1998 SERVICE MANUAL

SECOND EDITION

CHEVROLET PONTIAC

Camaro
Firebird

F
PLATFORM

VOLUME 1 OF 3
GMP/98-F-1F

1998 Chevrolet Camaro and Pontiac Firebird Service Manual

Volume 1

This manual provides information on the diagnosis, the service procedures, the adjustments, and the specifications for the 1998 Chevrolet Camaro and Pontiac Firebird. This is the second edition of the 1998 Chevrolet Camaro and Pontiac Firebird Service Manual. This manual contains new and updated information that will help you diagnose and service vehicles. If you are in the possession of the early edition of this manual GMP/98-F Volumes 1, 2, and 3 please DISCARD it because the information is outdated.

Information on transmission unit repair (overhaul) can be found in the 1998 Transmission/Transaxle/Transfer Case Unit Repair Manual (TURM), GMPT/98-TURM, available separately. The TURM manual contains information on automatic and manual transmissions, including the fluid flow and circuit description information.

The technicians who understand the material in this manual and in the appropriate Dealer Service Bulletins better serve the vehicle owners.

When this manual refers to a brand name, a part number, or a specific tool, you may use an equivalent product in place of the recommended item. All information, illustrations, and specifications in this manual are based on the latest product information available at the time of publication approval. General Motors reserves the right to make changes at any time without notice.

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Cautions and Notices

Definition of Caution, Notice, and Important

The diagnosis and repair procedures in the GM Service Manual contain both general and specific Cautions, Notices, and Importants. GM is dedicated to the presentation of service information that helps the technician to diagnose and repair the systems necessary for the proper operation of the vehicle, however, certain procedures may present a hazard to the technician if they are not followed in the recommended manner. Cautions, Notices, and Importants are elements designed to prevent these hazards, however, not all hazards can be foreseen. This information is placed at strategic locations within the service manual. This information is designed to prevent the following from occurring:

- Serious bodily injury to the technician
- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper repair or replacement of vehicle components. Any caution or notice that appears in general information is referenced from the individual service categories.

CAUTION Defined

When encountering a CAUTION, you will be asked to take a necessary action or not to take a prohibited action. If a CAUTION is not heeded, the following consequences may occur:

- Serious bodily injury to the technician
- Serious bodily injury to other technicians in the workplace area
- Serious bodily injury to the driver and/or passenger(s) of the vehicle, if the vehicle has been improperly repaired

NOTICE Defined

Notices call special attention to a necessary action or to a prohibited action. If a NOTICE is not heeded, the following consequences may occur:

- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary component replacement
- Improper operation or performance of the system or component under repair
- Damage to any systems or components which are dependent upon the proper operation of the system or component under repair
- Improper operation or performance of any systems or components which are dependent upon the proper operation or performance of the system or component under repair
- Damage to fasteners, basic tools, or special tools
- The leakage of coolant, lubricant, or other vital fluids

IMPORTANT Defined

IMPORTANT statements emphasize a necessary characteristic of a diagnostic or repair procedure. IMPORTANT statements are designed to do the following:

- Clarify a procedure
- Present additional information for accomplishing a procedure
- Give insight into the reason or reasons for performing a procedure in the manner recommended
- Present information that will help to accomplish a procedure in a more effective manner
- Present information that gives the technician the benefit of past experience in accomplishing a procedure with greater ease

ABS Handling Caution

Caution: Certain components in the Antilock Brake System (ABS) are not intended to be serviced individually. Attempting to remove or disconnect certain system components may result in personal injury and/or improper system operation. Only those components with approved removal and installation procedures should be serviced.

Battery Disconnect Caution

Caution: Before servicing any electrical component, the ignition key must be in the OFF or LOCK position and all electrical loads must be OFF, unless instructed otherwise in these procedures. If a tool or equipment could easily come in contact with a live exposed electrical terminal, also disconnect the negative battery cable. Failure to follow these precautions may cause personal injury and/or damage to the vehicle or its components.

Brake Dust Caution

Caution: Avoid taking the following actions when you service wheel brake parts:

- ***Do not grind brake linings.***
- ***Do not sand brake linings.***
- ***Do not clean wheel brake parts with a dry brush or with compressed air.***

Some models or aftermarket brake parts may contain asbestos fibers which can become airborne in dust. Breathing dust with asbestos fibers may cause serious bodily harm. Use a water-dampened cloth in order to remove any dust on brake parts. Equipment is available commercially in order to perform this washing function. These wet methods prevent fibers from becoming airborne.

Brake Fluid Caution

Caution: Brake fluid may be irritating to the skin or eyes. In case of contact, take the following actions:

- *Eye contact—rinse eyes thoroughly with water.*
- *Skin contact—wash skin with soap and water.*

Clutch Dust Caution

Caution: When servicing clutch parts, do not create dust by grinding or sanding the clutch disc or by cleaning parts with a dry brush or with compressed air. A water-dampened cloth—NOT SOAKED—should be used. The clutch disc contains asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm.

Electric Coolant Fan Caution

Caution: An electric fan under the hood can start up even when the engine is not running and can injure you. Keep hands, clothing and tools away from any underhood electric fan.

Fuel and EVAP Pipe Caution

Caution: In order to reduce the risk of fire and personal injury observe the following items:

- *Replace all nylon fuel pipes that are nicked, scratched or damaged during installation, do not attempt to repair the sections of the nylon fuel pipes*
- *Do not hammer directly on the fuel harness body clips when installing new fuel pipes. Damage to the nylon pipes may result in a fuel leak.*
- *Always cover nylon vapor pipes with a wet towel before using a torch near them. Also, never expose the vehicle to temperatures higher than 115°C (239°F) for more than one hour, or more than 90°C (194°F) for any extended period.*
- *Apply a few drops of clean engine oil to the male pipe ends before connecting fuel pipe fittings. This will ensure proper reconnection and prevent a possible fuel leak. (During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.)*

Fuel Gauge Leak Caution

Caution: Wrap a shop towel around the fuel pressure connection in order to reduce the risk of fire and personal injury. The towel will absorb any fuel leakage that occurs during the connection of the fuel pressure gauge. Place the towel in an approved container when the connection of the fuel pressure gauge is complete.

Fuel Pipe Fitting Caution

Caution: Always apply a few drops of clean engine oil to the male pipe ends before connecting fuel pipe fittings in order to reduce the risk of fire and personal injury.

This will ensure proper reconnection and prevent a possible fuel leak.

During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.

Fuel Storage Caution

Caution: Do not drain the fuel into an open container. Never store the fuel in an open container due to the possibility of a fire or an explosion.

Gasoline/Gasoline Vapors Caution

Caution: Gasoline or gasoline vapors are highly flammable. A fire could occur if an ignition source is present. Never drain or store gasoline or diesel fuel in an open container, due to the possibility of fire or explosion. Have a dry chemical (Class B) fire extinguisher nearby.

Lower O-Ring Removal Caution

Caution: Verify that the lower (small) O-ring of each injector does not remain in the lower manifold in order to reduce the risk of fire and personal injury.

If the O-ring is not removed with the injector, the replacement injector with new O-rings will not seat properly in the injector socket. Improper seating could cause a fuel leak.

Moving Parts and Hot Surfaces Caution

Caution: While working around a running engine, avoid contact with moving parts and hot surfaces to prevent possible bodily injury.

Relieving Fuel Pressure Caution

Caution: Relieve the fuel system pressure before servicing fuel system components in order to reduce the risk of fire and personal injury.

After relieving the system pressure, a small amount of fuel may be released when servicing the fuel lines or connections. In order to reduce the chance of personal injury, cover the regulator and the fuel line fittings with a shop towel before disconnecting. This will catch any fuel that may leak out. Place the towel in an approved container when the disconnection is complete.

Road Test Caution

Caution: Road test a vehicle under safe conditions and while obeying all traffic laws. Do not attempt any maneuvers that could jeopardize vehicle control. Failure to adhere to these precautions could lead to serious personal injury.

Safety Glasses and Compressed Air Caution

Caution: Wear safety glasses when using compressed air in order to prevent eye injury.

Safety Goggles and Fuel Caution

Caution: Always wear safety goggles when working with fuel in order to protect the eyes from fuel splash.

Seat Belt Replacement Caution

Caution: To help avoid personal injury from unrepaired crash damage to a restraint system:

- *Replace each seat belt system worn during a crash unless the crash was minor.*
- *Perform the seat belt check for each seat belt system. Replace the seat belt system if there is any doubt about the condition of system components.*

SIR Caution

Caution: This vehicle has a Supplemental Inflatable Restraint (SIR) System. Refer to SIR Component Views in order to determine whether you are performing service on or near the SIR components or the SIR wiring. When you are performing service on or near the SIR components or the SIR wiring, refer to Repair Instructions in SIR. Failure to follow the CAUTIONS could cause air bag deployment, personal injury, or unnecessary SIR system repairs.

SIR Handling Caution

Caution: When you are performing service on or near the SIR components or the SIR wiring, you must disable the SIR system. Refer to Disabling the SIR System. Failure to follow the correct procedure could cause air bag deployment, personal injury, or unnecessary SIR system repairs.

SIR Inflator Module Disposal Caution

Caution: In order to prevent accidental deployment of the air bag which could cause personal injury, do not dispose of an undeployed inflator module as normal shop waste. The undeployed inflator module contains substances that could cause severe illness or personal injury if the sealed container is damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to dispose of an inflator module as instructed may be a violation of federal, state, province, or local laws.

SIR Inflator Module Handling and Storage Caution

Caution: When you are carrying an undeployed inflator module:

- *Do not carry the inflator module by the wires or connector on the inflator module*
- *Make sure the bag opening points away from you*

When you are storing an undeployed inflator module, make sure the bag opening points away from the surface on which the inflator module rests. When you are storing a steering column, do not rest the column with the bag opening facing down and the column vertical. Provide free space for the air bag to expand in case of an accidental deployment. Otherwise, personal injury may result.

SIR Special Tool Caution

Caution: In order to avoid deploying the air bag when troubleshooting the SIR system, use only the equipment specified in this manual and the instructions given in this manual. Failure to use the specified equipment as instructed could cause air bag deployment, personal injury to you or someone else, or unnecessary SIR system repairs.

Vehicle Lifting Caution

Caution: To avoid any vehicle damage, serious personal injury or death when components are removed from the vehicle and the vehicle is supported by a hoist, perform the following steps:

- *Chain the vehicle to the hoist at the same end as the components that are being removed.*
- *Support the vehicle at the opposite end from which the components are being removed.*

Window Removal Caution

Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

Window Retention Caution

Caution: When replacing stationary windows, Urethane Adhesive Kit GM P/N 12346392, or a urethane adhesive system meeting GM Specification GM3651M, must be used to maintain original installation integrity. Failure to use the urethane adhesive kit will result in poor retention of the window which may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

Work Stall Test Caution

Caution: One or more of the following guidelines may apply when performing specific required tests in the work stall:

- ***When a test requires spinning the drive wheels with the vehicle jacked up, adhere to the following precautions:***
  - ***Do not exceed 56 km/h (35 mph) when spinning one drive wheel with the other drive wheel stopped. This limit is necessary because the speedometer indicates only one-half the actual vehicle speed under these conditions. Personal injury may result from excessive wheel spinning.***
  - ***If all of the drive wheels are spinning at the same speed, do not exceed 112 km/h (70 mph). Personal injury may result from excessive wheel spinning.***
  - ***All persons should stay clear of the rotating components and the balance weight areas in order to avoid possible personal injury.***
  - ***When running an engine in the repair stall for an extended period of time, use care not to overheat the engine and the transmission.***
- ***When a test requires jacking up the vehicle and running with the wheels and brake rotors removed, adhere to the following precautions:***
  - ***Support the suspension of all drive wheels at normal ride height.***
  - ***Do not apply the brake with the brake rotors removed.***
  - ***Do not place the transmission in PARK with the drive wheels still spinning.***
  - ***Turn Off the ignition in order to stop the powertrain components from spinning.***

Defective Scan Tool Notice

Notice: Do not use a scan tool that displays faulty data. Report the scan tool problem to the manufacturer. Use of a faulty scan tool can result in misdiagnosis and unnecessary parts replacement.

Fastener Notice

Notice: Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

Fuel Pressure Notice

Notice: Do not allow the fuel pressure to exceed the specified value because damage to the fuel pressure regulator or the fuel pressure gauge may result.

Handling ESD Sensitive Parts Notice

Notice: Electrostatic discharge (ESD) can damage many solid-state electrical components. ESD susceptible components may or may not be labeled with the ESD symbol. Handle all electrical components carefully. Use the following precautions in order to avoid ESD damage:

- Touch a metal ground point in order to remove your body's static charge before servicing any electronic component; especially after sliding across the vehicle seat.
- Do not touch exposed terminals. Terminals may connect to circuits susceptible the ESD damage.
- Do not allow tools to contact exposed terminals when servicing connectors.
- Do not remove components from their protective packaging until required to do so.
- Avoid the following actions unless required by the diagnostic procedure:
  - Jumpering or grounding of the components or connectors.
  - Connecting test equipment probes to components or connectors. Connect the ground lead first when using test probes.
- Ground the protective packaging of any component before opening. Do not rest solid-state components on metal workbenches, or on top of TVs, radios, or other electrical devices.

Handling IAC Valve Notice

Notice: If the IAC valve has been in service: DO NOT push or pull on the IAC valve pintle. The force required to move the pintle may damage the threads on the worm drive. Also, DO NOT soak the IAC valve in any liquid cleaner or solvent, as damage may result.

Ignition OFF When Disconnecting Battery Notice

Notice: Always turn the ignition OFF when connecting or disconnecting battery cables, battery chargers, or jumper cables. Failing to do so may damage the Powertrain Control Module (PCM) or other electronic components.

Latched DTC B1018, B1024 Notice (SDM-RSD)

Notice: When DTC B1018 or B1024 has been set it is necessary to replace the inflatable restraint Sensing and Diagnostic Module (SDM). Setting DTC B1018 or B1024 will also cause DTC B1071 to set. When a scan tool clear codes command is issued and the malfunction is no longer present, DTC B1018 or B1024 and DTC B1071 will remain current. Make sure that the short to ground condition is repaired prior to installing a replacement SDM to avoid damaging the SDM.

Nylon Fuel Lines Notice

Notice: Do not attempt to straighten any kinked nylon fuel lines. Replace any kinked nylon fuel feed or return pipes in order to prevent damage to the vehicle.

OBDII System Description Notice

Notice: The OBD II symbol is used on the circuit diagrams in order to alert the technician that the circuit is essential for proper OBD II emission control circuit operation. Any circuit which, if it fails causes the Malfunction Indicator Lamp (MIL) to turn on, is identified as an OBDII circuit.

PCM and ESD Notice

Notice: Do not touch the connector pins or soldered components on the circuit board in order to prevent possible electrostatic discharge (ESD) damage to the PCM.

Servicing and Replacing Seat Belts Notice

Notice: To prevent possible seat belt damage, refer to the following items before servicing or replacing lap and shoulder belts, including single loop belt systems:

- Lap and shoulder belts will be serviced as follows:
  - Replace only the part in question.
  - All belts need to be serviced as a set to assure the belt components are from the same supplier.
  - Do not intermix standard and deluxe belts on front or rear seats.
  - All attachment hardware must be replaced, not reused.
- Keep sharp edges and damaging objects away from belts.
- Avoid bending or damaging any portion of the belt buckle or latch plate.
- Do not bleach or dye belt or strap webbing. Clean with a mild soap solution and water.
- When installing lap or shoulder belt anchor bolts, start the bolts by hand to ensure that the bolts are threaded straight.
- Do not attempt repairs on lap or shoulder belt retractor mechanisms to lap belt retractor covers. Replace defective assemblies with new service replacement parts.
- Do not attempt to remove the seat belt retractor cover. The cover and the long rivet securing the cover to the retractor are not available as service replacement parts.

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General Information

Conversion - English/Metric

English	Multiply / Divide by	Metric
Length		
in	25.4	mm
ft	0.3048	m
yd	0.9144	
mi	1.609	km
Area		
sq in	645.2	sq mm
	6.45	sq cm
sq ft	0.0929	sq m
sq yd	0.8361	
Volume		
cu in	16,387.0	cu mm
	16.387	cu cm
	0.0164	L
qt	0.9464	
gal	3.7854	
cu yd	0.764	cu m
Mass		
lb	0.4536	kg
ton	907.18	
	0.907	tonne (t)
Force		
kg F	9.807	newtons (N)
oz F	0.2780	
lb F	4.448	
Acceleration		
ft/s^2	0.3048	m/s^2
in/s^2	0.0254	
Torque		
lb in	0.11296	N·m
lb ft	1.3558	
Power		
hp	0.745	kW
Pressure (Stress)		
inches of H2O	0.2488	kPa
lb/sq in	6.895	
Energy (Work)		
Btu	1055.0	J (J= one Ws)
lb ft	1.3558	
kW hour	3,600,000.0	
Light		
Foot Candle	10.764	lm/m^2
Velocity		
mph	1.6093	km/h

Conversion - English/Metric (cont'd)

English	Multiply / Divide by	Metric
Temperature		
(°F – 32)*5/9	=	°C
°F	=	(9/5 *°C + 32)
Fuel Performance		
235.215/mpg	=	100 km/L

Equivalents - Decimal and Metric

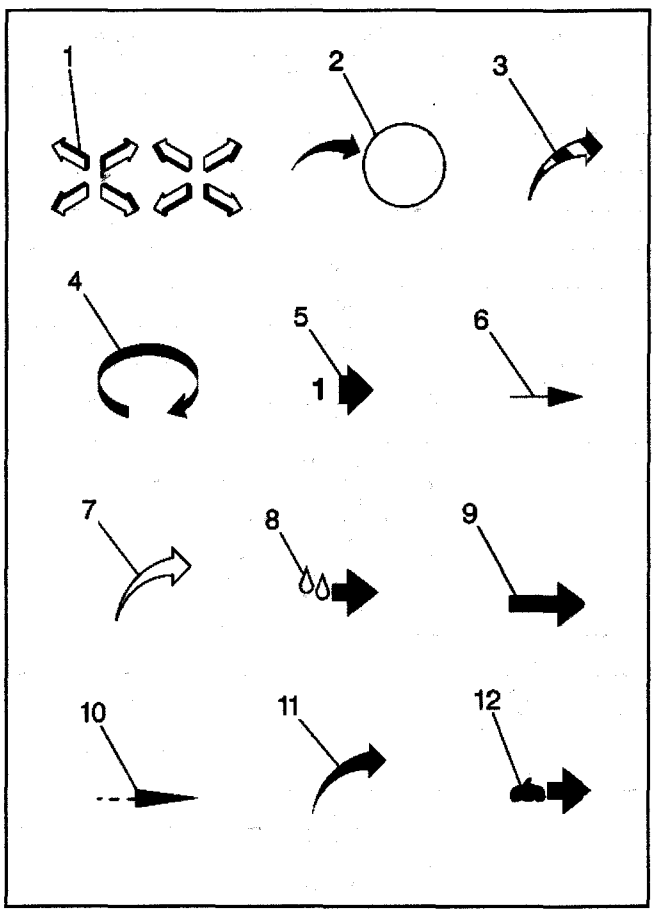
Fraction (in)	Decimal (in)	Metric (mm)
1/64	0.015625	0.39688
1/32	0.03125	0.79375
3/64	0.046875	1.19062
1/16	0.0625	1.5875
5/64	0.078125	1.98437
3/32	0.09375	2.38125
7/64	0.109375	2.77812
1/8	0.125	3.175
9/64	0.140625	3.57187
5/32	0.15625	3.96875
11/64	0.171875	4.36562
3/16	0.1875	4.7625
13/64	0.203125	5.15937
7/32	0.21875	5.55625
15/64	0.234375	5.95312
1/4	0.25	6.35
17/64	0.265625	6.74687
9/32	0.28125	7.14375
19/64	0.296875	7.54062
5/16	0.3125	7.9375
21/64	0.328125	8.33437
11/32	0.34375	8.73125
23/64	0.359375	9.12812
3/8	0.375	9.525
25/64	0.390625	9.92187
13/32	0.40625	10.31875
27/64	0.421875	10.71562
7/16	0.4375	11.1125
29/64	0.453125	11.50937
15/32	0.46875	11.90625
31/64	0.484375	12.30312
1/2	0.5	12.7
33/64	0.515625	13.09687
17/32	0.53125	13.49375
35/64	0.546875	13.89062
9/16	0.5625	14.2875
37/64	0.578125	14.68437
19/32	0.59375	15.08125

Equivalents - Decimal and Metric (cont'd)

Fraction (in)	Decimal (in)	Metric (mm)
39/64	0.609375	15.47812
5/8	0.625	15.875
41/64	0.640625	16.27187
21/32	0.65625	16.66875
43/64	0.671875	17.06562
11/16	0.6875	17.4625
45/64	0.703125	17.85937
23/32	0.71875	18.25625
47/64	0.734375	18.65312
3/4	0.75	19.05
49/64	0.765625	19.44687
25/32	0.78125	19.84375
51/64	0.796875	20.24062
13/16	0.8125	20.6375
53/64	0.828125	21.03437
27/32	0.84375	21.43125
55/64	0.859375	21.82812
7/8	0.875	22.225
57/64	0.890625	22.62187
29/32	0.90625	23.01875
59/64	0.921875	23.41562
15/16	0.9375	23.8125
61/64	0.953125	24.20937
31/32	0.96875	24.60625
63/64	0.984375	25.00312
1	1.0	25.4

Arrows and Symbols

This service manual uses various symbols in order to describe different service operations.



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Legend

(1) Front of Vehicle
(2) View Detail
(3) Ambient Air Mixed With Another Gas or Indicate Temperature Change
(4) Motion or Direction
(5) View Angle
(6) Dimension (1:2)
(7) Ambient/Clean Air Flow or Cool Air Flow
(8) Lubrication Point—Oil or Fluid
(9) Task Related
(10) Sectioning (1:3)
(11) Gas Other Than Ambient Air or Hot Air Flow
(12) Lubrication Point—Grease or Jelly

Special Tools Ordering Information

The special service tools shown in this service manual that have product numbers beginning with J or BT are available for worldwide distribution from:

OE Tool and Equipment Group
Kent-Moore
28635 Mound Road
Warren, MI, U.S.A. 48092–3499
Phone: 1–800–345–2233 or 810–574–2332
Monday through Friday
8:00 a.m.–7:00 p.m. Eastern Standard Time
Fax: 1–800–578–7375 or 810–578–7321

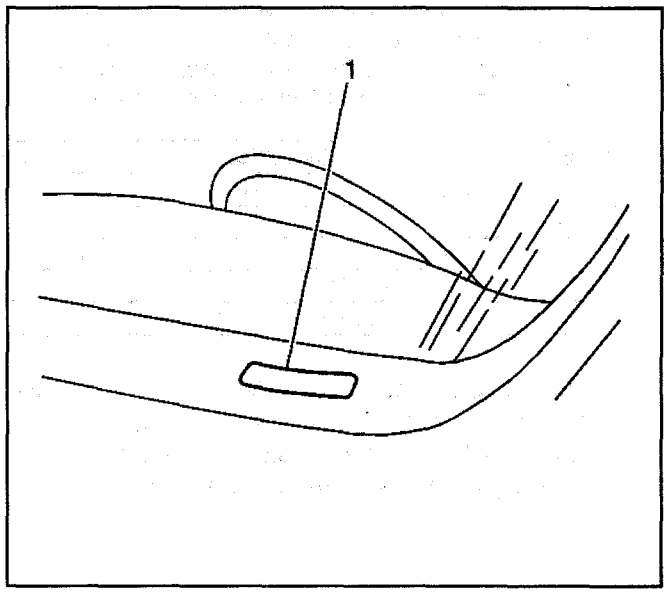
The TECH 2® scan tool and accessories can be purchased through:

Dealer Equipment and Services
5775 Enterprise Dr.
Warren, MI, U.S.A. 48092–3463
Phone: 1–800–GM-TOOLS or 810–574–2332
Monday through Friday
8:00 a.m.–6:00 p.m. EST
Fax: 1–810–578–7205

Diagnostic Work Sheets

The GM Diagnostic Worksheet has been designed to improve communications between the service customer and the technician. The diagnostic worksheet can provide the technician with more information than the conventional repair order, since it is filled out by the service customer. The GM Diagnostic Worksheets are available to you at no cost. GM Service Bulletin 58-01-01 has information on how to order this diagnostic worksheet.

Vehicle Identification



65474

Legend

(1) Vehicle Identification Number Plate Location

The vehicle identification number (VIN) plate is the legal identifier of the vehicle. The VIN plate is located on the upper LH corner of the instrument panel (I/P) and can be seen through the windshield from the outside of the vehicle.

The last five digits of the assembly plant sequential number are stamped onto the rear side of the front sill (tie bar). This number is the same as the last five digits on the VIN plate. The VIN plate also has bar code characteristics.

Vehicle Identification Number (VIN) System

Position	Definition	Character	Description
1	Country of Origin	1	United States
2	Manufacturer	G	General Motors
3	Division	1	Chevrolet
4–5	Carline/Series	YY	Corvette
6	Body Type	2	Two Door Hatchback/Liftback (GM Style 07)
		3	Two Door Convertible (GM Style 67)
7	Restraint System	2	Active (Manual) Belts with Driver and Passenger Inflatable Restraint System
8	Engine	G	RPO LS1, V8, 5.7L, SFI, United States Production, Mid/Lux Division
9	Check Digit	—	—
10	Model Year	W	1998
11	Assembly Plant	5	Bowling Green
12–17	Plant Sequence Number	—	—

VIN Derivative

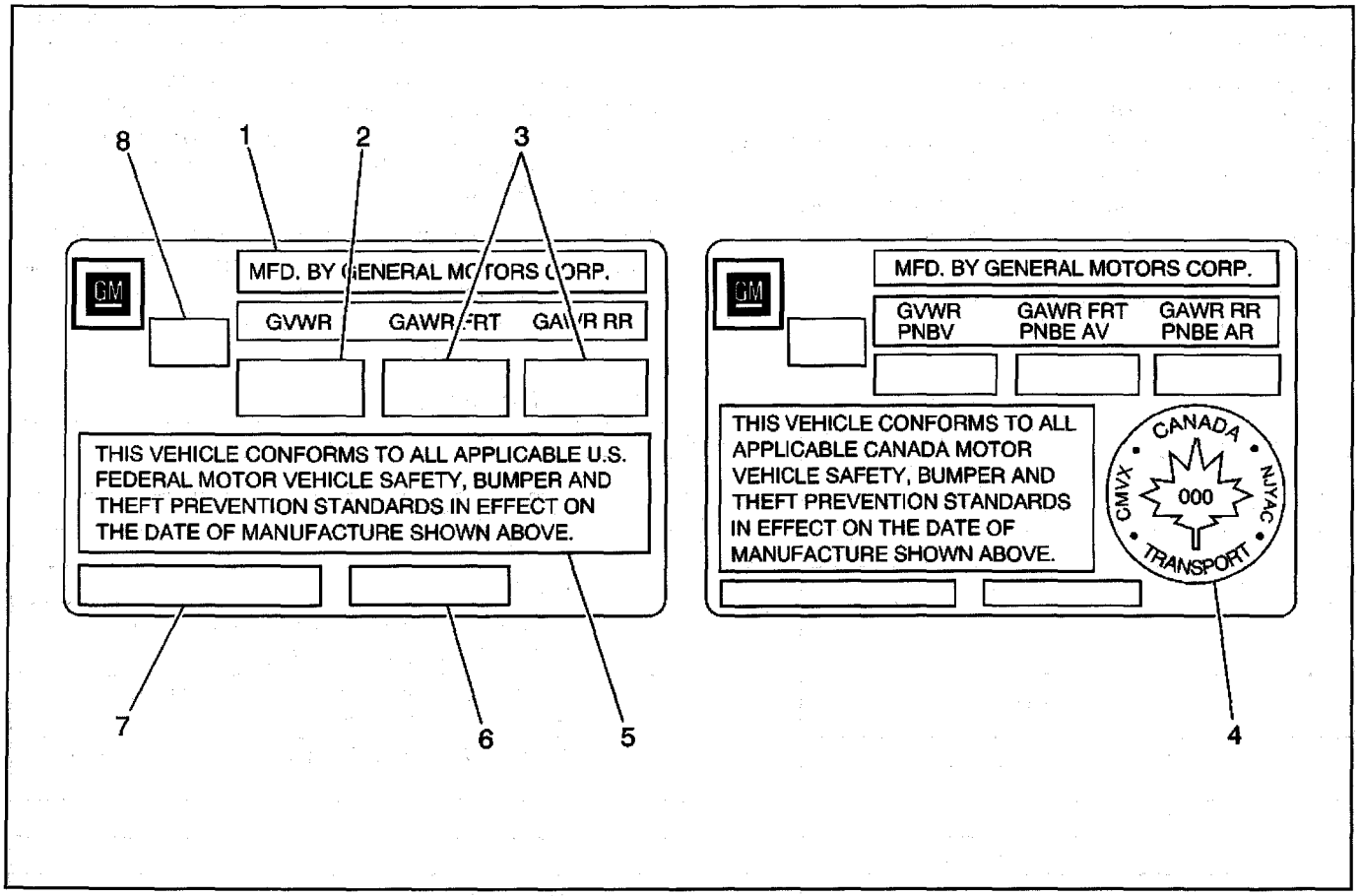
All engines and transmissions are stamped or laser etched with a partial vehicle identification number (VIN), which was derived from the complete VIN. A VIN derivative contains the following nine positions:

Position	Definition	Character	Description
1	GM Division Identifier	1	Chevrolet
—	—	2	Pontiac
2	Model Year	W	1998
3	Assembly Plant	2	St. Therese
4–9	Plant Sequence Number	—	—

A VIN derivative can be used to determine if a vehicle contains the original engine or transmission, by matching the VIN derivative positions to their accompanying positions in the complete VIN:

VIN Derivative Position	Equivalent VIN Position
1	3
2	10
3	11
4–9	12–17

Label - Vehicle Certification



65484

The vehicle certification label displays the following assessments:

- The Gross Vehicle Weight Rating (GVWR)
- The Gross Axle Weight Rating (GAWR)
- The vehicle's payload rating
- The original equipment tire sizes and the recommended tire pressures

Gross vehicle weight (GVW) is the weight of the vehicle and everything it carries. Include the following items when figuring the GVW:

- The base vehicle weight (factory weight)
- The weight of all vehicle accessories, like the winches or the plows
- The weight of the driver and the passengers
- The weight of the cargo

The gross vehicle weight must not exceed the Gross Vehicle Weight Rating.

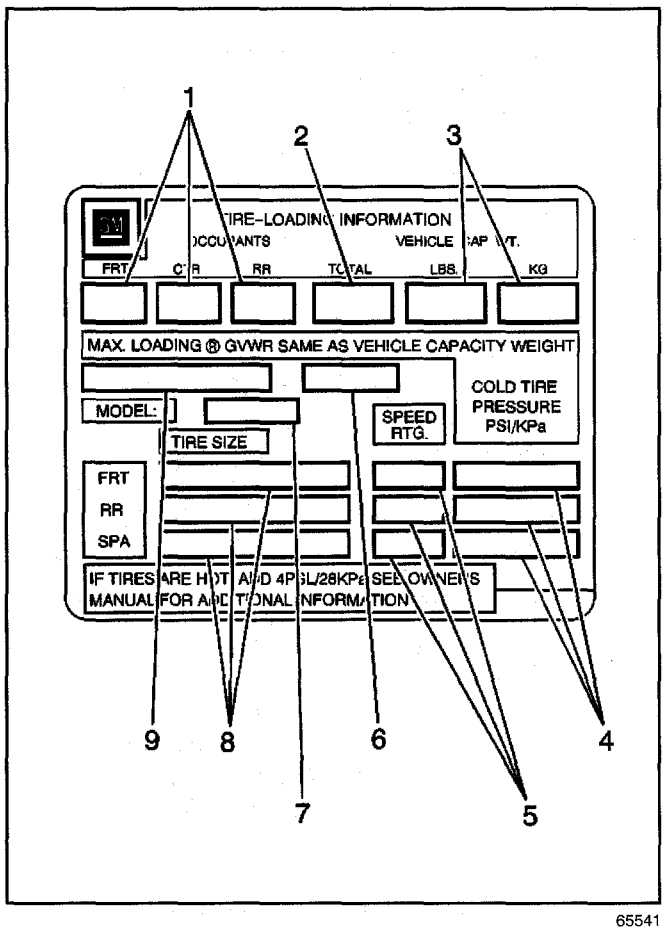
The front gross axle weight (GAW) is the weight exerted on the front axle. The rear gross axle weight (GAW) is the weight exerted on the rear axle. The front and rear gross axle weights must not exceed the front and rear gross axle weight ratings.

The payload rating defines the vehicle's maximum allowable cargo load. The cargo load includes the driver and the passengers. The payload rating is based on the vehicle's factory installed equipment. Deduct from the payload rating the weight of accessories added to the vehicle after the final date of manufacture.

The vehicle may have a Gross Combination Weight Rating (GCWR). The Gross Combination Weight Rating refers to the total maximum weight of the loaded tow vehicle (including driver and passengers) and a loaded trailer.

The vehicle's tires must be the proper size and properly inflated for the load the vehicle is carrying. For more information on tires, refer to *Tire Inflation Pressure Specifications*

Tire Placard



65541

Legend

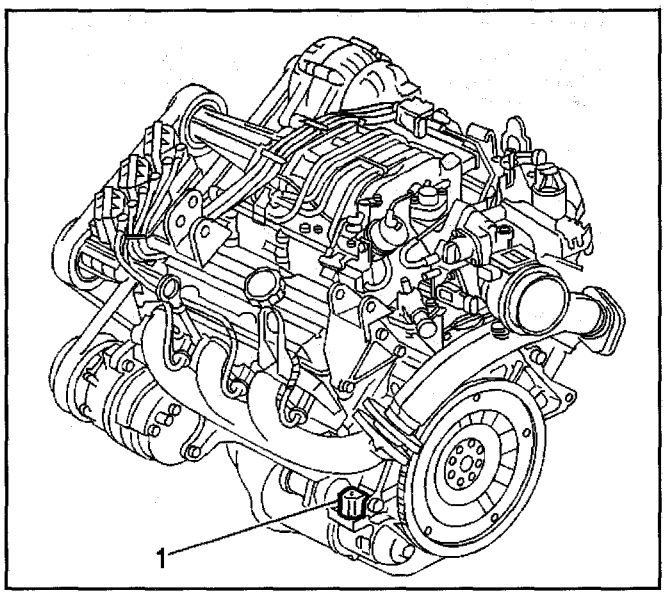
(1) Specified Occupant Seating Positions
(2) Total Occupant Seating
(3) Maximum Vehicle Capacity Weight
(4) Tire Pressures, Front, Rear, and Spare
(5) Tire Speed Rating, Front, Rear, and Spare
(6) Tire Label Code
(7) Engineering Model Minus First Character
(8) Tire Sizes, Front, Rear, and Spare
(9) Vehicle Identification Number

The Tire Placard is permanently located on the edge of the driver's door. Refer to the placard in order to obtain the following information:

- The maximum vehicle capacity weight
- The cold tire inflation pressures
- The tire sizes (original equipment tires)
- The tire speed ratings (original equipment tires)

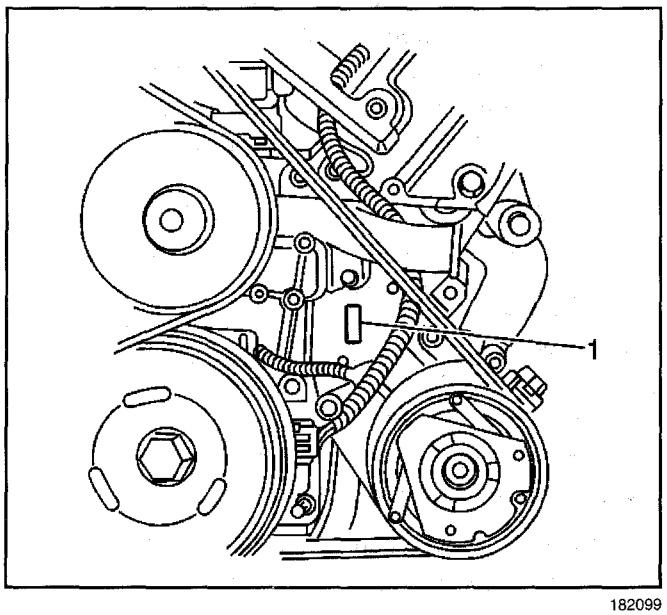
Engine ID and VIN Derivative Location (L36 V-6 I.D. Location)

The eighth character in the Vehicle Identification Number (VIN) identifies the engine. Adhesive-backed labels attached to the engine, laser etching or stampings on the engine block indicate the engine unit number/date code. All engines are stamped with a VIN derivative. For added information on VIN derivative, refer to *VIN Derivative*



182087

The primary location of the VIN derivative for the 3800 engine is above the starter motor on the engine block (1).

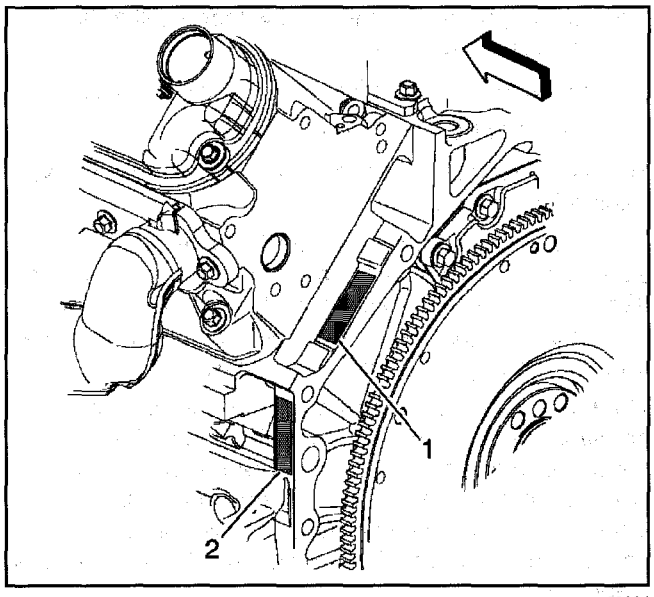


182099

The secondary location of the VIN derivative for the 3800 engine is below the water pump on the engine block (1).

Engine ID and VIN Derivative Location (LS1 V-8 I.D. Location)

Engine ID Number Locations



63234

Legend

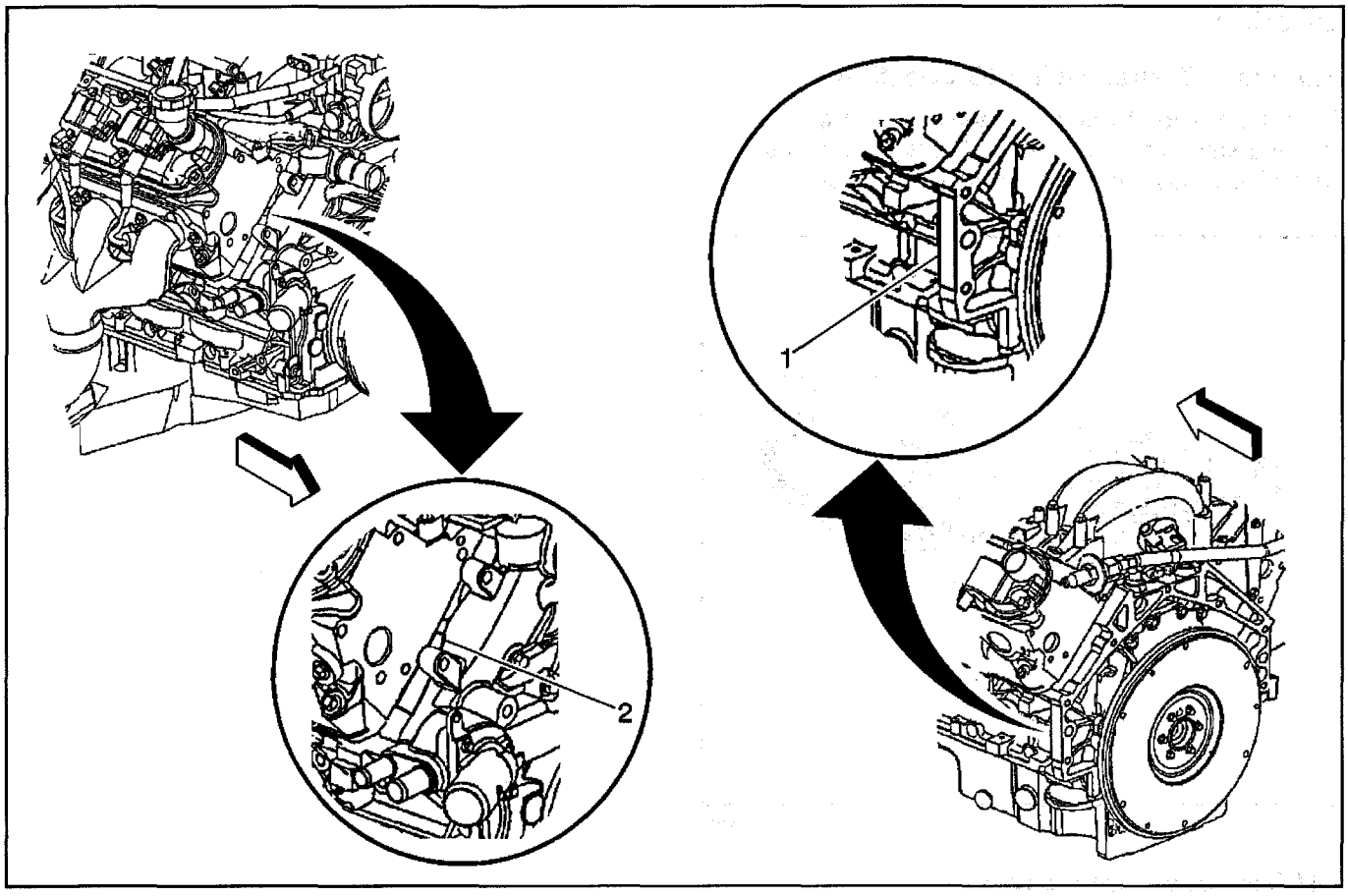
(1) Engine ID Number, Primary Location
(2) Engine ID Number, Secondary Location

The eighth digit of the vehicle identification number (VIN) is the engine code letter, which identifies the engine as a 5.7L V8 (VIN eighth digit: G) (RPO code LS1).

Stick-on labels attached to the engine, laser etching, or stampings in the engine block indicate the engine unit number/build date code.

The engine ID number will be located in either the primary or the secondary location, as shown.

Engine VIN Derivative Locations



171897

Legend

(1) VIN Derivative, Primary Location

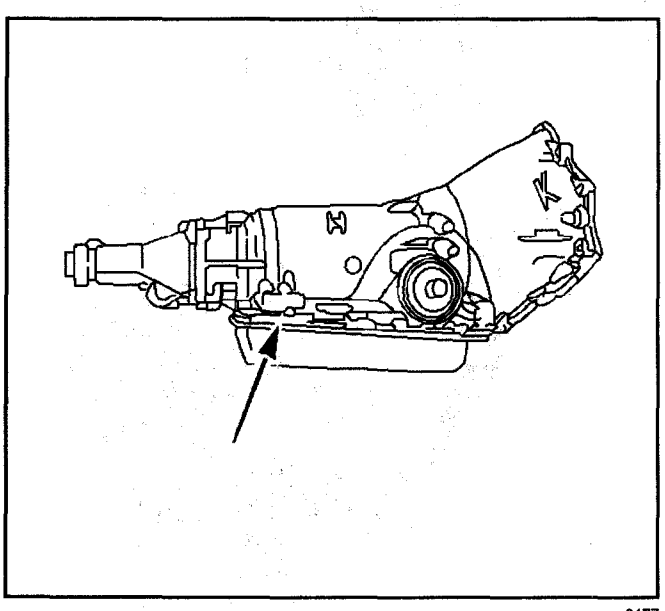
(2) VIN Derivative, Secondary Location

The engine is also stamped with a VIN derivative which will be located in either the primary or secondary location, as shown. For additional information, refer to *Fuel Tank Replacement (Right w/Manual Trans)*

Transmission ID and VIN Derivative Location

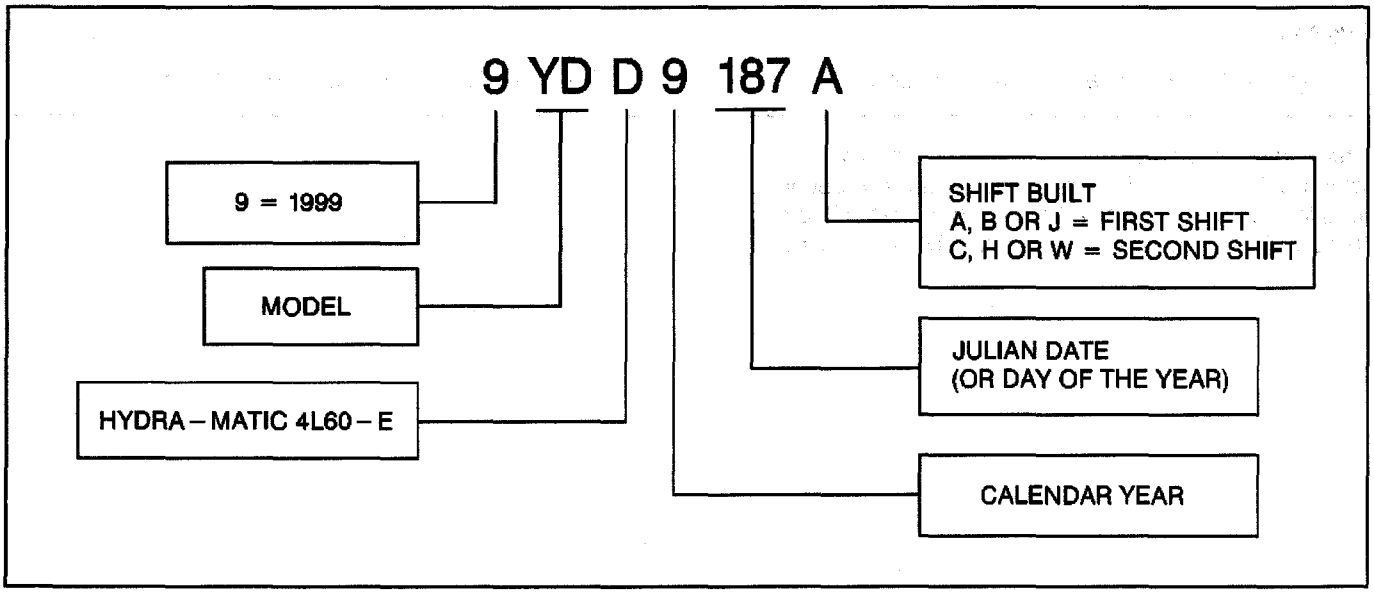
Automatic Transmission ID Location

The transmission ID and VIN derivative for the M30 transmission is located on the right side of the transmission just above the transmission pan.



6477

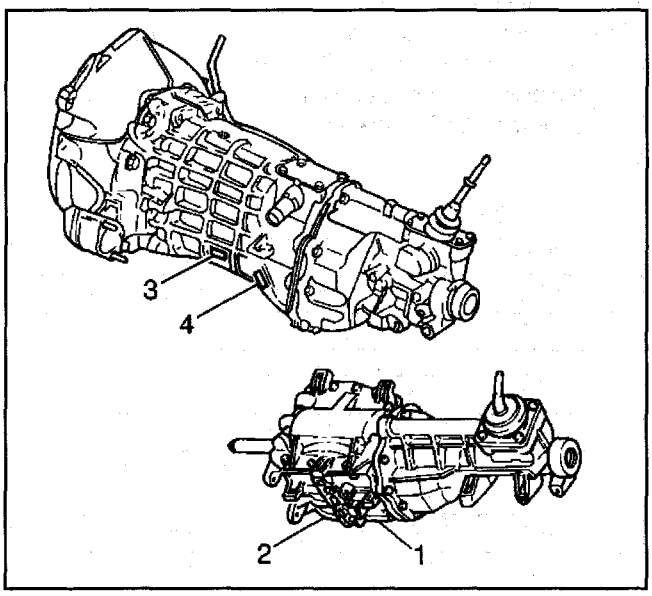
VIN Derivative Breakdown



174101

This graphic depicts the breakdown of the VIN derivative.

Manual Transmission ID Location



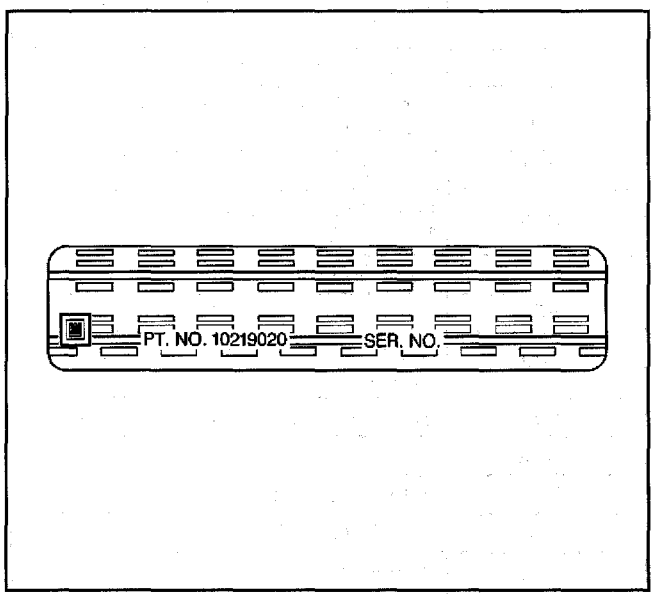
255753

The transmission model identification is located on a label or tag on the transmission case. If this label is missing or unreadable, use the service parts identification label in order to identify the vehicle's transmission.

Transmission Usage

Body Type	Car Line (Division)	Engine Size	Fuel System	Engine RPO	Automatic Transmission Used	Manual Transmission Used
F	CAMARO (CHEVROLET)	5.7L V8	SFI	LS1	4L60-E (M30)	T56 (MM6)
F	CAMARO (CHEVROLET)	3.8L V6	SFI	L36	4L60-E (M30)	T-5 (M49)
F	FIREBIRD (PONTIAC)	5.7L V8	SFI	LS1	4L60-E (M30)	T56 (MM6)
F	FIREBIRD (PONTIAC)	3.8L V6	SFI	L36	4L60-E (M30)	T-5 (M49)

Labeling - Anti-Theft

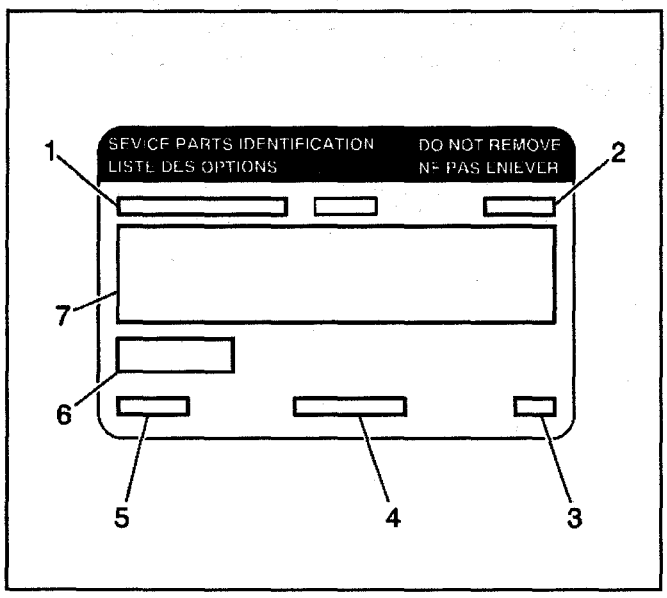


175291

Federal law requires that General Motors label certain body parts on this vehicle with the VIN. The purpose of the law is to reduce the number of motor vehicle thefts by helping in the tracing and recovering of parts from stolen vehicles.

The labels are permanently affixed to an interior surface of the part. The label on a replacement part contains the letter R, the manufacturer's logo, and the DOT symbol.

Label - Service Parts ID



65485

Legend

(1) Vehicle Identification Number
(2) Engineering Model Number (Vehicle Division, Vehicle Line and Body Style)
(3) Interior Trim and Decor Level
(4) Exterior (Paint Color) WA Number
(5) Paint Technology
(6) Special Order Paint Colors and Numbers
(7) Vehicle Option Content

The Service Parts Identification Label aids the service personnel in identifying the parts and options originally installed on the vehicle.

RPO Code List

The production/process codes provide the description of the Regular Production Options (RPOs) used on the Camaro and Firebird. The RPO list is printed on the Service Parts Identification Label. The following is a list of the RPO abbreviations and the description of each:

Camaro/Firebird RPO Table

RPO	Description
AG1	Driver Front Seat Power Adjuster
AH3	Front Seat Manual 4-Way Adjuster
AK5	Inflatable Restraint System Driver and Passenger
AN4	Restraint Provisions Child
AQ9	Front Seat Driver and Passenger Recline
AR9	Front Bucket Seat Deluxe
AU0	Remote Entry Lock Control
AU3	Side Door Elec Lock Control
AX4	Restraint Conversion Seat Manual European
A31	Window Power Operated, Side
A90	Lock Control RR Compt Lid Remote Elec Release
B35	Covering Rear Floor Mats
B4C	Sales Special Service PKG (Police)
B84	Molding B/S Exterior
CC1	Roof Hatch Removable Panels, Glass
C49	RR Window Defogger Electric
C60	HVAC System AC Man Controls
DD9	Mirror O/S LH & RH Remote Control Electric Color
DE4	Sunshade Removeable Hatch Roof
DG7	Mirror O/S LH & RH Remote Control Electric Color
D21	Sunshade Windshield
D35	Mirror O/S LH Remote Control RH Manual, Color
D82	Paint Special
FE2	Suspension System Ride Handling
FE4	Suspension System Special Ride and Handling
FE7	Suspension System Frt & RR HD
GU2	Axle Ratio 2.73
GU4	Axle Ratio 3.08
GU5	Axle Ratio 3.23
GU6	Axle Rear 3.42
G80	Axle Positraction
J65	Brake System PWR FRT & RR Disc
K05	Heater Eng Block
K29	Module Powertrain Control
K34	Cruise Control Automatic

Camaro/Firebird RPO Table (cont'd)

RPO	Description
K68	Generator 105 Amp
LS1	Engine Gas V8 5.7L SFI Aluminum
L36	Engine Gas 6 Cyl 3.8L MFI V6 HO
M49	Transmission Manual 5 Speed OD
MM6	Transmission Manual 6 Speed OD
M30	Transmission Auto 4 Spd Electronic
NK3	Steering Wheel Sport Soft Rim Simulated Leather
NP5	Steering Wheel Leather Wrapped
NP7	Steering Column EEC Approved
NW9	Traction Control Electronic
N36	Steering Wheel 4 Spokes Sport
N60	Wheel Aluminum Painted
N66	Wheel Styled Aluminum
N73	Wheel Custom Sport Var4
N92	Cover Wheel Bolt On
N96	Wheel 16 X 8 Cast Aluminum
N98	Wheel Chrome
PA6	Wheel Styled Painted
P05	Wheel Chrome
QB3	Wheel 16 X 7.5 Steel
QCB	Tire All P235/55r16 BW
QEA	Tire All P215/60R16 BW
QFK	Tire All P275/40R17 BW
QFZ	Tire All P245/50R16 BW
QLC	Tire All P245/50R16 BW
TR7	Headlamps Control Leveling System Automatic
T1G	Vehicle Military Personnel
T37	Lamp Fog Deluxe
T39	Lamp Turn Signal Aux
T43	Spoiler, RR
T62	Lighting Daytime Running Delete
T65	Lighting Daytime Running Export
T78	Headlamp Control Delete
T79	Lamp Fog RR
T82	Headlamp Control Automatic ON-OFF
T84	Headlamps RH Rule of Road
T85	Headlamps LH Rule of the Road
T89	Lamp Tail & Stop Export
T96	Lamp Fog
UA6	Theft Deterrent Sys
UB3	Cluster Inst Oil Cool Temp Volts Trip Odom Tach
UC2	Speedometer Inst Kilo Positive Bias
UK3	Electronic System Steering Wheel Acc Controls
UL0	Radio AM/FM Stereo Auto Rev Music Srch Cass, Clock, ETR

Camaro/Firebird RPO Table (cont'd)

RPO	Description
UM6	Radio, AM/FM Stereo Auto Rev Cass Clock, ETR
UN0	Radio AM/FM Stereo Compact Disc Auto Tone Clock
UQ0	Speaker Sys 4 Dual Frt Dr Mtd Dual STD RGE Qtr/Shelf
UW3	Radio AM/FM Stereo Auto Rev Music Search Cass Data Sys
UZ7	Speaker System 8 Quat Frt Dr Mtd Dual RR Hatch Amplifier
U1S	Player Multiple Compact Disc
U62	Speaker System 4 Dual Coax Frt Dual Coax PKG Shelf
U73	Antenna Fixed Radio
U75	Antenna Power Radio
VK3	License Plate Frt Mounting Pkg
VL4	License Plate RR Mounting Pkg
V12	Cooling System Power Steering
V76	Hook Tow
WS6	Performance Package Special
WS9	Model Conversion Formula
WU6	Sales Package Firehawk Upfitter
WU8	Sales Package Z28 SS
W52	Entertainment System Option B
W53	Entertainment System Option C
W54	Entertainment System Option D
W55	Entertainment System Option E
W59	Entertainment System Option I
W66	Merchandised Pkg Formula
W68	Sales Package Firebird Upfitter
W73	Entertainment System Option J
Y3F	Sales Package RS Camaro
Y81	Merchandised PKG Firebird
Y82	Merchandised PKG Trans Am
Y84	Merchandised Pkg Trans Am GTA
Y87	Merchandised Pkg Performance Enhancement
Z5X	Mirror Provisions Arabic Language
01U	Primary Color Exterior Special
1LE	Performance Package Component Special
1OI	Interior Trim Artic White
10Q	Molding Color Artic White
10U	Primary Color Exterior Artic White
1O2	Trim Combination Leather Artic White
14B	Trim Combination Cloth Dk Grey
14D	Trim Combination Cloth Dk Grey
144I	Interior Trim Very Dark Gray
144	Trim Combination Leather Dk Gray
28Q	Molding Color Navy Blue Met

Camaro/Firebird RPO Table (cont'd)

RPO	Description
28U	Primary Color Exterior, Navy Blue Met
31Q	Molding Color Bright Green
31U	Primary Color Exterior Bright Green
41Q	Molding Color Black
41T	Top Color Black
41U	Primary Color Exterior Black
52B	Trim Combination Cloth Lt Neutral
52D	Trim Combination Cloth LT Neutral
52I	Interior Trim Med Neutral
522	Trim Combination Leather Lt Neutral
523	Trim Combination Leather Med Neutral II
524	Trim Combination Leather Med Neutral
56T	Top Color Med Dk Neutral
73B	Trim Combination Cloth Flame Red
73I	Interior Trim Flame Red
79Q	Molding Color Mystic Teal
79U	Primary Color Exterior Mystic Teal
81Q	Molding Color Bright Red
81U	Primary Color Exterior Bright Red
88Q	Molding Color Bright Purple
88U	Primary Color Exterior Bright Purple
92B	Trim Combination Cloth Med Pewter
92I	Interior Trim Pewter
96Q	Molding Color Cayenne Red
96U	Primary Color Exterior Cayenne Red Met

Labels - How to Obtain Replacement

Obtain replacements for the following labels through the GM Service Parts Operations:

- The vehicle emission control information (exhaust emission tune-up) label
- The spare wheel caution label
- The jacking label
- The serpentine belt routing label
- The engine fan caution label
- The spare tire storage label

The following labels are not available as service parts:

- The vehicle certification label
- The tire pressure placard
- The service parts identification label

Fasteners

Metric Fasteners

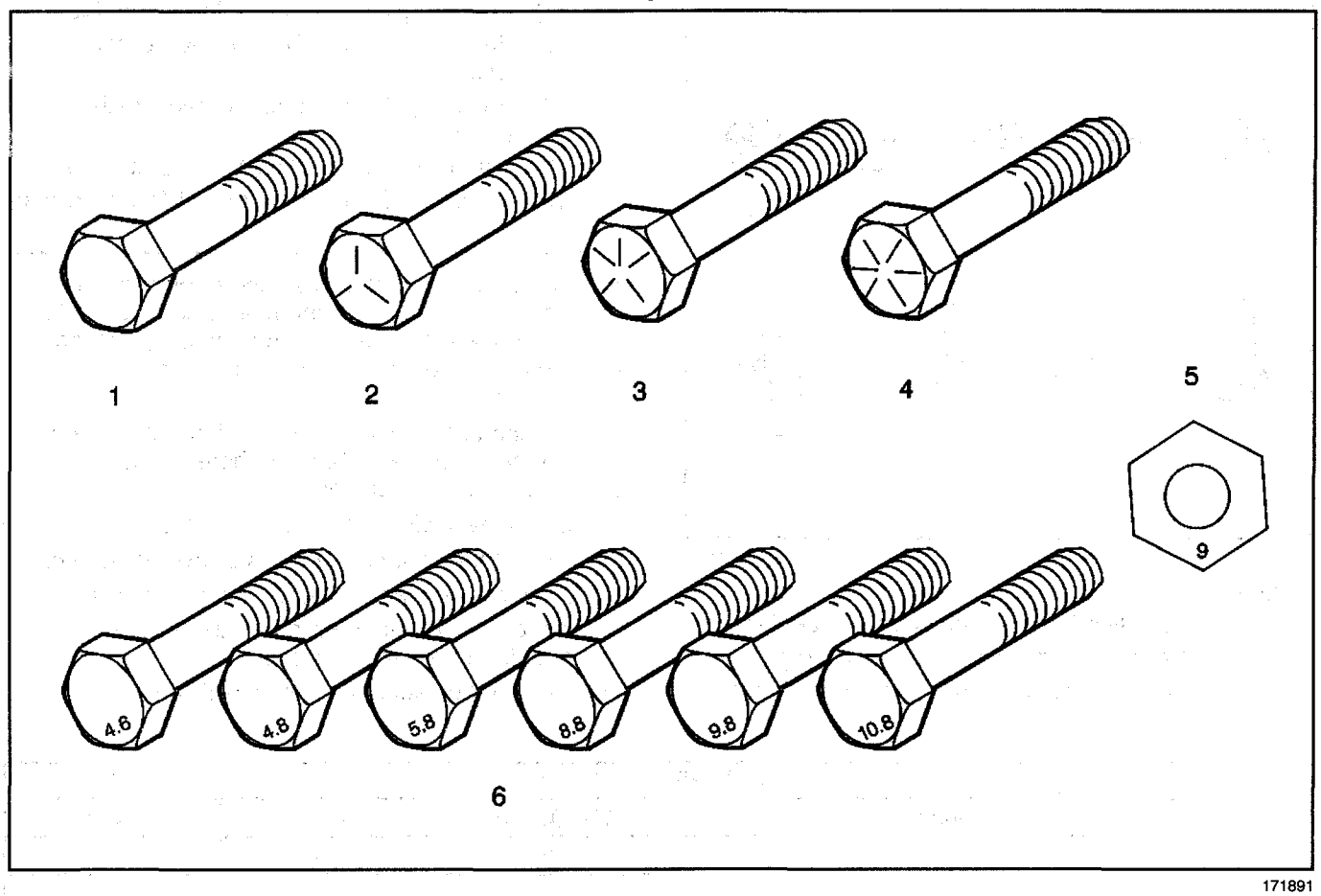
This vehicle is dimensioned in the metric system. Most metric fasteners are very close in diameter to well known fasteners in the English (inch) system. Replace fasteners with those of the same nominal diameter, thread pitch, and strength.

A number marking identifies the OE metric fasteners (except cross-recess head screws). The number also indicates the strength of the fastener material. A Posidriv® or Type 1A cross-recess identifies a metric cross-recess screw. For best results, use a Type 1A cross-recess screwdriver, or equivalent, in Posidriv® recess head screws.

GM Engineering Standards and North American Industries have adopted a portion of the ISO-defined standard metric fastener sizes. The purpose was to reduce the number of fastener sizes used while retaining the best thread qualities in each thread size. For example, the metric M6.0 X 1 screw, with nearly the same diameter and 25.4 threads per inch replaced the English 1/4–20 and 1/4–28 screws. The thread pitch is midway between the English coarse and fine thread pitches.

Fastener Strength Identification

Fastener Strength Identification



171891

Legend

(1) English Bolt, Grade 2 (Strength Class)
(2) English Bolt, Grade 5 (Strength Class)
(3) English Bolt, Grade 7 (Strength Class)
(4) English Bolt, Grade 8 (Strength Class)
(5) Metric Nut, Strength Class 9
(6) Metric Bolts, Strength Class Increases as Numbers Increase

The most commonly used metric fastener strength property classes are 9.8 and 10.9. The class identification is embossed on the head of each bolt. The English (inch) strength classes range from grade 2 to grade 8. Radial lines are embossed on the head of each bolt to identify the strength class. The number of lines on the head of the bolt is two lines less than the actual grade. For example, a grade 8 bolt will have 6 radial lines on the bolt head. Some metric nuts are marked with a single digit strength identification number on the nut face.

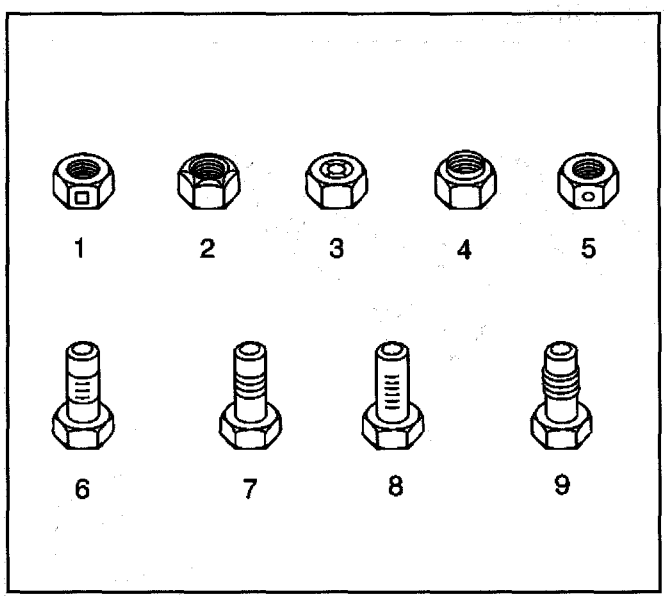
The correct fasteners are available through GM SPO. Many metric fasteners available in the aftermarket parts channels were designed to metric standards of countries other than the United States, and may exhibit the following defects:

- Lower strength
- No numbered head marking system
- Wrong thread pitch

The metric fasteners on GM products are designed to new, international standards. Following are the common sizes and pitches, except for special applications:

- M6.0 X 1
- M8 X 1.25
- M10 X 1.5
- M12 X 1.75

Prevailing Torque Fasteners



171892

Legend

(1) Prevailing Torque Nut, Center Lock Type
(2) Prevailing Torque Nut, Top Lock Type
(3) Prevailing Torque Nut, Nylon Patch Type
(4) Prevailing Torque Nut, Nylon Washer Insert Type
(5) Prevailing Torque Nut, Nylon Insert Type
(6) Prevailing Torque Bolt, Dry Adhesive Coating Type
(7) Prevailing Torque Bolt, Thread Profile Deformed Type
(8) Prevailing Torque Bolt, Nylon Strip Type
(9) Prevailing Torque Bolt, Out-of-Round Thread Area Type

A prevailing torque nut is designed to develop an interface between the nut and bolt threads. Distortion of the top of a metal nut or using a nylon patch on the threads in the middle of the hex flat causes that interface.

A prevailing torque bolt/nut that is clean and free of rust can be reused as follows. If there is any doubt, replace the fastener:

1. Clean away all dirt or foreign material.
2. Inspect the fastener for signs of overtightening.
3. Handstart the fastener at the original location.
4. Inspect the fastener for torque development, referring to the table below.
5. Tighten the fastener within specifications.

Metric-Size Fasteners			
Component	**Size (in mm)**	**N·m**	**Lb in**
Nuts and All Metal Bolts/Screws	6	0.4	4
	6.3	0.4	4
	8	0.6	7
	10	1.4	12
	12	2.2	18
	14	3.0	27
	16	4.2	37
	20	7.0	82
Adhesive or Nylon Coated Bolts/Screws	6	0.4	4
	6.3	0.4	4
	8	0.6	5
	10	1.2	11
	12	1.6	14
	14	2.4	21
	16	3.4	30
	20	5.6	50

English-Size Fasteners			
Component	Size (in inches)	N·m	Lb in
Nuts and All Metal Bolts/Screws	0.250	0.4	4
	0.312	0.6	5
	0.375	1.4	12
	0.437	1.6	16
	0.500	2.4	21
	0.562	3.2	28
	0.625	4.2	37
	0.750	7.0	62
Adhesive or Nylon Coated Bolts/Screws	0.250	0.4	4
	0.312	0.6	5
	0.375	1.0	9
	0.437	1.4	12
	0.500	1.8	16
	0.562	2.6	23
	0.625	3.4	30
	0.750	5.2	49

Thread Inserts

Repair Procedure

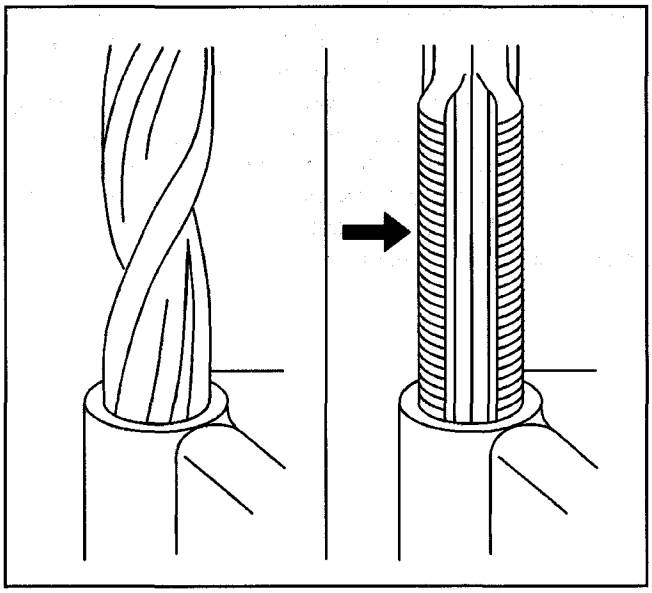
Tools Required

General purpose thread repair kits. These kits are available commercially.

Caution: Wear safety glasses in order to avoid eye damage.

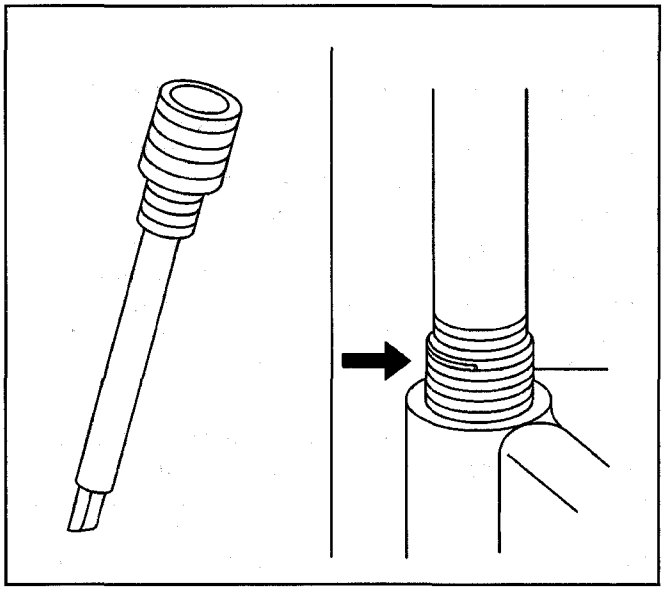
Important: Refer to the thread repair kit manufacturer's instructions regarding the size of the drill and tap to use.

Avoid any buildup of chips. Back out the tap every few turns and remove the chips.



4962

1. Determine the size, the pitch, and the depth of the damaged thread. If necessary, adjust the stop collars on the cutting tool and tap to the required depth.
2. Drill out the damaged threads. Clean out any chips.
3. Lubricate the tap with light engine oil. Tap the hole. Clean the threads.



4963

4. Thread the thread insert onto the mandrel of the installer. Engage the tang of the insert onto the end of the mandrel.

Important: The insert should be flush to one turn below the surface.

5. Lubricate the insert with light engine oil (except when installing in aluminum) and install the insert.
6. If the tang of the insert does not break off when backing out the installer, break the tang off with a drift.

Torque Wrenches

Torque Defined

Torque is defined as the measurement of resistance to turning or rotating. Torque, often called torsional or twisting movement, tends to twist a body about an axis of rotation. A typical application is the tightening of a screw.

Torque applied in tightening a common bolt, nut, or screw is expended in three areas:

- The head
- Bearing surface
- Clamp load

Clamp Load

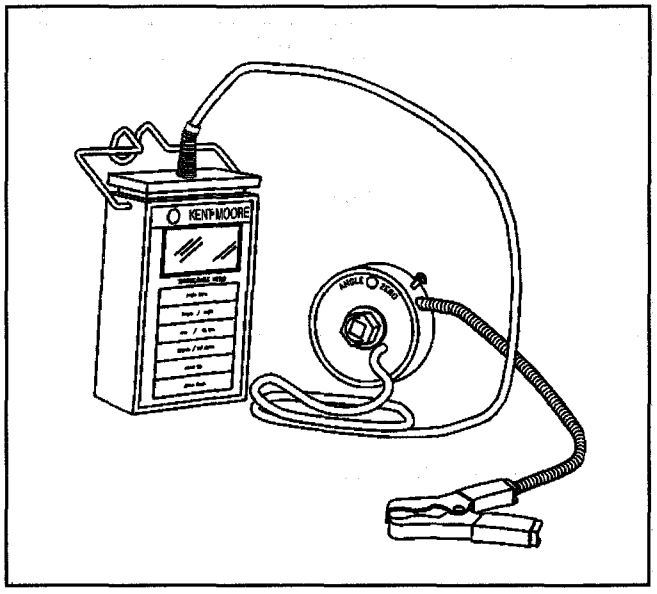
About 50 percent of applied torque is used in overcoming bearing friction. This is the friction between the bearing surface of the bolt head, screw head or nut face, and the base material or washer (the surface the fastener is rotating on). Approximately 40 percent of the applied torque is used in overcoming thread friction. This leaves only about 10 percent of the applied torque to develop useful clamp load. Clamp load is the force that holds a joint together. Friction can account for as much as 90 percent of the applied torque on a fastener.

Torque Techniques

The frictional characteristics of each fastener or threaded hole can vary under a variety of circumstances. For example, consider a joint that has 10 bolts. If all 10 fasteners were torqued to 20 N·m and the clamp load is measured, all 10 bolts would most likely have different clamp load readings. Even though all 10 bolts are torqued at 20 N·m, it is not guaranteed that they have all reached the same clamp load. A rule of thumb is that the clamp load can vary ± 25 percent using torque control for joint assembly.

At times, critical applications such as cylinder head bolts require very tight tolerances for clamp load distribution. If torque is not considered to be accurate enough for these critical joints, an alternative method of tightening called TORQUE ANGLE may be used.

Torque Angle Method



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Torque angle is required for critical joints because it can help eliminate frictional variations in the joint. The following are the general steps used for the torque angle method:

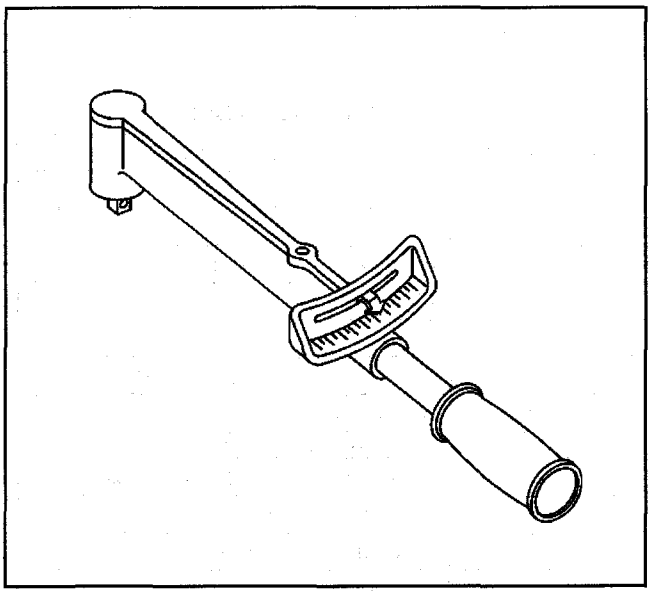
1. Tighten to a predetermined seating torque to remove any compliance out of the joint.
2. Turn the fastener to a specified angle of rotation. Use the Torque Angle Meter *J 36660.*

This is the only acceptable general method for measuring this angle of rotation. Follow the specific procedure where it is provided.

Torque Wrenches and Techniques

The term TORQUE WRENCH is commonly used to describe a type of measuring tool. The tool is set or calibrated in such a way as to make possible the measurements of the resistance to turning (torque). The torque wrench measures this resistance to turning and, therefore, is the method used to obtain objective tightening data used in the assembly of fasteners. A torque wrench is a gage tool that can be compared with micrometers, dial indicators, vernier calipers, levels, and other measuring devices.

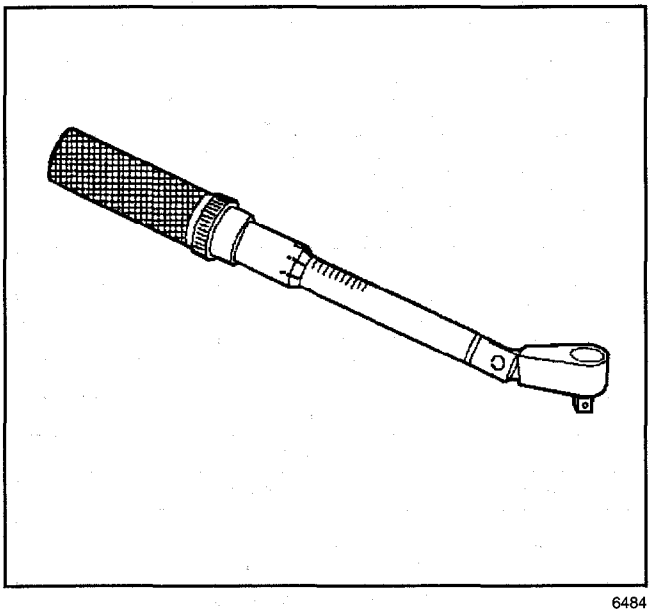
Tapered Beam Model Torque Wrench



65520

Of the many different types of torque wrenches available, the most popular in the service field is the tapered beam model. This model uses a pointer attached to the head that runs the length of the flexible beam (shaft) to a scale located near the handle. As the wrench is pulled, the beam bends and the pointer indicates the torque on the scale.

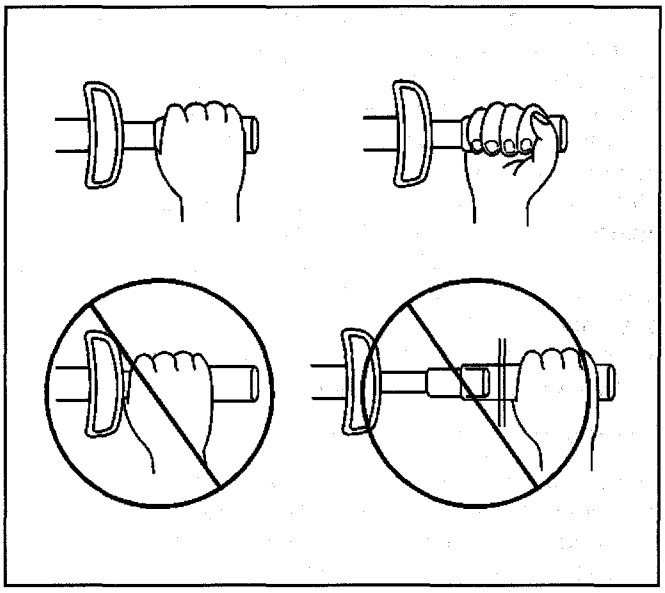
Click-type Torque Wrench



6484

Another type of torque wrench is the CLICK type which is adjusted to a predetermined torque. Once the designated torque has been reached, the wrench has a reflex signalling feature that causes a momentary breakaway of the body of the torque wrench. This feature has the effect of sending a strong impulse to the technician's hand. Although once quite popular, these wrenches are not the preferred method for torque applications.

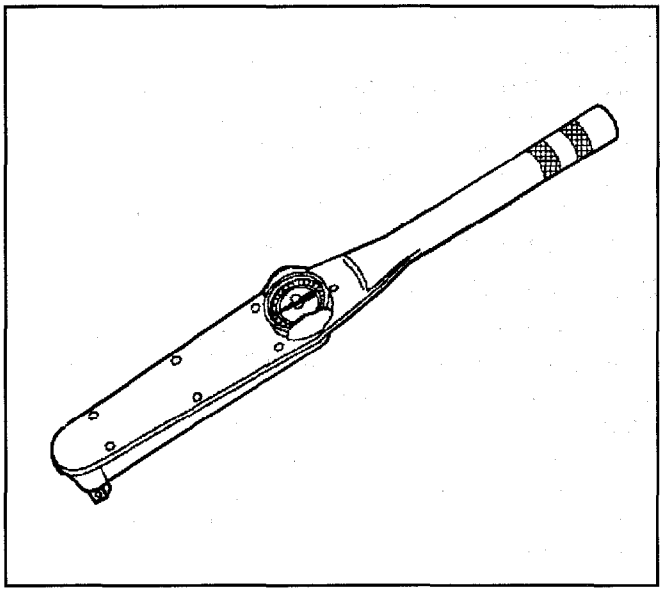
Pivoted Handle Torque Wrench



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Some types of torque wrenches are equipped with a pivoted handle. If used properly, this handle permits the accurate and correct use of the torque wrench. In order to hold a pivoted type handle, it should be floated on the pivot point. This concentrates your pulling force. If the pivoting handle comes in contact with the yoke extension during the process of pulling, there is a very good chance the torque readings will be inaccurate because this could alter the wrench loading point. The design of the handle, however, makes it inconvenient to deliberately use the floating principle improperly.

Direct Reading Torque Wrench



6486

Some of the newer model wrenches, such as the Snap-on® Direct Reading Torqometer wrench (Model TES or equivalent) can be held at any position on the wrench without affecting accuracy. These wrenches are preferred over the flexible beam types because of their greater degree of accuracy, compact design, and scales that are easily readable.

Torque Wrench Accuracy

Selecting the proper size and range of a torque wrench is important in obtaining accurate results. The best quality torque wrenches (the Snap-on® Direct Reading Torqometer models or equivalent) are accurate within 2 percent of the indicated reading from 20 percent of full scale to full scale. For example, a 200 N·m (148 lb ft) full scale torque wrench is guaranteed to be accurate from 40 N·m to 200 N·m (30–148 lb ft) (20–100 percent of full scale). Using this wrench below 40 N·m (30 lb ft) (its guaranteed operating range) could result in inaccurate torque readings and possible joint failure due to either an overtorque or undertorque condition.

Torque Wrench Selection

Since it is not possible to purchase one wrench to fit the widest range of torque specifications in the service environment, the following guidelines should be used for torque wrench selection:

- 0–20 N·m Full Scale (177 lb in). Accurate from 4–20 N·m (35–177 lb in).
- 0–75 N·m Full Scale (55 lb ft). Accurate from 15–75 N·m (11–55 lb ft).
- 0–250 N·m Full Scale (185 lb ft). Accurate from 50–250 N·m (37–185 lb ft).

Torque Wrench Calibration

This is a general guideline and is published to facilitate the selection of a range or torque wrenches that would cover most applications and would remain in the guaranteed accuracy ranges of the wrenches. Once a wrench is put into service, nothing guarantees that the wrench will remain calibrated within its accuracy range. It is recommended, therefore, that torque wrenches be calibrated a minimum of twice annually. Once again, the torque wrench is a precision measuring device. The torque wrench is exposed to rugged working conditions. Precautions must be taken in order to protect against inaccurate measurements.

Continuous Pull Method

Once a torque wrench is selected, use a technique called the CONTINUOUS PULL METHOD in order to increase accuracy during torquing. Pull the torque wrench in one continuous, smooth action until the specified torque is reached. There is no jerking or ratcheting during this final tightening effort. The continuous pull method is an excellent way to develop consistency.

Abbreviations and Their Meanings

The following abbreviations may appear in this manual.

Abbreviations Table

Abbreviation	Meaning
A	
A	Ampere(s)
ABS	Antilock Brake System
A/C	Air Conditioning
AC	Alternating Current
ACC	Accessory, Automatic Climate Control
ACL	Air Cleaner
ACR4	Air Conditioning Refrigerant, Recovery, Recycling, Recharging
A/D	Analog to Digital
ADL	Automatic Door Lock
A/F	Air/Fuel (Ratio)
AIR	Secondary Air Injection
ALC	Automatic Level Control
AM/FM	Amplitude Modulation/Frequency Modulation
Ant	Antenna
AP	Accelerator Pedal
API	American Petroleum Institute
APP	Accelerator Pedal Position
APT	Adjustable Part Throttle
ARS	Automatic Restraint System
ASR	Acceleration Slip Regulation
A/T	Automatic Transmission/Transaxle
ATC	Automatic Temperature Control
ATDC	After Top Dead Center
Auto	Automatic
avg	average
AWD	All Wheel Drive
AWG	American Wire Gage
B	
B+	Battery Positive Voltage
B-	Battery Negative Voltage
BARO	Barometric (pressure)
batt	battery
BBV	Brake Booster Vacuum
BCM	Body Control Module
BHP	Brake Horsepower
BLK	Black
BLU	Blue
BP	Back Pressure
BPM	Brake Pressure Modulator
BPMV	Brake Pressure Modulator Valve
BPP	Brake Pedal Position
BRN	Brown

Abbreviations Table (cont'd)

Abbreviation	Meaning
BTDC	Before Top Dead Center
BTSI	Brake Transmission Shift Interlock
Btu	British thermal units
C	
°C	Degrees Celsius
CAC	Charge Air Cooler
CAFE	Corporate Average Fuel Economy
Cal	Calibration
Cam	Camshaft
CARB	California Air Resources Board
cc	cubic centimeters
CCM	Central Control Module
CCOT	Cycling Clutch Orifice Tube
CCP	Climate Control Panel
CD	Compact Disc
CE	Commutator End
CEAB	Cold Engine Air Bleed
CEMF	Counter Electromotive Force
cfm	cubic feet per minute
cg	center of gravity
CID	Cubic Inch Displacement
CKP	Crankshaft Position
CKT	Circuit
CL	Closed Loop
C/Ltr	Cigar Lighter
CMP	Camshaft Position
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO2	Carbon Dioxide
Coax	Coaxial
COMM	Communication
Conn	Connector
CPA	Connector Position Assurance
CPP	Clutch Pedal Position
CPS	Central Power Supply
CPU	Central Processing Unit
CRT	Cathode Ray Tube
CRTC	Cathode Ray Tube Controller
CS	Charging System
CTP	Closed Throttle Position
cu ft	cubic foot/feet
cu in	cubic inch/inches
CV	Contant Velocity (joint)
CVRSS	Continuously Variable Road Sensing Suspension
Cyl	Cylinder(s)

Abbreviations Table (cont'd)

Abbreviation	Meaning
D	
DAB	Delayed Accessory Bus
dB	decibels
dBA	decibels on A-weighted scale
DC	Direct Current
DCM	Door Control Module
DE	Drive End
DEC	Digital Electronic Controller
DERM	Diagnostic Energy Reserve Module
DI	Distributor Ignition
dia	diameter
DIC	Driver Information Center
Diff	Differential
DK	Dark
DLC	Data Link Connector
DMM	Digital Multimeter
DOHC	Dual Overhead Camshafts
DR	Driver
DRL	Daytime Running Lamps
DTC	Diagnostic Trouble Code
E	
EBCM	Electronic Brake Control Module
EBTCM	Electronic Brake and Traction Control Module
EC	Electrical Center
ECC	Electronic Climate Control
ECI	Extended Compressor at Idle
ECL	Engine Coolant Level
ECM	Engine Control Module
ECS	Emission Control System
ECT	Engine Coolant Temperature
EEPROM	Electronically Erasable Programmable Read Only Memory
EEVIR	Evaporator Equalized Values in Receiver
EFE	Early Fuel Evaporation
EGR	Exhaust Gas Recirculation
EGR TVV	Exhaust Gas Recirculation Thermal Vacuum Valve
EI	Electronic Ignition
ELAP	Elapsed
ELC	Electronic Level Control
E/M	English / Metric
EMF	Electromotive Force
Eng	Engine
EOP	Engine Oil Pressure
EOT	Engine Oil Temperature
EPA	Environmental Protection Agency
EPR	Exhaust Pressure Regulator

Abbreviations Table (cont'd)

Abbreviation	Meaning
EPROM	Erasable Programmable Read Only Memory
ESC	Electronic Suspension Control
ESD	Electrostatic Discharge
ETC	Electronic Throttle Control, Electronic Temperature Control
ETCC	Electronic Touch Climate Control
ETR	Electronically Tuned Receiver
EVAP	Evaporative Emission
EVO	Electronic Variable Orifice
Exh	Exhaust
F	
°F	Degrees Fahrenheit
FC	Fan Control
FDC	Fuel Data Center
FED	Federal (all United States except California)
FEDS	Fuel Enable Data Stream
FF	Flexible Fuel
FI	Fuel Injection
FMVSS	Federal Motor Vehicle Safety Standards
F/P	Fuel Pump
ft	foot/feet
FT	Fuel Trim
F4WD	Full Time Four Wheel Drive
4WAL	Four Wheel Antilock
4WD	Four Wheel Drive
FW	Flat Wire
FWD	Front Wheel Drive
G	
g	grams, gravitational accelaration
GA	Gage
gal	gallon
gas	gasoline
GCW	Gross Combination Weight
Gen	Generator
GL	Gear Lubricant
GM	General Motors
GM SPO	General Motors Service Parts Operations
gnd	ground
gpm	gallons per minute
GRN	Green
GRY	Gray
GVWR	Gross Vehicle Weight Rating

Abbreviations Table (cont'd)

Abbreviation	Meaning
H	
H	Hydrogen
H2O	Water
Harn	Harness
HC	Hydrocarbons
H/CMPR	High Compression
HD	Heavy Duty
HDC	Heavy Duty Cooling
hex	hexagon
Hg	Mercury
Hi Alt	High Altitude
HO2S	Heated Oxygen Sensor
hp	horsepower
HPL	High Pressure Liquid
HPS	High Performance System
HPV	High Pressure Vapor
Htd	Heated
HTR	Heater
HUD	Head-up Display
HVAC	Heater-Vent-Air Conditioning
HVACM	Heater-Vent-Air Conditioning Module
HVM	Heater Vent Module
Hz	Hertz
I	
IAC	Idle Air Control
IAT	Intake Air Temperature
IC	Integrated Circuit, Ignition Control
ICM	Ignition Control Module
ID	Identification, Inside Diameter
IDI	Integrated Direct Ignition
ign	ignition
ILC	Idle Load Compensator
in	inch/inches
INJ	Injection
inst	instantaneous
I/P	Instrument Panel
IPC	Instrument Panel Cluster
I/PEC	Instrument Panel Electrical Center
ISC	Idle Speed Control
ISO	International Standards Organization
ISS	Input Speed Shaft
K	
KAM	Keep Alive Memory
KDD	Keyboard Display Driver
kg	kilogram
kHz	kilohertz
km	kilometer

Abbreviations Table (cont'd)

Abbreviation	Meaning
km/h	kilometers per hour
km/l	kilometers per liter
kPa	kilopascals
KS	Knock Sensor
kV	kilovolts
L	
L	Liter
L4	Four Cylinder Engine, In-line
L6	Six Cylinder Engine, In-Line
lb	pound
lb ft	pound feet (torque)
lb in	pound inch (torque)
LCD	Liquid Crystal Display
LDCL	Left Door Closed Locking
LDCM	Left Door Control Module
LED	Light Emitting Diode
LF	Left Front
LH	Left Hand
lm	lumens
LR	Left Rear
lt	left
LT	Light
M	
MAF	Mass Air Flow
Man	Manual
MAP	Manifold Absolute Pressure
MAT	Manifold Absolute Temperature
max	maximum
M/C	Mixture Control
MDP	Manifold Differential Pressure
MFI	Multiport Fuel Injection
mi	miles
MIL	Malfunction Indicator Lamp
min	minimum
ml	milliliter
mm	millimeter
mpg	miles per gallon
mph	miles per hour
ms	millisecond
MST	Manifold Surface Temperature
M/T	Manual Transmission/Transaxle
MV	Megavolt
mV	millivolt
N	
NAES	North American Export Sales
NC	Normally Closed
NEG	Negative
Neu	Neutral

Abbreviations Table (cont'd)

Abbreviation	Meaning
NLGI	National Lubricating Grease Institute
N·m	Newton-meter (torque)
NO	Normally Open
NOx	Oxides of Nitrogen
NPTC	National Pipe Thread Coarse
NPTF	National Pipe Thread Fine
NVRAM	Non Volatile Random Access Memory
O	
O2	Oxygen
O2S	Oxygen Sensor
OBD II	On-Board Diagnostics II
OC	Oxidation Converter (Catalytic)
OD	Outside Diameter
ODO	Odometer
OE	Original Equipment
OEM	Original Equipment Manufacturer
OHC	Overhead Camshaft
OL	Open Loop
ORN	Orange
OSS	Output Shaft Speed
oz	ounce(s)
P	
PAG	Polyalkylene Glycol
PASS	Passenger
PASS-Key®	Personalized Automotive Security System
P/B	Power Brakes
PC	Pressure Control
PCB	Printed Circuit Board
PCM	Powertrain Control Module
PCS	Pressure Control Solenoid
PCV	Positive Crankcase Ventilation
PM	Permanent Magnet (Generator)
P/N	Part Number
PNK	Pink
PNP	Park/Neutral Position
PRNDL	Park, Reverse, Neutral, Drive, Low
POA	Pilot Operated Absolute (Valve)
POS	Positive
POT	Potentiometer (Variable Resistor)
PPL	Purple
ppm	parts per million
PROM	Programmable Read Only Memory
P/S	Power Steering
PSD	Power Sliding Door
PSP	Power Steering Pressure
psi	pounds per square inch
psia	pounds per square inch absolute

Abbreviations Table (cont'd)

Abbreviation	Meaning
psig	pounds per square inch gage
pt	pint
PWM	Pulse Width Modulated
Q	
qt	quart(s)
R	
R-12	Refrigerant-12
R-134a	Refrigerant-134a
RAM	Random Access Memory (non permanent memory devise, memory contents are lost when power is removed)
RAP	Retained Accessory Power
RAV	Remote Activation Verification
RCDLR	Remote Control Door Lock Receiver
RDCM	Right Door Control Module
Ref	Reference
Rev	Reverse
RF	Right Front, Radio Frequency
RFA	Remote Function Actuation
RFI	Radio Frequency Interference
RH	Right Hand
RKE	Remote Keyless Entry
Rly	Relay
ROM	Read Only Memory (permanent memory devise, memory contents are retained when power is removed)
RPM	Engine Speed (Revolutions Per Minute)
RPO	Regular Production Option
RR	Right Rear
rt	right
RTD	Real Time Damping
RTV	Room Temperature Vulcanizing (sealer)
RWAL	Rear Wheel Antilock
RWD	Rear Wheel Drive
S	
s	second(s)
SAE	Society of Automotive Engineers
SC	Supercharger
SCB	Supercharger Bypass
SCM	Seat Control Module
SDM	Sensing and Diagnostic Module
SEO	Special Equipment Option
SFI	Sequential Multiport Fuel Injection
SI	System International (modern version of metric system)
SIR	Supplemental Inflatable Restraint
SLA	Short/Long Arm (suspension)

Abbreviations Table (cont'd)

Abbreviation	Meaning
sol	solenoid
SO2	Sulfur Dioxide
SP	Splice Pack
SPO	Service Parts Operations
sq ft	square foot/feet
sq in	square inch/inches
SRC	Service Ride Control
SRI	Service Reminder Indicator
ST	Scan Tool
S4WD	Selectable Four Wheel Drive
Sw	Switch
syn	synchronizer
T	
Tach	Tachometer
TBI	Throttle Body Fuel Injection
TC	Turbocharger
TCC	Torque Converter Clutch
TCS	Traction Control System
TDC	Top Dead Center
TEMP	Temperature
Term	Terminal
TFP	Transmission Fluid Pressure
TFT	Transmission Fluid Temperature
TOC	Transmission Oil Cooler
TP	Throttle Position
TPA	Terminal Positive Assurance
TPM	Tire Pressure Monitoring
TR	Transmission Range
TRANS	Transmission/Transaxle
TV	Throttle Valve
TVRS	Television and Radio Suppression
TVV	Thermal Vacuum Valve
TWC	Three Way Converter (Catalytic)
TWC+OC	Three Way + Oxidation Converter (Catalytic)
TXV	Thermal Expansion Valve
U	
UART	Universal Asynchronous Receive and Transmit
U/H	Underhood
U/HEC	Underhood Electrical Center
U-joint	Universal Joint
UTD	Universal Theft Deterrent
UV	Ultraviolet
V	
V	Volt(s), Voltage
V6	Six Cylinder Engine, V-Type
V8	Eight Cylinder Engine, V-Type

Abbreviations Table (cont'd)

Abbreviation	Meaning
Vac	Vacuum
VAC	Vehicle Access Code
VATS	Vehicle Anti-Theft System
VCM	Vehicle Control Module
VDOT	Variable Displacement Orifice Tube
VDV	Vacuum Delay Valve
vel	velocity
VES	Variable Effort Steering
VF	Vacuum Fluorescent
VIO	Violet
VIN	Vehicle Identification Number
VMV	Vacuum Modulator Valve
VR	Voltage Regulator
V ref	Voltage Reference
VSS	Vehicle Speed Sensor
W	
w/	with
W/B	Wheel Base
WHL	Wheel
WHT	White
w/o	without
WOT	Wide Open Throttle
W/P	Water Pump
W/S	Windshield
WSS	Wheel Speed Sensor
WU-OC	Warm Up Oxidation Converter (Catalytic)
WU-TWC	Warm Up Three Way Converter (Catalytic)
X	
X-valve	Expansion valve
Y	
yd	yard(s)
YEL	Yellow

Key and Lock Cylinder Coding

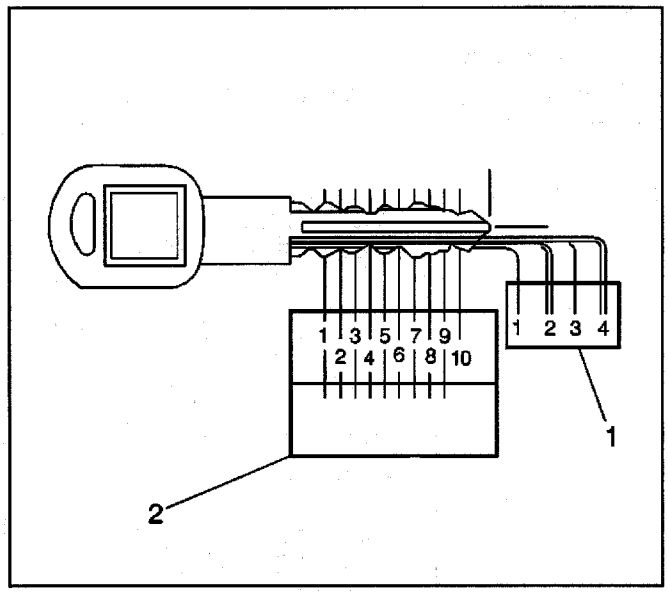
Key Identification and Usage

The lock cylinder keyway is designed so that other model keys will not enter a current model lock cylinder. A single key is used for all locks on the vehicle.

The key identification is obtained from the four-character key code stamped on the knockout portion of the key head. Knock the plugs out of the key head after code numbers have been recorded. The code list, available to owners of key cutting equipment from equipment suppliers, determines the lock combinations from the code numbers.

If the code numbers are not available from the records or from the knockout plug, lay the key on the key code diagram in order to determine the lock combinations (the tumbler numbers and the position arrangement).

Cutting Keys



65495

After the code has been determined from the code list or the key code diagram, perform the following steps:

1. Cut a blank key to the proper level (1) of each of the tumbler positions (2).
2. Inspect the key operation in the lock cylinder.

Replacement Lock Cylinders

New lock cylinders (except ignition lock cylinders) are available from the service parts warehouse with new lock cylinder locking bars. The tumblers are also available and must be assembled into the cylinder as recommended. For additional information, refer to the following.

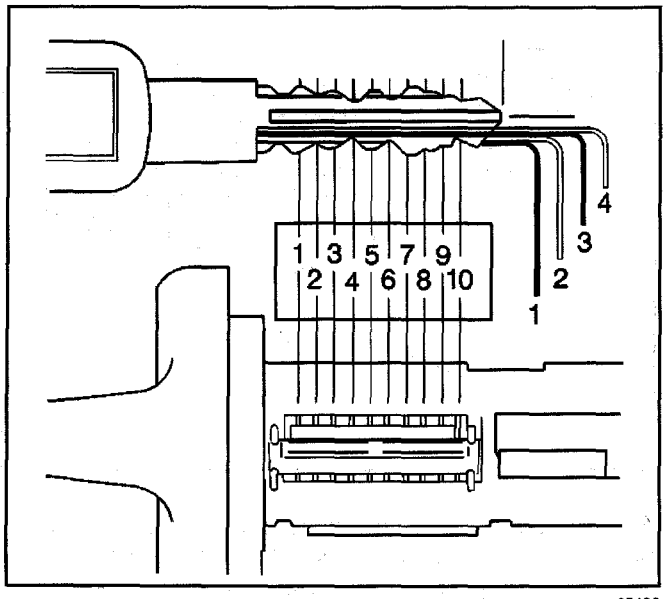
Lock Cylinder Tumbler Operation

All lock tumblers are shaped alike with the exception of the notched position on one side. As the key is inserted into the lock cylinder, the tumblers are lowered to the correct height so that notches on each tumbler are at the same level. When the notches on all six tumblers line up, two small springs push the side bar into the notches, allowing the cylinder to turn in the cylinder bore. Five types of tumblers are used in making the lock combinations, and each is coded and stamped with a number between 1 and 5.

Assembling and Coding Ignition Lock Cylinders

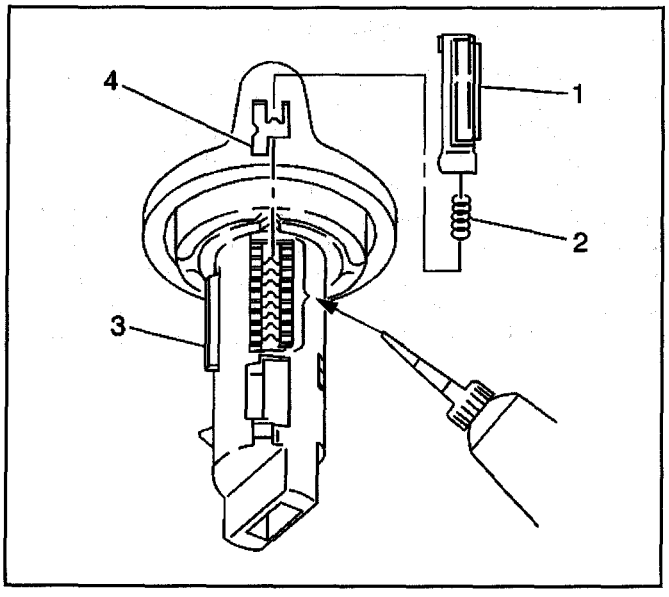
Tools Required

J 41340 Lock Cylinder Staking and Holding Fixture



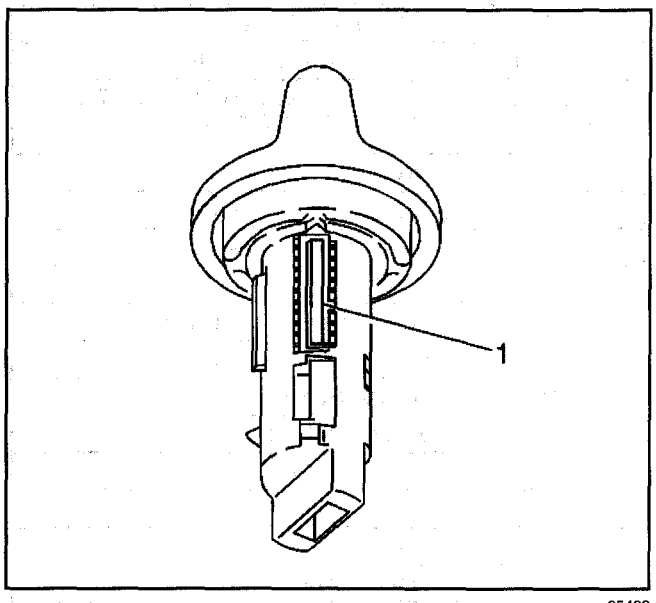
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1. Determine the tumbler numbers/arrangement:
   1.1. Place the tip of the key directly over the tip of the illustrated key.
   1.2. Inspect that the diagram outlines the key.
   1.3. Starting with position 1 (open end of cylinder), find and record the lowest level (tumbler number) that is visible.
   1.4. Repeat the previous step for positions 2–10.



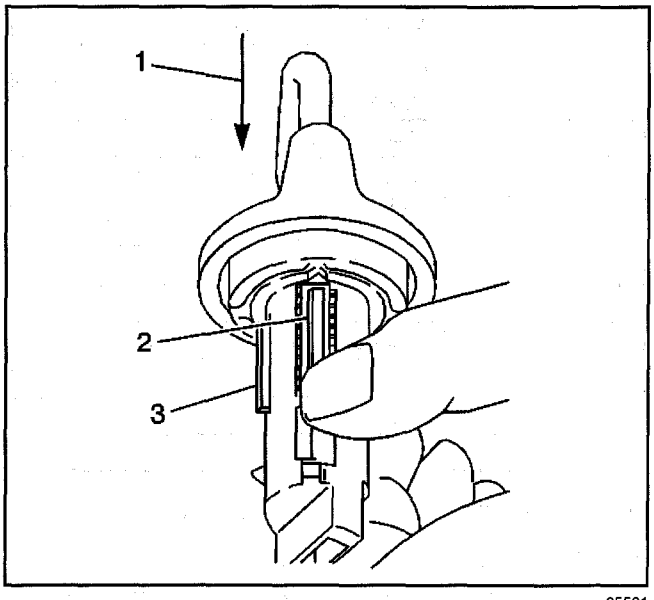
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2. Starting with position 1, insert the tumblers (4) into their corresponding slots in the coded order.
3. Using your fingers, pull out the side bar (3) until the tumblers fall completely into place.
4. Insert one tumbler spring (2) above each tumbler (4).
5. Lubricate the tumblers using Superlube® GM P/N 12346241 or equivalent.
6. Insert the spring retainer (1) prongs into the slots at the end of each cylinder.



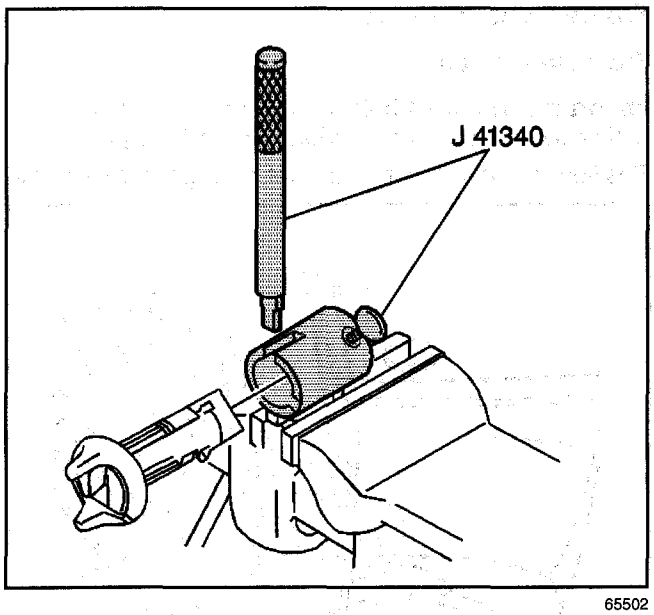
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7. Press down the retainer (1) until fully seated in the depression.



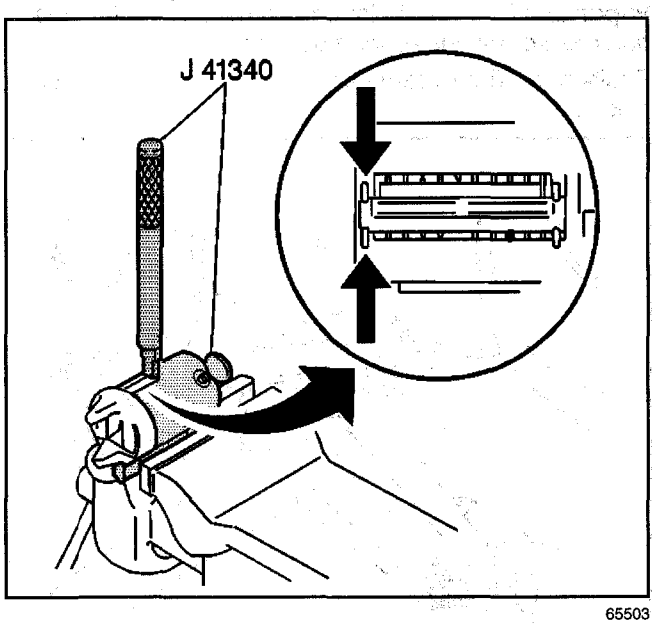
65501

8. Inspect for proper tumbler installation:
   8.1. Hold the spring retainer (2) in position.
   8.2. Insert the key (1) into the cylinder.
   8.3. The side bar (3) should drop down flush with the cylinder diameter if properly installed.
   8.4. Disassemble and assemble properly as needed.
9. Remove the key.



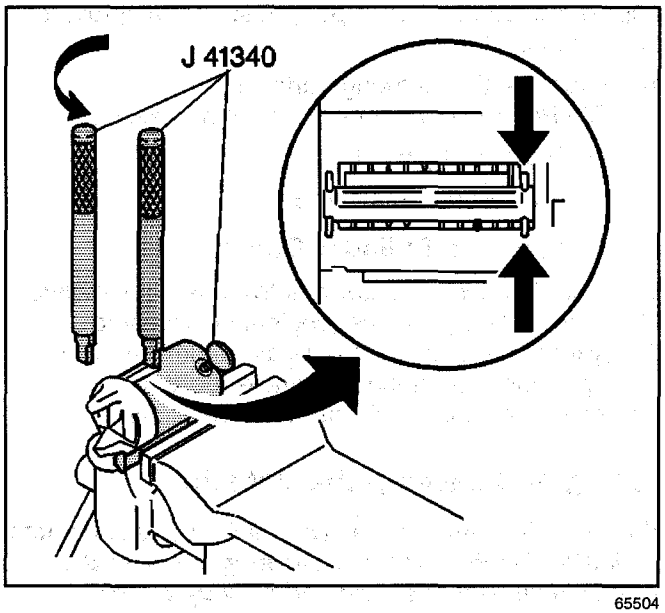
65502

10. Secure the cylinder in the *J 41340*.
    10.1. Inspect that the spring retainer is facing up and positioned directly under the punch slots.
    10.2. Push the cylinder into the *J 41340* until butted with the cylinder bezel.
    10.3. Tighten the holding screw.



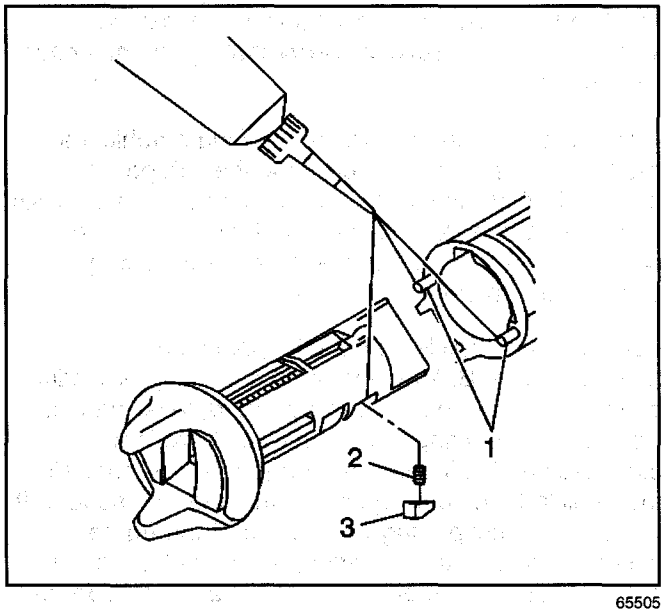
65503

11. Stake the bezel end of the retainer in place:
    11.1. Hold the flat side of the punch, part of *J 41340*, squarely against the face of the cylinder bezel.
    11.2. Stake the lock cylinder metal over the retainer corners.



65504

12. Stake the other end of the retainer:
    12.1. Remove the punch, part of *J 41340*.
    12.2. Rotate the punch, part of *J 41340*, 180 degrees.
    12.3. Hold the punch, part of *J 41340*, squarely against the end of the punch slot on *J 41340*.
    12.4. Stake the metal over the other end of the retainer.



65505

13. Loosen the holding screw.
14. Remove the cylinder from the *J 41340*.
15. Inspect that the retainer is properly staked. Restake as needed.
16. Lubricate the cylinder retainer slot.
17. Insert the following parts into the cylinder retainer slot:
    - The retainer spring (2)
    - The retainer (3)

Important: Use a paste type grease, not a spray, for the following step.

18. Lubricate the following parts with GM P/N 12345996 or equivalent as needed:
    - The detent pins (1)
    - The cylinder retainer (3)

Side Door Lock Cylinder Coding

The side door lock cylinder has five snap-in tumblers. The number 1–5 positions (beginning closest to the cylinder head) is a brass retainer tumbler. The 6–10 positions are standard tumbler positions. Therefore, only the 6–10 positions are required.

Lifting and Jacking the Vehicle

Caution: To help avoid personal injury, always use jack stands when you are working on or under any vehicle that is supported only by a jack.

Caution: To help avoid personal injury, when a vehicle is on a hoist, provide additional support for the vehicle at the opposite end from which you are removing components. The additional support will reduce the possibility of the vehicle falling off the hoist. When you are removing major components from the vehicle while the vehicle is on a hoist, chain the vehicle frame to the hoist pads at the same end from which you are removing the major components to prevent tip-off. If you fail to follow these precautionary measures, vehicle damage, serious personal injury, or death may result.

Notice: When you are jacking or lifting a vehicle at the frame side rails or other prescribed lift points, be certain that the lift pads do not contact the catalytic converter, the brake pipes or the fuel lines. If such contact occurs, vehicle damage or unsatisfactory vehicle performance may result.

For lifting the vehicle, various lift points are recommended. Before you begin any lifting procedure, be sure the vehicle is on a clean, hard, level surface. Be sure all the lifting equipment meets weight standards and is in good working order. Be sure all the vehicle loads are equally distributed and secure. If you are only supporting the vehicle at the frame side rails, make sure the lifting equipment does not put too much stress on or weaken the frame side rails.

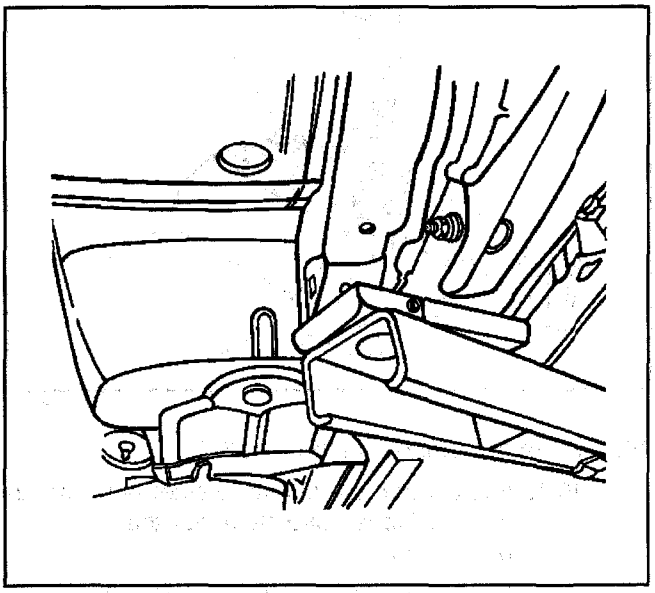
If you use any other hoisting methods than those called out, take special care not to damage the fuel tanks, the exhaust system or the underbody.

Frame Contact Hoist

Front Hoist Pads

Important: The front hoist pads must not contact the rocker panels, the front fenders, or the floor pan.

Position the (frame contact) front hoist pads as follows:

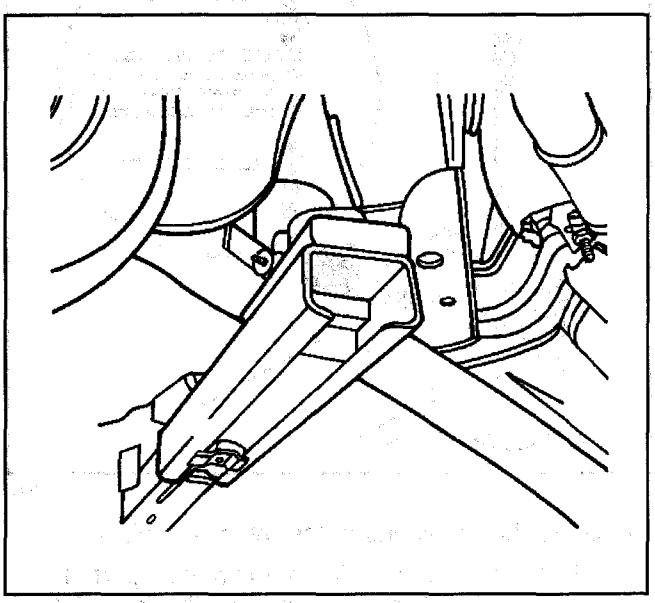


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Rear Hoist Pads

Important: The rear hoist pads must not contact the body rocker panels or the floor pan.

Position the (body/frame contact) rear hoist pads as follows:

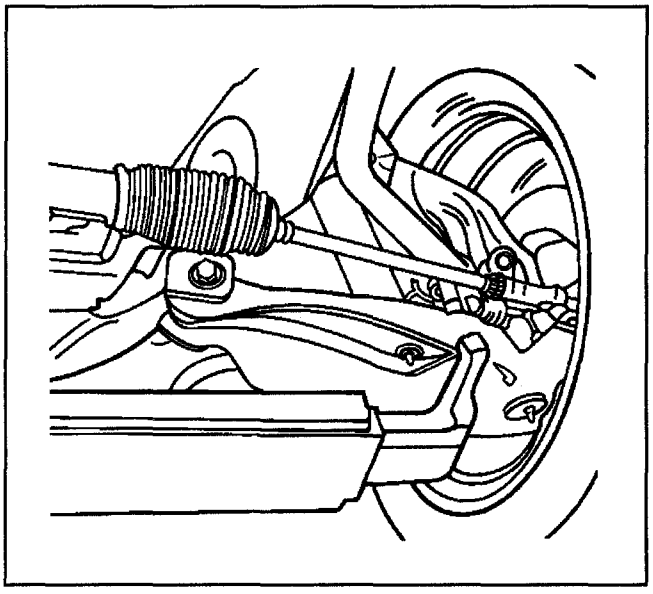


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Suspension Contact Hoist

Front Lift

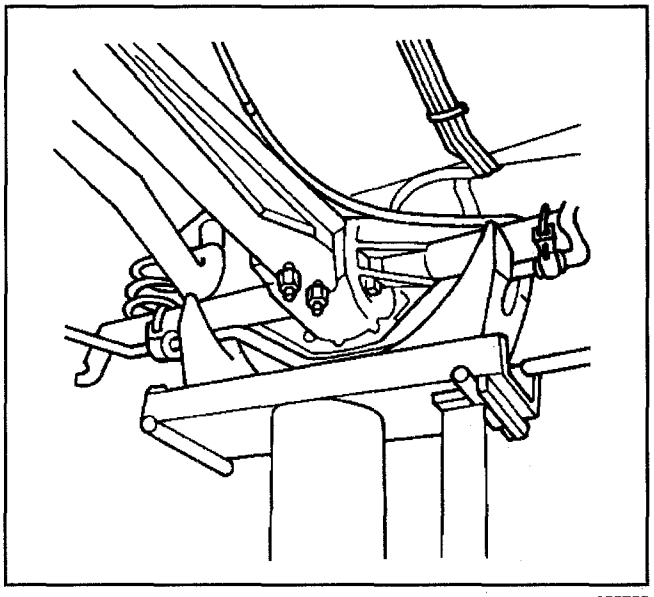
Position the (suspension contact) front lift as follows: under the outer edge of the front suspension lower control arms.



255761

Rear Lift

Position the (suspension contact) rear lift as follows:



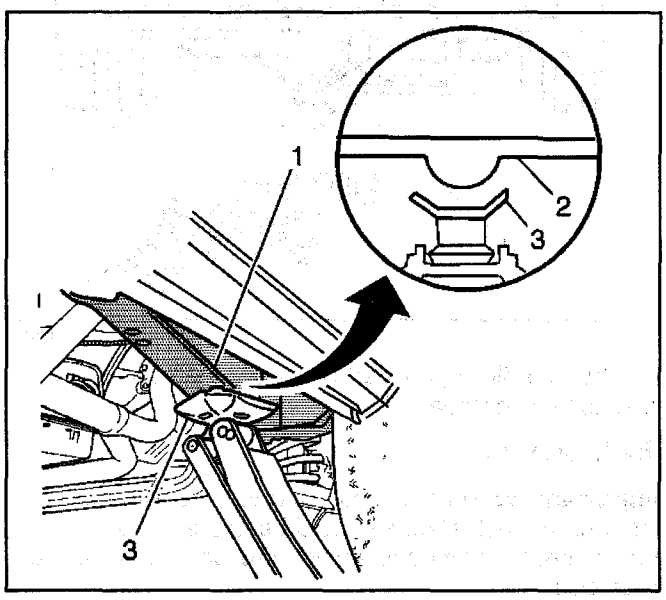
255755

Jacking

When you are lifting a vehicle with a vehicle jack or a floor jack, block the wheels at the opposite end from which you are lifting. Use jack stands to provide additional support.

Under the Frame Rails

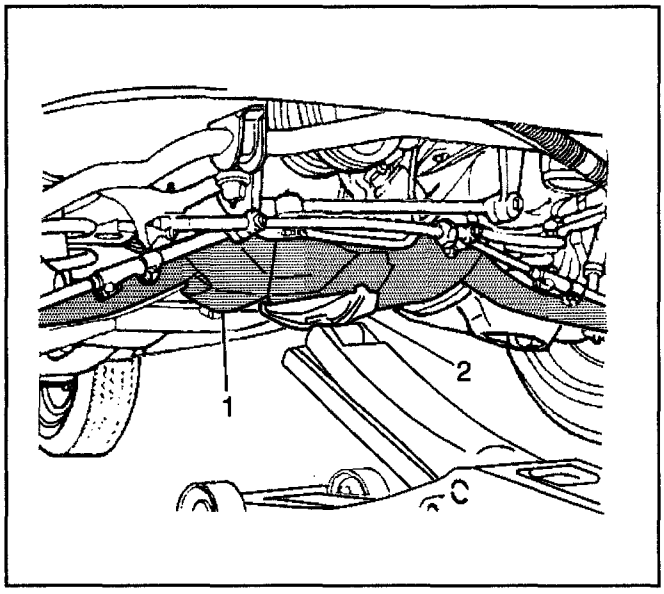
Important: The floor jack pad must not contact rocker panel or the floor pan.



175238

Position the floor jack pad (3) under the frame rail (1).

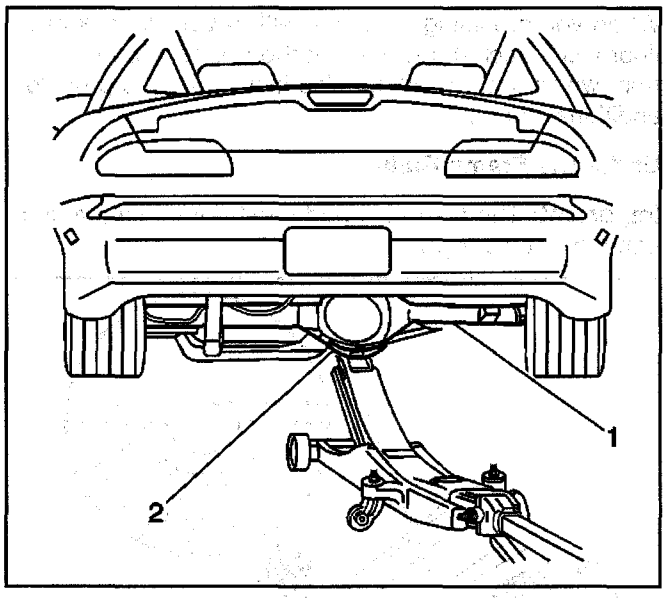
Under the Front Suspension Crossmember



175243

Position the floor jack pad (2) under the center of the front suspension crossmember (1).

Under the Rear Differential



175241

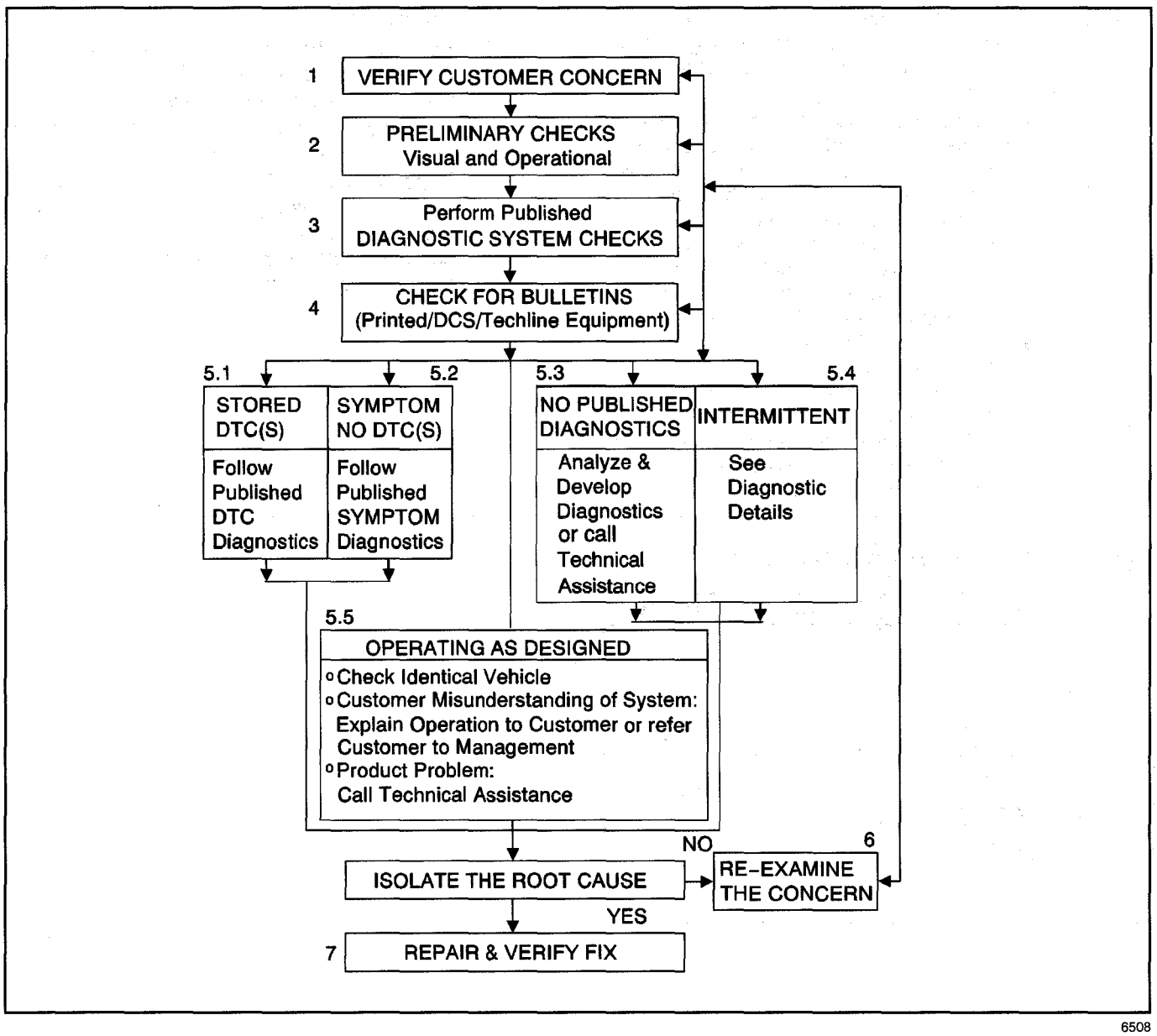
Position the floor jack pad (2) under the center of the rear axle differential (1).

Jack Stands

Important: When supporting the vehicle with jack stands, the jack stands should be placed under the frame, the front suspension crossmember, or the rear axle.

Strategy Based Diagnosis

Strategy based diagnostics is a uniform approach for repairing all electrical/electronics systems. The diagnostic flow may always be used in order to resolve an E/E system problem. The diagnostic flow is the place to start when repairs are necessary. Refer to the following chart for proper strategy based diagnostics.



6508

Legend

(1) Verify the concern: In order to verify the concern the technician should know the normal operation of the system.

(2) Preliminary Checks: Conduct a thorough visual inspection. Review the service history. Detect unusual sounds or odors. Gather diagnostic trouble code information in order to achieve an effective repair.

(3) Perform Published Diagnostic System Checks: One or more DTCs may not support a system. System checks verify the proper operation of the system. This will lead the technician in an organized approach to diagnostics.

(4) Check Bulletins and Other Service Information: Also checks the videos, the newsletters, and the Pulsat programs.

(5.1) Stored DTCs: Follow the designated DTC table exactly in order to make an effective repair.

(5.2) Symptom No DTC: Select the symptom from the symptom tables. Follow the diagnostic steps or suggestions in order to complete the repair, or refer to the applicable component/system check.

(5.3) No Published Diagnostics: Analyze the concern. Develop a plan for the diagnostics. Utilize the wiring diagrams and theory of operation.

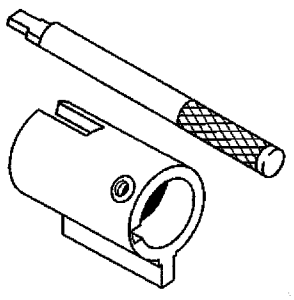
(5.4) Intermittents: Conditions that are not always present are intermittent. In order to resolve intermittents, perform the following. Observe the history for similar cases where repair history may be available. Combine the technician knowledge with efficient use of the available service information. Evaluate the symptoms and conditions described by the customer. Use a check sheet or other method in order to identify the circuit or electrical system component. Follow the suggestions for intermittent diagnosis found in the service documentation. The Tech 1, Tech 2 and Fluke 87 scan tools have data capturing capabilities that can assist in detection of intermittents.

(5.5) Vehicle Operates as Designed: This condition exists when the vehicle is found to operate normally. The condition described by the customer may be normal. Verify against another vehicle that is operating normally. The condition may be intermittent. Verify the concern under the conditions described by the customer before releasing the vehicle.

(6) Re-examine the Concern: If a technician cannot successfully find or isolate the concern, a reevaluation is necessary. Re-verify the concern. The concern could be an intermittent or normal.

(7) Repair and Verify Fix: After isolating the cause, make the repairs. Then validate for proper operation. Verify that the symptom has been corrected. Verification may involve road testing the vehicle.

Special Tools and Equipment

Tool Illustration	Tool Number/Description
 65540	J 41340 Ignition Lock Holding Fixture

Maintenance and Lubrication

Specifications

Drive Belt Tension Specifications

Serpentine Belt

Belt tension is maintained by a spring tensioned idler pulley.

No adjustment of the serpentine belt is necessary.

Approximate Fluid Capacities

—	Liters	Quarts
Engine Cooling System		
3.8L (L36) With Manual Transmission	11.8	12.5
3.8L (L36) With Automatic Transmission	11.6	12.3
5.7L (LS1) With Manual Tranasmission	14.5	15.3
5.7L (LS1) With Automatic Transmission	14.3	15.1
Engine Crankcase		
3.8L (L36) With Filter	4.2	4.5
5.7L (LS1) With Filter	5.2	5.5
Transmission		
4L60-E	4.7	5.0
After Complete Overhaul (L36)	8.3	8.8
After Complete Overhaul (LS1)	10.2	10.8
M49 5-Speed Manual Transmission	3.2	3.4
MM6 6-Speed Manual Transmission	3.8	4.0
Fuel Tank		
All Vehicles	58.7	15.5

Fluid and Lubricant Recommendations

Usage	Fluid/Lubricant
Engine Oil	Engine oil with the American Petroleum Institute Certified For Gasoline Engines "Starburst" symbol of the proper viscosity. To determine the preferred viscosity for your vehicle's engine, refer to the Owner's Manual
Engine Coolant	50/50 mixture of clean water (preferably distilled) and use only GM Goodwrench® DEX-COOL® or Havoline® DEX-COOL® coolant.
Hydraulic Brake System	Delco Supreme 11® Brake Fluid (GM P/N 12377967 or equivalent DOT-3 brake fluid).
Parking Brake Cable Guides	Chassis lubricant (GM P/N 12377985 or equivalent) meeting requirements of NLGI Grade 2, Category GC or GC-LB
Power Steering System	GM Hydraulic Power Steering Fluid (GM P/N 1052884 - 1 pint, 1050017 - 1 quart, or equivalent).
Automatic Transmission	DEXRON®-III Automatic Transmission Fluid
Key Lock Cylinders	Multi-Purpose Lubricant, Superlube® (GM P/N 12346241 or equivalent).
Chassis Lubrication	Chassis lubricant (GM P/N 12377985 or equivalent) or lubricant meeting requirements of NLGI Grade 2, Category GC or GC-LB.
Differential, Locking and Non-Locking	Axle Lubricant (GM P/N 1052271) or SAE 80W-90 GL-5 Gear Lubricant.
Differential, Locking	Axle Lubricant (GM P/N 1052271) or SAE 80W-90 GL-5 Gear Lubricant.
Windshield Washer Solvent	GM Optikleen® Washer Solvent (GM P/N 1051515) or equivalent
Hood Latch Assembly • Pivots and Spring Anchor • Release Pawl	Lubriplate lubricant aerosol (GM Part No. 12346293 or equivalent) or lubricant meeting requirements of NLGI Grade 2, Category LB or GC-LB.
Hood and Door Hinges	Multi-Purpose lubricant, Superlube® (GM P/N 12346241 or equivalent).
Weatherstrip Conditioning	Dielectric Silicone Grease (GM P/N 12345579 or equivalent).

Tire Inflation Pressure Specifications

Application	Specification	
	Metric	English
Front and rear tires under normal driving conditions	210 kPa	30 psi
Front and rear tires under sustained high speed driving of 160 km/h (100 mph) or higher	265 kPa	38 psi
Compact spare tire only	420 kPa	60 psi

Maintenance Items

Usage	Type
Air Cleaner	
3.8L (L36) and 5.7L (LS1)	AC Type A1163C
Engine Oil Filter	
3.8L (L36)	AC Type PF-47
5.7L (LS1)	AC Type PF-44
PCV Valve	
3.8L (L36)	AC Type CV892C
5.7L (LS1)	AC Type CV895C
Spark Plugs and Gaps	
3.8L (L36)	AC Type 41-921 (GAP 1.52 mm, 0.060 in)
5.7L (LS1)	AC Type 41-931 (GAP 1.52 mm, 0.060 in)
Fuel Filter	
3.8L (L36) and 5.7L (LS1)	AC Type GF-578
Radiator Cap	
3.8L (L36) and 5.7L (LS1)	AC Type RC-24

Maintenance

Maintenance Schedule

Using The Maintenance Schedule

Because of the different ways GM vehicles are used, maintenance needs vary. More frequent maintenance intervals than found in these manual may by needed. When reading this section, keep in mind the conditions under which the vehicle is operated, and adjust the maintenance intervals accordingly.

The proper fluids and lubricants to use are listed in *Fluid and Lubricant Recommendations* Use the proper fluids and lubricants whenever servicing this vehicle.

The maintenance schedules found in this manual are for vehicles that:

- Carry passengers and cargo within recommended limits.
- Are driven on reasonable road surfaces within legal driving limits.
- Are driven off-road in the recommended manner. Refer to the Owner's Manual.
- Use recommended unleaded fuel.

Selecting The Right Schedule

To determine the correct maintenance schedule for any given vehicle, refer to the schedule guidelines/definitions below:

Short Trip/City Definition

Follow the Short Trip/City maintenance schedule if any one of these are true:

- Most trips are less than 5 to 10 miles (8 to 16 km). This is particularly important when outside temperatures are below freezing.
- Most trips include extensive idling (such as frequent driving in stop and go traffic).
- The vehicle is operated in dusty areas, or off-road frequently.
- Trailer towing or using a carrier on top of the vehicle frequently.
- The vehicle is used for delivery service, police, taxi, or other commercial application.

Short Trip/City Maintenance Schedule Summary

These intervals summarize the Short Trip/City Maintenance Schedule. Refer to *Maintenance Schedule - Short Trip/City* for the complete maintenance schedule.

Long Trip/Highway Maintenance Schedule Definition

Follow the Long Trip/Highway maintenance schedule ONLY if none of the conditions from the Short Trip/City maintenance schedule are true. Refer to *Maintenance Schedule - Long Trip/Highway*

Maintenance Schedule - Short Trip/City

Perform the services shown in this schedule up to 166 000 km (100,000 miles) and after 166 000 km (100,000 miles) at the same intervals.

5 000 km (3,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Verify the rear fluid level. Add fluid as needed.
- Inspect the axle seals for leaks.

10 000 km (6,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The front suspension
  - The steering linkage
  - The transmission shift linkage
- Do not lubricate the ball joints unless the ball joint temperature is -12°C (10°F) or higher.
- Verify the rear fluid level. Add fluid as needed.
- Inspect the constant velocity joints for leaks.
- Inspect the axle seals for leaks.
- Tire rotation.

15 000 km (9,000 miles)

Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

20 000 km (12,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation
- Brake System Inspection

25 000 km (15,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Inspect the air cleaner filter.
- Change automatic transmission fluid and filter.

30 000 km (18,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation.
- Brake System Inspection

35 000 km (21,000 miles)

Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

40 000 km (24,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Rotate the tires. Refer to *Tire Rotation.*
- Tire rotation

45 000 km (27,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

50 000 km (30,000 miles)

- Change the engine oil and the filter every 5,000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The front suspension
  - The steering linkage
  - The transmission shift linkage
- Do not lubricate the ball joints unless the ball joint temperature is -12°C (10°F) or higher.
- Change automatic transmission fluid.
- Verify the rear fluid level. Add fluid as needed.
- Inspect the axle seals for leaks.
- Replace the air filter.
- Replace the fuel filter. An Emission Control Service.
- Tire rotation.

55 000 km (33,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

60 000 km (36,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Verify the rear fluid level. Add fluid as needed.
- Tire rotation.
- Brake System Inspection

65 000 km (39,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

70 000 km (42,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Brake System Inspection
- Tire rotation

75 000 km (45,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Regularly inspect the air filter when driving in dusty conditions. Replace the air filter if necessary. An Emission Control Service *
- Change automatic transmission fluid and filter.

80 000 km (48,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Rotate the tires.
- Brake System Inspection

85 000 km (51,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

90 000 km (54,000 miles)

- Change the engine oil and the filter at 90 000 km (54,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Brake System Imspection.
- Tire Rotation

95 000 km (57,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

100 000 km (60,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Verify the rear fluid level. Add fluid as needed.
- Inspect the engine accessory drive belt. An Emission Control Service *
- Replace the air filter.
- Replace the fuel filter. An Emission Control Service *

105 000 km (63,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

110 000 km (66,000 miles)

- Change the engine oil and the filter at 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The front suspension
  - The steering linkage
  - The transmission shift linkage
- Do not lubricate the ball joints unless the ball joint temperature is -12°C (10°F) or higher.
- Tire rotation.
- Brake system inspection

115 000 km (69,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

120 000 km (72,000 miles)

- Change the engine oil and the filter at 120 000 km (72,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
  - The parking brake cable guides
  - The rear driveline center splines
  - The brake pedal springs
- Tire rotation
- Brake system inspection

125 000 km (75,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Inspect the air cleaner filter. Replace as necessary.
- Change automatic transmission fluid and filter.

130 000 km (78,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation
- Brake system inspection

135 000 km (81,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

140 000 km (84,000 miles)

- Change the engine oil and the filter every 140 000 km (84,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation
- Brake system inspection

145 000 km (87,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

150 000 km (90,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Replace the air filter.
- Inspect the fuel tank, cap, lines for damage or leaks. Inspect fuel cap for any damage.
- Replace the fuel filter. An Emission Control Service.
- Tire rotation
- Brake system inspection

155 000 km (93,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

160 000 km (96,000 miles)

- Change the engine oil and the filter every 5 000 km (3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation
- Brake system inspection

165 000 km (99,000 miles)

Change the engine oil and the filter every 5 000 km 3,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *

166 000 km (100,000 miles)

- Replace the spark plugs. An Emission Control Service *
- Inspect the spark plug wires. *
- Change the automatic transmission fluid and the filter
- Change the automatic transmission fluid and the filter if the vehicle's GVWR exceeds 3 900 kg (8,600 lbs).
- Change the automatic transmission fluid and the filter.
- Inspect the Positive Crankcase Ventilation (PCV) Valve.

240 000 km (150,000 miles)

- Drain, flush and refill the cooling system every 240 000 km (150,000 miles) or every 60 months, whichever occurs first. Refer to *Fluid and Lubricant Recommendations* in General Information.
- Inspect the hoses.
- Clean the radiator, condenser, pressure cap and the neck. An Emission Control Service *
- Pressure test the cooling system.

Maintenance Schedule - Long Trip/Highway

Perform the services shown in this schedule up to 240 000 km (150,000 miles) in this schedule and after 244 000 km (150,000 miles) at the same intervals.

8 000 km (5,000 miles)

- Change the engine oil and the filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

25 000 km (15,000 miles)

- Change engine oil and filter at 12 500 km (75,000 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

37 500 km (22,500 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation.

48 000 km (30,000 miles)

- Change engine oil and filter every 48 000 km (30,000 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Replace the air filters. An Emission Control Service *
- Tire rotation
- Inspect fuel tank, cap, and lines for damage or leaks. Inspect fuel cap gasket for any damage. Replace parts as needed.

62 500 km (37,500 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

72 000 km (45,000 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

87 500 km (52,500 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation.

96 000 km (60,000 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 3 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Inspect serpentine drive belt
- Replace the air filter. An Emission Control Service. *
- Inspect fuel tank, cap, and lines for damage and replace any parts as needed.

112 500 km (67,500 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire inspection

120 000 km (75,000 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

137 500 km (82,500 miles)

- Change engine oil and filter every 12 500 km (7,500 miles) or every 12 months, or whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Tire rotation.

144 000 km (90,000 miles)

- Change engine oil and filter every 12,000 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Replace the air filter. An Emission Control Service.
- Tire rotation
- Brake system inspection
- Inspect fuel tank, cap, and lines for damage or leaks. Inspect cap gasket for any damage and replace parts as necessary.

162 500 km (97,500 miles)

- Change engine oil and filter every 12 000 km (7,500 miles) or every 12 months, whichever occurs first. An Emission Control Service *
- Lubricate the following vehicle components when performing a maintenance schedule:
  - The steering linkage
  - The transmission shift linkage
- Brake system inspection
- Tire rotation

160 000 km (100,000 miles)

- Inspect spark plug wires.
- Replace spark plugs
- Rotate the tire. Refer to *Tire Rotation* in Tires and Wheels.
- Change the automatic transmission fluid and filter.

240 000 km (150,000 miles)

- Drain, flush and refill the cooling system every 240 000 km (150,000 miles) or every 60 months, whatever exceeds first. Refer to *Fluid and Lubricant Recommendations* in General Information. Inspect the hoses. Clean the radiator, condenser, pressure cap and neck. An Emission Control Service *
- Inspect hoses
- Clean radiator, condensor, pressure cap and neck.
- Pressure test cooling system and pressure cap.

Explanation of Scheduled Services

For time and/or mileage intervals of scheduled maintenance items, refer to *Maintenance Schedule*

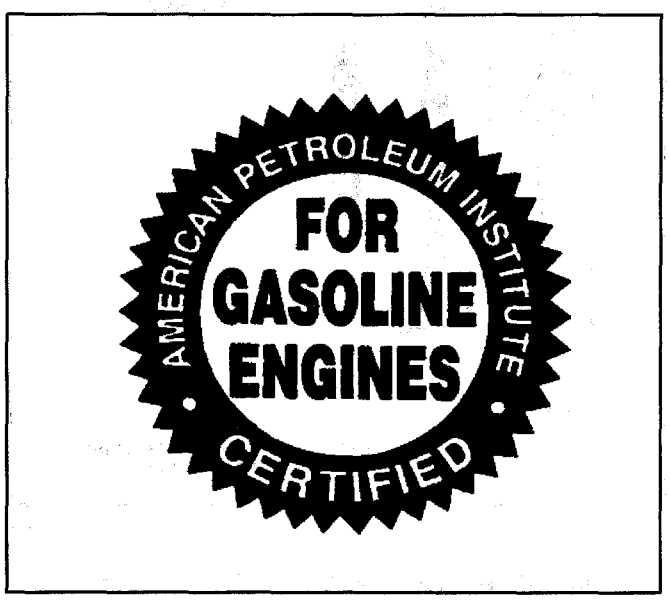
The following text and illustrations describe the details of the required scheduled maintenance services.

For information on the proper fluids and lubricants to use, refer to *Fluid and Lubricant Recommendations*

Engine Oil and Oil Filter Change

For the engine oil and oil filter changing procedure, refer to *Engine Oil and Oil Filter Replacement* in Engine Mechanical.

Engine Oil Quality

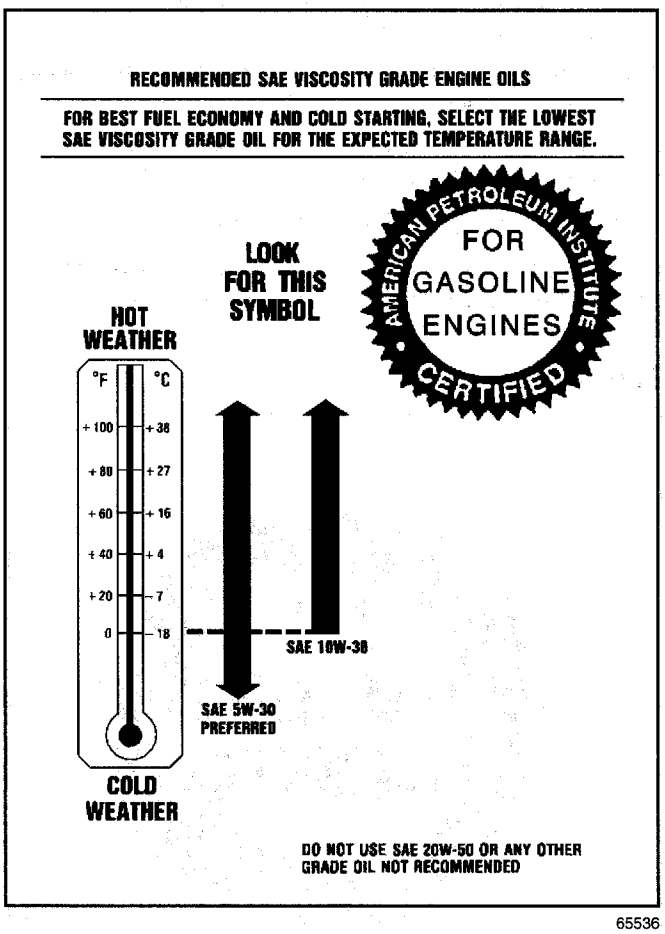


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Important: DO NOT use engine oil additives in Camaro and Firebird engines.

When changing or adding to the motor oil, use ONLY motor oils of the proper quality. The engines in the Camaro and Firebird require motor oils of the proper viscosity (thickness) and marked by the American Petrolium Institute (API) Certified For Gasoline Engines STARBURST symbol.

Engine Oil Viscosity



65536

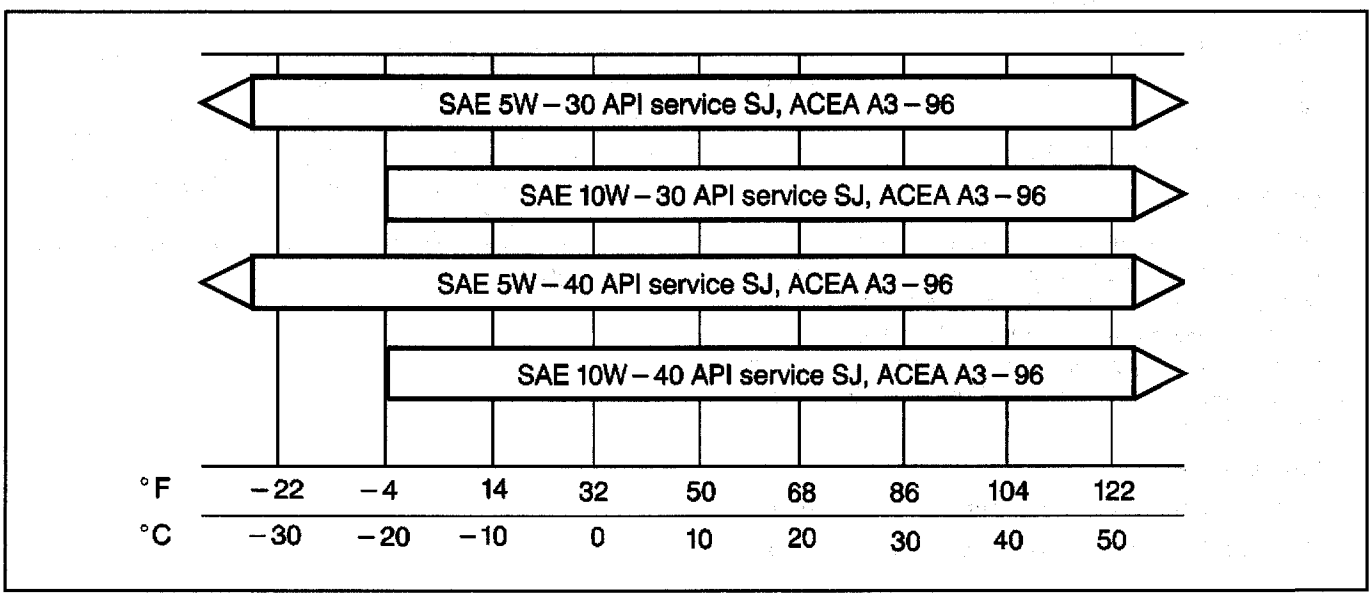
Notice: Using engine oils of any viscosity other than those viscosities recommended could result in engine damage.

Engine oil viscosity (thickness) has an effect on fuel economy and cold-weather operation (starting and oil flow). Lower viscosity engine oils can provide better fuel economy and cold-weather performance.

When you are choosing an engine oil viscosity, consider the range of temperatures the vehicle will be operated in before the next oil change. Then, select the recommended oil viscosity.

The recommended SAE engine oil viscosity is 5W-30, however, if temperatures are above -18°C (0°F) 10W-30 may be used.

Engine Oil Quality and Viscosity (Export)



191050

In areas of the world other than North America, it may be difficult to find oils that display the API STARBURST symbol.

If you cannot find oils displaying the API STARBURST, look for oils that meet the API Service SJ and ACEA A3-96 requirements.

The recommended SAE engine oil viscosity is 5W-30, however, additional engine oil viscosites meeting the API Service SJ and ACEA A3-96 requirements may be used in accordance with the temperature ranges shown.

Accessory Drive Belt Inspection

Inspect the accessory drive belts for the following:

- Cracks
- Fraying
- Wear
- Proper tension

Replace as needed. (Belts can have many small cracks in individual ribs without affecting the performance.) Refer to *Drive Belt Replacement*

Cooling System Service

Notice: DO NOT use cooling system seal tabs (or similar compounds) unless otherwise instructed. The use of cooling system seal tabs (or similar compounds) may restrict coolant flow through the passages of the cooling system or the engine components. Restricted coolant flow may cause engine overheating and/or damage to the cooling system or the engine components/assembly.

Important: If silicate coolant is added to the cooling system, premature engine, heater core or radiator corrosion may result. In addition, the coolant will require change SOONER, at 50 000 km (30,000 miles) or 24 months.

Drain, flush and refill the system with a 50/50 mixture of clean water (preferably distilled) and ONLY GM Goodwrench® DEX-COOL® or Havoline® DEX-COOL® (silicate-free) coolant. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling.

Transmission Service

Manual Transmission

No fluid changing service required. For fluid level checking maintenance intervals, refer to *Inspections and Other Services.*

Automatic Transmission

Change both the fluid and the filter according to the maintenance schedule intervals. For maintenance shedule information, refer to *Maintenance Schedule*

For the fluid and filter changing procedure, refer to *AT Fluid/Filter Changing* in Automatic Transmission.

Spark Plug Replacement

Replace the spark plugs according to the maintenance schedule intervals with the correct type. For maintenance shedule information, refer to *Maintenance Schedule*

For information on the correct type of spark plug, refer to *Maintenance Items*

For the spark plug replacement procedure, Refer to *Spark Plug Replacement*

Spark Plug Wire Inspection

Clean the spark plug wires and inspect for burns, cracks or other damage. Check the wire boot fit at the coils and at the spark plugs. Replace wires as needed. Refer to *Spark Plug Wire Harness Replacement (V6)* or *Spark Plug Wire Harness Replacement (V8)*

Air Cleaner Filter Replacement

Replace the air cleaner filter according to the maintenance schedule intervals with the correct type. For maintenance shedule information, refer to *Maintenance Schedule*

For information on the correct type of air cleaner filter, refer to *Maintenance Items*

For the air cleaner filter replacement procedure, refer to *Air Cleaner Element Replacement*

Fuel Tanks, Cap and Lines Inspection

Inspect the following components for damage or leaks:

- The fuel tanks
- The cap
- The lines
- The fuel rails
- The injection assemblies

Inspect the fuel cap gasket for an even filler neck imprint and any damage. Replace parts as needed. Periodic replacement of the fuel filter is not required. For fuel system diagnosis information, refer to *Fuel System Diagnosis*

Inspections and Other Services

Listed below are the vehicle inspections and services that should be made by either the owner or a qualified technician at the frequencies indicated to help ensure the following:

- Proper safety of the vehicle.
- The vehicle emission system performance.
- Dependability of the vehicle.

Complete any necessary repairs at once. Use the proper fluids or lubricants whenever adding to the vehicle. For information on fluids and lubricants to use when service is required, refer to *Fluid and Lubricant Recommendations*

For emission system diagnosis information, Refer to *A Powertrain On Board Diagnostic (OBD) System Check* or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls.

At Least Monthly

Tire Inflation Check

Check the tire pressure when the tires are COLD. Maintain tire pressures indicated on the Tire Placard on the driver's door of the vehicle, or refer to *Tire Inflation Pressure Specifications*

Cassette Deck Service

Clean the cassette deck. Cleaning should be done every 50 hours of tape play to prevent permanent damage, or every 30 hours for maximum performance. Refer to *Cleaning Tape Head and Capstan, Cassette Cleaning* in Entertainment.

At Least Twice A Year

Restraint System Check

Make sure the safety belt reminder light and all the belts, buckles, latch plates, retractors, anchorages are working properly. Look for any other loose or damaged safety belt system parts. If anything is seen that might keep a seat belt system from doing it's job, have it repaired. Have any torn or frayed seat belts replaced. For seat belt diagnosis information, Refer to *Seat Belt Checks* in Restraints.

Also look for any opened or broken supplemental inflatable restraint (SIR) covers. For SIR diagnosis information, Refer to *SIR General Diagnosis* in Restraints.

The SIR system does not need regular maintenance.

Throttle System Inspection

Throttle system (includes accelerator and cruise control) should operate freely without hesitation between full closed and wide open throttle.

Important: The accelerator and cruise control cables should not be lubricated under any condition. Throttle system components causing hesitation or sticking should be replaced.

Inspect the following:

- Missing parts such as retainers or clips.
- Interference of the linkage or the cable conduit to critical components such as fuel lines, brake lines, harness leads, etc.
- Proximity of the cable to the exhaust system and other heat sources: check for melting and/or discoloration.
- Cable kinking. Avoid sharp bends of cables.
- Clearance of the throttle system moving parts throughout their travel from other stationary components.
- Damage of the components due to cable kinking, severe kinking, severe abrasion, misalignment, etc. If any of the above conditions exists, notify your dealer for a recommended rerouting, adjustment, or replacement.

Automatic Transmission Check

Check the automatic transmission fluid level. Add the proper transmission fluid if needed. A fluid loss may indicate a problem. Check the system and repair if needed. For information on the correct fluid to use, refer to *Fluid and Lubricant Recommendations*

For the automatic transmission fluid level checking procedure, Refer to *Transmission Fluid Checking Procedure*

Weatherstrip Lubrication

Clean the weatherstrip surface, and then apply a thin film of silicone grease, GM P/N 12345579 or equivalent, using a clean, dry cloth.

Wiper Blade Check

Inspect wiper blades for wear or cracking. Replace blade inserts that appear worn or damaged, or that streak or miss areas of the windshield. Refer to *Wiper Arm Blade Replacement* in Wiper/Washer Systems.

At Least Once A Year

Key Lock Cylinders

Lubricate the key lock cylinders with the proper lubricant. For information on the proper lubricant to use, refer to *Fluid and Lubricant Recommendations.*

Body Lubrication

Lubricate all body door hinges and latches, including the following:

- The hood
- The rear compartment lid
- The fuel door
- The headlamp pivot points
- The console door
- The I/P passenger compartment

For information on the proper lubricants to use, refer to *Fluid and Lubricant Recommendations*

More frequent lubrication may be required when exposed to a corrosive environment.

Starter Switch Check

Caution: When performing this check, the vehicle could move suddenly. Personal injury or property damage may result. Make sure there is enough room around the vehicle, in case the vehicle does move. Do not use the accelerator pedal, and be ready to turn OFF the engine immediately if it starts.

On an automatic transmission vehicle, try to start the engine in each gear. The starter should crank only in PARK or NEUTRAL. If the starter operates in any other position, the vehicle needs service.

On a manual transmission vehicle, place the shift lever in NEUTRAL, push the clutch pedal down halfway and try to start the engine. The starter should operate only when the clutch pedal is fully depressed all the way to the floor. If the starter operates when the clutch pedal is not pushed all the way down to the floor, the vehicle needs service.

Brake Transmission Shift Interlock (BTSI) Check

Caution: When performing this check, the vehicle could move suddenly. Personal injury or property damage may result. Make sure there is enough room around the vehicle, in case the vehicle does move. Be ready to apply the regular brake immediately should the vehicle begin to move.

With the engine OFF, turn the ignition to RUN, but do not start the engine. Without applying the regular brakes, try to move the transmission shift lever out of PARK with normal effort. If the shift lever moves out of PARK, the brake transmission shift interlock (BTSI) needs service. For wiring schematic information, Refer to *Tilt Wheel/Column Schematic References* in Steering Wheel and Coulmn-Tilt.

For the BTSI solenoid replacement procedure, refer to *BTSI Solenoid Replacement* in Transmission/Transaxle.

Steering Column Park Lock Check

While parked and with the parking brake set, try to turn the ignition key to LOCK in each shift lever position.

On an automatic transmission vehicle, the key should turn to LOCK only when the shift lever is in PARK.

On a manual transmission vehicle, the key should turn to LOCK only when the shift lever is in REVERSE.

On all vehicles, the key should come out only in the LOCK position. For wiring schematic information, Refer to *Tilt Wheel/Column Schematic References* in Steering Wheel and Column-Tilt.

Parking Brake and Automatic Transmission PARK Mechanism Check

Caution: When performing this check, the vehicle could begin to move. Personal injury or property damage may result. Make sure there is enough room in front of the vehicle, in case the vehicle begins to roll. Be ready to apply the regular brake immediately should the vehicle begin to move.

To check the parking brake's holding ability: with the engine running and transmission in NEUTRAL, slowly remove foot pressure from the regular brake pedal. Do this until the vehicle is held by the parking brake only.

To check the automatic transmission PARK mechanism's holding ability: with the engine running, shift the transmission to PARK, then release all brakes. For diagnosis information of a malfunctioning PARK mechanism, refer to Transmission/Transaxle.

Underbody Flushing

At least every spring, use plain water to flush any corrosive materials from the underbody. Take care to thoroughly clean any areas where mud and other debris can collect.

Periodic Maintenance Inspection (General Maintenance)

Listed below are inspections and services which should be performed at least twice a year (for instance, each spring and fall). A dealer's service department or qualified service center should perform these inspections. All repairs should be completed at once.

Steering, Suspension and Front Drive Axle Boot and Seal Inspection

Inspect the front and the rear suspension for the following:

- Damaged parts
- Loose or missing parts
- Signs of wear or lack of lubrication

Inspect the power steering lines and the hoses for the following:

- Proper hookup
- Binding
- Leaks
- Cracks
- Chafing, etc.

Inspect the drive axle boot seals for the following:

- Damage
- Tears
- Leakage

Replace damaged, torn or leaking seals.

Exhaust System Inspection

Inspect the complete system. Inspect the body near the exhaust system. Look for broken, damaged, missing or out-of-position parts as well as open seams, holes, loose connections or other conditions which could cause a heat build-up in the floor pan or could let exhaust fumes into the vehicle. For exhaust system inspection diagnosis, refer to *Exhaust Leakage* in Engine Exhaust.

Radiator and Heater Hose Inspection

Inspect the hoses and replace if they are cracked, swollen or deteriorated.

Inspect all pipes, fittings and clamps; replace as needed.

Throttle Linkage Inspection

Inspect the following:

- Missing parts such as retainers or clips
- Interference of the linkage or cable conduit to critical components such as fuel lines, brake lines, harness leads, etc.
- Proximity of the cable to the exhaust system and other head sources: check for melting and/or discoloration
- Cable for kinks and sharp bends
- Clearance of the throttle system moving parts throughout their travel from other stationary components
- Damage of the components due to cable kinking, severe kinking, severe abrasion, misalignment, etc.

Replace high effort or excessively worn cables.

Drive Axle Inspection

Check the front/rear axle fluid level, add the proper fluid as needed. Refer to *Lubricant Level Check*

Check the universal joints for damage or leakage.

Brake System Inspection

Inspect the complete system.

Notice: A low brake fluid level can indicate worn disc brake pads which may need to be serviced. Also, if the brake system warning light stays on or comes on, something may be wrong with the brake system. If the anti-lock brake system warning light stays on or comes on, something may be wrong with the anti-lock brake system.

Inspect the brake lines and the hoses for the following:

- Proper hookup
- Binding
- Leaks
- Cracks
- Chafing, etc.

Inspect the disc brake pads for wear. Inspect the rotors for surface condition. Inspect the drum brake linings for wear and cracks. Inspect other brake parts, including the calipers, the wheel cylinders, the parking brake, etc. Check the parking brake adjustment.

The brakes may need to be inspected more often if driving habits or conditions result in frequent braking.

Periodic Maintenance Inspection (Cooling System Maintenance)

Notice: Do not spray cold water on a hot radiator.

Notice: Do not use pressure greater than 138 kPa (20 psi) to test the radiator. Damage to the radiator will result if a higher pressure is used.

- Check the outside of the radiator for bent fins or signs of leakage. Do not temporarily seal the cooling system with a sealer type antifreeze or coolant additive.
- Remove any stones from between the fins.
- Clean loose debris and road film from the radiator core with a quality grease solvent and compressed air. For a more efficient cleaning, direct the stream of solvent at the front of the core. Remove the radiator grille, the fan guard, and the fan shroud in order to ensure a thorough cleaning.
- Remove the radiator cap and look for plugging and scale on the inside of the tank. Replace a badly plugged radiator. Test the cooling system and the radiator.
- Check the coolant level. If the level is low, add the recommended coolant as required.
- Check the condition of the radiator hose clamps. Tighten the clamps if any leakage is seen. Replace the clamps if you see the following conditions:
  - Cracked clamps
  - Stripped clamps
  - Corroded clamps
- Check the radiator hoses for cracking or for a spongy appearance. Replace deteriorated hoses or bursting could occur, resulting in coolant loss and extensive damage from overheating.
- Check the radiator core for leaks and for accumulation of dirt that could obstruct the air passages and reduce heat transfer.
- Check the coolant recovery reservoir for leaks.
- Inspect the radiator rubber mountings and bumpers for deterioration. Replace these as necessary. Check the mounting bolts, the supports, and the braces. Also, check for damage to the radiator core, the side flanges, and the supporting components.
- Check for clearance between the fan blade, the core, and the shroud. Check the fan attaching bolts for tightness. Make sure no bolts are missing. Replace the fan if any blade is bent. The blade and the shroud should be equal distance around the entire perimeter of the shroud. Adjust the distance as necessary after you make any adjustment to the fan or the fan mounting bracket and hub.
- Inspect the filler cap seal. Replace the cap if the following seal conditions apply:
  - Cracking
  - Separation
  - Deterioration
- In order to help maintain efficient heat dissipation, do an occasional external flush of the radiator with water. This removes the majority of dirt accumulation and foreign matter from between the core fins. Using moderate pressure, direct water from behind the core in order to force out debris. Direct the water stream in line with the fins in order to reduce the possibility of bending the fins.
- A radiator with a dirty, obstructed, or leaking core causes the engine to overheat. Radiator scale deposits result from using water that is hard and has a high mineral content in the cooling system. Heat affects the minerals in the water causing the formation of scale, or hard coating, on the metal surfaces within the radiator, reducing the transfer of heat. Some hard water produces a silt-like deposit that restricts the flow of water. Replace a radiator that is plugged, or has a heavy scale on te core.

Vibration Diagnosis and Correction

Specifications

Propeller Shaft Runout Specifications

Application	Millimeters	Inches
Aluminum Wheel		
Lateral Runout	0.762	0.030
Radial Runout	0.762	0.030
Tire and Wheel Assembly (Radial and Lateral Runout)		
Off-Vehicle	1.27	0.05
On-Vehicle	1.52	0.06
Wheel Stud	0.25	0.01
Wheel Hub	0.132	0.0052
One-Piece Propeller Shaft Runout Specifications		
Front	1.016 mm	0.040 in
Center	1.27 mm	0.050 in
Rear	1.40 mm	0.055 in
Two-Piece Propeller Shaft Runout Specifications		
Front	0.762 mm	0.030 in
Center	0.762 mm	0.030 in
Rear	0.889 mm	0.035 in
Pinion Runout Specifications		
Flange	0.076 mm	0.003 in

Propeller Shaft Balancing Weight Amounts

Correction, Total Weight	Clamp Spread, Degrees
0.0	180
0.1	174
0.2	169
0.3	163
0.4	157
0.5	151
0.6	145
0.7	139
0.8	133
0.9	127
1.0	120
1.1	113
1.2	106
1.3	99
1.4	91
1.5	83
1.6	74
1.7	64
1.8	52
1.9	36
2.0	0

Diagnostic Information and Procedures

Vibration Diagnosis

The techniques and procedures for correcting the following types of vibrations are including in the road testing diagnosis:

- Tire and wheel shake
- Steering/suspension shimmy and shake
- Launch shudder
- Exhaust moan
- Engine firing frequency

A Process of Elimination

A few basic concepts must be understood before attempting to diagnose a vibration. As in any diagnostic process, information must be gathered and deciphered, and a correction made based on the results. Road testing and inspecting the vehicle in a manner which systematically eliminates different components, in turn supplements the information received from the customer concerning the complaint. Concentrating efforts on the areas that have not been eliminated will make repairs faster and more effective.

Duplicate the Condition

All vehicles produce vibrations. Some vibrations are normal, while others are not. Some vibrations can be repaired, some cannot. The customer's complaint must be duplicated or experienced. The vibration and the cause of the vibration must be evaluated under changing conditions. Otherwise, there is no way to know for sure that you are fixing what the customer would like fixed.

The symptoms and characteristics of a noise or vibration are also important information. Ask yourself the following questions before you begin:

- What does the vibration feel like?
- Does the vibration make noise? If so, what does the vibration sound like?

What Does the Vibration Feel Like?

Different types of noise and vibration have particular characteristics. These characteristics will help determine the cause of the condition, and the best way to correct the condition. This is the reason for duplicating the vibration.

Identifying the Complaint

The first step in diagnosing a vibration complaint is identifying the exact vibration that the customer is complaining about.

Sometimes the vibration can be duplicated at a given speed. Other vibrations may not be as evident and may require questioning the customer carefully. A road test may need to be performed with the customer in the vehicle in order to point out the specific vibration complaint.

The following questions should be asked when attempting to identify a vibration complaint:

- At what speed is the vibration the worst?
- Can the vibration be felt? If so, where?
- Can the vibration be heard?
- Does the engine or the vehicle load affect the vibration?
- Does the vibration occur in more than one gear range?
- When did the vibration first appear?

The answers to these questions will help in duplicating and diagnosing the vibration.

If the vibration that has been duplicated is suspected as being normal, compare the vibration with a vehicle that is equipped in the same way. The same equipment should include the following:

- Body style
- Engine option
- Engine driven accessories
- Transmission type
- Tire size
- Suspension performance type
- Axle ratio

Important: Once an attempt has been made to repair what may be a normal condition, the customer will likely be convinced that the vehicle has a problem. Customer satisfaction becomes extremely difficult after this point.

If necessary, make the comparison with the customer present and explain the situation.

Purpose of Road Testing

The purpose of road testing is to duplicate the vibration complaint and to find any operating conditions that change or eliminate the vibration. Most importantly, road testing will determine whether the vibration is related to the engine speed or the road speed.

In order to complete a quick and accurate road test, install an engine tachometer (such as a scan tool) and the EVA in the vehicle. Place the EVA vibration sensor in a location where the customer's concern can be felt.

Which Component Group is Causing the Vibration

After a vibration has been categorized as being engine or vehicle-speed related, the vibration can be broken down further to fit into one of the following three groups of rotating components:

- The engine, the clutch disc (manual transmission), the propeller shaft (within the driveline support assembly), the transmission flexplate (automatic transmission) and the transmission torque converter
- The transmission output shaft and the rear axle differential pinion (mounted in the rear of the differential)
- The tires, wheels, hubs, and rotors

These three groups represent the major areas that can produce vibration complaints. The components in each group are related to each other because they are either bolted or splined together. This means that each group of components rotates at the exact same speed.

These categories can be broken down further in order to identify the exact component responsible for the disturbance. The emphasis is on testing (and more testing) in order to pinpoint the source and to eliminate unnecessary parts replacement.

Types of Road Tests

Caution: Refer to Road Test Caution in Cautions and Notices.

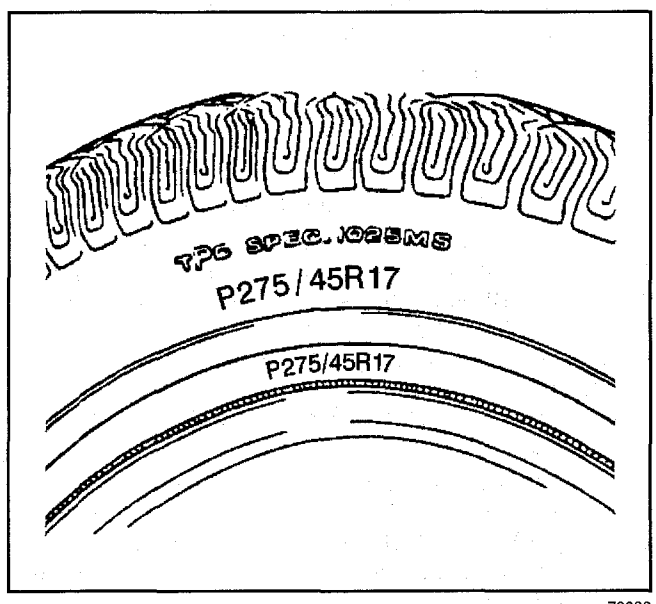
The following are the most often used and informative road test procedures:

- Tire and Wheel Inspection
- Slow Acceleration Test
- Neutral Coast-Down Test
- Downshift Test
- Neutral Run-up Test
- Brake Torque Test
- Steering Input Test
- Standing Start Acceleration Test (Launch Shudder)

These tests will help to pinpoint the vibration. Perform all of the tests on a smooth, level road.

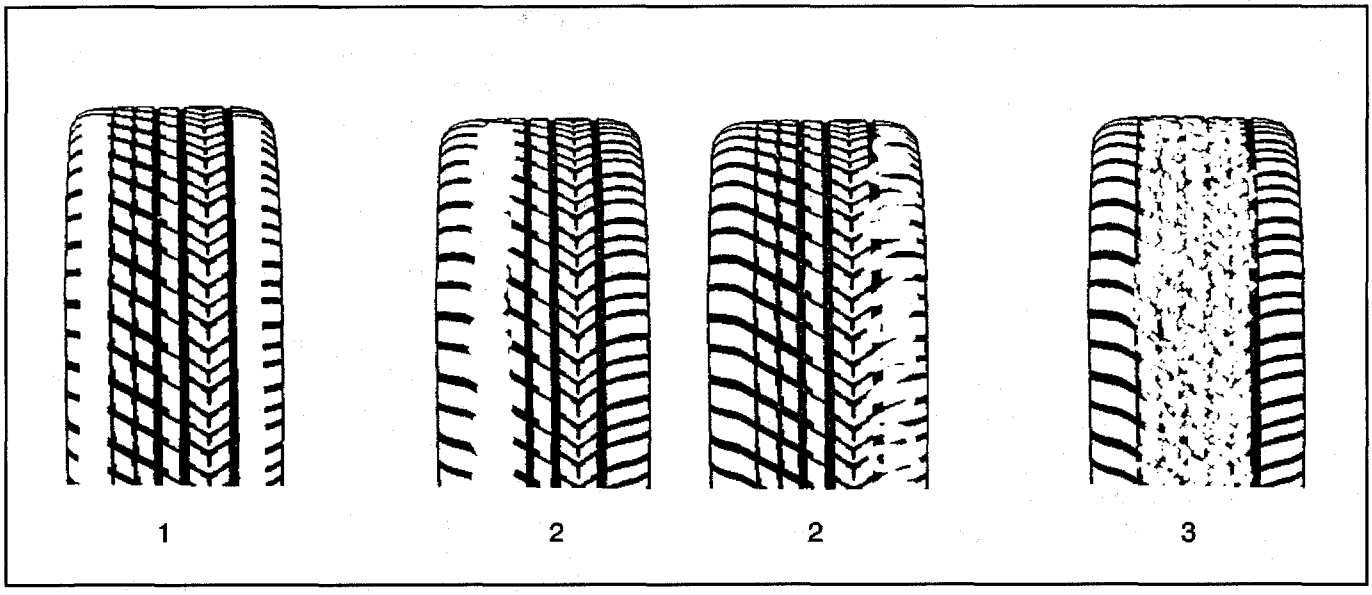
Road Test

Tire and Wheel Inspection



70080

The tires on all new GM models have a tire performance criteria (TPC) rating number molded on the sidewall. The TPC rating will appear as a four-digit number preceded by TPC SPEC on the tire wall near the tire size. A replacement tire should have the same TPC rating.



95607

Legend

(1) Hard Cornering, Under Inflation
(2) Excessive Toe on Non–Drive Axle
(3) Heavy Acceleration on Drive Axle, Excessive Toe on Drive Axle, Over Inflation

This test should be performed for ALL vibration complaints unless the disturbance occurs only with the vehicle at a standstill.

Inspect the tire and wheel assemblies for the following conditions:

- Unusual wear such as cupping, flat spots, and heel-and-toe wear

  (These conditions can cause tire growl, howl, slapping noises, and vibrations throughout the vehicle.)
- Proper inflation
- Bulges in the sidewalls

  (Not to be confused with normal ply splices, commonly seen as indentations in the sidewall.)
- Bent rim flanges

Inspecting these characteristics of the tire and wheel assemblies may lead to the cause of the vibration. At the very least, the inspection will provide assurance that the vehicle is safe for road testing.

Slow Acceleration Test

This test will identify the engine-speed or vehicle-speed related conditions. Additional tests may be necessary in order to determine in which category the vibration belongs.

Caution: Refer to Road Test Caution in Cautions and Notices.

1. On a smooth, level road, slowly accelerate up to highway speed.
2. Look for disturbances that match the customer's description.
3. Note the following readings where the disturbance occurs:
   - The vehicle speed, km/h (mph)
   - The engine speed (RPM)
   - The frequency (if possible)

Following this test, perform the Neutral Coast-Down Test and the Downshift Test.

Neutral Coast-Down Test

Caution: Refer to Road Test Caution in Cautions and Notices.

1. On a smooth level road, accelerate to a speed slightly higher than the speed at which the vibration occurs.
2. Shift the vehicle into NEUTRAL and coast down through the vibration range.

   Note if the vibration is present in NEUTRAL.

If the vibration still occurs in NEUTRAL, then the vibration is definitely vehicle-speed sensitive. At this point, the engine, the clutch disc (manual transmission), the propeller shaft (located inside the driveline support assembly), the transmission flex plate (automatic transmission) and the torque converter have been eliminated as a cause. Depending on the symptoms or frequency, the repair will concentrate on the tire and wheel assemblies, the transmission output shaft, the rear axle differential pinion, or the rear drive axle shafts.

Downshift Test

Caution: Refer to Road Test Caution in Cautions and Notices.

1. On a smooth, level road, accelerate to the speed at which the complaint vibration occurs.

   Note the engine RPM.
2. Decelerate and safely downshift to the next lower gear (from OVERDRIVE to DRIVE, or from DRIVE to SECOND, etc.)
3. Operate the vehicle at the previous engine RPM.

If the vibration returns at the same engine RPM, the engine, the clutch disc (manual transmission), the propeller shaft (located inside the driveline support assembly), the transmission flex plate (automatic transmission), or the torque converter are the most probable causes. You may repeat this test is still smaller gears, and in NEUTRAL, in order to confirm the results.

In some cases, a vibration may be sensitive to torque or engine load, as well as being related to a specific engine (RPM) or vehicle (km/h / mph) speed. These vibrations can be most difficult to diagnose, and require additional testing. Still, following a systematic approach usually leads to pinpointing the problem.

Neutral Run-Up Test

This test is designed to identify engine-speed related vibrations. Use this test when the customer complains of vibration at idle, or as a follow-up to the downshift test. This test more than likely doesn't apply when the complaint is vehicle-speed related only (appearing at the same vehicle speed regardless of the engine speed).

Caution: Refer to Road Test Caution in Cautions and Notices.

1. Slowly increase the engine speed while looking for disturbances that match the customer's complaint.
2. Note at which engine speed (RPM) and frequency (if possible) that the vibration occurs.

Brake Torque Test

This test is designed to identify engine-related vibrations that were not uncovered with the Neutral Run-Up Test. This test also works for vibrations that are sensitive to the engine load or to the torque. This test will more than likely not apply to vehicle-speed related only vibrations.

Caution: Refer to Road Test Caution in Cautions and Notices.

1. Apply the parking brake.
2. Block the front wheels.
3. Step firmly on the brake pedal.
4. Place the vehicle in Drive.
5. Slowly increase the engine speed while looking for vibrations that match the customer's description.
6. Note the engine speed (RPM) and frequency (if possible) at which the disturbance occurs.
7. Repeat steps 4, 6, and 7 in Reverse, if necessary.

Additional Tests

You can perform one or more of the following tests for unique vibration complaints such as those that are torque/load sensitive, in addition to vehicle-speed or engine-speed sensitive:

- Steering Input Test
- Standing Start Acceleration Test

Steering Input Test

This test is intended to determine how much the wheel bearings and other suspension components contribute to the vibration, especially those relating to noises such as growl, grinding, and roaring.

Caution: Refer to Road Test Caution in Cautions and Notices.

1. Drive through slow sweeping turns with the vehicle at the vibration speed (mph) in one direction, then in the other.
2. If the vibration gets worse or goes away, inspect the following components as possible causes of the vibration:
   - The wheel bearings
   - The hubs
   - The tire tread

Standing Start Acceleration (Launch Shudder) Test

The purpose of this test is to duplicate a vibration called launch shudder. In some cases, a powertrain mount or an exhaust ground-out may also be suspected, depending on the symptoms.

Caution: Refer to Road Test Caution in Cautions and Notices.

1. Observe the necessary safety precautions.
2. With the vehicle at a complete stop and in gear, remove your foot from the brake pedal.
3. Accelerate to 48–64 km/h (30–40 mph) while looking for vibrations that match the customer's description.

Other possible causes of launch shudder include the following conditions:

- Incorrect trim height. Refer to *Trim Height Specifications*
- A worn or damaged drive axle CV joint.
- A ground-out engine/transmission mount.
- Faulty exhaust hangers and mounts.

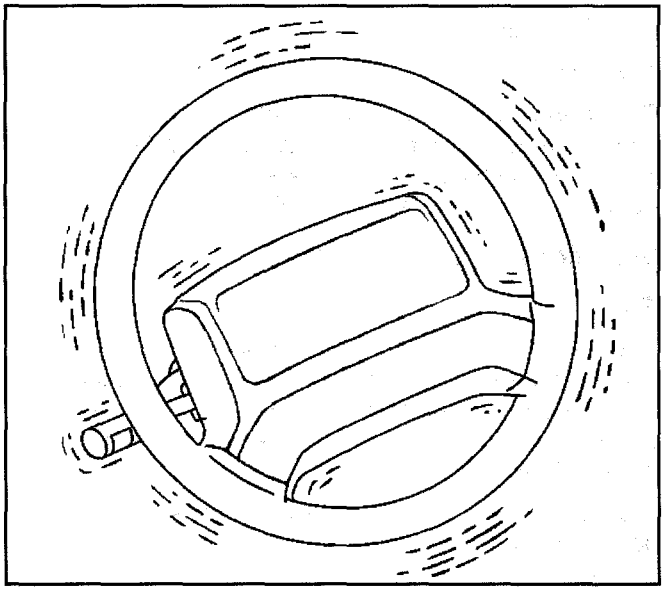
Classifying the Vibration

The next step after road testing the vehicle is to identify the frequency of the duplicated and abnormal vibration. Use the EVA in order to measure the frequency. If the EVA is not available, the frequency can be categorized into groups according to how the vibration feels or sounds. The majority of vibrations will fit into one of the following categories.

- Vibrations that can be felt:
  - Shake
  - Roughness
  - Buzz
  - Tingling
- Vibrations that make noise:
  - Boom
  - Moan and groan
  - Howl
  - Whine

Vibrations That Can Be Felt

Shake



95608

The shake is a low frequency vibration, typically 5–20 Hz. The shake is sometimes seen in the steering wheel, the seat, or the console. The best description is the feeling from an out-of-round or unbalanced tire. Customers may refer to shake in one of the following terms:

- Shimmy
- Wobble
- Shudder
- Waddle
- Hop

In most cases, damage to or wear of the following components is to blame for the shake:

- The tires
- The wheels
- The brake rotors (vehicle-speed sensitive)
- The steering tie rod ends
- The suspension ball joints
- The engine (engine-speed sensitive)

Roughness

Roughness is a vibration with a slightly higher frequency than the shake, usually 20–50 Hz. Roughness is similar to the feeling you get from holding a jigsaw.

Buzz

Buzz is slightly higher in frequency: 50–100 Hz. A buzz is similar to the feel of an electric razor. You may feel it in your hands through the steering wheel, in the feet through the floor, or in the seat. Inspect the following components for a possible cause:

- The exhaust system
- The A/C compressor
- The engine

Tingling

This is the highest frequency that can still be felt. Tingling may sometimes produce a PINS AND NEEDLES sensation. Customers may say the vibration puts their hands or feet TO SLEEP.

Vibrations That Make Noise

Boom

Boom is a low frequency interior noise of 20–60 Hz. Sometimes the customer complains of a pressure in their ears. Examples of similar noises include a bowling ball rolling down an alley, deep thunder, or a bass drum.

A customer may use the following words to describe boom:

- Droning
- Growling
- Moaning
- Roaring
- Rumbling
- Humming

Boom may not be accompanied by a perceptible vibration (roughness).

Moan or Drone

Moan or drone is a sustained tone at a low frequency of 60–120 Hz, somewhat higher than boom.

Examples of similar noises include a bumble bee, or blowing air across the top of a soda bottle. Examples of words to describe moan or drone are humming, buzzing, resonance. Moan or drone may be accompanied by a perceptible buzzing vibration. Inspect the following systems:

- The powertrain mounts
- The exhaust system.

Howl

Howl is a noise at mid-range frequency of 120–300 Hz. This sounds like the wind howling.

Whine

Whine is a prolonged, high-pitched sound in the 300–500 Hz range, and is usually related to the meshing gears or gear noise. Similar sounds include mosquitoes, turbine engines, and vacuum cleaners.

Matching Frequency to Component Speed

At this point in the diagnosis, the vibration has been duplicated, designated as abnormal, identified as being related to engine speed or vehicle speed, and assigned a frequency from the EVA or categorized into a symptom group based on how it feels or sounds.

Automotive vibrations are usually related to the rotating speed of a component. The speed of these components will be calculated using either an engine speed or vehicle speed method. The engine rpm readings taken during the road test will be used in diagnosing vibrations that are engine speed sensitive. If the vibration is vehicle speed sensitive, the rotational speed of the tires needs to be determined. As long as the vehicle is operated at a constant speed, the tires will operate at a constant speed. These speed is measured in rotations or cycles per second. The reading is then compared to the frequency of the vibration, which is also measured in cycles per second.

Calculating Tire Rotation

TIRE/WHEEL ROTATION WORKSHEET

Vehicle Information

Complaint Speed: _____ mph Year: _____ Model: _____

Symptom: _____ VIN: _____

Frequency: _____ Engine: _____ Trans: _____

Engine Speed: _____ rpm Tire Size: _____ Axle Ratio: _____ : ___

Gear: _____ TPC Spec: _____

Tire/Wheel Speed

Vibration Occurs at:	☐	mph ÷ 8 (km/h) 5 (mph)		=	☐	increments of 8 km/h / 5 mph
						Tire/Wheel Speed, RPS (Hz)
8 km/h / 5 mph increments	☐	x	☐ tire RPS * at 8 km/h / 5 mph (from table)	=	☐	**1st order**
1st order	☐	x 2		=	☐	**2nd order**
1st order	☐	x 3		=	☐	**3rd order**

*RPS revolutions per second; equates to cycles per second (Hz).

95609

Determine the rotational speed of the tires in revolutions per second, or Hertz (Hz), based on the vehicle speed at which the vibration occurs. In order to determine the rotational speed, follow this procedure:

1. Determine the complaint speed — the vehicle speed at which the vibration occurs.
2. Determine the number of 8 km/h (5 mph) increments:
   - Divide the complaint speed by 8 when using km/h.
   - Divide the complaint speed by 5 when using mph.
3. Determine the vehicle tire size.
4. Locate on the table below, the Hertz value at 8 km/h (5 mph) for that tire size.
5. Multiply the Hertz value by the number of 8 km/h (5 mph) increments.
6. The result is the rotational speed of the tires in Hertz at the complaint speed. If this figure matches the vibration frequency, a first-order vibration is present in the tire and wheel assembly.

Tire/Speed Table

Tire Size	Tread	Revs/Sec at 5 MPH
P235/55R16	ALS	1.066
P245/50R16	AL2	1.079
P275/40R17	AL2	1.100
AL2		Touring
ALS		All Season

Sometimes, the tire/wheel vibration may be of a higher-order. In order to compute possible higher-order vibrations, multiply the rotational speed of the tires in Hertz at the complaint speed by the order number. If any of these matches the vibration frequency, then a vibration of that particular order is present in one of the tire and wheel assemblies.

Steering and Suspension Assembly Vibrations

Steering and suspension assembly vibrations are the first level of testing for low-frequency vibrations that are vehicle-speed sensitive. The symptoms if a steering/suspension first-order vibration are shimmy or shake, usually felt in the steering wheel or in the seat. Inspect the following components for wear or damage:

- The steering tie rod ends.
- The suspension ball joints.

Tire and Wheel Vibration

Tire and wheel assembly vibrations are the next level of testing for low-frequency vibrations that are vehicle speed sensitive. The tires, wheels, brake rotors and wheel hubs should be systematically tested, according to the symptoms.

First-Order Tire and Wheel Assembly Vibration

The following are symptoms of first-order vibrations caused by tire and wheel assemblies:

- The vibration is always vehicle-speed related.

  If the vibration is affected by the speed of the engine, or is eliminated by placing the transmission in NEUTRAL, then the vibration is not related to the tire and wheel assemblies.
- The vibration will feel like a SHAKE, usually in the steering wheel or the seat:
  - Tire and wheel vibrations that are felt in the steering wheel are most likely related to the front tire and wheel assemblies.
  - Tire and wheel vibrations that are felt in the seat or the floor are most likely related to the rear tire and wheel assemblies.

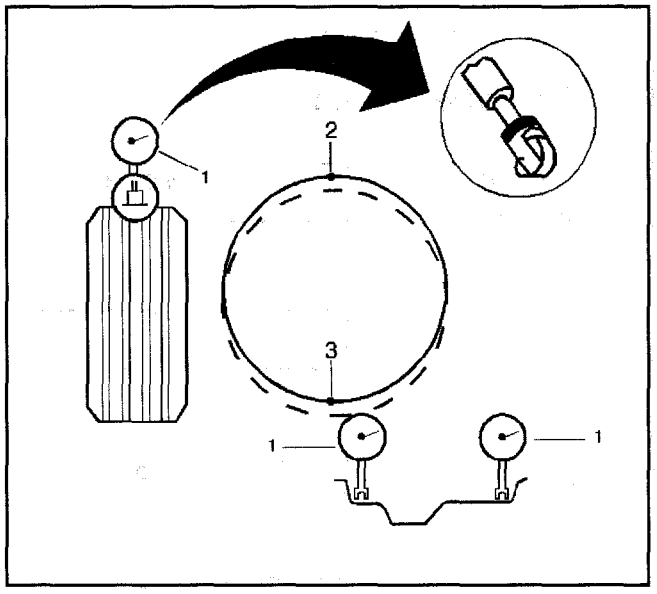
  This may not always hold true, but is a general rule that may serve to initially isolate a problem to the front or the rear of the vehicle.
- The customer may complain of a WADDLE at low speeds of 8 to 56 km/h (5 to 35 mph).
- The frequency on the EVA will correspond to the first-order of tire rotation. This frequency will usually be in the 10 to 20 Hz range, depending on the speed of the complaint and the size of the tire. The smaller the tire, the faster it will rotate at any given speed.
- The range of the human ear begins at 20 Hz. For this reason, first-order tire vibrations are rarely produce noise. The exception to this would be if the tires display an irregular tread pattern or flat spots, causing a GROWLING or SLAPPING noise.

Tire and Wheel Runout Measurement

Measure wheel runout with an accurate dial indicator. Measure with the wheel installed or with the wheel off of the vehicle. Use an accurate mounting surface such as a wheel balancer. You can measure with or without the tire mounted on the wheel.

Measure radial runout and lateral runout on the inboard and outboard rim flanges. With the dial indicator in position, rotate the wheel slowly one revolution. Record the total indicator reading. If any measurement exceeds the specifications, and if there is a vibration that wheel balancing does not correct, replace the wheel. Disregard any indicator readings that are due to welds, paint runs, or scratches.

Radial Runout



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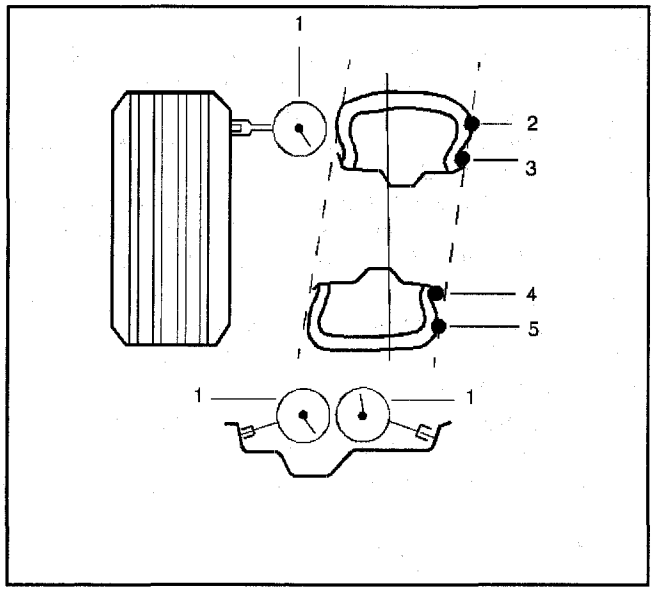
Legend

(1) Dial Indicator
(2) High Spot
(3) Low Spot

Unlike a perfect circle, the tire shape of radial runout is oval. Measure radial tire runout from the center tire tread rib. You can measure other tread ribs. The gauge reads the total runout. The high spot is the location of the maximum runout. If either flange is beyond specifications, replace the rim.

- Aluminum Wheels – 0.762 mm (0.030 in)
- Steel Wheels – 1.015 mm (0.040 in)

Lateral Runout



977

Legend

(1) Dial Indicator
(2) Tire High Spot
(3) Wheel High Spot
(4) Wheel Low Spot
(5) Tire Low Spot

Lateral runout is a sideways variation of the wheel. This runout causes a twist or a wobble. Measure lateral runout on a side surface. On the tire and wheel assembly, measure the side wall of the tire as close to the tread shoulder design edge as possible. The gage reads the total runout. The high spot is the location of the maximum runout. If either flange is beyond guidelines, replace the rim.

- Aluminum Wheels – 0.762 mm (0.030 in)
- Steel Wheels – 1.143 mm (0.045 in)

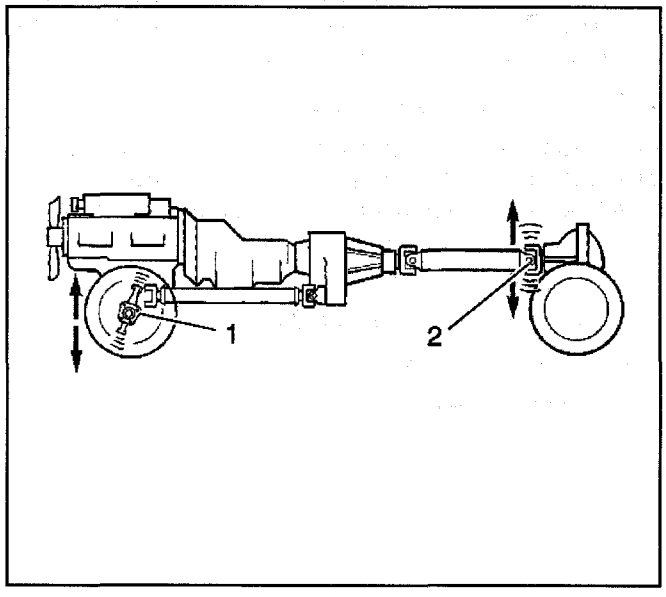
Measurement Procedures

Do the following tire and wheel runout measurement:

1. Inflate the tires to specifications.
2. Warm up the tires before taking measurements. This eliminates flat spotting. You do not need to warm up newly installed tires.
3. Raise the vehicle on a lift.

   If measurement is taken with the wheel off of the vehicle, mount each tire and wheel assembly on a dynamic balance machine.
4. Mark the tire and wheel assemblies for exact replacement.
   4.1. Mark a wheel hub bolt. Mark the hub bolt's exact position on the wheel.
   4.2. Mark each tire and wheel assembly for replacement on the exact hub/rotor assembly.
5. Take a radial measurement or a lateral runout measurement.
   5.1. Place the dial indicator in position.
   5.2. Rotate the tire and wheel assembly. Or rotate the wheel in order to find the wheel's low spot. Adjust the dial indicator to read zero.
   5.3. Rotate the tire and wheel assembly again in order to verify the low spot location. The dial indicator must return to zero. Disregard any dial activity due to welds, paint runs, or scratches on the wheel.
   5.4. Rotate the tire and wheel assembly, or rotate the wheel. Note the amount of variance (runout) from zero. Locate the high spot. Mark the high spot.
6. If there is a large difference in runout measurements from on-vehicle to off-vehicle, excessive runout of the bolt circle or the hub may be causing the problem.
7. If the measured runouts are not within specifications, vector the tire and wheel assembly in order to correct the problem.

Driveline Vibration Analysis



95589

The following components are possible sources of driveline vibration:

- The transmission output shaft
- The propeller shaft/s (driveshaft/s)
- The union flange
- The pinion gear

The above components are either bolted or splined together. Therefore, all of the components rotate at the same speed, vibrate at the same frequency and have the same symptoms.

Driveline vibrations may relate either to the first or to the second order of driveline rotation. Driveline vibrations are always related to the speed of the vehicle. The vibration is often related to torque. If the vibration is worse or only noticeable when accelerating, decelerating, or crowding the throttle, then the vibration is related to the torque. The vibration will always occur at the same speed. If a vibration is both torque and speed sensitive, the driveline is the probable cause. Tire/wheel vibrations are speed sensitive, but not torque sensitive.

First-Order Driveline Vibration Symptoms

The following symptoms may indicate first-order driveline vibration:

- The vibration is related to vehicle speed.
- The vibration is torque sensitive.
- A "boom" or "moan" noise is present.
- The vibration occurs commonly above 72 km/h (45 mph), but possibly as low as 48 km/h (30 mph).
- The "roughness" or "buzz" vibration is felt in the seat, floor or steering wheel.
- The corresponding frequency on the EVA equals first-order driveline rotation (25-60 Hz), depending on the speed of the vehicle and the ratio of the axle. Refer to the worksheet in order to obtain the rotation speed of the propeller shaft.

Driveline Vibration Analysis

Once you identify a vibration that is related to the driveline, continue testing in this service area. The following components are possible sources of first-order driveline vibration:

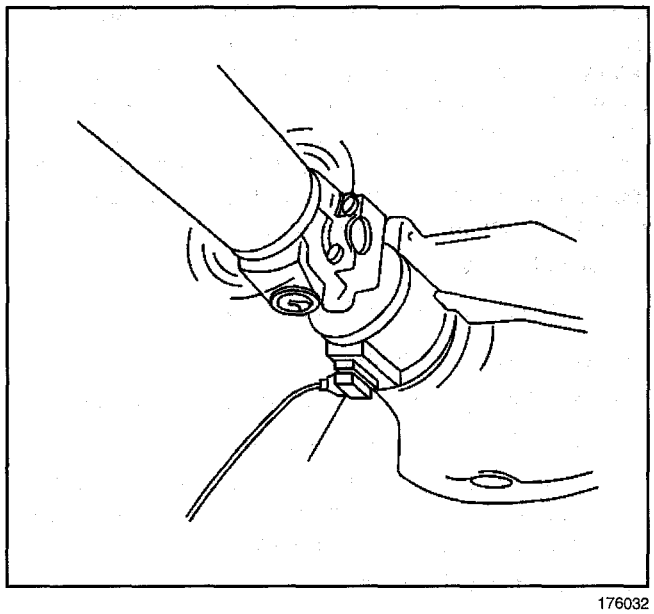
- The propeller shafts
- The transmission output shaft
- The pinion flange
- The pinion gear

Locate the Source of Driveline Vibration with the EVA

Caution: Never run the vehicle faster than 112 km/h (70 mph) when performing propeller shaft vibration or checking for balance. Stay clear of rotating components and balance weights to avoid personal injury. Do not run the vehicle on the hoist for extended periods of time to avoid engine or transmission overheating. Do not step on the brake pedal with the brake drums removed.

In order to pinpoint the source of vibration, reproduce the vibration with the vehicle in the service stall. Then determine which component is vibrating the most using the EVA and the following procedure:

1. Raise the vehicle to curb height. Support the vehicle on a hoist or on safety stands. Do not allow the axle to hang. Refer to *Lifting and Jacking the Vehicle*
2. Remove the rear tire/wheel assemblies. Refer to *Lifting and Jacking the Vehicle*
3. Ensure that the propeller shaft is free of undercoating.
4. Inspect the propeller shaft and U-joints for dents or damage.
5. Start the engine.
6. Place the transmission in gear.
7. Run the vehicle at the speed which the vibration occurs.



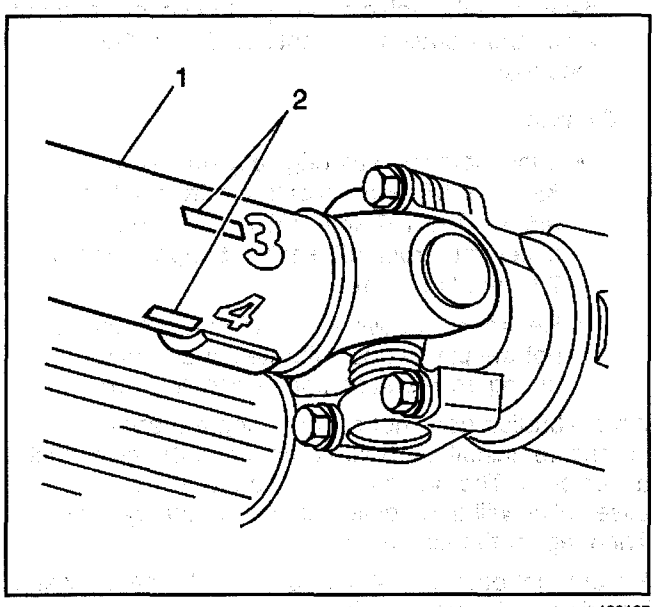
176032

Hold the EVA sensor against the pinion nose and the transmission tailshaft assembly in order to determine which end of the propeller shaft has the most vibration. The end that has the most vibration will have a higher amplitude on the EVA.

If the vehicle has a two-piece propeller shaft, inspect the center support bearing.

If the transmission tailshaft vibrates, inspect the transmission crossmember under the transmission mount. If the mount is secured properly, there should be no vibration at the crossmember.

Runout and Balance Testing with the EVA



182137

Ensure that the runout of the various driveline components are within specifications. If the runouts are within specifications, strobe balance the driveline. The EVA is able to simplify the balancing process. Use the following procedure:

1. Use the EVA in order to determine which end of the propeller shaft has the most vibration.
2. Mark the end of the propeller shaft (1) that has the most vibration at four points (2), 90 degrees apart. Number the marks 1 through 4.
3. Mount the EVA sensor onto the bottom of the following components:
   - The differential housing
   - The center bearing support (for two-part propeller shafts)
   - The transmission tailshaft assembly
4. Position the sensor as close to the propeller shaft as possible. Ensure that the UP side of the sensor faces up. Ensure that the sensor is horizontal.

Notice: Do not use cruise control to maintain vehicle speed.

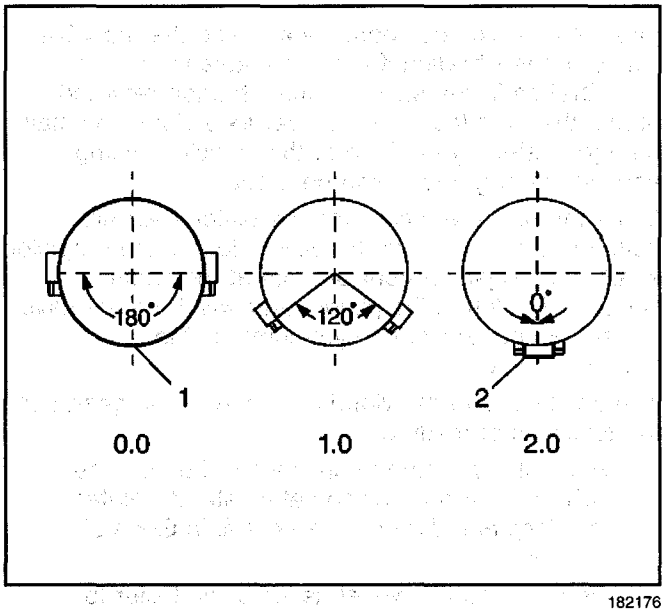
5. Start the engine.
6. Turn off all engine accessories.
7. Place the transmission in gear.
8. Run the vehicle at the speed which causes the most vibration in the propeller shaft.
9. Hook the timing light clip to the trigger wire.
10. Plug the vibration sensor into Input A of the EVA. Input B does not have strobe light capability.
11. Verify that the predominant frequency on the EVA display matches the frequency of the original vibration. Use the strobe light only if the rotation speed of the propeller shaft is the predominant frequency.
12. The EVA displays a series of questions in order to select the correct filter. Press YES in order to select the desired filter. Ensure that the frequency is in the middle of the filter range. Use the full range only as a last resort.
13. The EVA displays the test frequency, the amplitude and the filter range. The driveline is balanced when the amplitude is near two. In some cases a slightly higher amplitude will provide adequate balance.
14. Point the timing light at the propeller shaft. The strobe effect will appear to freeze the propeller shaft. Note which of the numbered marks is at the bottom of the propeller shaft (the 6 o'clock position). This position is the light spot.
15. Turn the engine off.
16. Install a weight directly on the light spot.
17. Start the engine.
18. Run the vehicle at peak vibration speed.
19. Strobe the propeller shaft again.

The propeller shaft is balanced if the strobe image is erratic and the amplitude is near two.

The propeller shaft is not balanced if one of the following conditions exist:

- The weight and the original light spot are at the 6 o'clock position — This condition means that there is not enough weight on the propeller shaft.

  In order to correct the balance, add a second weight next to the first weight. Inspect the balance again using the strobe light.



182176

If the weights are now between 90 and 180 degrees off (between the 9 and the 3 o'clock positions) there is too much weight. In order to correct the balance, split the two weights equally on either side of the original light spot. Splitting the weight will produce a total weight between one and two weights.

Inspect the balance again using the strobe light. Adjust the weights as necessary.

- The weight and original light spot are 90 to 180 degrees off (between the 9 and the 3 o'clock positions) — This condition means that one weight is too much.

  In order to correct the balance, split the two weights equally on either side of the original light spot. in order to produce a total weight less than one (between 120 and 180 degrees apart).

  Inspect the balance again using the strobe light. Adjust the weights as necessary.
- The weight and the original light spot are within 180 degrees of the 6 o'clock position.

  Move weight towards the 6 o'clock position. Inspect the balance again using the strobe light. Adjust the weight as necessary. Refer to the previous two conditions.

If the shaft will not balance using two weights, then place a third weight on the light spot. Split the first two weights in order to produce a total weight between two and three weights.

If three weights fail to balance the driveline, replace the propeller shaft.

When the propeller shaft balances, road test the vehicle in order to verify that the vibration is eliminated.

First-Order Driveline Vibration Analysis (Torque Sensitive)

If the vehicle has a vibration that is equal to first-order driveline rotation, and the vibration is not present when testing the vehicle in the stall, then internal rear axle components are the probable cause of the vibration.

Internal rear axle components are also the probable cause of the vibration if you were able to correct the vibration in the stall, but the vibration returned during the road test. Internal rear axle vibrations may be aggravated by the load of the vehicle working against the ring and pinion gear seat.

Since the propeller shaft and the pinion gear are bolted together through the pinion flange, the propeller shaft and the pinion gear operate at the same speed. Vibration in the pinion gear will therefore have the same frequency and symptoms as the propeller shaft.

In order to isolate the vibration to the pinion gear, use the following procedure:

1. Raise the vehicle to curb height. Support the vehicle on a hoist or on safety stands. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire/wheel assemblies. Refer to *Wheel Removal* in Tires and Wheels.
3. Remove the brake drums.
4. Touch the pinion nose, or hold the EVA vibration sensor up to the pinion nose.
5. Use another technician in order to accelerate and decelerate the vehicle through the speed range at which the vibration was noticed during the road test.

   Example

   - If the vibration was originally noticed at 88 km/h (55 mph), accelerate from 72 km/h (45 mph) to 107 km/h (65 mph). Then decelerate from 107 km/h (65 mph) back to 72 km/h (45 mph).
   - Repeat the above step and note whether or not the pinion nose vibrates under load during acceleration and/or deceleration.

If the vibration does not occur during the above procedure, install the brake drums and the tire/wheel assemblies. The brake drums and tire/wheel assemblies will add additional load on the system. Then repeat the above test.

Ensure that both axle shafts rotate at the same speed. The differential may mask a vibration when one tire is spinning faster than the other tire. Adjust the brakes in order to correct unequal tire rotation speed.

If you are unable to reproduce the vibration in the stall, apply the brake lightly in order to load the system further. Maintain the vehicle speed at which the vibration was noticed. Do not overheat the brakes.

If the pinion nose vibrates under acceleration and/or deceleration, and the other driveline components are eliminated as the cause of the vibration, then one of the following conditions may cause the vibration:

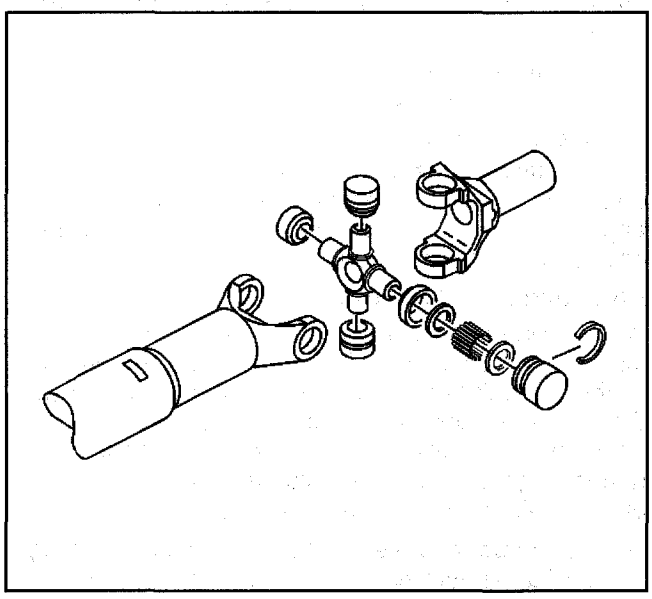
- A high spot on the pinion gear
- A bent pinion stem
- A cocked pinion bearing
- An improper axle housing bore

Anything that effects the pinion gear and how the pinion gear contacts the rotating ring gear may contribute to a first-order, torque-sensitive driveline vibration. The only way to correct the condition is to replace the faulty components. In most cases, the ring and pinion gear set and the related bearings must be replaced. In some case, however, the axle housing must be replaced. Complete a close-up visual inspection for damage or unusual wear in order to measure or identify the specific faulty component.

It is possible to isolate an internal axle vibration. Install a "known good" axle assembly from a stock unit. Verify that the "known good" axle assembly does not have a vibration problem.

Once you correct the internal axle problem, road test the vehicle. Inspect the vehicle for vibration. Balance the driveline as necessary in order to eliminate any remaining vibration.

Second-Order Driveline Vibration Theory



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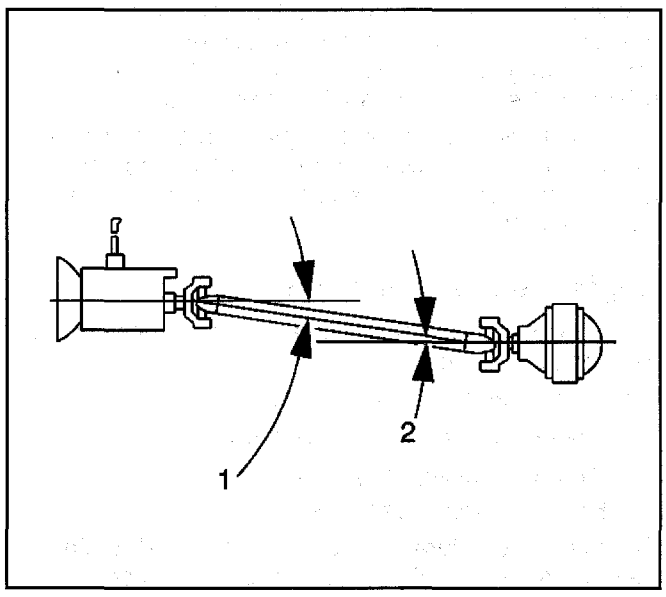
A faulty universal joint (U-joint) may cause a vibration that occurs twice for each rotation of the propeller shaft. This type of vibration is called a second-order vibration.

Second-order driveline vibrations are independent of runout or balance of a driveline component.

The following description of basic U-joint theory will help you to understand where second-order driveline vibrations originate and why they occur.

- As the propeller shaft rotates, the U-joints speed up and slow down twice for each rotation of the propeller shaft.
- The acceleration and deceleration of the U-joints is not visible. If there is vibration in the U-joints, the acceleration and deceleration will be audible and tactile.
- Compare the U-joint in a vehicle to a universal-type socket. When a universal-type socket is used to tighten a bolt, the socket will "bind and release" as the socket turns toward 90 degrees. The "bind and release" occurs twice for each revolution of the socket.
- The U-joint in a vehicle works in the same way as the universal-type socket. The "bind and release" effect is directly proportional to the angle that the U-joint operates: the greater the angle, the greater the effect.
- Because the transmission output speed is constant, the binding and releasing of the U-joints is better described as an acceleration and deceleration which occurs twice for each revolution of the propeller shaft.
- If the propeller shaft is running slowly, the accelerating and decelerating effect is visible. The acceleration and deceleration may create a vibration due to the fluctuations in force that are generated at high speeds.

Canceled Out Driveline Angles



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Legend

(1) Front Working Angle
(2) Rear Working Angle

Engineers design drivelines in order to compensate for the accelerations and decelerations in order to produce a smooth, constant flow of power, as listed below:

- The transmission drives the front yoke of the propeller shaft at a smooth and constant speed.
- The first U-joint causes the power to fluctuate twice for each revolution of the propeller shaft.
- The second U-joint, oriented 90 degrees from the first U-joint, causes the power to fluctuate opposite that of the first U-joint.
- As the first joint slows down, the second joint speeds up.

This design causes one U-joint to cancel out the effect of the other U-joint. The cancelled effects result in a smooth, constant power flow from the output yoke of the propeller shaft.

Second-order driveline vibrations occur when the cancellation become unequal between the front and rear U-joints.

Second-Order Driveline Vibration Symptoms

Second-Order driveline vibration has the following signs and symptoms:

- The vibration is always related to vehicle speed.
- The vibration is usually torque-sensitive.
- The vibration is worse under a torque load.

Launch shudder is the most common complaint of a second-order driveline vibration.

Launch shudder occurs during acceleration from 0–40 km/h (0–25 mph). Launch shudder appears as a low frequency shake, wobble, or shudder. The driver may feel the vibrations in the seat or steering wheel at low speeds [0–24 km/h (0–15 mph)].

The vibrations will increase in frequency as the vehicle speed increases. Launch shudder feels more like driveline roughness at higher speeds [24–40 km/h (15–25 mph)]. At speeds greater than 40 km/h (25 mph) the vibration usually disappears.

Launch shudder vibration is equal to a second-order vibration of the driveline. The EVA will not perceive frequency information due to the transitory nature of launch shudder.

Engine Related Vibration

Engine vibration is usually due to one or more of the following conditions:

- First-order engine imbalance
- Inherent engine firing sequence
- Inherent shaking engine forces
- Engine-driven accessories

Because these vibrations are engine-speed related, they are also normally torque sensitive. These vibrations may appear and disappear at different vehicle or road speeds, but will always appear at the same engine speed.

For example, if a customer states that a vibration is present at 40 km/h (25 mph), 64 km/h (40 mph), and again at 104 km/h (65 mph), and that the symptoms of the vibration are similar at all of these speeds, the vibration is probably engine-speed related.

Any disturbance or vibration that is present during the following road tests would be considered engine-speed related:

- The Neutral run-up test
- The downshift test
- The brake torque test

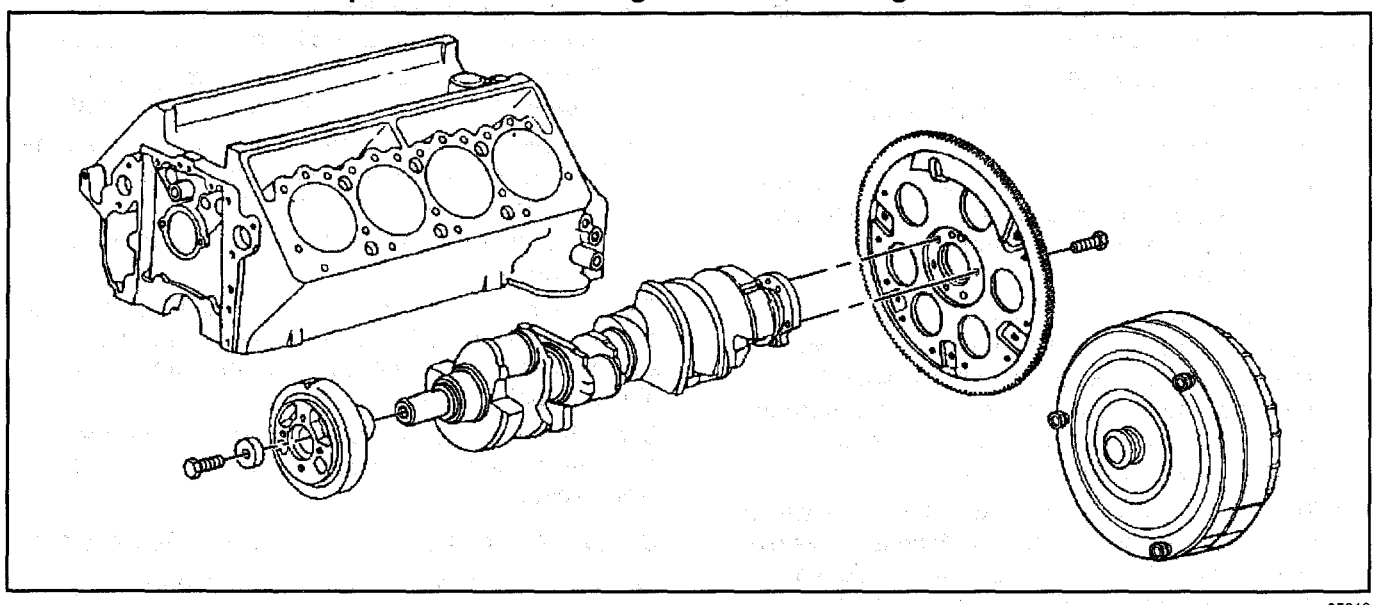
Any vibration that is present during the Neutral coast-down test is not engine-speed related. The engine-related vibrations covered in this diagnosis are engine-speed sensitive only.

First-Order Engine Imbalance

Notice: Do not accelerate against the brakes for longer than 10 seconds. Do not overheat the engine or the transmission. Depending on the vehicle design, the engine will only accelerate to a certain point under these conditions. Also, care should be taken during diagnosis as some disturbances may be created during brake torque that normally do not exist.

Notice: Proper flywheel installation requires carefully WALKING the flywheel onto the crankshaft and stagger-tightening the bolts. Proper torque converter to flywheel installation then requires gradually WALKING the torque converter to be flush with the flywheel, prior to installing the bolts. Do not draw the torque converter to the flywheel with the bolts. If these precautions are not followed, warping or bending of the flywheel and/or damage to the transmission torque converter may result.

Components Contributing to First-Order Engine Imbalance



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Engine imbalance is a condition that exists when a component that rotates at crankshaft speed is either unbalanced or has excessive runout. In rare cases, the crankshaft may be unbalanced. In any case, balancing the component or correcting the runout may bring the disturbance to an acceptable level.

Symptoms

- Vehicle shake at low speeds of 500–1200 rpm, or 8–20 Hz
- Roughness and BOOM at higher speeds of 1200–3000 rpm, or 20–50 Hz
- Vibration usually detected during the Neutral run-up test

Isolating the Components

1. Perform the Neutral run-up test, noting the rpm at which the vibration is the worst, and the severity. Refer to *Road Test.*
2. Inspect all powertrain mounts. Repair or replace as needed.
3. Inspect for any bindings or ground-outs in the exhaust system.

Important: The following steps apply to A/T-equipped vehicles only.

4. Matchmark the torque converter and the flywheel.
5. Disconnect the torque converter from the propeller shaft, pushing the converter back from the flywheel.
6. Tie up the converter, away from the flywheel.
7. Perform the Neutral run-up test again. Refer to *Road Test*
   - If the flexplate shows any wobble or lateral runout, replace the flexplate. Refer to *Engine Flywheel Replacement* or *Engine Flywheel Replacement*
   - Reindex the torque converter in three different positions. If the disturbance still exists, replace the torque converter.
8. If the vibration still exists, inspect the propeller shaft runout.
9. If the vibration still exists, inspect the harmonic balancer.
10. If the vibration still exists, the problem is related to residual engine imbalance. Refer to the procedure below.

Correcting Residual Engine Imbalance

1. Install washers on the harmonic balancer pulley bolts.
2. Replace bolts with longer bolts of equal hardness as needed.
3. (M/T only): Inspect the flywheel and the pressure plate for the following conditions:
   - Correct factory indexing. (The white paint spot on the flywheel and the pressure plate should line up.)
   - Warping
   - Balance

Excessive Inherent Engine Firing Frequency

Engine Speeds and Frequencies

Type of Vibration	First Order		Firing Frequency
	rpm	Hz	V8 Fourth Order
Shake	500	8.3	33.2
	750	12.5	50.0
	1000	16.6	66.4
	1500	25.0	100.0
Roughness	2000	33.3	133.2
	2500	41.6	166.4
Buzz	3000	50.0	200.0
	3500	110.6	233.2
	4000	132.4	266.4

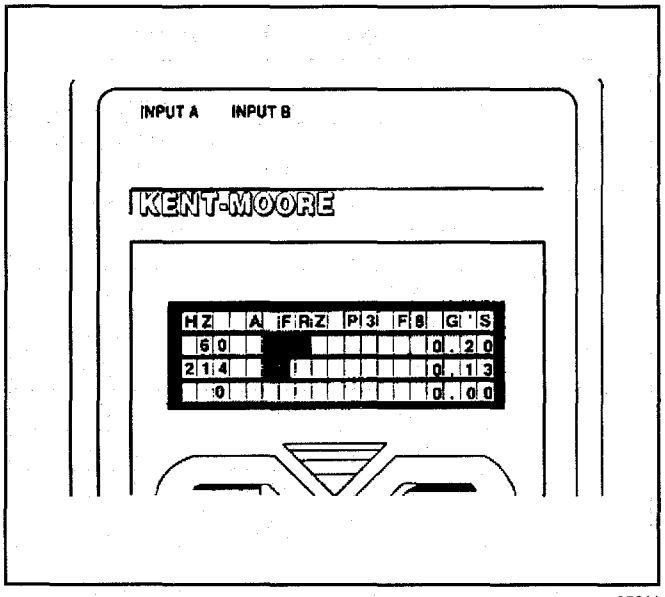
Firing frequency is a term used to describe the pulses created as the engine fires each cylinder. All engines have a firing frequency — but the object is to keep these disturbances from entering the passenger compartment. Initially, inspect for the following conditions:

- The engine and the exhaust system are mounted in a relaxed position.
- All of the mounts and hangers should be in good condition and correct for the application.
- No components, hoses, or lines are grounding to the frame or to the body.

The frequency of these disturbances will depend on the number of cylinders. The engine order will always be equal to one-half the number of cylinders. This is because a four-stroke engine requires two complete revolutions of the crankshaft in order to fire all of the cylinders.

For example, a V8 engine will fire cylinders 1, 3, 5, and 7 on the first revolution. Cylinders 2, 4, 6, and 8 will fire on the second revolution. This results in four firing pulses per revolution of the crankshaft, or fourth order.

Engine Vibration Diagnosis with the EVA



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1. Place the EVA vibration sensor on the seat track rail with the UP label facing upward.
2. Plug the EVA into a 12-volt power supply.
3. Prepare the EVA for data recording:
   3.1. Press RECORD.
   3.2. Select a snapshot tag number.
   3.3. Press ENTER in order to begin recording.
4. Slowly accelerate until the vibration occurs.
5. Note the vehicle and engine rpm where the disturbance occurs.
6. Press ENTER on the EVA in order to record the vibration data.
7. Perform the road test diagnoses in order to determine engine-speed or vehicle-speed sensitivity. Refer to *Road Test*

Engine Firing Frequency Symptoms

- The vibration may be torque sensitive.
- The vibration is engine-speed related.
- The vibration is heard as a boom or a moan.
- The vibration is felt ass shake, roughness, or buzz (depending on the number of cylinders).
- The vibration excites the resonance of a system or a component, causing the system or the component to have a narrow rpm range.

The key to correcting these types of complaints is to isolate the vibration from the passenger compartment or the body.

Diagnosis and Repair of Engine Firing Frequency-Related Vibrations

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Take the necessary safety precautions. Refer to *Work Stall Test Caution* in General Information.
3. Attempt to duplicate the vibration.
4. While the vibration is present, find the area(s) of the vehicle excited by the vibration.
5. Inspect for witness marks due to a rubbing component.
6. Isolate the component and re-evaluate the vibration.
7. Inspect for proper torque on the excited component(s). Tighten as needed.
8. If the vibration still exists, proceed to the procedure below.

Engine Firing Frequency-Related Vibration Causing Components

1. Inspect for collapsed engine mounts.

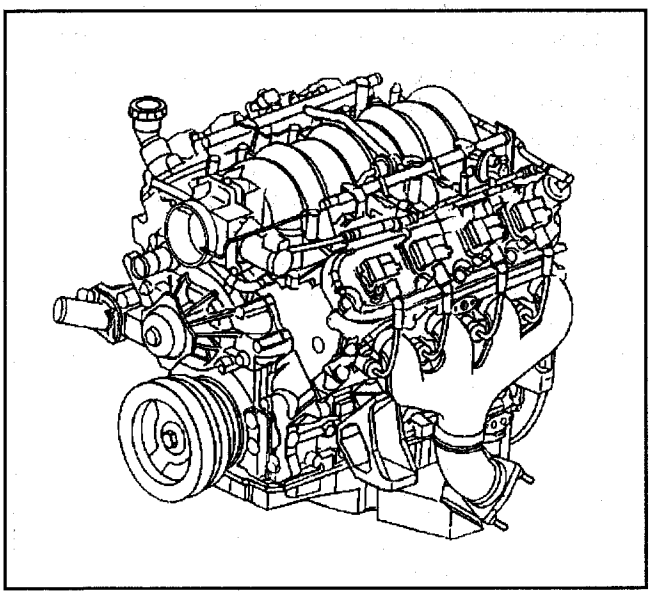
   Replace as needed. Refer to *Engine Mount Replacement* or *Engine Mount Replacement (Right Side)*
2. Inspect the exhaust hangers.
   - Exhaust systems can expand one to two inches when hot.
   - Remove the hangers one at a time.
   - Adjust or replace as needed.
3. Lubricate the manifold flexible coupling.
4. Inspect the A/C and P/S lines.
   - Isolate the hoses from the body.
   - Install the retainers.
5. Inspect the drive belts for whipping.
6. Inspect the accessory unit fasteners for damage or looseness.
7. Inspect the body panels for missing or loose welds.
8. Remove any aftermarket equipment that may complete a transfer path into the passenger compartment.
9. Inspect the exhaust system and powertrain mounts. Re-bed the engine and align the exhaust system as follows if needed:
   - Loosen the mounts and hangers.
   - Tighten all fasteners with the powertrain in the relaxed position.

Some residual vibrations may be normal. Compare the vibrations with a similar vehicle to get a feel for what is commercially acceptable, preferably with the customer present. Also, refer to bulletins for updates on the use of mass damper weights for specific applications.

Inherent Engine Shaking Forces

Engine Order Vibration Table

Engine Order	V8 90°
1/2 Order Torque Sensitive	Single Cylinder Misfire
1st Order Imbalance	Abnormal
1.5 Order Torque Sensitive	—
2nd Order	Abnormal
2nd Order Torque Sensitive	Bank-to-Bank EGR/Fuel Var.
3rd Order Torque Sensitive	—
4th Order Torque Sensitive	Normal



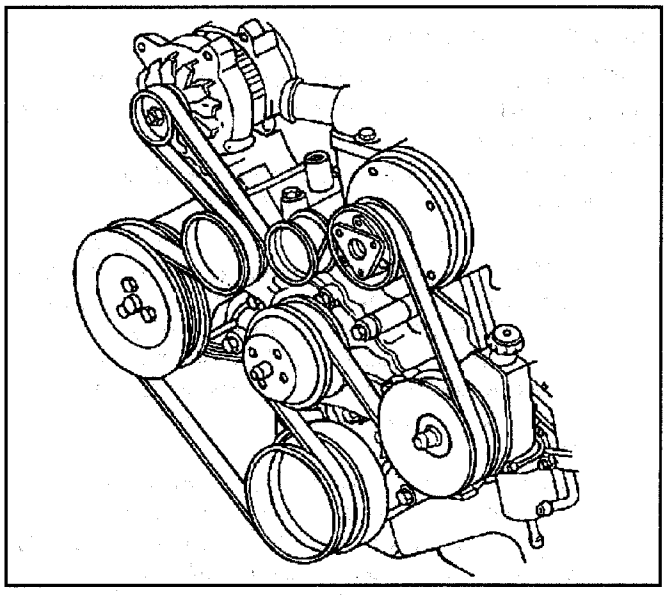
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Just like firing frequency, some engine disturbances are the result of normal operation. Some engines can have additional inherent vibration due to the cylinder arrangement, the design, and the firing order.

Before attempting to repair a disturbance, compare the disturbance to another known good vehicle. Although some vibrations could be normal, they may not be pleasant to the customer.

The key to resolve an inherent engine disturbance is to isolate the vibration from the passenger compartment. Follow the same procedures as outlined for the engine firing frequency-related vibrations.

Engine-Driven Accessories



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Engine driven accessories that exhibit vibration pose some special challenges. For example, the drive belts can no longer be removed one at a time in order to isolate the condition. If removing the belt eliminates the vibration, reinstall the belt and operate each accessory one at a time in order to see which has the most effect on the vibration. However, one component may affect another because the drive belt drives all of the accessories.

Inspect that the accessory load is not exciting the engine firing frequency.

Diagnosis

1. Compare the vibrations to a known good vehicle in order to ensure they are abnormal.
2. Remove the drive belts.
3. If the vibration stops, perform the following steps:
   3.1. Install the drive belts.

Important: The drive belts drive all of the engine accessories. Therefore, one component may affect another.

   3.2. Operate each accessory one at a time in order to see which has the most effect on the vibration.
4. Inspect for accessory load affecting the engine firing frequency.
5. Inspect the pulleys for misalignment or bends. Repair or replace as needed.
6. Inspect the A/C system for overcharging. Evacuate and Recharge as needed. Refer to Evacuation and A.C Charging in HVAC Systems with A/C – Manual.
7. Inspect the engine oil level. Add or drain as needed.

Repair Instructions

General Service Precautions

Caution: One or more of the following guidelines may apply when performing specific required tests in the work stall:

1. ***When a test requires spinning the drive wheels with the vehicle jacked up:***
   - ***On vehicles equipped with a limited-slip differential, do not attempt to spin one drive wheel with the other wheel on the ground. The vehicle may drive through this wheel and cause the vehicle to move unexpectedly, or drive off the safety stands. This may result in personal injury or damage.***
   - ***Do not exceed 56 km/h (35 mph) when spinning one drive wheel with the other drive wheel stopped. This limit is necessary because the speedometer indicates only one-half the actual wheel speed under these conditions. If all drive wheels are spinning at the same speed, do not exceed 112 km/h (70 mph). Personal injury may result from excessive speed wheel spinning. All persons should stay clear of rotating components and balance weight areas to avoid possible personal injury.***
   - ***When running an engine in the repair stall for an extended period of time, use care not to overheat the engine and transmission.***
2. ***When a test requires jacking up the vehicle and running with the wheels and brake drum removed:***
   - ***Do not apply the brake with the brake drums removed.***
   - ***Do not place the transmission in Park with the propeller shaft still spinning.***
   - ***Turn off the ignition to stop the powertrain components from spinning.***

Correcting Tire and Wheel Vibration

A first order tire and wheel vibration is usually the result of one of the following five conditions:

- Excessive radial runout
- Excessive lateral runout
- Excessive imbalance
- Excessive radial force variation
- Excessive lateral force variation

These conditions must be eliminated one at a time in order to attain a set of tires that are free from vibration causing elements. Substitute a set of tires from another vehicle only as a last resort, and only after the tires have been tested on a similar vehicle under the same conditions. Correcting the existing tire and wheel assemblies is the most accurate and least time consuming approach. This is due to vehicle-to-vehicle sensitivities and the differences between the hubs of any two vehicles.

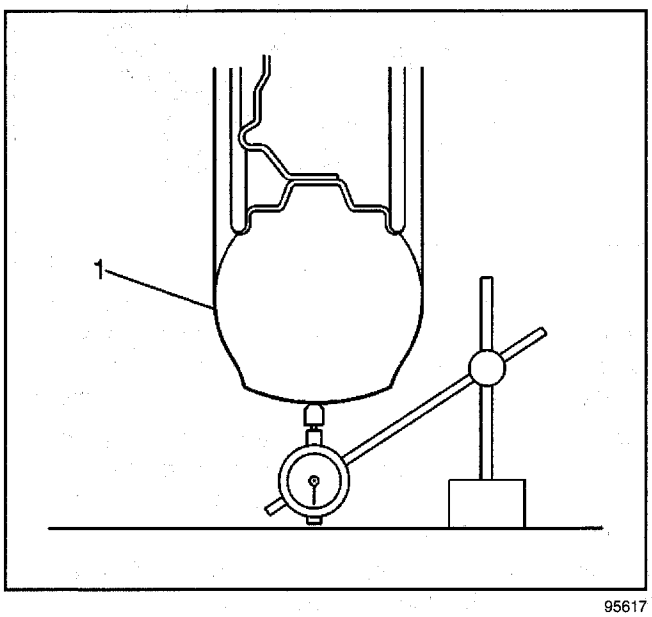
Methods of Measuring Tire/Wheel Assembly Runout

The tire and wheel assembly runout will directly affect the amount of the imbalance and the radial force variation. Therefore, correct the runout first before further diagnosis. The less runout, the less imbalance and radial force variation. Radial and lateral runout can be corrected at the same time. There are two methods for correcting the tire and wheel assembly runout:

- The on-vehicle method, with the tire and wheel assembly mounted on the hub. The wheel bearing must be in good condition.
- The off-vehicle method, with the tire and wheel assembly mounted on a spin-type tire balancer.

Perform the following initial on-vehicle inspections prior to the off-vehicle runout checks:

1. Inspect the tires for any uneven bead seatings. The distance from the edge of the ring to the concentric rim locating ring should be equal around the entire circumference.
2. Properly mount the tires if the beads are not seated properly in order to avoid excessive runout and imbalance.



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The off-vehicle method is the easiest way of measuring the tire and wheel runout. Properly mounting the dial indicator in the correct location in relation to the tire (1) is easier. The dial indicator is less likely to be subjected to water, snow, dirt, or other elements. After measuring the correct runout off-vehicle, inspect the runout with the tire and wheel assembly mounted on the vehicle. The runout measurement may vary greatly between these two methods. If so, the runout is due to one of the following conditions:

- Stud circle runout
- Hub flange runout
- A mounting problem between the wheel and the vehicle

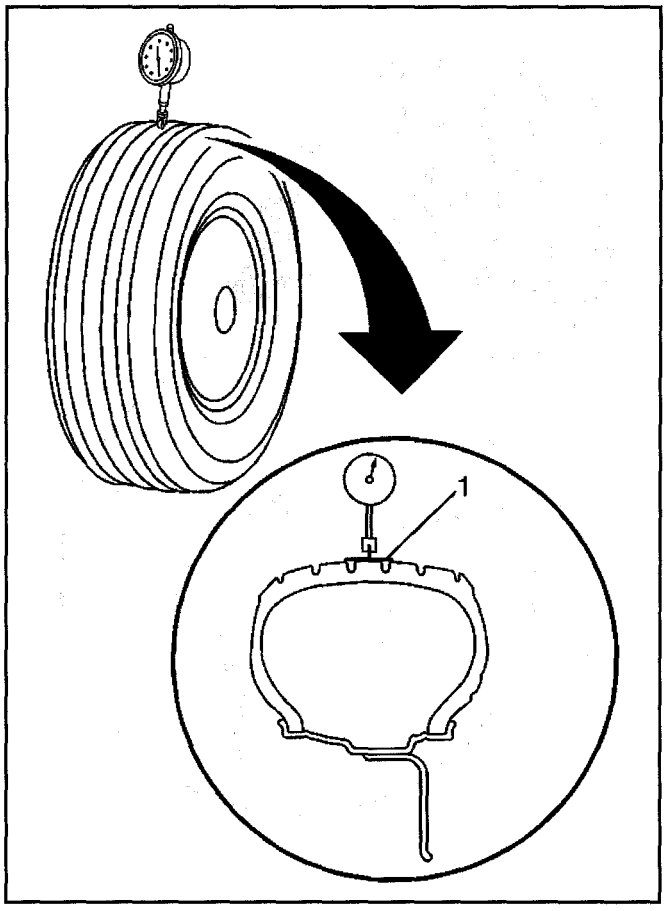
Measuring Tire/Wheel Assembly Runout

If the vehicle has been sitting in one place for an extended period of time, the tires may develop flat spots at the point where the tires were resting on the ground. These flat spots will affect the runout readings. In order to eliminate these flat spots, drive the vehicle long enough to warm up the tires. The flat spots must be eliminated prior to taking any runout measurements.

Measurement Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle*
2. Obtain an initial indication of how much runout exists:
   2.1. Spin the each tire and wheel assembly on the vehicle by hand (or at a slow speed using the engine to run the drive wheels).
   2.2. Visually inspect the amount of runout from the front or rear of the tire.
3. Matchmark the each of the tire and wheel assemblies in relation to the wheel studs and to their position on the vehicle (LF, LR, RF, RR) for future reference.
4. Remove the tire and wheel assemblies one at a time and mount on a spin-type wheel balancer. Refer to *Wheel Removal*

   Locate the tire and wheel assembly on the balancer with a cone through the back side of the center pilot hole.

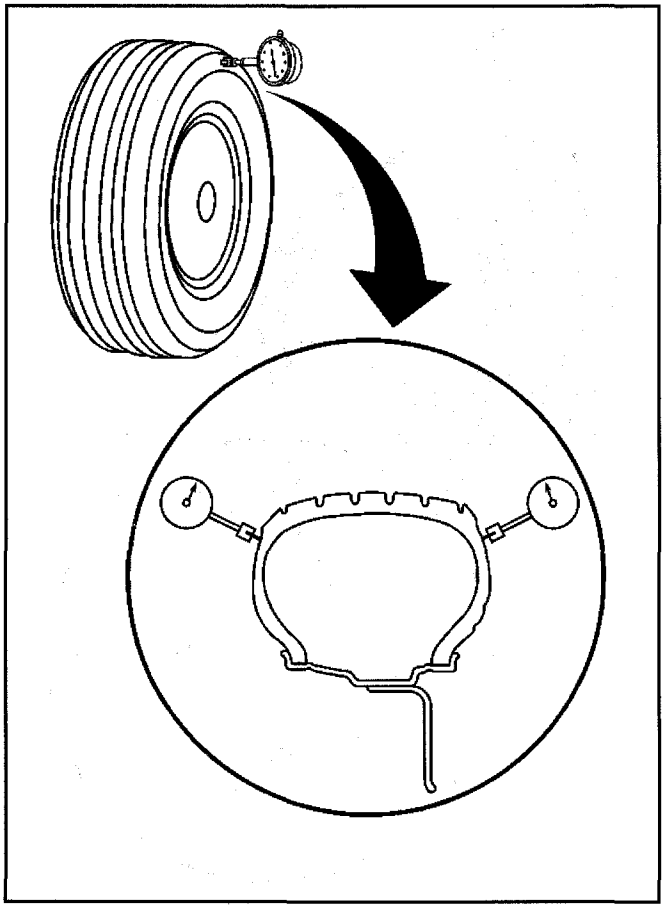


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5. Wrap the outer circumference of tires that use an all-season or aggressive tread pattern with tape (1), in order to accurately measure the radial runout.
6. Measure the tire and wheel assembly radial runout.
   6.1. Slowly rotate the tire and wheel assembly one complete revolution and ZERO the dial indicator on the low spot.
   6.2. Rotate the assembly one more complete revolution and note the total amount of runout indicated.

   Maximum Radial Runout

   - Measured off-vehicle: 1.27 mm (0.050 in)
   - Measured on-vehicle: 1.52 mm (0.060 in)



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7. Measure the tire and wheel assembly lateral runout.

   Lateral runout should be measured on a smooth area of the sidewall as close to the tread as possible. Ignore any jumps or dips due to sidewall splices and attain an average amount of runout.

   7.1. Slowly rotate the tire and wheel assembly one complete revolution and ZERO the dial indicator on the low spot.

   7.2. Rotate the assembly one more complete revolution and note the total amount of runout indicated.

   Maximum Lateral Runout

   - Measured off-vehicle: 1.27 mm (0.050 in)
   - Measured on-vehicle: 1.52 mm (0.060 in)

8. Make the necessary repairs to the tire and wheel assembly.
9. Install the tire and wheel assembly to the vehicle. Refer to *Wheel Removal*
10. Repeat the procedure until all the wheel runouts have been measured.
11. Lower the vehicle.

Measuring Wheel Runout

If tire and wheel assembly runout cannot be brought within tolerance, measure the wheel runout.

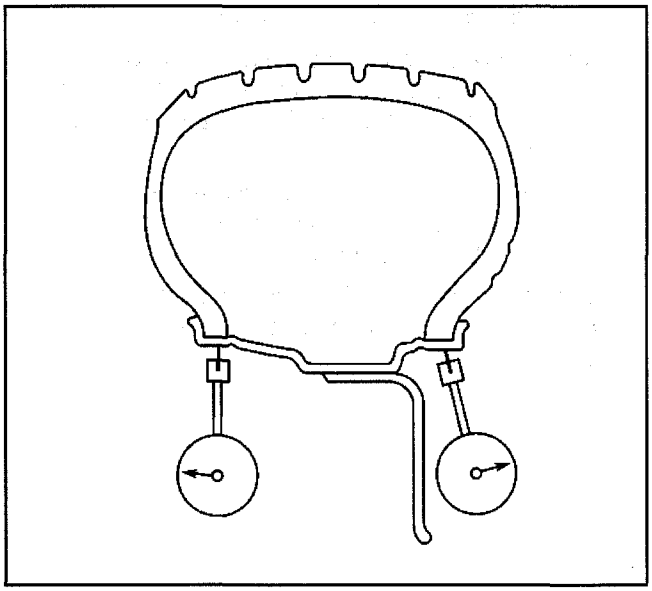
If any runout measurement of a wheel exceeds specifications, the wheel should be replaced. (ALWAYS measure the runout of a new wheel.)

If the runout of the wheel is within tolerance, and the tire and wheel assembly runout cannot be reduced to an acceptable level, the tire should be replaced. (ALWAYS measure the tire and wheel assembly runout after replacing the tire.)

Measurement Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle*
2. Matchmark the each of the tire and wheel assemblies in relation to the wheel studs and to their position on the vehicle (LF, LR, RF, RR) for future reference.
3. Remove the tire and wheel assemblies one at a time and mount on a spin-type wheel balancer. Refer to *Wheel Removal*

   Locate the tire and wheel assembly on the balancer with a cone through the back side of the center pilot hole.



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4. Measure the wheel radial runout on the outside of the wheel (with the tire mounted), if the wheel disign allows.

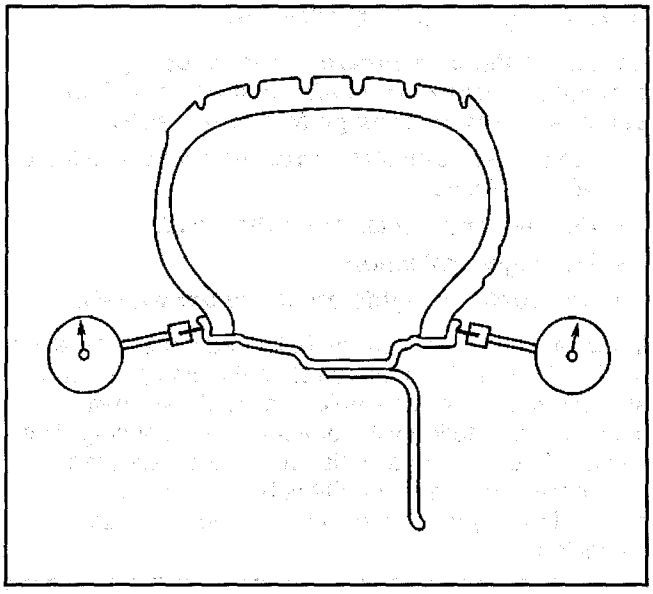
   Wheel runout should be measured on both the inboard and outboard rim flanges. Ignore any jumps or dips due to paint drips, chips, or welds.

   4.1. Slowly rotate the tire and wheel assembly one complete revolution and ZERO the dial indicator on the low spot.

   4.2. Rotate the assembly one more complete revolution and note the total amount of runout indicated.

   Aluminum Wheel Maximum Radial Runout

   0.762 mm (0.030 in)



176968

5. Measure the wheel lateral runout on the outside of the wheel (with the tire mounted), if the wheel design allows.

   Wheel runout should be measured on both the inboard and outboard rim flanges. Ignore any jumps or dips due to paint drips, chips, or welds.

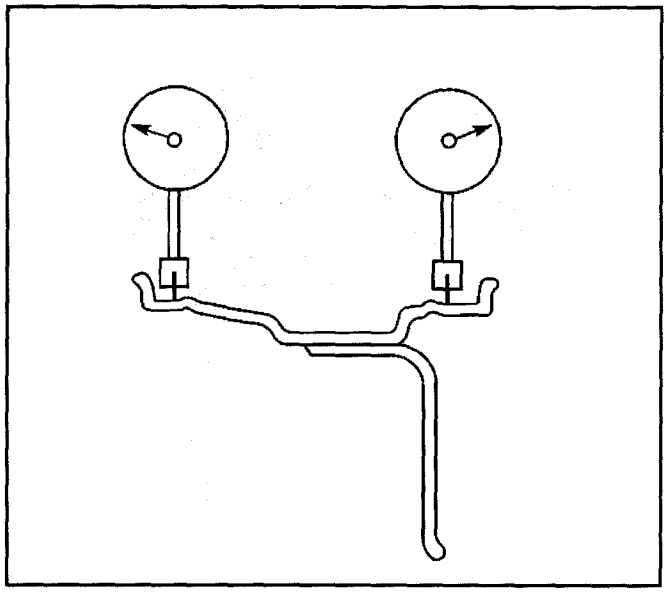
   5.1. Slowly rotate the tire and wheel assembly one complete revolution and ZERO the dial indicator on the low spot.

   5.2. Rotate the assembly one more complete revolution and note the total amount of runout indicated.

   Aluminum Wheel Maximum Lateral Runout

   0.762 mm (0.030 in)

6. If the wheel design does not allow runout measurements to be made with the tire mounted, dismount the tire from the wheel.



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7. Measure the wheel radial runout on the inside of the wheel.

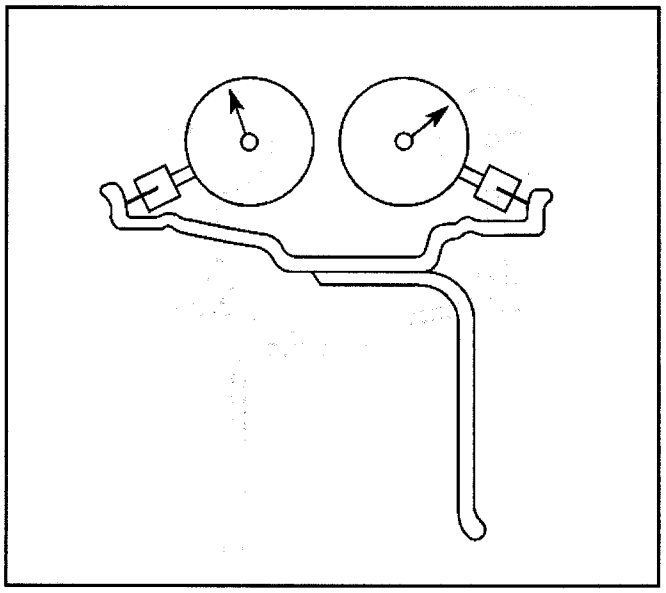
   Wheel runout should be measured on both the inboard and outboard rim flanges. Ignore any jumps or dips due to paint drips, chips, or welds.

   7.1. Slowly rotate the wheel one complete revolution and ZERO the dial indicator on the low spot.

   7.2. Rotate the wheel one more complete revolution and note the total amount of runout indicated.

   Aluminum Wheel Maximum Radial Runout

   0.762 mm (0.030 in)



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8. Measure the wheel lateral runout on the inside of the wheel.

   Wheel runout should be measured on both the inboard and outboard rim flanges. Ignore any jumps or dips due to paint drips, chips, or welds.

   8.1. Slowly rotate the wheel one complete revolution and ZERO the dial indicator on the low spot.

   8.2. Rotate the wheel one more complete revolution and note the total amount of runout indicated.

   Aluminum Wheel Maximum Lateral Runout

   0.762 mm (0.030 in)

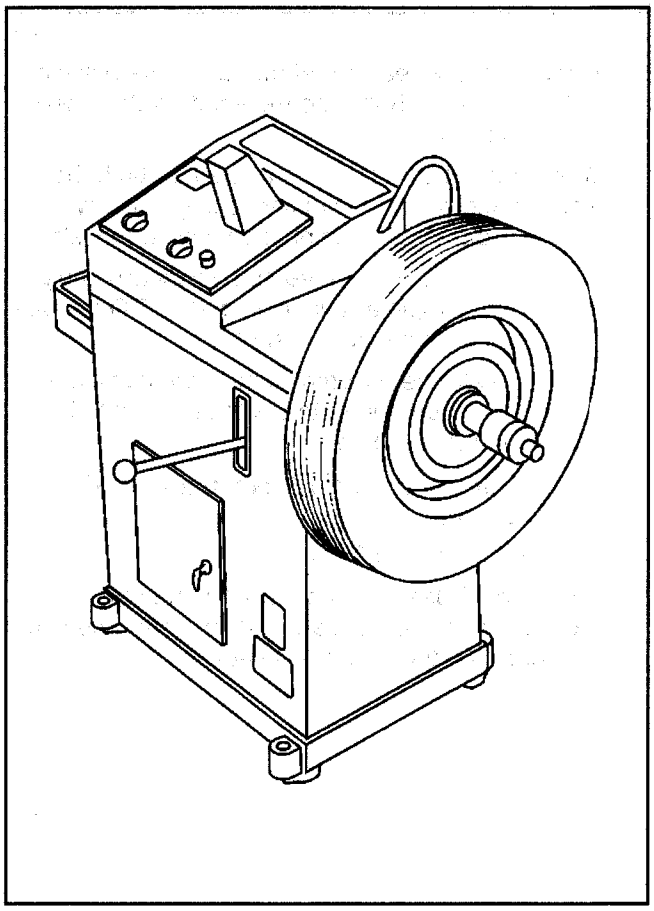
9. Make the necessary repairs to the tire and wheel assembly.
10. Install the tire and wheel assembly to the vehicle. Refer to *Wheel Removal* in Tires and Wheels.
11. Repeat the procedure until all the wheel runouts have been measured.
12. Lower the vehicle.

Balancing Tires and Wheels

Caution: Failure to adhere to the following precautions before tire balancing can result in personal injury or damage to components:

- ***Clean away any dirt or deposits from the inside of the wheels.***
- ***Remove any stones from the tread.***
- ***Wear eye protection.***
- ***Use coated weights on aluminum wheels.***

Important: The tires can be balanced either on-vehicle or off-vehicle, but the off-vehicle balancing procedures are recommended. Off-vehicle methods are better because tire rotation will not affect the balancing. The off-vehicle balancers are also more accurate than the on-vehicle balancers. Off-vehicle balancers can perform dynamic balancing as well as static balancing.



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Tire and wheel balancers can drift out of calibration without warning, or can become inaccurate as a result of abuse. The balancer calibration should be inspected every two weeks, and whenever the readings are questionable.

Tire Balancer Calibration Test

1. Spin the balancer without a wheel or any of the adapters on the shaft.
2. Inspect the balancer readings.

   Specification

   0.00–0.25 oz
3. Balance a tire and wheel assembly that is within radial and lateral tolerances to ZERO.
4. Add a 3 ounce test weight to the wheel at any location.
5. Spin the tire and wheel assembly again, noting the readings.
   - In the static and dynamic modes, the balancer should call for 3 ounces of weight, 180 degrees opposite the test weight.
   - In the dynamic mode only, the weight should be called for on the flange of the wheel opposite the last weight.
6. With the assembly unbalanced to 3 ounces, cycle the balancer 5 times.
7. Take the balancer readings:

   Specification

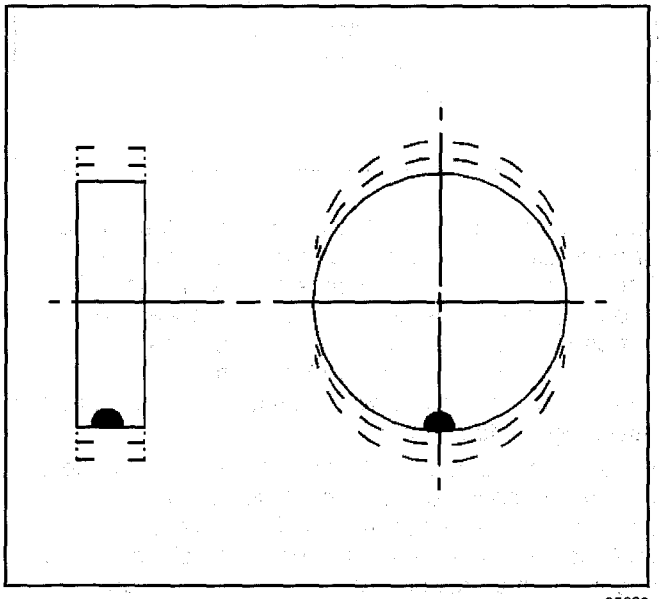
   Variation: 0.25 oz or less
8. Index the tire and wheel assembly at four separate locations on the balancer shaft, 90 degrees apart.
9. Cycle the balancer with the assembly at each location.
10. Take the balancer readings:

    Specification

    Variation: 0.25 oz or less

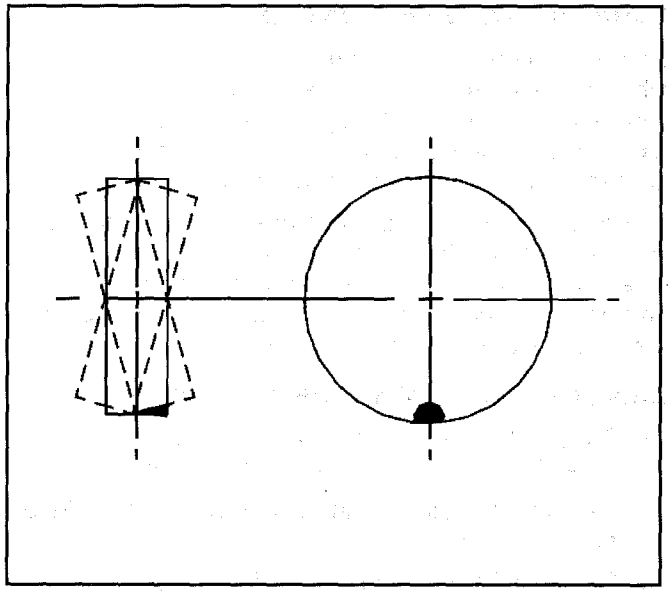
Tire Balancing Guidelines

Static and dynamic balance are two kinds of tire/wheel balance:



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- Static balance, also called single plane balance, affects the distribution of weights around the wheel circumference.



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- Dynamic balance, or two-plane balance, affects the distribution of weight on each side of the tire/wheel centerline.

Most off-vehicle balancers are capable of checking both types of balance simultaneously.

As a general rule, most vehicles are more sensitive to static imbalance than to dynamic imbalance, with as little as 0.50–0.75 oz capable of inducing a vibration in some vehicles. Vibration induced by static imbalance will cause a vertical or BOUNCING motion of the tire.

Dynamic imbalance results in a side-to-side motion of the tire. This motion is referred to as SHIMMY.

- Balance all four tires as close to ZERO as possible.
- Carefully follow the wheel balancer manufacturer's instructions for proper mounting techniques to be used on different types of wheels.
- Regard aftermarket wheels, especially those incorporating universal lug patterns, as potential sources of runout and mounting problems.
- Use the correct coated weights on aluminum wheels.
- Recheck the tire and wheel assemblies for excessive runout after they have been corrected and installed.
- Evaluate the vehicle at the complaint speed and note if the vibration has been corrected.
- If the vibration is still present, or is reduced but still unacceptable, you may find one of two possibilities:
  - On-vehicle imbalance
  - Radial or lateral force variation

Correcting On-Vehicle Imbalance

On-vehicle imbalance may result from components other than the tire and wheel assemblies having imbalance. An on-vehicle high-speed balance or replacement of suspected components may be necessary in order to correct the condition.

Rotors do not have a set tolerance. However, rotors with more than 0.75 ounce imbalance have the potential to cause vibration. The rotors can be inspected for imbalance using either the on-vehicle or the off-vehicle method as described below:

Checking Rotor Imbalance (On-Vehicle)

1. Support the vehicle rear axle on a suitable hoist. Refer to *Lifting and Jacking the Vehicle*
2. Remove the rear tire and wheel assemblies. Refer to *Wheel Removal*
3. Reinstall the wheel nuts in order to retain the rotors.

Caution: Refer to Work Stall Test Caution in Cautions and Notices.

4. Take the necessary precautions.
5. Run the vehicle at the complaint speed while inspecting for vibration.
6. If the vibration still exists, perform the following steps:
   6.1. Remove the rotors.
   6.2. Run the vehicle back to speed.
7. If the vibration is eliminated, perform the following steps:
   7.1. Remove the rotors one at a time.
   7.2. Perform the vibration test for each rotor.
   7.3. Replace the rotor causing the imbalance.
   7.4. Inspect the balance of the new rotor.

Checking Rotor Imbalance (Off-Vehicle)

1. Measure the diameter and the width of the rotor.
2. Mount the rotor on a balancer in the same manner as a wheel.

Important: The rotors can only be inspected for static imbalance. Ignore the dynamic imbalance reading.

3. Inspect for static imbalance.

On-Vehicle Balancing Procedure

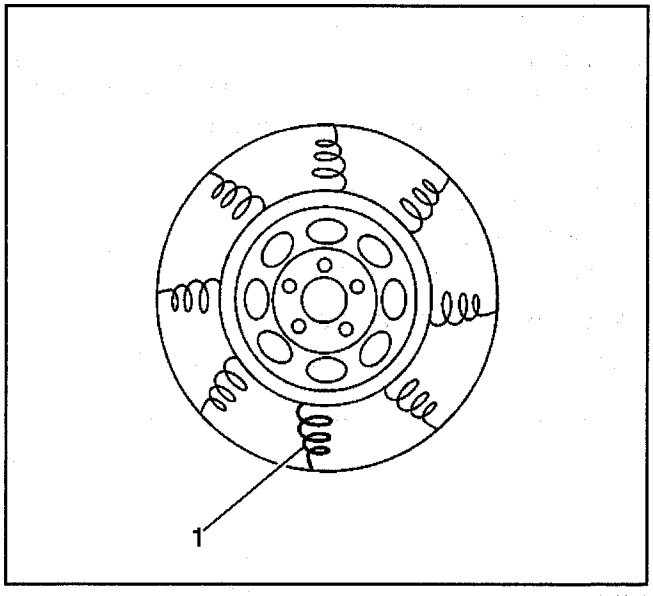
The vibration problem may not be correctable with the components removed from the vehicle. An on-vehicle high-speed balancer may be required in order to balance the tire and wheel assemblies while still mounted on the vehicle. On-vehicle balancing will balance the hubs and the rotors simultaneously, and will compensate for any residual runout encountered as a result of mounting the tire and wheel assemblies on the vehicle as opposed to off-vehicle balancing.

Follow the on-vehicle balancer manufacturer operator's manual for specific instructions while keeping the following tips in mind:

Balancing Tips

- Do not remove the off-vehicle balancing weights. The purpose of on-vehicle balance is to FINE TUNE the assembly balance already achieved, not to start over again.
- If the on-vehicle balance calls for more than 1 ounce of additional weight, split the weight between the inboard and outboard flanges of the wheel, so as not to upset the dynamic balance of the assembly that was achieved in the off-vehicle balance.
- An EVA vibration sensor placed on the fender of the vehicle during the on-vehicle balance is an excellent indicator of the amplitude of the vibration, and the effect that the balance has on the vibration.
- Evaluate the vibration after the on-vehicle balance in order to determine if the vibration condition has been resolved.

Radial Force Variation



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Radial force variation is the difference in the stiffness of a tire as the tire rotates and contacts the road. The tire and wheel assemblies have some variation due to splices in the tire plies. These splices do not cause a problem unless the force variation is excessive. These STIFF SPOTS in the tire (1) can deflect the tire and wheel assembly upward as the assembly contacts the road.

If the tire has only one stiff spot, the spot will deflect the spindle once per each revolution of the tire and wheel assembly, thus causing a first-order tire/wheel vibration. If the tire has two stiff spots, the spots cause a second-order vibration. First- and second-order tire/wheel vibrations are the most common to occur as a result of radial force variation. Third-, fourth-, or higher orders are possible but rarely occur.

The most effective way to minimize the possibility of force variation as a factor in tire and wheel assembly vibrations is to ensure that the tire and wheel assembly runout is at an absolute minimum. However, some tire and wheel assemblies exhibit vibration-causing force variation even though they are within runout and balance tolerances. These instances are becoming rare due to tighter tolerances and higher standards in manufacturing.

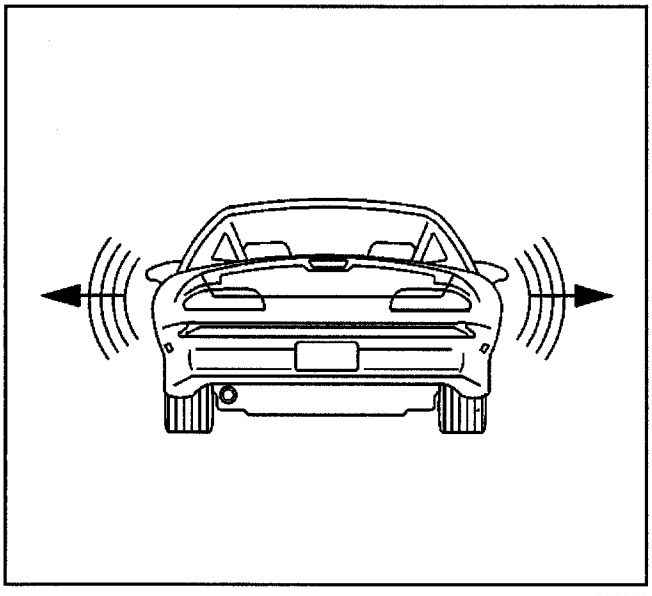
The following two alternatives are available if force variation is suspected as a factor in tire and wheel assembly vibration complaints:

- Buff the tires.
- Substitute one or more known good tire and wheel assemblies.

The tires may be buffed on a tire matching machine that is designed to remove small amounts of rubber from the outer rows of the tread blocks at the location of the stiff spots under load. This eliminates the spindle deflection. This type of equipment is not currently in widespread use. Do not use a TRUER or any tool that is designed to make the tire perfectly round. These tools will not correct the condition.

You may substitute one or more known good tire and wheel assemblies when a tire manufacturer is not available locally.

Lateral Force Variation



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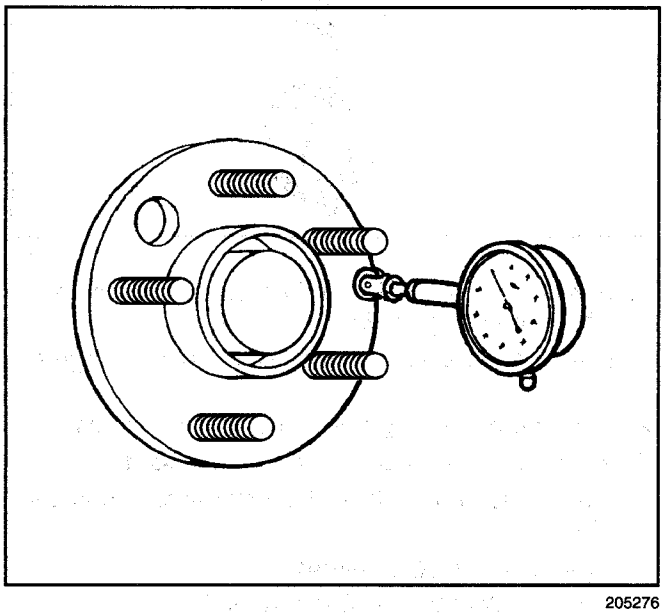
Lateral force variation tends to deflect the vehicle sideway, or laterally. Lateral force variation is based on the same concept as radial force variation. A SNAKY belt inside the tire may be the cause of lateral force. The tire substitution method may have to be used before tire replacement.

A lateral force variation condition is rare. The best way to eliminate lateral force variation as a factor in tire and wheel vibration conditions is to ensure that the lateral runout of the tire and wheel assemblies is at an absolute minimum.

The vehicle will WOBBLE or WADDLE at slow speeds of 8–40 km/h (5–25 mph) when lateral force variation is excessive. This condition is usually related to the first-order of tire and wheel rotation.

Wheel Hub/Axle Flange Runout

Inspect the wheel hub/axle flange runout when lateral runout occurs during on-vehicle testing but not during off-vehicle testing. The tolerances provided are only guidelines. Perform corrections only if the on-vehicle runout cannot be brought to within tolerance.



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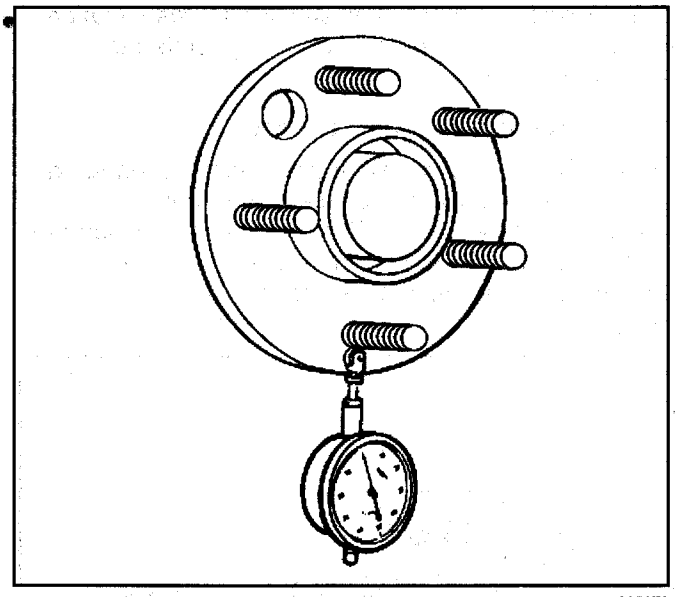
1. Position the dial indicator on the machined surface of the hub, the axle flange, or the rotor, outside of the wheel studs.
2. Rotate the hub in order to find the low spot.
3. Set the dial indicator to zero at the low spot.
4. Rotate the hub again and check the total amount of runout.

Specification (Guideline)

Runout tolerance: 0.130 mm (0.0050 in)

Wheel Stud (Stud Circle) Runout

Use the following procedure whenever the off-vehicle radial runout and the on-vehicle radial runout are significantly different, and earlier attempts to correct the tire and wheel vibration condition have not been successful.



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1. Position the dial indicator in order to contact the wheel mounting studs.

   Measure the stud runout as close to the flange as possible.
2. Turn the hub to register on each of the studs.
3. Zero the dial indicator on the lowest stud.
4. Rotate the hub again and check the total amount of runout.

   Specification (Guideline)

   Runout tolerance: 0.80 mm (0.030 in)

Correcting Non-Uniform Tires

Use the following two methods to correct tires which cause a vibration, although the tires are balanced properly:

1. This method uses an automatic machine that loads the tire and buffs small amounts of rubber from high spots on the outer two tread rows.
   - Using this method in order to correct the tires is usually permanent. This method does not significantly affect the appearance or the tire tread life.
   - Do not true the tires with a blade-type machine. This reduces the tread life substantially, and this often does not permanently correct the problem.
2. The second method is to dismount the tire and rotate it 180 degrees on the rim. It is important that this is be done on the tire and wheel assemblies which are known to be causing a vibration, as it is just as likely to cause good assemblies to vibrate.

Correcting Driveline Vibration - RWD and 4WD

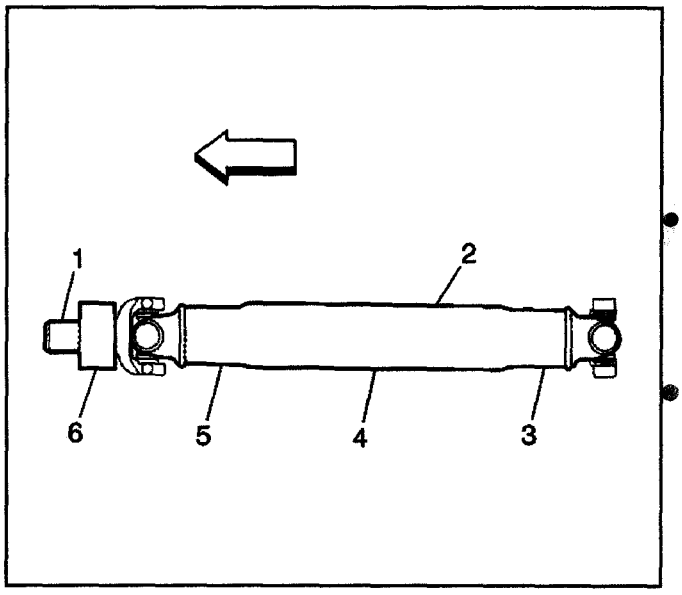
Diagnosis will be much easier once you have identified a vibration as first-order of driveline rotation during the road test. Then identify the exact area that the vibration is coming from and take proper action.

In most cases, vibration may be reproduced in the stall. In the stall the vibration may be better or worse than that experienced during the road test.

The objective is to reduce the vibration to the lowest point possible in the stall, than evaluate the results on a road test. Many times, a vibration you were able to reduce drastically in the stall will be completely eliminated on the road.

The cause of first-order drive line vibration is usually excessive runout or an imbalanced component.

The following procedure offers a systematic process of elimination in order to determine which component is at fault:



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1. Raise the vehicle to curb height. Support the vehicle on a hoist or heavy stands. Refer to *Lifting and Jacking the Vehicle*
2. Remove the rear tire/wheel assemblies. Refer to *Wheel Removal*
3. Inspect the propeller shaft. The propeller shaft should be free of undercoating before continuing this diagnosis.
4. Inspect the propeller shaft or U-joints for any obvious dents or damage. Dents or damage will contribute to first-order driveline vibrations.
5. Start the engine.
6. Place the transmission in gear.
7. Run the vehicle up to the speed at which the vibration was most severe. Do not step on the brake while the brake drums are removed.
8. Note the vibration present, and at what speed.
9. If the vibration is not present, refer to *Driveline Vibration Analysis*.
10. If the vibration is present, determine which end of the driveshaft is vibrating the most. Hold your hand against the pinion nose and the transmission tailshaft, or hold an EVA vibration sensor up to each component.
11. If the vehicle is equipped with a two-piece propeller shaft, inspect the center support bearing for vibration.
12. If the transmission tail is vibrating, touch the transmission crossmember under the transmission mount. If there is no vibration on the crossmember, then the transmission mount is working properly.
13. Note which end of the driveshaft is the worst, and how severe the vibration is. The inspection will be a reference by which to judge future progress.



Helpful Hints

Do not fill the propeller shaft with foam, oil, or any other substance in order to correct a vibration. Filling the propeller shaft is only effective in reducing an unrelated condition called Torsional Rattle. Filling the propeller shaft should only be done in strict adherence to the procedure outlined in corporate bulletins that address Torsional Rattle. Failure to follow the correct procedure will induce a vibration and/or affect the structural integrity of the propeller shaft. The propeller shaft will then have to be replaced.

Propeller Shaft Runout

A propeller shaft or pinion (companion) flange with excessive runout causes first-order driveline vibrations. Use the following procedure in order to measure runout of the propeller shaft (2). The tolerances are critical for smooth operation of the driveline.

- Remove excess corrosion of the propeller shaft surface before checking runout. Also inspect for damage and dents. Replace dented propeller shafts. Remove any undercoating from the propeller shaft before proceeding.
- The measurement procedure that follows applies to all one-piece and two-piece propeller shaft assemblies.

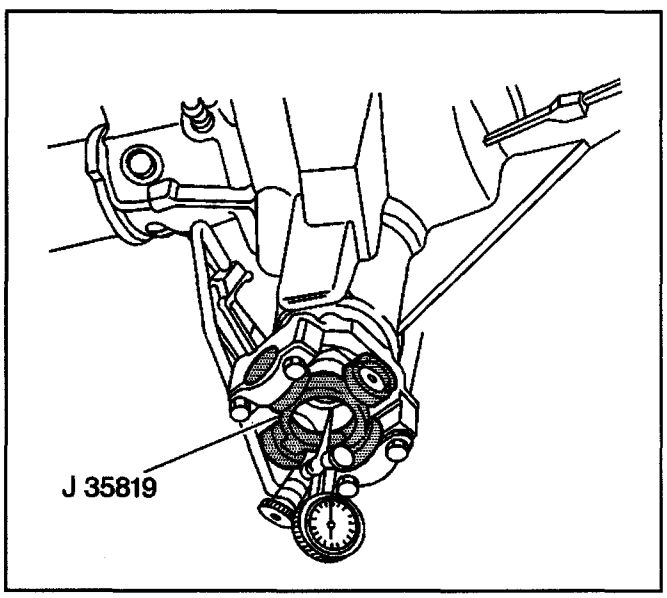
  The splined end (1) of a propeller shaft is critical to the smooth operation of a two-piece propeller shaft. When checking stub-shaft runout, ensure that the dial indicator readings are accurate.

Measuring Propeller Shaft Runout

Tools Required

- *J 8001* Dial Indicator Set
- *J 7872* Magnetic Base Dial Indicator Set

1. Raise the vehicle on a suitable hoist. Refer to *Lifting and Jacking the Vehicle*
2. Allow the wheels to spin freely.
3. Attach a *J 8001 J 7872*
4. Place the transmission in Neutral. Rotate the pinion flange or transmission yoke by hand while taking the measurements for runout. The propeller shaft will turn easier in one direction than in the other. Removing the wheels and drums will also help.Do not include fluctuations on the dial indicator due to welds or surface irregularities.
5. For one piece propeller shafts, if the runout exceeds the tolerances at one or more points:
   - 5.1. Rotate the propeller shaft 180 degrees in the pinion flange. Reinstall the propeller shaft and recheck the measurement.
   - 5.2. If the runout still exceeds the tolerance, double-check the pinion flange runout before replacing the propeller shaft.



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6. For two-piece propeller shafts, if the runout exceeds the tolerances at one or more points:
   6.1. Measure the rear propeller shaft.
   6.2. Mark the position of the rear shaft in the pinion flange, then remove the rear shaft.
   6.3. Measure the front propeller shaft runout on the tube and the stub shaft.
   6.4. Replace the propeller shaft if either measurement is out of tolerance.

Refer to *Propeller Shaft Runout Specifications*

Important: When you replace a propeller shaft, check the new shaft for runout. Double-check the pinion flange runout if the replacement shaft runout is also out of tolerance.

Measuring Pinion Flange Runout

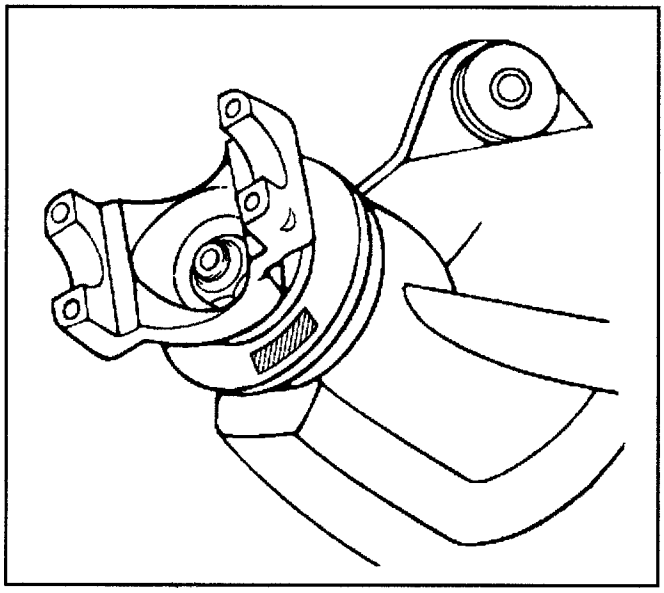
Tools Required

- *J 8001* Dial Indicator Set
- *J 23409* Dial Indicator Extension
- *J 35819* Flange Runout Gage

1. Place the vehicle on a suitable hoist. Refer to *Lifting and Jacking the Vehicle* Allow the wheels to rotate freely.
2. Remove the propeller shaft from the pinion flange.
3. Install the *J 35819*

Important: The dial indicator will have inverted readings. You are measuring the inside diameter of the flange, and not the outside diameter. The highest reading on the dial indicator is the low spot. The lowest reading is the high spot.

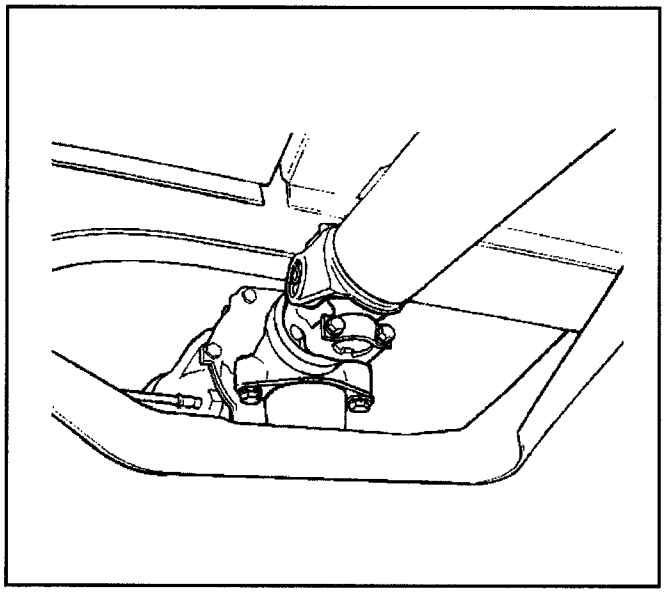
4. Rotate the pinion shaft 360 degrees and zero the dial indicator on the low spot.
5. Rotate the pinion flange again and record the total runout.
6. If the pinion flange runout is 0.15 mm (0.006 in) or less, remove the pinion flange balance weight.
7. If the pinion flange runout is over 0.15 mm (0.006 in) but no less than 0.28 mm (0.011 in), and the runout compensation weight is at or near the low spot, then no further action is necessary. Remove the weight if the runout compensation weight is not at or near the low spot.
8. If the pinion flange runout is more than 0.28 mm (0.011 in) but no greater than 0.38 mm (0.015 in), and the balance weight is at or near the low point, then no further action is necessary. Remove the weight and re-index the pinion flange until the runout is 0.25 mm (0.010 in) or less if the runout compensation weight is not at or near the low spot.
9. Replace the pinion shaft when the runout is 0.25 mm (0.010 in) or less. Then, recheck the runout. Service replacement flanges do not have balance weights.



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Helpful Hints

- If necessary, add compensation weights on the face of the pinion flange dust slinger. These weights are tack-welded onto the slinger. You may remove the weights with a die-grinder.
- Carefully remove the spot weld at either end of the weight.
- Do not remove the weight unless you have inspected the pinion flange runout and the procedure calls for weight removal.
- Do not remove any weights on the outboard edge of the dust slinger. These weights are present in order to internal axle components. The weights are not related to the pinion flange runout.



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Correcting Vibration at the Pinion Nose

Most first-order driveline vibrations originate at the pinion nose end of the driveshaft. Ensure that the vibrations are at a minimum at this location in order to achieve acceptable results. Reduce the runout of the components to a minimum. Balance the driveline as a system when necessary.

1. Measure the runout of the propeller shaft and check the tolerance.
2. If the tolerance is excessive, mark the position of the shaft for future reference and rotate the shaft 180 degrees.
3. Reinstall the shaft and recheck the runout. Inspect the level of vibration in order to determine if the vibration is lower or corrected.
4. If the runout is still excessive, or if the vibration is still present, refer to Measuring Pinion Flange Runout. Replace the pinion flange or re-index the flange 180 degrees if the pinion flange runout exceeds the tolerance.

   Remove and reinstall the pinion flange only once on axles utilizing a "crush" type sleeve. Replace the sleeve with a new sleeve if the sleeve is "crushed". Removing the sleeve requires removal of the ring and pinion set. Therefore, replace flanges with excessive runout. Regardless of the method used, measure the pinion flange runout in order to ensure that the flange is within tolerance.
5. Recheck the propeller shaft runout if the vibration is present after the pinion flange runout is corrected. If the propeller shaft runout is still excessive, correct the runout before doing a driveline system balance. Either replace the shaft with a shaft that is within tolerance or sublet the shaft to a reputable independent for straightening and re-balance. Ensure that the new or rebuilt shaft is within runout tolerance before you continue.

6. Once the propeller shaft and pinion flange are within runout tolerances, check if the vibration is gone. If the level of the vibration is still unacceptable, perform a driveline system balance procedure.

Correcting Vibration at the Transmission Tailshaft

First-order driveline vibrations that originate at the transmission end of the propeller shaft are rare. If the tailshaft of the transmission is vibrating, inspect the tailshaft housing bushing for wear or damage. A leaky transmission tailshaft oil seal indicates bushing problems.

Feel for vibration at the crossmember underneath the transmission mount. If there is no vibration, the transmission mount is doing its job of isolating the vibration from the structure of the vehicle. The transmission mount is therefore probably not cause of vibration.

Use the following procedure if you can feel vibration on the crossmember and the tailshaft bushing, and if transmission output is normal:

1. Measure the propeller shaft runout. If the runout is excessive, replace the shaft with one that has acceptable runout. Alternatively, sublet the shaft to a reputable independent service shop in order to have the shaft rebalanced and the runout corrected.
2. Test drive the vehicle. If the vibration is still unacceptable, balance the propeller shaft on the vehicle.

Correcting Vibration at the Center Support Bearing

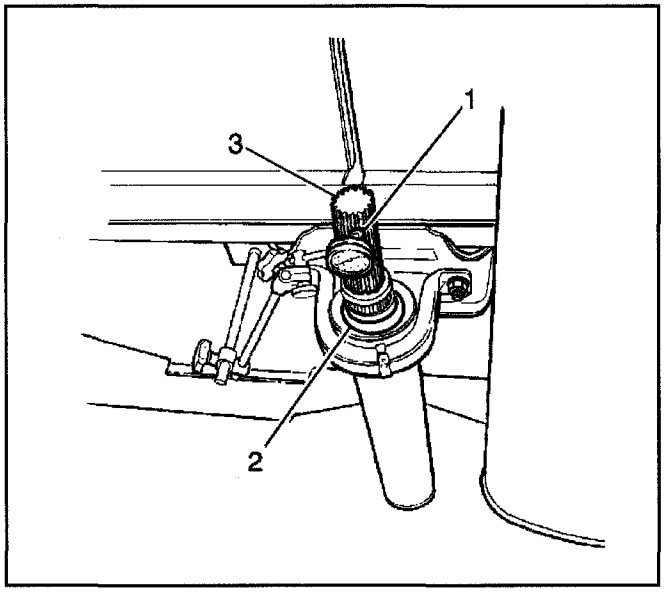
These guidelines apply to the two-piece propeller shaft only. First-order driveline vibrations that occur mainly at the center support bearing (2) are usually the result of excessive runout at the stub (splined) shaft (3).

Unlike other first-order driveline vibrations, these vibrations can appear at unusually low speeds of 40 km/h (25 mph) and up.

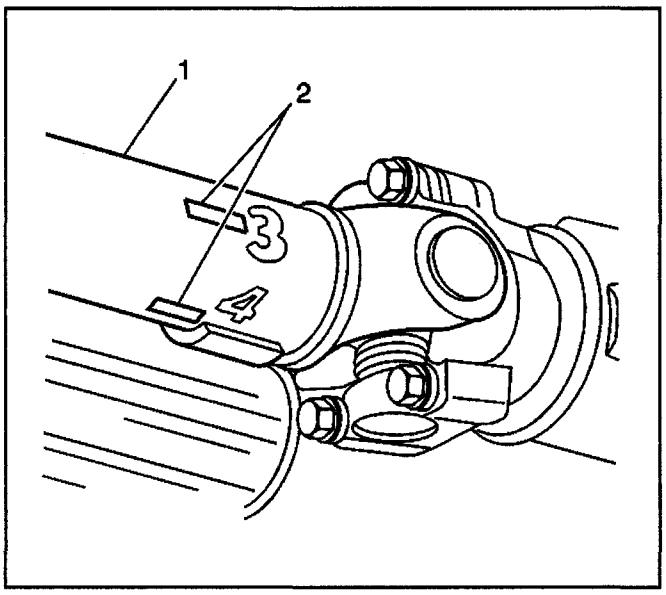
Follow the following procedure to correct this type of vibration:

1. Mark the position of the rear propeller shaft at both ends for proper reassembly. Remove the rear propeller shaft form the vehicle.
2. Measure the runout of the splines about 12.7 mm (0.5 in) from the end (1).
3. Replace the shaft if the runout exceeds the tolerances.

   Stub shaft/spline runout 0.076 mm (0.003 in)



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Troubleshooting Hints

Vibration is eliminated with the correction of the propeller shaft runout. If some vibration is still present, perform a vehicle road test. Then, determine if an on-vehicle system balance is necessary.

Driveline System Balance with Electronic Vibration Analyzer (EVA)

To pinpoint the source, you must reproduce the vibration in the service stall and then determine which component is vibrating the most using the EVA:

1. Support the vehicle on a suitable hoist or on safety stands. Ensure that the rear of the rear axle is at curb height. Do not allow the axle to hang. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the rear tire/wheel assemblies. Refer to *Wheel Removal* in Tires and Wheels.
3. Remove the brake drums. Refer to Brakes.
4. Ensure that the propeller shaft is free of undercoating. Check for dents or damage to the propeller shaft or U-joints.

Caution: Refer to Running a Vehicle on Hoist Caution in Cautions and Notices.

5. Start the engine. Place the transmission in gear and run at the vehicle speed at which the vibration occurs at.

Determine which end of the propeller shaft is vibrating the most. Hold the EVA's sensor against the pinion nose and the transmission tailshaft assembly. The higher the amplitude reading, the greater the vibration.

If the vehicle has a two-piece propeller shaft, check the center support bearing.

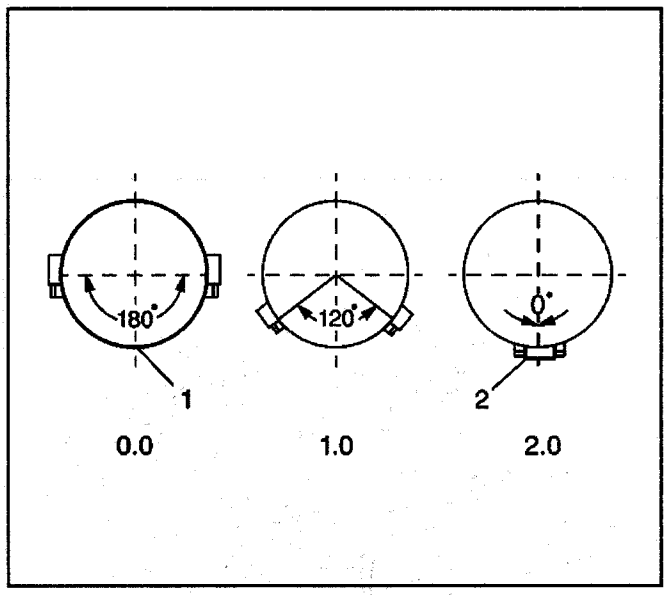
If the transmission tailshaft vibrates, check the transmission crossmember under the transmission mount. The vibration should not be present if the mount is doing its job.

Runout and Balance Testing with the Electronic Vibration Analyzer (EVA)

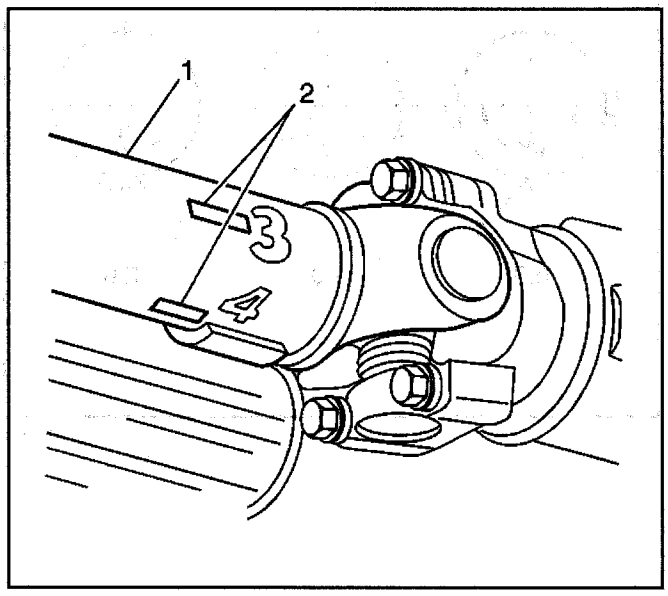
Ensure that the runout of the various driveline components are within specifications. If the runouts are within specifications, strobe balance the driveline. The EVA is able to simplify the balancing process, using the following procedure:

1. Use the EVA in order to determine which end of the propeller shaft has the most vibration.
2. Mark the end of the propeller shaft (1) that has the most vibration at four points, 90 degrees apart. Number the marks 1 through 4 (2).
3. Mount the EVA sensor onto the bottom of the following components:
   - The differential housing
   - The center bearing support (for two-part propeller shafts)
   - The transmission tailshaft assembly
4. Position the sensor as close to the propeller shaft as possible. Ensure that the UP side of the sensor faces up. Ensure that the sensor is horizontal.
5. Start the engine.
6. Turn off all engine accessories.
7. Place the transmission in gear.
8. Run the vehicle at the speed which causes the most vibration in the propeller shaft.
9. Hook the timing light clip to the trigger wire.
10. Plug the vibration sensor into Input A of the EVA. Input B does not have strobe light capability.
11. Verify that the predominant frequency on the EVA display matches the frequency of the original vibration. Use the strobe light only if the rotation speed of the propeller shaft is the predominant frequency.
12. The EVA displays a series of questions in order to select the correct filter. Press YES in order to select the desired filter. Ensure that the frequency is in the middle of the filter range. Use the full range only as a last resort.
13. The display shows the test frequency, the amplitude and the filter range. The driveline is balanced when the amplitude is near two. In some cases a slightly higher amplitude will provide adequate balance.
14. Point the timing light at the propeller shaft. The strobe effect will appear to freeze the propeller shaft. Note which of the numbered marks is at the bottom of the propeller shaft, or the 6 o'clock position. This position is the light spot.
15. Turn the engine off.
16. Install a weight directly on the light spot.
17. Start the engine.
18. Run the vehicle at peak vibration speed.
19. Strobe the propeller shaft again.

The propeller shaft is balanced if the strobe image is erratic and the amplitude is near two.



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The propeller shaft is not balanced if one of the following conditions exist:

- The weight and the original light spot are at the 6 o'clock position.

  The above condition means that there is not enough weight on the propeller shaft. In order to correct the balance, add a second weight next to the first weight. Inspect the balance again using the strobe light.

  If the weights are now between 90 and 180 degrees off (between the 9 and the 3 o'clock positions) too much weight exists. In order to correct the balance, split the two weights equally on either side of the original light spot in order to produce a total weight between one and two weights (between 0 and 120 degrees apart). Inspect the balance again using the strobe light. Adjust the weights as necessary.
- The weight and original light spot are 90 to 180 degrees off (between the 9 and the 3 o'clock positions).

  The above condition means that one weight is too much. In order to correct the balance, split the two weights equally on either side of the original light spot in order to produce a total weight less than one (between 120 and 180 degrees apart). Inspect the balance again using the strobe light. Adjust the weights as necessary.
- The weight and the original light spot are within 180 degrees of the 6 o'clock position.

  Move weight towards the 6 o'clock position. Inspect the balance again using the strobe light. Adjust the weight as necessary. Refer to the previous two conditions.

If the shaft will not balance using two weights, then place a third weight on the light spot. Split the first two weights in order to produce a total weight between two and three weights.

If three weights fail to balance the driveline, then replace the propeller shaft.

When the propeller shaft balances, road test the vehicle in order to verify that the vibration is eliminated.

Driveline System Balance without the Electronic Vibration Analyzer

The following procedure is designed to fine-tune the balance of the propeller shaft while it is mounted in the vehicle. The procedure also is able correct residual imbalance of the remaining driveline components.

Prior to balancing the driveline system, verify that the propeller shaft and the pinion flange runout are within specification.

Do not overheat the engine when performing this procedure.

1. Raise the vehicle to curb height. Support the vehicle on a hoist or on safety stands. Do not allow the axle to hang. Refer to *Lifting and Jacking the Vehicle*
2. Remove the rear tire/wheel assemblies. Refer to *Wheel Removal*

3. Determine which end of the propeller shaft has the most vibration in order to identify where to begin installing the hose clamps.
4. Mark the end of the propeller shaft (1) which has the most vibration at four points, 90 degrees apart. Number the marks 1 through 4 (2).

Troubleshooting Hints

The following procedure uses a trial and error method of determining where to place the hose clamps on the shaft. Use the following tips in order to help locate the clamps:

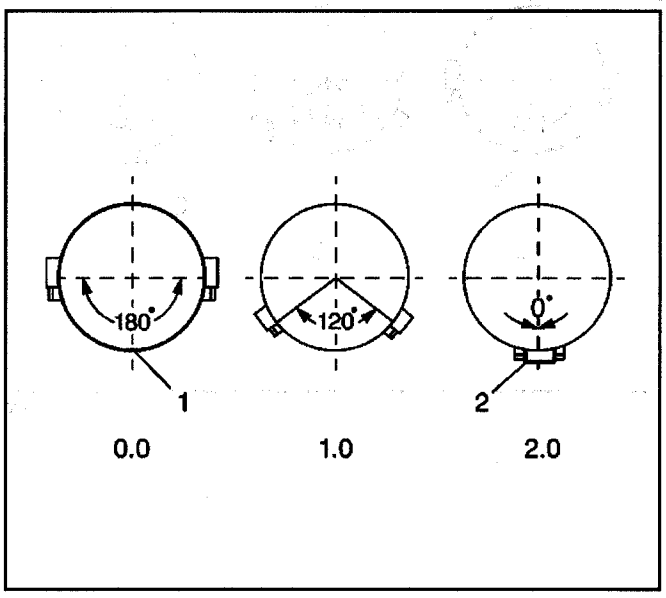
1. Because the imbalance may be related to propeller shaft runout, begin installing the clamps at the low point of the propeller shaft runout.
2. When the plant workers balance the propeller shaft, they use weights in graduated increments: 1/16 oz, 1/8 oz, etc. If the stock weight is too light or too heavy, place the hose clamp either directly in line with or opposite to the stock weight.

The last method involves road testing the vehicle at a speed which the vibration is felt.

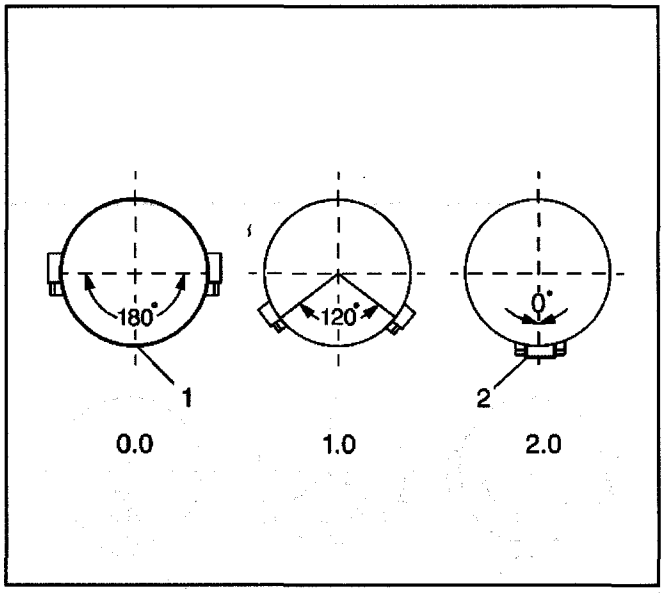
1. Carefully hold a piece of chalk up to the very end of the propeller shaft. Barely touch the chalk to the shaft.
2. Shut the engine off in order to stop the propeller shaft from rotating. Do not step on the brake pedal. Do not put the transmission in Park.
3. Inspect the chalk mark.

If you performed the above procedure correctly, the chalk mark will indicate the heavy spot on the shaft. The heavy spot deflected downward and touched the chalk. If the chalk mark circle the entire shaft, touch the chalk more gently to the shaft. Ensure that the chalk touches only the heavy spot. Once the heavy spot is located, place the hose clamp 180 degrees opposite to the chalk mark. Then perform the following steps:

1. Place the hose clamp at the light spot, or at any of the four points marked previously.
2. Test drive the vehicle at the speed at which the vibration occurred. Record any changes in the vibration.
3. Move the clamp to the other positions.
4. Test drive the vehicle each time the clamp is moved. Record any changes in vibration. Note which position gives the best balance.



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If the vibration does not change at all, or gets worse, then one clamp is too light or too heavy.

- If the vibration did not change at all, then repeat the procedure using two clamps together.
- If the vibration got worse, repeat the procedure using two clamps separated. Separate the clamps to reduce the spinning weight.

Continue the trial and error procedure using different weights in different locations until you achieve the best balance. If more that three clamps aligned in the same position are required, then replace the propeller shaft.

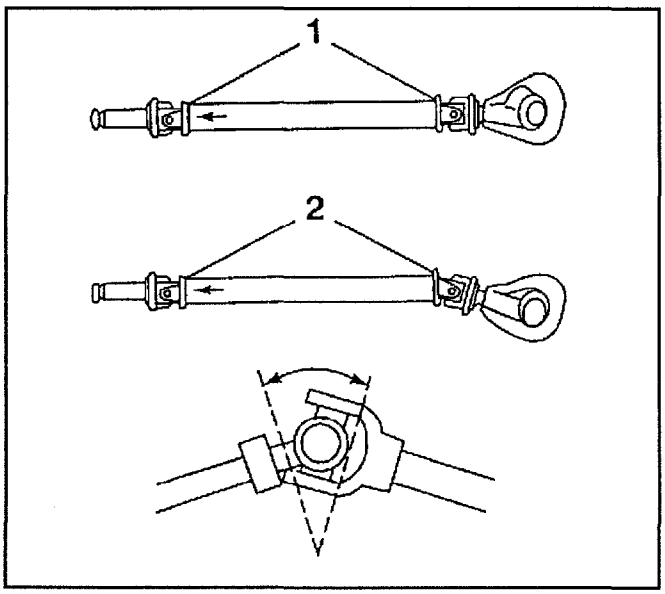
If you are able to reduce the vibration in the stall, but are unable to eliminate the vibration completely, perform a road test on the vehicle. A slight vibration noticeable in the stall may not be noticeable on the road.

Propeller Shaft Balance Weights

When using clamps in order to balance a propeller shaft with the total wight method, the correction weight required will often be a fraction or a multiple of one hose clamp. Use the following phasing procedure with two hose clamp in order to accurately place any required amount between zero weights (0.0 total weight) to two weights (2.0 total weight).

Ensure that the clamps are located with even spaces on either side of the light spot, or 180 degrees opposite the heavy spot.

The following table contains the weight amounts in terms of the total weight and the included angle (spread) between the clamps. Refer to *Propeller Shaft Runout Specifications*



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The main objective of this section is to correct the conditions that interfere with the proper cancellation effect of the U-joints. The most common condition, especially where the where launch shudder is concerned, is incorrect driveline working angles. However, other factors may aggravate the condition.

Address these factors before you attempt to measure or correct driveline working angles:

- Worn, failed, damaged, or improperly installed U-joints
- Worn, collapsed, or improper powertrain mounts
- Incorrect vehicle trim height adjustment for the front suspension. This condition aggravates launch shudder.
- Incorrect trim height adjustment for the rear suspension.
- Trim height inspection includes trim heights that are too low or too high. Vehicles equipped with aftermarket lift kits, vehicles that are constantly loaded with cargo, and custom conversion vans all fit in this category. On rear drive vehicles, the pinion nose tilts upward as the rear trim height is lowered.

If a second-order driveline vibration exists after these conditions are corrected, measure and correct the driveline angles.

If the complaint is present only with cargo in the vehicle, perform the measurements with the vehicle fully loaded. Once a second-order driveline vibration has been corrected with the vehicle loaded, the vibration may reappear with the vehicle unloaded. The reverse of this is also true. You may have to reach a compromise with the customer in this case.

Driveline Working Angles

Tools Required

- *J 23498-A* Driveshaft Inclinometer
- *J 23498-20* Driveshaft Inclinometer Adapter (Offset)

Driveline working angle does not refer to the angle of any one shaft, but to the angle that is formed by the intersection of two shafts, as shown.

The procedure for measuring and correcting driveline working angles depends on whether the vehicle is equipped with a one or two-piece propeller shaft.

You need a *J 38460*

- The *J 23498-A*
- The *J 38460*
- Use *J 23498-20*

To verify the accuracy of the adapter, check the angle of an angle of an accessible joint with the inclinometer prior to assign it on an inaccessible joint.

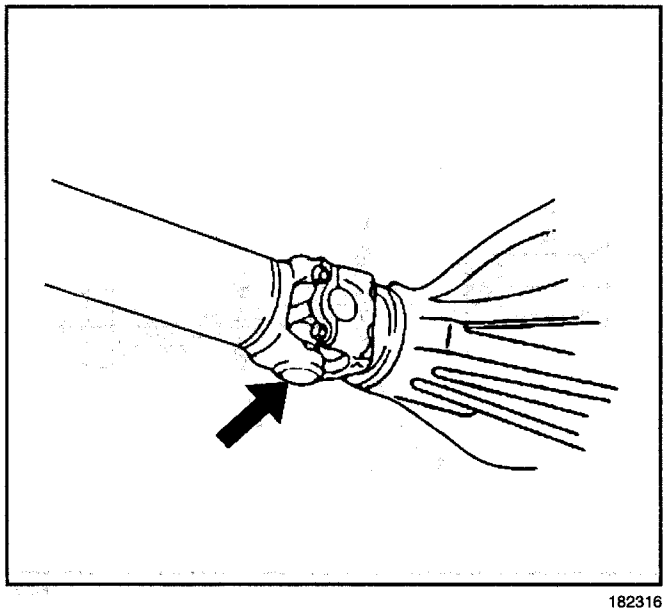
Preliminary Checks

Raise the vehicle on a suitable hoist or on safety stands. Ensure that the rear axle is supported at curb height and that the wheels are free to spin. Refer to *Lifting and Jacking the Vehicle* in General Information. Place the transmission in Neutral. Make sure the vehicle has a full tank of fuel or the equivalent amount of weight in the rear to simulate a full tank. 3.8 liters of gasoline (one gallon) weighs approximately 2.8 kg (6.2 lb).

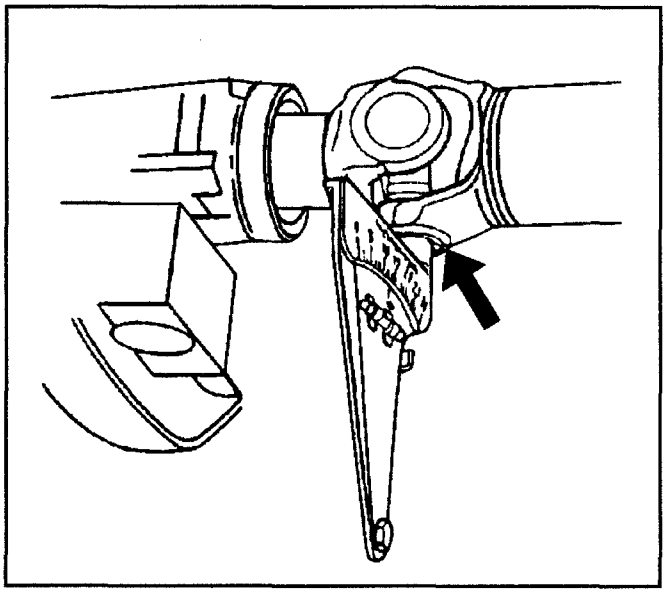
Checking Phasing of U-joints

Inspect the propeller shaft for correct phasing. This means that the front and rear U-joints are directly in line or parallel with each other so that proper cancellation takes place.

1. Rotate the propeller shaft so that the propeller shaft rear U-joint bearing cap (1) is vertical as shown.

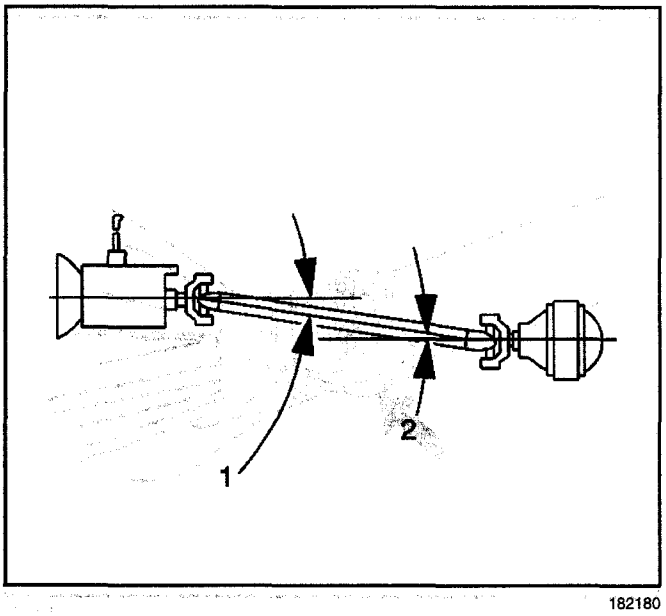


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2. Ensure that the front bearing cap (1) is also vertical.
3. Place the inclinometer on the propeller shaft rear U-joint bearing cap in order to ensure that both U-joints are vertical.
4. Set the indicator line above the sight glass on 15 (the horizontal reference) and rotate the propeller shaft until the bubble centers in the sight glass. This brings the rear U-joint to vertical.
5. Remove the inclinometer without disturbing the setting. Leave the setting on 15 and install the inclinometer on the front U-joint. The bubble should remain centered plus or minus 3 degrees if the shaft is properly phased.



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The out of phasing of the single-piece propeller shaft is very unusual. If the shaft is visibly out of place, the end yokes are welded on in the wrong position, or the shaft is damaged due to twisting. In either case, replace the propeller shaft before continuing with this procedure.

Measuring the Working Angles

The working angle of a U-joint is the difference between the angles formed when two shafts intersect. One piece propeller shaft systems have two working angles, the front and the rear.

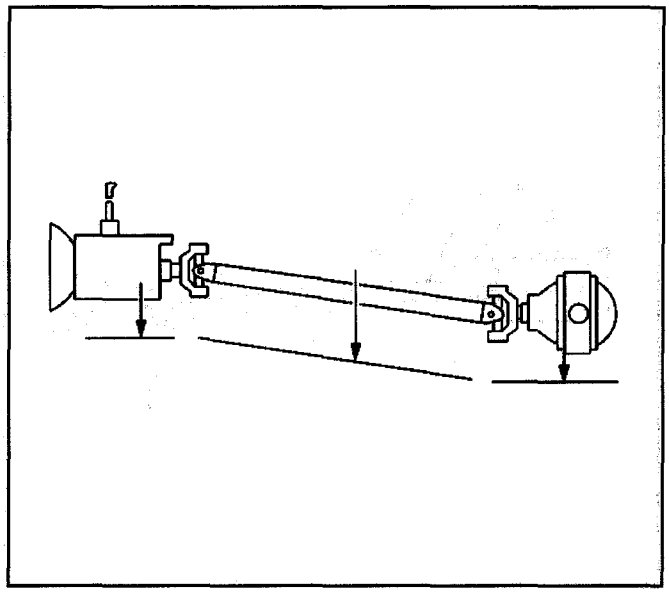
- The two working angles should be equal within 1/2 of a degree.
- The working angles themselves should not exceed 4 degrees.
- The working angles themselves should not be equal to zero because a zero working angle will cause premature U-joint wear due to lack of rotation of the U-joints.

The angle of the propeller shaft and the rear axle pinion form the rear working angle (2). The angle of the propeller shaft and the transmission output shaft form the front working angle (1).

The angles of these components are most accurately measured from the U-joint bearing caps. The bearing caps should be free of corrosion or foreign material to ensure accurate readings. Remove any snap rings that may interfere wit the correct placement of the inclinometer. Do not forget to reinstall them after you take the measurements.

Take the measurements from the same side of the propeller shaft to maintain consistent angle measurements (either driver or passenger side).

It is extremely helpful to record the readings on a diagram like the one shown as you proceed through the measurements.



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Evaluation

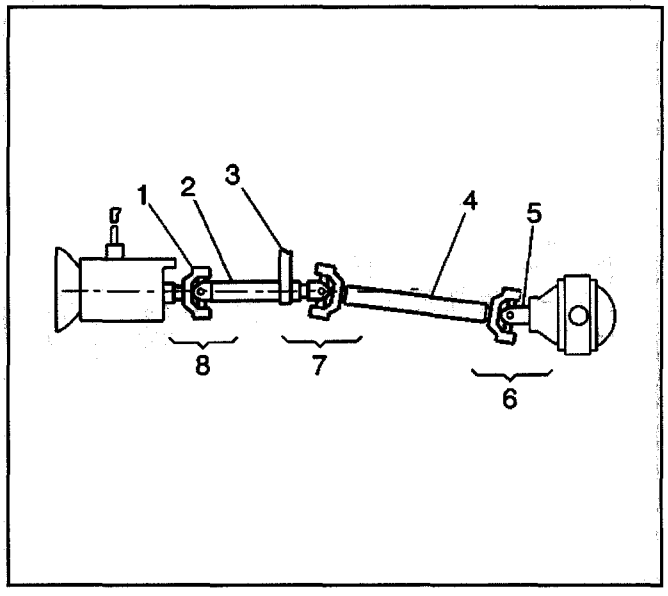
The two working angles in a one-piece propeller shaft system should be equal to within 1/2 of a degree for effective cancellation.

Measuring Two-Piece Propeller Shaft System Working Angles

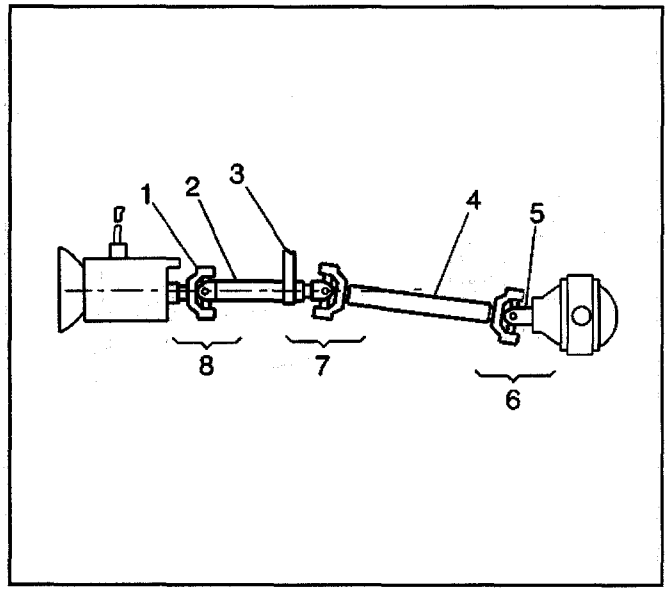
Introduction

Two-piece propeller shaft systems have three working angles instead of two as in one-piece systems.

- The first angle is the front working angle. It is formed by the angle of the output shaft of the transmission and the angle of the front propeller shaft.
- The second angle is the middle working angle. It is formed by the angle of the front propeller shaft and the angle of the rear propeller shaft.
- The third angle is the rear working angle. It is formed by the angle of the rear propeller shaft and the angle of the pinion yoke of the rear axle.



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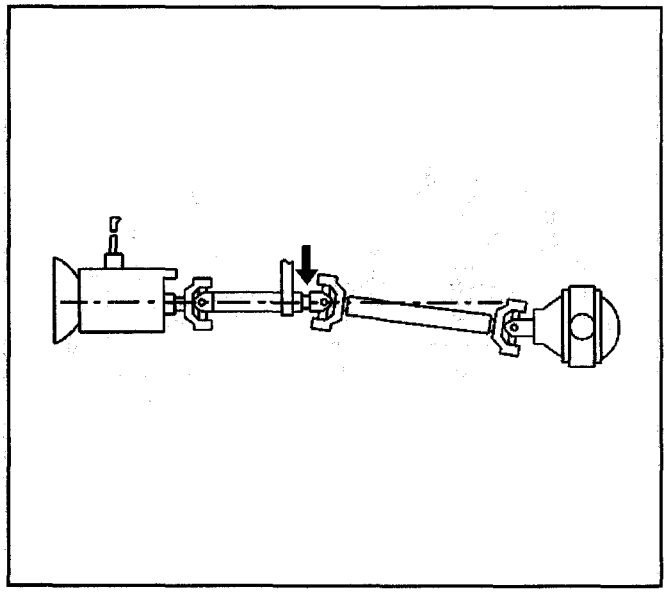


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This system has an odd joint that does not have another joint to provide cancellation. Therefore, the rear working angle and the middle working angle act as a pair of joints to cancel each other out, like in one-piece propeller shaft systems.

The front angle is considered the odd joint because it does not have another joint to provide cancellation. Because of this, the working angle of the odd joint must be kept at or under 1/2 or a degree.

Keep the working angle of this odd joint to a minimum so that there are not any great fluctuations in speed that need to be canceled out. The front joint is used as the odd joint because the front joint angle does not change with suspension bounce, rebound, or axle windup. For this reason, think of the front propeller shaft of a two piece system as an extension of the transmission output shaft.

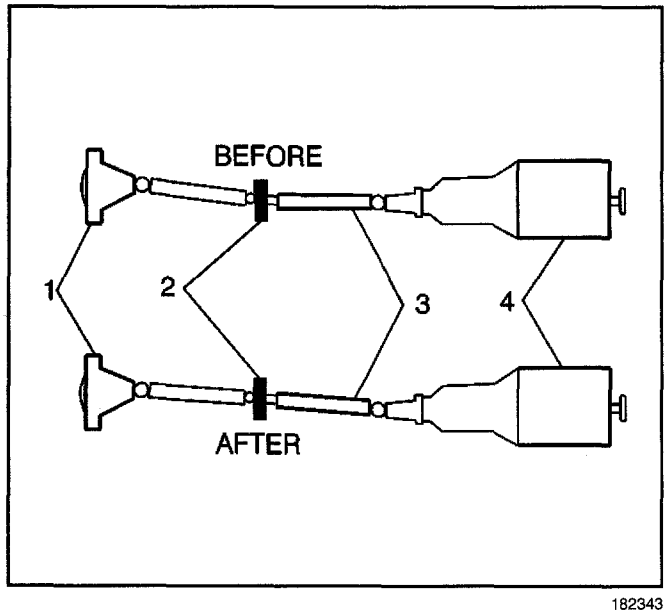


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Two-Piece Propeller Shaft Phasing

The setup and measurement techniques are identical to that of a one-piece propeller shaft system. First, check for proper phasing:

1. Turn the rear shaft so the rear U-joint is straight up and down. Ensure that the front U-joint of the rear propeller shaft is also straight up and down.
2. Rotate the shafts 90 degrees so that the front propeller shaft front U-joint is straight up and down. Ensure that the front propeller shaft is also straight up and down (actually part of the slip yoke on the rear shaft).



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If the two U-joints of the front propeller shaft are not in this phase, the two halves of the propeller shaft may have been assembled incorrectly.

Two-Piece Propeller Shaft Lateral Alignment

The procedure for lateral alignment of a two-piece propeller shaft is used for launch shudder or any second-order, driveline vibrations. Adjust the lateral alignment before you measure and adjust the driveline angles.

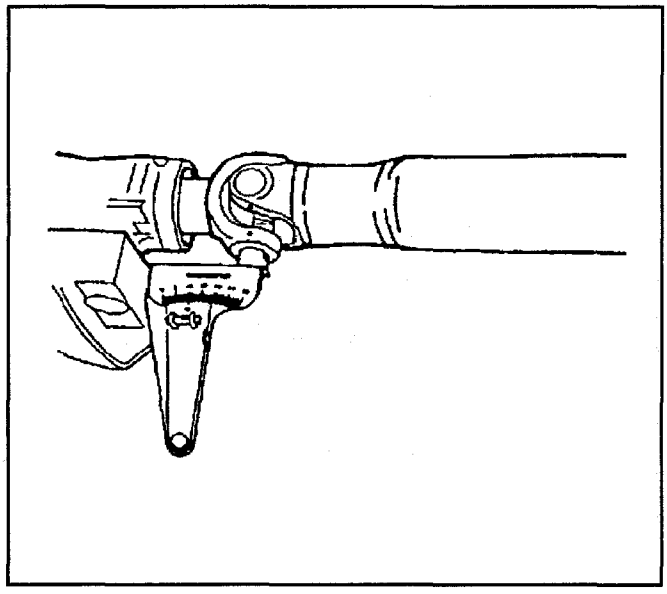
1. Raise and suitably support the vehicle on a hoist. Refer to *Lifting and Jacking the Vehicle*
2. Look down the front of the propeller shaft.
3. If the propeller shaft is not straight, or if the center bearing support is off to one side, relocate center support bearing to make the propeller shaft assembly as straight as possible. Ensure that you do not create a ground-out condition against the exhaust or another component.

If launch shudder or second-order driveline vibration is still present, measure and correct the driveline angles.

Measuring Two-Piece Propeller Shaft Working Angles

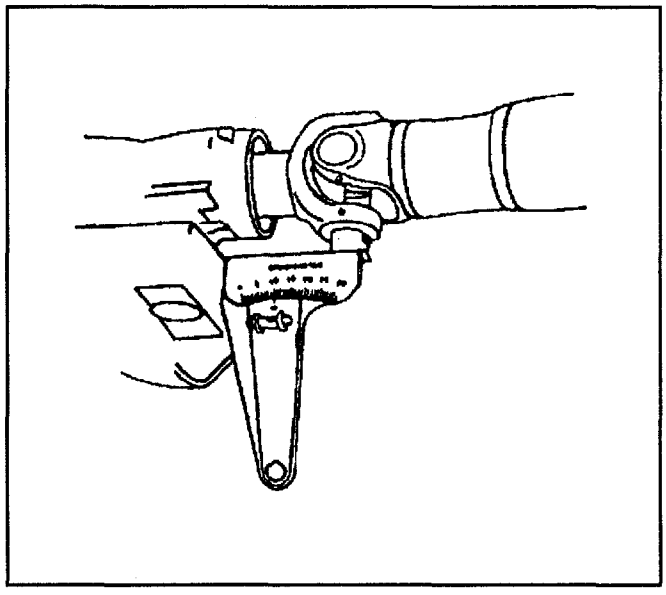
This procedure is essentially the same as for one-piece propeller shafts. You must, however, take into account the third angle.

1. Place the inclinometer on the propeller shaft bearing cap (1).



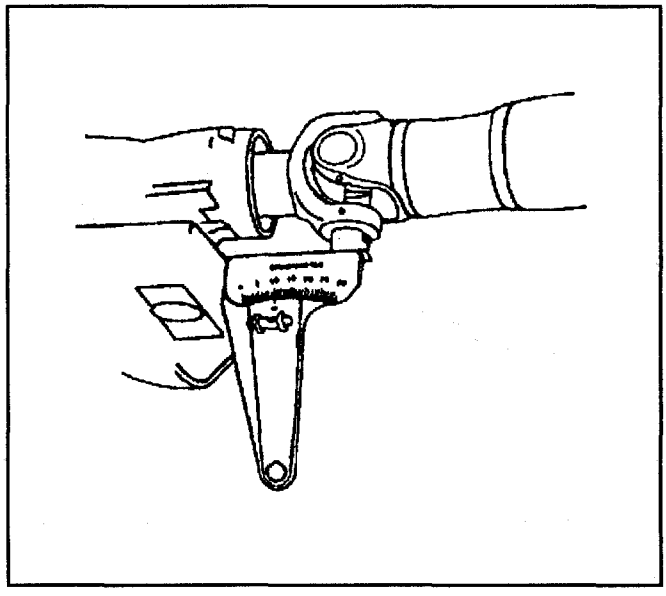
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2. Center the bubble in the sight glass and record the measurement. The bearing cap must be straight up and down to obtain accurate measurement. Enter the measurements on your diagram.

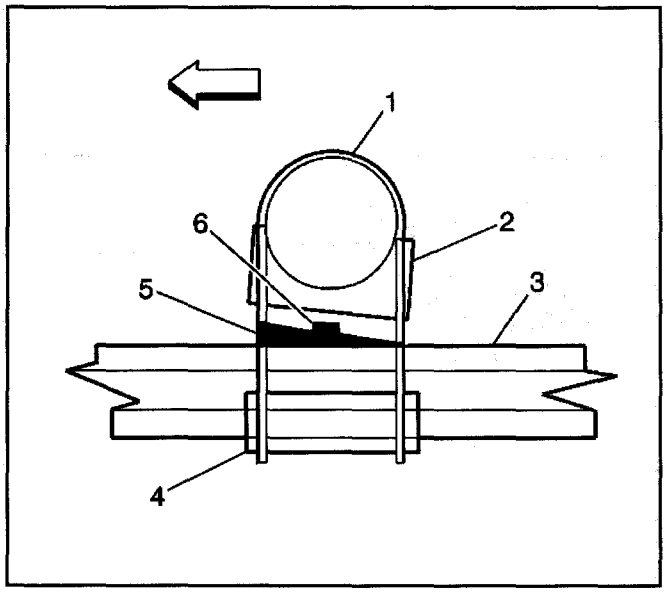


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3. Rotate the propeller shaft 90 degrees and place the inclinometer on the transmission output yoke bearing cap. Again, the bearing cap must be straight up and down to obtain an accurate measurement.
4. Center the bubble in the sight glass and record the measurement.
5. Subtract the smaller reading from the larger reading to obtain the front U-joint working angle.



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Evaluation

The working angle is within tolerance, following the rule that the working angle of an odd joint in a two-piece joint system is 1/2 degree or less. Notice that in each of the good examples that the front working angle (FWA) is 1/2 degree or less and is treated as a separate joint. The middle working angle (MWA) and rear working angle (RWA) are subtracted and the difference (DIFF) is 1/2 degree or less. The middle and rear joints may cancel each other.

Correcting Working Angles

In order to change the working angles, shim the components up or down. Look closely at the existing angles. Use the existing angles and the shims in order to achieve the correct working angles.

Compared to horizontal or true level, the components located at the rear of the vehicle are usually lower than the components located at the front of the vehicle. This condition is called "down in the rear". If a component with a down in the rear angle is shimmed up at the rear, then the shim will bring the component closer to the horizontal (zero). Alternately, if a component with a down in the rear angle is shimmed down, then the component will move farther from the horizontal (zero).

Rear Axle Wind-Up

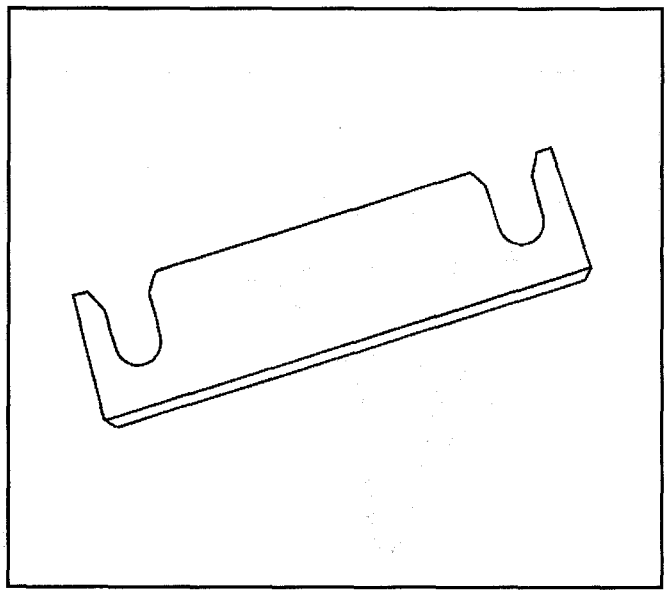
Rear axle wind-up may cause launch shudder even when all of the working angles are within specifications. Rear axle wind-up occurs when heavy torque during acceleration causes the pinion nose to point upward. In order to compensate for axle wind-up, tip the pinion nose downward. Install the axle shims incrementally, performing a road test after each shim. Add shims until the road test indicates that the shudder is eliminated.

Rear Axle Shims

Wedge shims of different sizes are available through GMSPO and independent suppliers for the purpose of shimming the rear axle angle. GM shims are available in two, three and four degrees.

Caution: Never attempt to shim a rear axle using anything except shims that are designed for this purpose. Failure to do so will result in the shims falling out and a loss of vehicle control and that could cause personal injury.

Install the shims (5) in order to increase or decrease the angle of the rear axle pinion. Install the shims between the leaf spring (3) and the spring seat. Depending on the design of the suspension (leaf spring on top or underneath the axle), and the direction of the desired change, install the shims with either the thick side toward the front of the vehicle or toward the rear of the vehicle.



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Important: After installing the shims, ensure that the U-bolt has two or three threads above the nut. Ensure also that the center bolt, located in the spring seat, is long enough to seat in the locator hole. If these two conditions do not exist, use longer U-bolts and center bolts. Longer U-bolts and center bolts are available through local spring shops.

Transmission Shims

If a transmission requires shims, order the shims through GMSPO.

Installing most shims will change the transmission angle approximately ½ degree.

When shimming transmissions, use a shim made from steel stock at the necessary thickness. Ensure that the shim contacts the full width of the area to be shimmed. Do not use washers.

Description and Operation

General Description

Vibration Theory

The vehicle designs and the engineering requirements have undergone drastic changes in this decade. The following factors drive many of these requirements:

- Increased fuel costs
- Decreased fuel supplies
- Corporate Average Fuel Economy (CAFE)
- Clean air legislation
- Foreign competition
- Crashworthiness
- Rising customer expectations

The vehicle designs have evolved from the full frame construction, where multiple isolating body mounts were used, to the lighter unibody designs of today. The unibody designs transfer any noise or vibration faster.

The use of heavier V8 engines has been reduced, being replaced with lighter, more fuel-efficient four and six-cylinder engines. During this same period, options such as A/C and PS have become more popular. These types of options increase the engine load, resulting in more unwanted noise and vibration.

The presence/absence of unwanted noise and vibration is linked to the customer's perception of the overall vehicle quality.

Vibration is the repetitive motion of an object, back and forth, or up and down. The following conditions cause most vehicle vibrations:

- A rotating component
- The engine combustion process firing impulses

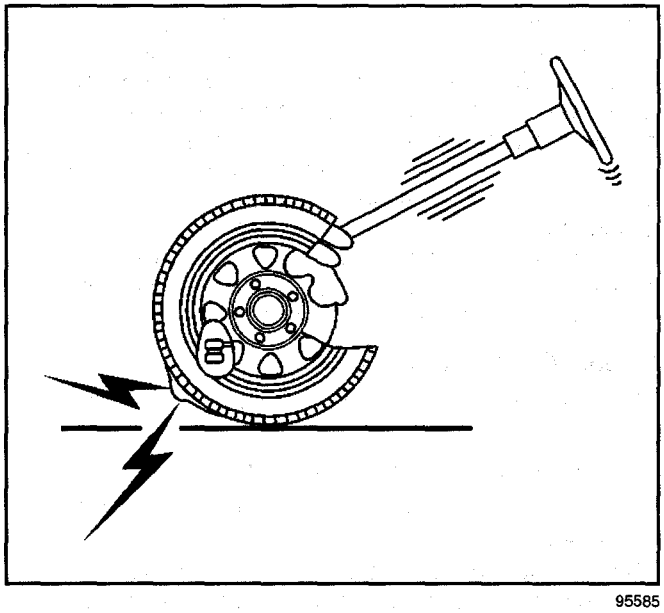
Rotating components will vibrate with excessive imbalance or runout. During vibration diagnosis, the amount of allowable imbalance or runout should be considered a TOLERANCE and not a SPECIFICATION. In other words, the less imbalance or runout the better.

A vibration concern will occur when the firing impulses of the engine are not properly isolated from the passenger compartment.

A vibrating component operates at a consistent rate (km/h, mph, or rpm). Measure the rate of vibration in question. When the rate/speed is determined, relate the vibration to a component that operates at an equal rate/speed in order to pinpoint the source. Vibrations also tend to transmit through the body structure to other components. Therefore, just because the seat vibrates doesn't mean the source of vibration is in the seat.

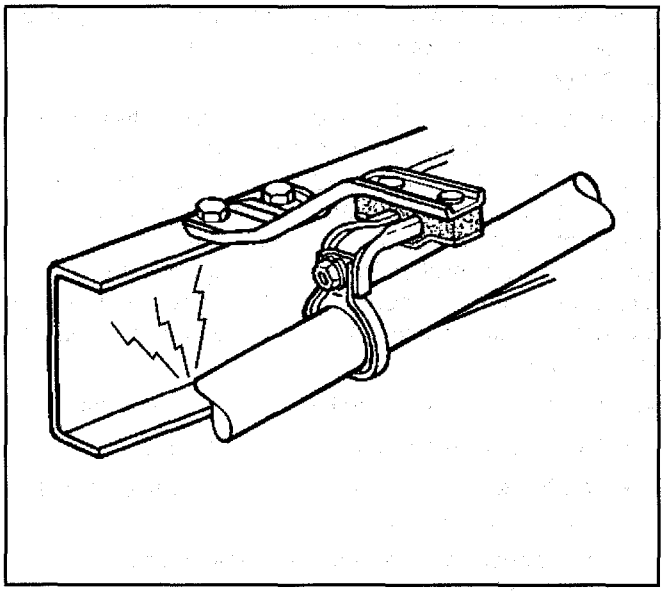
Vibrations consist of the following three elements:

- The source — the cause of the vibration
- The transfer path — the path the vibration travels through the vehicle
- The responder — the component where the vibration is felt



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In the preceding picture, the source is the unbalanced tire. The transfer path is the route the vibrations travels through the vehicle's suspension system into the steering column. The responder is the steering wheel, which the customer reports as vibrating. Eliminating any one of these three elements will usually correct the condition. Decide, from the gathered information, which element makes the most sense to repair. Adding a brace to the steering column may keep the steering wheel from vibrating, but adding a brace is not a practical solution. The most direct and effective repair would be to properly balance the tire.



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Vibration can also produce noise. As an example, consider a vehicle that has an exhaust pipe GROUNDED to the frame. The source of the vibration is the engine firing impulses traveling through the exhaust. The transfer path is a grounded or bound-up exhaust hanger. The responder is the frame. The floor panel vibrates, acting as a large speaker, which produces noise. The best repair would be to eliminate the transfer path. Aligning the exhaust system and correcting the grounded condition at the frame would eliminate the transfer path.

Basic Vibration Terminology

The following are the two primary components of vibration diagnosis:

- The physical properties of objects
- The object's properties of conducting mechanical energy

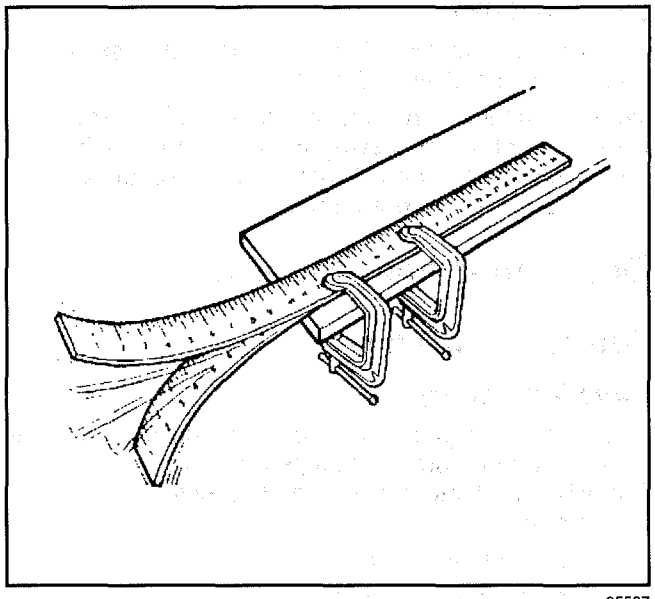
The repetitive up and down or back and forth movement of a component cause most customer vibration complaints. The following are the common components that vibrate:

- The steering wheel
- The seat cushion
- The frame
- The I/P

Vibration diagnosis involves the following simple stepwise outline:

1. Measure the repetitive motion and assign a value to the measurement in cycles per second or cycles per minute.
2. Relate the frequency back on terms of the rotational speed of a component that is operating at the same rate or speed.
3. Inspect and test the components for conditions that cause vibration.

For example, performing the following steps will help demonstrate the vibration theory:



95587

1. Clamp a yardstick to the edge of a table, leaving about 50 cm (20 in) hanging over the edge of the table.
2. Pull down on the edge of the stick and release while observing the movement of the stick.

The motion of the stick occurs in repetitive cycles. The cycle begins at midpoint, continues through the lowest extreme of travel, then back past the midpoint, through the upper extreme of travel, and back to the midpoint where the cycle begins again.

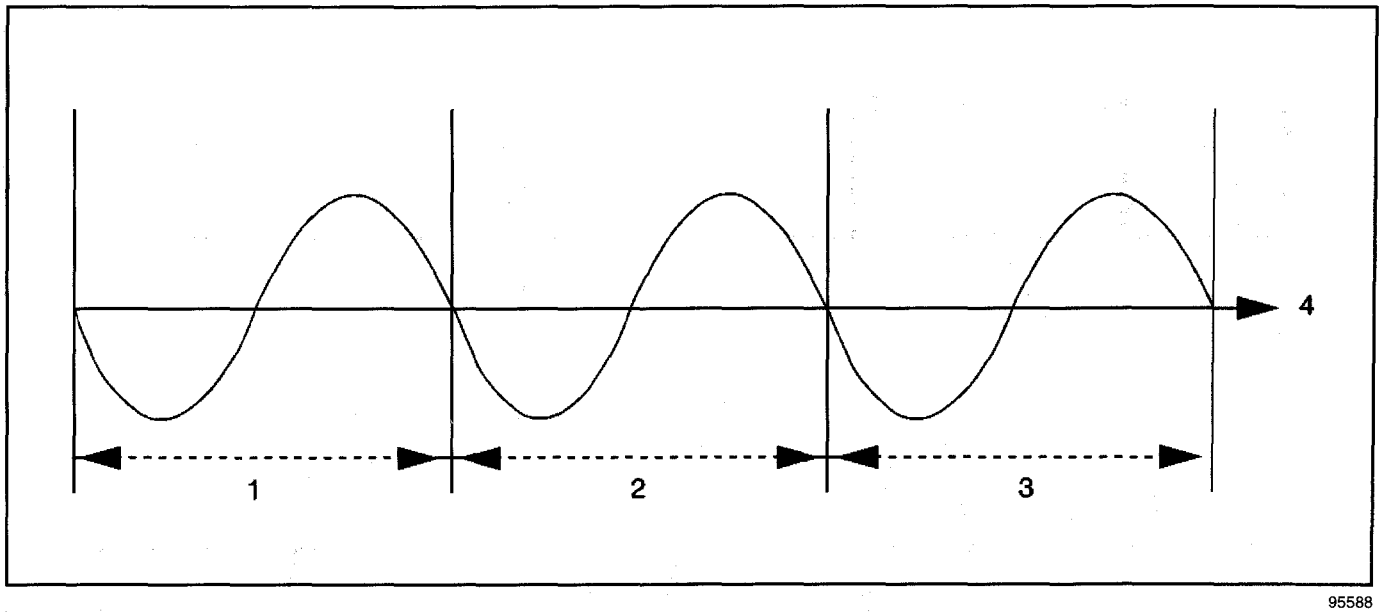
The cycle occurs over and over again at the same rate, or frequency. In this case, about 10 cycles in one minute. If we measure the frequency to reflect the number of complete cycles that the yardstick made in one minute, the measure would be 10 cycles x 60 seconds = 600 cycles per minute (cpm).

We have also found a specific amount of motion, or amplitude, in the total travel of the yardstick from the very top to the very bottom. Redo the experiment as follows:

1. Reclamp the yardstick to the edge of a table, leaving about 25 cm (10 in) hanging over the edge of the table.
2. Pull down on the edge of the stick and release while observing the movement of the stick.

The stick vibrates at a much faster frequency: 30 cycles per second (1800 cycles per minute).

Cycle

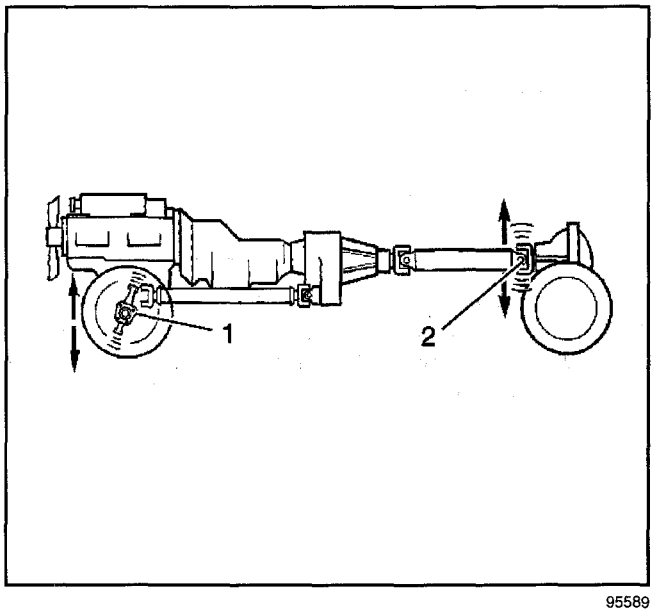


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Legend

(1) 1st Cycle
(2) 2nd Cycle
(3) 3rd Cycle
(4) Time

Vibration Cycles in Powertrain Components



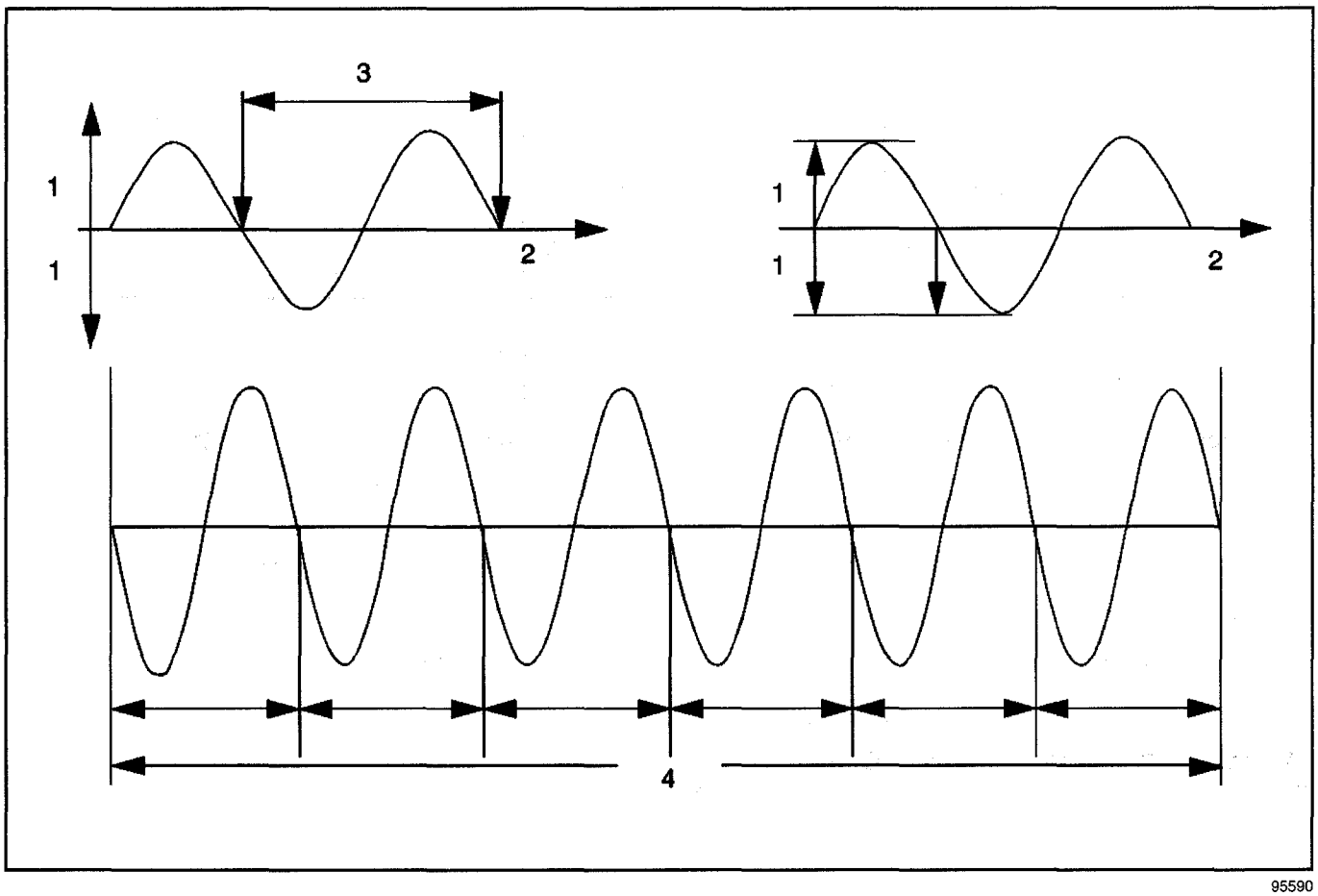
95589

Legend

(1) Spindle
(2) Pinion Nose

The word CYCLE comes from the same root as the word CIRCLE. A circle begins and ends at the same point, as thus, so does a cycle. All vibrations consist of repetitive cycles.

Frequency



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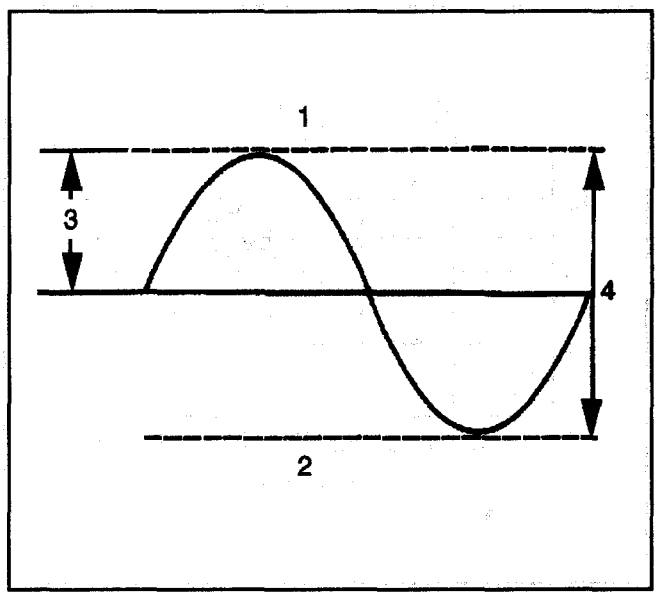
Legend

(1) Amplitude
(2) Reference
(3) Time in Seconds
(4) 1 Second

Frequency is defined as the rate at which an event occurs during a given period of time. With a vibration, the event is a cycle, and the period of time is one second. Thus, frequency is expressed in cycles per second.

The proper term for cycles per seconds is Hertz (Hz). This is the most common way to measure frequency. Multiply the Hertz by 60 to get the cycles or revolutions per minute (RPM).

Amplitude



95593

Legend

(1) Maximum
(2) Minimum
(3) Zero-to-Peak Amplitude
(4) Peak-to-Peak Amplitude

Amplitude is the maximum value of a periodically varying quantity. Used in vibration diagnostics, we are referring it to the magnitude of the disturbance. A severe disturbance would have a high amplitude; a minor disturbance would have a low amplitude.

Amplitude is measured by the amount of actual movement, or the displacement. For example, consider the vibration caused by an out-of-balance wheel at 80 km/h (50 mph) as opposed to 40 km/h (25 mph). As the speed increases, the amplitude increases.

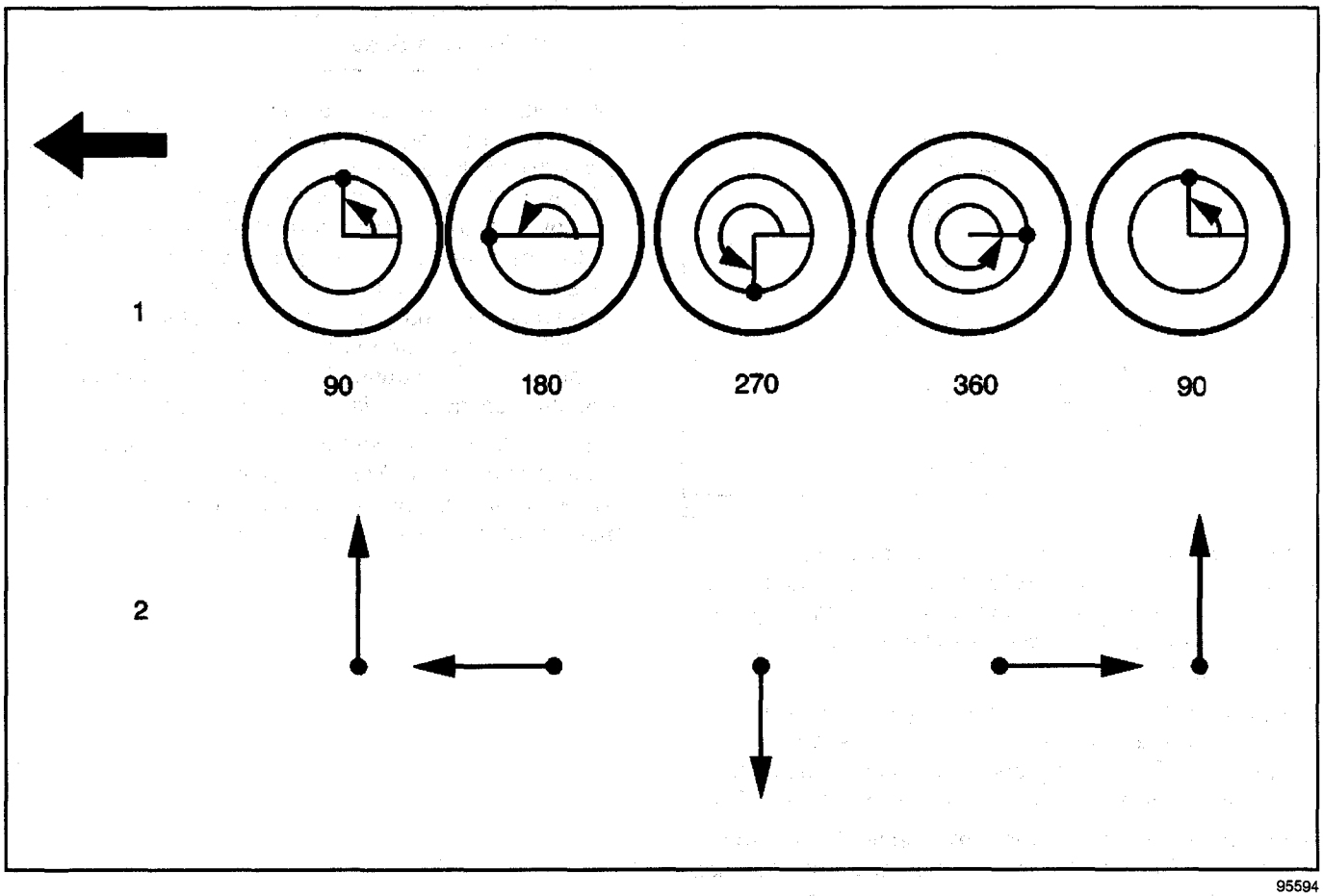
Free Vibration

Free vibration is the continued vibration in the absence of any outside force. In the yardstick example, the yardstick continued to vibrate even after the end was released.

Forced Vibration

Forced vibration is when an object is vibrating continuously as a result of an outside force.

Centrifugal Force Due to an Imbalance



95594

Legend

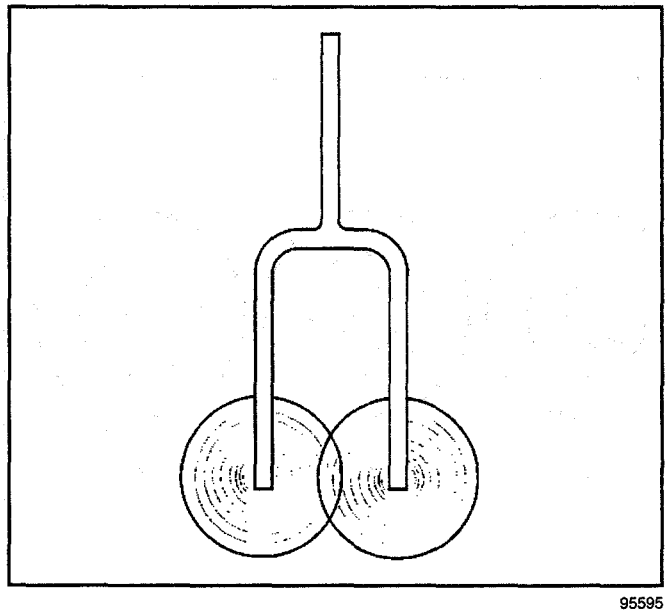
(1) Location of Imbalance (Degrees)
(2) Centrifugal Force Acting on Spindle

A spinning object with an imbalance generates a centrifugal force. Performing the following steps will help to demonstrate centrifugal force:

1. Tie a nut to a string.
2. Hold the string. The nut hangs vertically due to gravity.
3. Spin the string. The nut will spin in a circle.

Centrifugal force is trying to make the nut fly outward, causing the pull you feel on your hand. An unbalanced tire follows the same example. The nut is the imbalance in the tire. The string is the tire, wheel, and suspension assembly. As the vehicle speed increases, the disturbing force of the unbalanced tire can be felt in the steering wheel, the seat, and the floor. This disturbance will be repetitive (Hz) and the amplitude will increase. At higher speeds, both the frequency and the amplitude will increase. As the tire revolves, the imbalance, or the centrifugal force, will alternately lift the tire up and force the tire downward, along with the spindle, once for each revolution of the tire.

Natural or Resonant Frequency



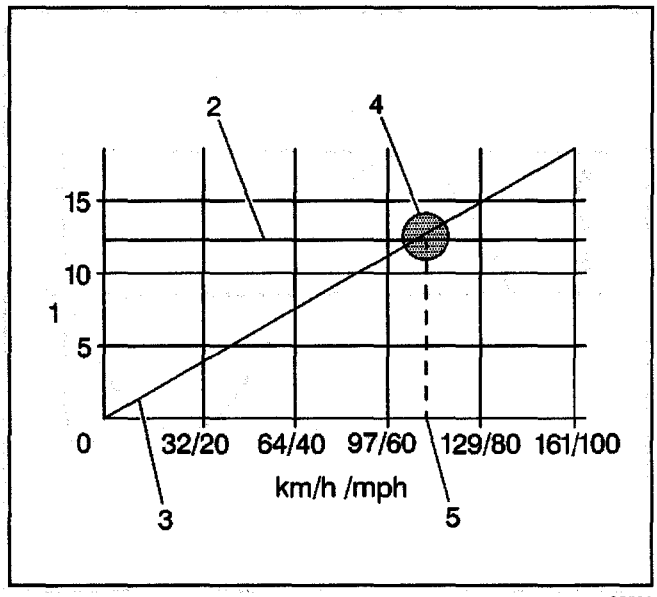
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The natural frequency is the frequency at which an object tends to vibrate. Bells, guitar strings, and tuning forks are all examples of objects that tend to vibrate at specific frequencies when excited by an external force.

Suspension systems, and even engines within the mounts, have a tendency to vibrate at certain frequencies. This is why some vibration complaints occur only at specific vehicle speeds or engine RPM.

The stiffness and the natural frequency of a material have a relationship. Generally, the stiffer the material, the higher the natural frequency. The opposite is also true. The softer a material, the lower the natural frequency. Conversely, the greater the mass, the lower the natural frequency.

Resonance



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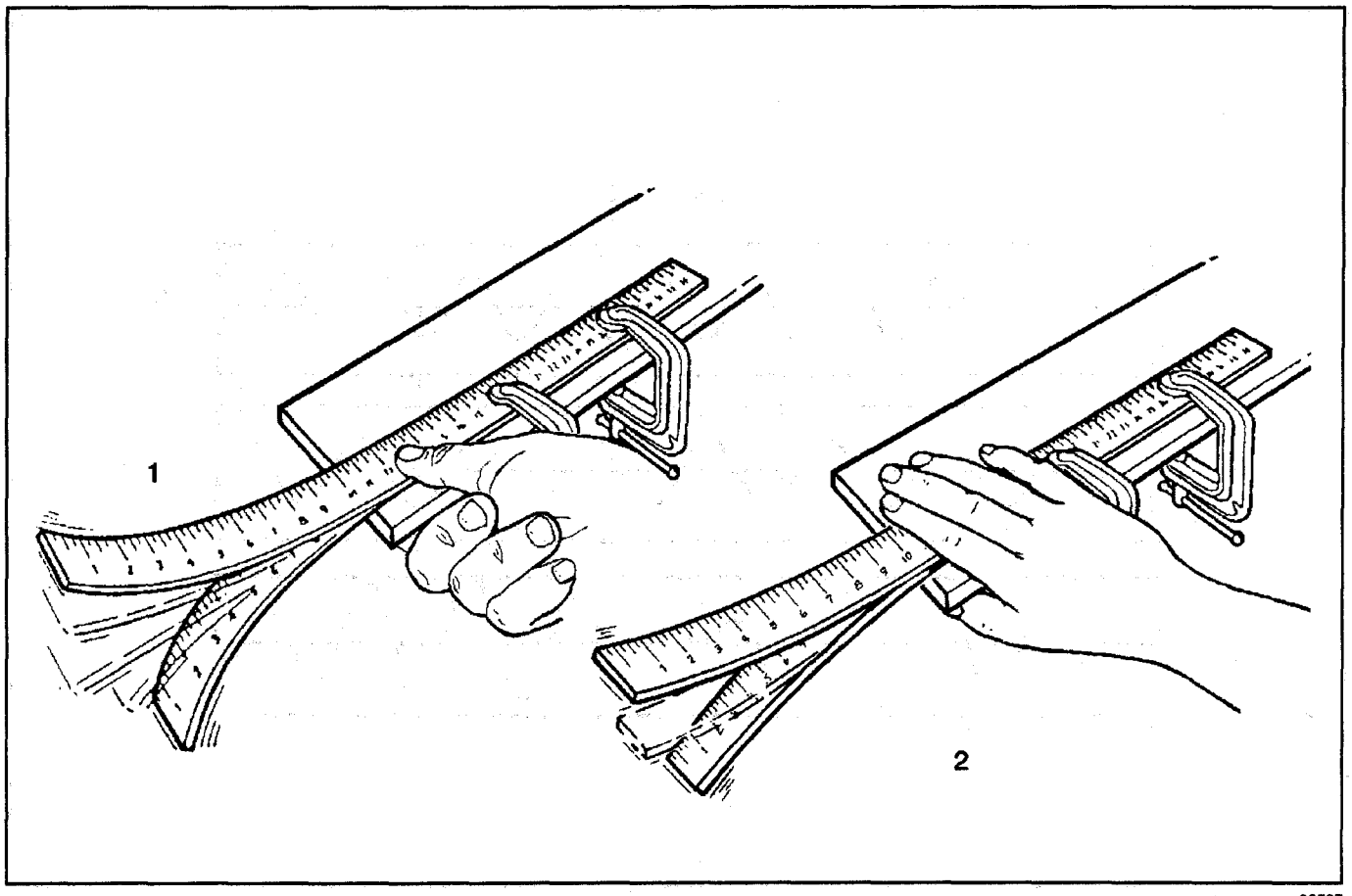
Legend

(1) Frequency – cps
(2) Suspension Frequency
(3) Unbalanced Excitation
(4) Point of Resonance
(5) Problem Speed

All objects have natural frequencies. The natural frequency of a typical automotive front suspension is in the 10–15Hz range. This natural frequency is the result of the suspension design. The suspension's natural frequency is the same at all vehicle speeds. As the tire speed increases along with the vehicle speed, the disturbance created by the tire increases in frequency. Eventually, the frequency of the unbalanced tire will intersect with the natural frequency of the suspension. This causes the suspension to vibrate. The intersecting point is called the resonance.

The amplitude off a vibration will be greatest at the point of resonance. While the vibration may be felt above and below the problem speed, the vibration may be felt the most a the point of resonance.

Damping



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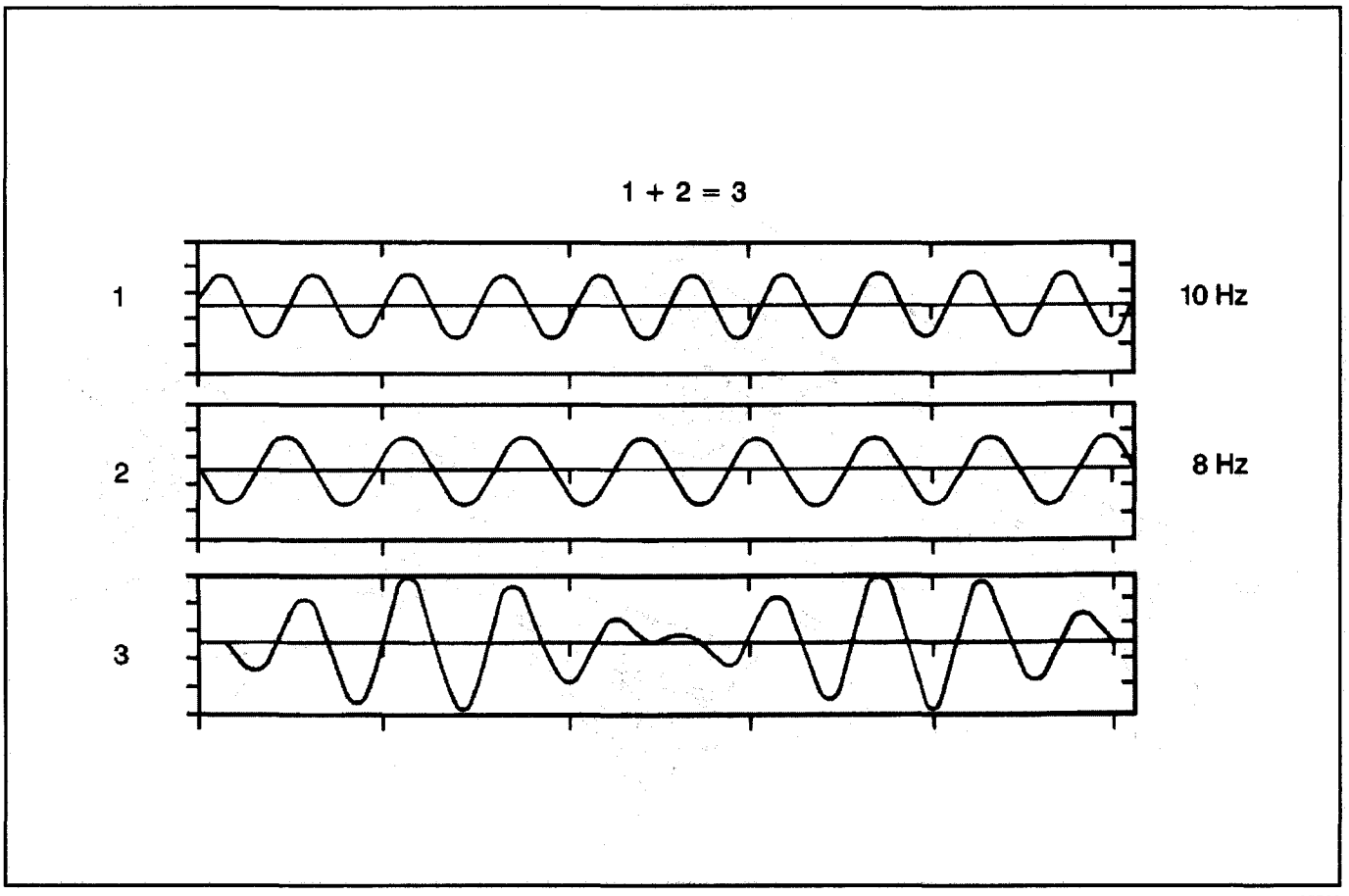
Legend

(1) Low Damping

(2) High Damping

Damping is the ability of an object or material to dissipate or absorb vibration. The automotive shock absorber is a good example. The function of the shock absorber is to absorb or dampen the oscillations of the suspension system.

Beating (Phasing)



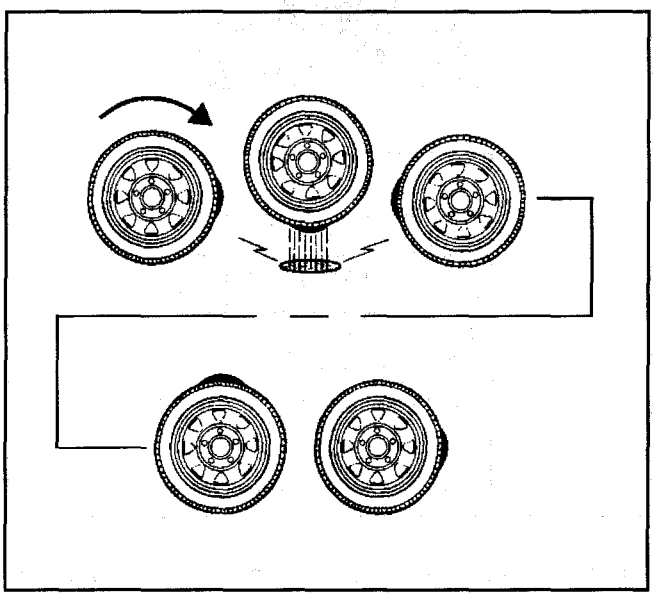
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Two separate disturbances that are relatively close together in frequency will lead to a condition called beating, or phasing. A beating vibration condition will increase in intensity or amplitude in a repetitive fashion as the vehicle travels at a steady speed. This beating vibration can produce the familiar droning noise heard in some vehicles.

Beating occurs when two vibrating forces are adding to each other's amplitude. However, two vibrating forces can also subtract from each other's amplitude. The adding and subtracting of amplitudes in similar frequencies is called beating. In many cases, eliminating either one of the disturbances can correct the condition.

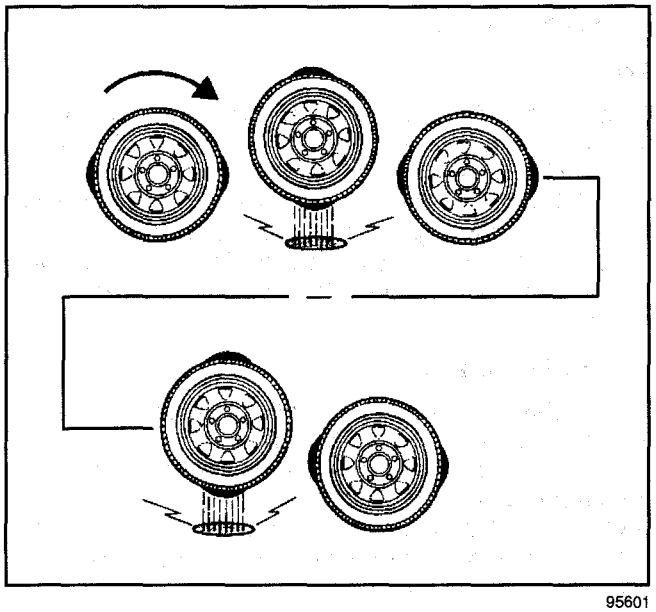
Order

Order refers to how many times an event occurs during one revolution of a rotating component.



95600

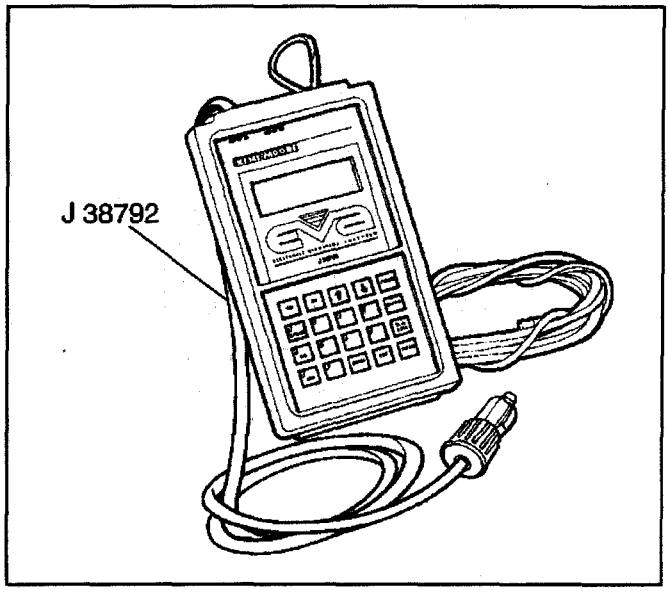
For example, a tire with one high spot would create a disturbance once for every revolution of the tire. This is called first-order vibration.



95601

An oval-shaped tire with two high spots would create a disturbance twice for every revolution. This is called second-order vibration. Three high spots would be third-order, and so forth. Two first-order vibrations may add or subtract from the overall amplitude of the disturbance, but that is all. Two first-order vibrations do not equal a second-order. Due to centrifugal force, an unbalanced component will always create at least a first-order vibration.

Electronic Vibration Analyzer (EVA)



95602

The *J 38792* Electronic Vibration Analyzer (EVA) is specifically designed to diagnose vibrations. This hand-held device is similar to a scan tool. A standard 12-volt power feed supplies the power. The vibration sensor, or the accelerometer, is at the end of a 6 m (20 ft) cord. The vibration sensor can be mounted virtually anywhere on the vehicle where a vibration is felt.

EVA Basic Hookup

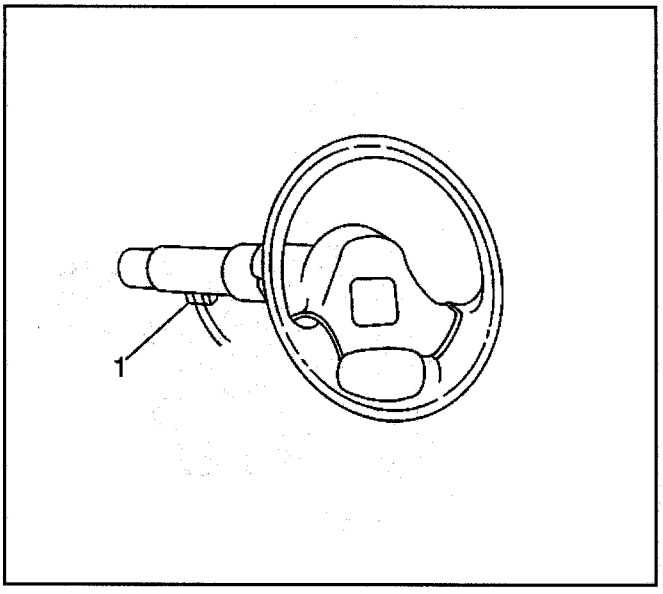
1. Inspect that the software cartridge is correctly inserted at the bottom of the unit. (The cartridge usually remains there at all times.)
2. Connect the vibration sensor cord into either input A or B.
3. Line up the connector so that the release button is at the bottom.

Important: Do not twist the connector. The sensor should remain plugged into the unit at all times.

4. Push the connector into the input until the connector clicks and locks in place.
5. Plug the power cord into a 12-volt power feed in order to turn the EVA on. (There is no ON-OFF switch.)

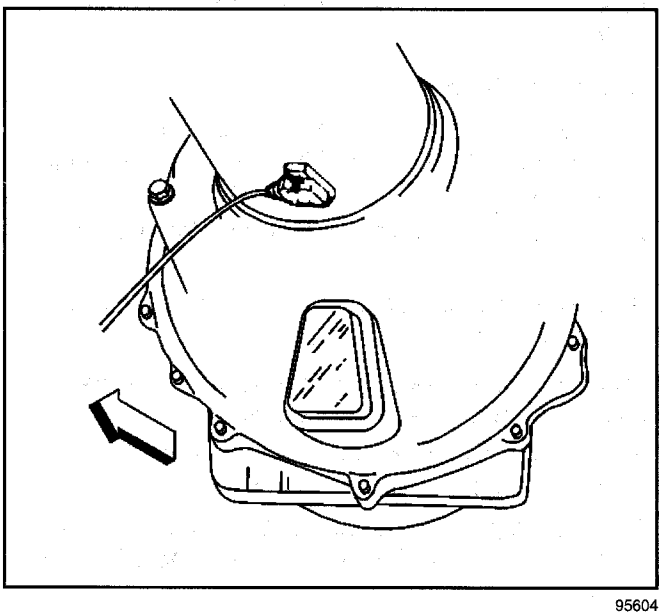
To Disconnect the sensor, press the release button and gently pull the connector straight out.

EVA Sensor Placement



95603

Proper EVA sensor placement is critical in order to take proper vibration readings. The sensor can be placed anywhere on the vehicle where vibrations are felt. Use putty or a hook and loop fastener in order to hold the sensor in place on non-ferrous surfaces, such as the surface of the steering column.

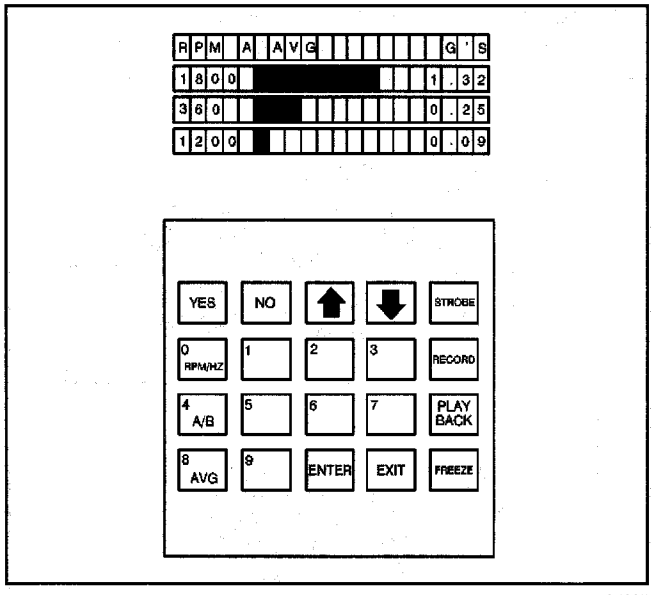


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A magnet is supplied in order to hold the sensor to ferrous surfaces.

Vibrations are typically felt in an up-and-down direction. The sensor is directionally sensitive. Therefore, place the sensor as flat as possible with the side marked UP facing upward. Place the UP side of the sensor in the exact position every time for consistent results when repeating the tests or making a comparison.

EVA Display



95605

The EVA offers the following main display features, all of which are described below:

- Freeze
- Record/Playback
- Averaging/Non-averaging modes
- Strobe Balancing

Freeze

Pressing the FREEZE button on the keypad activates the freeze function, which locks the display of data. The display shows FRZ at the top. The freeze function is useful when conducting an acceleration/deceleration test in which the significant amount of vibration registers only for a very short time. Pressing EXIT or the FREEZE button again deactivates the freeze function.

Record/Playback

The displayed vibration information can be recorded for later playback. The EVA retains stored data for about 70 hours after the unit has been unplugged from a power source. Data is recorded as SNAPSHOTS of vibration information. Each snapshot consists of 10 different frames. Up to 10 of these snapshots can be recorded.

Press RECORD in order to record a snapshot. The screen will display R? in order to request a tag number between 0 and 9. These tag numbers are the individual frames of the snapshot recording. New data will replace the existing data when a number is chosen that has already been used in order to tag a snapshot.

Pressing PLAYBACK plays back the recorded data. The screen shows P? in order to request the tag number for the wanted snapshot. Once the number is entered, the snapshot data is displayed: P and the tag number will appear. Then, an F and a 0–9 will be displayed in order to indicate which frame of the snapshot is being displayed.

The freeze function can be used in order to freeze the display at any point in the sequence during playback. Individual frames can be viewed in a forward or backward sequence using the up and down arrow keys.

The display returns to the active screen when the recording or playback of a snapshot is finished, or when EXIT is pressed.

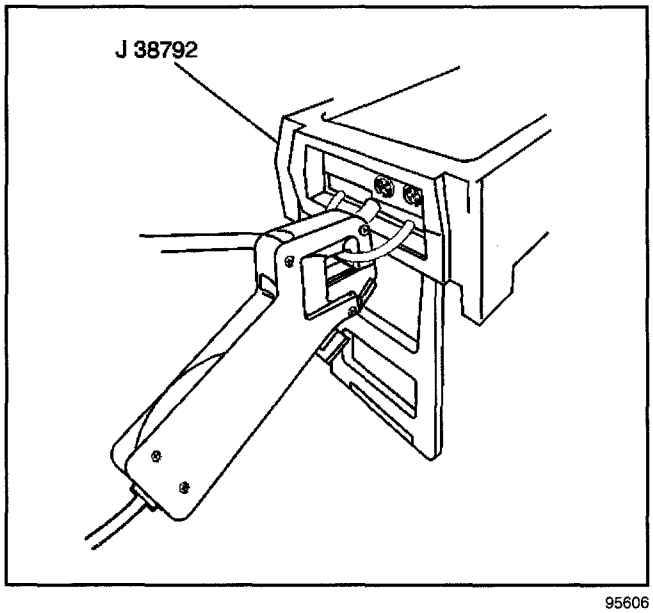
Averaging/Non-Averaging Modes

The EVA normally operates in an averaging mode that averages multiple vibration samples over a period of time. The averaging mode minimizes the effects of sudden vibration that are not related to the problem (such as form potholes or uneven road surfaces). Most tests use the averaging mode.

The EVA is more sensitive to vibrations in the non-averaging mode. The display is more instantaneous and not averaged over a period of time. The non-averaging mode is used when measuring a vibration that exists for only a short period of time, and during acceleration/deceleration tests.

Pressing the AVG button switches between the averaging and non-averaging modes. The screen will display AVG.

Strobe Balancing



95606

The EVA can strobe balance a rotating component. A trigger wire is located on the top of the EVA, which is used in conjunction with an inductive pick-up light strobe. The EVA triggers the strobe light at the same frequency as the vibration. The timing light clips on to the trigger wire. The vibration sensor must be attached to input A. Input B does not provide the strobe function.

Pressing STROBE starts the strobe balancing function. The EVA will ask a series of questions in order to determine the correct filter range: full, low, or high. The low and high ranges prevent other vibrations from interfering with the operation of the strobe light. Use the full range as a last resort only. Press YES in order to select a range. Press NO in order to go on to the next range. The vibration/strobe frequency must fall within the selected range.

The EVA will display the strobe frequency, amplitude, and filter range. The EVA is now ready to begin the strobe balance procedure.

EVA Calibration

The EVA features the following two built in calibration procedures:

- Sensor Calibration
- Phase Shift Calibration

A replaced or added sensor must be calibrated in order to function properly with the EVA unit. The phase shift calibration is performed at the factory and should not be repeated under normal use.

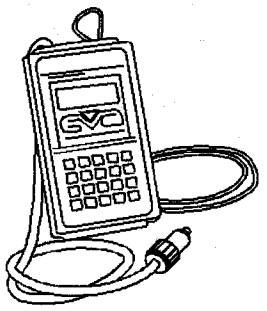
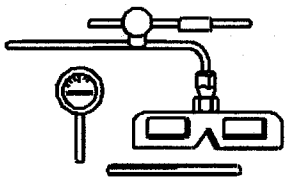
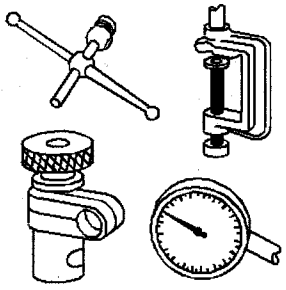
Sensor Calibration

1. Lay the sensor on a flat stationary surface with the UP side facing upward.
2. Plug the sensor into either input A or B.
3. Plug the EVA into a 12-volt power supply.
4. After the display initializes, select the proper input.
5. Press the up arrow key.
6. Press the number 2 three times on the keypad. The message BURNING will appear, followed by a request to turn the sensor over.
7. Turn the sensor over.
8. Press any key in order to commence calibration:
   - Calibration will take about 20 seconds.
   - The display will return to the active mode when calibration is complete.

Phase Shift Calibration

1. Plug the EVA into a 12-volt power supply.
2. Press the down arrow key on the EVA keypad.
3. Press the number 2 three times in order to begin calibration:
   - Do not press any key until the message ANY KEY TO CONTINUE appears. Pressing a key will cancel the calibration process.
   - The display will flash numbers for 5–6 minutes. (If the numbers flash for more than 10 minutes, the EVA is defective.)
   - The message BURNING PHASE SHIFT CONSTANTS will appear for one minute.
   - The BURNING CENTER FREQUENCIES LOW=39 HIGH=48 message will appear.
   - The ANY KEY TO CONTINUE message should appear.
4. Press any key in order to return to the active mode.

Special Tools and Equipment

Illustration	Tool Number/Description
 6826	J 38792 Electronic Vibration Analyzer (EVA)
 35463	J 7872 Magnetic Base Dial Indicator Set
 2014	J 8001 Dial Indicator Set

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HVAC

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HVAC System - Manual

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Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Conditioning Accumulator Bracket Bolt	6 N·m	53 lb ft
Air Conditioning Accumulator Bolt (At Module)	16 N·m	12 lb ft
Air Conditioning Accumulator Hose Bracket Nut (At Strut Tower)	8 N·m	71 lb in
Air Conditioning Compressor and Condenser Hose Bolt (At Accumulator)	16 N·m	12 lb ft
Air Conditioning Compressor and Condenser Hose Nut (At Condenser)	16 N·m	12 lb ft
Air Conditioning Compressor and Condenser Hose Bolt (At Compressor)	33 N·m	24 lb ft
Air Conditioning Compressor Bracket Bolt (3.8L VIN K)	30 N·m	22 lb ft
Air Conditioning Compressor Bracket Bolt (3.8L VIN K)	50 N·m	37 lb ft
Air Conditioning Compressor Bracket Bolt (5.7L VIN G)	50 N·m	37 lb ft
Air Conditioning Compressor Bolt (5.7L VIN G)	50 N·m	37 lb ft
Air Conditioning Compressor Bolt (3.8L VIN K)	50 N·m	37 lb ft
Air Conditioning Compressor Rear Bolt (3.8L VIN K)	30 N·m	22 lb ft
Air Conditioning Compressor Refrigerant Pressure Sensor	6 N·m	53 lb in
Air Conditioning Evaporator and Blower Upper Case Bolt	1.8 N·m	16 lb in
Air Conditioning Evaporator Bracket Bolt	2.0 N·m	18 lb in
Air Conditioning Evaporator Tube Bolt (At Module)	16 N·m	12 lb ft
Air Conditioning Evaporator Tube Bolt (At Condenser)	16 N·m	12 lb ft
Air Distributor Duct Bolt	2.2 N·m	19 lb in
Bi-Level Mode Valve Linkage Bolt	2.3 N·m	20 lb in
Blower Motor Bolt	2.3 N·m	20 lb in
Blower Motor Resistor Bolt	2 N·m	18 lb in
Front Floor Air Duct Bolt	1.9 N·m	17 lb in
HVAC Control Bolt	2.2 N·m	19 lb in
Heater Core Clamp Bolt	1.8 N·m	16 lb in
Heater Core Tube Clamp Bolt	2.0 N·m	18 lb in
Heater Module Screw	1.8 N·m	16 lb in
Heater Hose Bracket Bolt	14 N·m	10 lb ft
I/P Outer Air Outet Duct Bolt	2.2 N·m	19 lb in
Negative Battery Cable Nut to Engine Block Stud (3.8L VIN K)	25 N·m	18 lb ft
Temperature Control Cable Bolt	1.9 N·m	17 lb in
Temperature Valve Shroud Case Bolt	2.0 N·m	18 lb in
Vacuum Tank Mounting Bolt	2.5 N·m	22 lb in

System Capacities

Application	Specification	
	Metric	English
Air Conditioning (A/C) System R-134a Charge Capacity	0.68 kg	1.50 lb

Refrigerant Oil Distribution Specifications

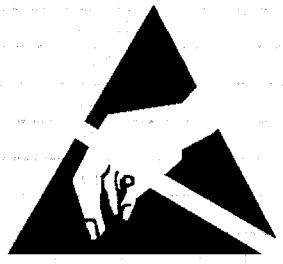
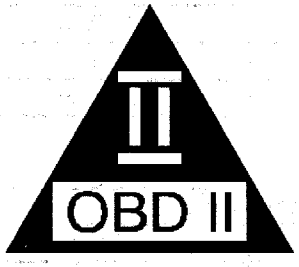
Application	Type of Material	GM Part Number
Air Conditioning (A/C) System Internal Lubricant (Including Compressor)	Polyalkylene Glycol (PAG) Synthetic Refrigerant Oil	12345923 (or equivalent)
Air Conditioning (A/C) System O-Ring and Fitting Lubricant	Mineral Base 525 Viscosity Refrigerant Oil	12301108 (or equivalent)

Schematic and Routing Diagrams

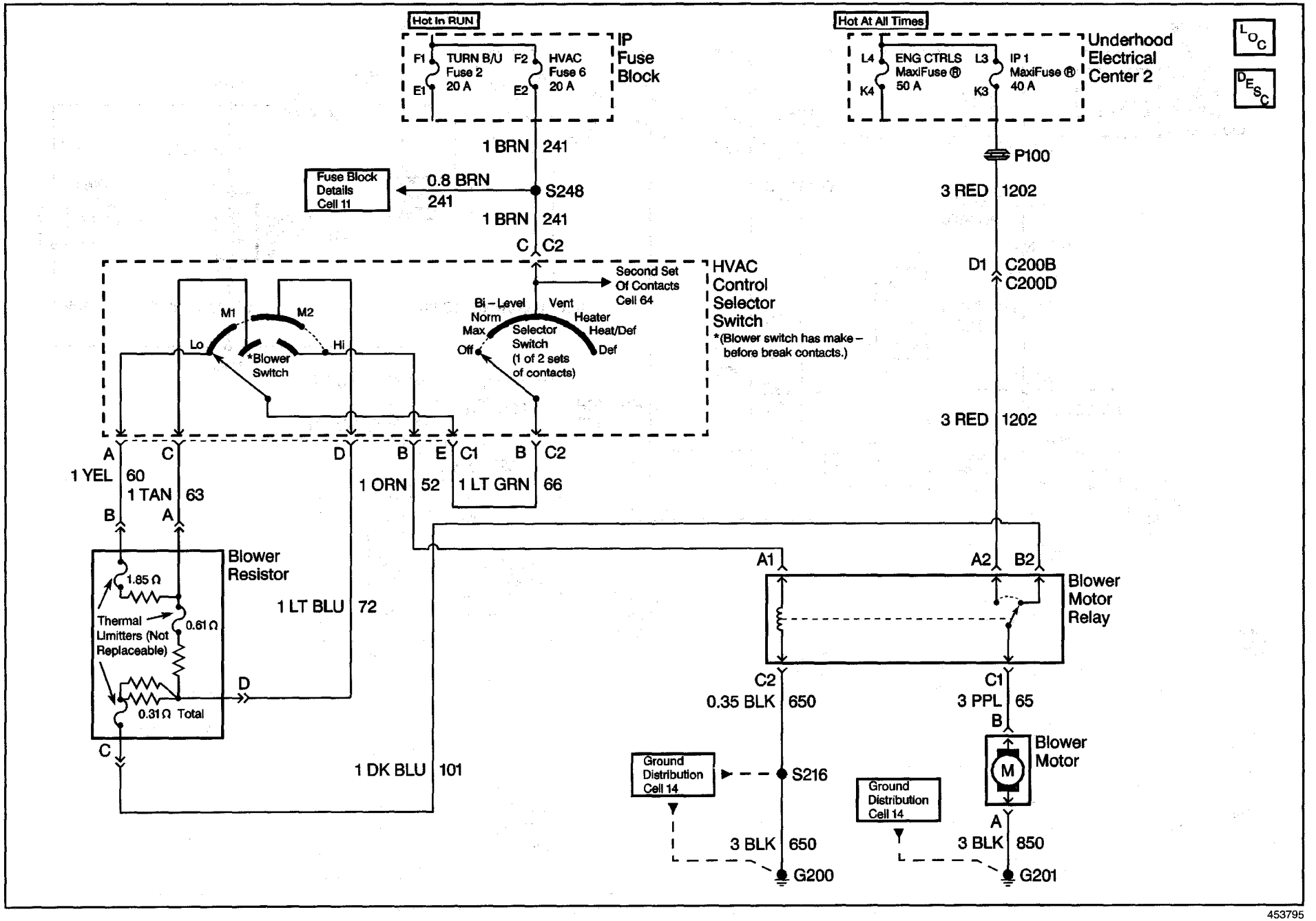
HVAC Schematic References

Reference on Schematic	Section Number - Subsection Name
Fuse Block Details - Cell 11	8-Wiring Systems
Ground Distribution - Cell 14	8-Wiring Systems
HVAC Compressor Controls - Cell 64	1-HVAC
Power Distribution - Cell 10	8-Wiring Systems

HVAC Schematic Icons

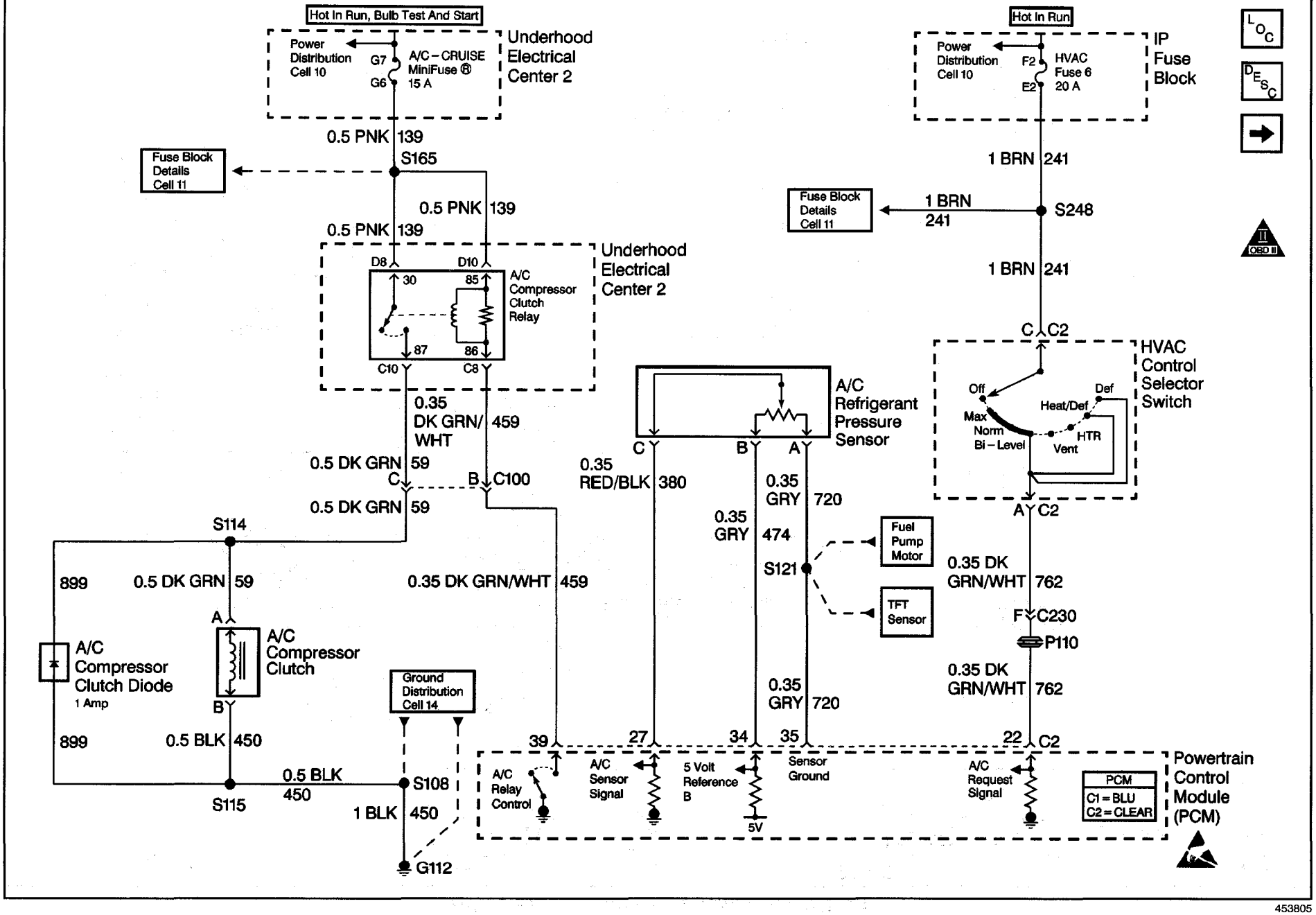
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.
 19385	Refer to *OBD II Symbol Description Notice* in Cautions and Notices.

HVAC Blower Control Schematics (Cell 63)



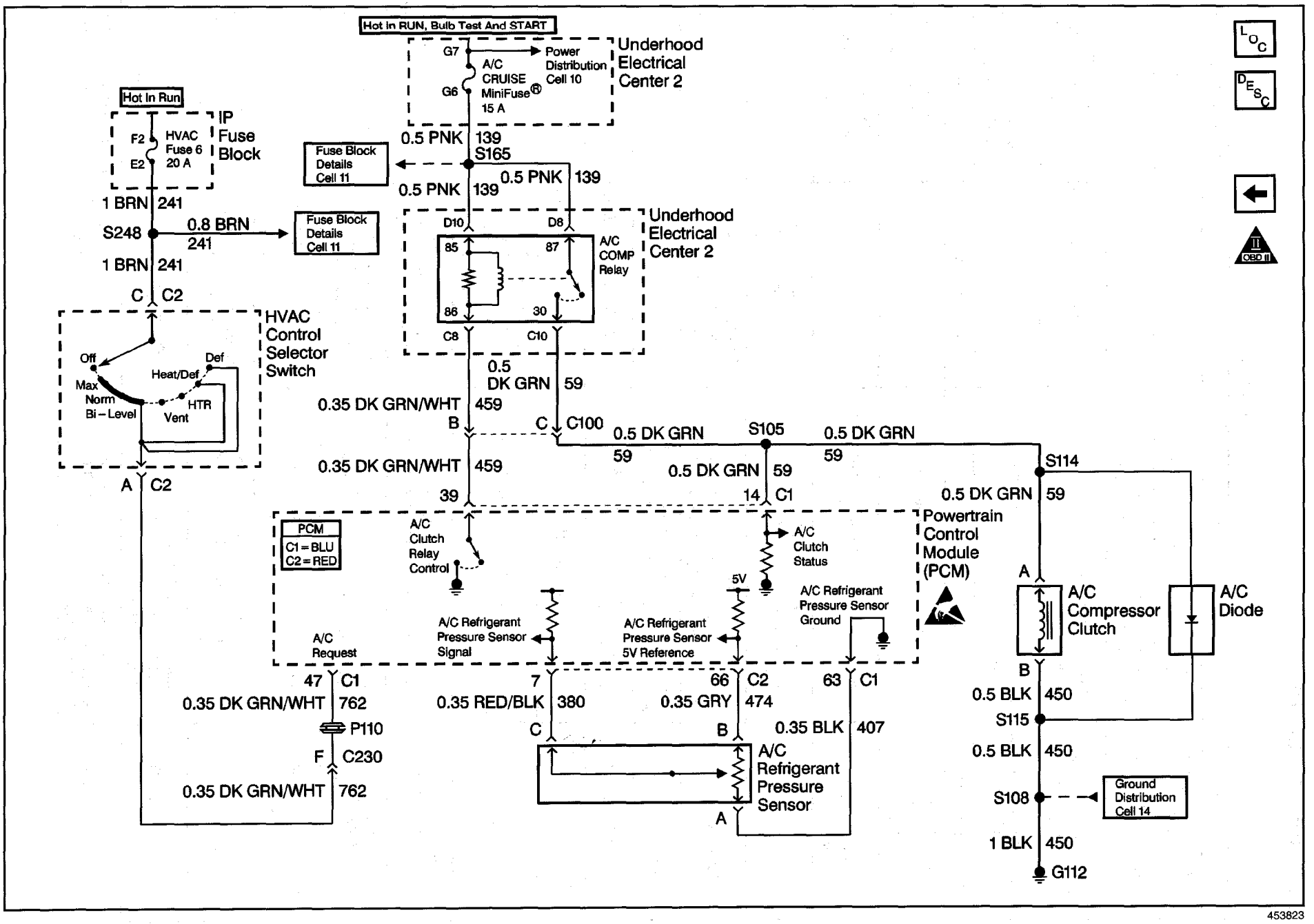
453795

HVAC Compressor Control Schematics (Cell 64 (V8 VIN G))



453805

HVAC Compressor Control Schematics (Cell 64 (V6 VIN K))



Component Locator

HVAC Components

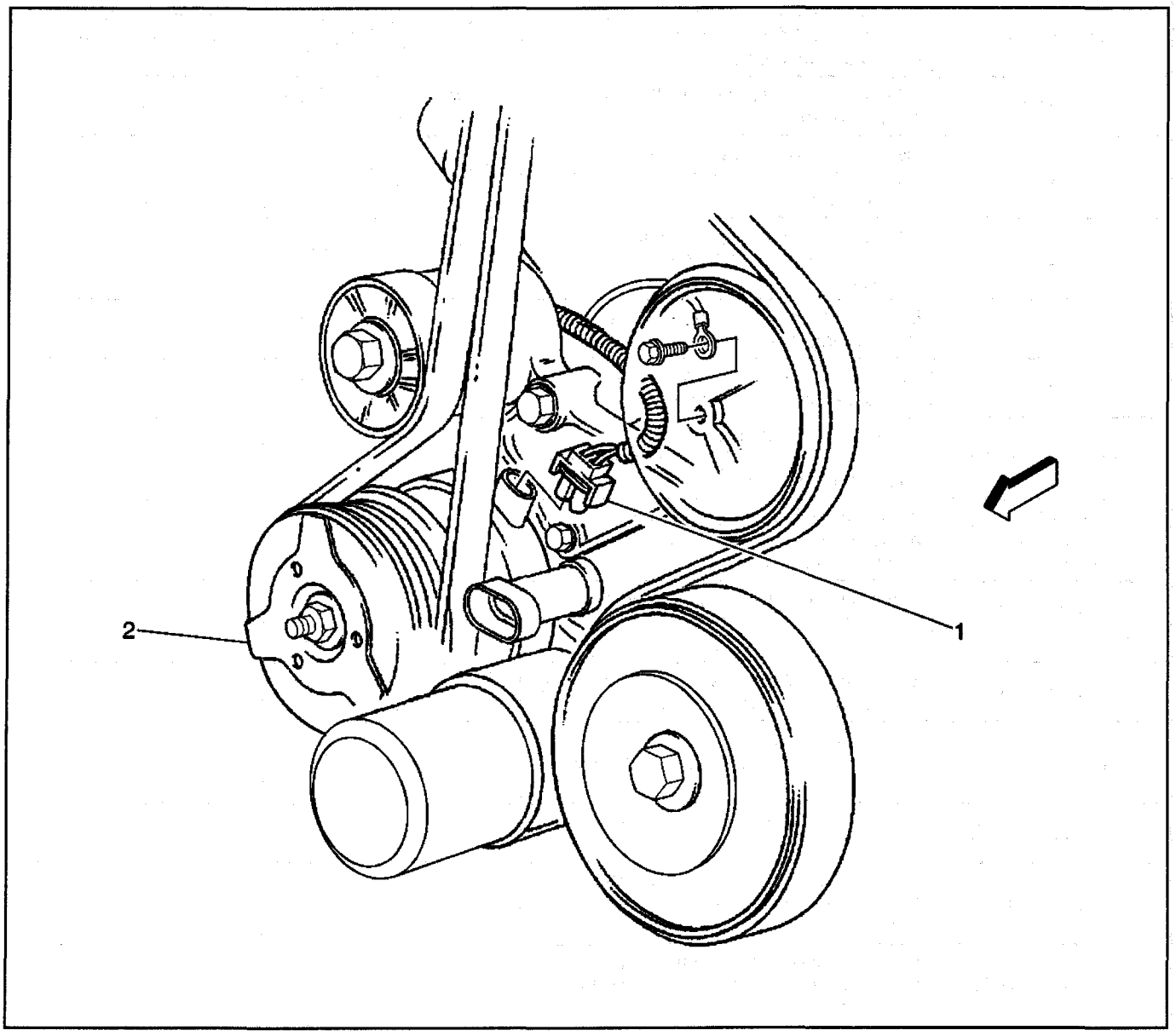
Name	Location	Locator View	Connector End View
A/C Clutch Diode (V6 VIN K)	Sealed in harness, approximately 3 cm (1 in) from the injector 2 breakout	—	—
A/C Clutch Diode (V8 VIN G)	Sealed in harness, approximately 17 cm (7 in) back from the A/C compressor clutch	—	—
A/C Compressor Clutch (V6 VIN K)	In the front of the engine, on the lower right side	*HVAC Component Views*	*Engine Controls Connector End Views* in Engine Controls
A/C Compressor Clutch (V8 VIN G)	In the front of the engine, on the lower right side	—	*Engine Controls Connector End Views* in Engine Controls
A/C Compressor Relay	In the underhood electrical center 2	*HVAC Component Views*	—
A/C Refrigerant Pressure Sensor (V6 VIN K)	Above right front wheelhouse, attached to the refrigerant line	—	*Engine Controls Connector End Views* in Engine Controls
A/C Refrigerant Pressure Sensor (V8 VIN G)	Above right front wheelhouse, attached to the refrigerant line	—	*Engine Controls Connector End Views* in Engine Controls
Blower Motor	Under the lower right side of the instrument panel, mounted in the HVAC module	*Body Control Module Component Views* in Body Control System	—
Blower Motor Relay	Under the instrument panel, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Blower Resistor	In HVAC module, forward and left of temperature control cable attachment	—	—
HVAC Control	In the center of the instrument panel, above the radio	*HVAC Component Views*	—
HVAC Control Selector Switch	Part of the HVAC control	*HVAC Component Views*	*HVAC Connector End Views*
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Guages and Console	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
Underhood Electrical Center 2	On the left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
C100 (10 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems

HVAC Components (cont'd)

Name	Location	Locator View	Connector End View
C230 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G112	Attached to the rear of the left cylinder head	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G201	Near the right A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
P110	Right side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
S108 (V6 VIN K)	In the engine harness, main branch, approximately 7 cm (3 in) from the vehicle speed sensor breakout	—	—
S108 (V8 VIN G) (Automatic Transmission)	In the engine harness, main branch, approximately 5 cm (2 in) from the automatic transmission breakout	—	—
S108 (V8 VIN G) (Manual Transmission)	In the engine harness, main branch, approximately 12 cm (5 in) from the vehicle speed sensor breakout	—	—
S114 (V6 VIN K)	Engine harness, approximately 3 cm (1 in) from generator breakout	—	—
S114 (V8 VIN G)	Engine harness, approximately 17 cm (7 in) back from A/C compressor clutch connector	—	—
S115 (V6 VIN K)	In the engine harness at the generator breakout	—	—
S115 (V8 VIN G)	In the engine harness, approximately 20 cm (8 in) back from the A/C compressor clutch connector	—	—
S121 (V6 VIN K)	Engine harness, main branch, 8 cm (3 in) from powertrain control module (PCM) breakout	—	—
S165	In the forward lamp harness, approximately 7 cm (3 in) from the main branch into the UH electrical center 2 breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S248	In the instrument panel harness, approximately 2 cm (1 in) from the radio connectors breakout	—	—

HVAC Component Views

Lower Right Front Side of the Engine (V6 VIN K)



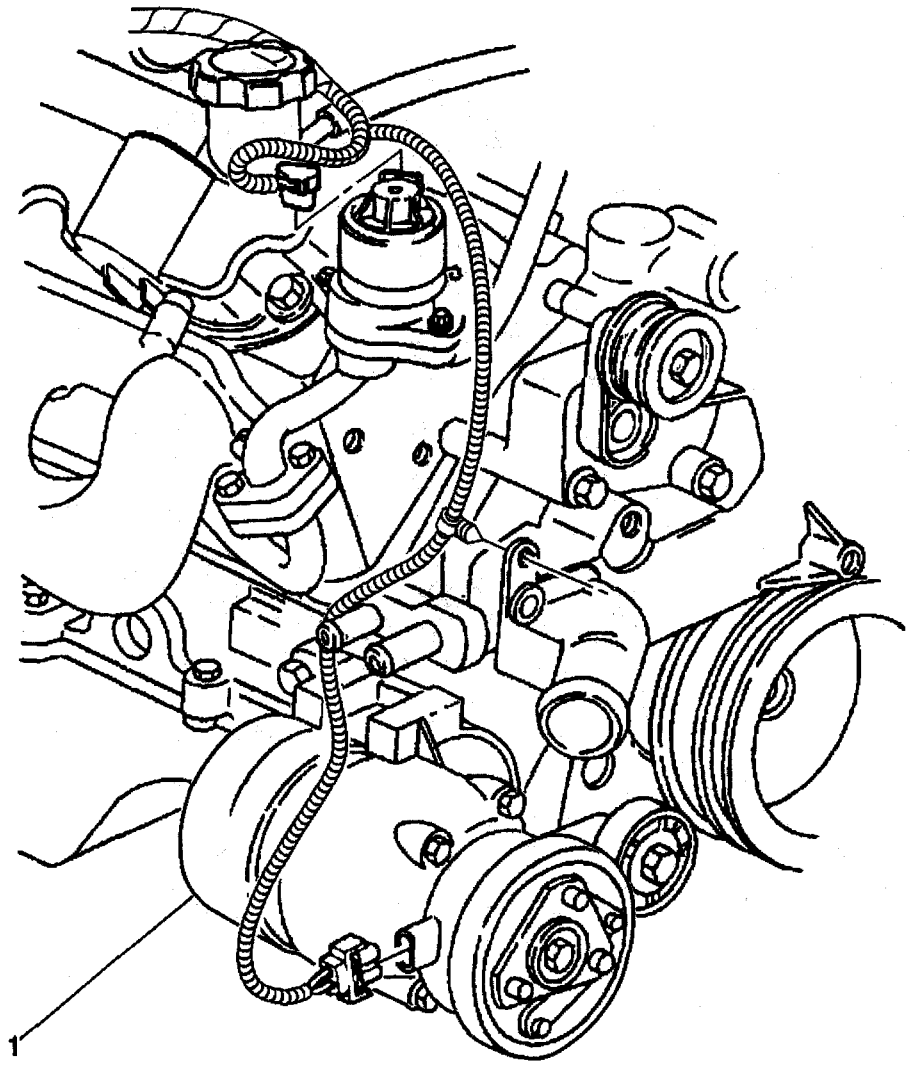
483470

Legend

(01) A/C Compressor Clutch Connector

(02) A/C Compressor

Lower Right Front Side of the Engine (V8 VIN G)

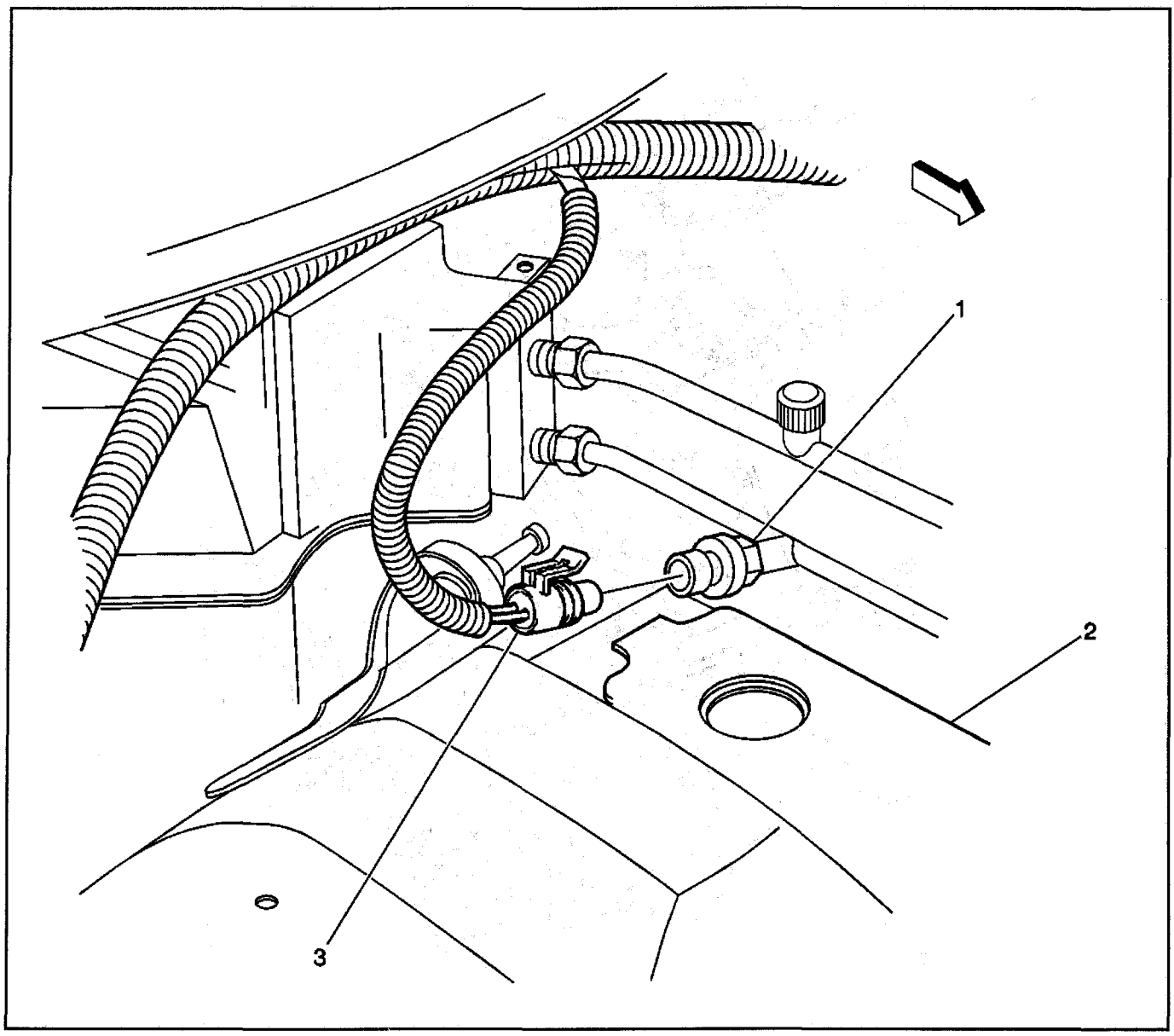


483471

Legend

(01) A/C Compressor

Right Rear Side of the Engine Compartment

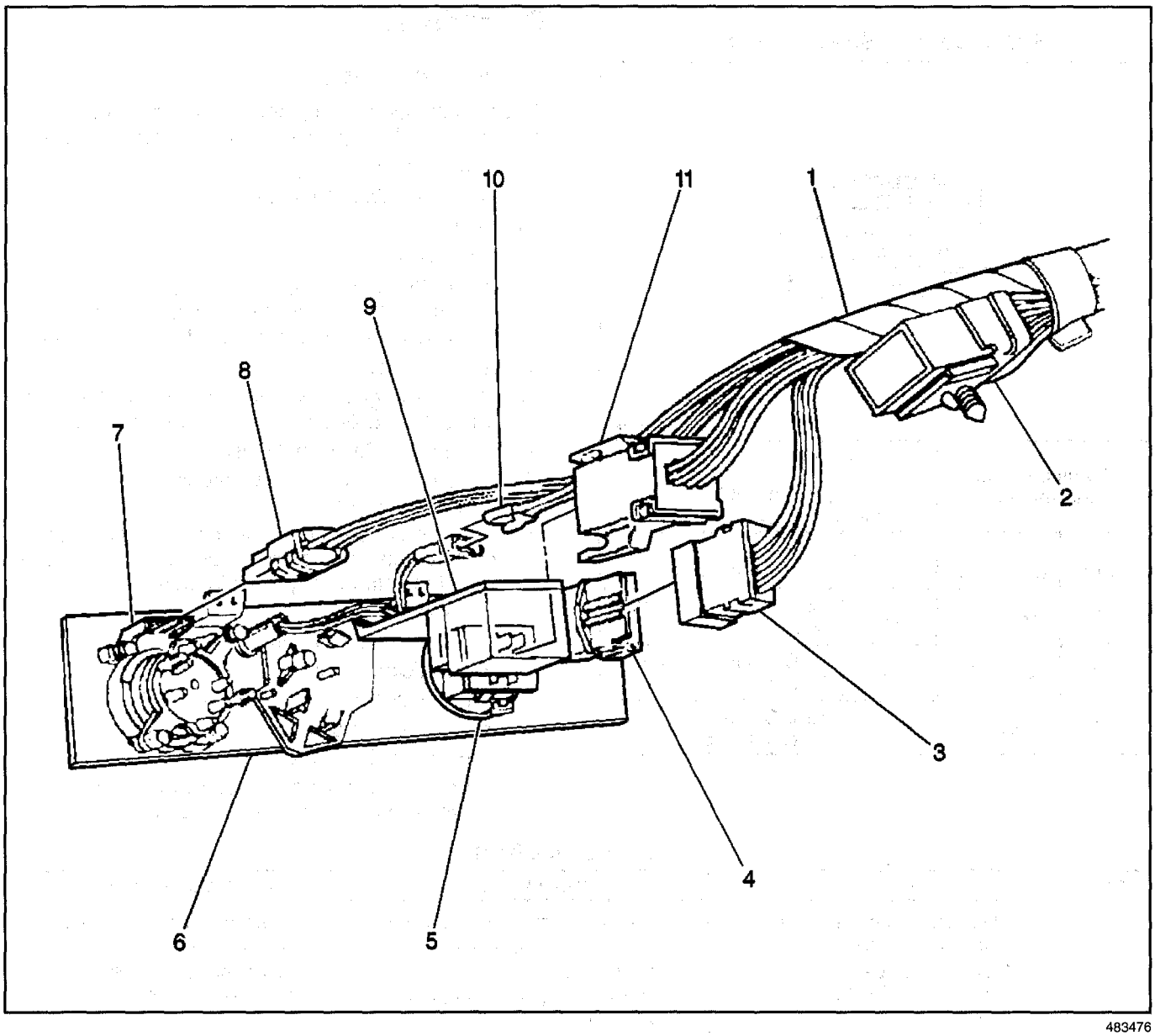


483472

Legend

(01) A/C Refrigerant Pressure Sensor
(02) Right Shock Tower
(03) Engine Wiring Harness

Center of the Instrument Panel



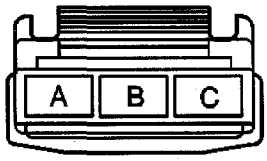
483476

Legend

(01) HVAC Control Connector C3
(02) HVAC Control Connector C1
(03) IP Wiring Harness
(04) Brake Malfunction Indicator Lamp Driver Module
(05) HVAC Control Connector C4
(06) Rear Defogger Switch
(07) Blower Switch
(08) HVAC Control
(09) HVAC Control Selector Switch
(10) HVAC Control Connector C2
(11) Rear Defogger Timer/Relay

HVAC Connector End Views

HVAC Control Selector Switch



38596

Connector Part Information		• 1202-0557 • 3-Way Metri-Pack Series 480 (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	GRN/WHT	762	Air conditioning Request Signal
B	LT GRN	66	Air Conditioning Switch Output
C	BRN	241	Fuse Output—ignition 3—type III fuse

Diagnostic Information and Procedures

Functional Check

This operational test sequence aids in determining whether the following systems are working properly:

- Air conditioning (A/C)
- Air conditioning (A/C) electrical
- Vacuum
- Refrigeration

1. Ensure that the temperature of the air is at least 16°C (60°F). The A/C system can not be properly tested unless it is at least this warm.
2. Start the engine.
3. Allow the engine to idle the engine for 20 minutes or until the cooling system thermostat is open.
4. Perform the Functional Check.
5. Compare the vehicle response to the normal system response.
6. If the vehicle does not respond correctly to any of the steps, use one of the following procedures in order to begin the appropriate diagnosis:
   - Insufficient heating
     Refer to *Heating Insufficient*
   - Insufficient cooling
     Refer to *Cooling Insufficient - A/C Inoperative*
   - Improper air delivery
     Refer to *Air Delivery Improper*
   - Blower motor inoperative. Refer to *Blower Motor Inoperative at Any Speed*

Functional Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Place the mode control knob in the OFF position. 2. Place the temperature control knob in the COLD (blue) position. 3. Place the blower motor knob in the LOW fan position.	• The blower motor speed is OFF. • There is no airflow from the heater outlets. • There is no airflow from the A/C outlets. • There is no air flow from the defroster outlets.	• Airflow from the heater, A/C, or defroster outlets. • Apply vacuum to each vacuum line individually (except black and orange) • If air flows out the outlets repair or replace the actuator linkage and/or air valve (door). • Blower motor runs. • Refer to *Air Delivery Improper*, or *Blower Motor Inoperative at Any Speed*
2	1. Place the mode control knob in the MAX A/C setting. 2. Place the temperature control knob in the COLD setting. 3. Place the blower motor knob in the LOW setting.	• The blower motor speed is LOW. • There is no airflow from the heater outlets. • There is airflow from the A/C outlets. • There is no air flow from the defroster outlets. • Temperature from the center A/C outlet should drop 11°C (20°F) from the temperature outside the vehicle. • Engagement of the detent is felt in each mode.	• Airflow from the heater or defroster outlets. No airflow from the A/C outlets. • Temperature does not change. • No blower motor speed change. • Blower motor speed inop. • Refer to *Cooling Insufficient - A/C Inoperative, System Performance Test, Air Delivery Improper, Temperature Control Inoperative* or *Blower Motor Inoperative at Any Speed.*

Functional Check (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
3	1. Place the mode control knob in the MAX A/C setting. 2. Place the temperature control knob in the COLD setting. 3. Place the blower motor knob in the LOW to HIGH setting.	• The blower motor speed is LOW to HIGH. • There is no airflow from the heater outlets. • There is airflow from the A/C outlets. • There is no air flow from the defroster outlets. • Temperature from the center A/C outlet should drop 11°C (20°F) from the temperature outside the vehicle. • A noticeable blower speed increase occurs from the following settings: • LOW • MEDIUM LOW • MEDIUM HIGH • HIGH • The outlets hold their position during high blower motor speed and are moveable by hand.	• There is airflow from the heater and/or defroster outlets. • There is no airflow from the A/C outlets. • Temperature does not change. • No blower motor speed change. • Blower motor speed inop. • Refer to *Cooling Insufficient - A/C Inoperative, System Performance Test, Air Delivery Improper, Temperature Control Inoperative* or *Blower Motor Inoperative at Any Speed.*
4	1. Place the mode control knob in the NORMAL A/C setting. 2. Place the temperature control knob in the COLD setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is no airflow from the heater outlets. • There is airflow from the A/C outlets. • There is no air flow from the defroster outlets. • Listen for a reduction of air noise due to the recirculation door closing. • Engagement of the detent is felt in each mode control setting.	• There is airflow from the heater and/or defroster outlets. • There is no airflow from the A/C outlets. • Temperature does not change. • No blower motor speed change. • Refer to *Cooling Insufficient - A/C Inoperative, System Performance Test, Air Delivery Improper, Temperature Control Inoperative* or *Blower Motor Inoperative at Any Speed.*
5	1. Place the mode control knob in the BI-LEVEL A/C setting. 2. Place the temperature control knob in the COLD setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is airflow from the heater outlets. • There is airflow from the A/C outlets. • There is minimum air flow from the defroster outlets. • Engagement of the detent is felt in each mode control setting.	• Blower motor speed inop. • Airflow from the heater outlets. • No airflow from the A/C outlets. • No engagement of the detent is felt. • Refer to *Blower Motor Inoperative at Any Speed, Cooling Insufficient - A/C Inoperative, Air Delivery Improper, Temperature Control Inoperative.*
6	1. Place the mode control knob in the VENT setting. 2. Place the temperature control knob in the COLD setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is no airflow from the heater outlets. • There is airflow from the A/C outlets. • There is no air flow from the defroster outlets. • Engagement of the detent is felt in each mode control lever setting.	• Blower motor speed inop. • Airflow from the heater and/or defroster outlets. • No airflow from the A/C outlets. • No engagement of the detent is felt. • Refer to *Blower Motor Inoperative at Any Speed, Cooling Insufficient - A/C Inoperative, Air Delivery Improper* or *Temperature Control Inoperative.*

Functional Check (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
7	1. Place the mode control knob in the HEATER setting. 2. Place the temperature control knob in the HOT setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is airflow from the heater outlets. • There is no airflow from the A/C outlets. • There is minimum air flow from the defroster outlets. • Engagement of the detent is felt in each mode control lever setting. • The temperature lever travels from full COLD to full HOT. • Air flow is present at the side window defogger outlets.	• Blower motor speed inop. • Airflow from the heater, defroster and A/C outlets. • No engagement of the detent is felt. • Refer to *Blower Motor Inoperative at Any Speed, Cooling Insufficient - A/C Inoperative, Air Delivery Improper* or *Temperature Control Inoperative.*
8	1. Place the mode control knob in the DEFROSTER BLEND setting. 2. Place the temperature control knob in the HOT setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is airflow from the heater outlets. • There is no airflow from the A/C outlets. • There is air flow from the defroster outlets. • Engagement of the detent is felt in each mode control lever setting. • Air flow is present at the side window defogger outlets.	• Blower motor speed inop. • No airflow from the heater and/or defroster outlets. • Airflow from the A/C outlets. • No engagement of the detent is felt. • No airflow at the side window defogger outlets. • Refer to *Blower Motor Inoperative at Any Speed, Heating Insufficient, Air Delivery Improper* or *Temperature Control Inoperative.*
9	1. Place the mode control knob in the DEFROST setting. 2. Place the temperature control knob in the HOT setting. 3. Place the blower motor knob in the HIGH setting.	• The blower motor speed is HIGH. • There is minimum airflow from the heater outlets. • There is no airflow from the A/C outlets. • There is air flow from the defroster outlets. • Engagement of the detent is felt in each mode control lever setting. • Air flow is present at the side window defogger outlets.	• Blower motor speed inop. • Airflow from the A/C outlets. • No airflow from the defroster outlets. • No engagement of the detent is felt. • No airflow at the side window defogger outlets. • Refer to *Blower Motor Inoperative at Any Speed, Heating Insufficient, Air Delivery Improper, Temperature Control Inoperative.*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

HVAC Blower Controls System Check

Step	Action	Normal Results	Abnormal Results
1	1. Place the ignition switch in the RUN position. 2. Place the blower switch in the LO position. 3. Place the selector switch in the MAX position, the NORM position, the VENT position, the BI-LEV position, the HEATER position, the HEAT/DEF position, and the DEF position.	The blower motor runs at low speed.	*Blower Motor Low Speed Inoperative*
2	1. Place the selector switch in the VENT position. 2. Place the blower switch in the M1 position.	The blower motor increases in speed.	*Blower Motor Inoperative in One Speed Only (High Speed Operates Normally)*

HVAC Blower Controls System Check (cont'd)

Step	Action	Normal Results	Abnormal Results
3	Place the blower switch in the M2 position.	The blower motor increases in speed.	*Blower Motor Inoperative in One Speed Only (High Speed Operates Normally)*
4	Place the blower switch in the HI position.	The blower motor increases in speed.	• *Blower Motor Inoperative at Any Speed* • *Blower Motor High Speed Inoperative* • *Blower Motor Operates at High Speed Only*
5	Put the selector switch in the OFF position.	The blower motor stops.	*Blower Motor Always On*

Blower Motor Inoperative at Any Speed

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC Blower Controls System Check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Place the ignition switch in the RUN position. 2. Place the selector switch in the VENT position. 3. With a test light, backprobe the HVAC control selector switch between connector C1 terminal E and ground. Is the test light on?	—	Go to *Step 3*	Go to *Step 12*
3	1. Place the blower switch in the LO position. 2. With a test light, backprobe the HVAC control selector switch between connector C1 terminal A and ground. Is the test light on?	—	Go to *Step 4*	Go to *Step 5*
4	1. Place the ignition switch in the OFF position. 2. Disconnect the blower motor relay. 3. Connect a fused jumper between terminal B2 and terminal C1. 4. Place the ignition switch in the RUN position. 5. Place the selector switch in the VENT position. 6. Place the blower switch in the LO position. Does the blower motor run?	—	Go to *Step 7*	Go to *Step 6*
5	Replace the HVAC control selector switch. Refer to *Control Assembly Replacement* Has the repair been made?	—	Go to *Step 17*	—
6	1. Leave the jumper connected from previous step. 2. Disconnect the blower motor connector. 3. Connect a test light between the blower motor connector terminal A and terminal B. Is the test light on?	—	Go to *Step 9*	Go to *Step 8*
7	Replace the blower motor relay. Refer to *Blower Motor Relay Replacement* Is the repair complete?	—	Go to *Step 17*	—
8	1. Leave the jumper connected from previous step. 2. Connect the test light between the blower motor connector terminal B and ground. Is test light on?	—	Go to *Step 11*	Go to *Step 10*

Blower Motor Inoperative at Any Speed (cont'd)

Step	Action	Value(s)	Yes	No
9	Replace the blower motor. Refer to *Blower Motor and Fan Replacement* Is the repair complete?	—	Go to *Step 17*	—
10	Repair the poor connection or open in CKT 65. Is the repair complete?	—	Go to *Step 17*	—
11	Repair the poor connection or open in CKT 850. Is the repair complete?	—	Go to *Step 17*	—
12	Backprobe the HVAC control selector switch between connector C2 terminal C and ground. Is the test light on?	—	Go to *Step 13*	Go to *Step 15*
13	Inspect CKT 66 for an open or a poor connection at HVAC control selector switch C2 terminal B and terminal E. Does CKT 66 have an open or poor connection?	—	Go to *Step 16*	Go to *Step 14*
14	Replace the HVAC control selector switch. Refer to *Control Assembly Replacement* Is the repair complete?	—	Go to *Step 17*	—
15	Repair the open in CKT 241 between HVAC control selector switch and S248. Is the repair complete?	—	Go to *Step 17*	—
16	Repair a poor connection or open in circuit 66. Is the repair complete?	—	Go to *Step 17*	—
17	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

Blower Motor Low Speed Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC Blower Controls System Check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Turn the ignition switch to the OFF position. 2. Disconnect the blower resistor. 3. Connect a test light at the blower resistor connector terminal B and ground. 4. Turn the ignition switch to the RUN position. 5. Turn the blower switch to LO. 6. Turn the selector switch to the VENT position. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the blower resistor. Refer to *Blower Motor Resistor Replacement* Is the repair complete?	—	Go to *Step 7*	—
4	Connect a test light at the HVAC control selector switch connector C1 terminal A and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Repair a poor connection or open in circuit 60. Is the repair complete?	—	Go to *Step 7*	—
6	Replace the HVAC control selector switch. Refer to *Control Assembly Replacement* Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

Blower Motor Operates at High Speed Only

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC blower controls system check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Place the ignition switch in the RUN position. 2. Place the selector switch in the VENT position. 3. Place the blower switch in the LO position. 4. Backprobe with a test light between the blower resistor connector terminal C and ground. Is the test light on?	—	Go to *Step 3*	Go to *Step 4*
3	Backprobe with a test light between the blower motor relay connector terminal B2 and ground. Is the test light on?	—	Go to *Step 5*	Go to *Step 6*
4	Replace the blower resistor. Refer to *Blower Motor Resistor Replacement* Is the repair complete?	—	Go to *Step 7*	—
5	Replace the blower motor relay. Refer to *Blower Motor Relay Replacement* Is the repair complete?	—	Go to *Step 7*	—
6	Repair the open in CKT 101 between the blower resistor and the blower motor relay. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

Blower Motor Inoperative in One Speed Only (High Speed Operates Normally)

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC blowers controls system check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Disconnect the blower resistor connector. 2. Place the ignition switch in the RUN position. 3. Place the blower switch in the inoperative position. 4. Connect a test light from the blower resistor connector inoperative terminal (LO=B, M1=A, M2=D) to ground on the harness connector. Is the test light on?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the blower resistor. Refer to *Blower Motor Resistor Replacement* Is the repair complete?	—	Go to *Step 7*	—
4	Backprobe with a test light between the HVAC control selector switch connector C1 of the inoperative terminal (LO=A, M1=C, M2=D) and ground. Is the test light on?	—	Go to *Step 5*	Go to *Step 6*
5	Repair the open in the inoperative circuit (LO=60, M1=63, M2=72). Is the repair complete?	—	Go to *Step 7*	—
6	Replace the HVAC control selector switch. Refer to *Control Assembly Replacement* Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components disconnected. Have all repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

Blower Motor High Speed Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC blower controls system check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Disconnect the blower motor relay. 2. Connect a test light between terminal A2 and ground. Is the test light on?	—	Go to *Step 3*	Go to *Step 4*
3	Connect a test light between the blower motor relay terminal A2 and terminal C2. Is the test light on?	—	Go to *Step 5*	Go to *Step 6*
4	Repair the poor connection or open in CKT 1202. Is the repair complete?	—	Go to *Step 11*	—
5	1. Place the ignition switch in the RUN position. 2. Place the selector switch in the VENT position. 3. Place the blower switch in the HI position. 4. Connect the test light between the blower motor relay terminal A1 and ground. Is the test light on?	—	Go to *Step 7*	Go to *Step 8*
6	Repair the poor connection or open in CKT 650. Is the repair complete?	—	Go to *Step 11*	—
7	Replace the blower motor relay. Refer to *Blower Motor Relay Replacement* Is the repair complete?	—	Go to *Step 11*	—
8	Inspect CKT 52 for an open or for a poor connection. Is there an open or a poor connection?	—	Go to *Step 9*	Go to *Step 10*
9	Repair the poor connection or open in circuit 52. Is the repair complete?	—	Go to *Step 11*	—
10	Replace the HVAC control selector switch. Refer to *Control Assembly Replacement* Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

Blower Motor Always On

Step	Action	Value(s)	Yes	No
1	Was the entire HVAC Blower Controls System Check performed?	—	Go to *Step 2*	Go to *HVAC Blower Controls System Check*
2	1. Turn the ignition switch to the OFF position. 2. Disconnect the blower motor relay. 3. Connect a test light at the blower motor relay connector terminal A1 and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Repair a short to B+ in circuit 52. Is the repair complete?	—	Go to *Step 9*	—
4	Connect a test light at the blower motor relay connector terminal B2 and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Repair a short to B+ in circuit 101. Is the repair complete?	—	Go to *Step 9*	—

Blower Motor Always On (cont'd)

Step	Action	Value(s)	Yes	No
6	Connect a test light at the blower motor relay connector terminal C1 and ground. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
7	Repair a short to B+ in circuit 65. Is the repair complete?	—	Go to *Step 9*	—
8	Replace the blower motor relay. Refer to *Blower Motor Relay Replacement* Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors /components removed. Have all the repairs been made?	—	Go to *HVAC Blower Controls System Check*	—

System Performance Test

System Performance Test

Step	Action	Value(s)	Yes	No
DEFINITION: The performance test measures the air conditioning system operating efficiency. The test measures and compares the following areas: • The pressures at the high-pressure and low-pressure sides of the refrigeration system • The temperature of the air being discharged into the passenger compartment • The evaporator temperature				
1	Perform a functional check in order to ensure that the air distribution system valves are functioning properly. When functioning properly the valves route all of the air that passes through the evaporator to the outlets. Refer to *Functional Check.* Are the valves functioning properly?	—	*Go to Step 2*	—
2	1. Rotate the temperature knob from full COLD to full HOT and back to full COLD. 2. Listen for the temperature valve to seat in both the full HOT and full COLD position. A thud noise indicates that the valve is seated. Does the temperature valve seat in both positions?	—	*Go to Step 3*	*Go to Step 9*
3	1. Park the vehicle indoors. 2. Close the doors and the windows. 3. Select the full COLD, MAX A/C mode. 4. Select the HIGH blower motor speed. 5. Place the vehicle in park (automatic transmission). 6. Set the parking brake (manual or automatic transmission). 7. Start the engine. Does the compressor engage?	—	*Go to Step 4*	*Go to Step 5*
4	1. Install the scan tool with the powertrain cartridge. 2. Select the field service mode. 3. Use the scan tool to energize the cooling fans. 4. Inspect the cooling fan operation. Are both cooling fans operating?	—	*Go to Step 7*	*Go to Step 6*
5	Refer to Engine Controls for A/C Compressor Diagnosis.	—	—	—
6	Repair the cooling fan circuit. Refer to Engine Controls. Is the repair complete?	—	System OK	—

System Performance Test (cont'd)

Step	Action	Value(s)	Yes	No
7	1. Install the *J 39183-C* or the *J 39500-B* onto the vehicle. 2. Install the *J 6742-03* or the equivalent into the center instrument panel outlet. 3. Run the vehicle at the following settings: • MAX A/C mode • Full COLD • HIGH blower speed 4. Continue to run the vehicle at these settings for 2 minutes. Record the following information: • The A/C system high and low side pressure • The ambient temperature and humidity 5. Compare these measurements with the air conditioning performance chart. Refer to the performance chart which follows this test. Is the vehicle A/C performance within specifications?	—	System OK	*Go to Step 8*
8	Refer to the VDOT A/C system diagnostic charts within this section.	—	—	—
9	1. Disconnect the temperature cable at the heater and evaporator module. 2. Rotate the temperature lever from full HOT to full COLD while watching the cable end. Does the cable end rotate when the temperature lever is rotated?	—	*Go to Step 11*	*Go to Step 10*
10	Repair or replace the temperature cable as necessary. Is the repair complete?	—	System OK	—
11	Manually rotate the temperature valve by hand. Does the temperature valve rotate easily to both the full HOT and full COLD position with approximately 50 degrees of travel?	—	*Go to Step 12*	*Go to Step 13*
12	Adjust or replace the temperature cable. Is the repair complete?	—	System OK	—
13	Repair or replace the heater and evaporator module. Is the repair complete?	—	System OK	—

System Performance Test

Temperature	Humidity	Low Gauge Pressure	High Gauge Pressure	Center Outlet Temperature
21°–27°C (70°– 80°F)	Less than 50%	165–234 kPa (24– 34 psi)	793–1310 kPa (115–190 psi)	3°–9-C (38°–34°F)
	More than 50%	172–255 kPa (25– 37 psi)	793–1379 kPa (115–200 psi)	4°–13°C (40°– 55°F)
27°–33°C (80°– 90°F)	Less than 50%	193–262 kPa (28– 38 psi)	965–1482 kPa (140–215 psi)	3°–13°C (38°– 55°F)
	More than 50%	207–276 kPa (30– 40 psi)	1034–1620 kPa (150–235 psi)	7°–18°C (45°– 65°F)
33°–38°C (90°– 100°F)	Less than 40%	234–296 kPa (34– 43 psi)	1138–1793 kPa (165–260 psi)	7°–17°C (45°– 63°F)
	More than 40%	251–331 kPa (36– 48 psi)	1276–1862 kPa (185–270 psi)	13°–20°C (55°– 68°F)
38°–44°C (100°– 110°F)	Less than 20%	276–338 kPa (40– 49 psi)	1448–2000 kPa (210–290 psi)	12°–18°C (53°– 64°F)
	More than 20%	296–359 kPa (43– 52 psi)	1517–2137 kPa (220–310 psi)	14°–21°C (58°– 70°F)

Refrigerant System Checks

1. Visually inspect the outer surface of the condenser core for restricted air flow.
2. Inspect the following components for restrictions or kinks:
   - The condenser core
   - The hoses
   - The tubes
3. Inspect the blower fan operation.
4. Inspect the air ducts for leaks or restrictions.
5. Inspect for compressor clutch slippage.
6. Inspect the drive belt tension.
7. Inspect the compressor.
8. Inspect the cooling fans for proper operation.
9. Inspect for refrigerant leaks.
10. Inspect the front air deflector.

Leak Testing

A refrigerant leak test should be performed on the system whenever a leak is suspected due to system indication of low charge or after any service operation which disturbs the components, lines, or connections. Many methods and special tools are available for this purpose; however, no matter which tool is used, care and diligence are the biggest keys to success.

Electronic Leak Detection Method

Tools Required

J 39400-A Halogen Leak Detector

Use the electronic leak detector when inspecting for refrigeration system leaks. This unit operates on a 12 volt DC. The leak detector provides an audible signal which increases in frequency when a refrigerant leak is detected. Properly calibrate the tool. Use the tool at the proper setting for the system that you are testing. The electronic leak detector has the following three settings:

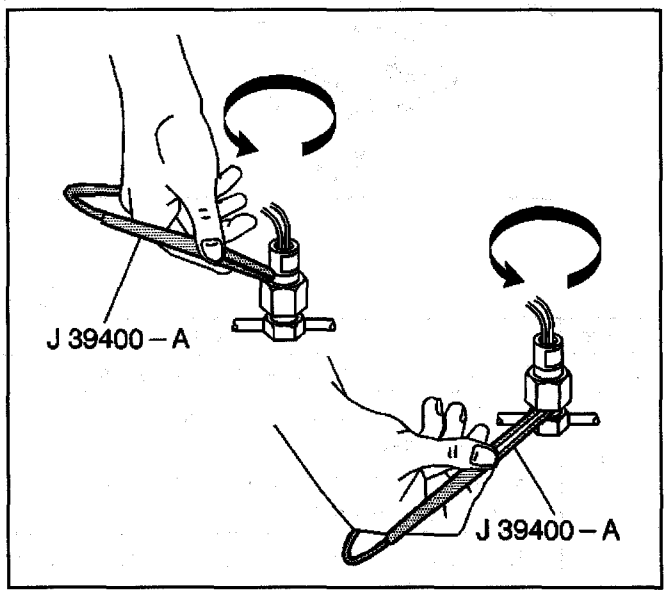
- R-12
- R-134a
- Gross leaks

  This setting isolates very large leaks that are found at one of the other settings

The halogen leak detectors are sensitive to windshield washing solution, many solvents and cleaners, and some adhesives. Work on a clean and dry surface. Complete the following actions when you test the joints:

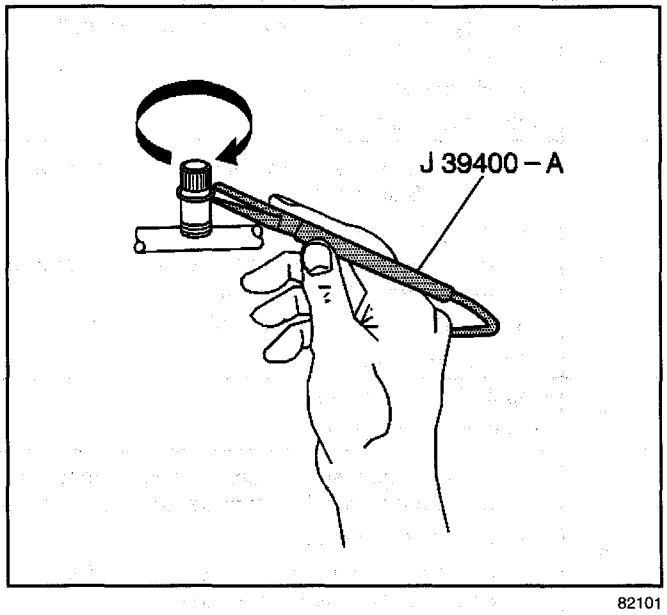
- Completely circle each joint.
- Move the tool 25-50 mm (1-2 inch) per second.
- Ensure that the tip of the probe is no more than 6 mm (0.25 inch) from the surface.

You may use this detector in order to test the following joints:



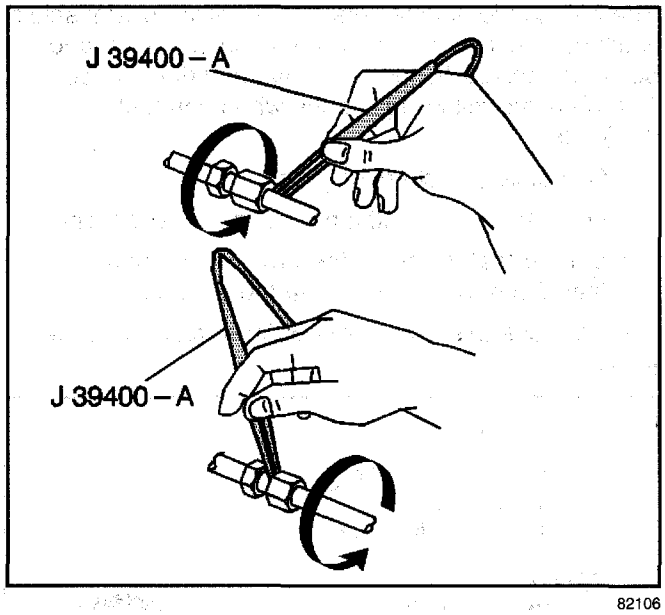
82107

1. Inspect the refrigerant pressure sensor.



82101

2. Inspect the service valves.



82106

3. Inspect the lines.
4. Inspect the evaporator inlet/outlet.
5. Inspect the accumulator dryer inlet/outlet connections.
6. Inspect the compressor rear head.
7. Inspect the housing joints.
8. A leak is indicated when the audible tone goes from a steady 1–2 clicks per second to a solid alarm. Adjust the balance knob frequently in order to maintain the 1–2 clicks per second.

   If a leak is not found, proceed to the Refrigerant Leak Diagnosis table:

Leak Testing

Step	Action	Value(s)	Yes	No
DEFINITION: Inspecting the refrigeration system for leaks.				
1	1. Inspect the refrigeration system components for proper torque. 2. Tighten the components as needed. Has the leak stopped?	—	System OK	*Go to Step 2*
2	1. Inspect the O-rings for damage, dirt or lack of lubrication. 2. Replace the O-rings as needed. Has the leak stopped?	—	System OK	*Go to Step 3*
3	1. Inspect the refrigeration system connections. Refer to Electrical Diagnosis. 2. Repair as needed. Has the leak stopped?	—	System OK	*Go to Step 4*
4	1. Turn the blower to the highest setting for at least 15 seconds. 2. Wait for 10 minutes. 3. Remove the blower motor resistor. Refer to *Blower Motor Resistor Replacement.* 4. Insert the probe into the resistor opening. Is the alarm solid?	—	*Go to Step 5*	*Go to Step 6*
5	Repair the leak as needed. Has the leak stopped?	—	System OK	*Go to Step 6*
6	1. Blow compressed air behind and in front of the compressor clutch and pulley for at least 15 seconds. 2. Wait 1-2 minutes. 3. Insert the probe behind and in front of the compressor clutch and pulley. Is the alarm solid?	—	*Go to Step 7*	System OK
7	Repair the leak as needed. Has the leak stopped?	—	System OK	—

Florescent Leak Detection Method

Tools Required

- Tracer Dye
- Tracer Dye Injector
- High Intensity Black Light

The R-134a refrigerant is uniquely different from the R-12 used in the past and may require additional methods for leak detection. The R-134a molecule is smaller than the R-12 molecule and can leak through smaller openings. R-134a also does not contain chlorine, which is easily detected using the black light. The efflorescence leak detection method is meant to be used in conjunction with the electronic method, and will pinpoint smaller leaks. The R-134a takes time to work. Depending on the rate of the leak, the dye may take up to 7 days to become visible.

Liquid Leak Detection/Pressure Testing Methods

Due to their lack of sensitivity and restricted visibility in today's refrigerant systems, liquid/bubble leak detectors have very limited usefulness. Therefore, the liquid leak detection/pressure testing methods are not recommended for this vehicle.

Service Port Seal/Cap

The primary seal for the service ports is the sealing cap. The cap contains a specially designed O-ring or gasket which provides a leak free seal. Should the cap be loose, missing, or the wrong usage, a loss of refrigerant could result.

VDOT A/C System Diagnosis

The V5 and V7 compressors are variable displacement compressors. The V5 and V7 compressors match the air conditioning demand by changing the compressor stroke instead of cycling the compressor clutch. A control valve is located in the rear head of the compressor. The control valve completes the following functions:

- Senses the low side pressure.
- Causes the compressor mechanism to change stroke.

Because the compressor always runs and the system does not cycle, these diagnostic procedures differ from procedures that are used for fixed displacement systems.

Preliminary Checks

- Inspect the A/C fuse. Replace as necessary.
- Inspect the A/C blower operation. Repair/replace as necessary.
- Inspect the clutch coil electrical connection. Repair/replace as necessary.
- Inspect the drive belt. Replace the drive belt if it is damaged or missing.
- Inspect the operation of the cooling fans. Repair/replace as necessary.
- Inspect the condenser for restricted air flow. Clean the condenser as necessary.

The A/C system is operating properly if the discharge air temperature and compressor pressures are equal to those in the *System Performance Test*

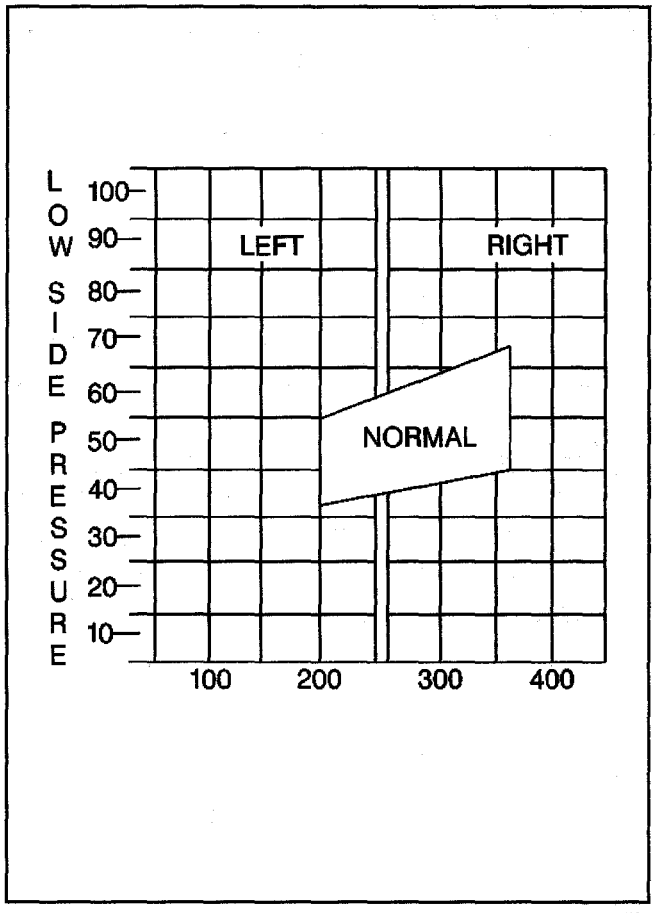
Refer to the following tables when you are diagnosing VDOT A/C system insufficient cooling complaints.

VDOT Refrigerant Charge

Step	Action	Value(s)	Yes	No
DEFINITION: The A/C system is blowing warm air. Check the refrigerant for a low charge.				
1	Were you sent here from the VDOT Diagnostic System Check?	—	*Go to Step 2*	Go to the VDOT System Performance table
2	With the ignition in the OFF position, connect the A/C gauges. Are the high and low side pressures equal to (or) above the value specified?	345 kPa (50 psi)	Go to the Compressor Clutch Engagement table	*Go to Step 3*
3	1. Add 0.45 kg (1 lb of R-134a). 2. Check the system for leaks. Is there a leak?	—	*Go to Step 6*	*Go to Step 4*
4	Are the high and low side pressures within the specified range?	69–345 kPa (10–50 psi)	System OK	*Go to Step 5*
5	Repair the leak. Is the repair complete?	—	*Go to Step 6*	—
6	Recover and recharge the A/C system. Refer to *Refrigerant Recovery and Recharging* Are the high and low side pressures above the value specified?	345 kPa (50 psi)	System OK	Go to the Compressor Clutch Engagement table

Compressor Clutch Engagement

Step	Action	Value(s)	Yes	No
DEFINITION: A/C compressor clutch will not engage when an A/C request has been made and no Powertrain DTC's are set.				
1	Were you sent here from the VDOT Refrigerant Charge Diagnostic Table?	—	*Go to Step 2*	Go to the VDOT System Performance table
2	1. Let the engine run at idle speed. 2. Set the A/C control to the NORM A/C mode. 3. Set the blower motor speed to high. 4. Set the temperature control to full cold. Does the clutch engage?	—	*Go to Step 3*	*Go to Step 12*
3	Check for a knocking noise coming from the compressor. Cycle the compressor ON and OFF to verify the source of the noise. Is there noise coming from the compressor?	—	*Go to Step 4*	Go to the VDOT System Performance table
4	Inspect the A/C drive belt for slippage. Is the noise due to belt slippage?	—	*Go to Step 5*	*Go to Step 6*
5	Replace the A/C drive belt. Refer to *Drive Belt Replacement (A/C)* in Engine Mechanical. Is the repair complete?	—	System OK	*Go to Step 9*
6	Listen to the compressor for the noise. Is the noise coming from the compressor?	—	*Go to Step 7*	*Go to Step 9*
7	Check the A/C lines for contact with other components. Is there contact with other components?	—	*Go to Step 8*	*Go to Step 9*
8	Reposition or replace the A/C lines as necessary. Is the repair complete?	—	System OK	Go to the VDOT System Performance table
9	Recover and recharge the A/C system. Refer to *Refrigerant Recovery and Recharging* Is the repair complete?	—	System OK	*Go to Step 10*
10	Refer to the noise diagnosis table. Is the noise coming from the compressor?	—	*Go to Step 11*	Go to the VDOT System Performance table
11	Replace the A/C compressor. Refer to *Compressor Replacement (3.8L)* or *Compressor Replacement (5.7L).* Is the noise still present?	—	Go to the VDOT System Performance table	System OK
12	1. Turn the ignition to the OFF position. 2. Disconnect the clutch wires at the compressor. 3. Connect a jumper wire from ground to one of the compressor clutch terminals. 4. Connect a fused-jumper wire from the positive battery post to the other compressor clutch terminal. Does the clutch engage?	—	*Go to Step 13*	*Go to Step 14*
13	1. Repair the electrical circuit to the compressor clutch. 2. Run the engine at idle speed. 3. Set the A/C control to the A/C mode. 4. Set the blower motor speed to high. 5. Set the temperature control to full cold. Does the clutch engage?	—	System OK	Go to the VDOT System Performance table
14	Replace the clutch coil. Is the repair complete?	—	System OK	Go to the VDOT System Performance table



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VDOT System Performance

Step	Action	Value(s)	Yes	No
DEFINITION: The A/C system is blowing warm air. Checking the VDOT system performance.				
1	Were you sent here from the Compressor Clutch Engagement Diagnostic Table?	—	*Go to Step 2*	Go to the VDOT System Performance table
2	1. Close all the vehicle windows and doors. 2. Set the A/C control to NORM A/C mode. 3. Set the blower motor speed to high. 4. Set the temperature control to full cold. 5. Let the engine run at idle speed for 5 minutes. 6. Feel the liquid line on both sides of the expansion (orifice) tube. Is the temperature the same on both sides of the expansion (orifice) tube?	—	*Go to Step 3*	*Go to Step 8*
3	1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.* 2. Inspect for a missing expansion (orifice) tube or O-ring. Is the expansion (orifice) tube or the O-ring missing?	—	*Go to Step 4*	*Go to Step 5*
4	Replace the missing expansion (orifice) tube or the O-ring. Is the repair complete?	—	*Go to Step 6*	—
5	Inspect for a restriction in the highside line. Is there a restriction?	—	*Go to Step 7*	—
6	1. Recover and recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.* 2. Leak test the system. 3. Check the discharge temperature. Is the discharge temperature within specifications?	—	System OK	*Go to Step 8*

VDOT System Performance (cont'd)

Step	Action	Value(s)	Yes	No
7	Repair the restriction in the highside line. Is the repair done?	—	System OK	—
8	1. Operate the A/C system for 5 minutes or longer. 2. Record the low and high side pressures. On engines equipped with electric cooling fans, record the pressures with the fans ON. 3. Locate the intersection of the low and high side pressures. Refer to the graphic/chart. Do the low and high side pressures intersect on the right side of the chart?	—	Go to the High Side Pressure	Go to the Low Side Pressure

High Side Pressure

Step	Action	Value(s)	Yes	No
DEFINITION: Right area diagnosis and service.				
1	Were you sent here from the VDOT System Performance Diagnostic Table?	—	*Go to step 2*	Go to the VDOT System Performance
2	1. Start the engine. 2. Close all the vehicle doors and windows. 3. Set the A/C control to the UPPER mode. 4. Set the blower motor speed to high. 5. Set the temperature control to full cold. 6. Push the A/C button to turn the A/C on. 7. Open the hood. 8. Feel the liquid line between the condenser and the expansion tube. Is the liquid line cold?	—	*Go to Step 3*	*Go to Step 7*
3	Check the cooling fan(s). Are the cooling fan(s) operating?	—	*Go to Step 4*	*Go to Step 5*
4	Check the airflow at the condenser for restrictions. Is the airflow at the condenser restricted?	—	*Go to Step 6*	Go to the VDOT System Performance
5	Repair or replace the cooling fan(s) as necessary. Refer to *Cooling Fan Replacement - Electric.* Is the repair complete?	—	System OK	—
6	Remove the restriction. Is the repair complete?	—	System OK	—
7	Check the A/C system for an overcharge of refrigerant.	—	*Go to Step 8*	*Go to step 9*
8	Recover and recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.* Is the repair complete?	—	System OK	Go to the VDOT System Performance
9	Check for air in the A/C system. Is there air in the A/C system?	—	*Go to Step 10*	—
10	Leak test the A/C system. Refer to *Leak Testing.* Is there a leak in the A/C system?	—	*Go to Step 11*	Go to the VDOT System Performance
11	1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.* 2. Repair the leak in the A/C system. 3. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.* Is the repair complete?	—	System OK	—

Low Side Pressure

Step	Action	Value(s)	Yes	No
DEFINITION: Left area diagnosis and service.				
1	Were you sent here from the VDOT System Performance Diagnostic Table?	—	*Go to Step 2*	Go to the VDOT System Performance
2	With the engine running, connect high and low side pressure gages. Are the high and low side pressures equal to the specified value?	207 kPa (30 psi)	*Go to Step 3*	*Go to Step 8*
3	1. Close all the vehicle doors and windows. 2. Run the engine at 2000 rpm. 3. Set the temperature control to full cold. 4. Set the blower motor speed to high. 5. Cycle the mode knob from vent to A/C every 20 seconds for 3 minutes. Are the high and low side pressures equal to the specified value?	207 kPa (30 psi)	*Go to Step 4*	—
4	Inspect for the following conditions: • A slow rise in pressure in both the low and high side gages. • The compressor suction line is warm. • The discharge line is very hot. Do all of the above conditions exist?	—	*Go to Step 5*	*Go to Step 6*
5	Replace the compressor. Refer to *Compressor Replacement (3.8L)* or *Compressor Replacement (5.7L)*. Is the repair complete?	—	System OK	—
6	Turn the engine OFF. With the compressor clutch disengaged, does the compressor clutch driver (not the pulley) turn freely by hand?	—	*Go to Step 5*	*Go to Step 7*
7	Inspect the low side pressure. Is there a rapid rise in the low side pressure with the engine rpm between the value(s) shown?	2000–2800 rpm	Go to the Control Valve	*Go to Step 5*
8	Inspect the low side pressure. Is the low side pressure within the specified values?	172–241 kPa (27–38 psi)	*Go to Step 9*	Go to the Control Valve
9	Feel the liquid line before the expansion (orifice) tube. Is the liquid cold?	—	*Go to Step 10*	*Go to Step 12*
10	Inspect the liquid line for a restriction before the expansion (orifice) tube. Is there a restriction in the liquid line before the expansion (orifice) tube?	—	*Go to Step 11*	Go to the System Performance
11	Repair the restriction or replace the liquid line before the expansion (orifice) tube. Is the repair complete?	—	System OK	Go to the System Performance
12	Add 0.40 kg (14 oz) of refrigerant to the system. Does the cooling improve?	—	*Go to Step 13*	*Go to Step 15*
13	Perform a leak test. Refer to *Leak Testing*. Is there a leak?	—	*Go to Step 14*	System OK
14	1. Repair the leak. 2. Recover and recharge the A/C system. Refer to *Refrigerant Recovery and Recharging*. Is the repair complete?	—	System OK	—

Low Side Pressure (cont'd)

Step	Action	Value(s)	Yes	No
15	1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.* 2. Inspect the expansion (orifice) tube. Is the expansion (orifice) tube plugged?	—	*Go to Step 16*	—
16	Remove and clean or replace the expansion (orifice) tube as necessary. Is the repair complete?	—	*Go to Step 17*	—
17	Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.* Is the repair complete?	—	System OK	Go to the System Performance

Control Valve

Step	Action	Value(s)	Yes	No
DEFINITION: The VDOT control valve is inoperative.				
1	Were you sent here from the Low Side Pressure Diagnostic Table?	—	*Go to Step 2*	Go to the System Performance
2	1. Connect high and low side pressure gages. 2. Close all the vehicle doors and windows. 3. Run the engine at 2000 rpm for 5 minutes. 4. Set the A/C control to the MAX A/C mode. 5. Set the temperature control to full cold. 6. Set the blower motor speed on low. Is the low side pressure within the value(s) shown.	172–241 kPa (25–35 psi)	Go to the System Performance	*Go to Step 3*
3	1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.* 2. Replace the control valve. Is the repair complete?	—	*Go to Step 4*	—
4	Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.* Is the repair complete?	—	System OK	Go to the System Performance

Heating Insufficient

Step	Action	Value(s)	Yes	No
Important: Insufficient heating may be caused by the following conditions: • A low coolant level • A faulty thermostat • A partially or fully clogged heater core or heater hose • An obstruction to air curculation • An air leak past a faulty seal into the passenger compartment				
1	Inspect for the following conditions: • Low coolant level • Loose or worn belts • Leaking or kinked hoses • Missing radiator cap pressure seal Are any of these conditions present? Repair as necessary. Is the repair complete?	—	System OK	*Go to Step 2*

Heating Insufficient (cont'd)

Step	Action	Value(s)	Yes	No
2	1. Adjust the heater controls to the following settings: 1.1. Heater mode 1.2. High blower speed 1.3. Full warm 2. Idle the vehicle. 3. Inspect the floor air outlet. 4. Inspect the outlet attachment. Is there high air flow?	—	*Go to Step 3*	*Go to Step 16*
3	Inspect the blower speed for airflow change. Does the speed of the airflow change?	—	System OK	*Go to Step 4*
4	1. Inspect the blower switch and the resistor. 2. Repair the blower switch and the resistor. 3. Complete the heater output temperature check. Is the heater output temperature correct?	—	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the vehicle for cold air leaks at the following locations: • The cowl • The heater case • The vents 2. Inspect under the seat for obstructions.	—	—	—
6	1. Place the ignition switch in the RUN position. 2. Place the blower on LOW. 3. Rotate the temperature control knob to the mid position. 4. Rotate the knob rapidly to the full HOT position. 5. Listen for valve slam at the end of the control knob rotation. Is there a valve slam?	—	*Go to Step 9*	*Go to Step 7*
7	1. Inspect the temperature control cable for correct attachment at the control and the heater module. 2. Repair as necessary. Is there valve slam?	—	*Go to Step 9*	*Go to Step 8*
8	Replace the temperature control cable. Refer to *Temperature Control Cable Replacement.* Is the repair complete?	—	System OK	—
9	1. Place the temperature valve in full WARM. 2. Start the vehicle. 3. Ensure that the air temperature around the hoses is at least 24°C (85°F). 4. Inspect the temperature of the heater inlet and outlet hoses by feel. Is the inlet hose hotter than the outlet hose?	—	*Go to Step 13*	*Go to Step 10*
10	1. Back flush the heater core. 2. Drain and refill the coolant. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling. 3. Retest. Is the inlet hose hotter than the outlet hose?	—	*Go to Step 11*	*Go to Step 12*

Heating Insufficient (cont'd)

Step	Action	Value(s)	Yes	No
11	Repeat the test. Do the symptoms still exist?	—	—	—
12	Replace the heater core. Is the repair complete?	—	System OK	—
13	Inspect the thermostat for proper installation and seating. Are the installation and seating correct?	—	*Go to Step 14*	*Go to Step 15*
14	Replace the thermostat. Refer to *Thermostat Replacement (3.8L V6)* or *Thermostat Replacement (5.7L V8)* in Engine Cooling. Is the repair complete?	—	System OK	—
15	1. Reinstall the thermostat. 2. Inspect the thermostat.	—	—	—
16	Run the *Functional Check*. Is the condition corrected?	—	System OK	*Go to Step 17*
17	Inspect the airflow from the defroster and vent outlets. Is there high airflow from the defroster or vent outlets?	—	*Go to Step 18*	*Go to Step 19*
18	1. Inspect the vacuum system. 2. Repair the system as necessary. Is the repair complete?	—	System OK	—
19	1. Switch the mode control knob to defrost. 2. Inspect the airflow. Is the defroster airflow correct?	—	*Go to Step 20*	*Go to Step 21*
20	Inspect the floor air outlet for obstructions.	—	—	—
21	Inspect the blower speeds for airflow change. Does the speed of the airflow change?	—	*Go to Step 22*	*Go to Step 26*
22	Inspect for airflow obstructions at blower inlet and plenum. Are there obstructions at the blower inlet and the plenum?	—	—	*Go to Step 23*
23	1. Place the blower on HIGH. 2. Move the temperature control knob from full WARM to full COOL. 3. Listen to the airflow. Does the speed of the airflow change?	—	*Go to Step 24*	*Go to Step 25*
24	Inspect for airflow obstruction between the blower and the system outlets. Is there an obstruction?	—	*Go to Step 26*	*Go to Step 25*
25	1. Inspect the following components: • Temperature valve • Temperature cables • Temperature control 2. Repair the components as necessary. Are the repairs complete?	—	System OK	—
26	1. Inspect the blower switch and resistor. 2. Repair as necessary. Are the repairs complete?	—	System OK	—

Heat Excessive

Excessive heat from the heater system may be caused by the following conditions:

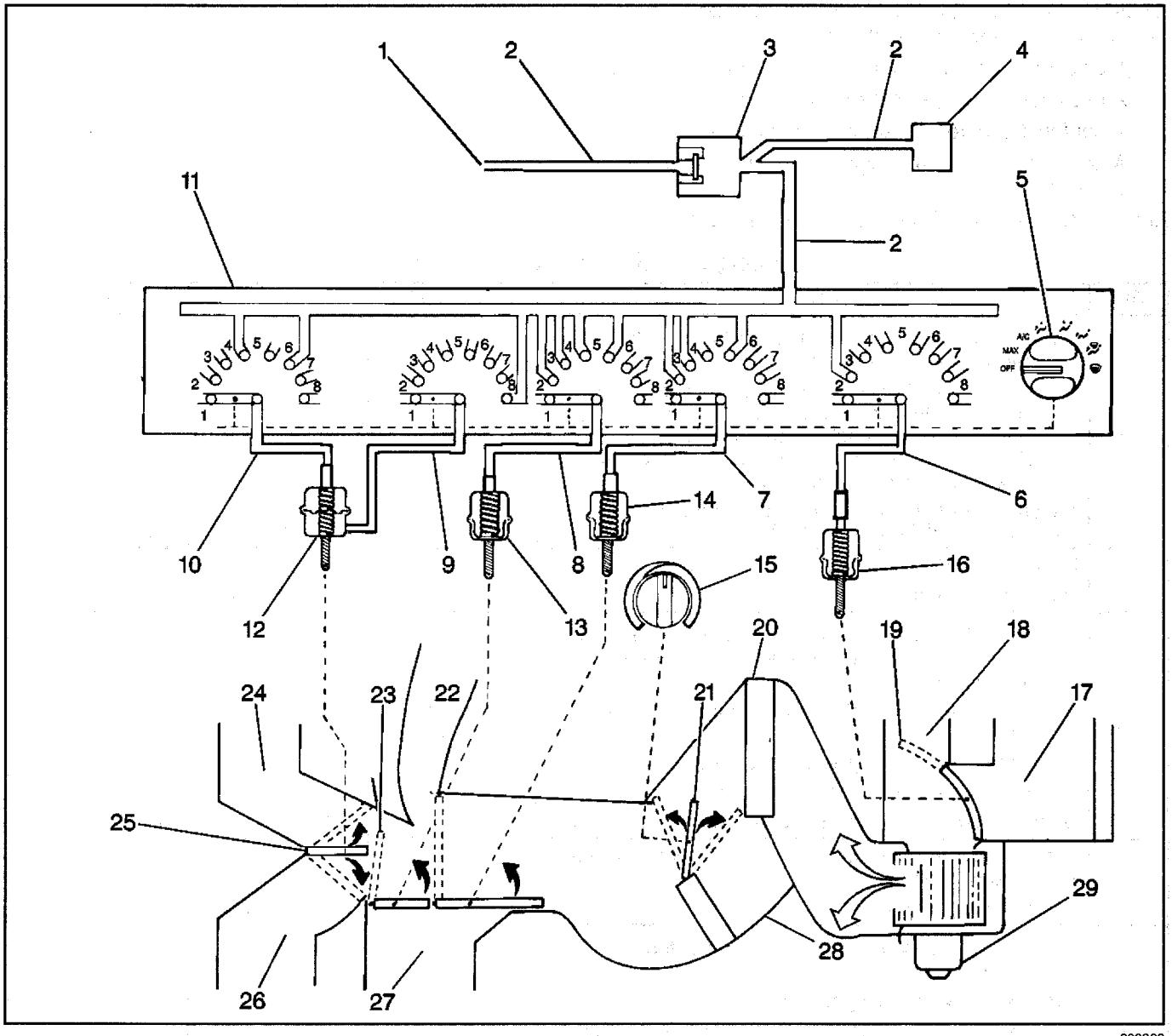
- A disconnected temperature control cable
- A misadjusted temperature control cable
- A nonfunctional temperature control cable
- A hot air leak from the engine compartment to the blower inlet

Refer to *Temperature Control Cable Adjustment.*

Cooling Insufficient - A/C Inoperative

Step	Action	Value(s)	Yes	No
1	1. Perform the Functional Check first in order to eliminate a misdiagnosis. 2. Perform the On Board Diagnostic System Check. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls-3.8L or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls-5.7L. Are any Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs) displayed?	—	*Go to Step 2*	*Go to Step 3*
2	Repair the DTCs. Refer to Engine Controls. Is the repair complete?	—	System OK	—
3	1. Open the doors and the hood in order to neutralize the vehicle's internal temperature with the shop temperature. 2. Install the *J 39183-C* or the *J 39500-B* on to the vehicle. 3. Ensure that the engine is not running. 4. Inspect the low side static pressure. Is the low side static pressure above the specified value?	310 kPa (45 psi)	*Go to Step 4*	*Go to Step 5*
4	Perform the System Performance Test. Refer to *System Performance Test.* Was the test performed?	—	System OK	—
5	1. Use the *J 39400-A* in order to leak test the air conditioning system. 2. Make any necessary repairs. 3. Use the proper amount of R-134a in order to charge the system. 4. Perform the Air Conditioning Performance Test. Refer to *System Performance Test.* Was the test performed?	—	System OK	—

Air Delivery Improper



283263

Legend

(1) Vacuum Source to Engine
(2) Black
(3) Vacuum Check Valve
(4) Vacuum Tank
(5) Control Vacuum Selector Valve
(6) Orange
(7) Red
(8) Purple
(9) Green
(10) Yellow
(11) Control Vacuum Logic Display Mode
(12) Heater and Defrost Vacuum Actuator
(13) Bi-level Vacuum Actuator
(14) Upper and Lower Mode Vacuum Actuator
(15) Temperature Control
(16) Air Inlet Vacuum Actuator
(17) From Inside Vehicle (Recirculated Air)
(18) From Plenum Area (Outside Air)
(19) Partially Open (With No Vacuum)
(20) Air Conditioning evaporator
(21) Temperature Valve
(22) To Side Window Defrost Outlets
(23) Partially Open (With No Vacuum)
(24) To Windshield Defrost Outlets
(25) Partially Open (With No Vacuum)
(26) To Floor Outlets
(27) To Instrument Panel Outlets
(28) Heater Core
(29) Blower Motor

Mode Control Vacuum Valve Positions	
1	OFF
2	MAX A/C
3	NORMAL A/C
4	BI-LEVEL A/C
5	VENT
6	HEATER
7	HEATER/DEFROST BLEND
8	DEFROSTER

A vacuum operates most of the air distribution system. Electrical power operates the blower motor.

The engine vacuum is routed through the following areas:

- The vacuum check valve
- The control vacuum selector
- The vacuum tank

The vacuum check valve prevents vacuum loss. Heavy acceleration or steep uphill traveling may cause vacuum loss.

Vacuum applied to a vacuum actuator moves the air door to the air door's correct position.

Preliminary Inspection

1. Inspect the vacuum lines at the engine and vacuum check valve for a proper connection.
2. Disconnect the vacuum line that leads to the engine at the vacuum check valve.
3. Start the engine.
4. Inspect for vacuum presence. If no vacuum is present, repair as required.
5. Disconnect the vacuum line that leads to the vacuum tank at the vacuum check valve.
6. Use a hand vacuum pump in order to apply vacuum to the vacuum line that leads to the vacuum tank. If the vacuum does not hold, replace the vacuum line and/or the vacuum tank.
7. Disconnect the vacuum line that leads to the control at the vacuum check valve.
8. Apply vacuum to the check valve port. If the vacuum does not hold, replace the vacuum check valve.
9. Quickly rotate the temperature control from full COLD to full HOT several times.
10. Listen for the temperature valve to seat in both positions.

    If the sound indicates that the temperature valve is not fully seating or opening, inspect the temperature control cable for proper operation. If the problem persists, ensure that the temperature valve door operates freely with the blower off.
11. Ensure that the vacuum line seals are positioned correctly at the vacuum line multi-connector that is located above the right-hand sound insulator panel.
12. Perform the diagnosis.

Diagnostic Aid

Checks	Action
Apply vacuum to the red vacuum line.	Air flow is diverted to the instrument panel outlets only.
Apply vacuum to the yellow vacuum line.	Air flow is diverted to the side window defogger and floor outlets.
Apply vacuum to the purple vacuum line.	Air flow is diverted to the side window defogger, floor and instrument panel outlets.
Apply vacuum to the green vacuum line.	Air flow is diverted to the windshield and side window defogger outlets.
Apply vacuum to the orange vacuum line.	Air flow is diverted to the blower motor assembly air noise increase.
Apply vacuum to no vacuum lines.	Air flow is diverted to all outlets except the instrument panel.

Improper Air Delivery Diagnosis

Step	Action	Value(s)	Yes	No
1	1. Perform the preliminary inspection. 2. Set the mode selector valve in the OFF position. 3. Disconnect the vacuum line at the check valve. 4. Use a hand vacuum pump in order to apply vacuum to the vacuum line that leads to the mode selector valve. Does the vacuum hold?	—	*Go to Step 3*	*Go to Step 2*
2	1. Inspect the black vacuum line that leads to the mode selector valve. 2. Replace the mode selector valve if the line is connected and working properly. Is the replacement complete?	—	System OK	—

Improper Air Delivery Diagnosis (cont'd)

Step	Action	Value(s)	Yes	No
3	1. Apply vacuum to the vacuum line that leads to the mode selector valve. 2. Inspect each setting (MAX A/C to DEFROST). Does vacuum hold in every setting?	—	*Go to Step 4*	*Go to Step 8*
4	1. Disconnect the vacuum line multi-connector under the right side sound insulator. 2. Turn the ignition switch to the RUN position (engine not running). 3. Select the HIGH blower motor assembly speed. 4. Apply vacuum to each vacuum line individually (except for the black and orange lines). 5. Inspect the lines for air flow at the proper outlets. Refer to the Diagnostic Aid Chart. Does air flow at the correct outlets?	—	*Go to Step 6*	*Go to Step 5*
5	Repair or replace the actuator linkage and/or air valve (door). Is the repair complete	—	System OK	—
6	Apply vacuum to the orange vacuum line. Does the blower motor air flow noise increase?	—	System OK	*Go to Step 7*
7	Repair or replace the air inlet vacuum actuator linkage and/or air inlet valve. Is the repair complete?	—	System OK	—
8	1. Disconnect the vacuum line multi-connector at the mode selector valve. 2. Apply vacuum to each line at the multi-connector that is controlled by the mode selector valve at a setting where vacuum did not hold. Is a vacuum leak present at one or more lines?	—	*Go to Step 9*	*Go to Step 10*
9	Repair or replace the vacuum line and/or the vacuum actuator. Is the repair complete?	—	System OK	—
10	Replace the mode selector valve. Is the replacement complete?	—	System OK	—

Noise Diagnosis

Compressor related noise is usually caused by the system. The compressor does not always cause the noise.

Feel the following items before you replace any of the components. Many of the noises stop upon contact:

- The lines
- The hoses
- The brackets

The following types of noise may exist:

- Vibration and rattle
- Moan
- Screech

The following items may cause a vibration and rattle noise:

- Misalignment of the belt in the groove
- The belt tensioner
- Contact between the lines or hoses and the other components
- The brackets are loose
- Other drive components

The following items may cause a moan noise:

- Incorrect refrigerant charge
- A loose or misaligned bracket
- Contact between the lines or hoses and the other components
- Other drive components

The following items may cause a screech noise:

- A worn serpentine belt
- The compressor bearings
- The compressor clutch
- The compressor alignment

Temperature Control Inoperative

Step	Action	Value(s)	Yes	No
1	1. Turn off the blower. 2. Test the temperature control effort. Is the proper effort required?	—	System OK	*Go to Step 2*
2	Determine if excessive effort is required. Is excessive effort required?	—	*Go to Step 3*	*Go to Step 12*
3	Inspect the cable for the following conditions: • The improper routing • A kink • Wiring interference • IP interference Do one of these conditions exist?	—	*Go to Step 13*	*Go to Step 4*
4	1. Remove the cable from the temperature valve. 2. Cycle the valve manually. 3. Inspect the valve for binding. Is there valve binding?	—	*Go to Step 10*	*Go to Step 5*
5	Inspect for control binding. Is there control binding?	—	*Go to Step 6*	*Go to Step 8*
6	1. Remove the cable. 2. Inspect for control binding. Is there control binding?	—	*Go to Step 7*	*Go to Step 9*
7	Replace the control. Refer to *Control Assembly Replacement.* Is the replacement complete?	—	System OK	—
8	1. Reinstall the cable. 2. Inspect the clearances to the dash components. Is the inspection complete?	—	System OK	—
9	Replace the cable(s). Refer to *Temperature Control Cable Replacement.* Is the replacement complete?	—	System OK	—
10	1. Lubricate the valve. 2. Retest the valve for binding. Does the valve bind?	—	*Go to Step 11*	System OK
11	1. Inspect the temperature valve for the following conditions: • Shaft alignment • A bent shaft • A bent valve • A warped case 2. Repair any of these conditions. Is the repair complete?	—	System OK	—
12	1. Remove the cable from the control. 2. Inspect the control in order to see if the control has detents. Does the control have detents?	—	*Go to Step 13*	*Go to Step 14*
13	Replace the cable. Refer to *Temperature Control Cable Replacement.* Is the replacement complete?	—	System OK	—
14	Replace the control. Refer to *Control Assembly Replacement.* Is the replacement complete?	—	System OK	—

Odor Diagnosis

Problem	Possible Cause	Correction
Musty Smell	• Water leaks (body) • The evaporator drain is blocked. • There is mold or mildew on the evaporator core.	• Locate and repair any water leaks. Refer to the appropriate repair procedure in Water Leaks. • Clean the evaporator drain. • Clean the evaporator. Refer to *Odor Correction.*
Coolant Smell	• The heater core is leaking. • The heater core pipes or hoses are leaking.	• Replace the heater core. Refer to *Heater Core Replacement.* • Replace the heater core pipes or hoses. Refer to *Heater Pipes Replacement (3.8L)* or *Heater Pipes Replacement (5.7L).*
Refrigerant Oil Smell	The evaporator core is leaking.	Replace the evaporator core. Refer to *Evaporator Core Replacement.*
Mold/mildew odor problem—Under certain climate and operating conditions a musty odor can develop. The odor is caused by a microbial growth in the evaporator core. This odor is generally temporary, and as climate conditions change, the odor will disappear. Should the odor persist it may become necessary to clean the evaporator core with an appropriate cleaner.		

Repair Instructions

Odor Correction

Eliminating Air Conditioning Odor

Odors may be emitted from the air conditioning system primarily at start up in hot, humid climates. The following conditions may cause the odor:

- Debris is present in the HVAC module.
- Microbial growth on the evaporator core.

When the blower motor fan is turned on, the microbial growth may release an unpleasant musty odor into the passenger compartment.

A service kit that can correct the condition is available through GMSPO to address this condition.

To remove odors of this type, it is necessary to eliminate the mirocbial growth and prevent its recurrence. To accomplish this, these two procedures must be completed.

- Deodorize the evaporator core using Deodorizing Aerosol Kit P/N 12377951
- Install the new A/C Delayed Blower Control Package, P/N 12370470

The blower control package will enable the blower to run at high speed for 5 minutes. It will do so approximately 50 minutes after the ignition has been turned off it the compressor had been engaged for 4 or more minutes prior to shutting off the engine. By doing so, the evaporator case and core are dried out, reducing the chances of a recurring A/C odor.

Perform the following steps in order to deodorize the A/C system:

1. Ensure that the plenum that draws outside air into the HVAC module is clear of all debris.
2. Disable the A/C compressor clutch operation by disconnecting the clutch coil electrical connector.
3. Dry the evaporator core by performing the following steps:
   3.1. Start the vehicle.
   3.2. Set the temperature control on maximum heat.
   3.3. Set the control to the MAX setting.
   3.4. Run the blower motor on high for 10 minutes.
4. Locate an area in the air conditioning duct between the blower motor and the evaporator core downstream of the blower motor.
5. Drill a 3.175 mm (0.125 in) hole where it will not interfere with, or damage the following components:
   - The blower motor
   - The evaporator core
   - Any other operating part the of system
6. Wear safety goggles and latex gloves in order to perform the following actions:
   6.1. Continue to operate the blower motor on high.
   6.2. Insert the extension tube of the deodorizer GM P/N 12377951 into the hole, past the mark on the extension tube.
   6.3. Use short spray bursts and vary the direction of spray for a 2-3 minute period of time, in order to dispense the contents of the can into the duct.
7. Shut the engine OFF. Allow the vehicle to sit for 3-5 minutes.
8. Seal the 3.175 mm (0.125 in) hole with body sealer or RTV gasket compound.
9. Start the engine.
10. Operate the blower motor on high for 15-20 minutes to dry.
11. Reconnect the A/C compressor clutch coil electrical connector.
12. Verify proper clutch operation.

Refrigerant Recovery and Recharging

Tools Required

- *J 39500-B* A/C Refrigerant Recovery, Recycling and Recharging (ACR4) System
- *J 41810* PureGuard 2
- *J-41810-100A* Active Flow Control Valve

Caution: Avoid breathing the A/C Refrigerant 134a (R-134a) and the lubricant vapor or the mist. Exposure may irritate the eyes, nose, and throat. Work in a well ventilated area. In order to remove R-134a from the A/C system, use service equipment that is certified to meet the requirements of SAE J 2210 (R-134a recycling equipment). If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Caution: For personal protection, goggles and gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If R-134a comes in contact with any part of the body severe frostbite and personal injury can result. The exposed area should be flushed immediately with cold water and prompt medical help should be obtained.

Notice: R-134a is the only approved refrigerant for use in this vehicle. The use of any other refrigerant may result in poor system performance or component failure.

Notice: To avoid system damage use only R-134a dedicated tools when servicing the A/C system.

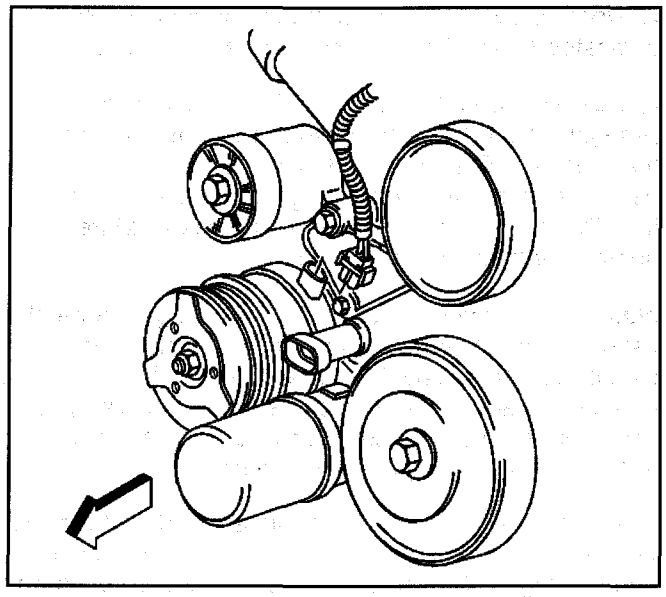
Notice: Use only Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system and only 525 viscosity mineral oil on fitting threads and O-rings. If lubricants other than those specified are used, compressor failure and/or fitting seizure may result.

Notice: R-12 refrigerant and R-134a refrigerant must never be mixed, even in the smallest of amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur. Refer to the manufacturer instructions included with the service equipment before servicing.

The *J 39500-B* removes the Refrigerant-134a from the vehicle's A/C system. The recovery procedure uses one filtering cycle. The evacuation procedure uses an automatic multiple pass filtering cycle. These filtering cycles ensure a constant supply of clean, dry refrigerant for A/C system charging.

The Initial Set-Up Instruction Manual, provided with the *J 39500-B*, contains specific procedures for proper recovery, evacuation and recharging.

For ACR4 technical assistance in the U.S., call 1-800-345-2233.



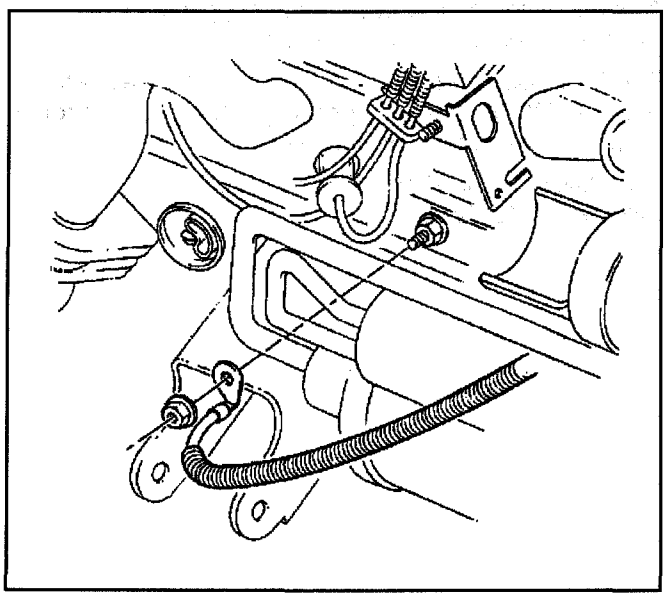
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Compressor Replacement (3.8L)

Removal Procedure

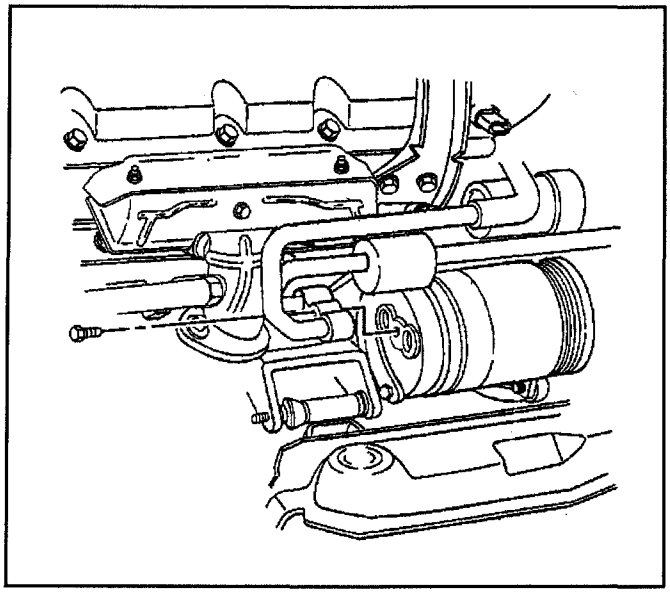
Important: Compressor related noise is generally A/C system related and not always caused by the compressor itself. Prior to replacing compressor, refer to *Noise Diagnosis*.

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging*.
2. Remove the serpentine drive belt. Refer to *Drive Belt Replacement* in Engine Mechanical.
3. Disconnect the electrical connector at the A/C compressor.



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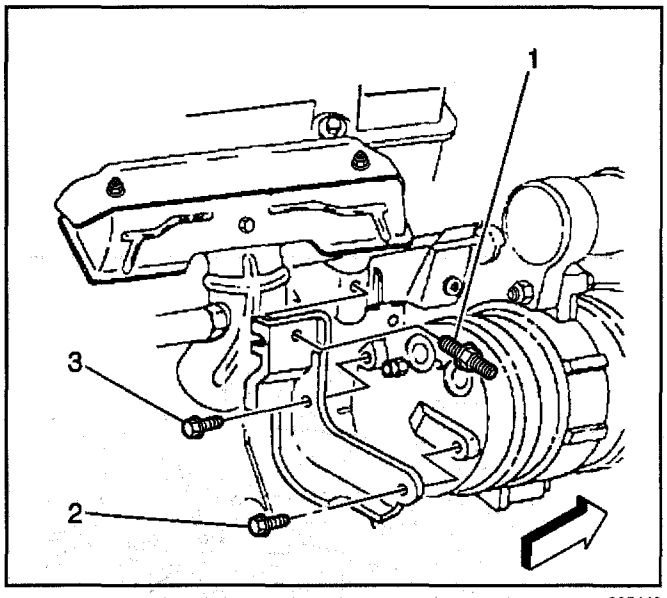
4. Remove the negative battery cable nut from the engine block stud.
5. Remove the negative battery cable from the stud.
6. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.



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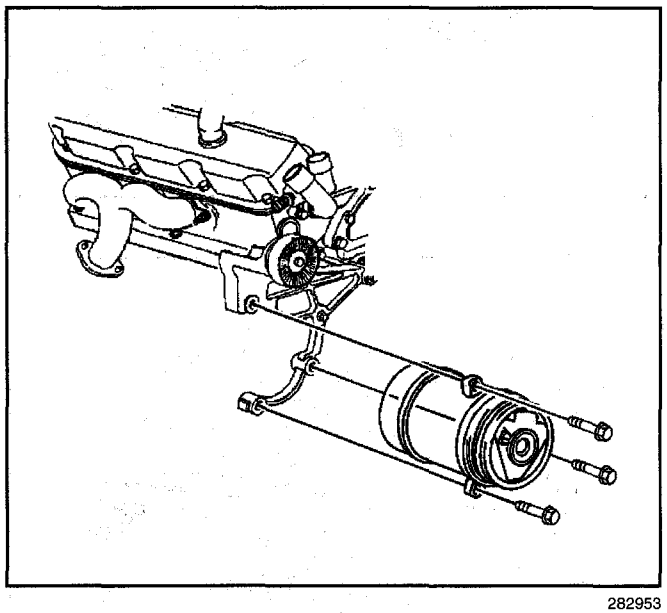
7. Remove the A/C compressor and condenser hose bolt.
8. Discard the O-ring.

9. Remove the A/C compressor rear bolts (2, 3).



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10. Remove the A/C compressor bolts.
11. Remove the A/C compressor.

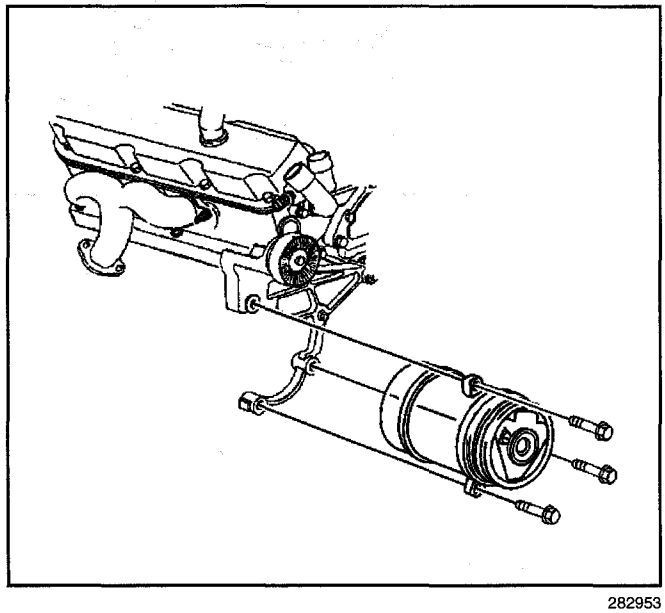


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Installation Procedure

Use the following procedure in order to install the polyalkaline glycol (PAG) refrigerant oil.

- If the compressor is being replaced, drain the refrigerant oil through the crankcase drain plug and suction/discharge ports of both the defective compressor and the new compressor.
- Measure the amount of oil removed from the defective compressor.
- If the measured amount of oil is less than 30 ml (1 fluid ounces), add 60 ml (2 fluid ounces) to the new compressor.
- If the measured amount of oil is more than 30 ml (1 fluid ounces), fill the new compressor with the same amount of PAG refrigerant oil.



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1. Install the A/C compressor.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the A/C compressor bolts.

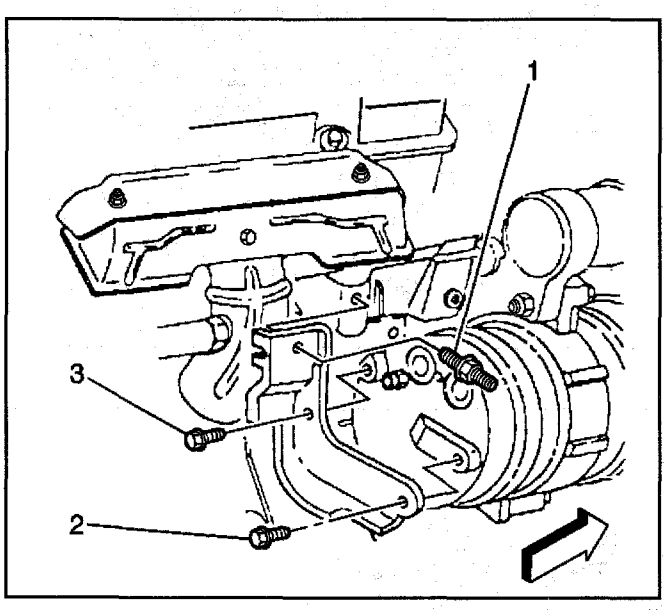
   Tighten

   Tighten the A/C compressor bolts to 50 N·m (37 lb ft).

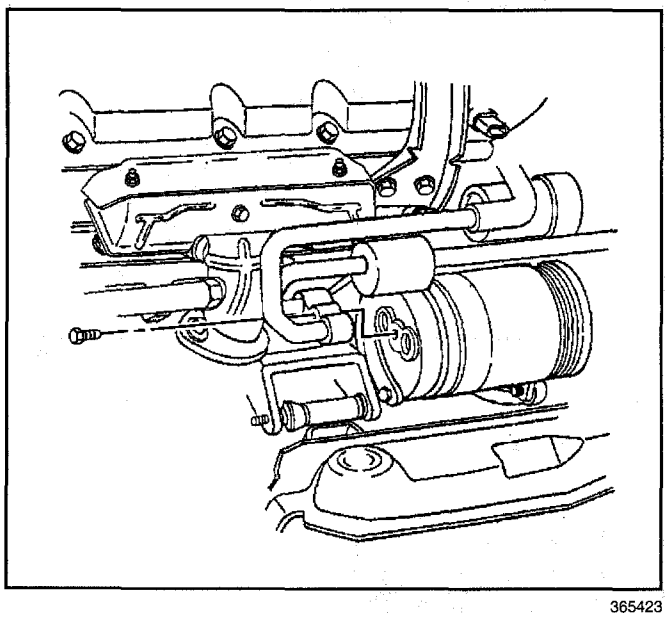
3. Install the A/C compressor rear bolts (2, 3).

   Tighten

   Tighten the A/C compressor rear bolts (2, 3) to 30 N·m (22 lb ft).



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4. Install a new O-ring.

   Lightly coat the O-ring with a mineral base 525 viscosity refrigerant oil.

5. Install the A/C compressor and condenser hose bolt.

   Tighten

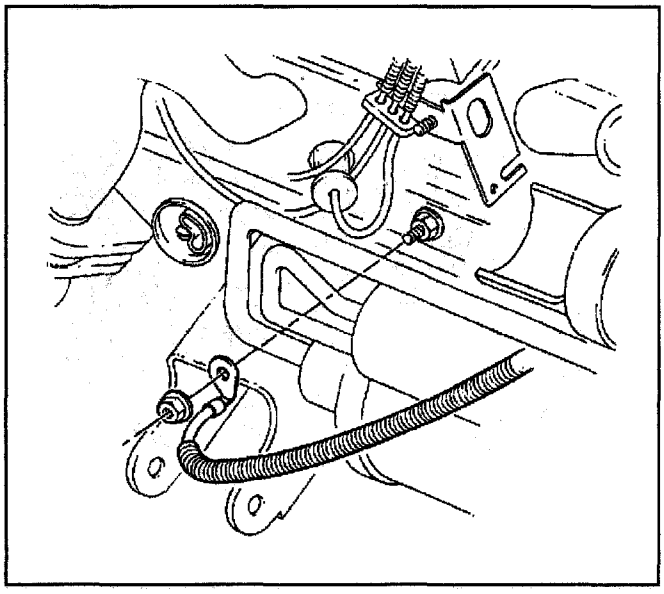
   Tighten the A/C compressor and condenser hose bolt to 33 N·m (24 lb ft).

6. Lower the vehicle.

7. Install the negative battery cable to the stud.
8. Install the negative battery cable nut to the engine block stud.

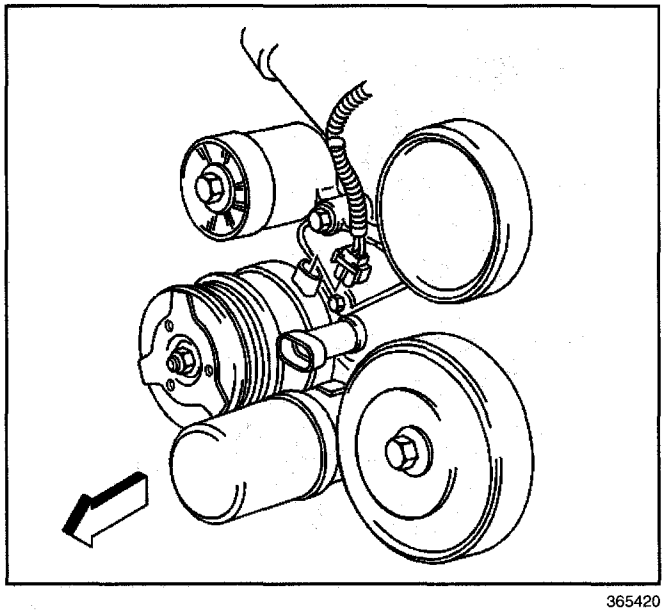
   Tighten

   Tighten the negative battery cable nut to the engine block stud to 25 N·m (18 lb ft).



43679

9. Connect the electrical connector at the A/C compressor.
10. Install the serpentine drive belt. Refer to *Drive Belt Replacement* in Engine Mechanical.
11. Charge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
12. Perform a leak test on the A/C system. Refer to *Leak Testing.*



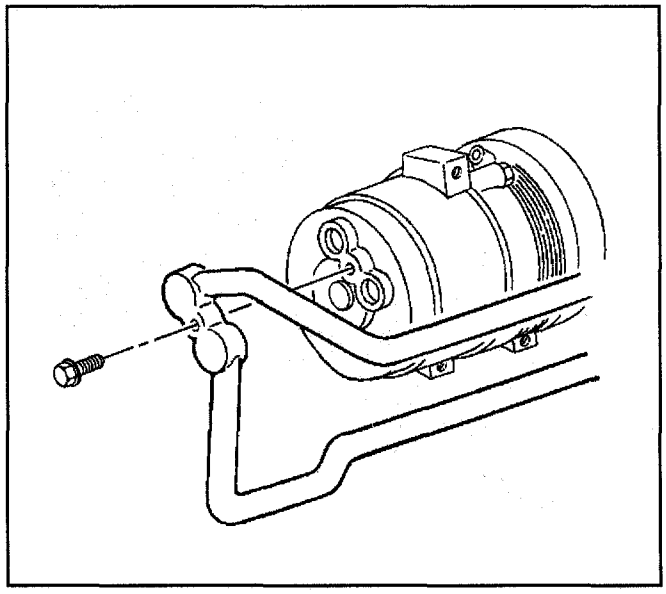
365420

Compressor Replacement (5.7L)

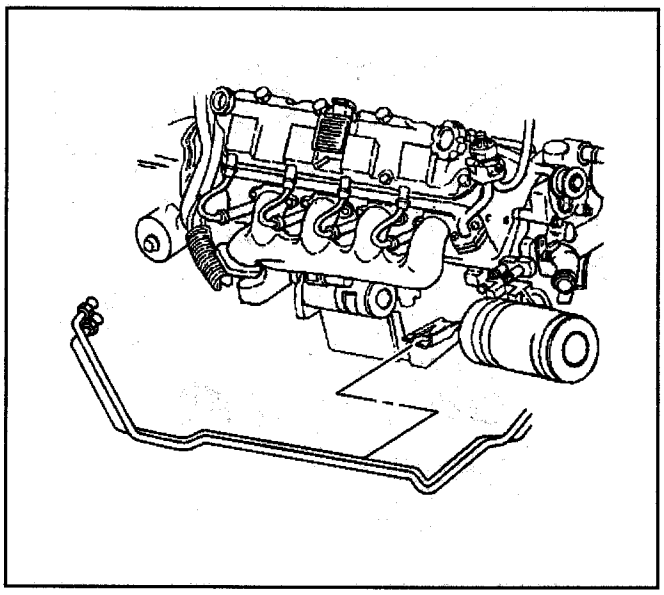
Removal Procedure

Important: Compressor related noise is generally A/C system related and not always the compressor itself. Prior to replacing the compressor, refer to *Noise Diagnosis.*

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.*
2. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
3. Remove the serpentine drive belt. Refer to *Drive Belt Replacement (A/C)* in Engine Mechanical.
4. Remove the A/C compressor and condenser hose bolt.
5. Discard the O-ring.

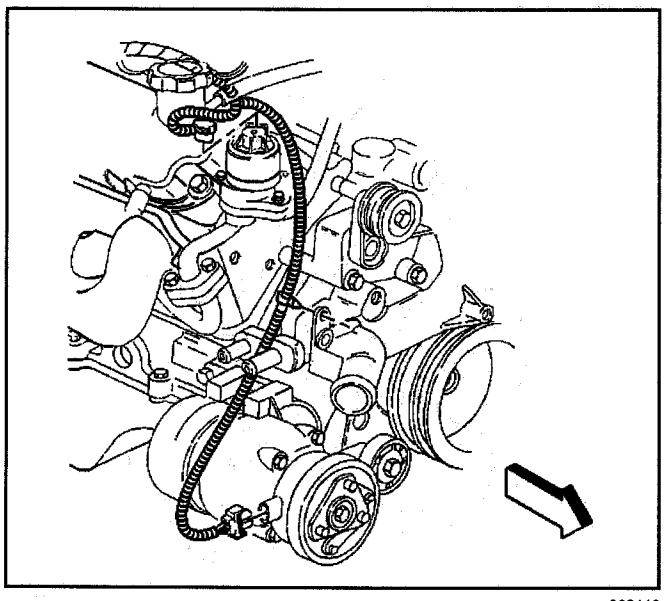


365448



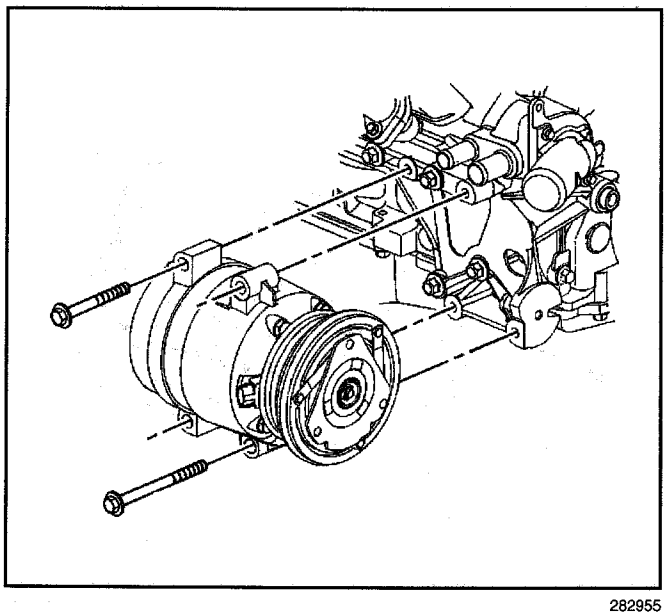
208334

6. Remove the transmission oil cooler pipes from the engine bracket, if necessary.



365446

7. Disconnect the electrical connector from the A/C compressor.



282955

8. Remove the A/C compressor bolts.
9. Remove the A/C compressor.

Installation Procedure

Use the following procedure in order to install the polyalkaline glycol (PAG) refrigerant oil.

- If the compressor is being replaced, drain the refrigerant oil from both the defective compressor and the new replacement compressor.
- Measure the amount of oil removed from the defective compressor.
- If the measured amount is less than 30 ml (1 oz), add 60 ml (2 oz) to the new replacement compressor.

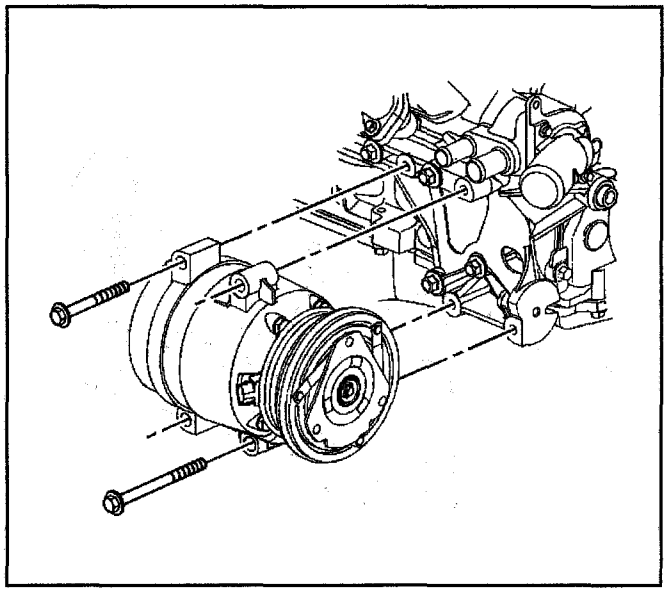
1. Install the A/C compressor.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the A/C compressor bolts.

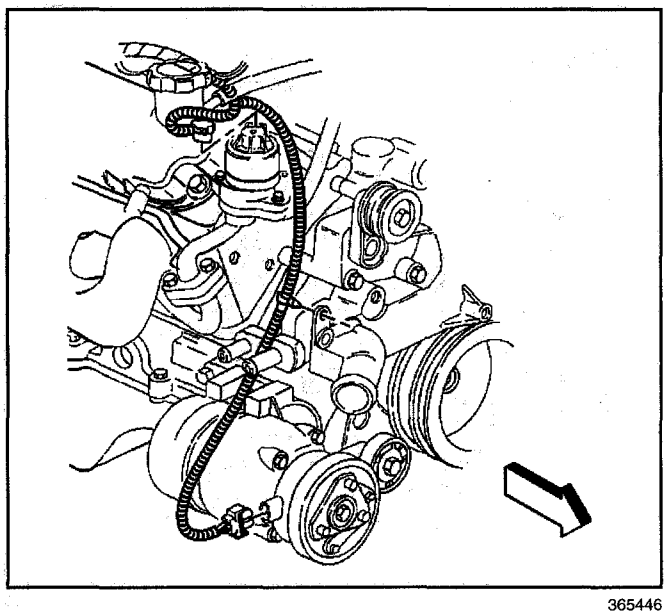
   Tighten

   Tighten the A/C compressor bolts to 50 N·m (37 lb ft).



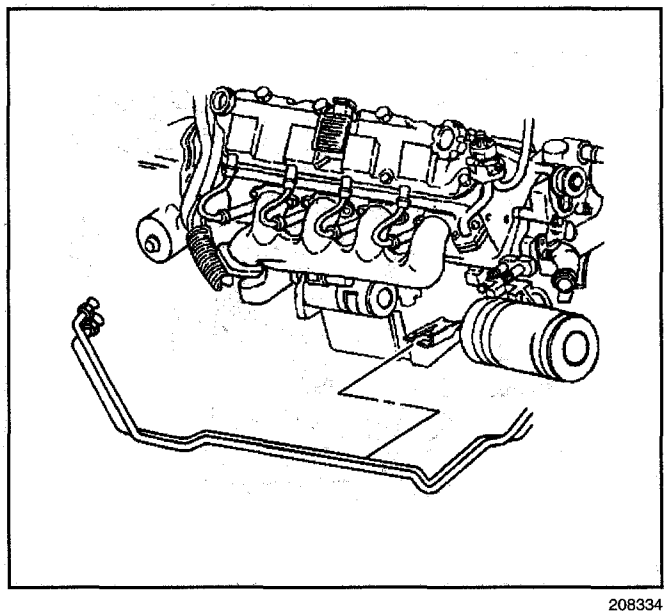
282955

3. Connect the electrical connector to the A/C compressor.

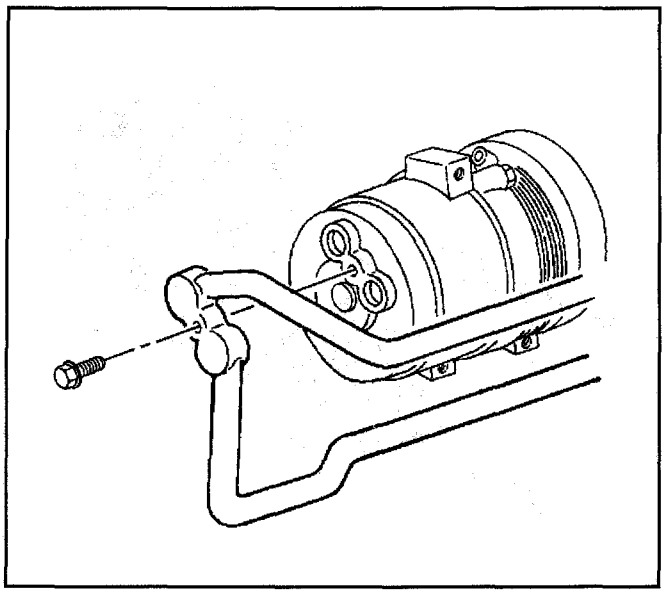


365446

4. Install the transmission oil cooler pipes to the engine bracket, if removed.

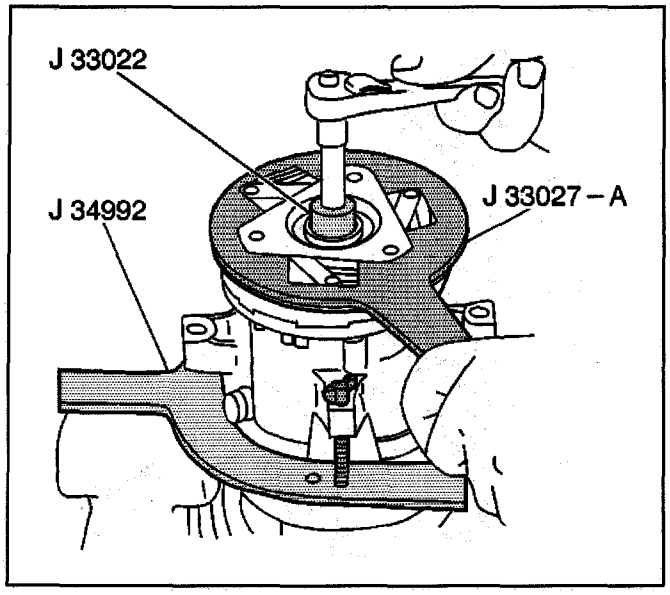


208334



365448

5. Install a new O-ring.
   Lightly coat the O-ring with a mineral base 525 viscosity refrigerant oil.
6. Install the A/C compressor and condenser hose bolt.
   Tighten
   Tighten the A/C compressor and condenser hose bolt to 33 N·m (24 lb ft).
7. Install the serpentine drive belt. Refer to *Drive Belt Replacement (A/C)* in Engine Mechanical.
8. Lower the vehicle.
9. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
10. Perform a leak test on the A/C system. Refer to *Leak Testing.*



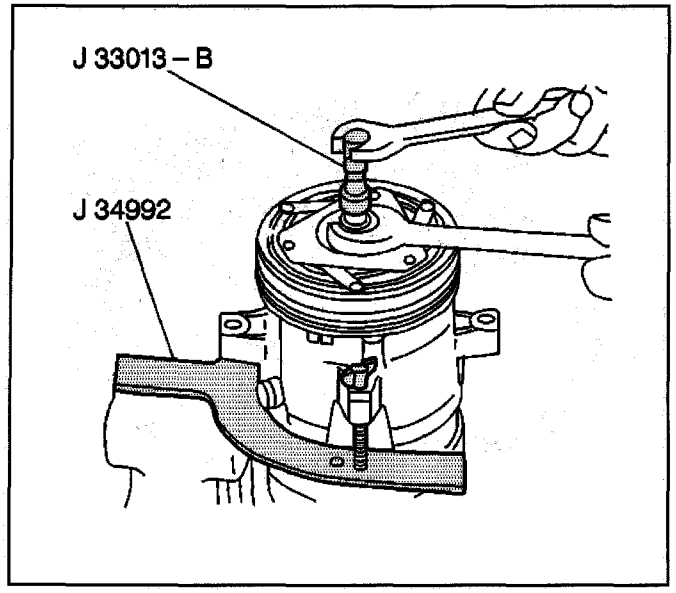
237075

Compressor Clutch Plate and Hub Assembly Removal (V5 - Conventional Mount)

Tools Required

- *J 33022* Shaft Nut Socket
- *J 33027-A* Clutch Hub Holding Tool
- *J 33013-B* Hub And Drive Plate Remover And Installer
- *J 34992* Compressor Holding Fixture

1. Clamp the *J 34992* in a vise.
2. Attach the compressor to the holding fixture using the thumb screws.
3. Use the *J 33027-A* in order to prevent the clutch hub and drive plate assembly from turning.
4. Use the *J 33022* in order to remove the shaft nut.



237077

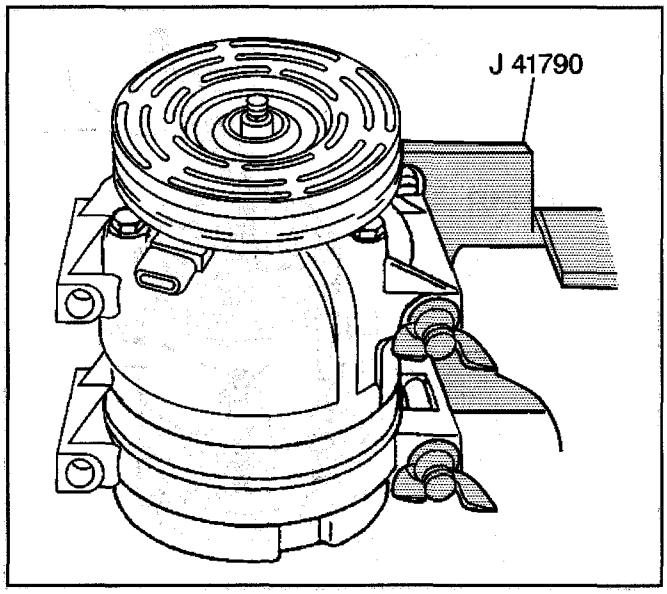
5. Thread the *J 33013-B* into the hub.
6. Use a wrench in order to hold the body of the *J 33013-B.*
7. Turn the center screw into the body of the *J 33013-B* in order to remove the clutch plate and hub assembly.
8. Remove the shaft key. Retain the shaft key for reassembly.

Compressor Clutch Plate and Hub Assembly Removal (V7 - Direct Mount)

Tools Required

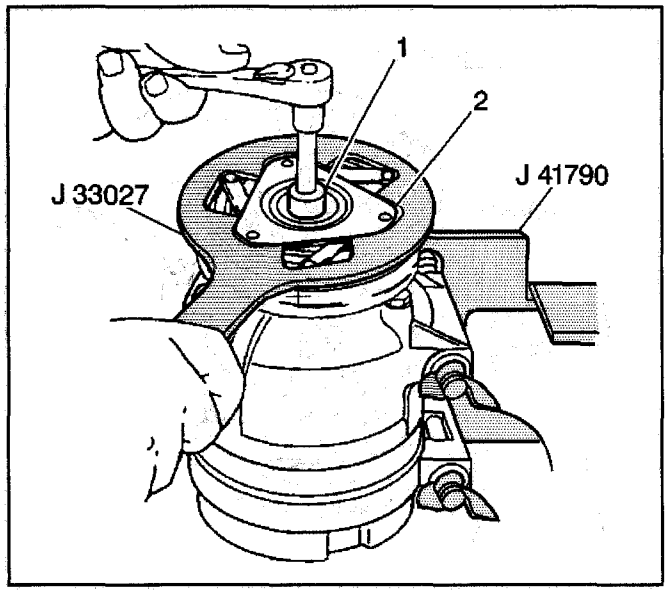
- *J 33013-B* Hub and Drive Plate Remover/Installer
- *J 33027-A* Clutch Hub Holding Tool
- *J 41790* Compressor Holding Fixture

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.



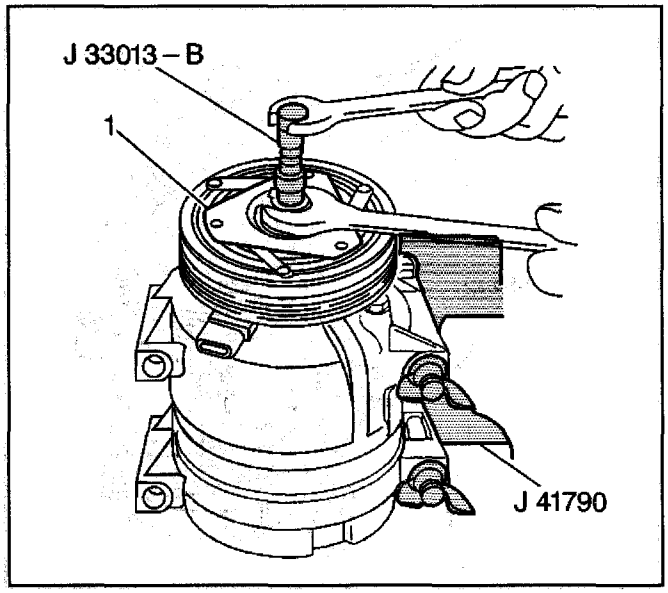
157595

3. Hold the clutch hub and drive plate assembly (2) in place using the *J 33027-A*.
4. Remove the compressor shaft nut with a 13 mm socket (1).

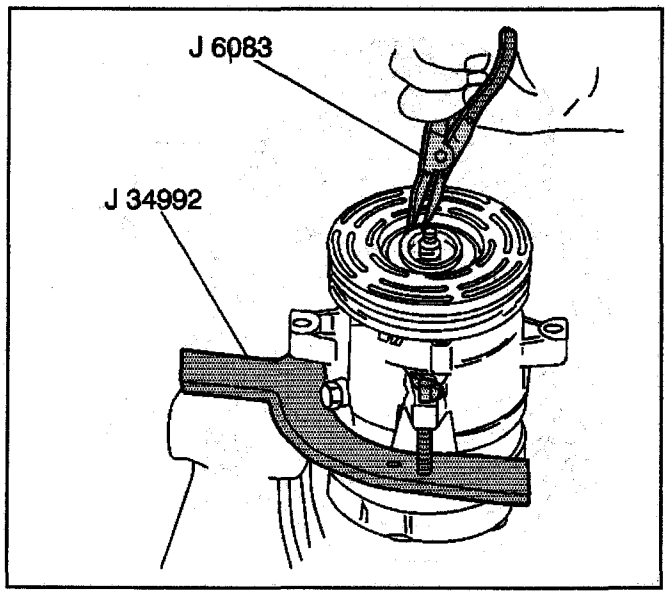


157218

5. Thread the *J 33013-B* into the hub.
6. Remove the hub and drive plate assembly (1) by turning the center screw into the body of the *J 33013-B* and against the compressor shaft.
7. Remove the shaft key and retain for reassembly.



157221



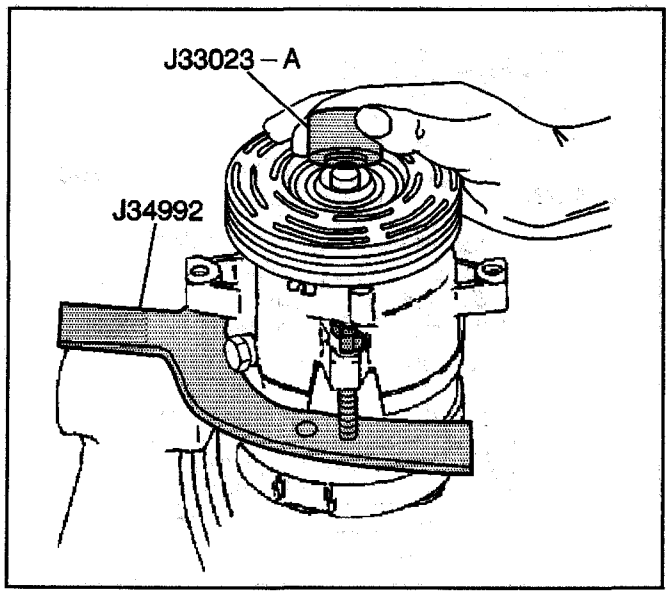
237119

Clutch Rotor and/or Bearing Removal (V5 - Conventional Mount)

Tools Required

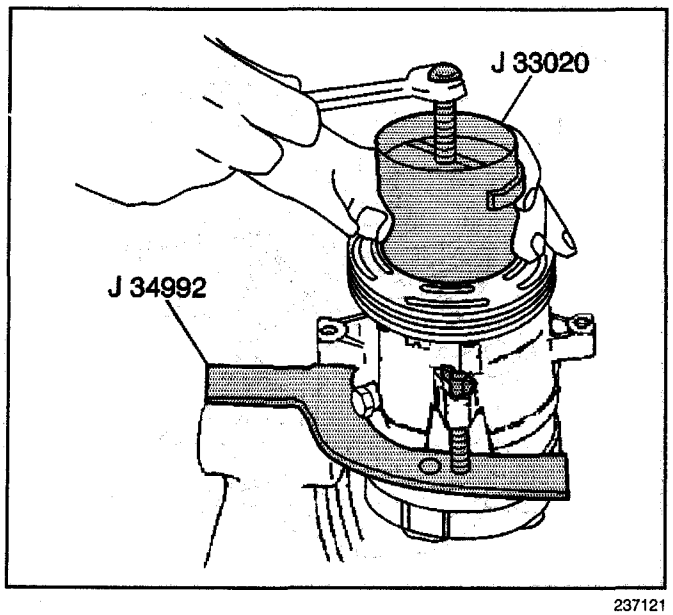
- *J 6083* Snap Ring Pliers
- *J 9398* Bearing Remover
- *J 8092* Driver Handle
- *J 33020* Pulley Puller
- *J 33023-A* Puller Pilot

1. Remove the clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V5 - Conventional Mount).*
2. Use the *J 6083* in order to remove the rotor and bearing assembly retaining ring.



237120

3. Install the *J 33023-A* to the front head.



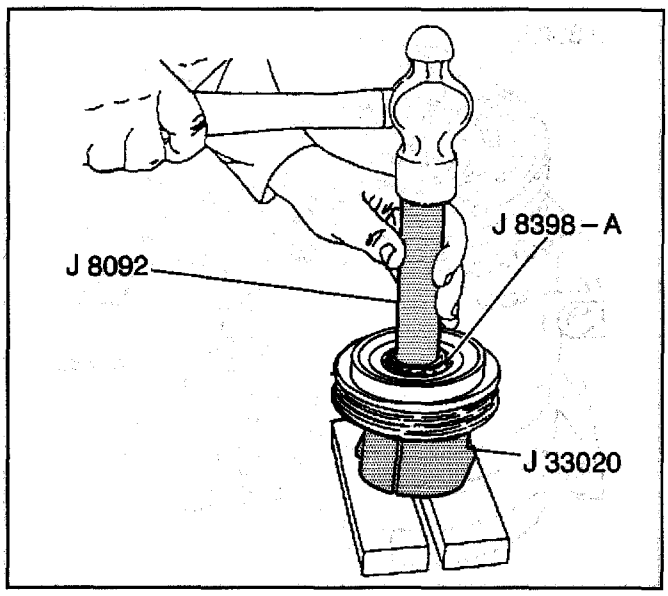
237121

4. Install the *J 33020* into the inner circle of slots in the rotor.
5. Turn the *J 33020* clockwise in the slots in order to engage the tangs of the puller with the segments between the slots in the rotor.
6. Hold the *J 33020* in place. Tighten the puller screw against the puller guide in order to remove the puller rotor and bearing assembly.

7. Support the rotor hub in order to prevent damage to the pulley rotor during bearing removal.
   7.1. Remove the forcing screw from the *J 33020*.
   7.2. With the tangs of the *J 33020* still engaged in the rotor slots, invert the assembly onto a solid, flat surface or blocks.

Notice: It is not necessary to remove the staking in front of the bearing to remove the bearing, however, it will be necessary to file away the old stake metal for proper clearance for the new bearing to be installed into the rotor bore or the bearing may be damaged.

8. Use a *J 9398* with the *J 8092* in order to drive the bearing out of the rotor hub.



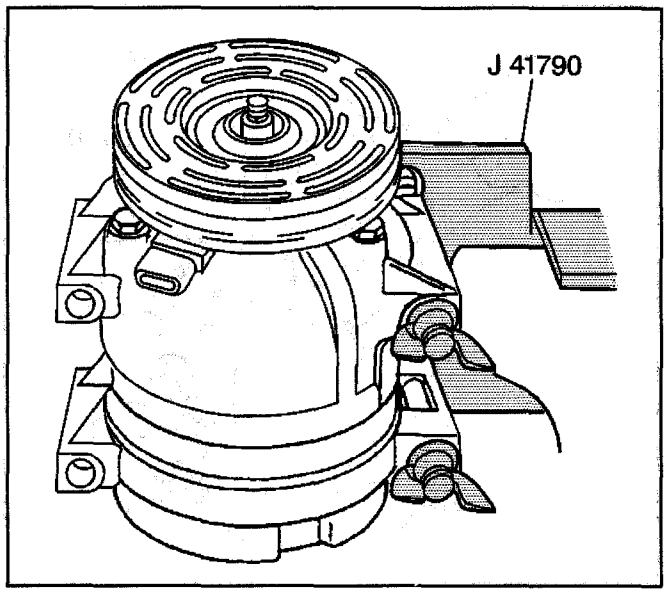
210141

Clutch Rotor and/or Bearing Removal (V7 - Direct Mount)

Tools Required

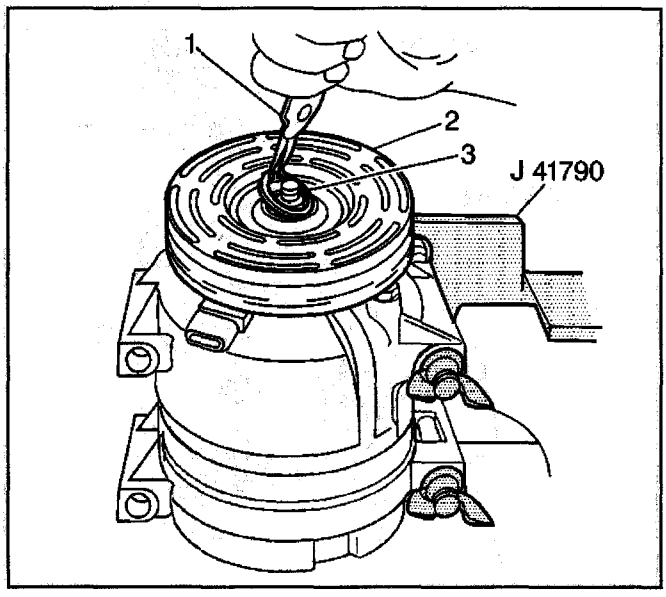
- *J 33023-A* Puller Pilot
- *J 41552* Compressor Pulley Puller
- *J 41790* Compressor Holding Fixture

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.

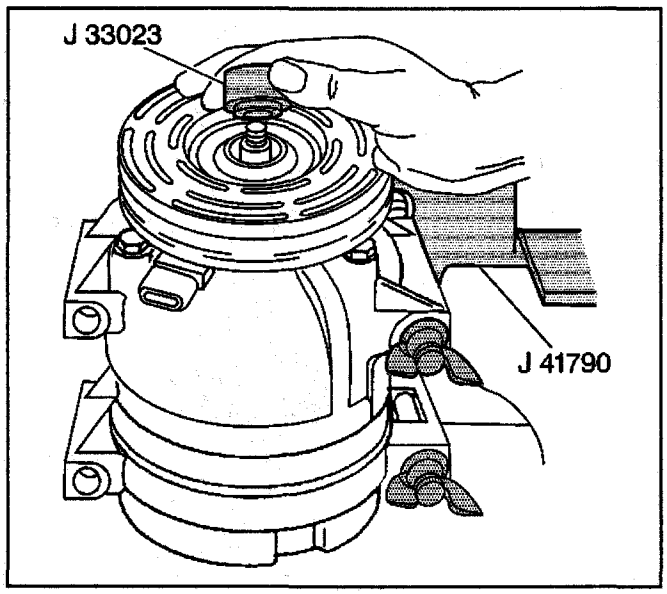


157595

3. Remove the clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V7 - Direct Mount)*.
4. Using external snap ring pliers (1), remove the clutch rotor and bearing assembly retaining ring (3).

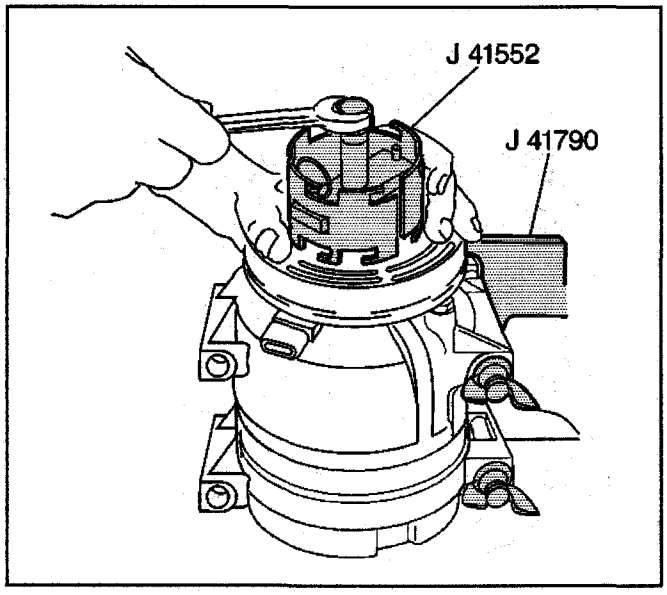


157223



157224

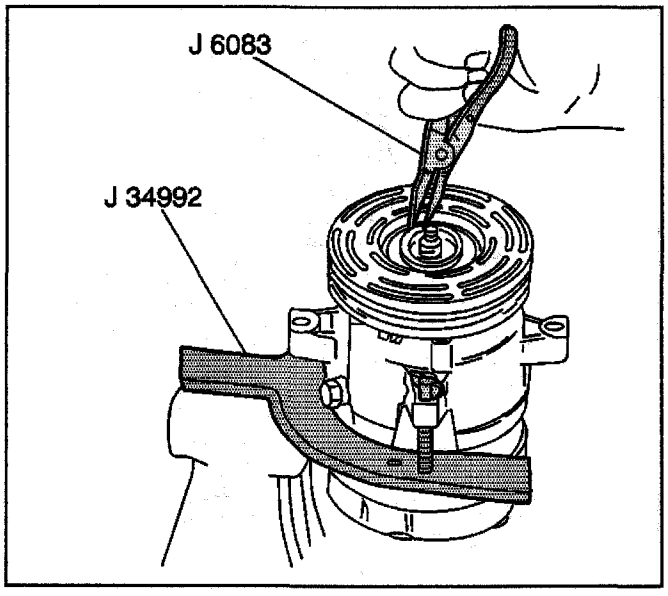
5. Place the *J 33023-A* on the clutch rotor.



157225

6. Install the *J 41552* down into the inner circle of slots in the rotor.

   Turn the *J 41552* clockwise in the slots to engage the puller tangs with the rotor.
7. Hold the *J 41552* in place and use a wrench to turn the center forcing screw against the *J 33023-A* to remove the clutch rotor and bearing assembly.



237119

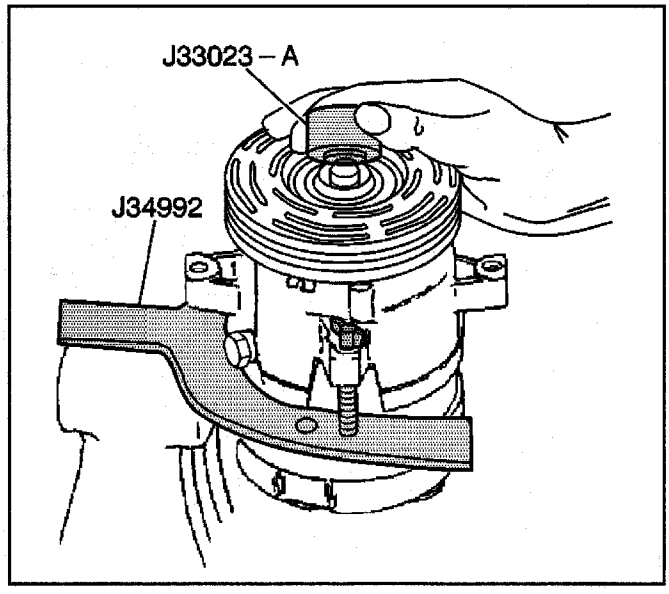
Compressor Clutch Coil Removal (V5 - Conventional Mount)

Tools Required

- *J 6083* Snap Ring Pliers
- *J 8433-1* Puller Bar
- *J 8433-3* Forcing Screw
- *J 33020* Pulley Puller
- *J 33023-A* Puller Pilot
- *J 33025* Clutch Coil Puller Legs

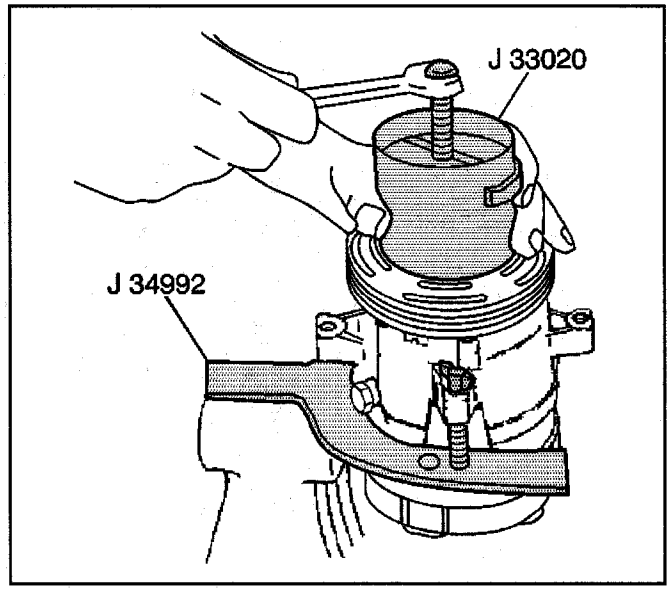
1. Remove the clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V5 - Conventional Mount).*
2. Use the *J 6083* in order to remove the rotor and bearing assembly retaining ring.

3. Install the *J 33023-A* to the front head.



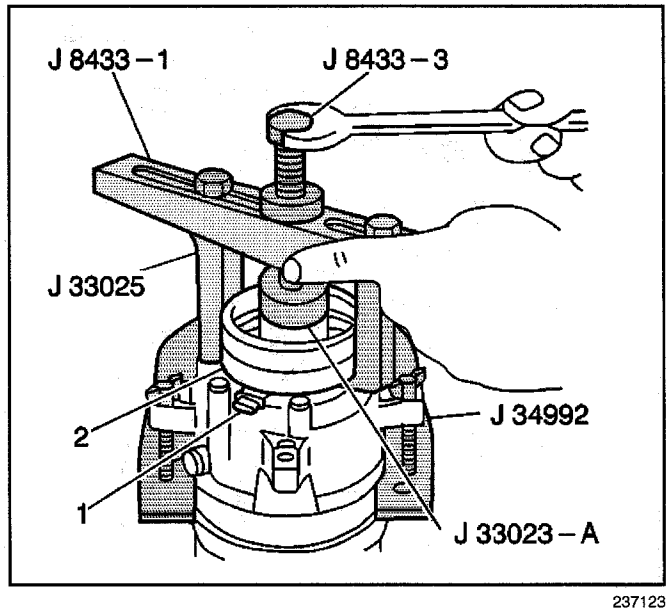
237120

4. Install the *J 33020* into the inner circle of slots in the rotor.
5. Turn the *J 33020* clockwise in the slots in order to engage the tangs of the puller with the segments between the slots in the rotor.
6. Hold the *J 33020* in place. Tighten the puller screw against the puller guide in order to remove the puller rotor and bearing assembly.

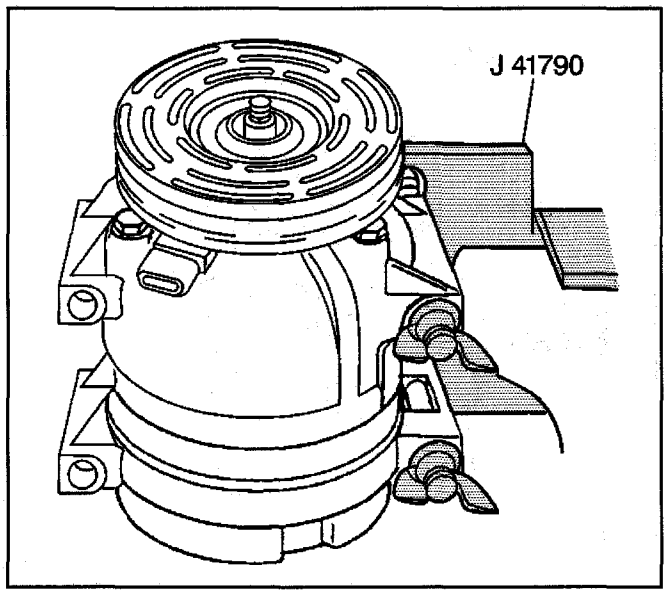


237121

7. Mark the location of the clutch coil terminal (1) on the compressor front head.
8. Install the *J 33023-A* on the front head of the compressor.
9. Install the *J 8433-1* and the *J 8433-3* with the *J 33025* on the front head of the compressor.
10. Tighten the *J 8433-3* against the *J 33023-A* in order to remove the clutch coil (2).



237123



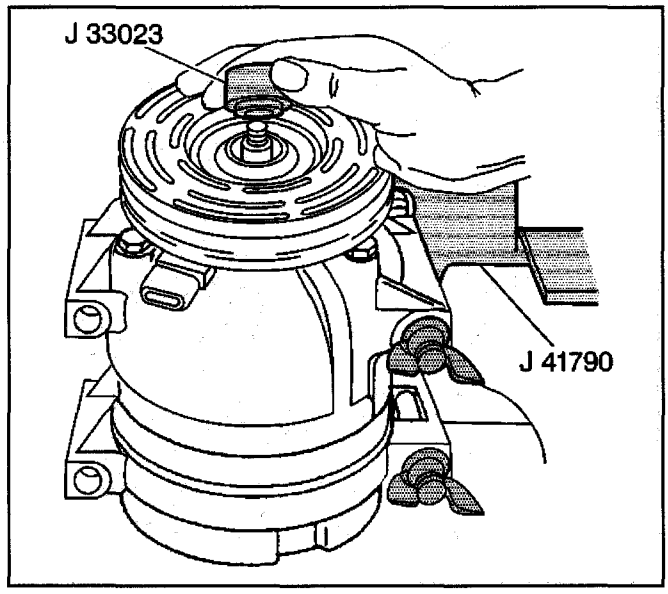
157595

Compressor Clutch Coil Removal (V7 - Direct Mount)

Tools Required

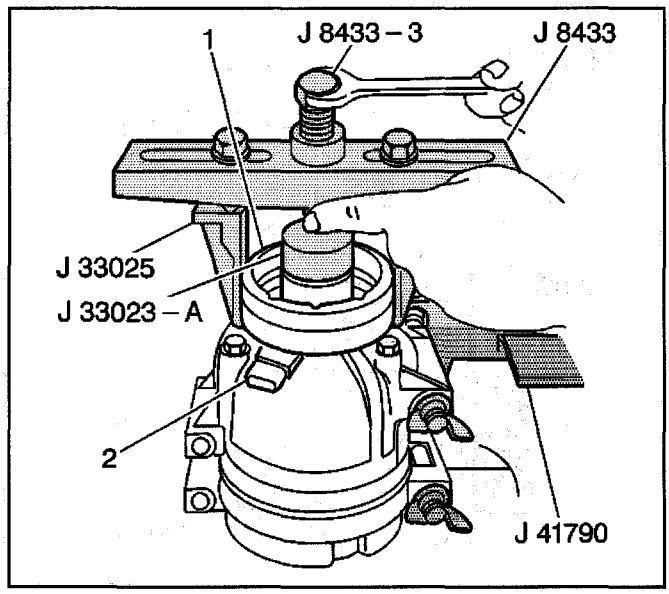
- *J 8433* Compressor Pulley Puller
- *J 8433-3* Forcing Screw
- *J 33023-A* Puller Pilot
- *J 33025* Clutch Coil Puller Legs
- *J 41790* Compressor Holding Fixture

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.



157224

3. Remove the compressor clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V7 - Direct Mount)*.
4. Install the *J 33023-A* onto the front head of the compressor.
5. Remove the compressor rotor and bearing assembly. Refer to *Clutch Rotor and/or Bearing Removal (V7 - Direct Mount)*.



157234

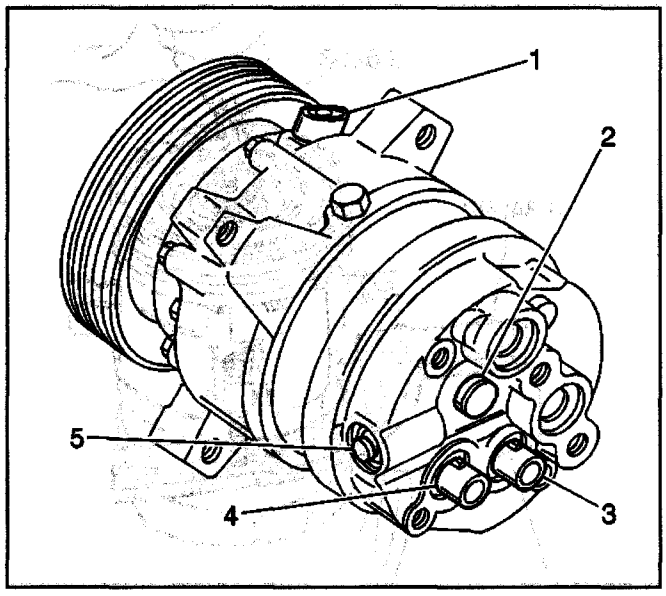
6. Mark the clutch coil terminal location (2) on the compressor front head.
7. Install the *J 33025* onto the *J 8433*.
8. Install the *J 8433* onto the compressor clutch coil (1) and tighten the puller leg bolts.
9. Tighten the center forcing screw *J 8433-3* of the compressor pulley puller *J 8433* against the *J 33023-A* to remove the compressor clutch coil from the compressor.
10. Remove the *J 8433-3*, the *J 33023-A*, the *J 33025* and the *J 8433*.

Compressor Control Valve Assembly Removal (V5 - Conventional Mount)

Tools Required

- *J 5403* Snap Ring Pliers
- *J 39500-B* A/C Refrigerant Recovery, Recycling and Recharging (ACR4) System

1. Recover the refrigerant using the *J 39500-B*.
2. Remove the control valve retaining ring using the *J 5403*.
3. Remove the control valve assembly (5).



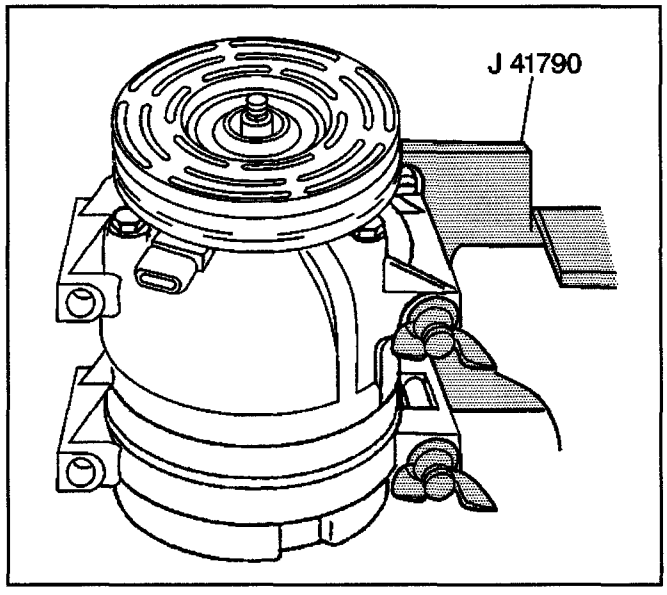
237069

Compressor Control Valve Assembly Removal (V7 - Direct Mount)

Tools Required

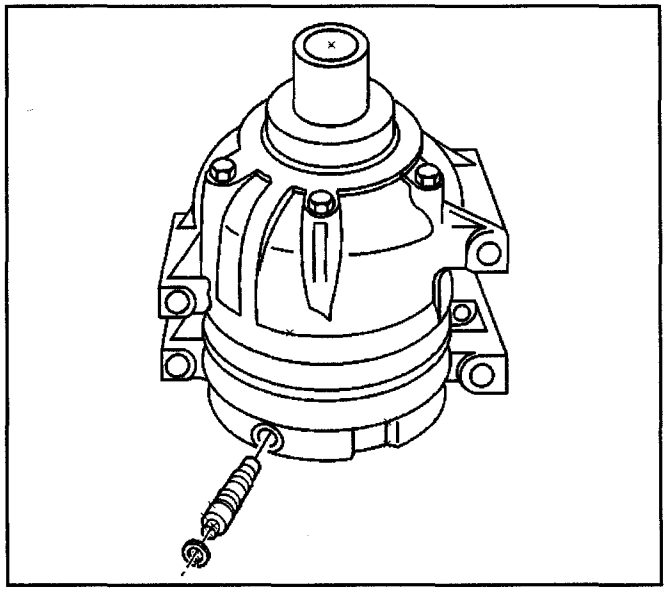
J 41790 Compressor Holding Fixture

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.

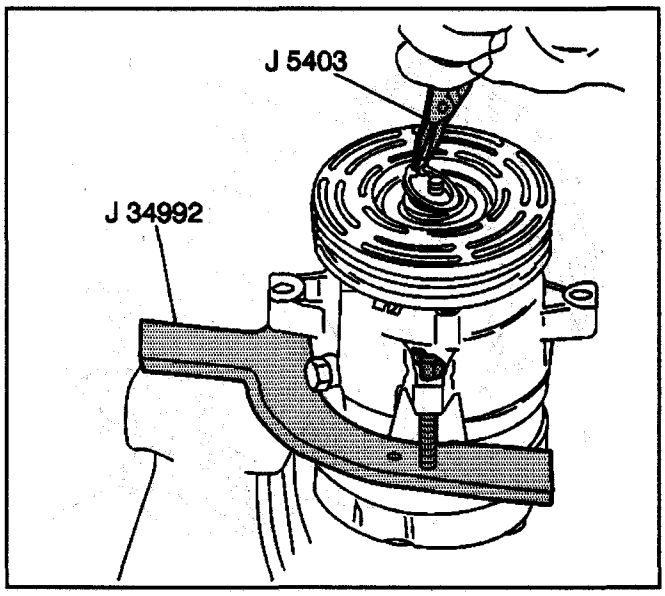


157595

3. Using internal snap ring pliers, remove the compressor control valve retaining ring.
4. Remove the compressor control valve from the compressor.



214740



237126

Compressor Shaft Seal Removal (V5 - Conventional Mount)

Tools Required

- *J 39400-A* Electronic Halogen Leak Detector
- *J 5403* Snap Ring Pliers
- *J 23128-A* Seal Seat Installer And Remover
- *J 39400-A* Electronic Halogen Leak Detector
- *J 39500-B* A/C Refrigerant Recovery, Recycling and Recharging (ACR4) System

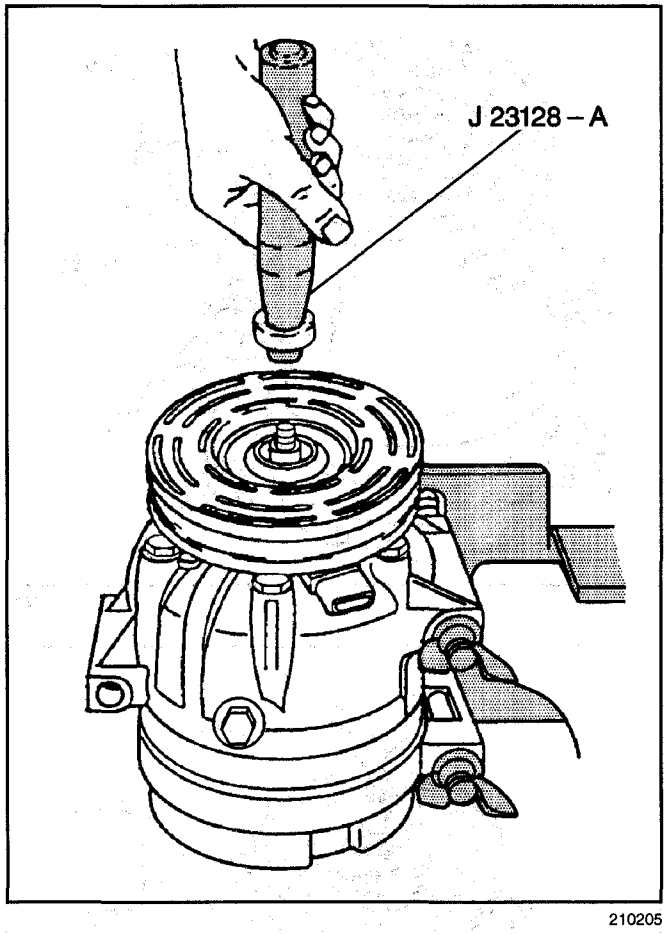
Important: Do not change a shaft seal because of small amounts of oil found on an adjacent surface. The seal allows some oil to pass for lubrication purposes. Change the shaft seal when the following conditions exist:

- A large amount of sprayed oil is found.
- Actual refrigerant leak is found, using a *J 39400-A* or equivalent.

1. Recover the refrigerant using the *J 39500-B*.
2. Loosen the compressor in the mounting brackets. Reposition the compressor.
3. Remove the clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V5 - Conventional Mount)*.
4. Remove the shaft seal retaining ring using the *J 5403*.
5. In order to prevent dirt or foreign material from damaging the compressor, thoroughly clean the following parts:
   - The inside of the compressor neck area surrounding the shaft
   - The exposed portion of the seal
   - The compressor shaft
   - The O-ring groove

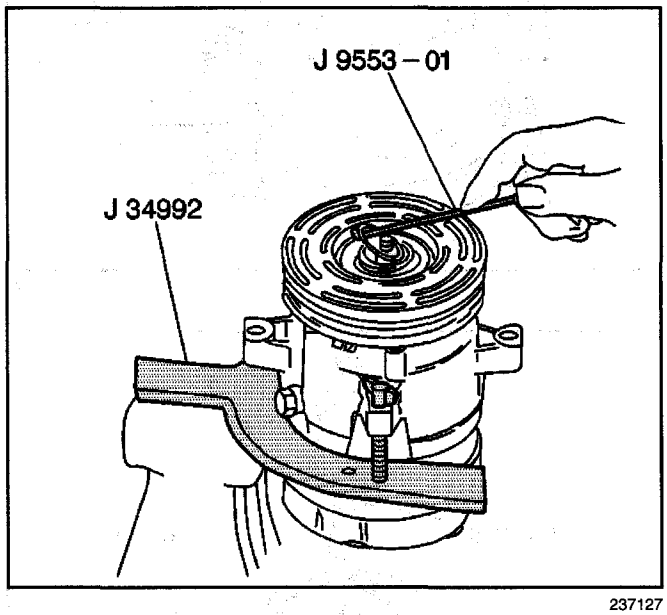
Important: Securely hand-tighten the handle of the *J 23128-A*. Do not use a wrench or pliers.

6. Fully engage the knurled tangs of the *J 23128-A* into the recessed portion of the seal by turning the handle clockwise.
7. Remove the seal from the compressor using a rotary-pulling motion. Discard the seal.

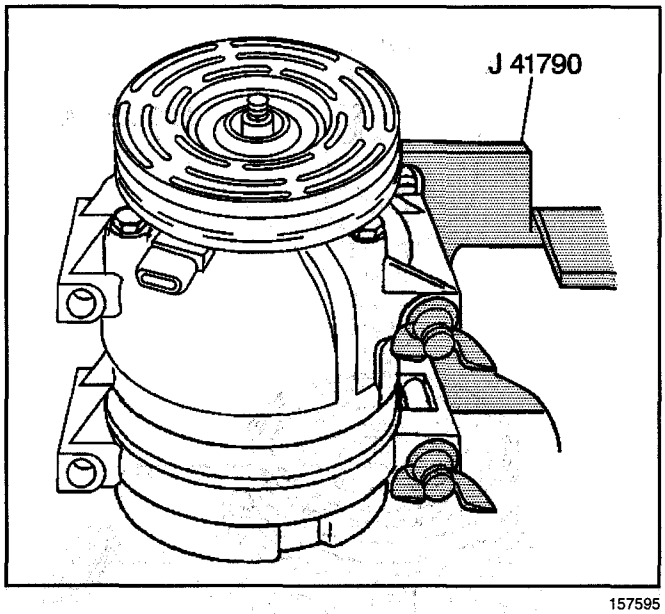


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8. Remove the seal O-ring from the compressor neck using the *J 9553-01*. Discard the seal O-ring.
9. Inspect the shaft and the inside of the compressor neck again for dirt and foreign material.
10. Ensure that the shaft and the inside of the compressor neck are perfectly clean prior to installing new parts.



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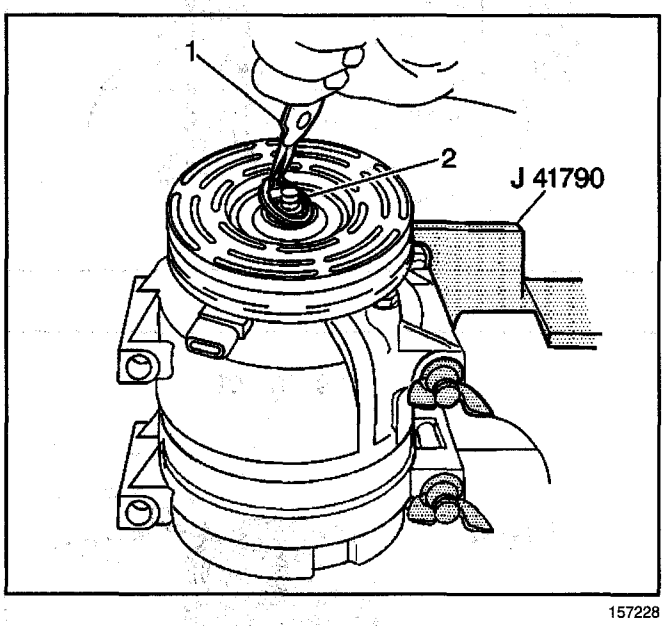
157595

Compressor Shaft Seal Removal (V7 - Direct Mount)

Tools Required

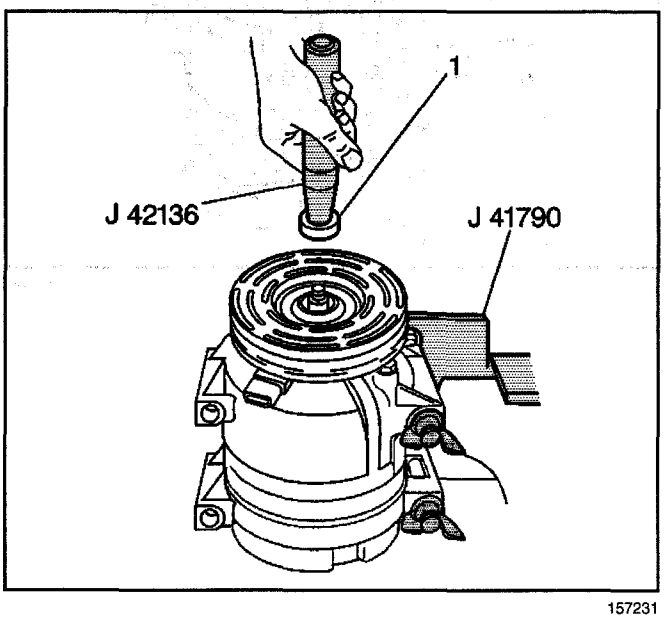
- *J 41790* Compressor Holding Tool
- *J 42136* A/C Lip Seal Remover

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.



157228

3. Remove the compressor clutch plate and hub assembly. Refer to *Compressor Clutch Plate and Hub Assembly Removal (V7 - Direct Mount).*
4. Using internal snap ring pliers (1), remove the compressor shaft seal retainer ring (2).
5. To keep any dirt or foreign material from getting into the compressor, thoroughly clean the following components:
   - The inside of the compressor neck area surrounding the shaft
   - The exposed portion of the compressor shaft seal
   - The compressor shaft
   - The O-ring groove



157231

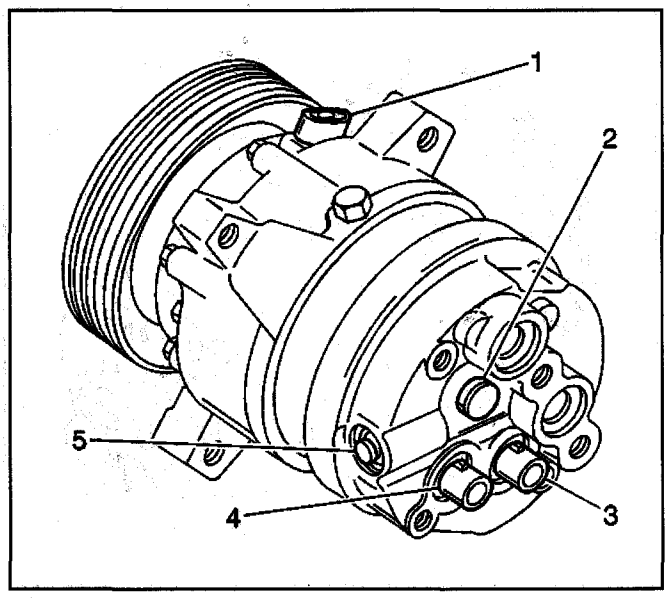
6. Fully engage the lip of the *J 42136* into the recessed portion of the seal (1) by turning the handle clockwise.
7. Remove the compressor shaft seal from the compressor with a rotary pulling motion.
8. Recheck the shaft and inside of the compressor neck for dirt or foreign material and make sure these areas are perfectly clean before installing the new compressor shaft seal.

Compressor Pressure Relief Valve Removal (V5 - Conventional Mount)

Tools Required

J 39500-B A/C Refrigerant Recovery, Recycling and Recharging (ACR4) System

1. Recover the refrigerant using the *J 39500-B*.
2. Remove the pressure relief valve (2).



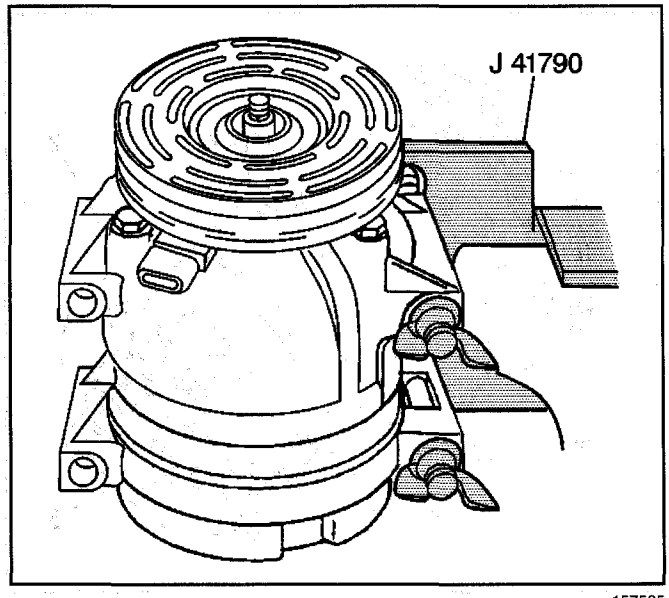
237069

Compressor Pressure Relief Valve Removal (V7 - Direct Mount)

Tools Required

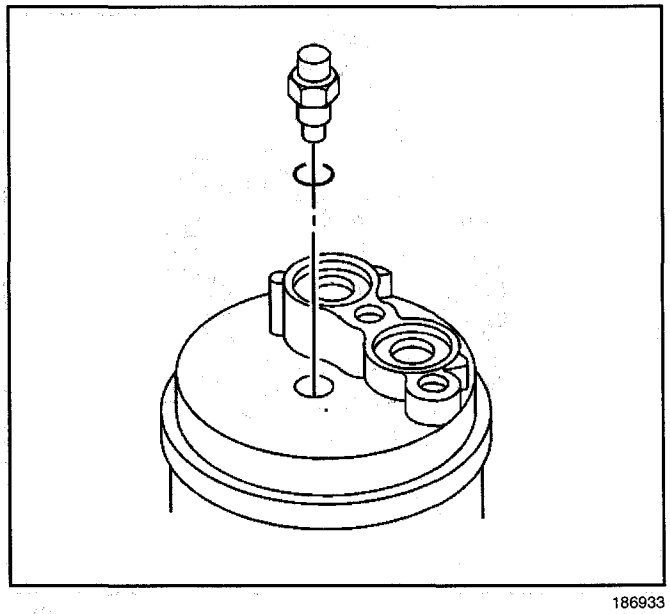
J 41790 Compressor Holding Fixture

1. Remove the compressor from the vehicle.
2. Clamp the compressor holding fixture, *J 41790* in a vise and attach the compressor to the *J 41790*.

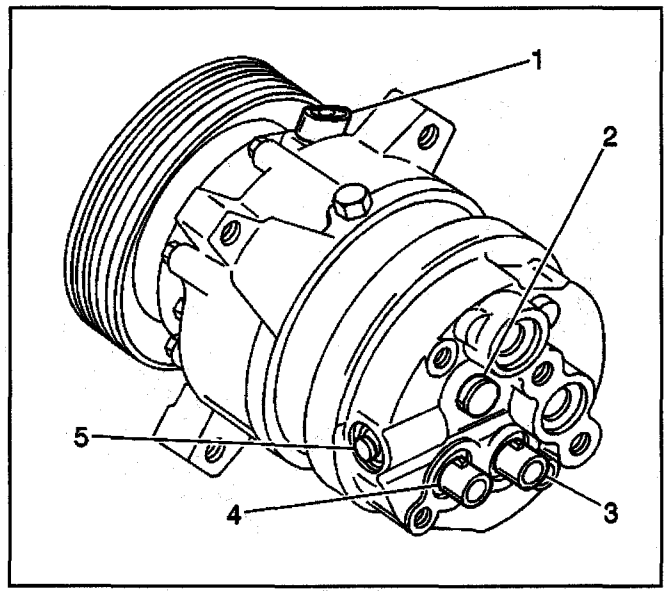


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3. Remove the pressure relief valve from the rear head of the compressor.



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Compressor Control Switches Removal (V5 - Conventional Mount)

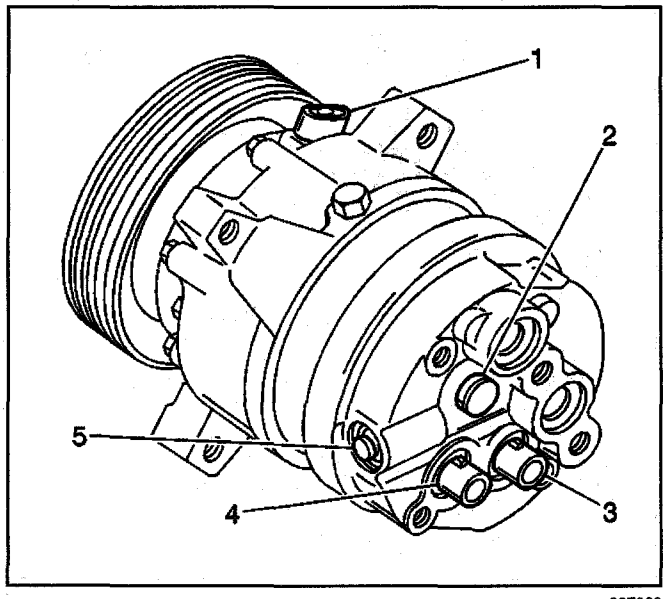
Tools Required

- *J 5403* Snap Ring Pliers
- *J 9553-01* O-Ring Remover
- *J 39500-B* R–134a Air Conditioning Refrigerant Recovery, Recycling And Recharging System

1. Recover the refrigerant using the *J 39500-B*.
2. Disconnect the electrical connector from the switch (3 or 4) in the rear head of the compressor.
3. Remove the switch retaining ring using the *J 5403*.
4. Remove the switch (3 or 4) from the compressor.

Notice: If the existing switch will be reinstalled in the compressor, a new O-ring seal must be used and preferably a new retainer should also be used. A new switch kit has the O-ring and retainer ring included.

5. Remove the old O-ring seal from the switch cavity using the *J 9553-01*.



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Compressor Control Valve Assembly Install (V5 - Conventional Mount)

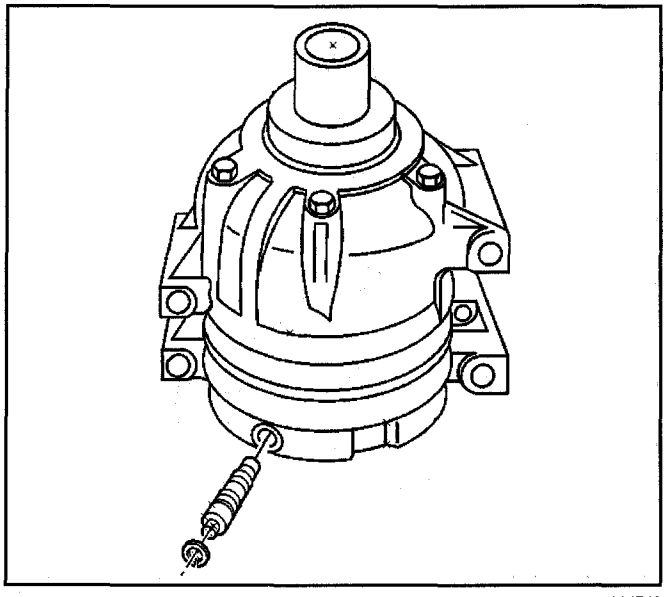
Tools Required

J 5403 Snap Ring Pliers

1. Coat the O-rings with 525 viscosity refrigeration oil.
2. Using thumb pressure, push the O-rings in place.

Important: Ensure that the retaining ring is properly seated in the ring groove.

3. Using the *J 5403*, install the valve retaining ring (5) with the high point of the curved sides against the valve housing.
4. Evacuate the system. Recharge the system.
5. Perform a leak test. Refer to *Compressor Leak Testing (V5 - Conventional Mount)*.



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Compressor Control Valve Assembly Install (V7 - Direct Mount)

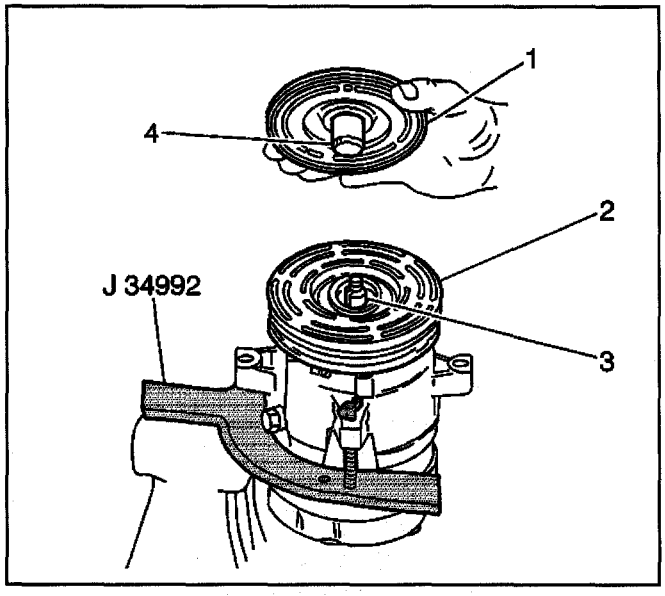
Tools Required

J 41790 Compressor Holding Fixture

1. Coat the control valve O-rings with clean 525 viscosity refrigeration oil.
2. Push the compressor control valve into the compressor with thumb pressure.
3. Using internal snap ring pliers, install the compressor control valve retaining ring.

   Make sure the retaining ring is properly seated in the ring groove.
4. Remove the compressor from the *J 41790*.
5. Install the compressor into the vehicle.

Compressor Clutch Plate/Hub Assembly Install (V5 - Conventional Mount)



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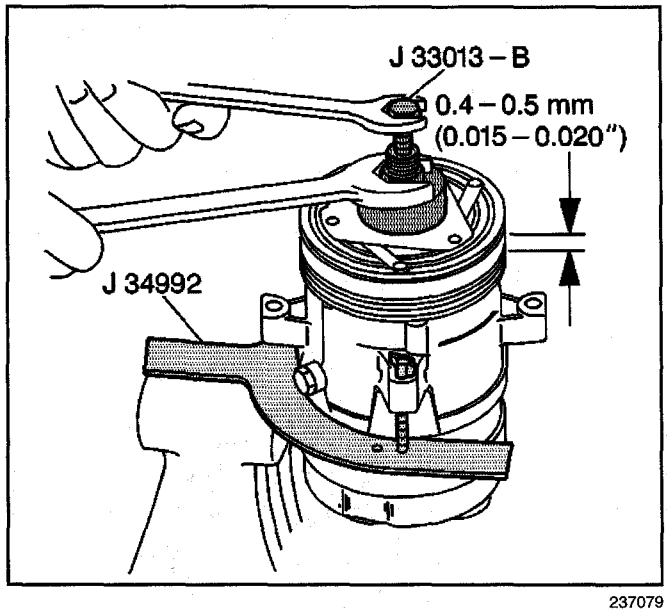
Tools Required

- *J 33013-B* Hub And Drive Plate Remover And Installer
- *J 33022* Shaft Nut Socket
- *J 33027-A* Clutch Hub Holding Tool

1. Install the shaft key (4) into the key groove of the clutch plate and hub (1).
   - Allow the key to project 3.2 mm (0.126 in) out of the key groove.
   - The shaft key is curved slightly in order to provide an interference fit in the key groove of the hub.
2. Clean the frictional surfaces of the clutch plate and hub and the clutch pulley rotor (2).
3. Align the shaft key with the shaft keyway (3).

Notice: Do not drive or pound on the clutch hub or the shaft. Internal damage to the compressor may result.

4. Place the clutch plate and hub assembly onto the compressor shaft.
5. Remove the center screw from the *J 33013-B*.
6. Reverse the body direction of the center screw of the *J 33013-B*.
7. Install the *J 33013-B* with the bearing.
8. Back off the body of the *J 33013-B* in order to allow the center screw to be threaded onto the end of the compressor shaft.
9. Hold the center screw of the *J 33013-B* with a wrench.



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Notice: If the center screw is threaded fully onto the end of the compressor shaft, or if the body of the installer is held and the center screw is rotated, the key will wedge and will break the clutch hub.

10. Tighten the hex portion of the body of the *J 33013-B* in order to press the hub onto the shaft.
11. Tighten the body of the *J 33013-B* several turns.
12. Remove the *J 33013-B*.
13. Verify that the shaft key remains in the keyway before installing the clutch plate and hub assembly to the final position.
14. Ensure that the gap between the frictional surfaces of the clutch plate and the clutch rotor is within 0.40–0.50 mm (0.016–0.020 in).
15. Remove the *J 33013-B*.
16. Verify that the shaft key is even with or slightly above the clutch hub.
17. Install the shaft nut.
18. Hold the clutch plate and hub assembly with the *J 33027-A*.

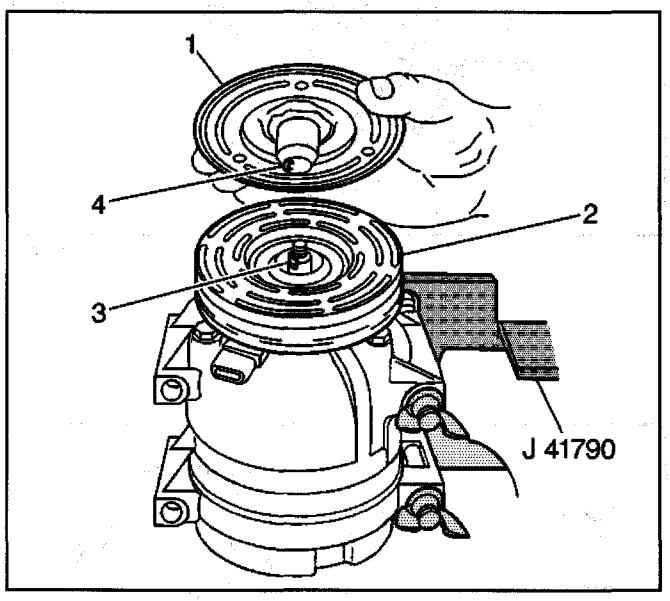
Notice: Refer to *Fastener Notice* in Cautions and Notices.

19. Tighten the shaft nut against the crankshaft shoulder, using a 17.5 N·m (12.5 lb ft) torque wrench and the *J 33022*.

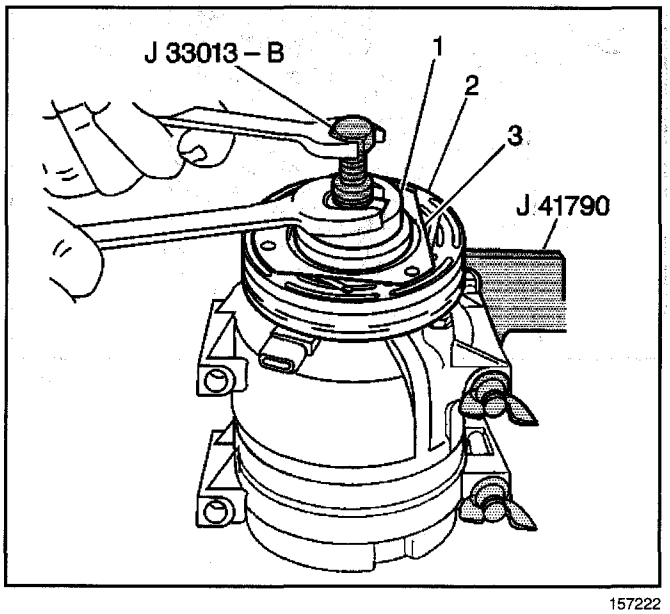
    Tighten

    Tighten the nut to 16.5 N·m (12 lb ft).

20. Spin the pulley rotor by hand in order to verify that the rotor does not rub the clutch drive plate.



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Compressor Clutch Plate/Hub Assembly Install (V7 - Direct Mount)

Tools Required

- *J 33013-B* Hub and Drive Plate Remover/Installer
- *J 33017* Pulley and Bearing Assembly Installer
- *J 33027-A* Clutch Hub Holding Tool

1. Install the shaft key into the hub key groove (4) approximately 3.2 mm (1/8 in) out of the keyway.

   The shaft key is curved slightly to provide an interference fit in the hub key groove.

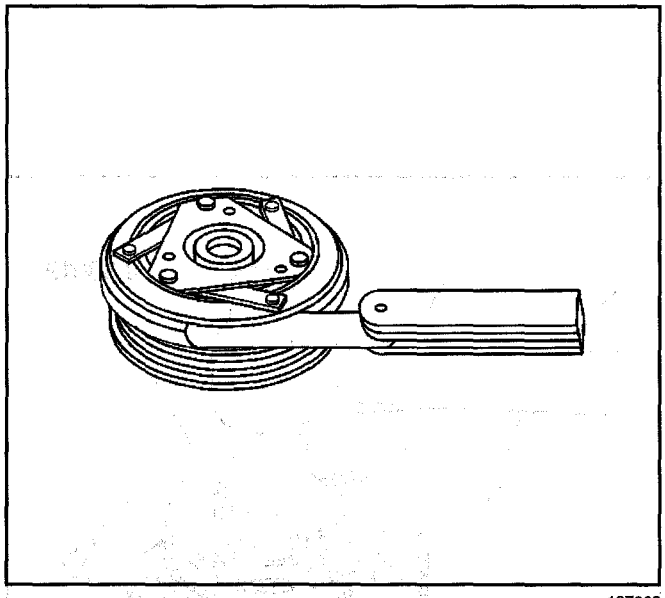
2. Clean the surfaces of the clutch plate (1) and the clutch rotor (2) before installing the clutch plate and hub assembly.
3. Align the shaft key with the shaft keyway in the clutch plate and the hub assembly and place onto the compressor shaft (3).
4. Remove the *J 33013-B*.
   - 4.1. Remove the center screw from the body of the *J 33013-B*.
   - 4.2. Install the center screw into the opposite end of the *J 33013-B*.
5. Install the *J 33013-B* and bearing tools (1) onto the clutch plate (3) and the hub assembly (2).
   - 5.1. Back the body of the *J 33013-B* off enough to allow the center screw to be threaded onto the end of the compressor shaft.
   - 5.2. Thread the center screw several turns onto the end of the compressor shaft.

     Do not tighten the center screw on the compressor shaft.
6. Hold the center screw with a wrench.
   - 6.1. Tighten the hex portion of the *J 33013-B* body several turns.
   - 6.2. Remove the *J 33013-B* from the clutch plate and hub.
   - 6.3. Make sure that the shaft key is still in place in the keyway.
7. Reinstall the *J 33013-B*.

8. Place a feeler gage between the clutch plate and the clutch rotor.

Important: Make sure that the air gap is even all around the clutch plate and hub assembly.

9. Tighten the hex portion of the *J 33013-B* until the air gap between the clutch plate and clutch rotor is 0.40 mm (0.015 in).



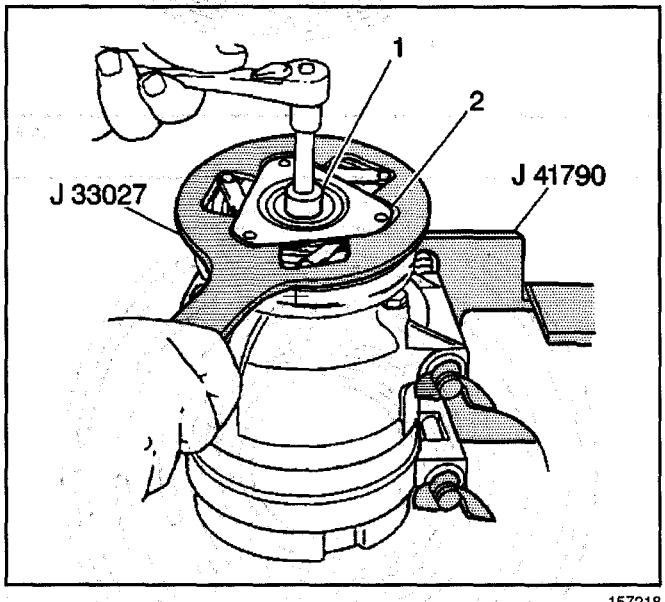
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10. Remove the *J 33013-B*.
11. Hold the clutch plate and hub assembly (2) with the *J 33027-A*.
12. Install the compressor shaft nut.

    Tighten

    Tighten the compressor shaft nut to 17.5 N·m (13 lb ft).

13. Spin the pulley rotor by hand to make sure the rotor is not rubbing against the clutch drive plate.
14. Remove the compressor from the *J 41790*.
15. Install the compressor into the vehicle.



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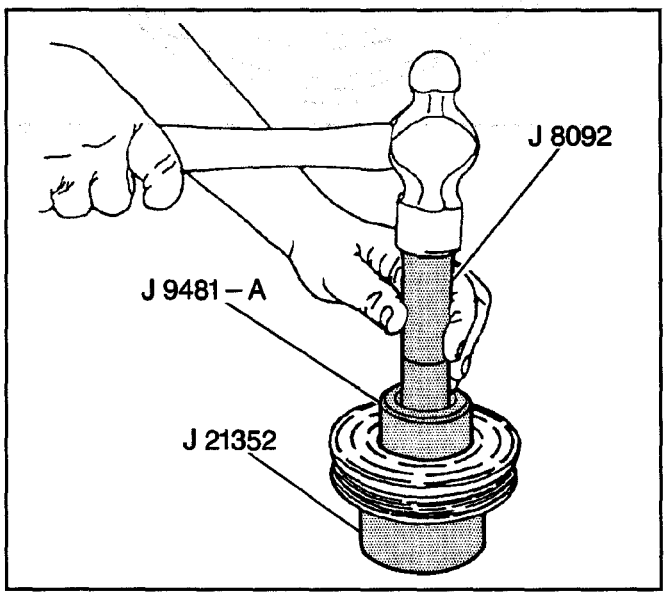
Clutch Rotor and/or Bearing Install (V5 - Conventional Mount)

Tools Required

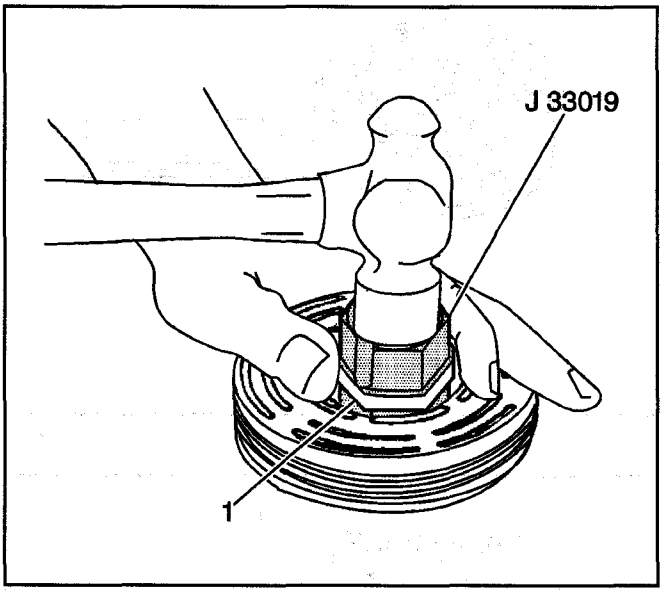
- *J 6083* Snap Ring Pliers
- *J 8092* Driver Handle
- *J 8433-1* Puller Bar
- *J 8433-3* Forcing Screw
- *J 9481-A* Bearing Installer
- *J 21352-A* Support Block
- *J 33017* Pulley And Bearing Assembly Installer
- *J 33019* Bearing Staking Tool
- *J 33023-A* Puller Pilot
- *J 34992* Compressor Holding Fixture

Notice: Do not support the rotor by resting the pulley rim on a flat surface during the bearing installation or the rotor face will be bent.

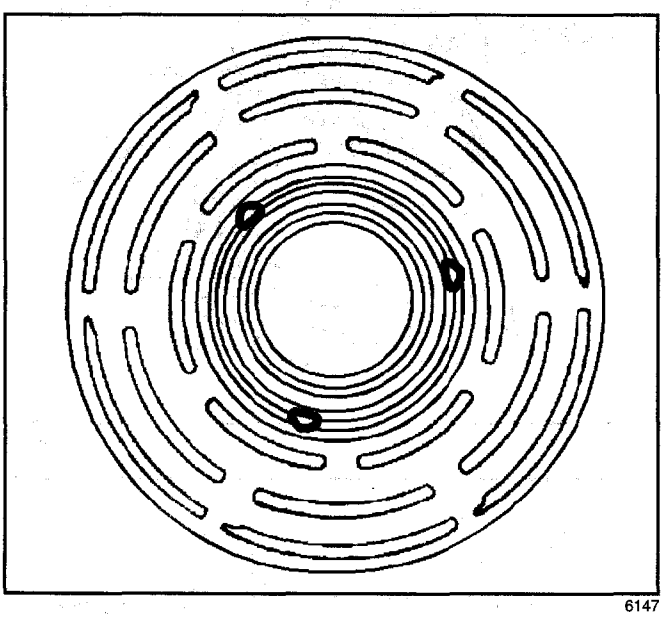
1. Place the pulley rotor on the *J 21352-A* in order to fully support the rotor hub during the bearing installation.



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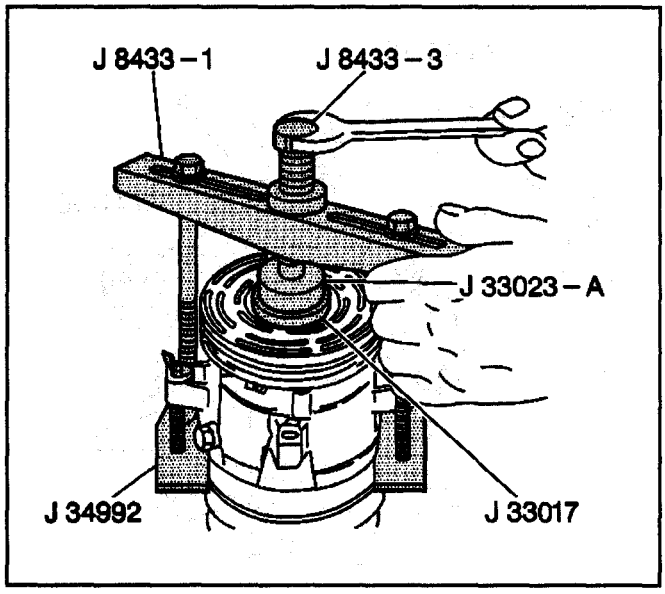
2. Align the new bearing with the hub bore.
3. Using the *J 9481-A* and the *J 8092*, drive the bearing into the hub.

   The *J 9481-A* applies force to the outer race of the bearing.
4. Place the *J 33019* and the staking pin in the hub bore.
5. Shift the rotor and bearing assembly on the *J 21352-A* in order to fully support of the hub under the location of the staking pin.
6. Use a heavy-duty rubber band (1) in order to hold the stake pin in the guide of the *J 33019*.

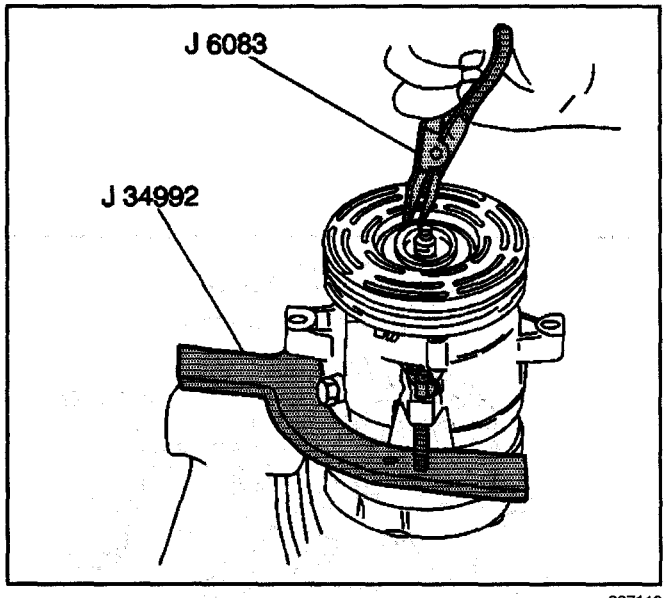
Important: Do not allow a metal stake to contact the outer face of the bearing in order to prevent distortion of the outer race.

7. Using care in order to prevent injury, strike the staking pin of the *J 33019*. Properly position the stake pin in the guide after each impact on the pin.
8. Continue to strike the pin of the *J 33019* until a stake, similar to the original stake, is formed down to, but not touching, the bearing.
9. Stake three places 120 degrees apart.

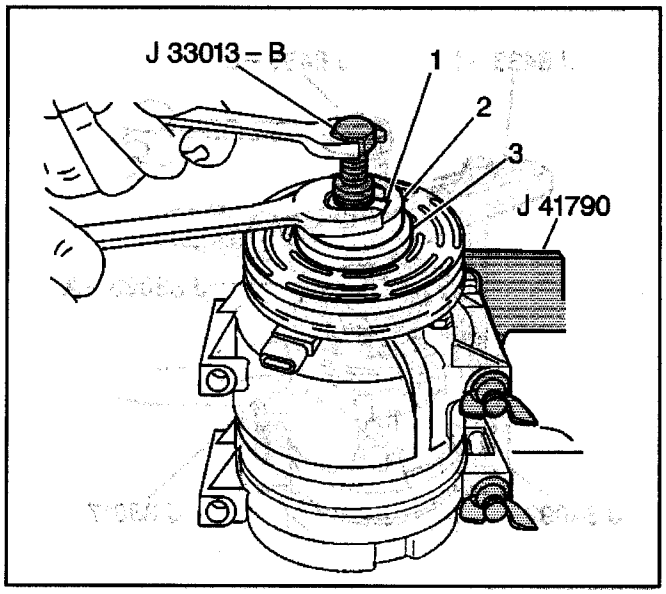
10. With the compressor mounted to the *J 34992*, position the rotor and bearing assembly on the front head.
11. Position the *J 33017* and the *J 33023-A* directly over the inner race of the bearing.
12. Position the *J 8433-1* on the *J 33023-A*.
13. Assemble the two through bolts and the washers of the *J 34992* through the slots of the *J 8433-1*.
14. Thread the two through bolts into the *J 34992*.
    Ensure that the thread of the through bolts engages the full thickness of the *J 34992*.
15. Tighten the *J 8433-3* in the *J 8433-1* in order to force the pulley rotor and bearing assembly onto the front head of the compressor.
16. If the *J 33017* slips off direct, in-line contact with inner face of the bearing, use the following steps:
    16.1. Loosen the *J 8433-3*.
    16.2. Realign the *J 33017* and the *J 33023-A* in order to ensure that the installer clears the front head.
17. Install the rotor and bearing assembly retainer ring using the *J 6083*.
18. Install the clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V5 - Conventional Mount)*.



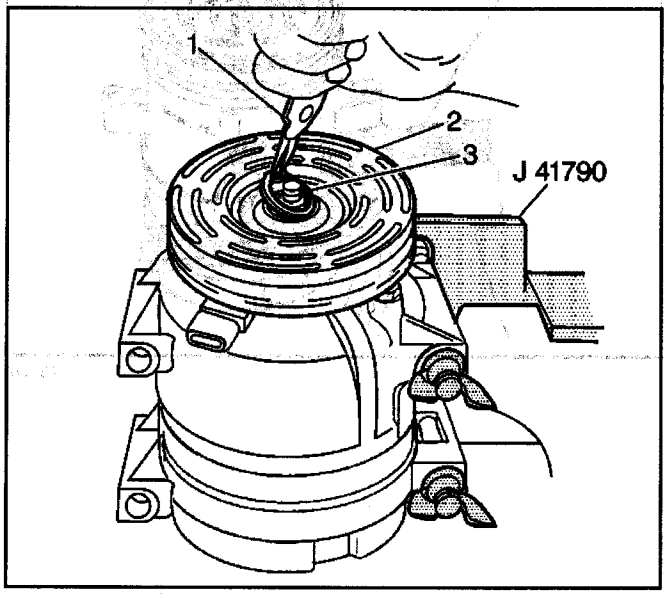
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Clutch Rotor and/or Bearing Install (V7 - Direct Mount)

Tools Required

- *J 33013-B* Hub and Drive Plate Remover/Installer
- *J 33017* Pulley and Bearing Assembly Installer

1. Position the clutch rotor and bearing assembly (2) onto the compressor.
2. Position the *J 33017* and bearing (1) from the *J 33013-B* directly over the inner race of the bearing.
3. Place the washer (3) from the J 42126 tool kit onto the body of the *J 33013-B*.
4. Remove the center screw from the body of the *J 33013-B*.
5. Install the center screw into the opposite end of the *J 33013-B*.
6. Back the body of the *J 33013-B* off enough to allow the center screw to be threaded onto the end of the compressor shaft.
7. Thread the center screw several turns onto the end of the compressor shaft.

   Do not tighten the center screw on the compressor shaft.
8. Hold the center screw with a wrench.
9. Tighten the hex portion of the *J 33013-B* body several turns.
10. Remove the *J 33013-B* from the clutch rotor and bearing assembly.
11. Make sure that the clutch rotor and bearing (2) is pressed onto the nose of the compressor far enough to clear the groove for the retaining ring.

    If the clutch rotor and bearing does not clear the groove, repeat steps 7, 8 and 9.
12. Install the clutch rotor and bearing retaining ring (3) using external snap ring pliers (1).

    Make sure that the camphor side of the retaining ring is facing up when the retaining ring is being installed.
13. Install the clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V7 - Direct Mount)*.
14. Remove the compressor from the *J 41790*.
15. Install the compressor into the vehicle.

Compressor Clutch Coil Install (V5 - Conventional Mount)

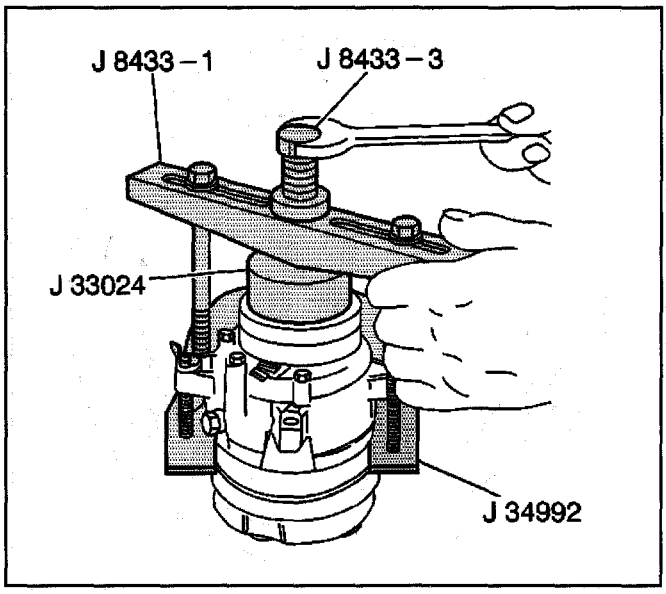
Tools Required

- *J 8433-1* Puller Bar
- *J 8433-3* Forcing Screw
- *J 33024* Clutch Coil Installer
- *J 34992* Compressor Holding Fixture

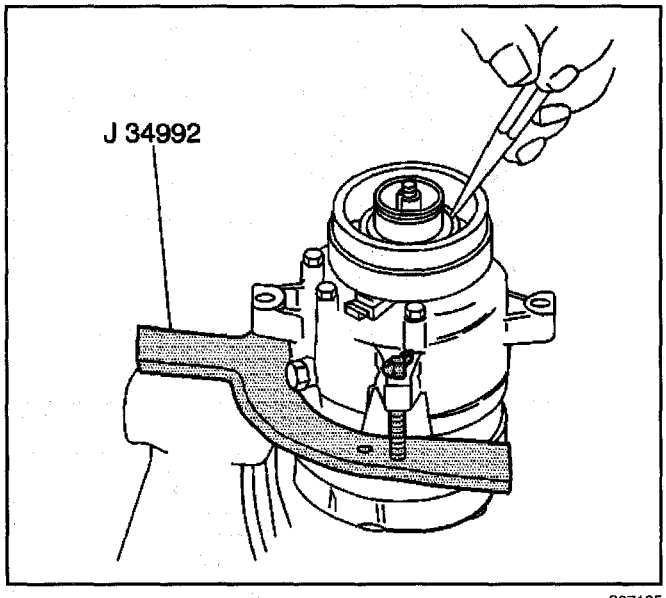
1. Place the clutch coil assembly on the front head with the terminals positioned at the marked location.
2. Place the *J 33024* over the internal opening of the clutch coil housing.
3. Align the *J 33024* with the compressor front head.
4. Center the *J 8433-1* on the countersunk center hole of the *J 33024*.
5. Install the through bolts and the washers of the *J 34992* through the slots in the *J 8433-1*.
6. Thread the through bolts into the *J 33025* in order to achieve full fixture thickness.

Important: Ensure that the clutch coil and the *J 33024* stay in-line during the installation.

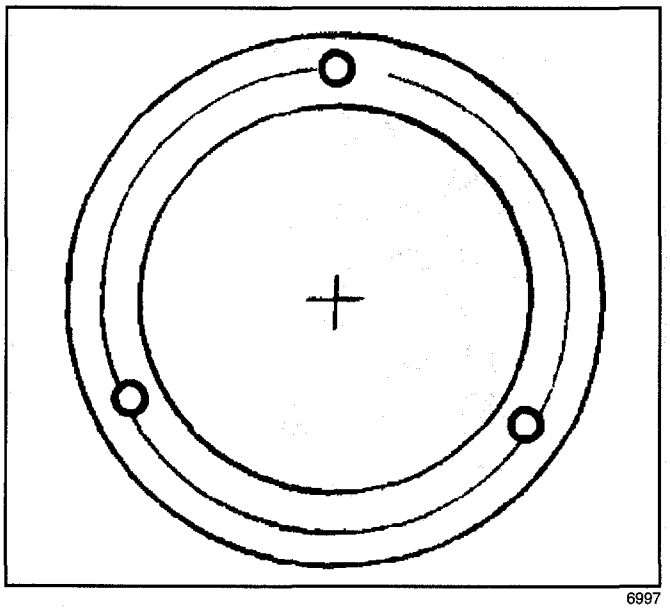
7. Turn the *J 8433-3* of the *J 8433-1* in order to force the clutch coil onto the head.
8. With the compressor still mounted to the *J 34992* and the coil seated on the front head, stake the front head using a drift punch with a diameter of 3.175 mm (0.125 in).



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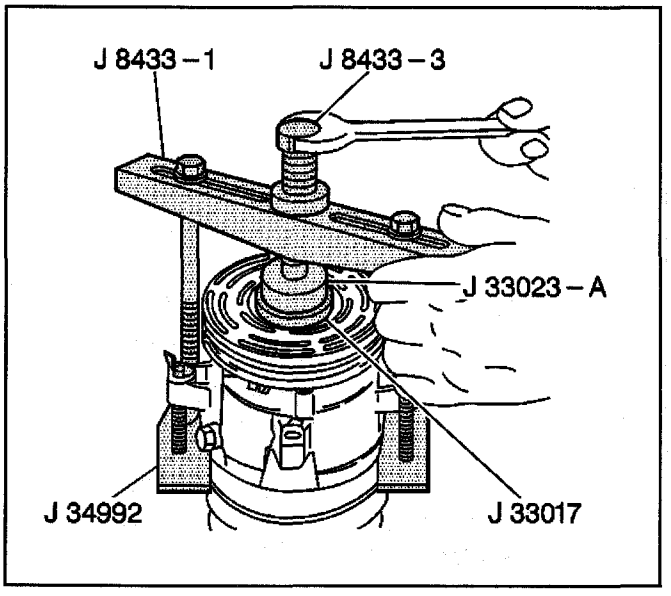


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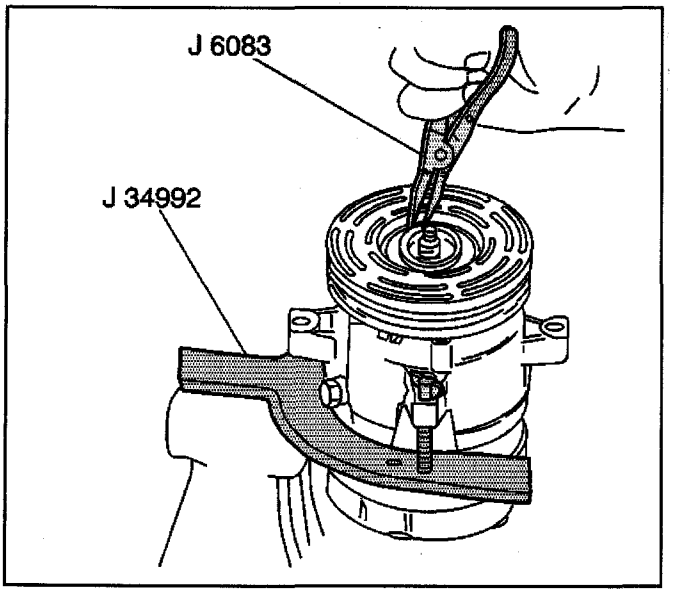
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9. Stake the front head at 3 places 120 degrees apart in order to ensure that the clutch coil remains in position.
10. Ensure that the stake size is only one half of the area of the punch tip and only 0.28–0.35 mm (0.010–0.015 in) in depth.



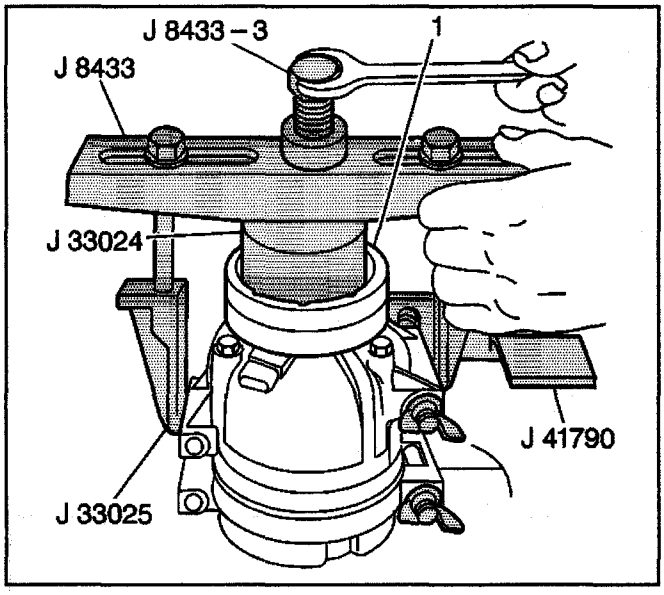
237122

11. With the compressor mounted to the *J 34992*, position the rotor and bearing assembly on the front head.
12. Position the *J 33017* and the *J 33023-A* directly over the inner race of the bearing.
13. Position the *J 8433-1* on the *J 33023-A*.
14. Assemble the two through bolts and the washers of the *J 34992* through the slots of the *J 8433-1*.
15. Thread the two through bolts into the *J 34992*. Ensure that the thread of the through bolts engages the full thickness of the *J 34992*.
16. Tighten the *J 8433-3* in the *J 8433-1* in order to force the pulley rotor and bearing assembly onto the front head of the compressor.
17. If the *J 33017* slips off direct, in-line contact with inner face of the bearing, use the following steps:
    17.1. Loosen the *J 8433-3*.
    17.2. Realign the *J 33017* and the *J 33023-A* in order to ensure that the installer clears the front head.
18. Install the rotor and bearing assembly retainer ring using the *J 6083*.
19. Install the clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V5 - Conventional Mount)*.
20. Install the shaft nut.



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Compressor Clutch Coil Install (V7 - Direct Mount)



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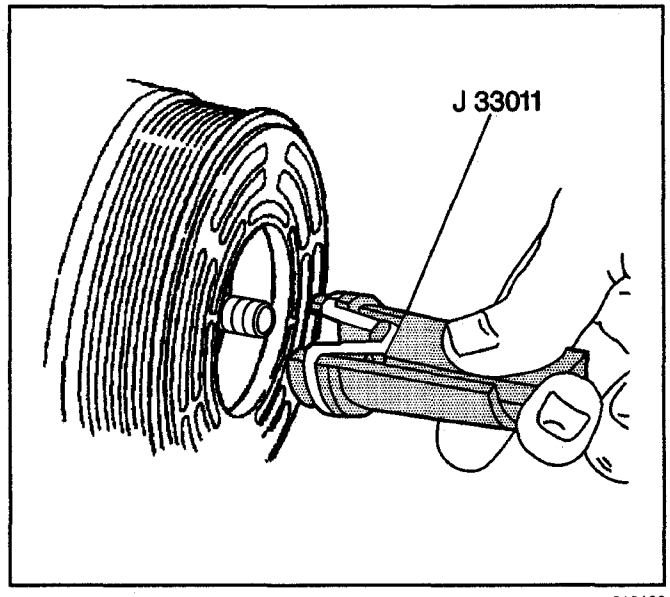
Tools Required

- *J 8433* Compressor Pulley Puller
- *J 8433-3* Forcing Screw
- *J 33024* Clutch Coil Installer Adaptor
- *J 33025* Clutch Coil Puller Legs
- *J 41790* Compressor Holding Fixture

1. Place the clutch coil assembly (1) on the front head with the clutch coil terminal positioned at the mark made during disassembly.
2. Place the *J 33024* over the internal opening of the clutch coil housing and align installer with the compressor front head.
3. Install the *J 8433-3* into the *J 8433* and center the screw in the countersunk center hole of the *J 33024.*
4. Install the 4 inch through bolts and washers from the J 42136 tool kit into the *J 33025* and attach them to the compressor mounting bosses.
5. Turn the center forcing screw of the *J 8433* to press the clutch coil onto the front head until the clutch coil is fully seated.

   Make sure the clutch coil and the *J 33024* stay in-line with each other while pressing the clutch coil onto the compressor.
6. Install the compressor clutch rotor and bearing assembly. Refer to *Clutch Rotor and/or Bearing Install (V7 - Direct Mount).*
7. Install the compressor clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V7 - Direct Mount).*
8. Remove the compressor from the *J 41790.*
9. Install the compressor into the vehicle.

Compressor Shaft Seal Install (V5 - Conventional Mount)



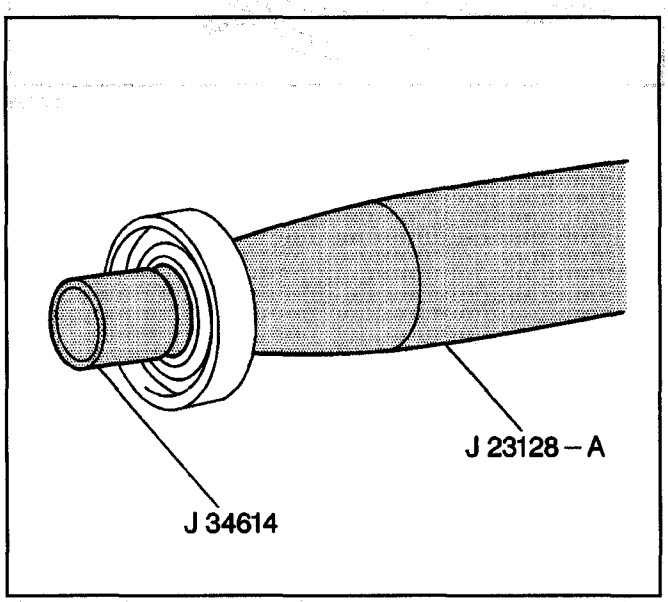
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Tools Required

- *J 5403* Snap Ring Pliers
- *J 23128-A* Seal Seat Installer And Remover
- *J 33011* O-Ring Installer
- *J 34614* Shaft Seal Protector
- *J 39500-B* R-134a Air Conditioning Refrigerant Recovery, Recycling And Recharging System.
- *J 39893* Pressure Testing Connector

Notice: Seals should not be re-used. Always use a new specification service seal kit. Be sure that the seal to be installed is not scratched or damaged in any way. Make sure that the seal is free of lint and dirt that could damage the seal surface or prevent sealing.

1. Thoroughly clean the seal O-ring groove in the front head.
2. Dip the new seal O-ring in clean 525 viscosity refrigerant oil.



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Notice: Any attempt to use makeshift or inadequate service tools or equipment may result in damage and/or improper compressor operation.

3. Assemble the O-ring onto the *J 33011*.
4. Install the O-ring.
   4.1. Insert the *J 33011* into the compressor neck until the installer bottoms out.

Important: The top groove in the compressor neck is for the shaft seal retainer ring.

   4.2. Lower the moveable slide of the *J 33011* in order to release the O-ring into the seal O-ring lower grove.
   4.3. Rotate the *J 33011* in order to seat the O-ring.
   4.4. Remove the installer.
5. Dip the new shaft seal in clean 525 viscosity refrigerant oil.
6. Assemble the seal to the *J 23128-A* by turning the handle clockwise.
   6.1. Ensure that the stamped steel case side of the lip seal engages with the knurled tangs of the *J 23128-A*.
   6.2. Ensure that the flared-out side of the lip seal faces toward the compressor.

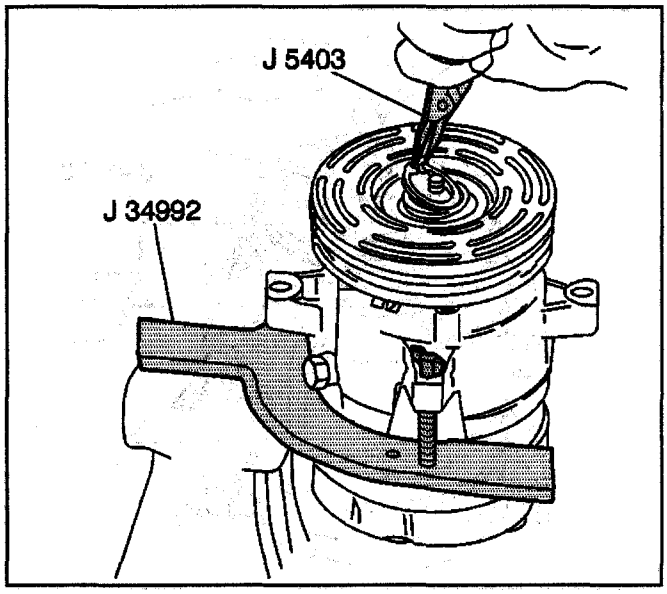
Notice: Use care when handling the seal protector. Do not nick the seal protector. This may damage the seal during installation. Ensure that the bottom of the seal protector is not flared. This may damage the seal during installation.

7. Install the *J 34614* on the lip seal.
8. Install the lip seal onto the shaft.
   8.1. Place the *J 34614* over the end of the compressor shaft.
   8.2. Slide the new seal onto the shaft using a rotary motion of the *J 23128-A*.
   8.3. Ensure that the seal makes good contact with the O-ring.

   Do not dislodge the O-ring.

   8.4. Disengage the *J 23128-A* from the seal.
   8.5. Remove the *J 23128-A* and the *J 34614* from the compressor.

9. Use the *J 5403* in order to install the new seal retainer ring with the flat side against the seal.
10. Use the sleeve of the *J 33011* in order to press in the seal retainer ring. Ensure that the ring snaps into the groove.
11. Leak test the compressor.
    11.1. Install the *J 39893* on the rear head of the compressor.
    11.2. Connect the gage charging lines using the *J 39500-B*.
    11.3. Pressurize the suction and the high-side of the compressor using R–134a Refrigerant.
    11.4. Temporarily install the shaft nut.
    11.5. With the compressor in a horizontal position, rotate by hand the compressor shaft several turns in the operating direction.
    11.6. Leak test the seal area. Correct any leaks found.
    11.7. Recover the refrigerant.
    11.8. Remove the shaft nut.
12. Remove any excess oil from the shaft and the inside of the compressor neck.
13. Install the clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V5 - Conventional Mount)*.
14. Install the compressor and the compressor belt. Tighten the bracket.
15. Evacuate and charge the refrigerant system using the *J 39500-B*.



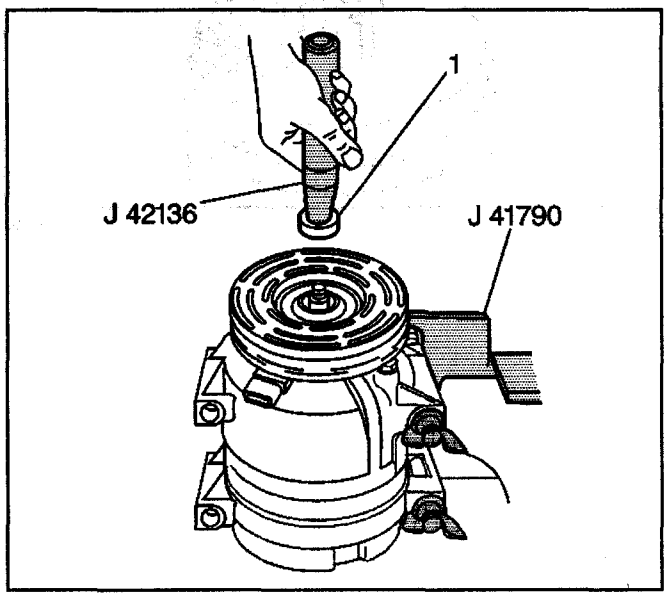
237126

Compressor Shaft Seal Install (V7 - Direct Mount)

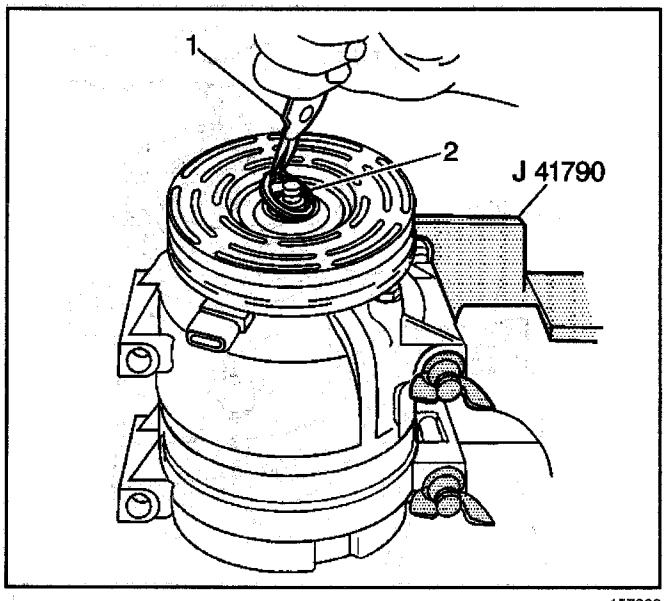
Tools Required

- *J 39893* Pressure Test Adaptor
- *J 34614* Shaft Seal Protector
- *J 42136* A/C Lip Seal Remover

1. Dip the new compressor shaft seal (1) in clean 525 viscosity refrigerant oil and assemble the seal onto the *J 42136*, by turning the handle clockwise.
2. Install the *J 34614* onto the compressor shaft.
3. Using a rotary motion, slide the new compressor shaft seal onto the compressor shaft until the seal is fully seated.
4. Remove the *J 34614* by turning the handle counterclockwise.



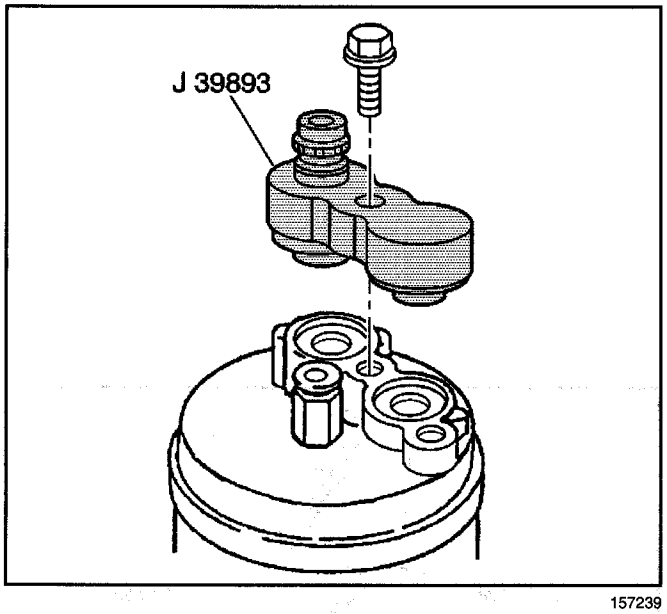
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5. Install a new compressor shaft seal retaining ring (2), using internal snap ring pliers (1).

   Make sure that the chamfer side of the retaining ring is facing up and that the retaining ring snaps into the groove.



157239

6. Leak test the compressor, using the *J 39893*.
   - 6.1. Install the *J 39893* onto the compressor and pressurize the suction and high-side of the compressor with R-134a.
   - 6.2. Temporarily install the shaft nut.
   - 6.3. With the compressor in a horizontal position, rotate the compressor shaft in the normal direction of rotation, several turns by hand.
   - 6.4. Leak test the seal area and repair if necessary.

   Remove the shaft nut.
7. Recover the refrigerant.
8. Remove the *J 39893*.
9. Remove and clean any excess oil resulting from installing the new seal parts from the shaft and inside the compressor neck.
10. Install the compressor clutch plate and hub assembly. Refer to *Compressor Clutch Plate/Hub Assembly Install (V7 - Direct Mount)*.
11. Remove the compressor from the *J 41790*.
12. Install the compressor into the vehicle.

Compressor Pressure Relief Valve Install (V5 - Conventional Mount)

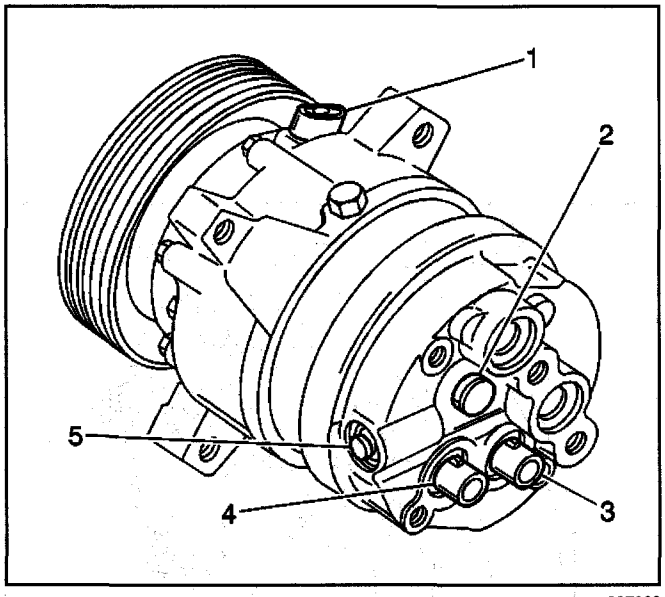
1. Clean the valve seat area on the rear head.
2. Lubricate the O-ring of the new pressure relief valve and the O-ring assembly using new 525 viscosity refrigerant oil.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the new pressure relief valve (2).

   Tighten

   Tighten the valve to 9 N·m (80 lb in).
4. Evacuate and recharge the system.
5. Perform a leak test. Refer to *Compressor Leak Testing (V5 - Conventional Mount).*



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Compressor Pressure Relief Valve Install (V7 - Direct Mount)

Tools Required

J 41790 Compressor Holding Fixture

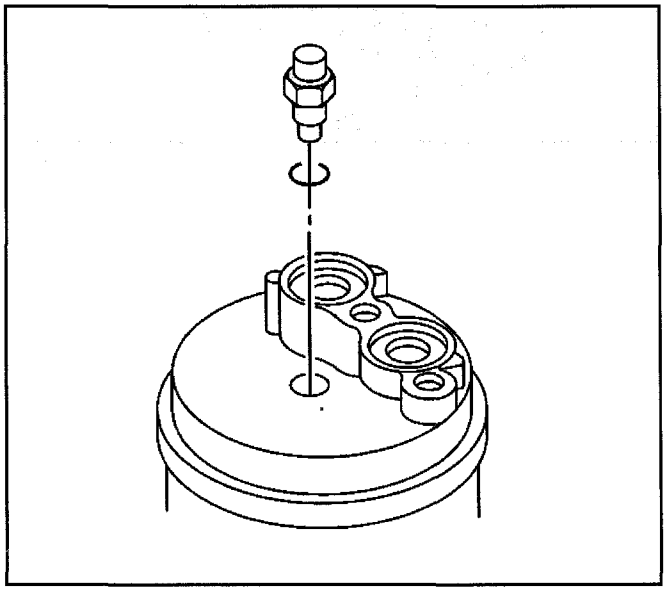
1. Clean the pressure relief valve seat area of the rear head.
2. Lubricate the O-ring of the new pressure relief valve with clean 525 viscosity refrigerant oil.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the new pressure relief valve into the compressor.

   Tighten

   Tighten the compressor pressure relief valve to 9 N·m (80 lb in).
4. Remove the compressor from the *J 41790.*
5. Install the compressor into the vehicle.



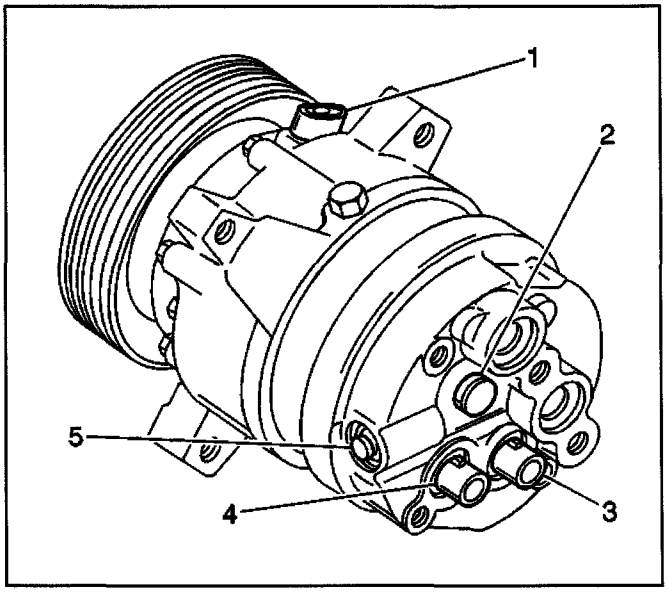
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Compressor Control Switches Install (V5 - Conventional Mount)

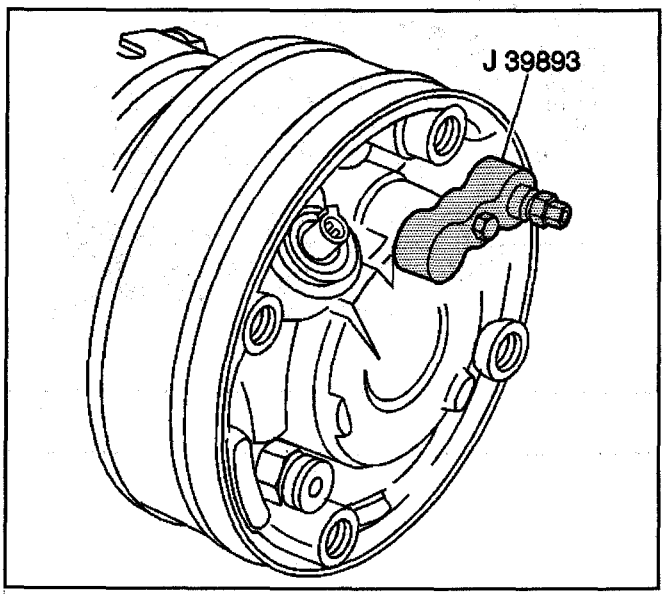
Tools Required

J 5403 Snap Ring Pliers

1. Inspect the switch cavity and the O-ring groove in the rear head for dirt or foreign material.
   Clean the cavity and groove as necessary.
2. Coat the new O-ring using clean 525 viscosity refrigerant oil.
3. Install the O-ring into the groove in the switch cavity.
4. Lubricate the switch housing using clean 525 viscosity refrigerant oil.
5. Carefully insert the switch (3 or 4) into the switch cavity until the switch bottoms in the cavity.
6. Using the *J 5403*, install the switch retaining ring with the high point of the curved sides adjacent to the switch housing.



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7. Ensure that the retaining ring is seated in the retaining ring groove in the switch cavity.
8. Evacuate and recharge the system.
9. Perform a leak test. Refer to *Compressor Leak Testing (V5 - Conventional Mount)*.

Compressor Leak Testing (V5 - Conventional Mount)

- *J 39400-A* Electronic Halogen Leak Detector
- *J 39500-B* A/C Refrigerant Recovery, Recycling and Recharging (ACR4) System
- *J 39893* Pressure Testing Connector

1. With the sealing washers in place, install the *J 39893* on the rear head of the compressor.
2. Connect the gage charging lines and the *J 39500-B*.
3. Pressurize the suction and the high-side of the compressor using R-134a refrigerant.
4. With the compressor in a horizontal position, rotate the compressor shaft several turns by hand in the operating direction.
5. Using the *J 39400-A*, inspect for leaks at the following locations:
   5.1. The pressure relief valve
   5.2. The rear head switch
   5.3. The front head seal
   5.4. The rear head seal
   5.5. The through bolt head gaskets
   5.6. The compressor shaft seal
6. Perform the measures necessary to correct any external leaks found.
7. Inspect for leaks again following any repair.
8. Recover the refrigerant.
9. Disconnect the hoses from the *J 39893*.
10. Remove the *J 39893*.

O-Ring Replacement

Install new GM-approved service replacement air conditioning O-rings whenever you service a A/C connection. Do not install different service replacement seals when seals are provided with new parts being replaced. The refrigerant R-134a may leak if the incorrect seals are used. Refer to the part number of the O-ring for identification. Do not rely on the former color-coating method of O-ring identification. Some formerly color-coated service replacement O-rings may now be black.

Coat the air conditioning O-ring seals with the 525 viscosity refrigerant oil before installation. Slip the seals onto the flange in order to ensure proper locating and sealing. Do not soak the seals in refrigerant oil. Soaking the seals in refrigerant oil may cause the following conditions:

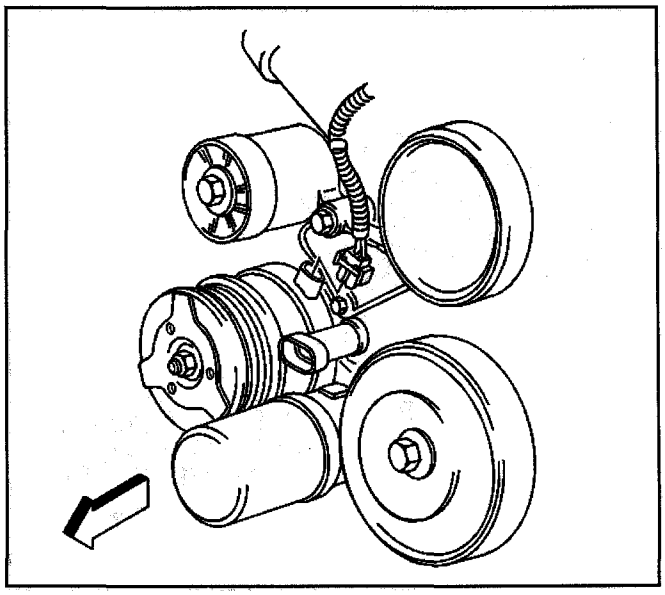
- Swelling of the O-ring
- Reduction in the sealing effectiveness

Inspect the O-rings for nicks or deformation before installation. Replace damaged O-rings in order to prevent leakage.

Compressor Mounting Bracket Replacement (3.8L)

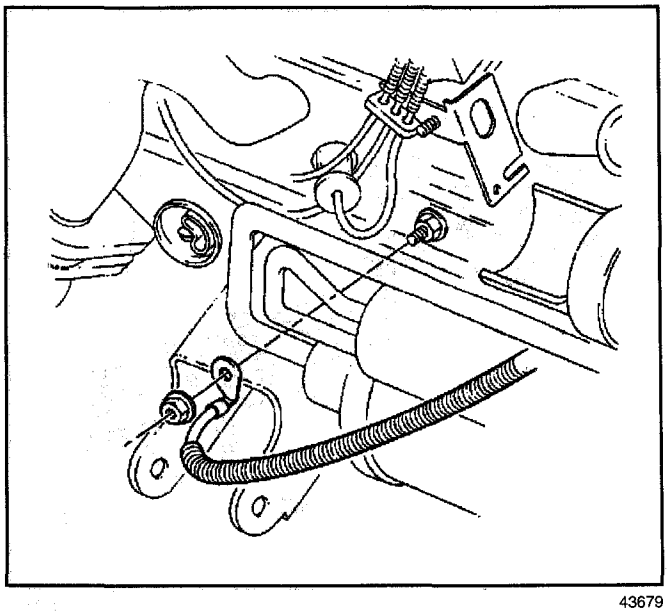
Removal Procedure

1. Remove the serpentine drive belt. Refer to *Drive Belt Replacement* in Engine Mechanical.
2. Disconnect the electrical connector at the A/C compressor.



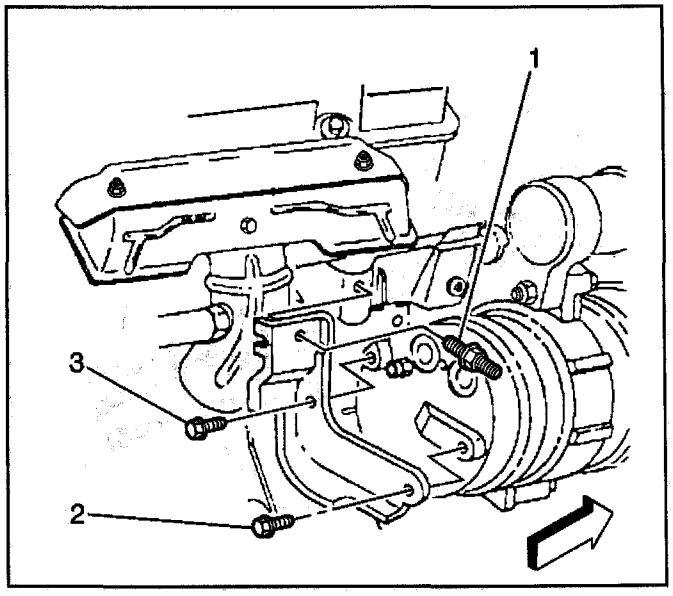
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3. Remove the negative battery cable nut from the engine block stud.
4. Remove the negative battery cable from the stud.
5. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

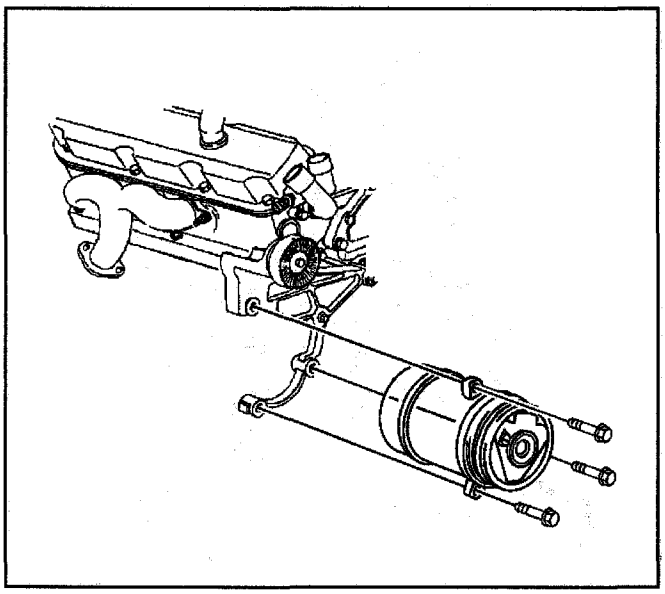


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6. Remove the A/C compressor rear bolts (2, 3).

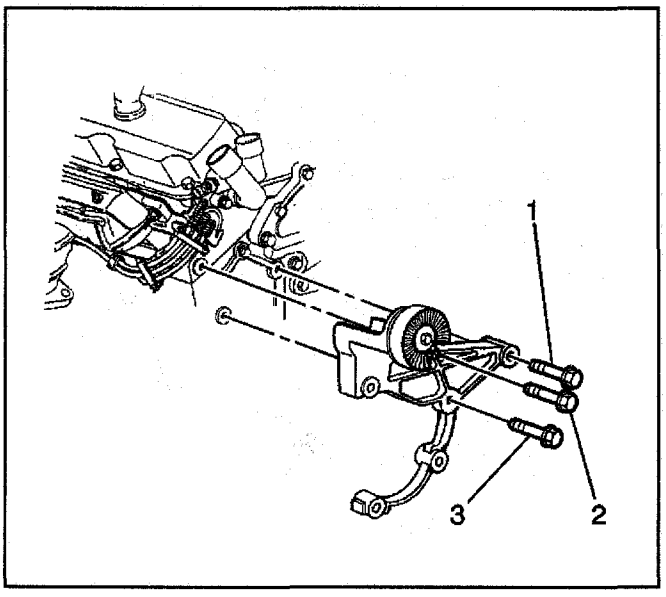


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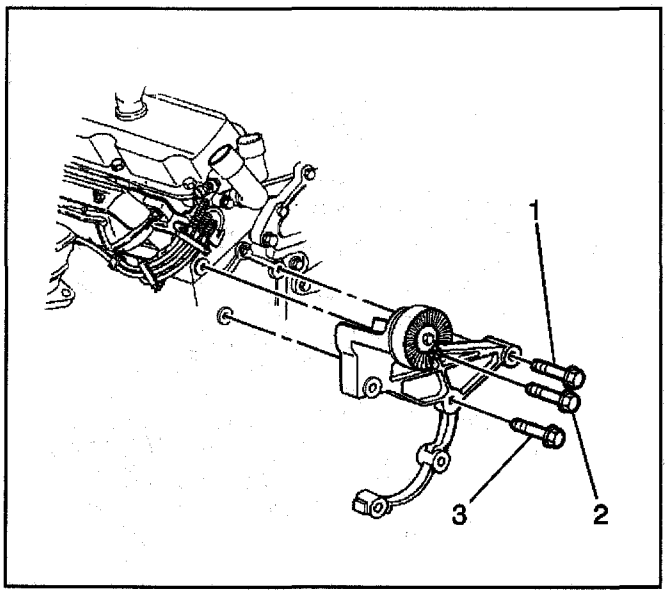
7. Remove the A/C compressor bolts.
8. Move the A/C compressor forward in order to allow access to the bracket.



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9. Remove the A/C compressor bracket bolts (1, 2, 3).
10. Remove the A/C compressor bracket.

    Transfer the idler pulley from the old bracket to the new bracket.



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Installation Procedure

1. Install the A/C compressor bracket.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the A/C compressor bolts (1, 2, 3).

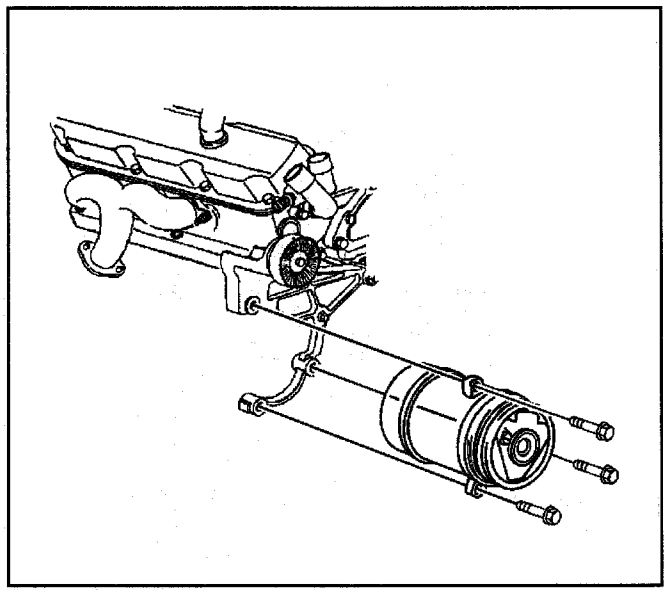
   Tighten

   - Tighten the A/C compressor bolt (1) to 30 N·m (22 lb. ft).
   - Tighten the A/C compressor bolts (2, 3) to 50 N·m (37 lb. ft)

3. Move the A/C compressor rearward to the bracket.
4. Install the A/C compressor bolts.

   Tighten

   Tighten the A/C compressor bolts to 50 N·m (37 lb ft).

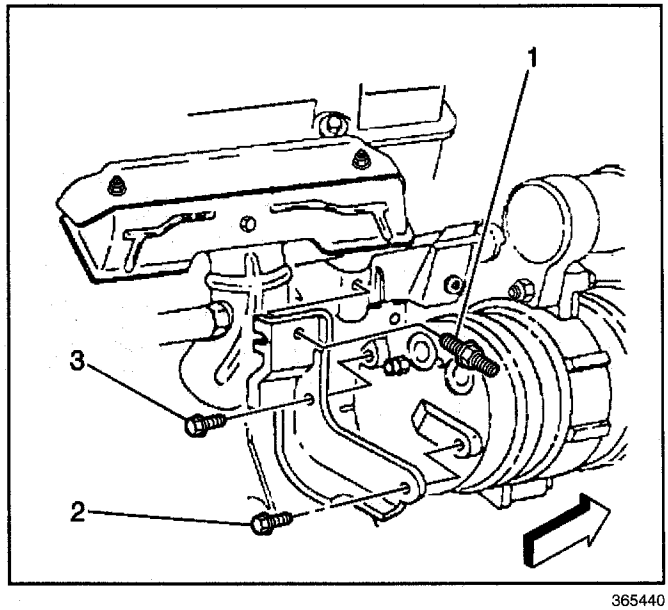


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5. Install the A/C compressor rear bolts (2, 3).

   Tighten

   Tighten the A/C compressor rear bolts (2, 3) to 30 N·m (22 lb ft).
6. Lower the vehicle.

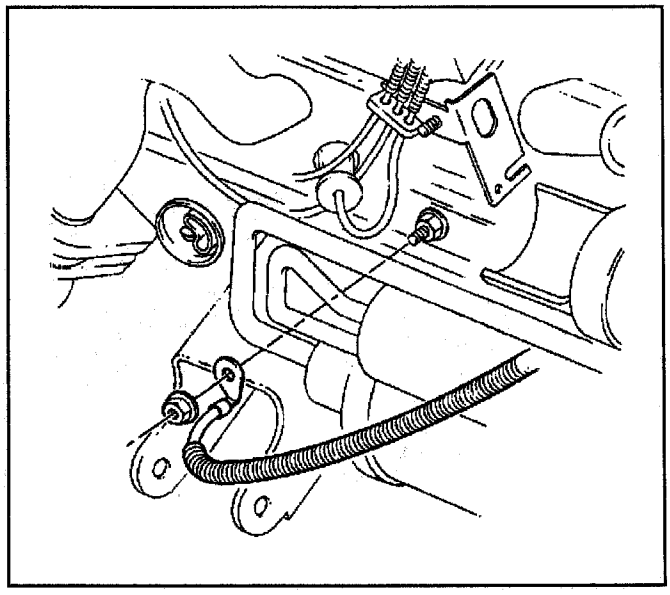


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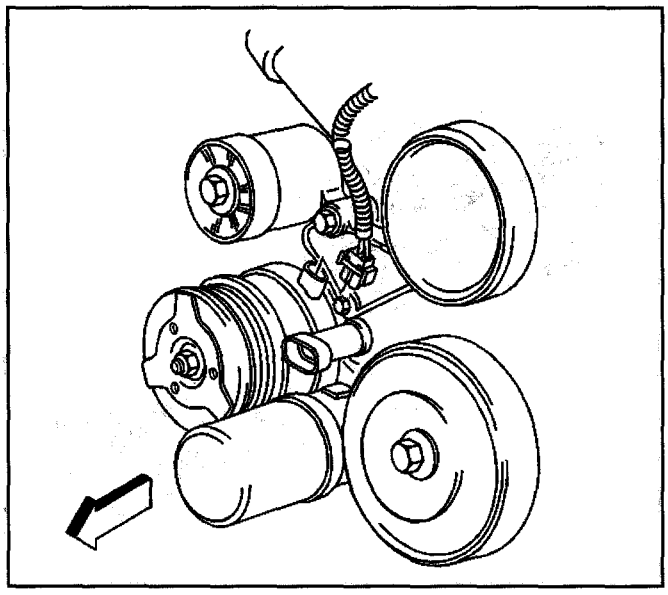
7. Install the negative battery cable to the stud.
8. Install the negative battery cable nut to the engine block stud.

   Tighten

   Tighten the negative battery cable nut to the engine block to 25 N·m (18 lb ft).

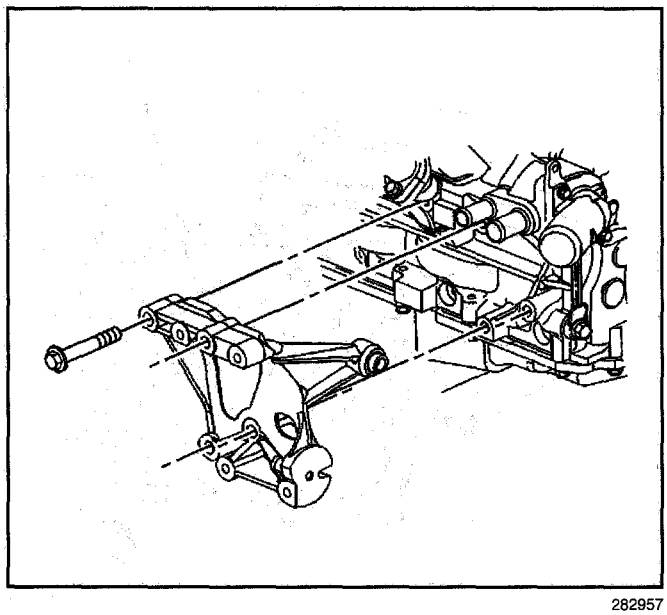


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9. Connect the electrical connector at the A/C compressor.
10. Install the serpentine drive belt. Refer to *Drive Belt Replacement* in Engine Mechanical.

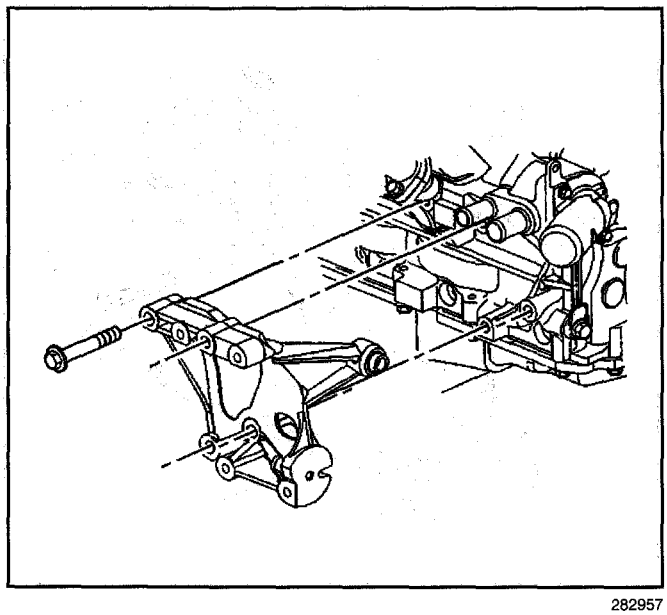


282957

Compressor Mounting Bracket Replacement (5.7L)

Removal Procedure

1. Remove the A/C drive belt. Refer to *Drive Belt Replacement (A/C)* in Engine Mechanical.
2. Remove the A/C compressor. Refer to *Compressor Replacement (5.7L)*.
3. Remove the A/C compressor bracket bolts.
4. Remove the A/C compressor bracket.
5. Remove the A/C belt tensioner from the bracket. Refer to *Drive Belt Tensioner Replacement (A/C)*.
6. Remove the A/C belt idler pulley from the bracket. Refer to *Drive Belt Idler Pulley Replacement (A/C)*.



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Installation Procedure

1. Install the A/C belt idler pulley from the bracket. Refer to *Drive Belt Idler Pulley Replacement (A/C)*.
2. Install the A/C belt tensioner from the bracket. Refer to *Drive Belt Tensioner Replacement (A/C)*.
3. Install the A/C compressor bracket.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the A/C compressor bracket bolts.

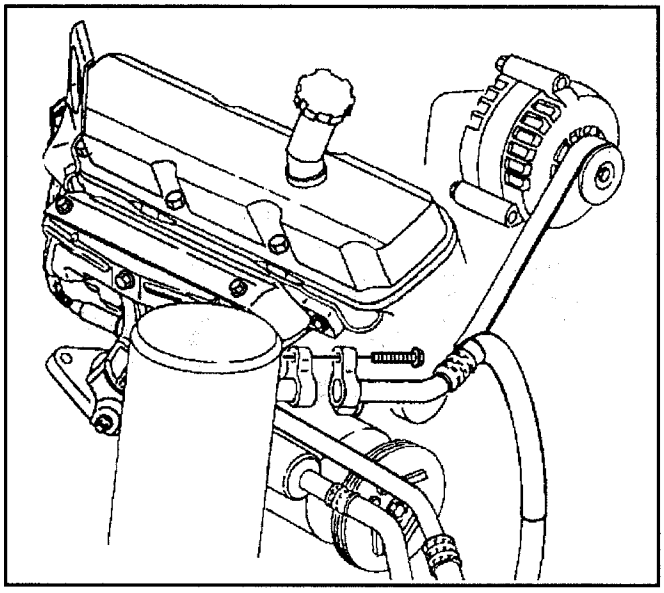
   Tighten

   Tighten the A/C compressor bracket bolts to 50 N·m (37 lb ft).
5. Install the A/C compressor. Refer to *Compressor Replacement (5.7L)*.
6. Install the A/C drive belt. Refer to *Drive Belt Replacement (A/C)* in Engine Mechanical.

Compressor Hose Assembly Replacement (3.8L)

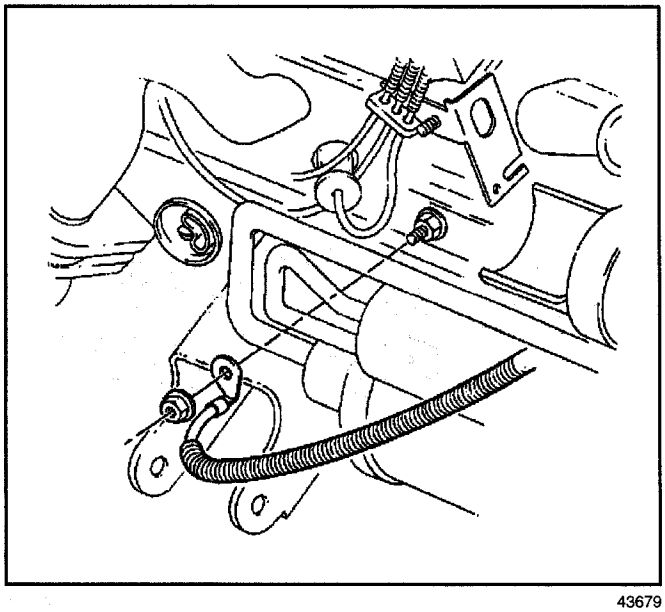
Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging*.
2. Remove the A/C compressor and condenser hose bolt at the accumulator.
3. Discard the O-ring.



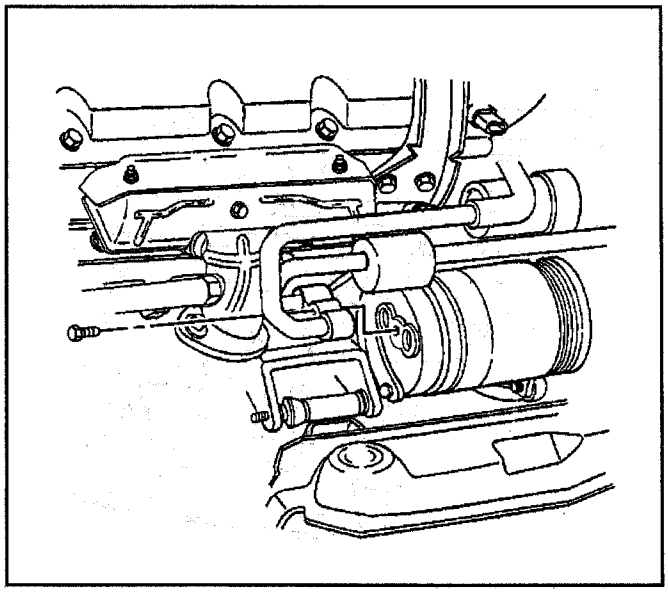
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4. Remove the negative battery cable nut from the engine block stud.
5. Remove the negative battery cable from the stud.
6. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

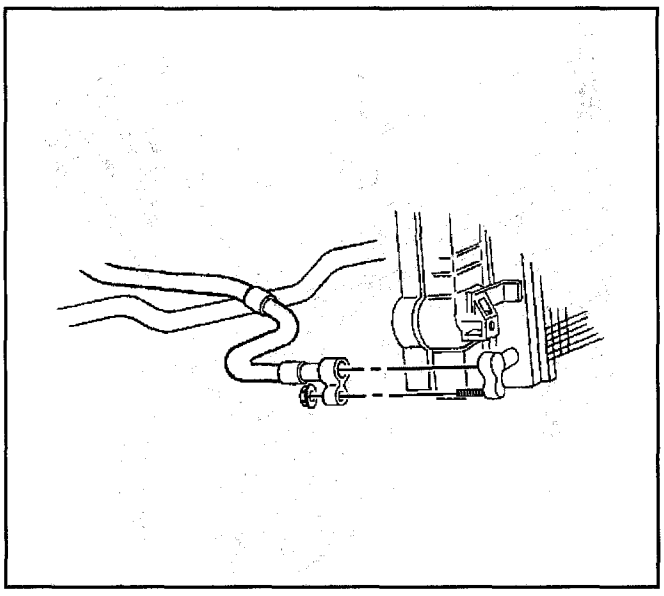


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7. Remove the A/C compressor and condenser hose bolt.
8. Discard the O-ring.

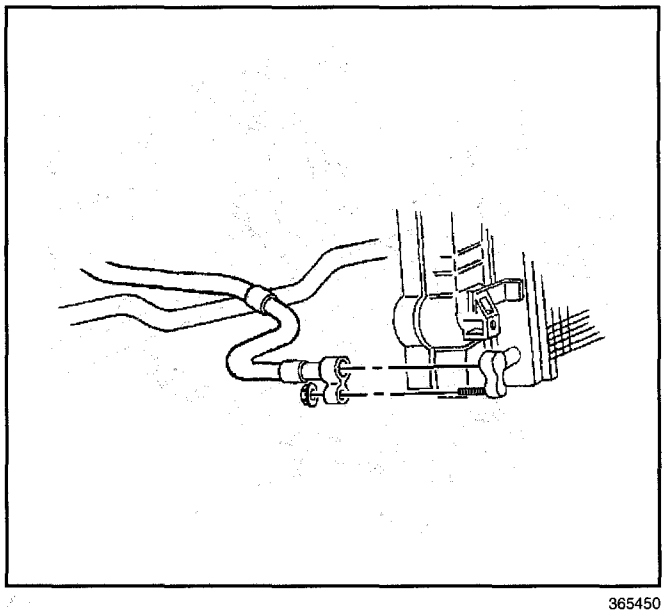


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9. Remove the A/C compressor and condenser hose nut at the condenser.
10. Discard the O-ring.
11. Lower the vehicle.
12. Remove the A/C compressor and condenser hose from the vehicle.



365450

Installation Procedure

Lightly coat the O-rings with a mineral base 525 viscosity refrigerant oil.

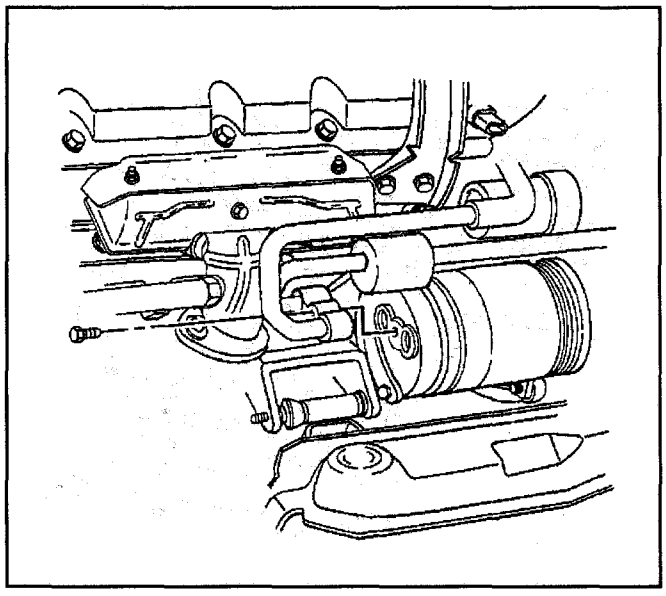
1. Install the A/C compressor and condenser hose to the vehicle.
2. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
3. Install a new O-ring.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the A/C compressor and condenser hose nut at the condenser.

   Tighten

   Tighten the A/C compressor and condenser hose nut at the condenser to 16 N·m (12 lb ft).



365423

5. Install a new O-ring.
6. Install the A/C compressor and condenser hose bolt.

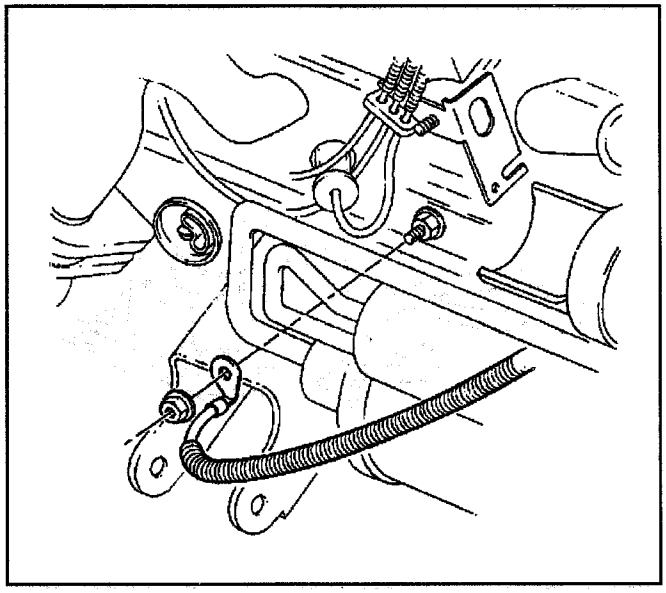
   Tighten

   Tighten the A/C compressor and condenser hose bolt to 50 N·m (37 lb ft).
7. Lower the vehicle.

8. Install the negative battery cable to the stud.
9. Install the negative battery cable nut to the engine block stud.

   Tighten

   Tighten the negative battery cable nut to the engine block stud to 25 N·m (18 lb ft).

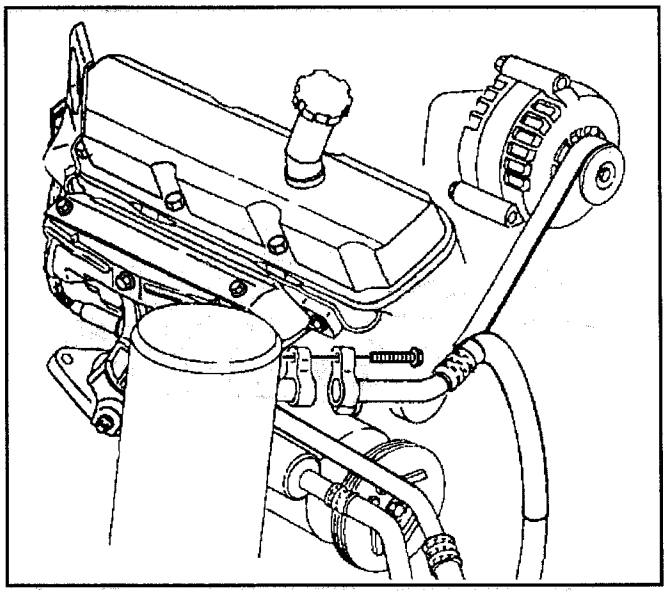


43679

10. Install a new O-ring.
11. Install the A/C compressor and condenser hose bolt at the accumulator.

    Tighten

    Tighten the A/C compressor and condenser hose bolt at the accumulator to 16 N·m (12 lb ft).
12. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging*.
13. Perform a leak test on the A/C system. Refer to *Leak Testing*.

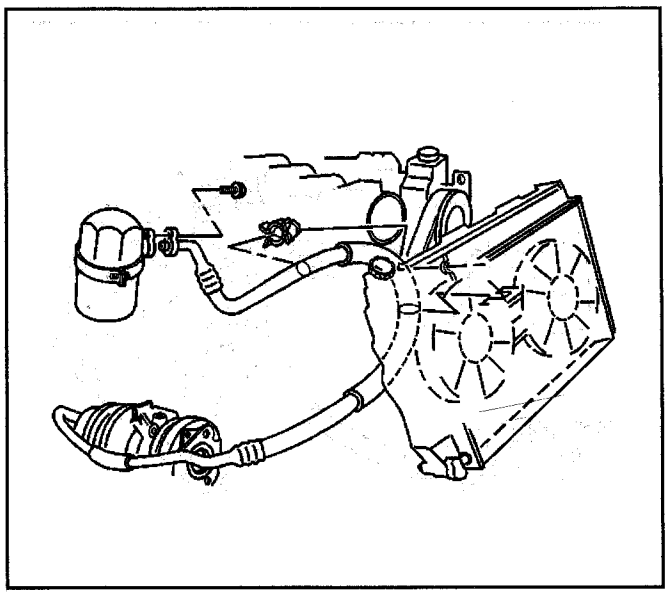


282936

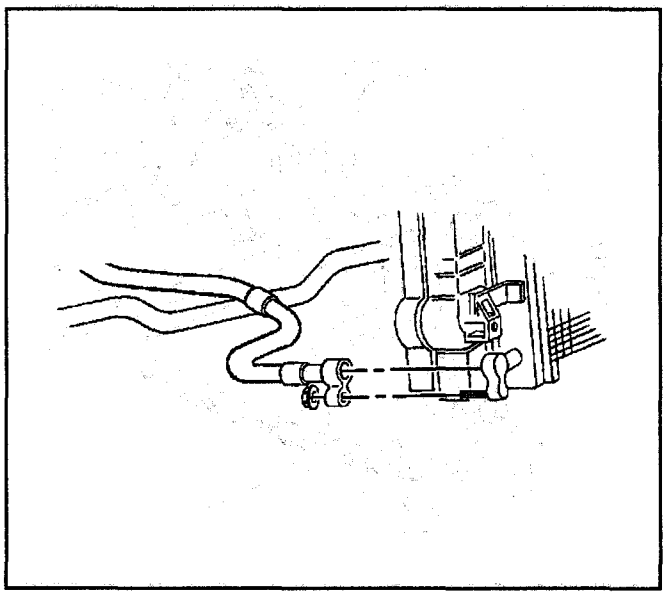
Compressor Hose Assembly Replacement (5.7L)

Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging*.
2. Remove the A/C compressor and condenser hose from the clip on the fan shroud.
3. Remove the A/C compressor and condenser hose bolt at the accumulator.
4. Discard the O-ring.
5. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

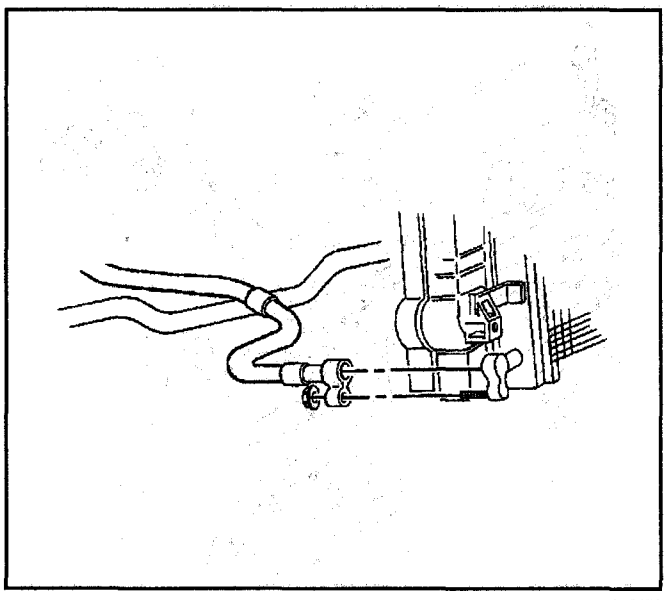


282941



365450

6. Remove the A/C compressor and condenser hose nut at the condenser:
7. Discard the O-ring.
8. Remove the A/C compressor. Refer to *Compressor Replacement (5.7L)*.
9. Remove the A/C compressor and condenser hose from the vehicle.
10. Discard the O-ring.



365450

Installation Procedure

Lightly coat the O-rings with the mineral base 525 viscosity refrigerant oil.

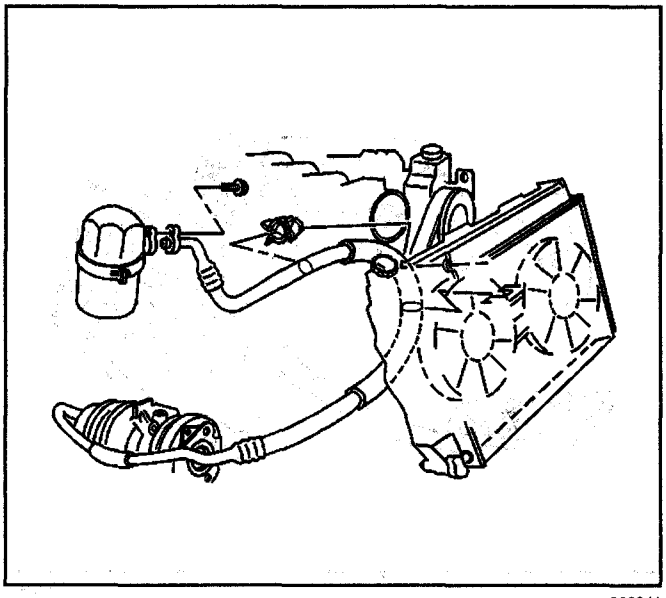
1. Install a new O-ring to the A/C compressor and condenser hose.
2. Install the compressor and condenser hose to the vehicle.
3. Install the A/C compressor. Refer to *Compressor Replacement (5.7L)*.
4. Install a new O-ring.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the A/C compressor and condenser hose nut at the condenser.

   Tighten

   Tighten the A/C compressor and condenser hose nut at the condenser to 16 N·m (12 lb ft).
6. Lower the vehicle.



282941

7. Install a new O-ring.
8. Install the A/C compressor and condenser hose bolt at the accumulator.

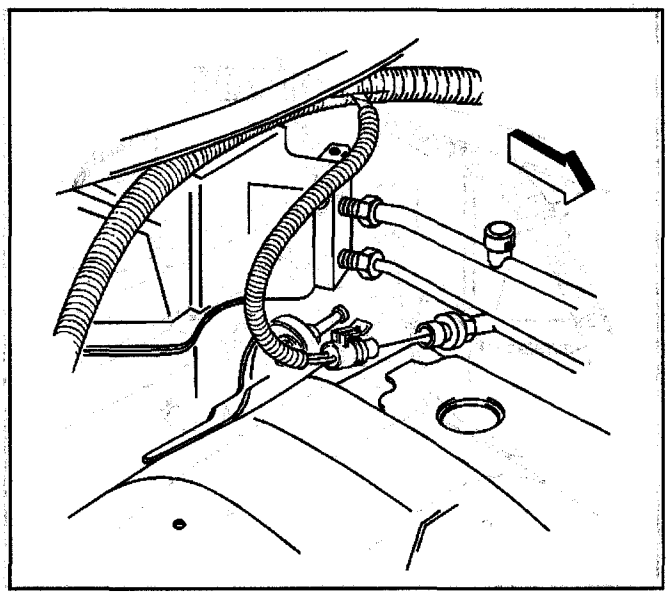
   Tighten

   Tighten the A/C compressor and condenser hose bolt at the accumulator to 16 N·m (12 lb ft).
9. Install the A/C compressor and condenser hose to the clip on the fan shroud.
10. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging*.
11. Perform a leak test on the A/C system. Refer to *Leak Testing*.

Evaporator Tube Replacement

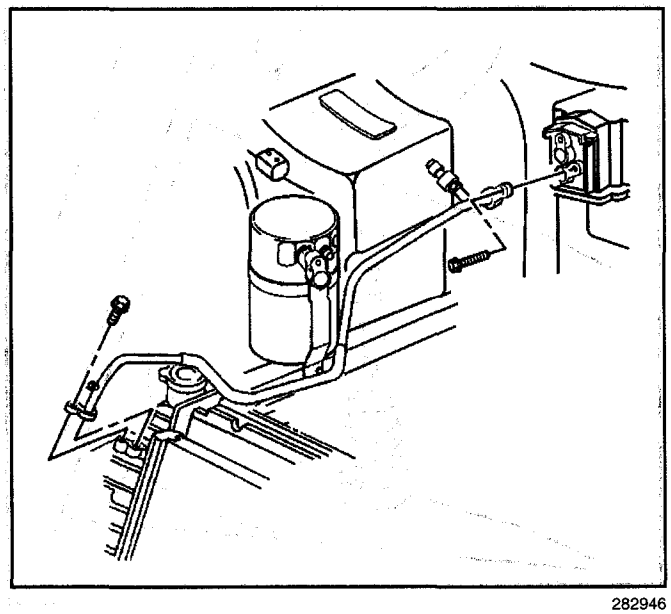
Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.*
2. Disconnect the electrical connector at the A/C refrigerant pressure sensor.



282947

3. Remove the A/C evaporator tube bolt at the module.
4. Remove the A/C evaporator tube bolt at the condenser.
5. Remove the A/C evaporator tube from the vehicle.
6. Discard the O-rings.
7. Remove the orifice and the pressure sensor, if replacing the tube.



282946

Installation Procedure

Lightly coat the O-rings with a mineral base 525 viscosity refrigerant oil.

1. Install the orifice and the pressure sensor, if replacing the tube.
2. Install new O-rings.
3. Install the A/C evaporator tube to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

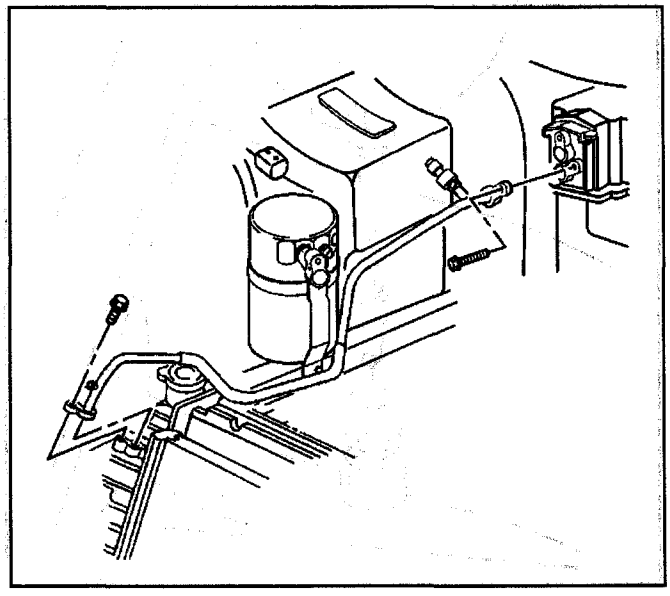
4. Install the A/C evaporator tube bolt at the condenser.

   Tighten

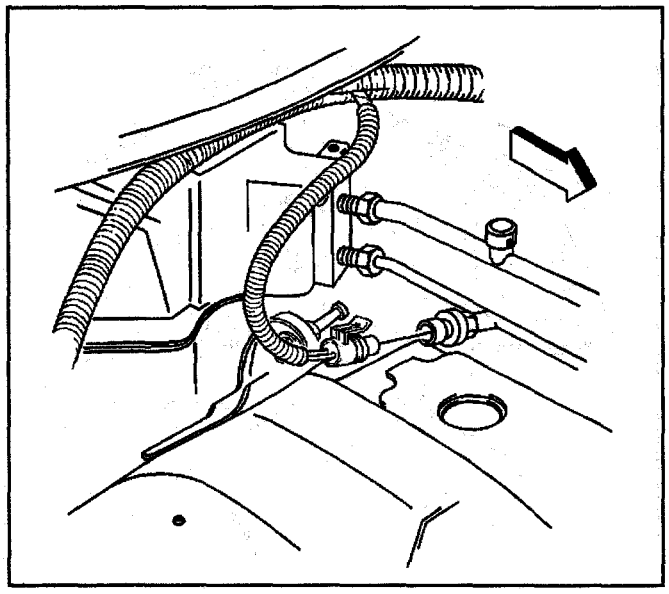
   Tighten the A/C evaporator tube bolt at the condenser to 16 N·m (12 lb ft).
5. Install the A/C evaporator tube bolt at the module.

   Tighten

   Tighten the A/C evaporator tube bolt at the module to 16 N·m (12 lb ft).

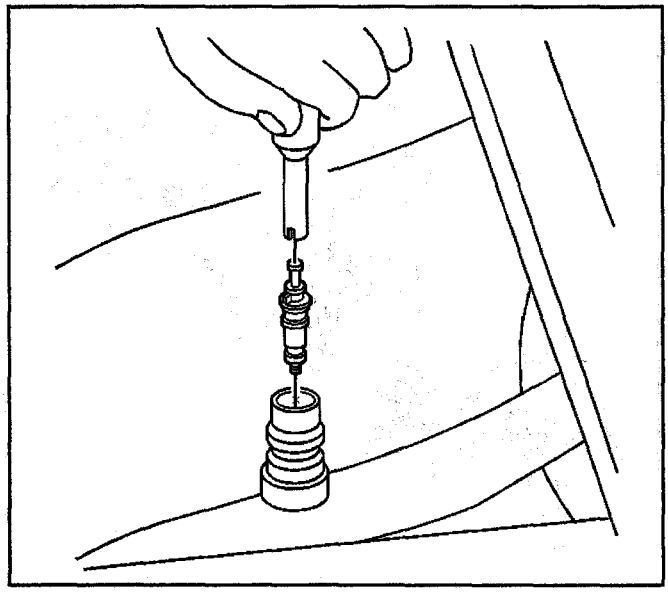


282946



282947

6. Connect the electrical connector at the A/C refrigerant pressure sensor.
7. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
8. Perform a leak test on the A/C system. Refer to *Leak Testing.*



297244

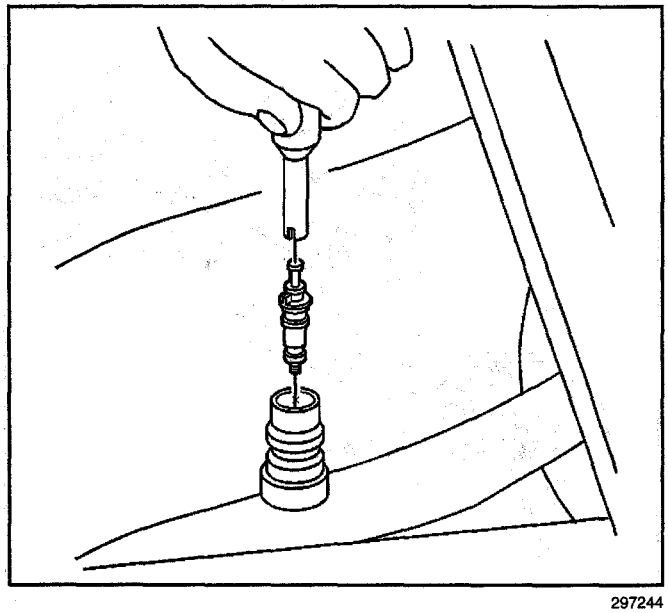
Service Ports Replacement

Removal Procedure

Tools Required

J 34611-A Valve Core Remover and Installer

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.*
2. Remove the valve core using *J 34611-A.*



297244

Installation Procedure

Tools Required

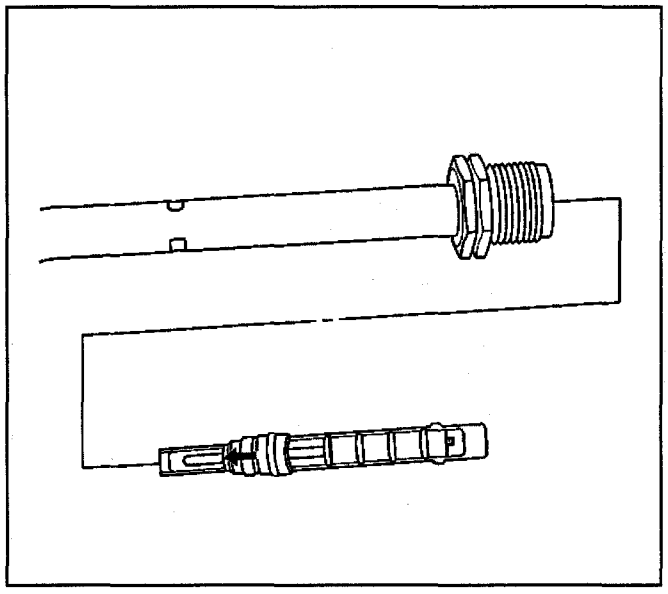
J 34611-A Valve Core Remover and Installer

1. Install the valve core using *J 34611-A.*
2. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
3. Test the fitting for leaks. Refer to *Leak Testing.*

Expansion (Orifice) Tube Replacement

Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.*
2. Remove the A/C evaporator. Refer to *Accumulator Replacement.*
3. Remove the orifice from the A/C evaporator tube.

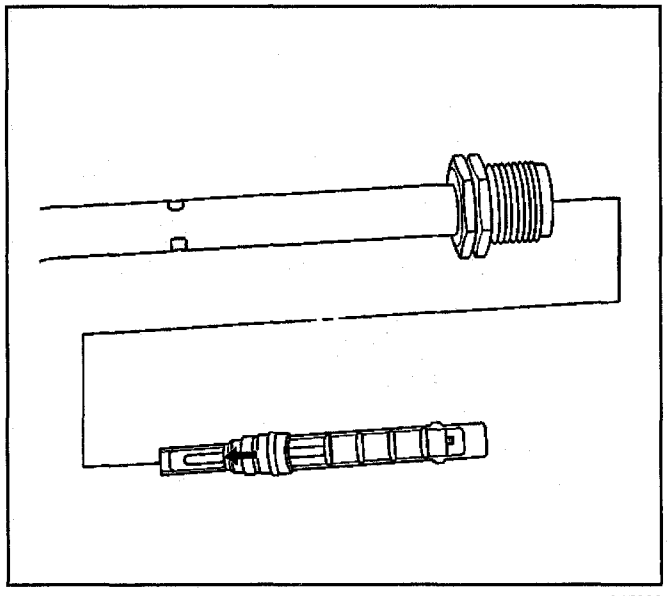


247323

Installation Procedure

Important: Install the long screen inlet end toward the condenser.

1. Install the orifice in the A/C evaporator tube.
2. Install the A/C evaporator. Refer to *Accumulator Replacement.*
3. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
4. Leak test the fitting for leaks. Refer to *Leak Testing.*

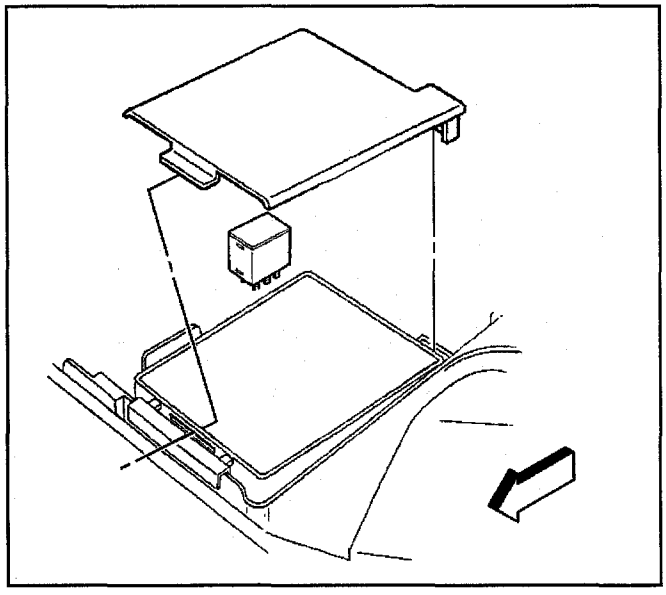


247323

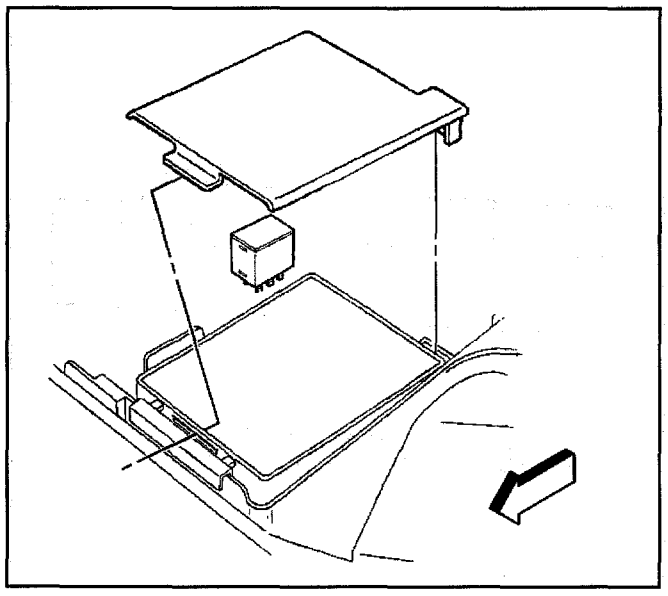
Compressor Relay Replacement

Removal Procedure

1. Remove the cover from the number 2 underhood electrical center.
2. Remove the A/C compressor relay. Refer to *Electrical Center Identification.*



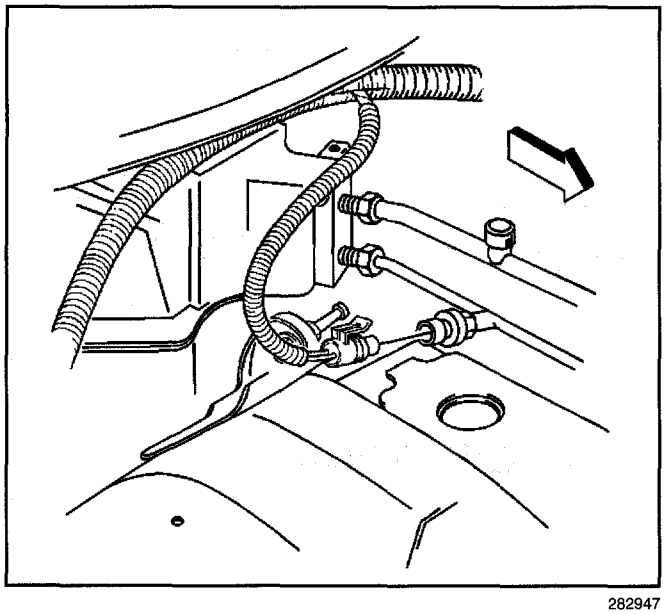
401242



401242

Installation Procedure

1. Install the A/C compressor relay. Refer to *Electrical Center Identification*.
2. Install the cover on the number 2 underhood electrical center.



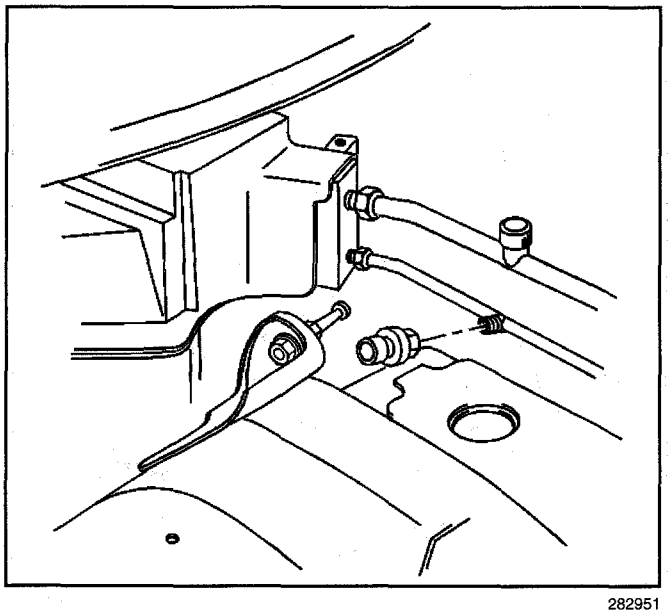
282947

A/C Refrigerant Pressure Sensor Replacement

Removal Procedure

Important: The A/C refrigerant pressure sensor is mounted on a Schrader® valve. Recovery of the A/C system is not needed.

1. Disconnect the electrical connector at the A/C refrigerant pressure sensor.



282951

2. Remove the A/C refrigerant pressure sensor and the seal.
3. Discard the seal.

Installation Procedure

Coat the seal with a mineral base 525 viscosity refrigerant oil.

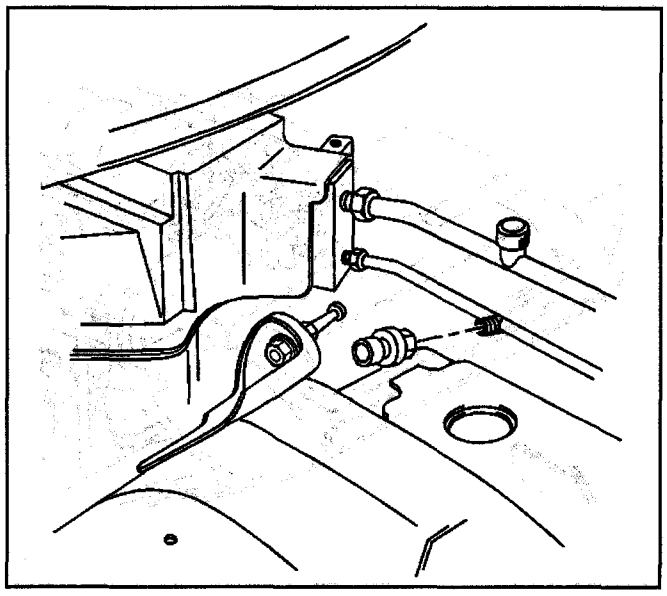
1. Install a new seal to the A/C refrigerant pressure sensor fitting.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the A/C refrigerant pressure sensor.

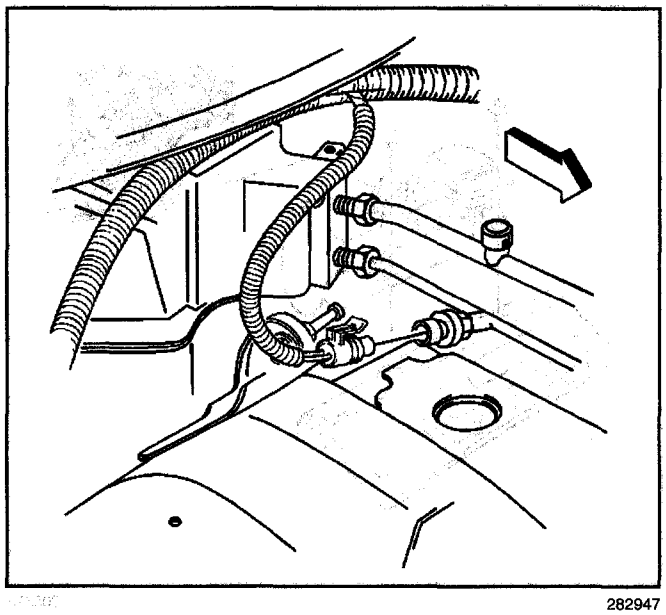
   Tighten

   Tighten the A/C refrigerant pressure sensor to 6 N·m (53 lb in).



282951

3. Connect the electrical connector to the A/C refrigerant pressure sensor.

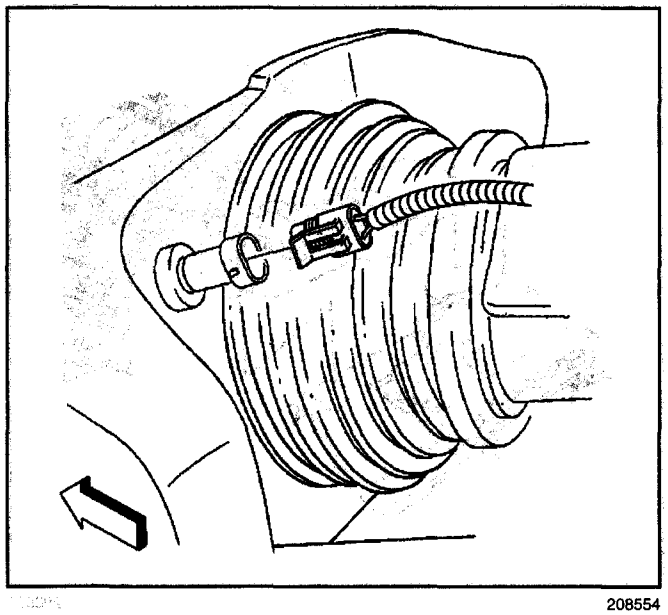


282947

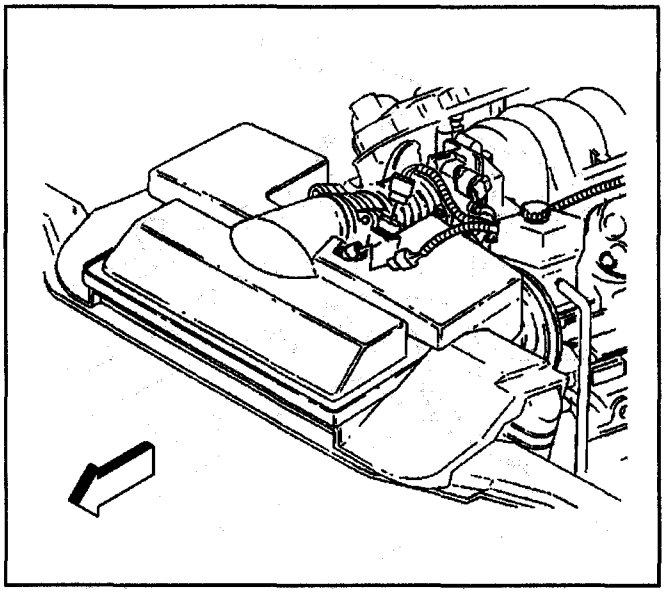
Condenser Replacement

Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging*.
2. Disconnect the intake air temperature (IAT) sensor connector at the air intake duct, if equipped with the 3800 engine.

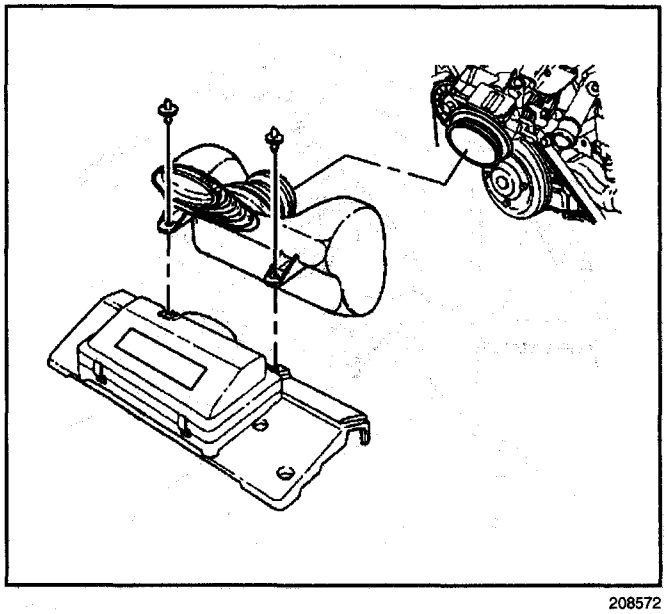


208554



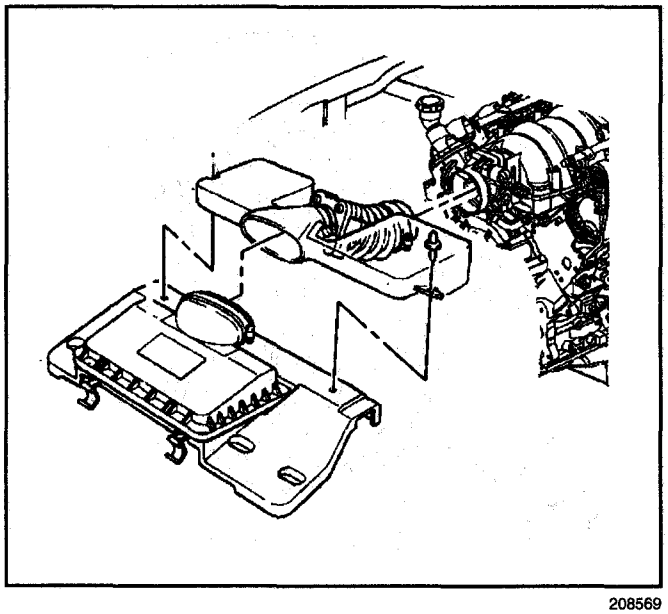
208553

3. Disconnect the intake air temperature (IAT) sensor and mass airflow (MAF) sensor connectors at the air intake duct, if equipped with the 5.7L engine.



208572

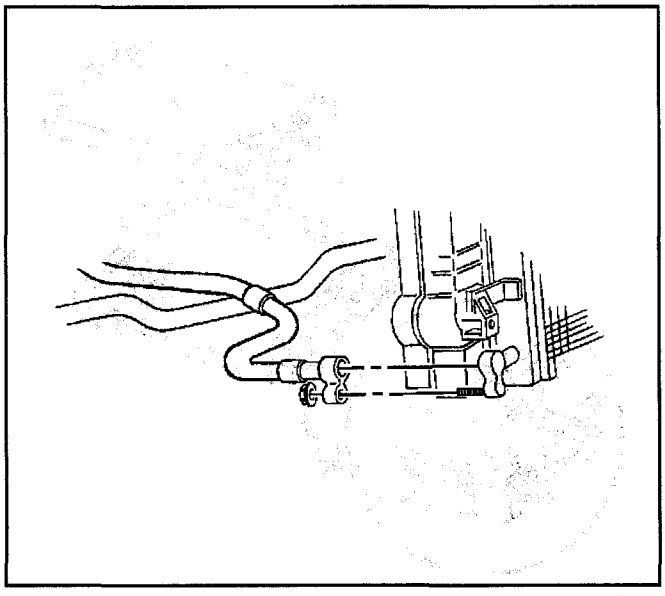
4. Remove the air intake duct, if equipped with the 3800 engine.



208569

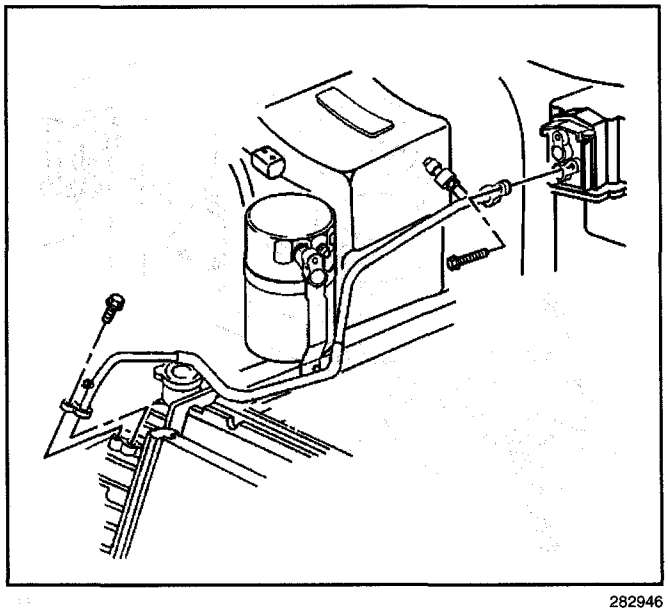
5. Remove the air intake duct, if equipped with the 5.7L engine.
6. Remove the radiator support. Refer to *Radiator Support Replacement* in Engine Cooling.
7. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

8. Remove the A/C compressor and condenser hose nut at the condenser.
9. Discard the O-ring.



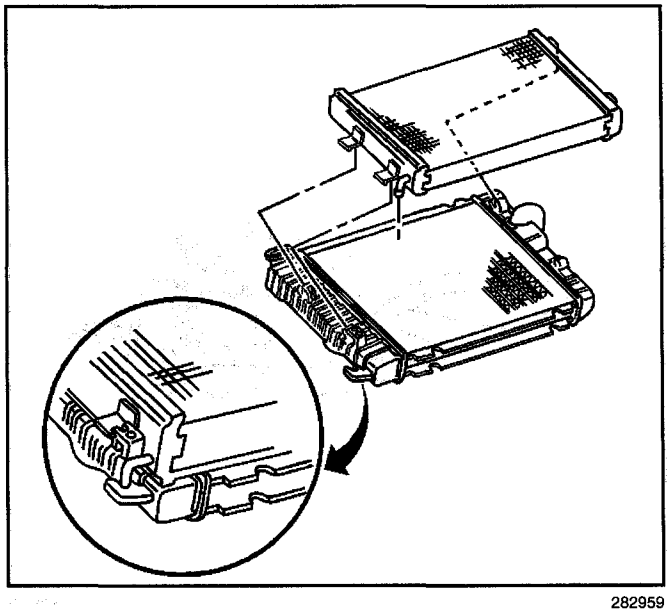
365450

10. Remove the A/C evaporator tube bolt at the condenser.
11. Discard the O-ring.
12. Remove the radiator air upper baffle from the condenser. Refer to *Radiator Air Baffle Assemblies and Deflectors (Upper)* in Engine Cooling.

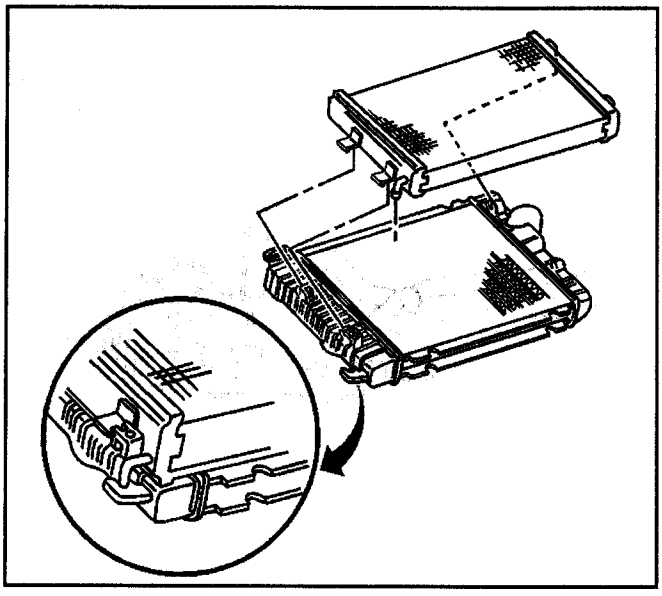


282946

13. Remove the condenser from the radiator.



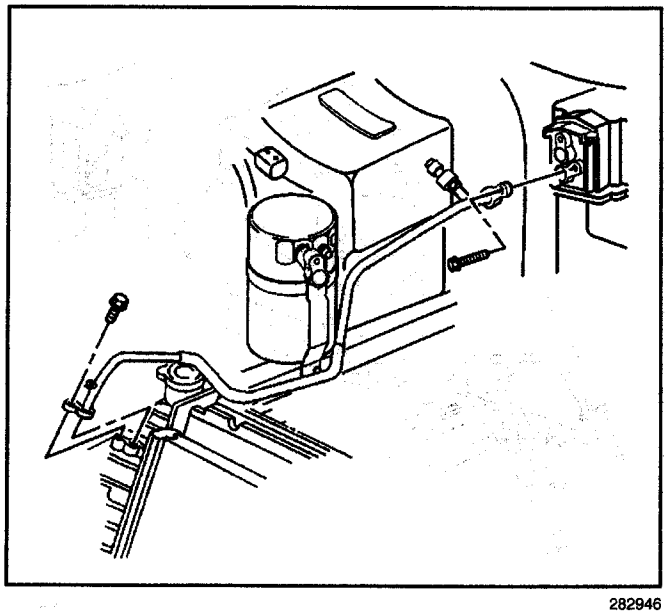
282959



282959

Installation Procedure

1. Install the condenser to the radiator.
2. Install the radiator air upper baffle to the condenser. Refer to *Radiator Air Baffle Assemblies and Deflectors (Upper)* in Engine Cooling.



282946

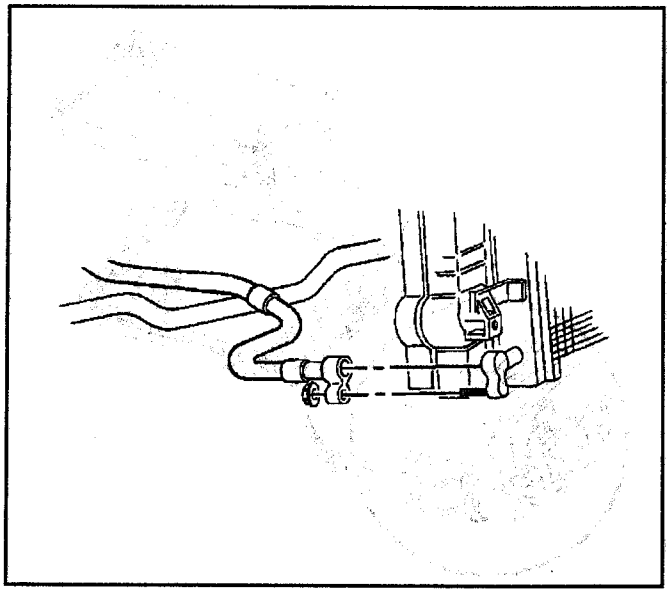
3. Install a new O-ring.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the A/C evaporator tube bolt at the condenser.

   Tighten

   Tighten the A/C evaporator tube bolt at the condenser to 16 N·m (12 lb ft).



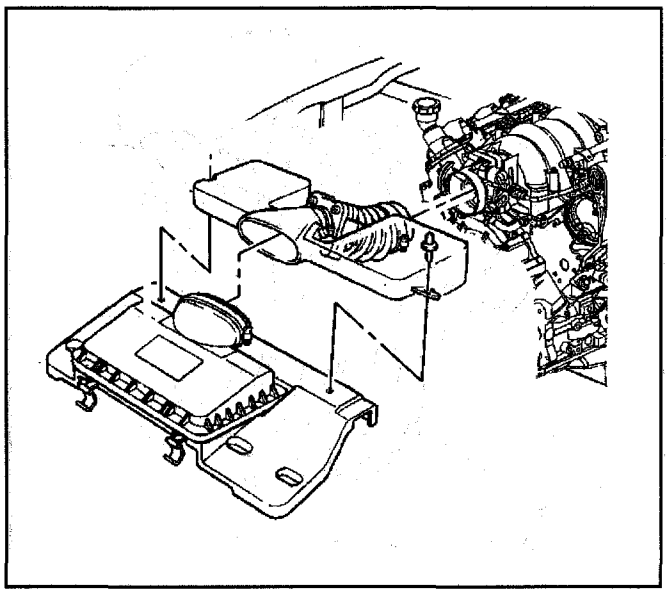
365450

5. Install a new O-ring.
6. Install the A/C compressor and condenser hose nut at the condenser.

   Tighten

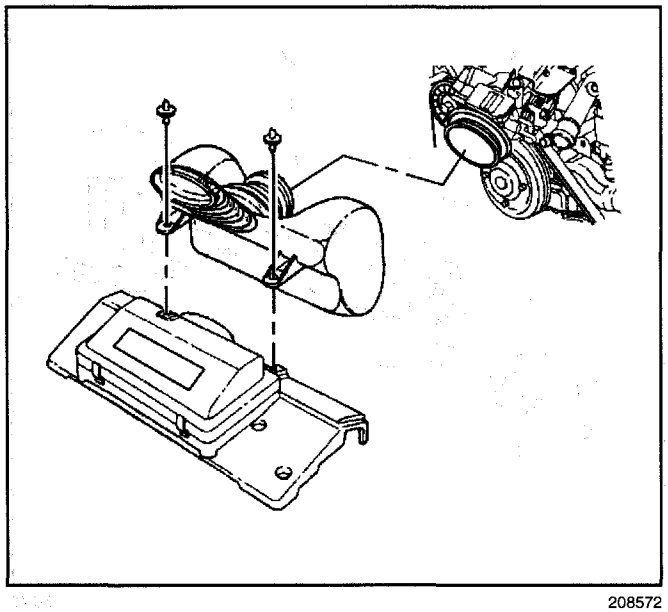
   Tighten the A/C compressor and condenser hose nut at the condenser to 16 N·m (12 lb ft).
7. Lower the vehicle.
8. Install the radiator support. Refer to *Radiator Support Replacement* in Engine Cooling.

9. Install the air intake duct, if equipped with the 5.7L engine.



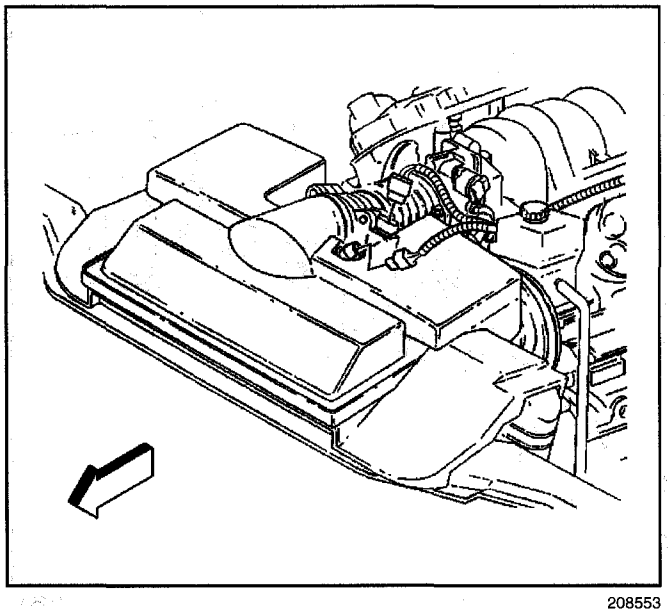
208569

10. Install the air intake duct, if equipped with the 3800 engine.

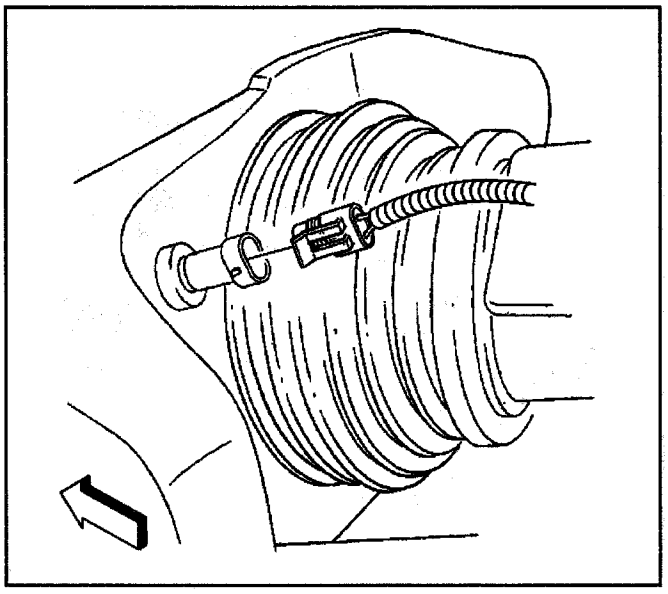


208572

11. Connect the intake air temperature (IAT) sensor and mass airflow (MAF) sensor connectors at the air intake duct, if equipped with the 5.7L engine.

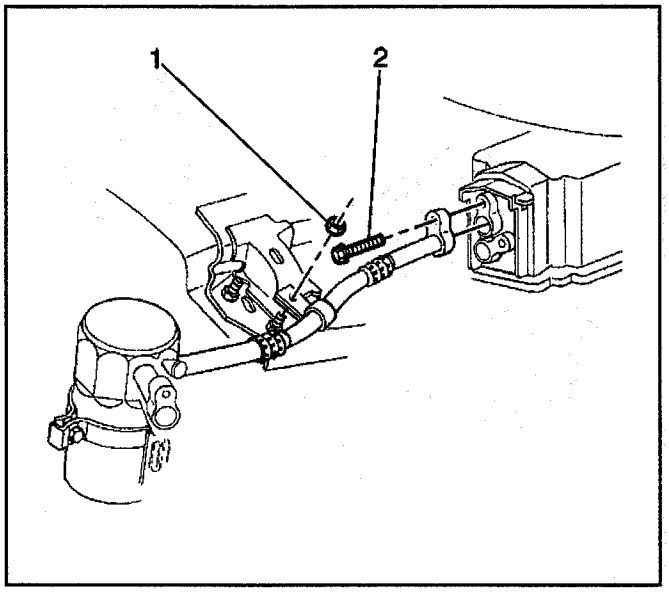


208553



208554

12. Connect the intake air temperature (IAT) sensor connector at the air intake duct, if equipped with the 3800 engine.
13. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging*.
14. Perform a leak test on the A/C system. Refer to *Leak Testing*.

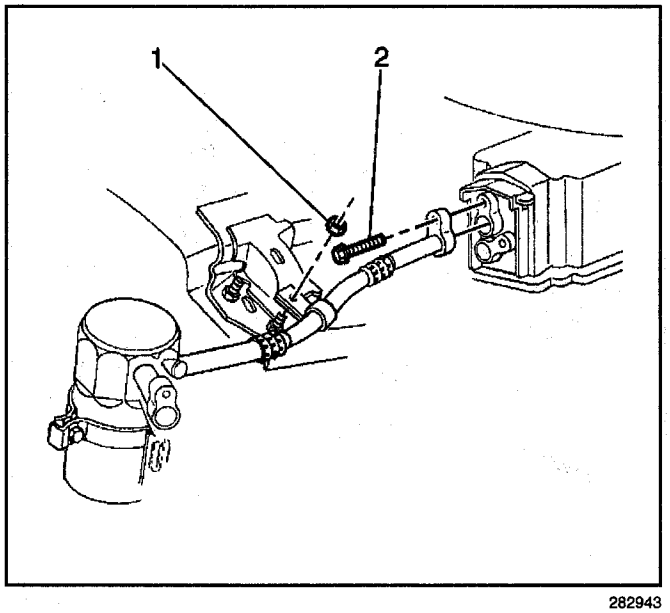


282943

Accumulator Replacement

Removal Procedure

1. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging*.
2. Disconnect the A/C compressor and condenser hose bolt at the accumulator:
3. Remove the accumulator bolt (2) at the module.
4. Remove the accumulator hose bracket nut (1) at the strut tower.
5. Remove the accumulator bracket bolt.
6. Remove the accumulator from the bracket.
7. Discard the O-rings.



282943

Installation Procedure

1. If installing a new accumulator, add 30 ml (1 fluid ounce) of polyalkylene glycol (PAG) synthetic refrigerant oil GM P/N 12345923.
2. Install the new O-ring.
3. Install the accumulator to the bracket.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the accumulator bracket bolt.

   Tighten

   Tighten the accumulator bracket bolt to 6 N·m (53 lb in).
5. Install the accumulator hose bracket nut (1) at the strut tower.

   Tighten

   Tighten the accumulator hose bracket nut (1) at the strut tower to 8 N·m (71 lb in).

6. Install the accumulator bolt (2) at the module.

   Tighten

   Tighten the accumulator bolt (2) at the module to 16 N·m (12 lb ft).

7. Connect the A/C compressor and condenser hose bolt at the accumulator.

   Tighten

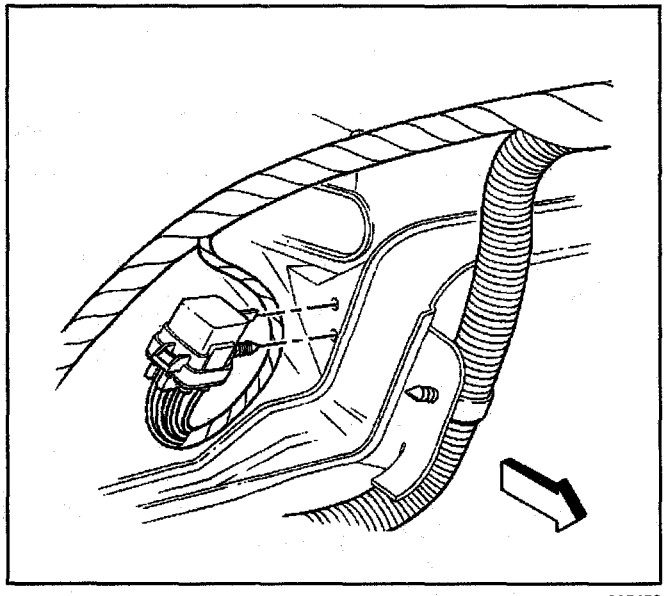
   Tighten the A/C compressor and condenser hose bolt at the accumulator to 16 N·m (12 lb ft).

8. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging*.
9. Perform a leak test on the A/C system. Refer to *Leak Testing*.

Blower Motor Relay Replacement

Removal Procedure

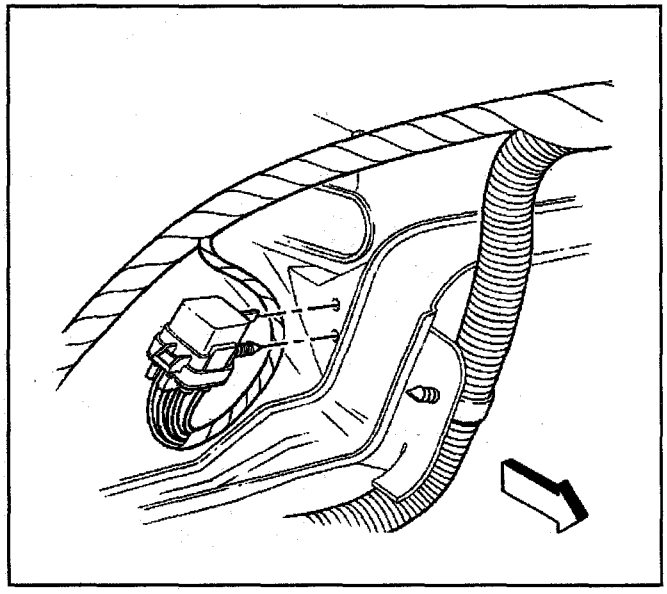
1. Remove the driver side I/P insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.
2. Remove the knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges and Console.
3. Remove the blower motor relay from the I/P tie bar.
4. Disconnect the electrical connector from the blower motor relay.



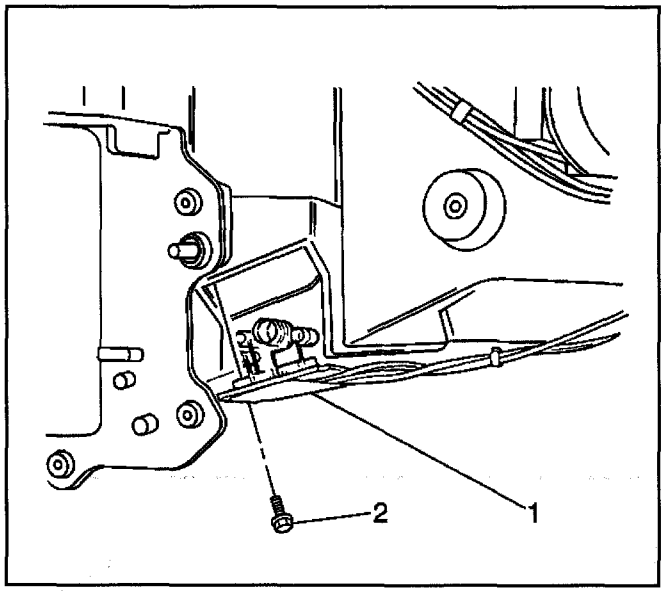
365453

Installation Procedure

1. Connect the electrical connector to the blower motor relay.
2. Install the blower motor relay to the I/P tie bar.
3. Install the knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges and Console.
4. Install the driver side I/P insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.



365453

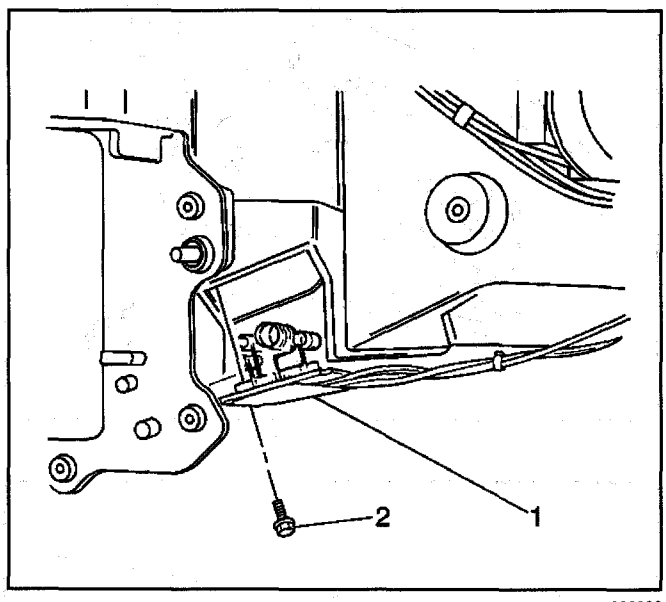


282923

Blower Motor Resistor Replacement

Removal Procedure

1. Remove the key from the ignition in order to assure that the ignition switch will remain in the OFF position.
2. Remove the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
3. Pull the carpet away from the heater module.
4. Remove the blower motor resistor bolt (2).
5. Remove the blower motor resistor (1).



282923

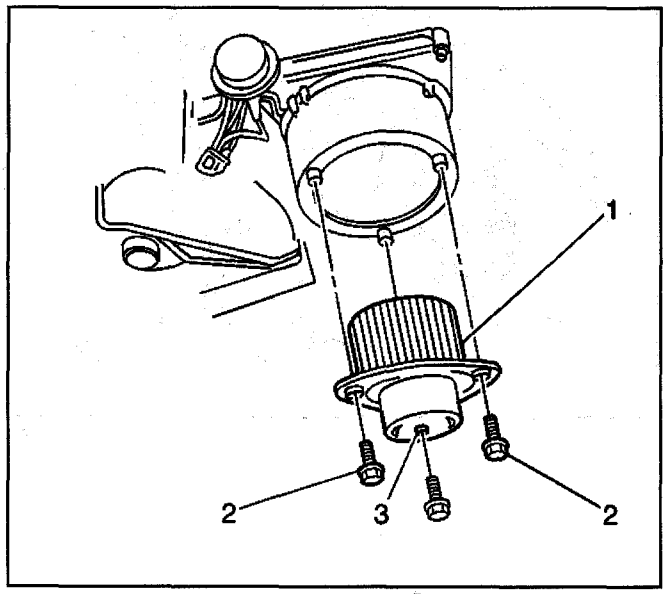
Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

1. Install the blower motor resistor (1).
2. Install the blower motor resistor bolt (2).

   Tighten

   Tighten the blower motor resistor bolt to 2 N·m (18 lb in).
3. Reposition the carpet.
4. Install the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
5. Test the blower motor operation at each of the four speeds.



282924

Blower Motor and Fan Replacement

Removal Procedure

1. Remove the key from the ignition switch in order to ensure that the ignition switch will remain OFF.
2. Remove the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
3. Remove the blower motor bolts (2).
   Remove the blower motor (3).
4. Inspect the blower motor terminals for corrosion. Perform the following tasks as necessary:
   - Clean the corrosion from the terminals.
   - Replace the blower motor.
5. Inspect the flange of the blower motor for any damage or distortion which could cause an air leak.

   Repair the flange of the blower motor as necessary.

6. Inspect the blower motor fan for damage and distortion.

   Perform the following tasks as necessary:
   - Repair the blower motor fan.
   - Replace the blower motor fan.

Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

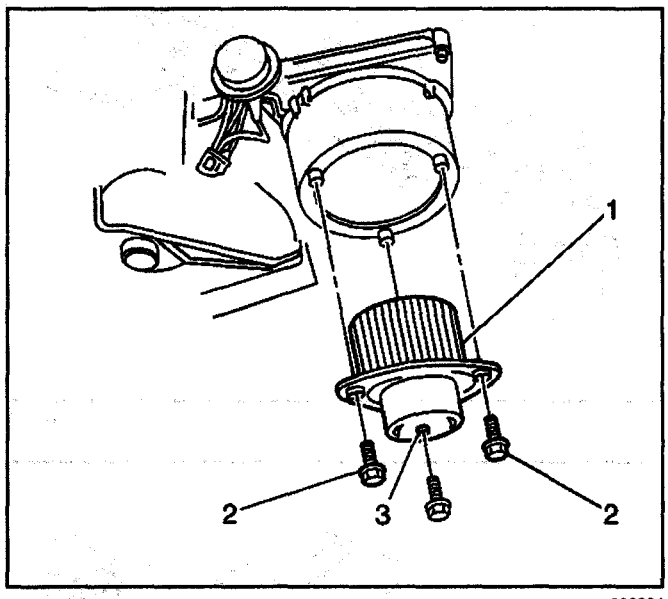
1. Install the blower motor (3) using the following steps:
   1.1. Guide the blower motor (3) into position.

   Do not catch the blower motor fan on the protruding parts.

   1.2. Install the blower motor bolts (2).

   Tighten

   Tighten the blower motor bolts (2) to 2.3 N·m (20 lb in).
2. Install the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
3. Check the blower for proper operation.

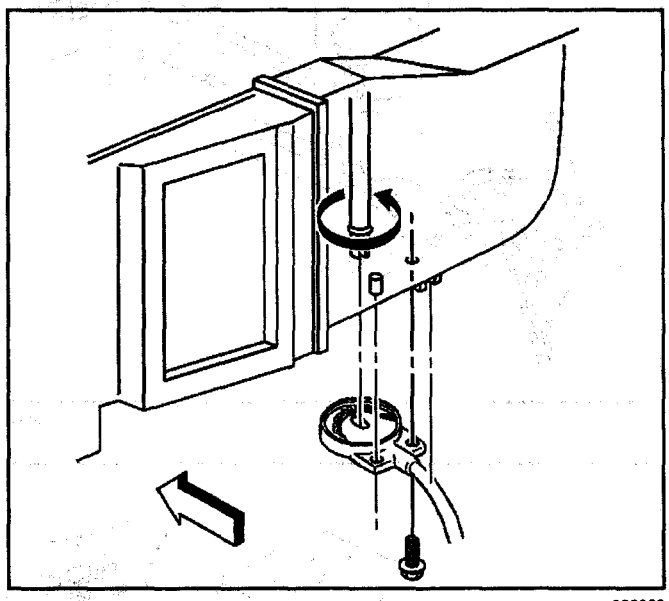


282924

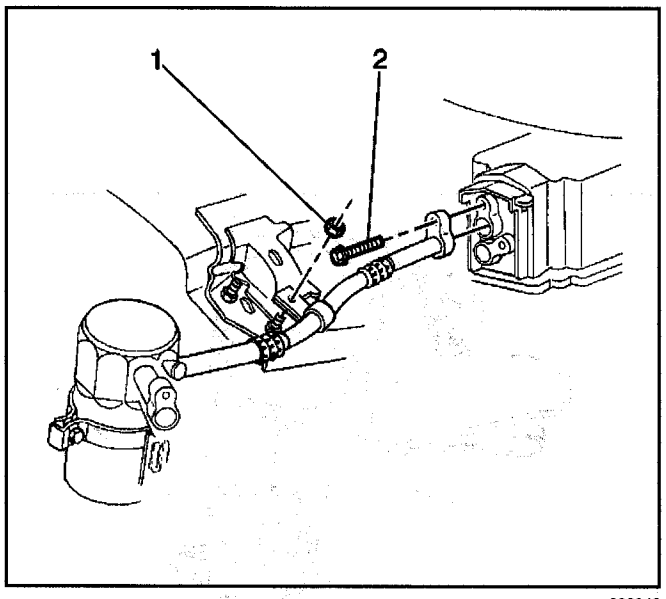
Evaporator Core Replacement

Removal Procedure

1. Drain the engine coolant. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling.
2. Recover the refrigerant. Refer to *Refrigerant Recovery and Recharging.*
3. Remove the heater core. Refer to *Heater Core Replacement.*
4. Remove the temperature control cable bolt.
5. Remove the temperature control cable from the module.

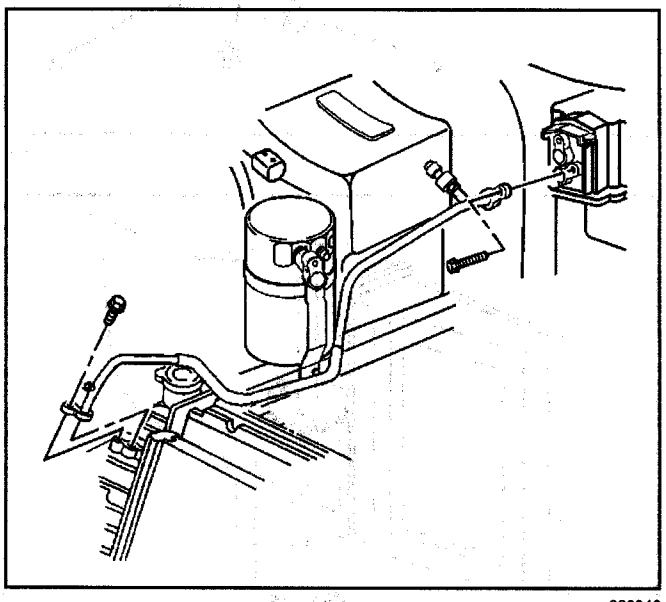


282922



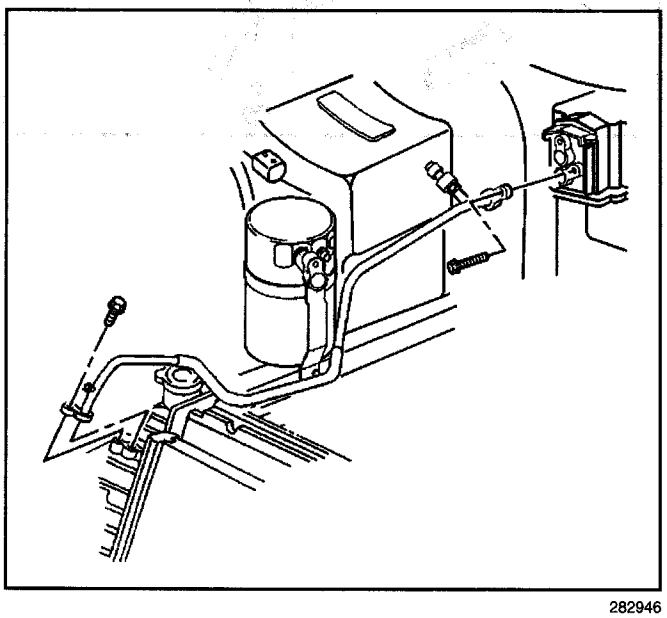
282943

6. Remove the bolts from the temperature valve shroud case.
7. Remove the temperature valve case:
   7.1. Slide the case downward to disengage the upper case clip.
   7.2. Remove the valve case from the I/P.
8. Use a small hand saw to remove the perforated section of the HVAC evaporator module.
   This section will be reused.
9. Water may leak onto the carpeting when performing this procedure. Place a mat on the passenger side floor.
10. Remove the A/C evaporator bracket nut (1).
11. Remove the A/C evaporator bracket.
12. Remove the accumulator bolt (2) at the module.
13. Discard the O-ring seal.



282946

14. Remove the A/C evaporator tube bolt at the module.
15. Discard the O-ring seal.
16. Remove the bolts from the A/C evaporator and blower upper case.
    Open the case slightly.
17. Remove the A/C evaporator seal.
18. Remove the evaporator.
19. Transfer the A/C evaporator air filter to the new evaporator.



282946

Installation Procedure

1. Install the A/C evaporator.
2. Install the A/C evaporator seal.
3. Apply sealer between the evaporator upper and lower case.
   Do not use epoxy glue as a sealer.

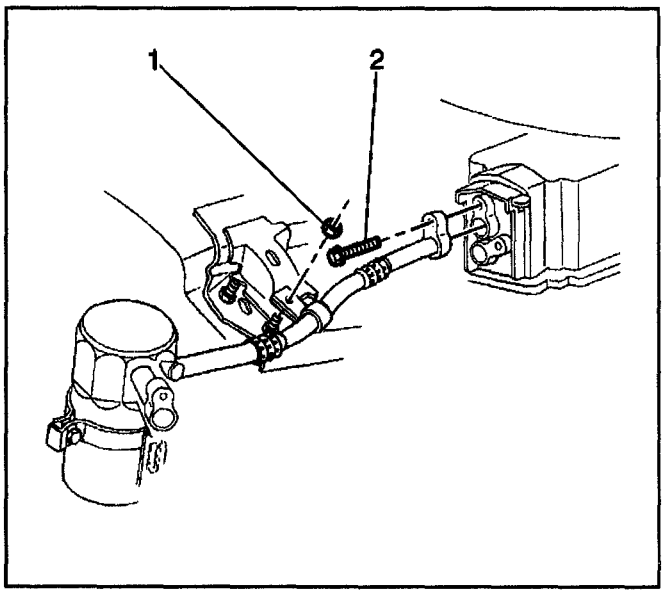
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the bolts to the A/C evaporator and blower upper case.
   Tighten
   Tighten the A/C evaporator and blower upper case bolts to 1.8 N·m (16 in).
5. Install a new O-ring seal.
6. Install the A/C evaporator tube bolt at the module.
   Tighten
   Tighten the A/C evaporator tube bolt to 16 N·m (12 lb ft).

7. Install a new O-ring seal.
8. Install the accumulator bolt at the module.

   Tighten

   Tighten the accumulator bolt (2) to 16 N·m (12 lb ft).



282943

9. Install the A/C evaporator bracket.
10. Install the A/C evaporator bracket nut (1).

    Tighten

    Tighten the A/C evaporator bracket nut (1) to 2.0 N·m (18 lb in).
11. Position the perforated section of the evaporator module.

    Use epoxy glue in order to adhere the perforated section to the module.

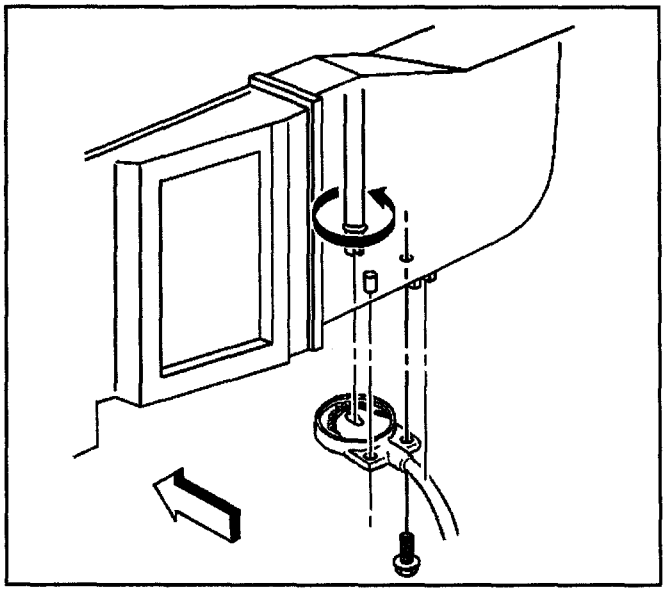
    Allow the epoxy to dry.
12. Use your thumb in order to grade the sealant on the inside and the outside in order to ensure a water-tight seal.
13. Use the following steps in order to install the temperature valve case:
    13.1. Slide the case upward into position until the upper clip engages.
    13.2. Engage the snap on the left edge of the temperature valve case to the distributor case.
14. Install the bolts to the temperature valve shroud case.

    Tighten

    Tighten the temperature valve shroud case bolts to 2.0 N·m (18 lb in).
15. Install the temperature control cable to the module.
16. Install the temperature control cable bolt.

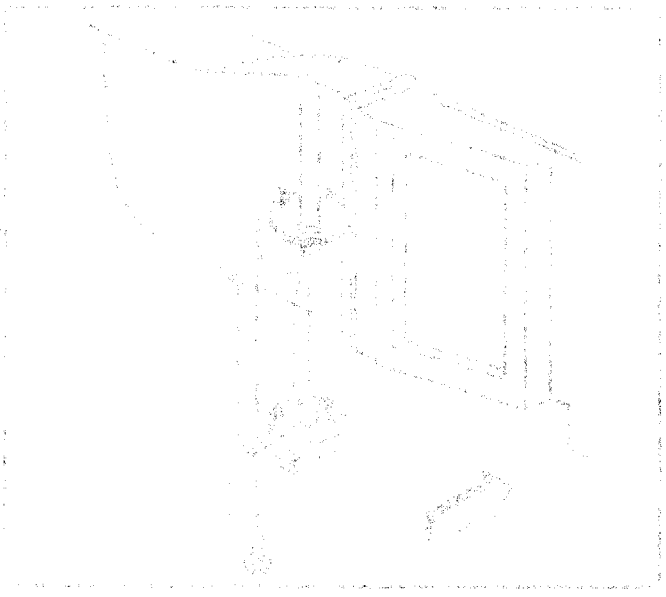
    Tighten

    Tighten the temperature control cable bolt to 1.9 N·m (17 lb in).
17. Install the heater core. Refer to *Heater Core Replacement.*
18. Recharge the A/C system. Refer to *Refrigerant Recovery and Recharging.*
19. Refill the cooling system. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling.



282922





Heater Core Replacement

Removal Procedure

1. Drain the engine coolant. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling.
2. Remove the I/P compartment door hinge screws.
3. Remove the I/P compartment door.
4. Remove the heater core tube clamp bolt.
5. Remove the heater core tube clamp.

Notice: Do not apply excessive force on the heater core pipes during hose removal. Applying excessive force on the heater core pipes may damage the heater core pipes.

6. Remove the heater hoses from the heater core pipes.
7. Remove the heater module screws.
8. Remove the heater module cover.
9. Remove the heater core clamp bolt.
10. Remove the heater core clamp.
11. Carefully pull the heater core toward you. Remove the heater core.

Installation Procedure

1. Install the heater core.
2. Install the heater core clamp.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the heater core clamp bolt.

   Tighten

   Tighten the heater core clamp bolt to 1.8 N·m (16 lb in).
4. Install the heater module cover.
5. Install the heater module screws.

   Tighten

   Tighten the heater module screws to 1.8 N·m (16 lb in).
6. Install the heater hose to the heater core pipes.
7. Remove the heater core tube clamp.
8. Remove the heater core tube clamp bolt.

   Tighten

   Tighten the heater core tube clamp bolt to 2 N·m (18 lb in).
9. Remove the I/P compartment door.
10. Remove the I/P compartment door hinge screws.
11. Drain the engine coolant. Refer to *Draining and Filling Cooling System (V6)* or *Draining and Filling Cooling System (V8)* in Engine Cooling.

Heater Pipes Replacement (3.8L)

Removal Procedure

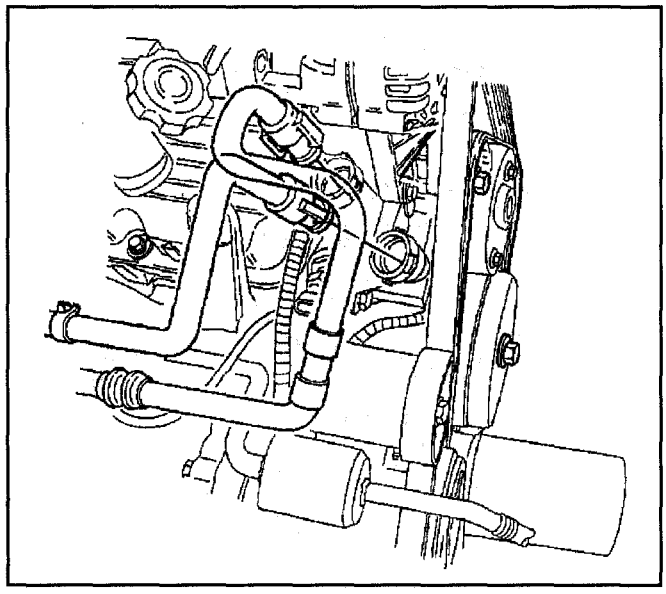
1. Partially drain the engine coolant.

Notice: Remove the heater hose quick connect fittings by hand. Do not attempt to pry the quick connect fittings from the drive belt tensioner. Prying the quick connect fittings may damage the quick connect fittings.

2. Disconnect the heater hose quick connect fittings from the drive belt tensioner.

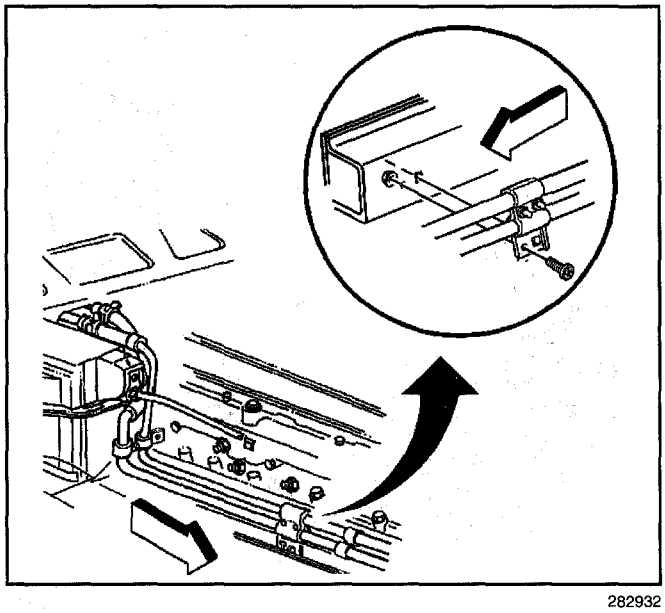
   Twist and pull the quick connect fittings from the drive belt tensioner.

3. Discard the O-rings.



282933

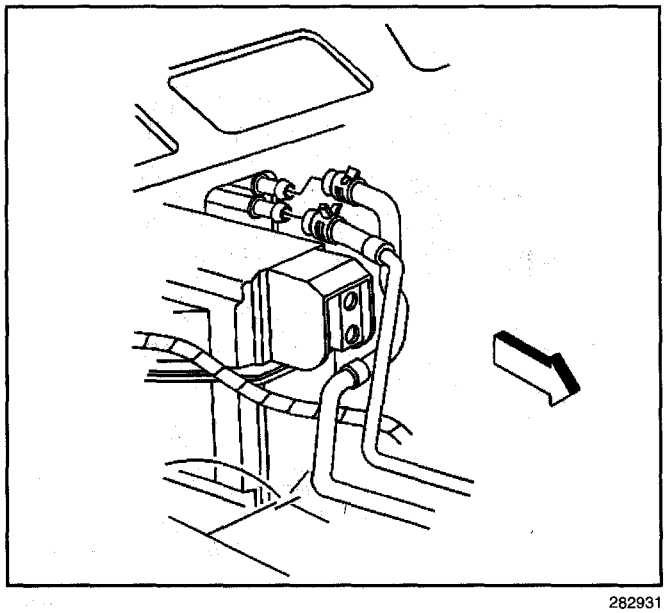
4. Remove the bolt attaching the inlet and outlet hose bracket at the mid rail.



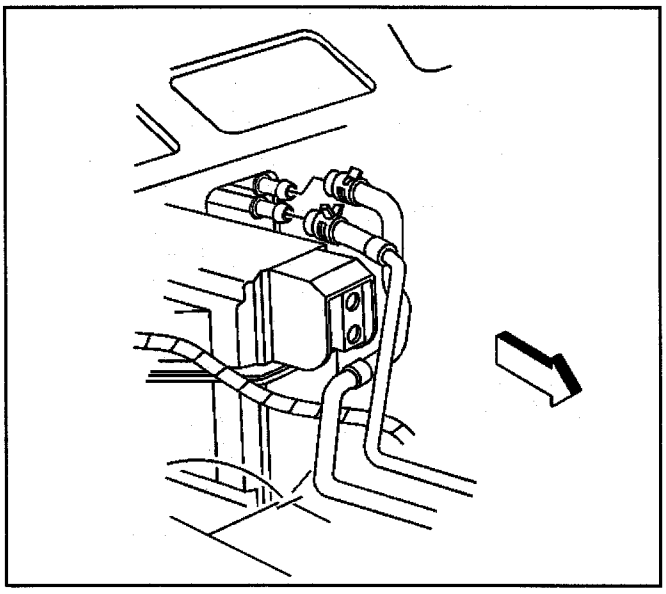
282932

Notice: Do not apply excessive force on the heater core pipes during hose removal. Applying excessive force on the heater core pipes may damage the heater core pipes.

5. Remove the inlet and outlet hoses from the heater core.
   - 5.1. Squeeze the hose clamp with the pliers.
   - 5.2. Slide the clamp away from the heater core fittings.
   - 5.3. Gently twist and pull the heater hose from the heater core fitting.
6. Remove the inlet hose from the module retainer.
7. Remove the inlet and outlet hoses (4) from the vehicle.



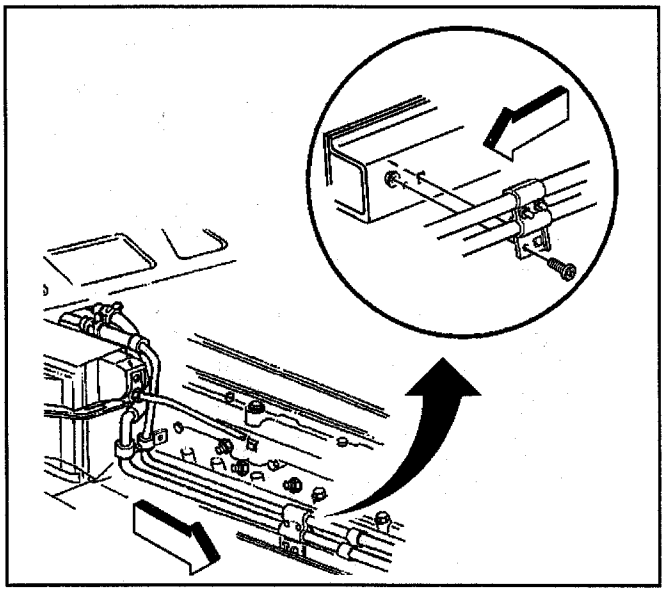
282931



282931

Installation Procedure

1. Install the inlet and outlet hoses to the vehicle.
2. Install the inlet hose to the module retainer.
3. Install the inlet and outlet hoses to the heater core.
   3.1. Apply lubricant to the inside diameter of the heater hose, if necessary.
   3.2. Push the heater hose onto the fitting with a twisting motion.
   3.3. Squeeze the hose clamp ends together and slide the clamp over the end of the heater hose.
   3.4. Install the clamp beyond the bead around the fitting.
   3.5. Install the other heater hose.



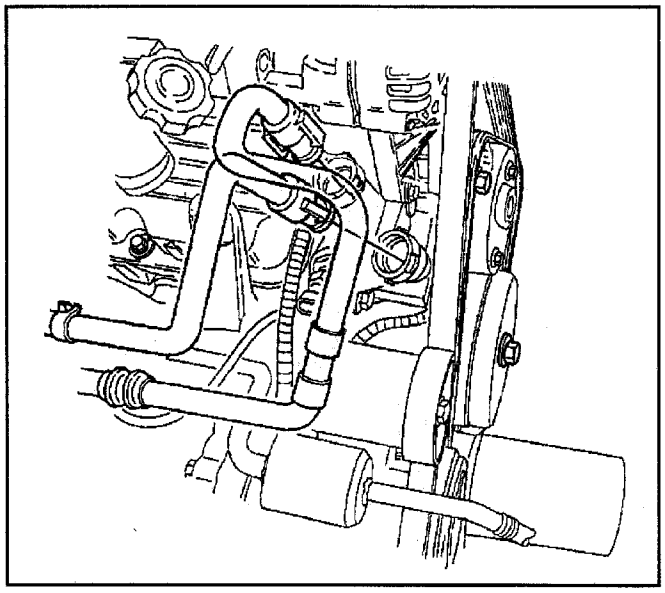
282932

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the bolt attaching the inlet and outlet hose bracket at the mid rail.

   Tighten

   Tighten the heater hose bracket bolt to 14 N·m (10 lb ft).



282933

5. Install the O-rings to the quick connect fittings.

   Snap the quick connect fittings to the drive belt tensioner.
6. Pull back on the quick connect fittings in order to verify proper connector engagement.
7. Add the engine coolant.
   - If the previously drained coolant is uncontaminated, use the previously drained coolant.
   - If the previously drained coolant is contaminated, discard the contaminated coolant.

     Then, add a fresh 50/50 DEX-COOL and water mixture.

Heater Pipes Replacement (5.7L)

Removal Procedure

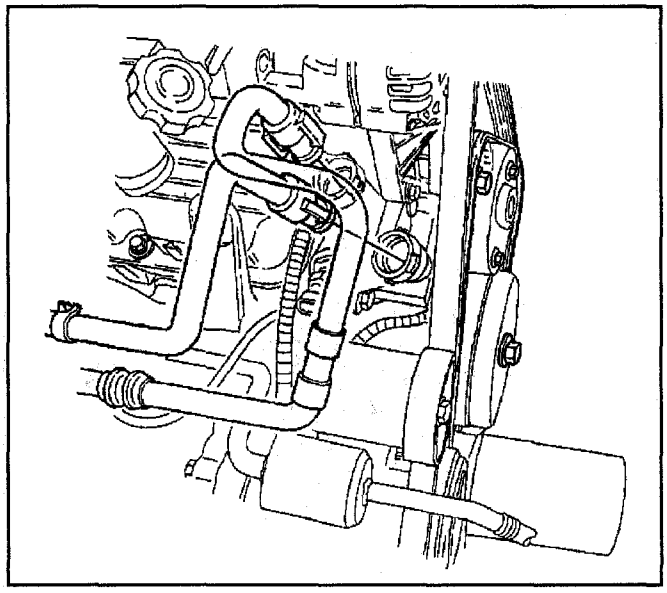
1. Partially drain the engine coolant.

Notice: Remove the heater hose quick connect fittings by hand. Do not attempt to pry the quick connect fittings from the drive belt tensioner. Prying the quick connect fittings may damage the quick connect fittings.

2. Disconnect the heater hose quick connect fittings from the drive belt tensioner.

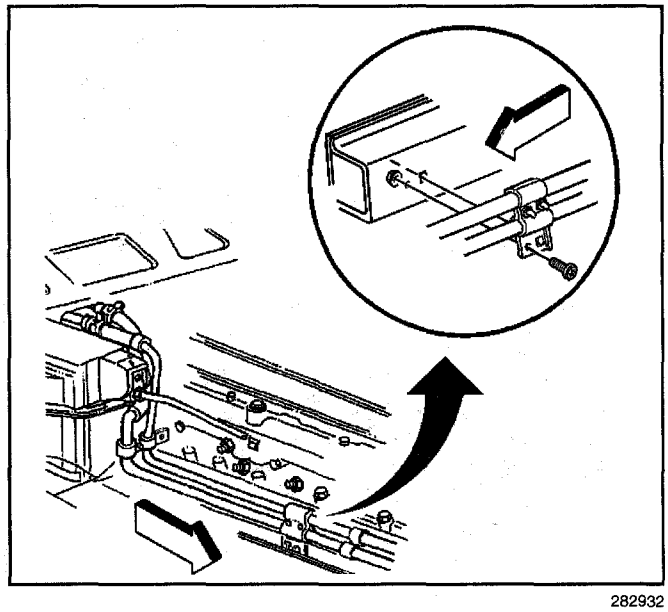
   Twist and pull the quick connect fittings from the drive belt tensioner.

3. Discard the O-rings.



282933

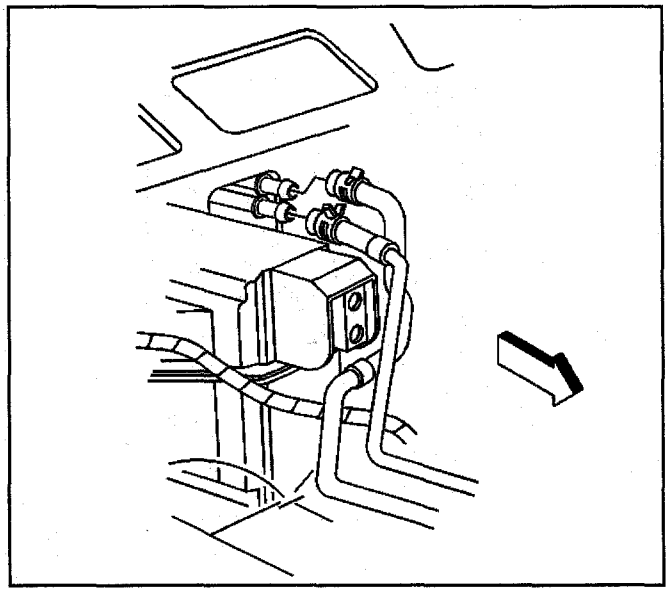
4. Remove the bolt attaching the inlet and outlet hose bracket at the mid rail.



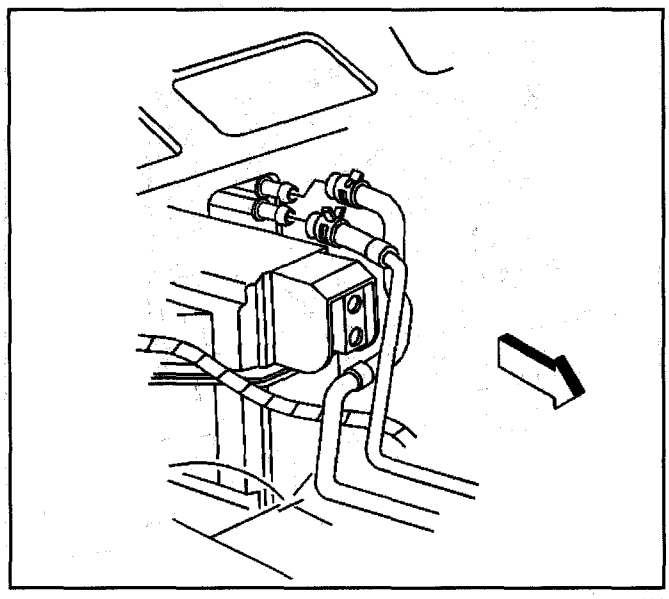
282932

Notice: Do not apply excessive force on the heater core pipes during hose removal. Applying excessive force on the heater core pipes may damage the heater core pipes.

5. Remove the inlet and outlet hoses from the heater core.
   - 5.1. Squeeze the hose clamp with the pliers.
   - 5.2. Slide the clamp away from the heater core fittings.
   - 5.3. Gently twist and pull the heater hose from the heater core fitting.
6. Remove the inlet hose from the module retainer.
7. Remove the inlet and outlet hoses (4) from the vehicle.



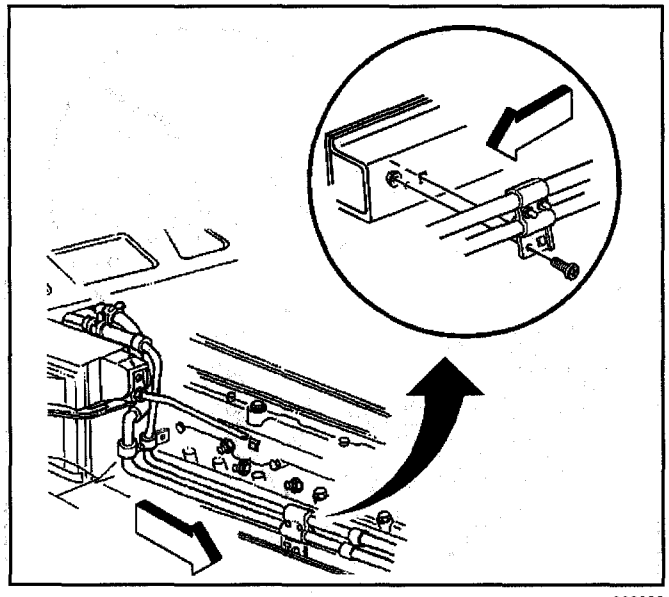
282931



282931

Installation Procedure

1. Install the inlet and outlet hoses to the vehicle.
2. Install the inlet hose to the module retainer.
3. Install the inlet and outlet hoses to the heater core.
   - 3.1. Apply lubricant to the inside diameter of the heater hose, if necessary.
   - 3.2. Push the heater hose onto the fitting with a twisting motion.
   - 3.3. Squeeze the hose clamp ends together and slide the clamp over the end of the heater hose.
   - 3.4. Install the clamp beyond the bead around the fitting.
   - 3.5. Install the other heater hose.



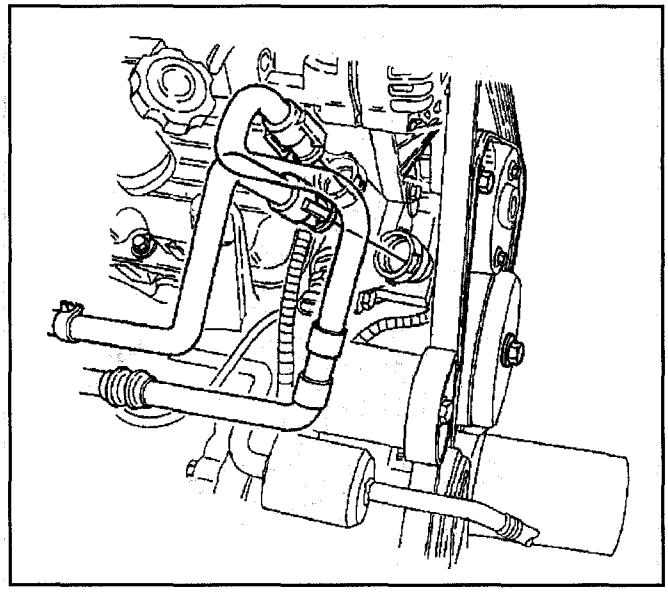
282932

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the bolt attaching the inlet and outlet hose bracket at the mid rail.

   Tighten

   Tighten the heater hose bracket bolt to 14 N·m (10 lb ft).



282933

5. Install the O-rings to the quick connect fittings.

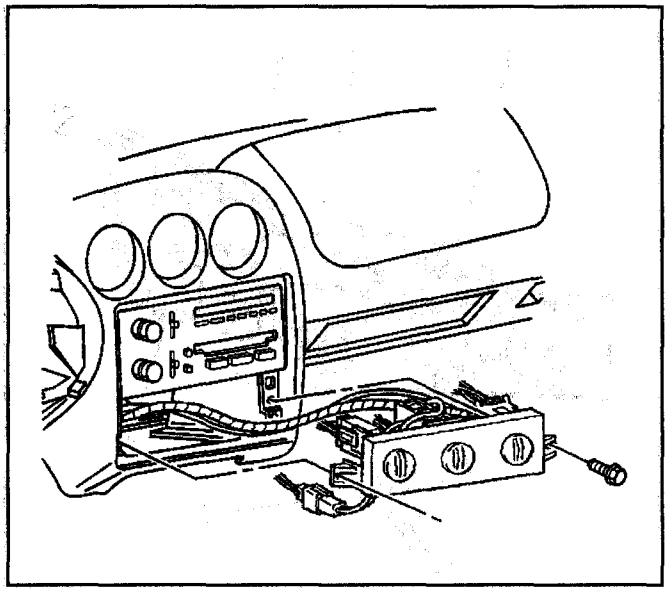
   Snap the quick connect fittings to the drive belt tensioner.
6. Pull back on the quick connect fittings in order to verify proper connector engagement.
7. Add the engine coolant.
   - If the previously drained coolant is uncontaminated, use the previously drained coolant.
   - If the previously drained coolant is contaminated, discard the contaminated coolant.

     Then, add a fresh 50/50 DEX-COOL and water mixture.

Control Assembly Replacement

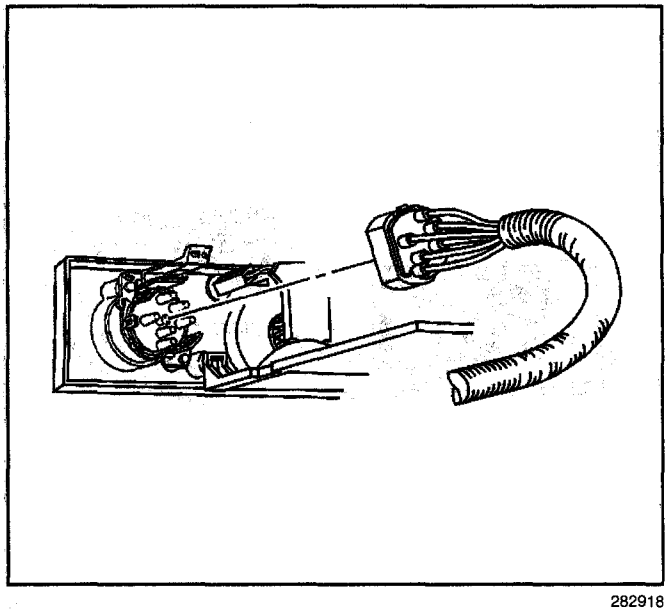
Removal Procedure

1. Remove the accessory trim plate. Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.
2. Remove the HVAC control bolts.
3. Pull the HVAC control out from the I/P far enough to access the following components:
   - The vacuum connector
   - The electrical connectors
   - The temperature cable connections



282916

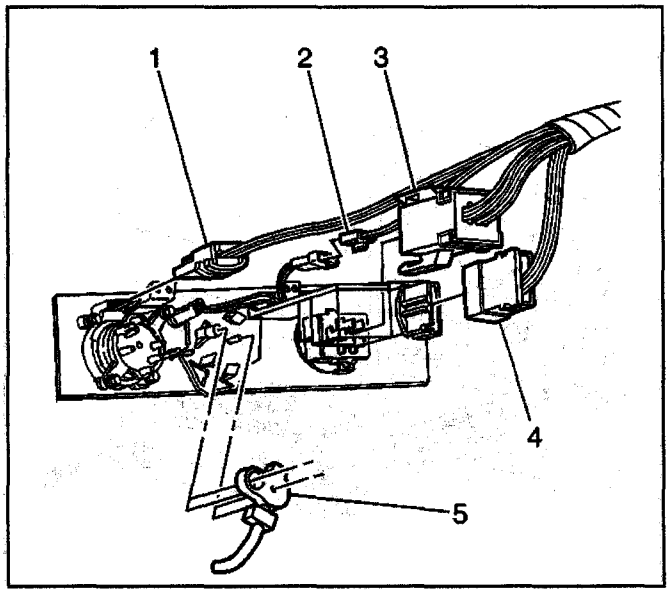
4. Disconnect the vacuum harness connector from the vacuum selector valve.



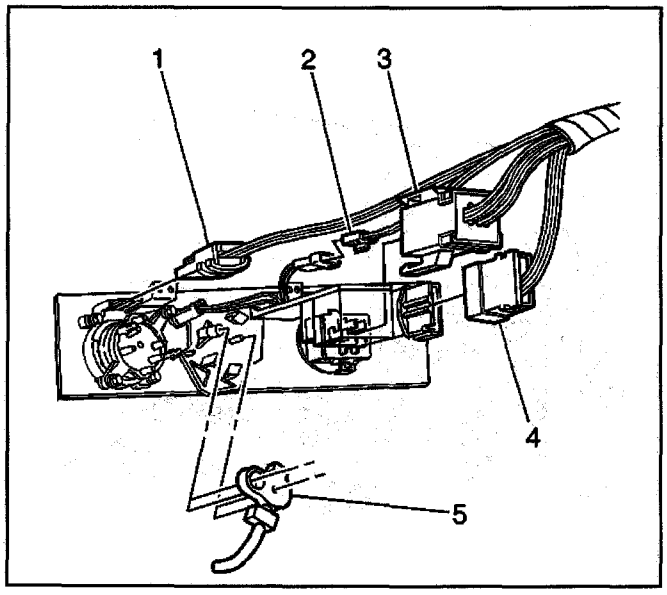
282918

5. Disconnect the following electrical connectors from the HVAC control:
   - HVAC mode switch (1)
   - HVAC control illumination (2)
   - HVAC blower switch (3)
   - Rear defogger (4)
6. Remove the temperature control cable (5) from the control.

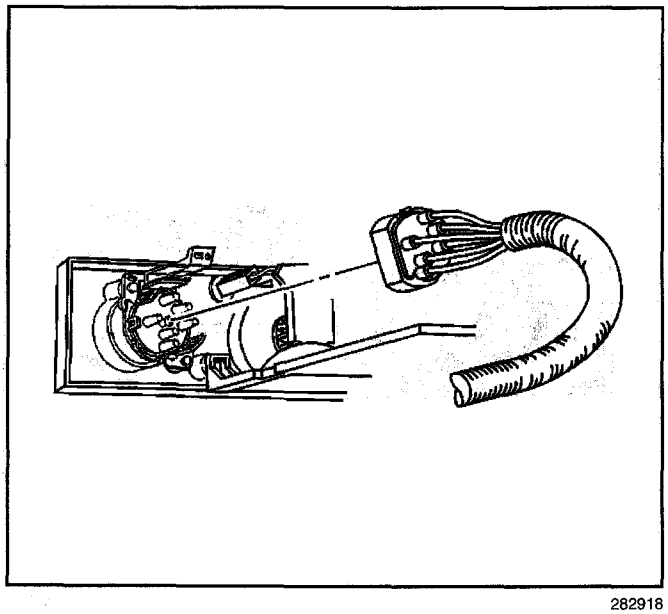
   When releasing the control cable clips, use a small screwdriver to gently pry the cable from the control.



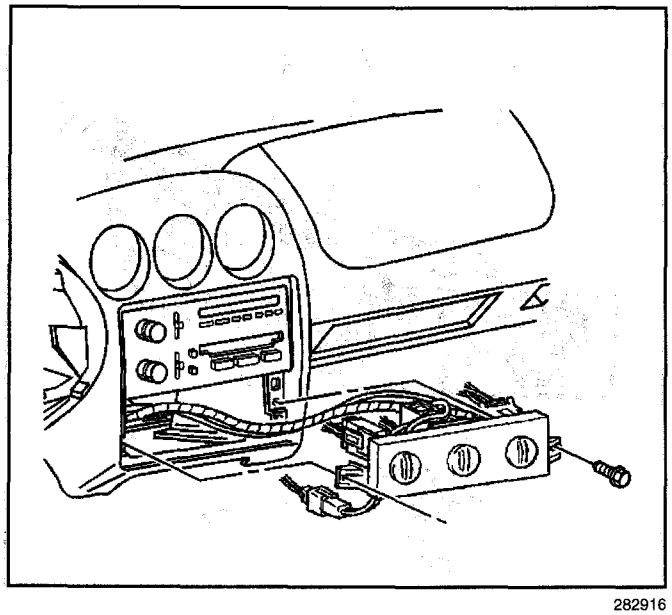
282917



282917



282918



282916

Installation Procedure

1. Install the temperature control cable connector (5) to the control.
2. Connect the following electrical connectors to the HVAC control:
   - Rear defogger (4)
   - HVAC blower switch (3)
   - HVAC control illumination (2)
   - HVAC mode switch (1)
3. Connect the vacuum harness connector to the vacuum selector valve.
4. Install the HVAC control.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the HVAC control bolts.

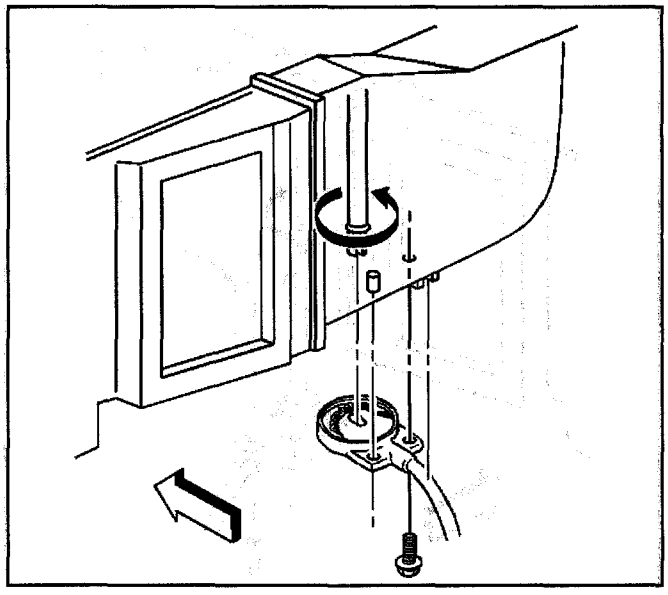
   Tighten

   Tighten the HVAC control bolts to 2.2 N·m (19 lb in).
6. Install the accessory trim plate.Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.

Temperature Control Cable Replacement

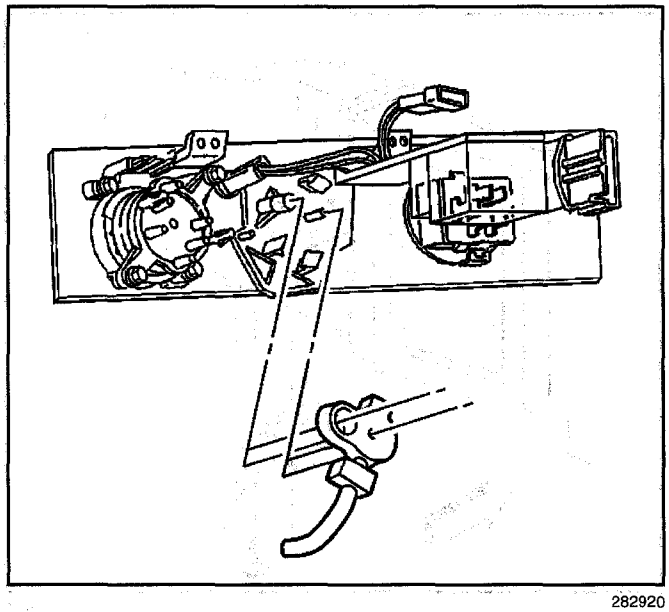
Removal Procedure

1. Remove the right I/P insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
2. Remove the temperature control cable bolt.
3. Disconnect the temperature control cable at the A/C module.
4. Remove the accessory trim plate. Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.



282922

5. Remove the HVAC control bolts.
6. Pull the HVAC control out of the I/P far enough to access the temperature control cable connection.
7. Remove the temperature control cable from the control.
8. When releasing the control cable clips, use a small screwdriver to gently pry the cable from the control.



282920

Installation Procedure

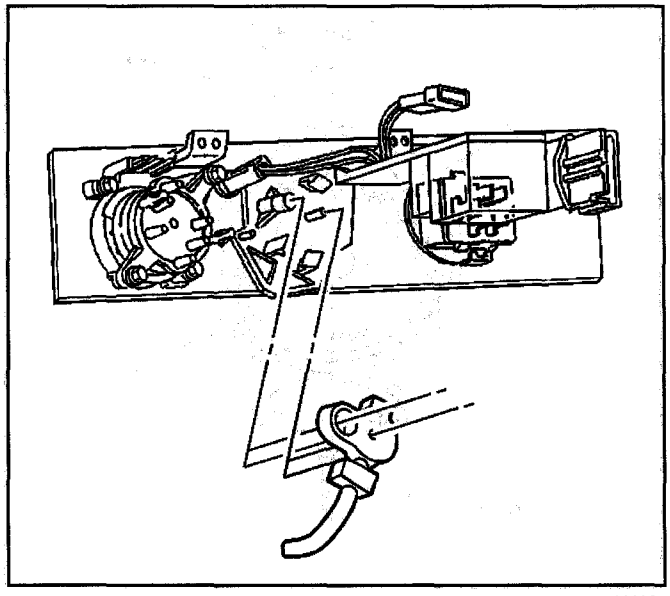
1. Install the temperature control cable to the control.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

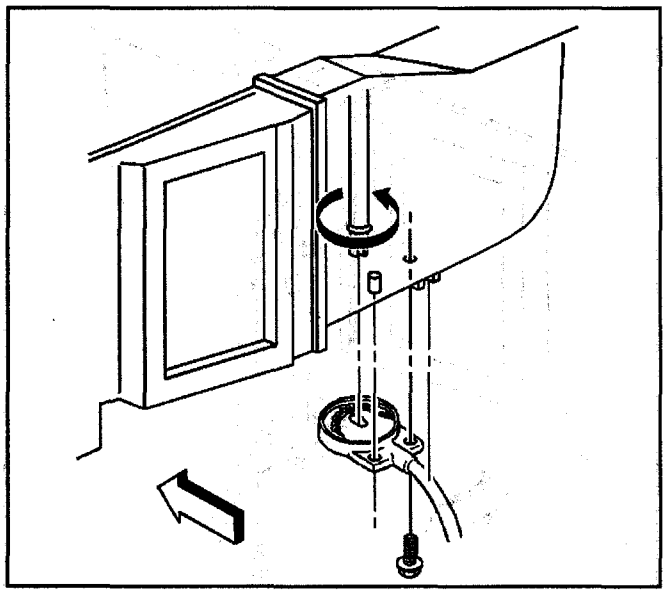
2. Install the HVAC control bolts.

   Tighten

   Tighten the HVAC control bolts to 2.2 N·m (19 lb in).



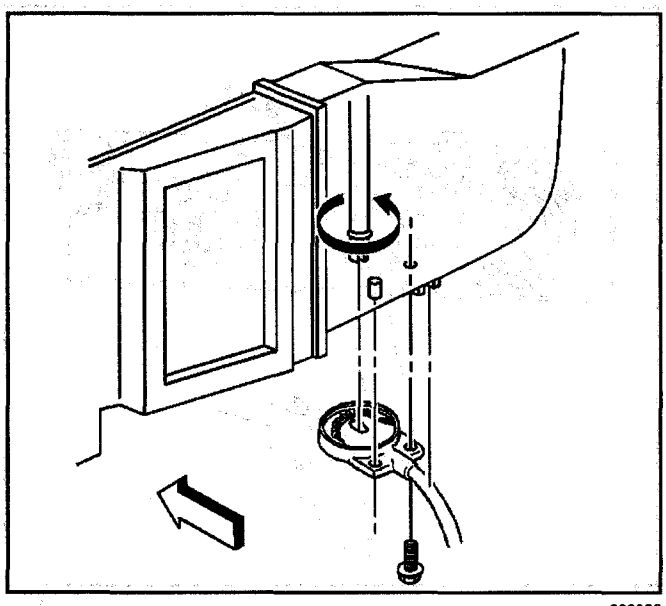
282920


282922

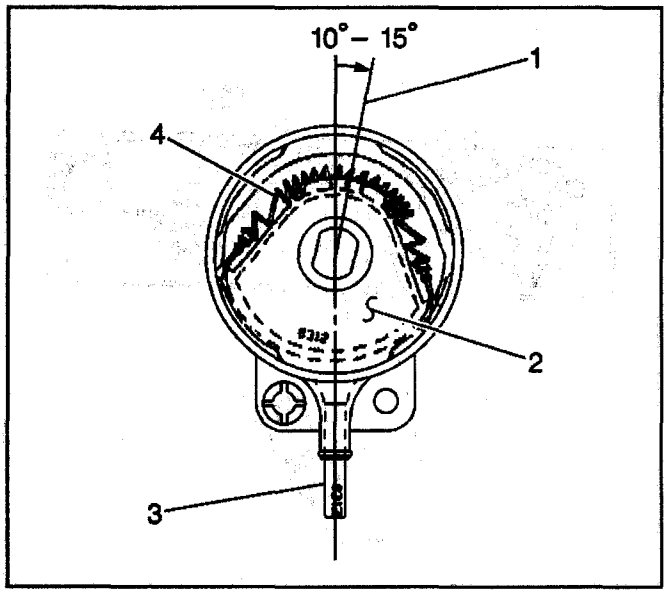
3. Connect the temperature control cable to the A/C module.
4. Use the following steps in order to install the temperature control cable to the control:
   4.1. Slip the temperature control cable into position over the lever arm.
   4.2. Align the shaft with the temperature control cable shaft.
   4.3. Press the temperature control cable clips into the slot in the control.
   4.4. Ensure that the temperature control cable clips are in place.
5. Install the temperature control cable bolt.
   Tighten
   Tighten the temperature control cable bolt to 1.9 N·m (17 lb in).
6. Install the accessory trim plate. Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.

Temperature Control Cable Adjustment

Removal Procedure


282922

1. Remove the right I/P insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
2. Remove the temperature control cable bolt.
3. Disconnect the temperature control cable at the A/C module.



282915

Important: Ensure that the temperature control cable (3) is still attached to the HVAC control.

4. Cycle the temperature control knob between the following positions:
   - Full cold position
   - Full hot position
5. Replace the temperature control cable if one of the following situations occur:
   - The temperature control cable binds
   - The temperature control cable does not rotate freely

   Refer to *Temperature Control Cable Replacement*.
6. Set the temperature control knob to the detent position half way between the full cold and the full hot positions.

7. Inspect the position of the temperature control cable pulley (2).

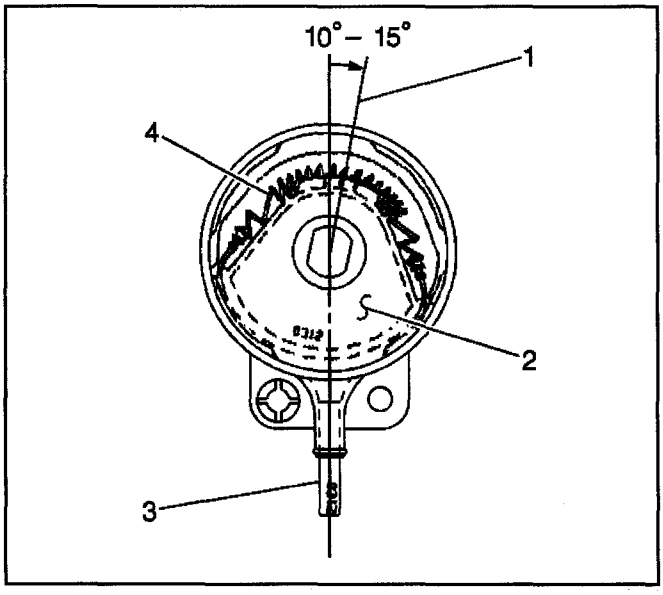
   Adjust the temperature control cable pulley (2):

   - Do not adjust the pulley if the pulley is skewed 5–10 degrees toward the full cold side.
   - Adjust the control cable if the pulley is skewed toward the full hot side.

8. Remove the spring (4) from the temperature control cable pulley.
9. Adjust the temperature control cable pulley 5–10 degrees toward the full cold position.

Installation Procedure

1. Install the temperature control cable spring (4) to the temperature control cable pulley (2).
2. Connect the temperature control cable (5) to the heater module.



282915

3. Connect the temperature control cable to the A/C module.

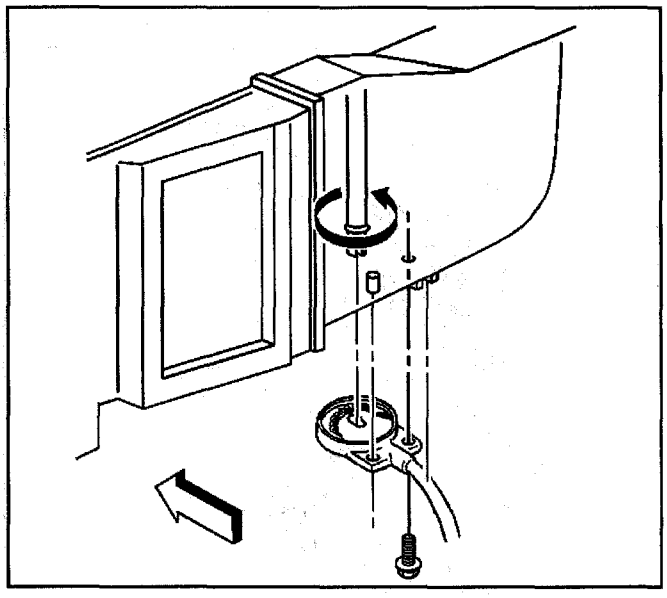
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the temperature control cable bolt.

   Tighten

   Tighten the temperature control cable bolt to 1.9 N·m (17 lb in).

5. Install the right I/P insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.



282922

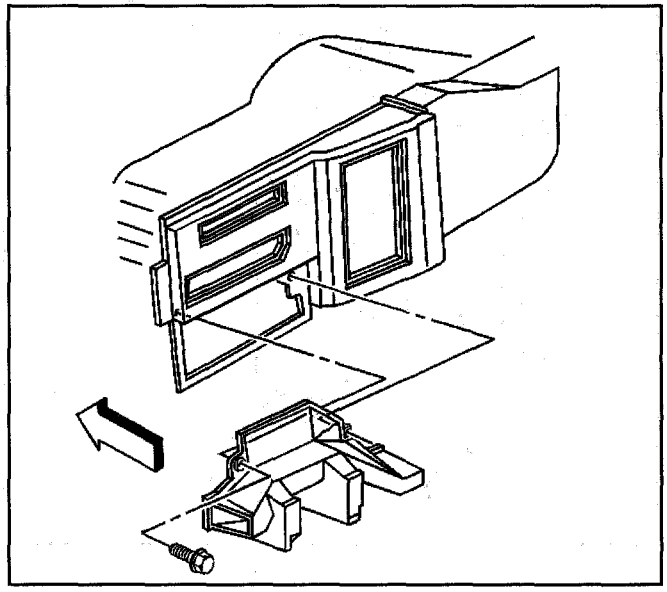
Air Inlet Actuator Replacement

Removal Procedure

1. Remove the right side insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
2. Remove the left side insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.
3. Remove the I/P compartment door hinge screws.
4. Remove the I/P compartment door.
5. Remove the HVAC module screws.
6. Remove the HVAC module cover.
7. Disconnect the air inlet valve linkage.
8. Remove the air inlet valve actuator and vacuum hose.

Installation Procedure

1. Install the air inlet valve actuator and vacuum hose.
2. Connect the air inlet valve linkage.
3. install the HVAC module cover.
4. Install the HVAC module screws.
5. Install the I/P compartment door.
6. Install the I/P compartment door hinge screws.
7. Install the left side insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.
8. Install the right side insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.



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Vent Actuator Replacement

Removal Procedure

1. Remove the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air duct bolt.
3. Remove the front floor air duct.
4. Remove the module cover screws.
5. Remove the module cover.
6. Remove the vent mode valve linkage.
7. Remove the vent mode valve actuator and vacuum hose.

Installation Procedure

1. Install vent mode valve actuator and vacuum hose.
2. Install the vent mode valve linkage.
3. Install the module cover.
4. Install the module cover screws.
5. Install the front floor air duct.

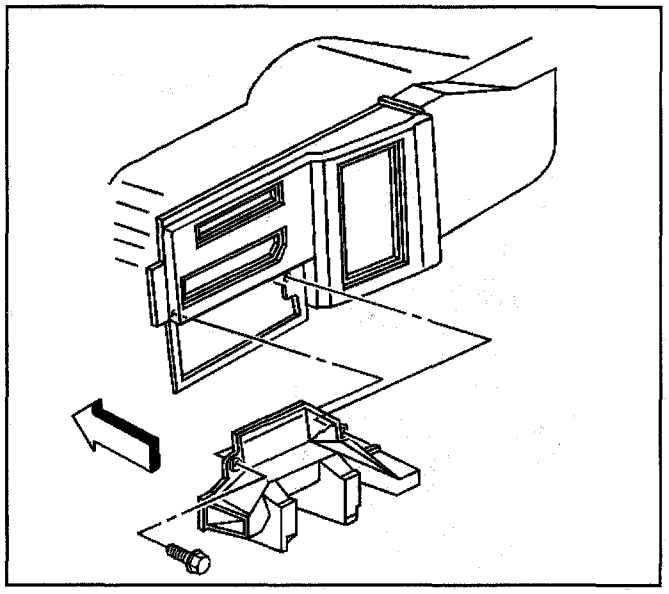
Notice: Refer to *Fastener Notice* in Cautions and Notices.

6. Install the front floor air duct bolt.

   Tighten

   Tighten the front floor air duct bolt to 1.9 N·m (17 lb in).

7. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.

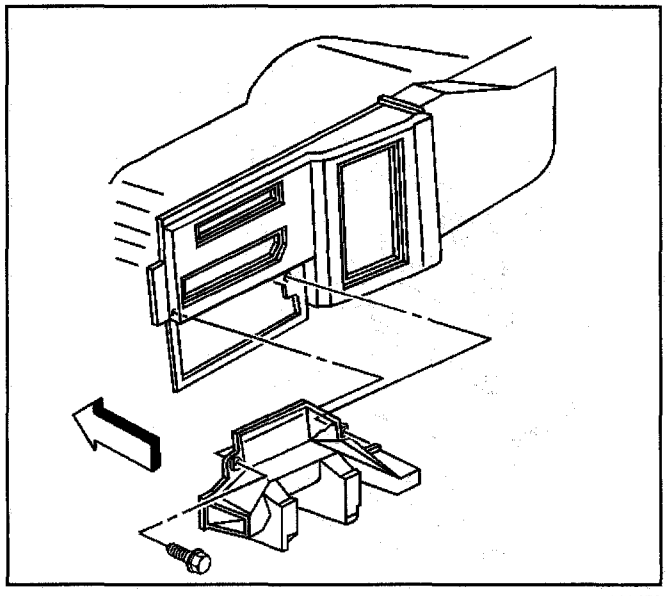


365458

Defroster Actuator Replacement

Removal Procedure

1. Remove the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air duct bolt.
3. Remove the front floor air duct.
4. Remove the module cover screws.
5. Remove the module cover.
6. Remove the defroster valve actuator from the linkage and vacuum hose.



365458

Installation Procedure

1. Install the defroster valve actuator to the linkage and vacuum hose.
2. Install the module cover.
3. Install the module cover screws.
4. Install the front floor air duct.

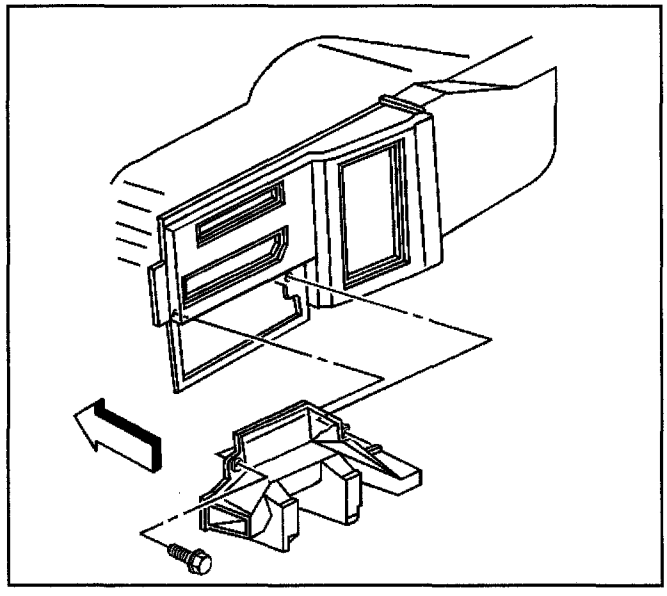
Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the front floor air duct bolt.

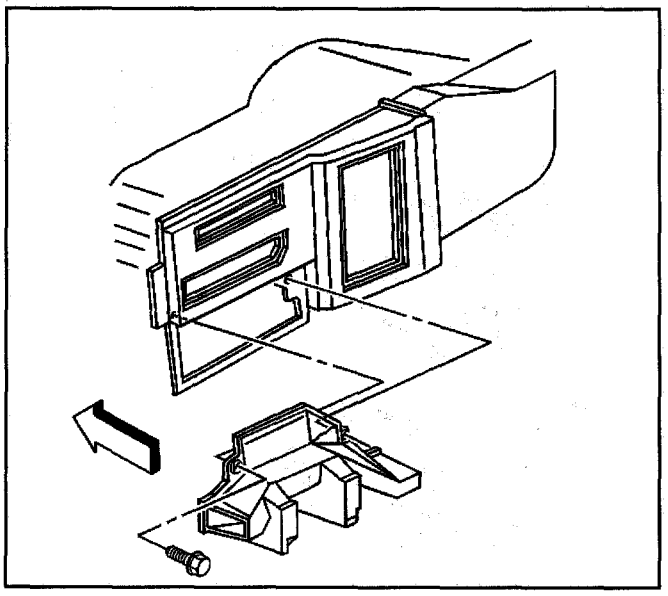
   Tighten

   Tighten the front floor air duct bolt to 1.9 N·m (17 lb in).

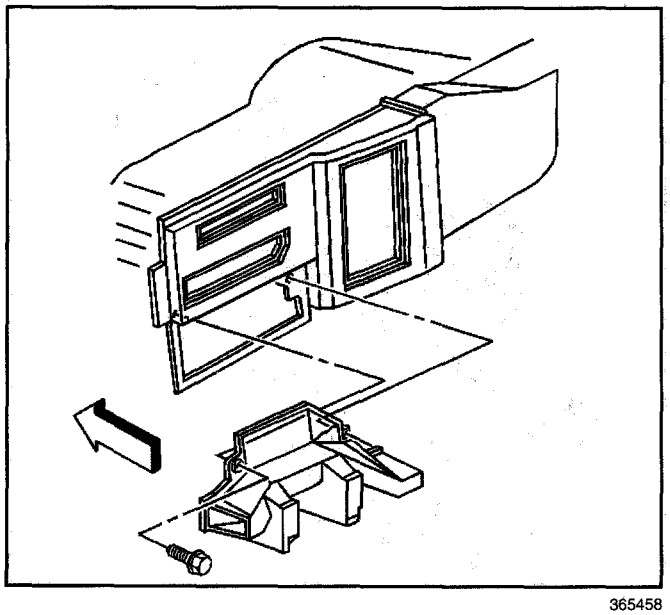
6. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



365458



365458



365458

Heater/Bi-Level Actuator Replacement

Removal Procedure

1. Remove the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air outlet bolt.
3. Remove the front floor air outlet.
4. Remove the module cover screws.
5. Remove the module cover.
6. Remove the screw from the bi-level mode linkage.
7. Remove the bi-level actuator and linkage.

Installation Procedure

1. Install the bi-level actuator and linkage.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bi-level mode valve linkage screw.
   Tighten
   Tighten the bi-level mode valve linkage screw to 2.3 N·m (20 lb in).
3. Install the module cover.
4. Install the module cover screws.
5. Install the front floor air outlet.
6. Install the front floor air outlet bolt.
   Tighten
   Tighten the front floor air outlet bolt to 1.9 N·m (17 lb in).
7. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.

IP Air Outlet Ducts Replacement

Pontiac vehicles have the following air deflectors:

- The right (passenger side) air deflector
- Three center air deflectors

Complete the following steps in order to remove any of the deflectors:

1. Close the deflector.
2. Gently ease the deflector and the housing from the instrument panel.

The left (driver side) air deflector is part of the instrument panel cluster trim plate. Refer to *Trim Plate Replacement - IP Accessory (Pontiac)* in Instrument Panel, Gauges and Console.

Chevrolet vehicles have the following air deflectors:

- The right (passenger side) air deflector
- The left (driver side) air deflector
- Two center air deflectors

Complete the following steps in order to remove the right or left air deflector:

1. Close the deflector.
2. Gently ease the deflector and the housing from the instrument panel.

Complete the following steps in order to remove either of the center air deflectors:

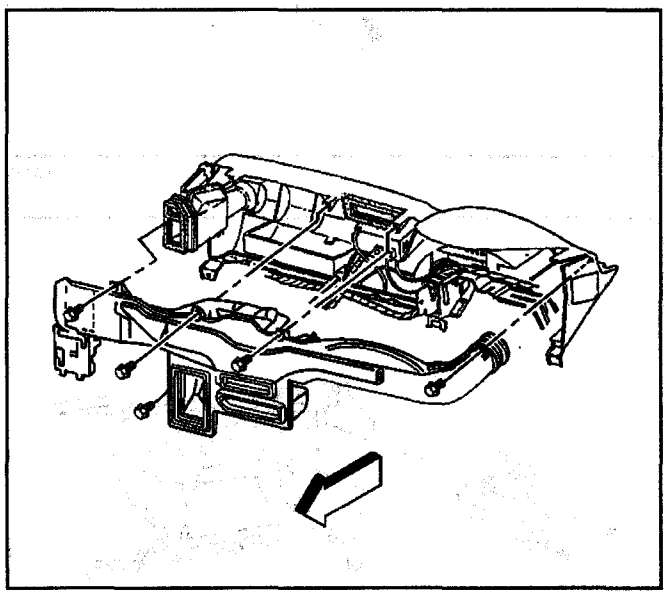
1. Remove the accessory trim plate.
2. Push out the air deflector from the rear.

   Refer to *Trim Plate Replacement - IP Accessory (Chevrolet)* in Instrument Panel, Gauges and Console.

Air Distributor Duct Replacement

Removal Procedure

1. Remove the I/P carrier.*IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Place the I/P carrier face down on a clean work surface.
3. Remove the air distributor duct bolts.
4. Remove the air distributor from the I/P carrier.



365456

Installation Procedure

1. Install the air distributor to the I/P carrier.

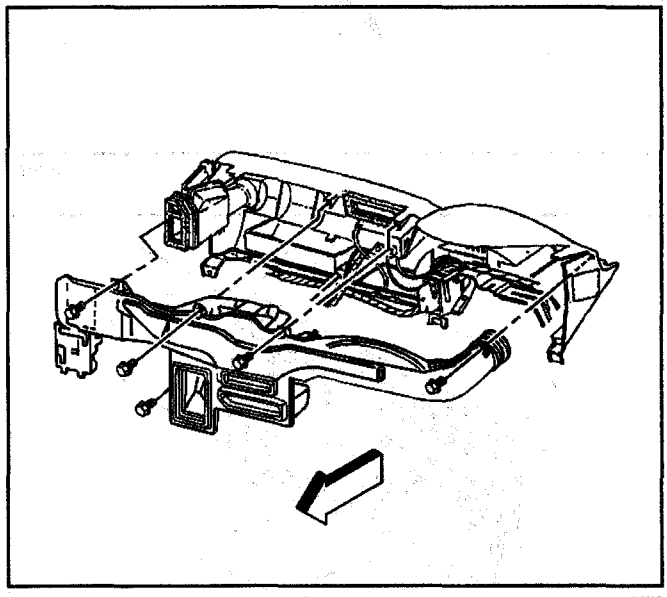
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the air distributor duct bolts.

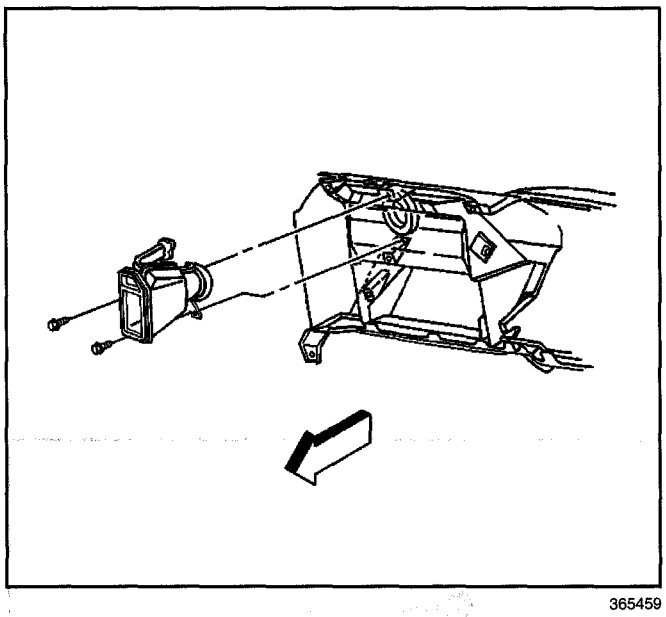
   Tighten

   Tighten the air distributor duct bolts to 2.2 N·m (19 lb in).

3. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



365456

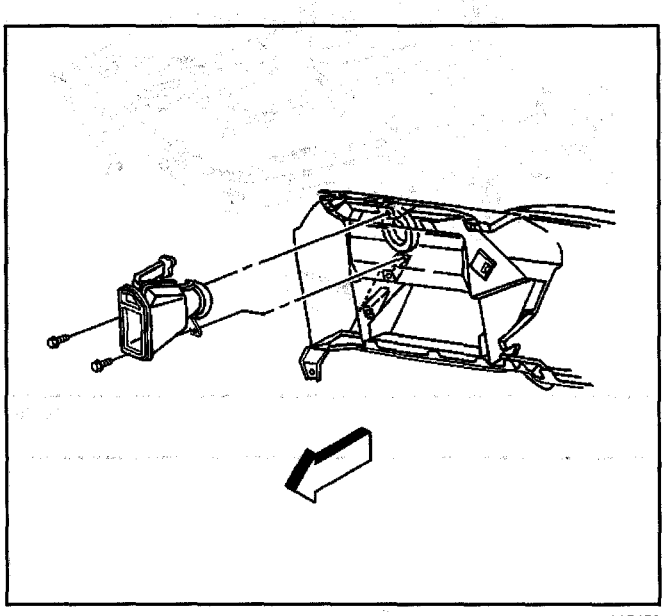


365459

Air Outlet Replacement - Right Defogger

Removal Procedure

1. Remove the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the I/P outer air outlet duct bolts.
3. Remove the I/P outlet air outlet duct.



365459

Installation Procedure

1. Install the I/P outer air outlet duct.

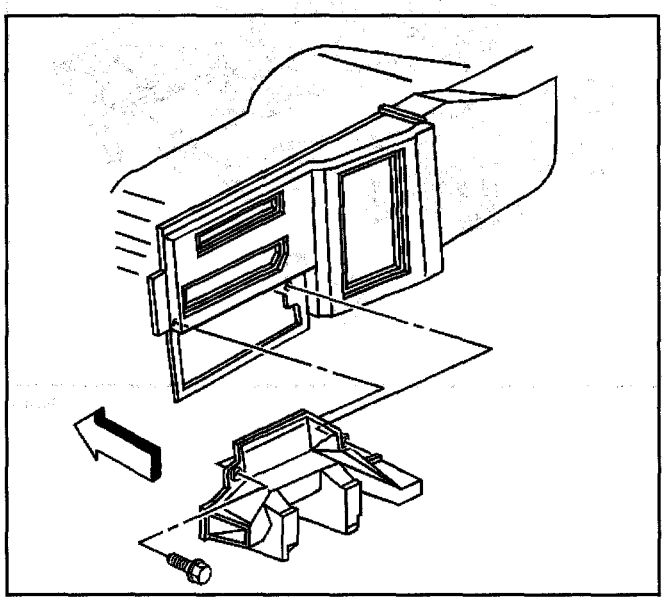
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the I/P outer air outlet duct bolts.

   Tighten

   Tighten the I/P outer air outlet duct bolts to 2.2 N·m (19 lb in).

3. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



365458

Air Outlet Replacement - Floor

Removal Procedure

1. Remove the front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.
2. Remove the front floor air outlet bolts.
3. Remove the front floor air outlet.

Installation Procedure

1. Install the front floor air outlet.

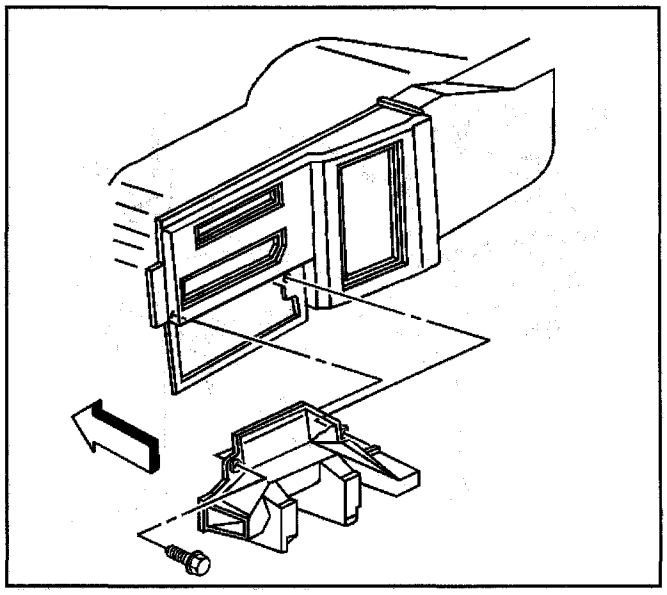
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the front floor air outlet bolts

   Tighten

   Tighten the floor air outlet bolts to 1.9 N·m (17 lb in).

3. Install the front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.

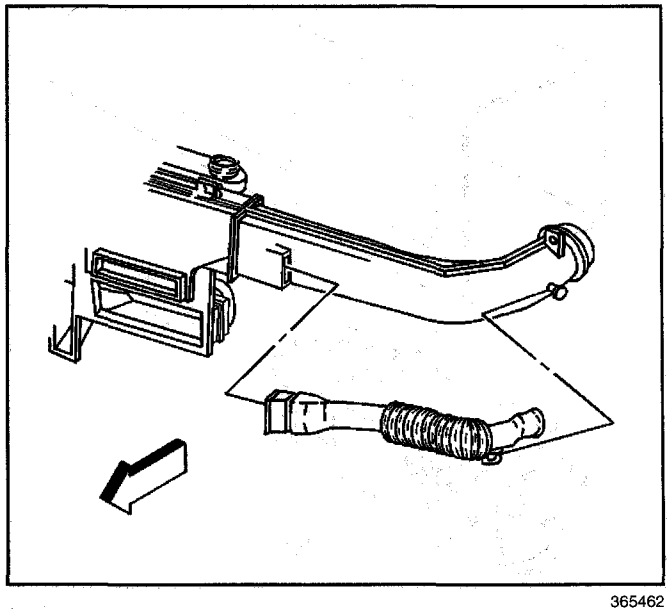


365458

Air Outlet Replacement - Side Window

Removal Procedure

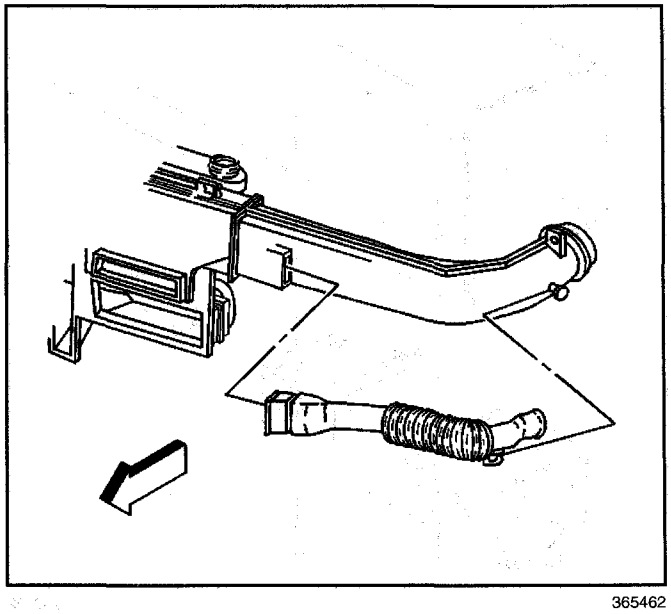
1. Remove the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Place the I/P carrier face down on a clean work surface.
3. Unsnap the side window defogger outlet duct from the air distributor.



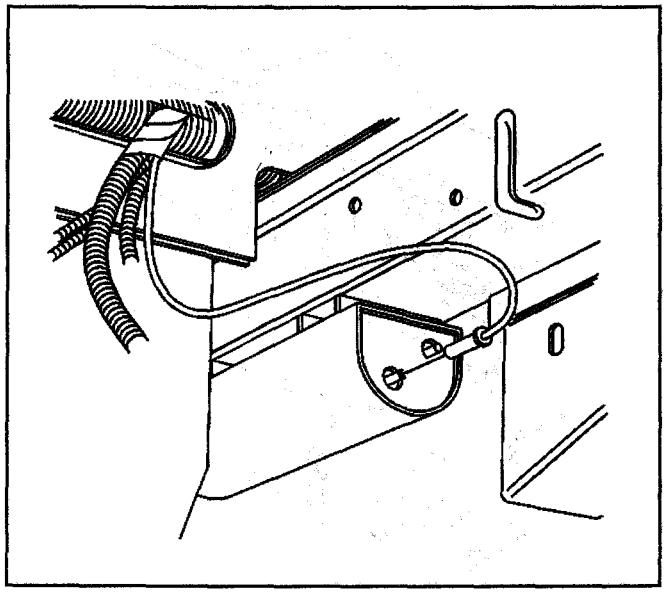
365462

Installation Procedure

1. Snap the side window defogger outlet duct to the air distributor.
2. Install the I/P carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



365462

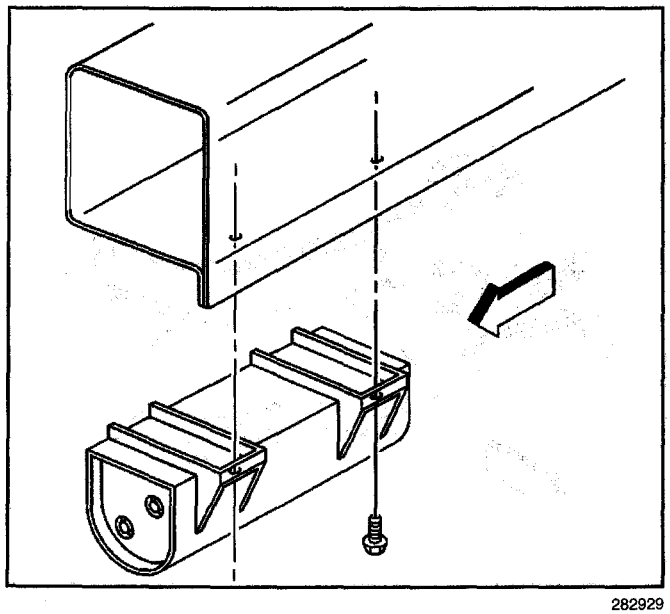


282928

Vacuum Tank Replacement

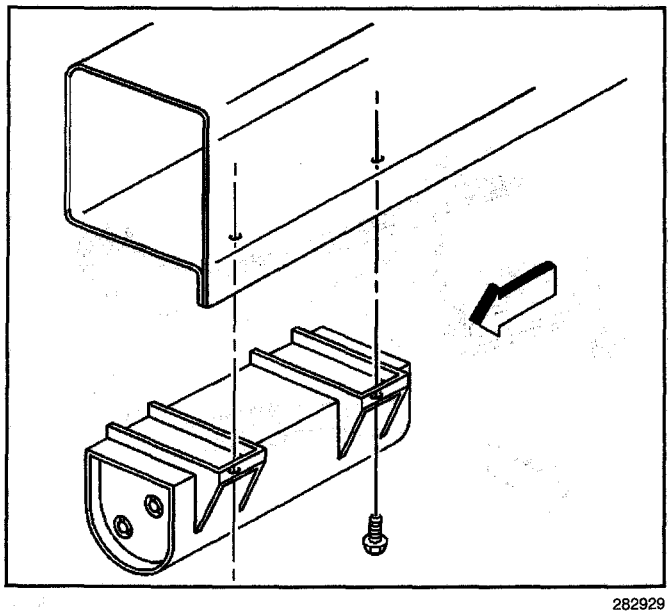
Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the front end fascia outer deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
3. Disconnect the vacuum line from the vacuum tank.



282929

4. Remove the vacuum tank mounting bolts
5. Remove the vacuum tank.



282929

Installation Procedure

1. Install the vacuum tank.

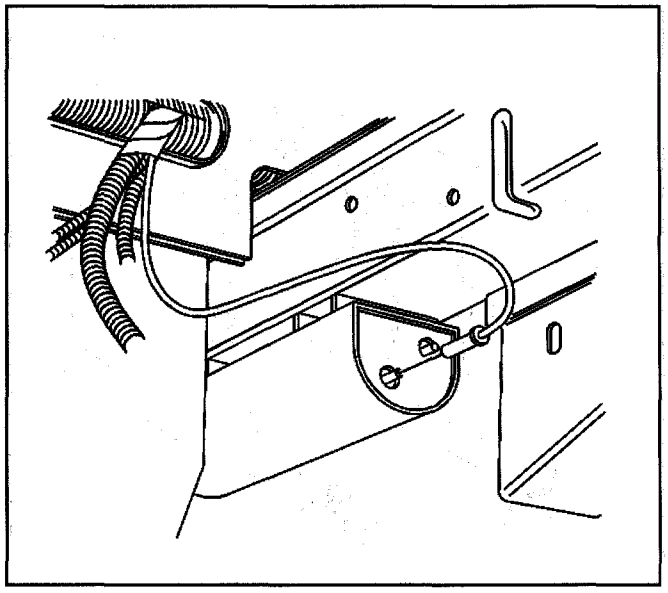
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the vacuum tank mounting bolts.

   Tighten

   Tighten the vacuum tank mounting bolts to 1.9 N·m (17 lb in).

3. Connect the vacuum line to the vacuum tank.
4. Install the front end fascia outer deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
5. Lower the vehicle.



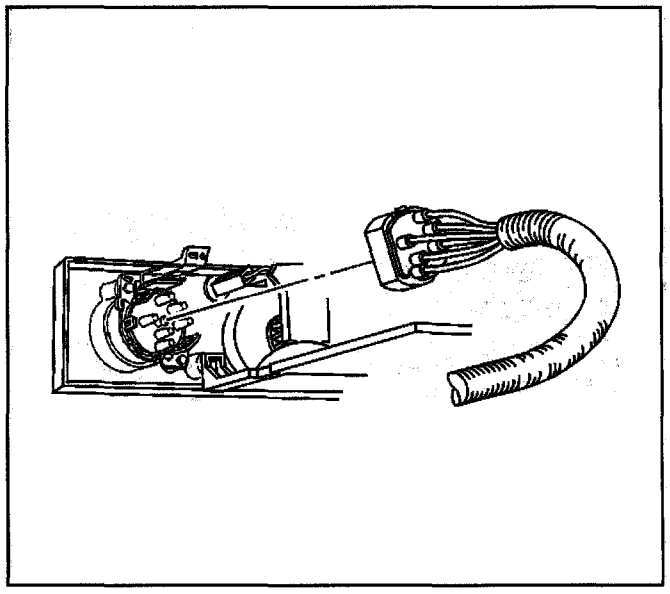
282928

Vacuum Hose Harness Replacement (Jumper Harness)

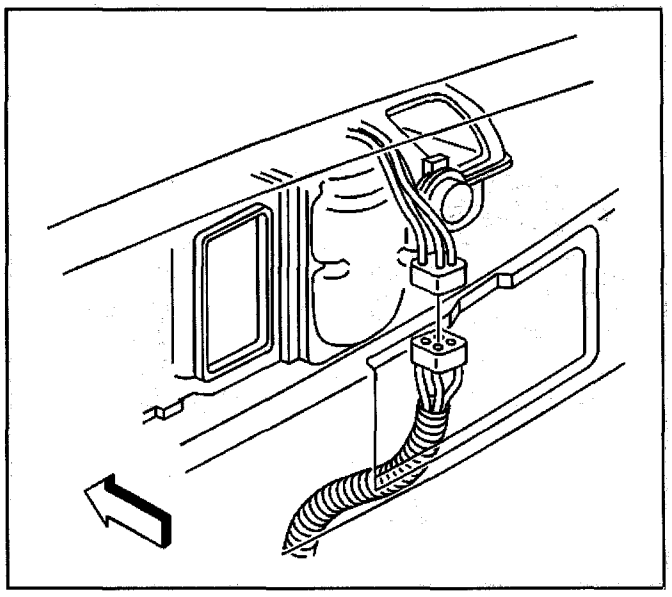
Removal Procedure

1. It is not necessary to replace the entire vacuum harness if there is a localized leakage or collapse in the vacuum hose.

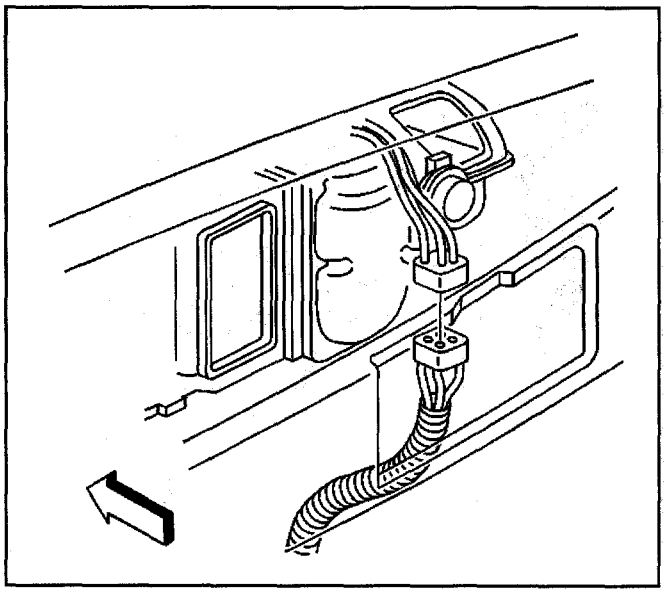
   If there is a localized leak or collapse in the vacuum hose, repair the vacuum hose:
   1.1. Cut the vacuum hose.
   1.2. Insert a plastic retainer into the vacuum hose.
2. Remove the HVAC control. Refer to *Control Assembly Replacement.*
3. Open the I/P compartment.
   Push in on both sides of the IP compartment. This will cause the I/P compartment to drop open completely to allow access to the vacuum harness.
4. Disconnect the vacuum harness connector from the vacuum selector valve.
5. Disconnect the vacuum harness jumper from the main harness connector.



282918



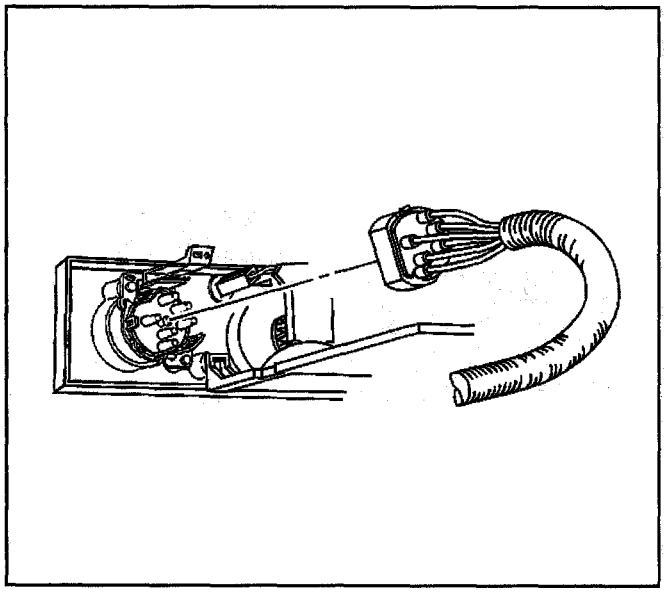
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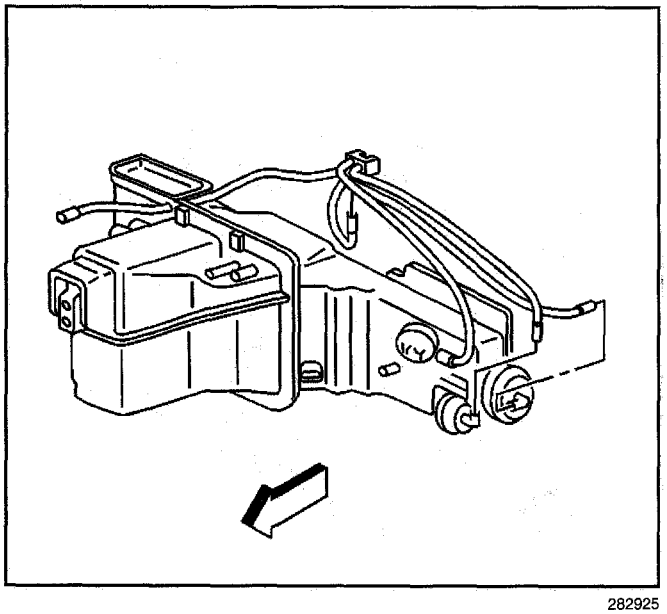
Installation Procedure

1. Connect the vacuum harness jumper to the main harness connector.



282918

2. Connect the vacuum harness connector to the vacuum selector valve.
3. Close the I/P compartment.
4. Install the HVAC control. Refer to *Control Assembly Replacement.*



282925

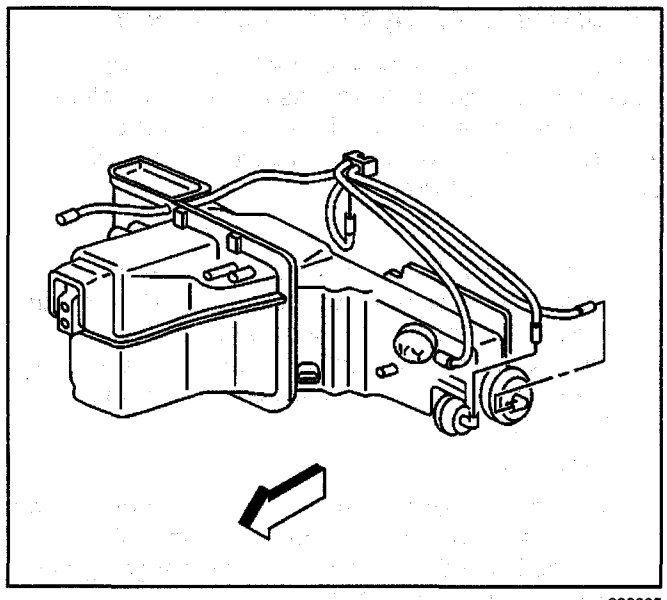
Vacuum Hose Harness Replacement (Main Harness)

Removal Procedure

1. Remove the I/P carrier. Refer to *IP Carrier Replacement.*
2. Disconnect the vacuum hoses from the actuators.
3. Remove the vacuum harness.

Installation Procedure

1. Install the vacuum harness.
2. Connect the vacuum hoses to the actuators.
3. Install the I/P carrier. Refer to *IP Carrier Replacement*.



282925

Description and Operation

A/C System Description

The HVAC system delivers air that has been heated or cooled and dehumidified for occupant comfort. The HVAC system also provides the following features:

- Ventilation
- Windshield defrosting
- Side window defogging

During most operating condition, the blower motor draws the outside air through the heater and air conditioning module. The forward movement of the vehicle forces additional air into the vehicle. The following actions occur in the evaporator core when the compressor is on:

- The air is filtered
- The air is dehumidified
- The air is cooled to about 2°C (35°F)

Some of the air then passes through the heater core where the flow of hot coolant reheats the air. Depending on the temperature door position, the heated air is mixed with cold air from the evaporator before the air enters into the passenger compartment. The air enters the passenger compartment through the upper, lower, or defroster outlets. This provides positive air flow even if the windows are closed.

When the Recirc mode is selected, most of the air entering the evaporator and heater core module is recirculated from the passenger compartment. Recirculated air is most likely cooler and dryer than outside air in very hot weather.

Air Distribution System Description

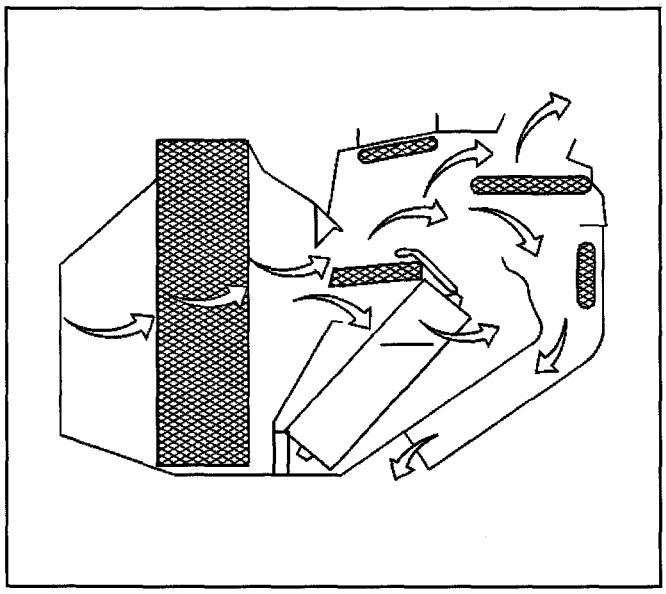
Vacuum regulates air flow through the system. Depending on the mode selected, the mode valves mix and direct either cooled, heated, or outside air through the air ducts. The various modes of operation are as follows:

1. RECIRC AIR

   This mode limits the amount of fresh air that enters the vehicle by recirculating most of the air inside the vehicle. This setting helps cool the air quickly and helps to limit odors from entering the vehicle. The air is delivered through the IP outlets.

2. OUTSIDE AIR

   This mode draws fresh air in from the outside and delivers the air through the IP outlets. This setting is used while defrosting or defogging the windows in order to help clear moisture.

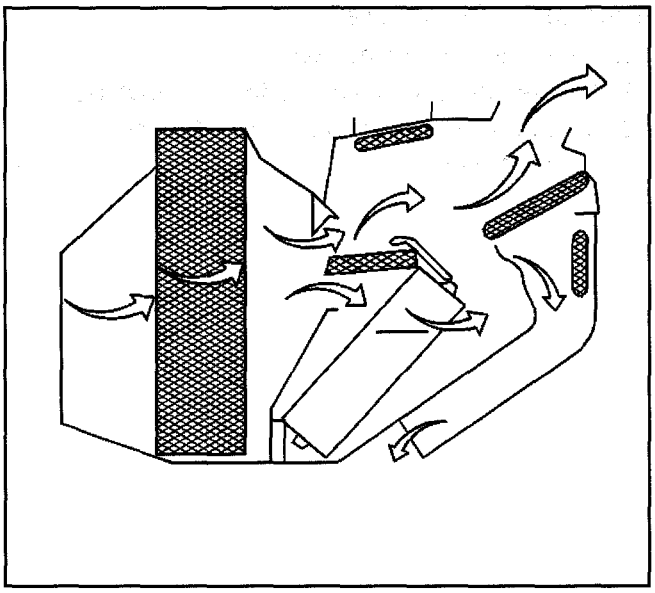


82066

3. BI/LEVEL

   This mode draws air from the outside. This mode directs air into the vehicle in two ways:

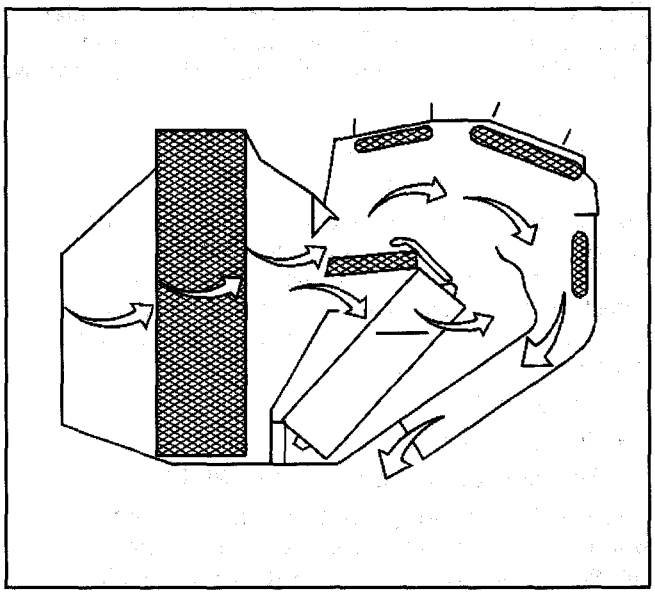
   - Cooler air is directed toward the upper body through the IP outlets.
   - Warmer air is directed through the lower outlets.



82067

4. UPPER

   This mode directs most of the air through the IP outlets and a small amount of the air to the lower outlets.

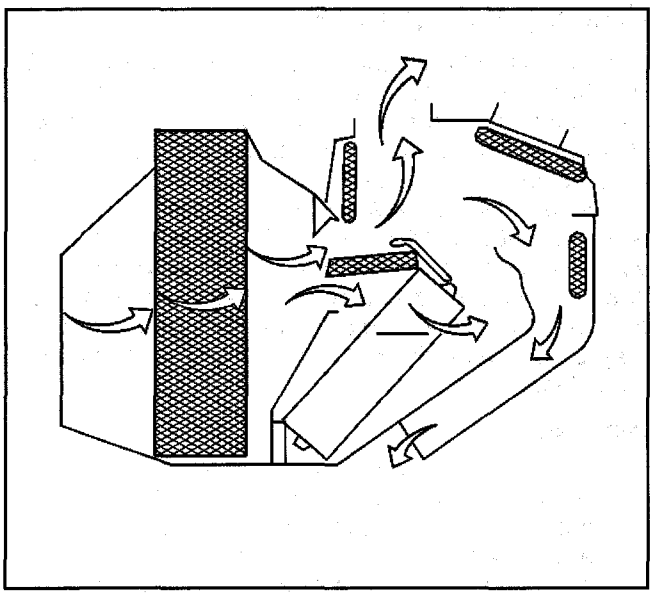


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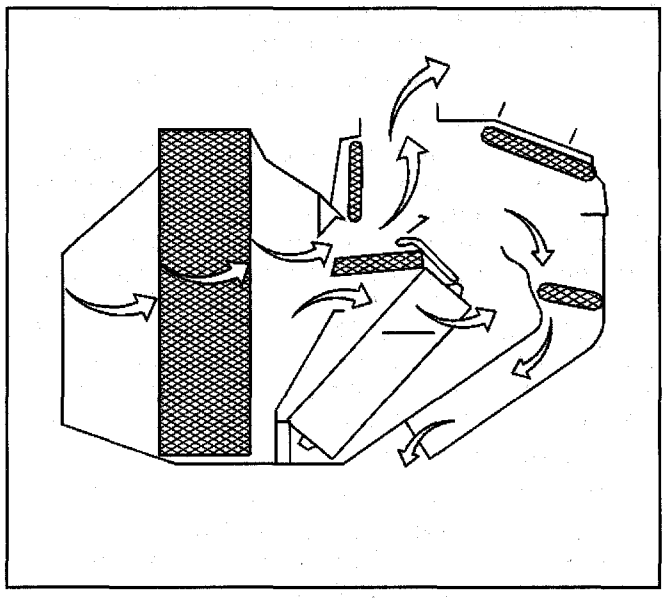
5. LOWER

   This mode directs air into the vehicle in several ways:

   - Most of the air is directed through the lower ducts to the floor area of the vehicle.
   - Some of the air is directed toward the windshield and the side window vents.



82070



82071

6. DEFOG

   This mode directs air in the vehicle in several ways:
   - Air is divided between the windshield and the lower outlets
   - A small amount of the air is directed toward the side window vents.

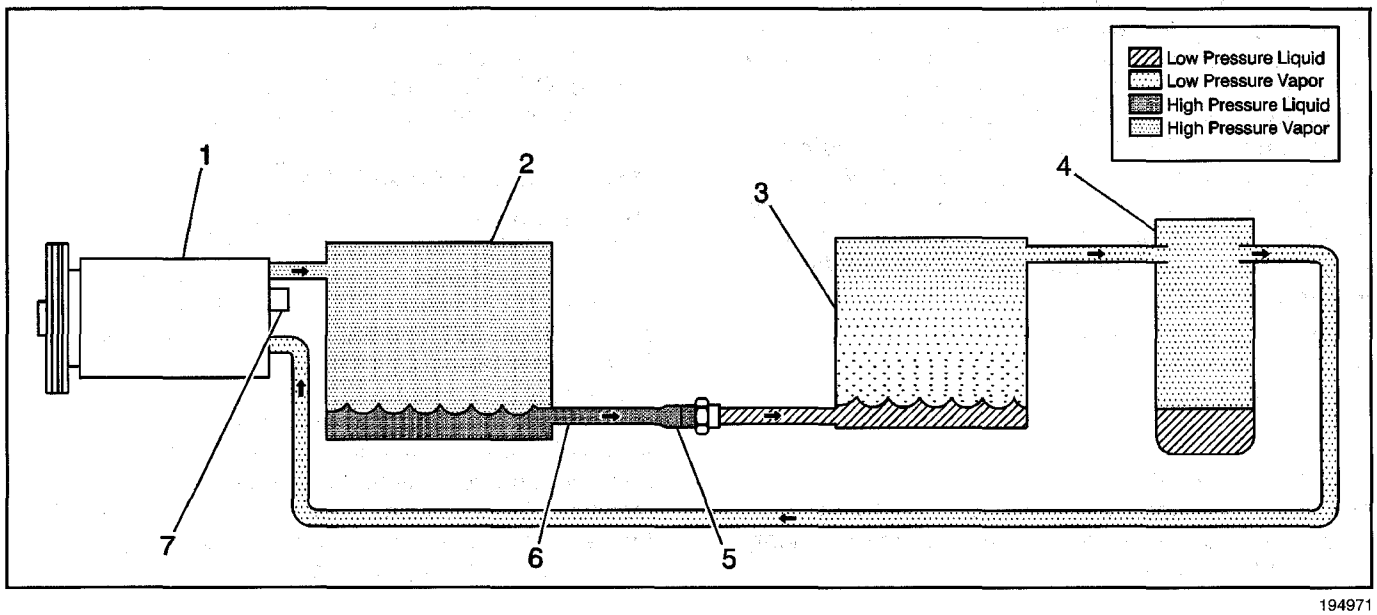
   This mode is useful when fog appears to the windshield or side glass due to rain or snowy conditions.

7. DEFROST

   This mode directs most of the air to the windshield for quick removal of fog or frost from the windshield. A small amount of air is also directed toward the lower and side window outlets.

Refrigeration System Description

VDOT Refrigeration System



194971

Legend

(1) Compressor
(2) Condenser
(3) Evaporator
(4) Accumulator
(5) Expansion (Orifice) Tube
(6) Liquid Line
(7) Pressure Relief Valve

The variable displacement orifice tube (VDOT) system is comprised of the following components:

- A variable displacement compressor (1)
- A fixed expansion tube (5)

This system matches the air conditioning demands under all modes without cycling. The basic compressor mechanism is a variable angle wobble-plate with five cylinders. The five cylinders are oriented around a common axis. The center of control of the compressor displacement is the control valve. The control valve is actuated by a bellows. The control valve is located in the rear head of the compressor (1) that senses compressor suction pressure. the crankcase-suction pressure differential controls the following conditions:

- The wobble-plate angle
- The compressor displacement

When the A/C capacity demand is high, the suction pressure will be above the control point. The valve performs the following functions:

- Maintains a bleed discharge gas into the crankcase
- Closes off a passage from the crankcase to the suction plenum

The angle of the wobble-plate is controlled by a force balance on the five pistons. A slight elevation of the crankcase suction pressure differential creates a total force on the pistons. The force on the pistons produces a movement about the wobble-plate pivot pin that reduces the plate angle.

Refrigerant R-134a

Caution: Avoid breathing the A/C Refrigerant 134a (R-134a) and the lubricant vapor or the mist. Exposure may irritate the eyes, nose, and throat. Work in a well ventilated area. In order to remove R-134a from the A/C system, use service equipment that is certified to meet the requirements of SAE J 2210 (R-134a recycling equipment). If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Refrigerant performs the following functions in the air conditioning system:

- Absorbs heat
- Carries heat
- Releases heat

These vehicles use Refrigerant-134a (R-134a). Refrigerant-134a is a nontoxic, nonflammable, clear, colorless liquified gas.

Handling Refrigerant R-134a

Caution: Avoid breathing the A/C Refrigerant 134a (R-134a) and the lubricant vapor or the mist. Exposure may irritate the eyes, nose, and throat. Work in a well ventilated area. In order to remove R-134a from the A/C system, use service equipment that is certified to meet the requirements of SAE J 2210 (R-134a recycling equipment). If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Important:

- Use only the approved lubricant for the R-134a system and the R-134a components. If lubricants other than those specified are used, compressor failure may occur. Coat all of the fittings and the O-ring seals with a clean approved refrigerant oil. This action will provide a leak-proof seal and to aid in assembly and disassembly.
- Do not store or heat the refrigerant containers above 125°F (52°C).
- Do not heat a refrigerant container with an open flame. If the container must be warmed, place the bottom of the container in a pail of warm water.
- Do not drop, puncture, or incinerate the refrigerant containers.
- Refrigerant will displace oxygen. Work in well-ventilated areas in order to prevent suffocation.
- Do not introduce compressed air to any refrigerant container or refrigerant component. The action may cause the contamination of the refrigerant.
- If it is necessary to carry a container of Dot CFR Refrigerant-134a in a vehicle, do not carry it in the passenger compartment.

Handling Compressor Oil

Use approved compressor oil from a closed, sealed container. When adding refrigerant oil, the transfer device and container should be clean and dry to minimize the possibility of contamination. Refrigerant oil is moisture-free and will readily absorb moisture from the air. Do not open the oil container until the service procedure requires oil. Cap the oil immediately after use. Always store compressor oil in a closed sealed container. Compressor oil left in open or improperly sealed containers will absorb moisture. Do not reuse oil that has been removed from the refrigeration system. Dispose of used oil properly, according to local regulations.

Handling of Refrigerant Lines and Fittings

- Ensure that the metal lines do not exhibit the following conditions.

  This will prevent the loss of system capacity due to line restriction:

  - Dents
  - Kinks
- Do not bend the flexible hose line to a radius of less that 4 time the diameter of the hose.
- Do not allow the flexible hose line to come within a distance of 63.5 mm (2 ½ in) of the exhaust manifold.
- Inspect the flexible hose lines regularly.

  Replace the flexible hose line with new hose if one of the following conditions exist:

  - Leaks
  - Brittleness
  - Deterioration
- Before disconnecting any fitting in the refrigeration system, discharge all of the Refrigerant-134a. Refer to *Refrigerant Recovery and Recharging*.
- Once you open a refrigerant line to the atmosphere, cap or tape the line immediately.

  This will prevent any of the following items from entering the line:

  - Moisture
  - Dirt
- Use the proper wrenches when you make connections on the O-ring fittings.

  Back-up the opposing fitting with a wrench in order to prevent distortion of the following areas:

  - The connecting lines
  - The components
- Tighten all of the tubing connections to the specified torque.

  Too much or too little torque may result in the following conditions:

  - Loose joints
  - Deformed joint parts
  - Refrigerant leakage
  - An inoperative A/C system
- Ensure that the O-rings and the seats are in perfect condition.

  A burr or a piece of dirt may cause a refrigerant leak.
- Install new O-rings that you have lubricated with the mineral base 525 viscosity refrigerant oil.

  Do not use polyalkylene glycol (PAG) synthetic oil.

  Do not wipe the threads with a cloth.
- Keep PAG synthetic refrigerant oil off fitting threads. Long term contact of PAG synthetic oil on threads may cause future disassembly difficulties. Flush threads of fitting with mineral base 525 viscosity refrigerant oil. Do not use PAG synthetic oil. Do not wipe threads with a cloth.

Handling A/C Compressor

Do not strike, drop, or turn the compressor upside down. If the compressor is knocked over or turned upside down, rotate the compressor's clutch 5–6 time by hand to circulate the oil which has settled in the cylinder. Sudden rotating with oil in the cylinder can cause valve damage and adversely affect durability.

Maintaining Chemical Stability

The chemical stability of the refrigeration system plays an important role in the efficient operation and longevity of the A/C system.

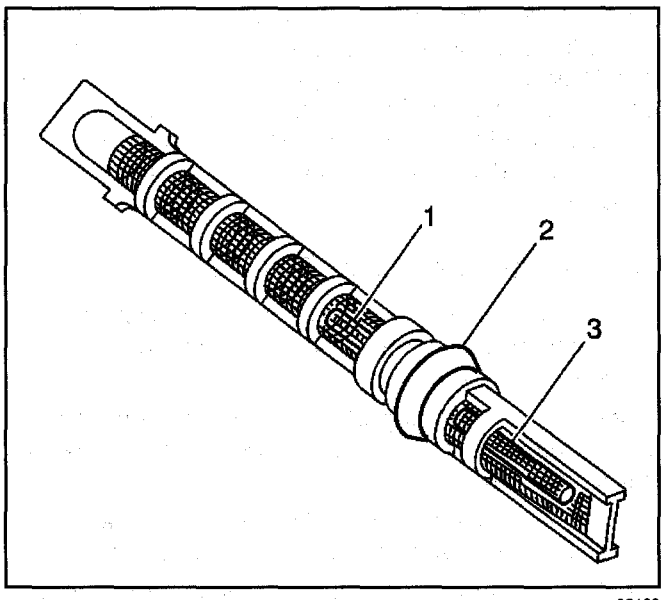
When air, moisture or particulate contamination are introduced into the refrigeration system, the following results will occur:

- The chemical stability of R-134a and polyalkylene glycol (PAG) synthetic lubricant will change.
- The pressure/temperature symmetry will change.
- The A/C system efficiency will be diminished.
- Internal A/C system parts may corrode and/or wear in an abnormal manner.

Use the following general practices to maintain chemical stability in the refrigeration system:

- Wipe away dirt and/or oil before you break a refrigerant connection. This will reduce the possibility of particulate contamination.
- Cap, plug or tape both sides of an open connection as soon as possible. This will minimize the amount of dirt and moisture entering the system.
- Ensure that the following remain clean and dry:
  - The tools being used for the repair
  - The surrounding area of the repair
  - The hoses and connectors for the ACR4 machine or manifold gage set
  - The replacement parts
- When adding polyalkylene glycol (PAG) lubricant, ensure the transfer device and the container remain clean and dry to minimize moisture intrusion.
- Do not leave the A/C system open any longer than necessary.
- Before recharging an A/C system that has been opened, properly evacuate and vacuum test the system.
- Service parts are dehydrated and sealed prior to shipping. Retain the parts in their sealed packages until you are ready to use them.
- Ensure the parts are at room temperature before opening the packages. This prevents condensation on the parts from humidity in the atmosphere.
- Attach the A/C service equipment quick-connects as soon as possible after removing the service caps.

Expansion (Orifice) Tube Description



82109

Legend

(1) Short Screen (Outlet)
(2) O-Ring
(3) Long Screen (Inlet)

The plastic expansion (orifice) tube includes the following components:

- A mesh screen
- An orifice

The expansion (orifice) tube is located in the evaporator inlet pipe at the liquid line connection. The tube restricts the high pressure liquid refrigerant in the liquid line. The tube meters the refrigerant flow to the evaporator as a low pressure liquid.

The expansion tube and the orifice have filter screens. The filter screens which protect the tube from contamination on both the inlet and the outlet sides.

The refrigerant in the system flows from the high pressure side of the tube to the low pressure side when the following conditions exist:

- The engine is OFF.
- The A/C is running.

The refrigerant will flow until the pressure is equalized. You may hear a faint hissing sound for 30–60 seconds. This sound is normal.

Evaporator Description

The evaporator cools and dehumidifies air before the air enters the passenger compartment. The following events occur in the evaporator:

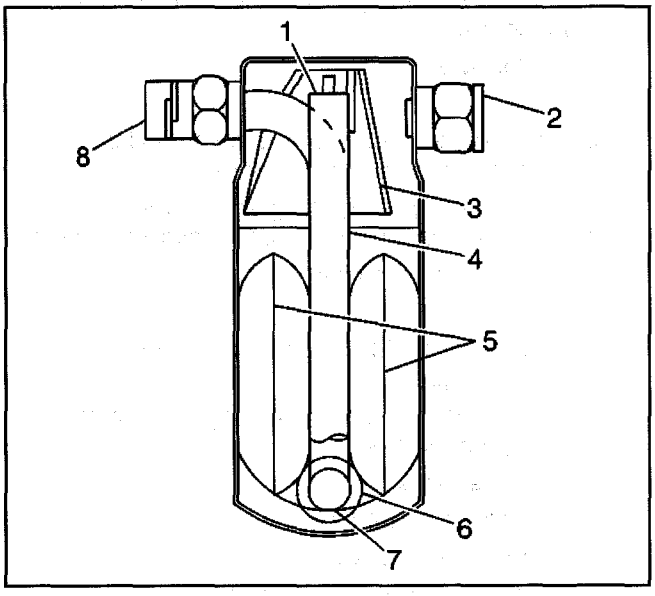
1. Low-pressure, low temperature liquid/vapor refrigerant enters the evaporator.
2. The refrigerant flows through the evaporator's tubing.
3. The refrigerant evaporates.
4. The refrigerant exits the evaporator as low-pressure, low temperature, mostly vapor refrigerant.
5. As the refrigerant evaporates, the refrigerant absorbs heat from the air flowing over the evaporator.

As the process of heat loss from the air to the evaporator core is taking place, any moisture (humidity) in the air condenses on the outside surface of the evaporator core and the moisture drains off as water.

Condenser Description

The condenser receives high pressure, high temperature refrigerant vapor from the A/C compressor. The condenser is made up of aluminum tubing and cooling fins which allow rapid heat transfer away from the high-pressure, high temperature refrigerant vapor. The cooling fins cause the high pressure, high temperature refrigerant vapor to condense into a high-pressure, medium temperature liquid.

Accumulator Description



82105

Legend

(1) Refrigerant Vapor Inlet
(2) Inlet
(3) Baffle
(4) Internal Tube
(5) Desiccant Bag
(6) Filter
(7) Oil Bleed Hole Location—In the Tube
(8) Outlet

The sealed accumulator is connected to the evaporator outlet pipe. The accumulator stores the refrigerant (vapor and liquid) and the oil from the evaporator. A desiccant at the accumulator bottom dries any moisture in the system. An oil bleed hole at the accumulator outlet pipe end provides the oil return path to the compressor. The accumulator is not serviceable and should only be replaced when leaking due to the following conditions:

- Perforation
- A damaged sealing area
- Damaged fastener threads
- Outside air has entered the system for extended periods of time

Heater Core Description

The heater core is the main component of the heater system. The heater core is located inside of the heater and evaporator module. Engine coolant is pumped into the heater core from the engine whenever the engine is operating. The heater core fins transfers the heat from the engine coolant to the air passing over the heater core. The heater core has specific inlet and outlet tubes. The placement of the heater hoses should be noted prior to servicing the heater core or the heater hoses.

The temperature control is linked to the temperature valve by a flexible control cable. When you rotate temperature control counterclockwise to the full COLD position, the temperature valve is held snugly against the air entrance to the heater core. The following actions occur:

- All of the airflow from the evaporator bypasses the heater core.
- No heat transfer occurs.

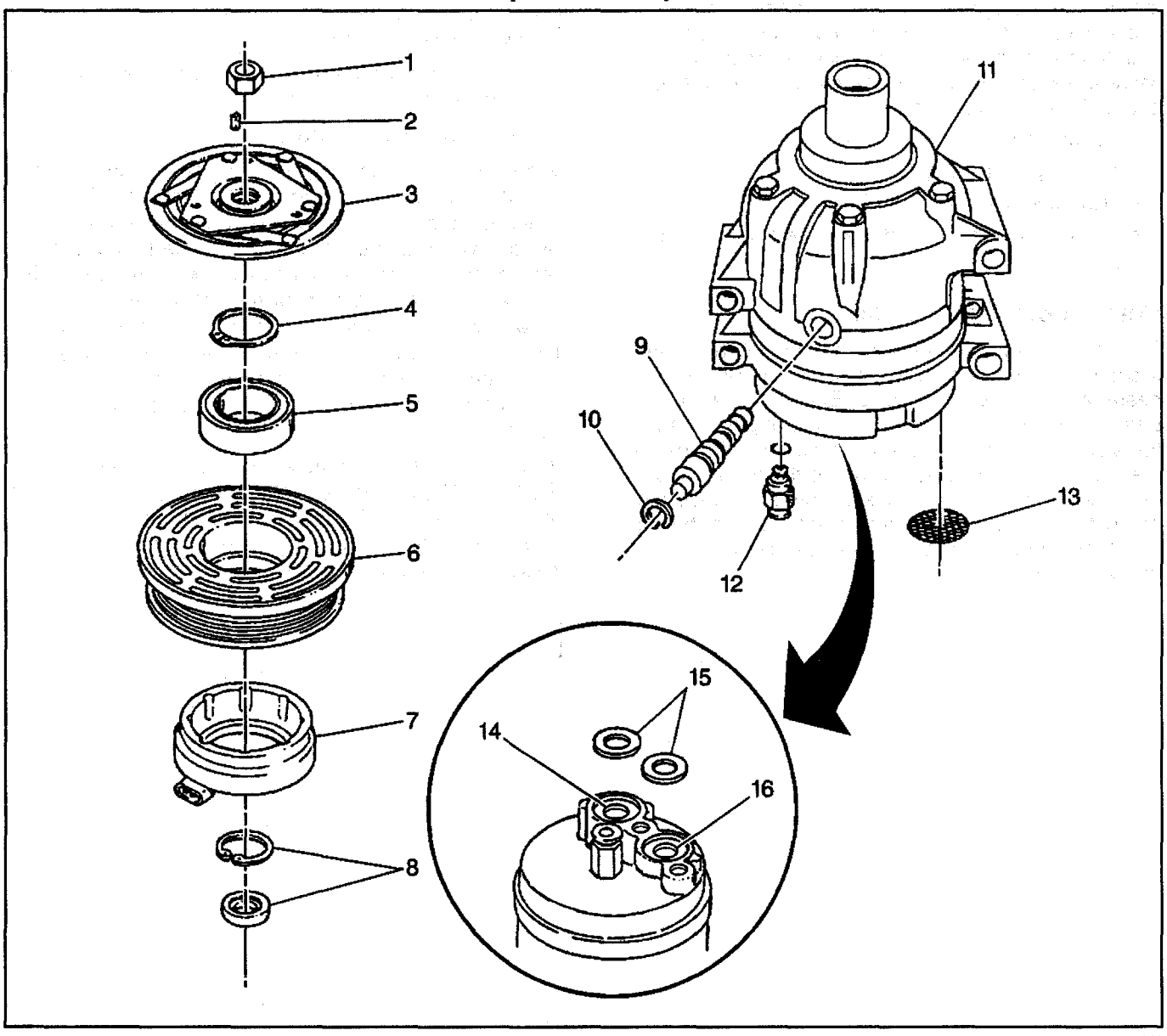
When you turn the temperature control away from the full COLD position, the temperature valve begins to direct air to the heater core. This action allows air to flow through the heater core. The farther the temperature control is rotated clockwise, the more the temperature valve directs air through the heater core. The air discharge is warmer when most of the airflow is heated in this manner. The air discharge is warmer because the heated and unheated air flows join and mix together thoroughly beyond the heater core.

When you rotate the temperature lever clockwise to the full HOT position, the temperature valve blocks off the passage that allows air to bypass the heater core. This action causes passage of the airflow through the heater core.

Compressor Description

V7 Compressor

V7 Compressor Components



157241

Legend

(1) Shaft Nut
(2) Clutch Hub Key
(3) Clutch Plate and Hub
(4) Clutch Rotor and Bearing Snap Ring
(5) Clutch Rotor Bearing
(6) Clutch Rotor
(7) Cluch Coil
(8) Compressor Shaft Seal and Snap Ring
(9) Compressor Control Valve
(10) Compressor Control Valve Retaing Ring
(11) Compressor
(12) Pressure Relief Valve
(13) Suction Port Screen
(14) Special R-134a Suction Port
(15) Seal Washers
(16) Special R-134a Discharge Port

The V7 compressor is a variable displacement compressor that can match the automotive air conditioning demand under all conditions without cycling. The basic compressor mechanism is a variable angle wobble-plate with seven axially oriented cylinders. A bellows actuated control valve located in the rear head of the compressor senses the compressor suction pressure and is the center of control for the compressor displacement. The crankcase-suction differential controls both the wobble-plate and the compressor displacement. When the A/C capacity demand is high, the suction pressure will be above the control point. The control valve will maintain a bleed from crankcase to suction which causes no crankcase-suction pressure differential giving the compressor maximum displacement. When the A/C capacity demand is lower and the suction pressure reaches the control point, the valve will bleed discharge gas into the crankcase and close of a passage from the crankcase to the suction plenum. The wobble-plate angle is controlled by a force balance on the seven pistons. A slight increase in the crankcase-suction pressure differential creates a force on the pistons. This results in a movement of the wobble-plate pivot pin that reduces the plate angle.

The compressor has a unique lubrication system. The crankcase-suction bleed is routed through the rotating wobble-plate for lubrication of the wobble-plate bearing. The rotation acts an oil separator, removing some of the oil from the crankcase-suction bleed, and rerouting the oil to the crankcase where the oil can lubricate the compressor mechanism.

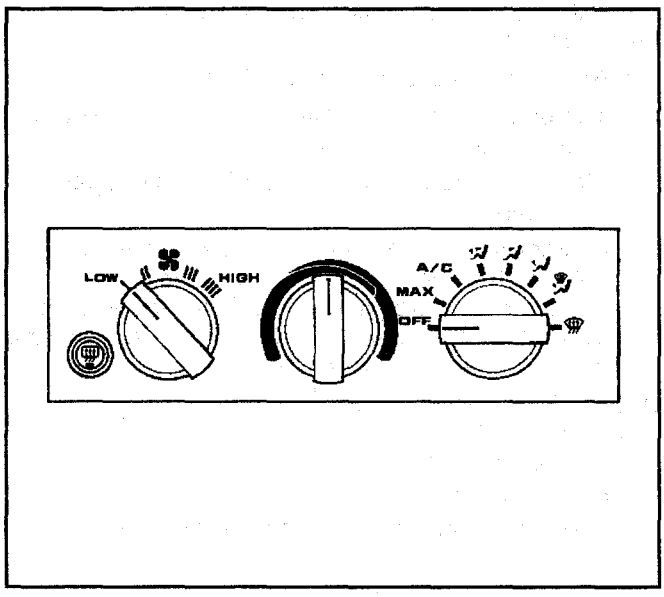
High Pressure Relief Valve Description

The V7 compressor is equipped with a pressure relief valve which is placed in the system as a safety factor.

Under certain conditions, the refrigerant on the discharge side may exceed the designed operating pressure. The valve is designed to open automatically at approximately 3036 kPa (440 psi) in order to prevent system damage.

Correct any condition that causes the valve to open. Replace refrigerant oil as necessary. Inspect the air conditioning refrigerant pressure sensor for proper calibration. Refer to *DTC P0530 Air Conditioning (A/C) Refrigerant Pressure Sensor Circuit* in Engine Controls–5.7L.

Control Assembly Description



283259

The HVAC control head uses three knobs and one push button in order to control the following features:

- The air delivery
- The air temperature
- The blower motor speed
- The rear defroster

Temperature Control Knob

The temperature control knob regulates the HVAC system air temperature. The knob is located in the center of the HVAC control head. A temperature control cable mechanically links the knob to the temperature valve (door).

- Turn the knob toward the driver for heat.
- Turn the knob toward the passenger for A/C.

Mode Control Knob

The mode control knob is located on the right side of the HVAC control head. The following are the eight different modes:

- OFF
- MAX
- A/C
- BI-LEVEL A/C
- VENT
- HEATER
- DEFROST/BLEND
- DEFROST

OFF

The following actions occur when the knob is in the OFF position:

- The blower motor does not operate.
- Electrical power is not supplied to the blower motor.
- An A/C request signal is not sent to the powertrain control module (PCM).
- A small amount of air is forced into the HVAC module by the forward movement of the vehicle. The air is discharged through the heater and defrost outlets.

MAX

The following actions occur when the knob is in the MAX position:

- An A/C request signal is sent to the PCM.
- The blower motor operates in one of four blower motor speed control settings.
- Air is discharged only from the instrument panel air outlets.
- In order to provide MAX A/C, most of the air entering the HVAC module is taken from the vehicle interior (re-circulated). This interior air is cooler than the outside air. MAX is the only setting at which the air is re-circulated.

Use the MAX setting when the following conditions exist:

- High temperature
- High humidity
- The outside air has an objectionable odor

A/C

The A/C setting functions the same as the MAX setting, except that only outside air enters the HVAC module. There may be a slight reduction of blower noise compared to the MAX setting because the re-circulation valve (door) is closed.

BI-LEVEL A/C

The following actions occur when the knob is in the BI-LEVEL A/C position:

- An A/C request signal is sent to the PCM in order to allow the blower motor to operate in one of four settings.
- Only outside air enters the HVAC module.
- Air is distributed through the instrument panel outlets and the floor outlets.
- A small amount of air is distributed to the defrost outlet.

VENT

The VENT setting does not activate an A/C request signal but allows the blower motor to operate normally. The VENT setting is one of two economy settings (other than OFF) in which there is no A/C request signal. Air is discharged through the instrument panel outlets only.

HEATER

The HEATER setting functions the same as the VENT setting, except that most of the air is discharged through the floor outlets with a small amount of air discharged through the defroster outlets. Use the HEATER setting for cold weather operation unless windshield or side window defogging/defrosting is required.

DEFROST/BLEND

The following actions occur in the DEFROST/BLEND setting:

- The blower motor operates.
- An A/C request signal is sent to the PCM.
- Air is discharged through the defroster and floor air outlets.

The DEFROST/BLEND setting provides greater passenger comfort than the DEFROST setting, but it is not as effective in defogging/defrosting the windshield and side windows.

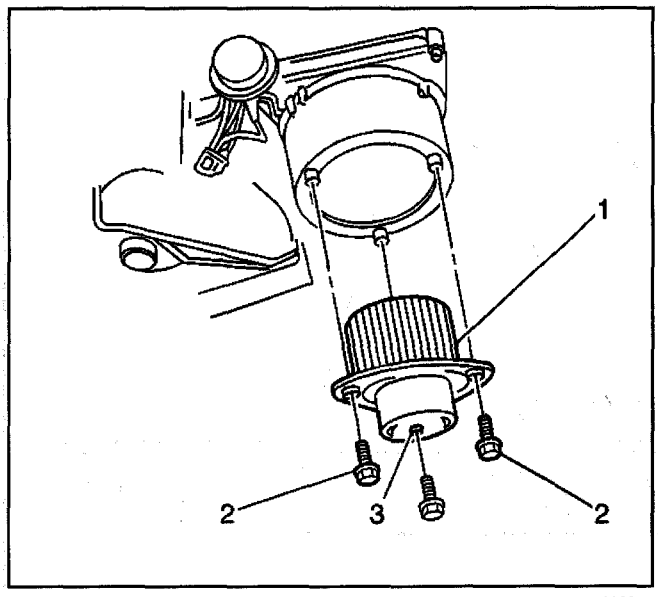
DEFROST

The DEFROST setting functions the same as the DEFROST/BLEND setting except that most of the air is discharged through the defroster outlets. A small amount of air goes through the heater and side windows defoggers.

Blower Motor Speed Control

- The blower motor runs in all mode positions except the OFF position when the ignition switch is in the RUN position.
- The blower motor speed is controlled by a four-position electrical blower motor speed control switch. The switch is located at the left side of the control.
- The blower motor speed control switch provides a choice of the following speeds:
  - Low
  - Medium (two settings)
  - High
- Power is routed from the HVAC fuse in the fuse block to the mode control switch.
- The mode control switch breaks the circuit when the switch is in the OFF position. The switch closes the circuit in all other positions.
- From the mode control switch the circuit goes to the blower motor speed control switch.
- When the blower motor speed control switch is turned to the LOW setting, voltage is conducted to the resistor. At the resistor, the voltage passes through all three resistors and is reduced to provide the low blower motor speed.
- When the blower switch is in either of the two medium speed positions, the switch closes. This action sends voltage through one or two of the resistors. Because the current follows the path of least resistance, the circuit branch that leads directly to all three resistors becomes ineffective. At this point the current bypasses either one or two resistors, depending upon which medium speed position is selected. The reduced resistance increases the current flow and blower motor speed.
- When the blower motor switch is turned to the HIGH setting, the action energizes the high blower relay. Power is taken from a separate circuit that is protected by a fusible link. The separate power circuit is hot at all times. The circuit has the capacity to handle the current demands of the blower motor at high speed.
- The circuit to the blower motor is completed to ground at the instrument panel through the instrument panel wiring harness.

Blower Motor Description



282924

The blower motor consists of the following components:

- A permanent magnet type motor (3)
- A squirrel cage type fan (1)

The blower operates at various speeds. The various speeds are determined by the resistance of the blower motor resistor which is controlled by the blower motor speed control.

Refrigerant Oil Distribution

Notice: Use only Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system and only 525 viscosity mineral oil on fitting threads and O-rings. If lubricants other than those specified are used, compressor failure and/or fitting seizure may result.

If the refrigerant charge is abruptly lost due to a large refrigerant leak, approximately 90 ml (3 fl oz) of refrigerant oil will be carried out of the system suspended in the refrigerant.

- Any failure that caused an abrupt refrigerant discharge will experience this oil loss.
- Failures that allow the refrigerant to seep or to bleed off over time do not experience this oil loss.

When you replace a component which caused a large refrigerant leak, add the following fluids:

- 90 ml (3 fl oz) of new polyalkylene glycol (PAG) synthetic refrigerant oil (GM P/N 12345923 or equivalent)
- The required amount of oil for the particular component

Add the oil directly to the replaced component if possible. If you cannot easily add the oil to the replaced part, add the oil to the accumulator.

You must add new oil to the system whenever you replace components, as follows:

- Compressor

  The compressor requires 240 ml (9 fl oz) of PAG refrigerant oil. Replacement compressors will not have oil in the them. Add the correct amount of oil to the replacement compressor before installation.
- Evaporator

  Add 90 ml (3 fl oz)
- Condenser

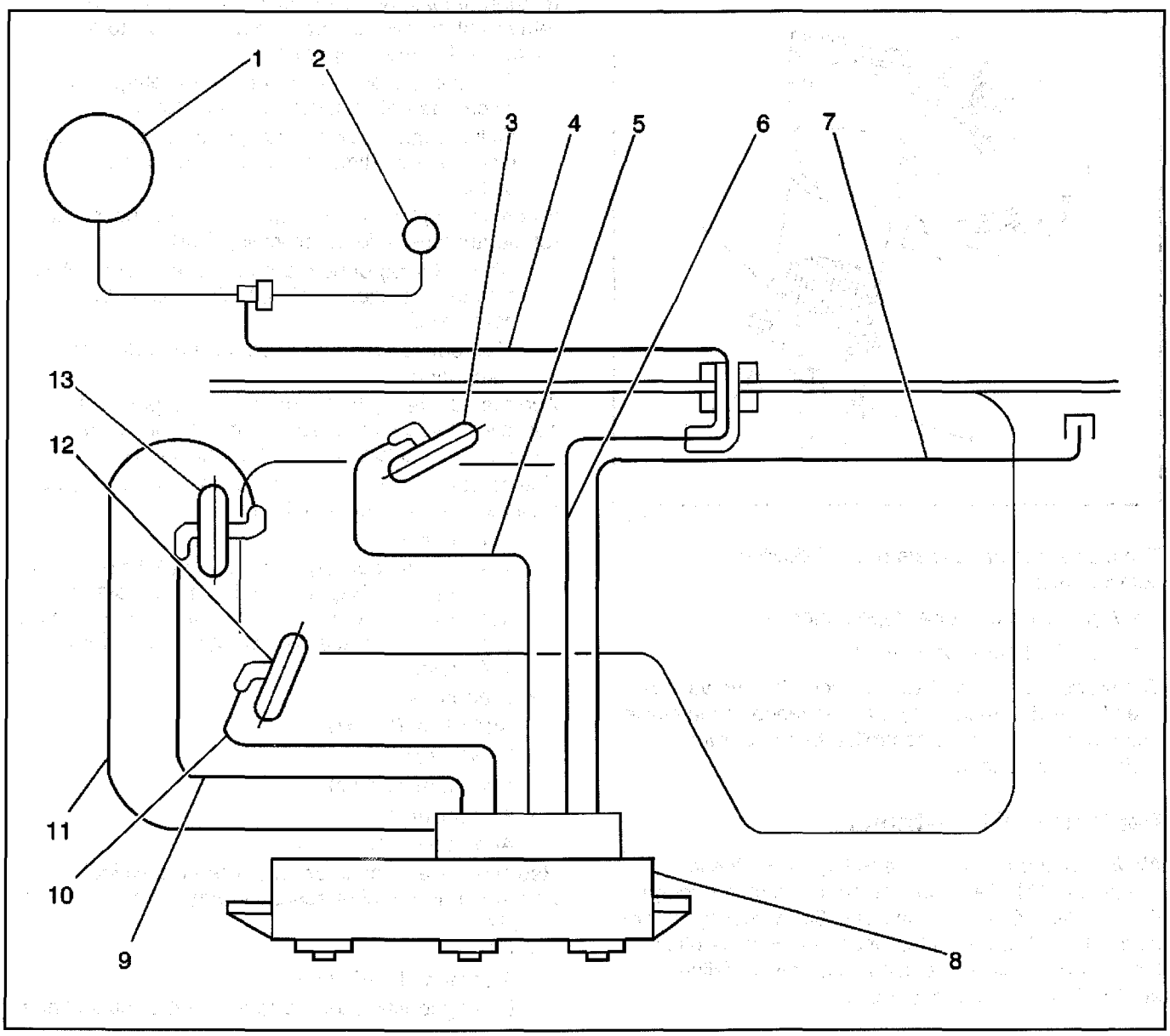
  Add 30 ml (1 fl oz)
- Accumulator

  Add 105 ml (3.5 fl oz)

Replace the accumulator only when a physical perforation to the shell results in any of the following conditions:

- A leak
- A damaged O-ring seal
- Damaged fitting thread to the inlet or outlet lines

Vacuum Hose Harness Description



570879

Legend

(1) Control Vacuum Selector Valve
(2) To Vacuum Source
(3) Vacuum Tank
(4) Upper and Lower Mode Vacuum Actuator
(5) Heater and Defrost Vacuum Actuator
(6) Bi-Level Vacuum Actuator
(7) Air Inlet Vacuum Actuator
(8) Multi-Connector
(9) Black
(10) Red
(11) Yellow
(12) Green
(13) Purple
(14) Orange

The engine vacuum regulates all of the actuators (4, 5, 6 and 7) (except the temperature valve) in the heater and A/C evaporator module. The vacuum is drawn from the vacuum tank (3). The tank is mounted to the right side body rail.

A vacuum selector valve (1) routes the vacuum to spring-loaded vacuum actuators (4, 5, 6 and 7) on the heater and A/C evaporator module.

During conditions of low engine manifold vacuum, a check valve in the vacuum source hose prevents vacuum in the vacuum tank from bleeding back to the vacuum's source.

The mode control regulates the vacuum selector valve (1). At each mode control position, the valve performs the following actions:

- Directs vacuum to the specific hoses in order to overcome the force of the spring within the actuators.
- Vents the hoses to normal air pressure. This action allows the spring to expand. The expansion results in the proper positioning of the valves (doors) for the selected operating mode.

The bi-level (6) and vent valves have two-position vacuum actuators. When vacuum is directed to either actuator's vacuum chamber, the vacuum pulls in a flexible diaphragm. The diaphragm forms one wall of the chamber. This action draws a movable shaft attached to the diaphragm. The shaft is linked to the corresponding valve. The shaft operates the valve when the vacuum is applied.

An external spring moves the shaft back to its original position when the vacuum chamber is vented to normal air pressure. The shaft, in turn, returns the valve to its original position.

The heater and defrost valve (5) uses a three-position vacuum actuator. A three-position vacuum actuator has a diaphragm with a spring on both sides. At rest (no vacuum applied) the diaphragm is in a mid-position. This allows for a blend mode. Apply vacuum to either end of the diaphragm in order to move the heater and defrost valve to either stop. This action directs airflow to either the defroster outlets or the floor outlets.

When air is directed to the floor outlets, as in the HEATER setting, a small amount of air still bleeds through the defroster outlets. This action helps eliminate the refogging of the windshield.

Relays and Sensors Description

Blower Motor Relay

Use the blower motor relay in order to provide battery voltage to the blower motor only during high blower motor speed. Use the blower motor resistor in order to provide power to the blower motor at all other speed settings. The blower motor relay is located under the instrument panel. Refer to *Blower Motor Relay Replacement.*

Air Conditioning Compressor Relay

Use the A/C compressor relay in order to provide battery voltage to the compressor clutch coil. The powertrain control module (PCM) controls the relay. The relay is located in the underhood electrical center. Refer to *Compressor Relay Replacement.*

A/C Refrigerant Pressure Sensor Description

An electronic A/C refrigerant pressure sensor is mounted in the evaporator tube between the evaporator and the condenser. The sensor output to the powertrain control module (PCM) varies.

The sensor output depends upon the pressure inside the line. The PCM constantly monitors the A/C refrigerant pressure in order to perform the following functions:

- Disengage the A/C clutch if the pressures are above 2826 kPa (410 psi).
- Disengage the A/C clutch if the pressures are below 207 kPa (30 psi)
- Boost idle air control in order to compensate for A/C load at idle.
- Control the cooling fan.

Replace the sensor if the sensor fails.

O-Ring/Flat Washer Description

Install new approved service replacement air conditioning O-ring(s) and flat washers whenever a joint or fitting is disassembled.

Some vehicles use flat sealing washers and O-ring(s) to seal the refrigerant system. The flat washers are used on block fittings of refrigerant components. The O-ring(s) is used to seal the refrigerant tubes.

The O-ring fitting consists of:

- An aluminum alloy, externally threaded fitting which is welded to an aluminum tube.
- A free-spinning internally threaded nut.
- An aluminum tube end which accommodates the O-ring(s).

Verify that the flat washers or O-ring(s) have not been damaged prior to installation. Replace damaged parts.

Coat O-ring(s) and flat washers with the approved refrigerant oil.

Failure to use the proper service replacement parts and procedures may result in a leak.

Service Caps Seal

The primary seal for the service ports is the sealing cap. The cap contains a specially designed O-ring or gasket which provides a leak free seal. Should the cap be loose, missing, or the wrong usage, a loss of refrigerant could result.

HVAC Blower Controls Circuit Description

With the Ignition Switch in RUN, battery voltage is applied to the HVAC Control Selector Switch. The HVAC Control Selector Switch applies power to the Selector Switch in all modes but OFF. With the Blower Switch set to LO, battery voltage is applied to the Blower Motor through the Blower Resistor and the normally closed contacts of the Blower Motor Relay. The Blower Motor runs at low speed. When the Blower Switch is in the M1 or M2 position, the operation is similar to the operation in LO except the resistance through the Blower Resistor is decreased, causing the Blower Motor to run faster in M1 and even faster in M2. When HI blower speed is selected, the Blower Switch applies voltage to the High Blower Relay coil. The Blower Motor Relay is energized, applying voltage from CKT 1202 through the relay directly to the Blower Motor. The Blower Motor then runs at high speed.

Special Tools and Equipment

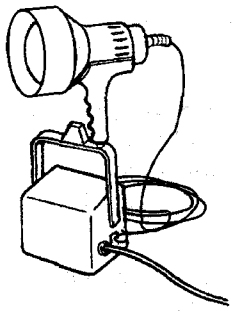
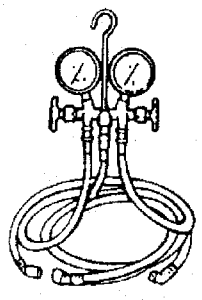
Illustration	Tool Number/ Description
 82136	J 6742-03 Precision Thermometer
 62292	J 28428-E High Intensity Black Light
 3550	J 36645 Air Conditioning Evaporator Cleaning Gun
 82129	J 39183-C R-134a Manifold Gauge Set

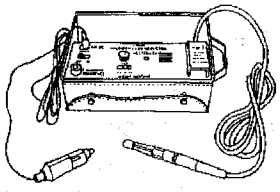
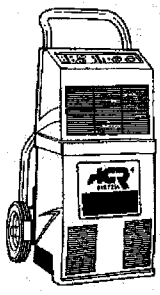
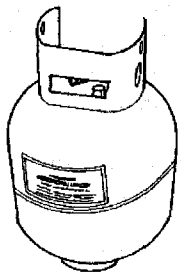
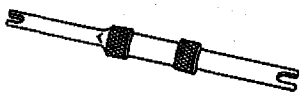
Illustration	Tool Number/ Description
 82132	J 39400 Halogen Leak Detector
 82133	J 39500 Air Refrigerant Recovery, Recycling and Recharging (ACR 4) System
 82128	J 39500-50 50 lb Refillable Recovery Tank
 283643	J 34611-A (or J 39923) Valve Core Remover and Installer

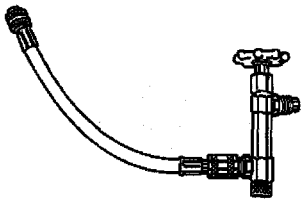
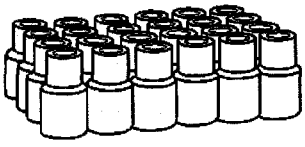
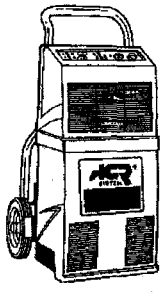
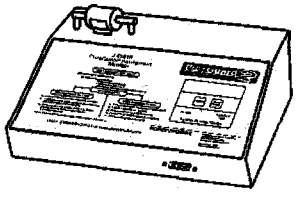
Illustration	Tool Number/ Description
 283642	J 41436 Tracer Dye Injector
 258343	J 41447 R134a Tracer Dye (24 1/4 oz. Bottles)
 82133	J 39500 Refrigerant Recovery, Recycling and Recharging (ACR4) System
 353273	J 41810 Pureguard 2

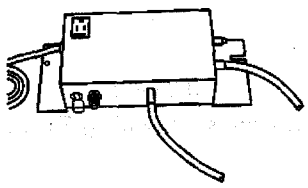
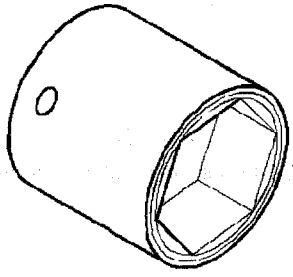
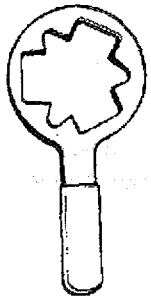
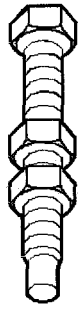
Illustration	Tool Number/ Description
 347269	J 41810–100A Active Flow Control Valve
 7033	J 33022 Shaft Nut Socket
 7039	J 33027– A Clutch Hub Holding Tool
 6187	J 33013– B Hub and Drive Plate Remover and Installer

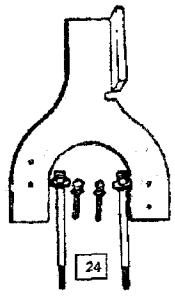
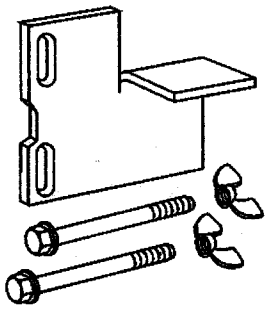
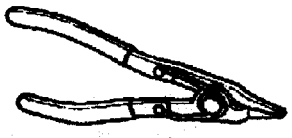
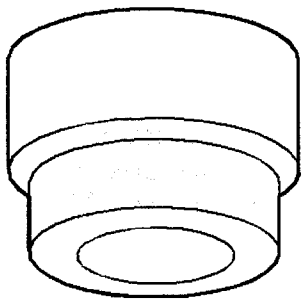
Illustration	Tool Number/ Description
 7038	J 34992 Compressor Holding Fixture
 157244	J 41790 Compressor Holding Fixture
 6183	J 6083 Snap Ring Pliers
 6186	J 9398 Bearing Remover

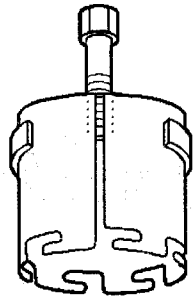
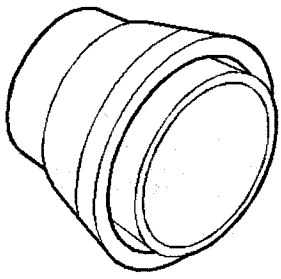
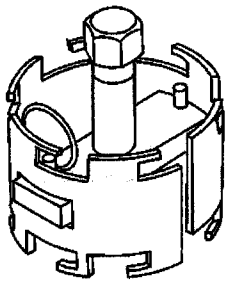
Illustration	Tool Number/ Description
 2015	J 8092 Driver Handle
 210049	J 33020 Pulley Puller
 7035	J 33023– A Puller Pilot
 157245	J 41552 Compressor Pulley Puller

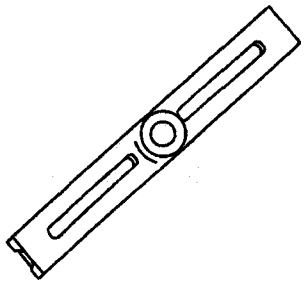
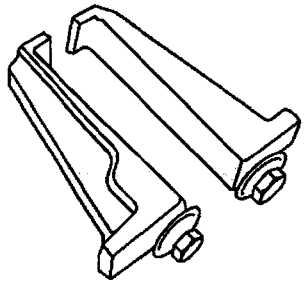
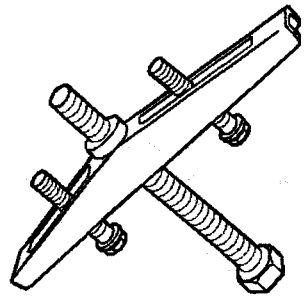
Illustration	Tool Number/ Description
 210221	J 8433–1 Puller Bar
 7029	J 8433–3 Forcing Screw
 7037	J 33025 Clutch Coil Puller Legs
 6185	J 8433 Compressor Pulley Puller

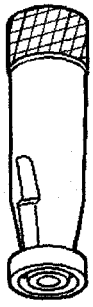
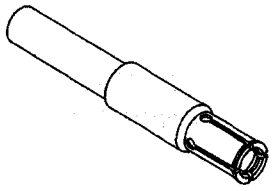
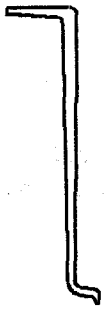
Illustration	Tool Number/ Description
 10767	J 5403 Snap Ring Pliers
 6193	J 23128– A Seal Seat Installer and Remover
 208026	J 42136 A/C Lip Seal Remover
 6190	J 9553– 01 O– Ring Remover

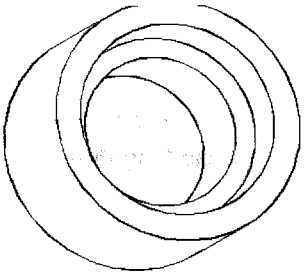
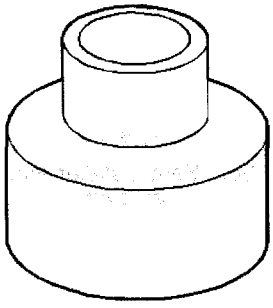
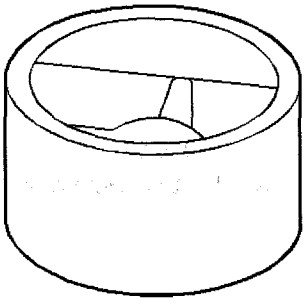
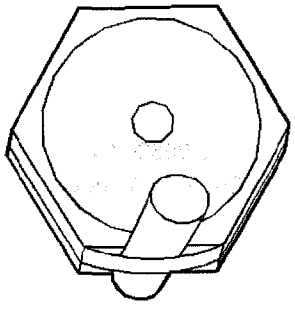
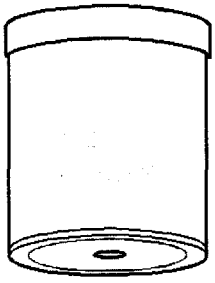
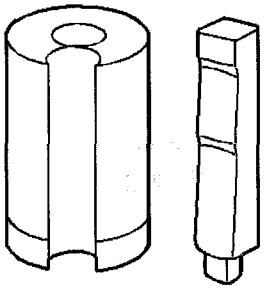
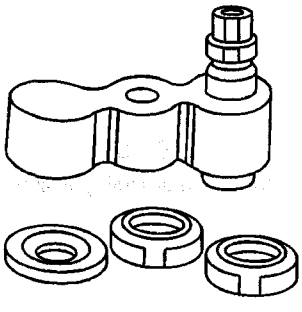
Illustration	Tool Number/ Description
 7032	J 33017 Pulley and Bearing Assembly Installer
 210053	J 9481– A Bearing Installer
 6192	J 21352– A Support Block
 6200	J 33019 Bearing Staking Tool

Illustration	Tool Number/ Description
 7036	J 33024 Clutch Coil Installer
 6207	J 33011 O–Ring Installer
 6206	J 34614 Shaft Seal Protector
 210224	J 39893 Pressure Testing Connector

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BLANK

Lighting Systems

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Dome Lamp Bolt/Screw	1.7 N·m	15 lb in
Fog Lamp to Headlamp Bolt	10 N·m	89 lb in
Fog Lamp Bolt (Pontiac)	15 N·m	11 lb ft
Fog Lamp Nut (Pontiac)	8 N·m	71 lb in
Fog Lamp to Bracket Bolt (Chevrolet)	10 N·m	89 lb in
Front Fascia Reinforcement Nut	10 N·m	89 lb in
Headlamp Bezel Screw (Pontiac)	1.7 N·m	15 lb in
Headlamp Housing Bracket Bolt	7 N·m	62 lb in
Headlamp Opening Door Bolt/Screw (Pontiac)	2.0 N·m	18 lb in
Headlamp Switch Bolt	1.9 N·m	17 lb in
High-Mount Stoplamp Screw	1.7 N·m	15 lb in
Inside Handle Bezel Bolt/Screw	1.4 N·m	12 lb in
Parking and Turn Signal Lamp Bolt	2.5 N·m	22 lb in
Park and Turn Signal Lamp Nut	4.0 N·m	35 lb in
Park and Turn Signal Lamp Bolt (Trans Am)	2.5 N·m	22 lb in
Rear Fog Lamp Nut (Export)	1.4 N·m	12 lb in
Rear License Lamp Screw	1.9 N·m	17 lb in
Rear Sidemarker Lamp Screw	1.4 N·m	12 lb in
Side Marker Lamp Screw	1.4 N·m	12 lb in
Taillamp Nut	3 N·m	27 lb in

Bulb Usage

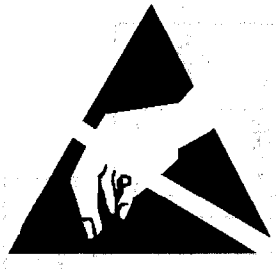
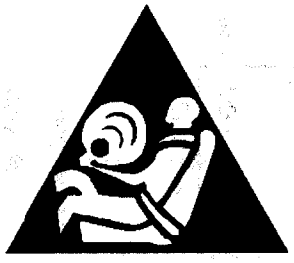
Type of Lamp	Trade Number
Exterior Lamp Usage	
Back-up Lamp	3155
Back-up Lamp (Export)	P21W
Fog Lamp (Chevrolet)	894X
For Lamp (Export)	H3
Fog Lamp (Pontiac)	880
Front Side Marker Lamp	194
Headlamp Low Beam (Chevrolet)	9006
Headlamp High Beam (Chevrolet)	9005
Headlamp Low Beam (Pontiac)	H4703
Headlamp High Beam (Pontiac)	H4701
High-Mount Stoplamp (Chevrolet Export)	W16W
High-Mount Stoplamp (Chevrolet and Pontiac Domestic)	921
License Lamp	194
License Lamp (Export-Europe)	W3W
Park and Turn Signal (Chevrolet)	3157k
Park and Turn Signal (Pontiac)	3157NAK
Park and Turn Signal (Export)	P27/7WLL
Rear Fog Lamp (Export)	P21W
Rear Sidemarker Lamp	194
Side Repeater Lamp (Export)	W5W
Taillamp, Stop/Tail	3057
Taillamp, Stop/Tail (Export)	P21/W5
Tailamp, Stop, Turn Signal (Pontiac)	3057
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Taillamp, Turn Signal (Export)	P21/W5
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Schematic and Routing Diagrams

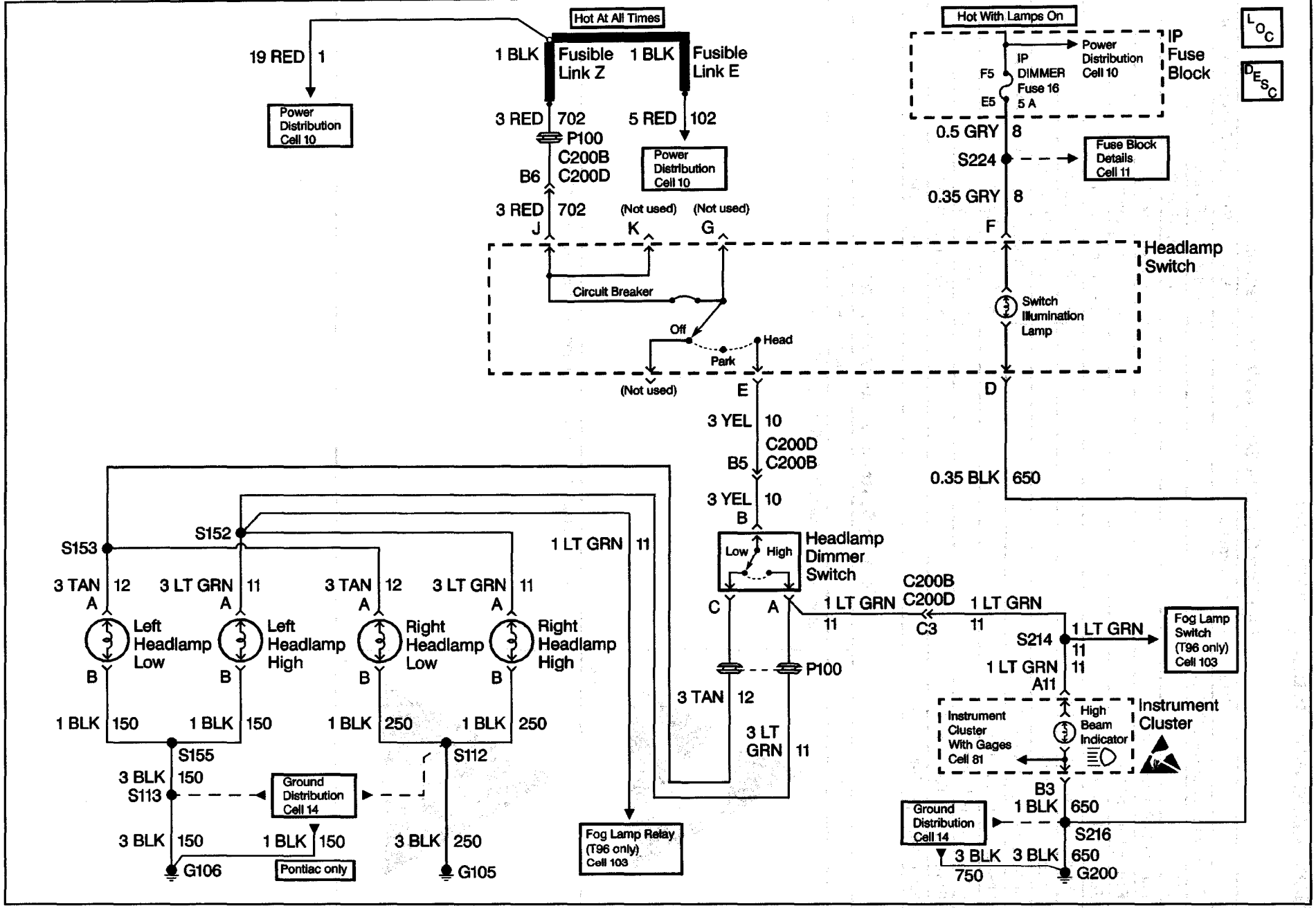
Lighting Systems Schematic References

Reference on Schematic	Section Number - Subsection Name
Brake Warning System Cell 41	5 - Hydraulic Brakes
DRL Cell 102	8 - Lighting Systems
Exterior Lights Cell 110	8 - Lighting Systems
Fog Lights Cell 103	8 - Lighting Systems
Fuse Block Details Cell 11	8 - Wiring Systems
Ground Distribution Cell 14	8 - Wiring Systems
Headlights Cell 100	8 - Lighting Systems
Instrument Cluster Cell 81	8 - Instrument Panel, Guages, Console
Interior Lights Cell 114	8 - Lighting Systems
Interior Lights Dimming Cell 117	8 - Lighting Systems
Power Distribution Cell 10	8 - Wiring Systems
Rear Defogger Cell 61	8- Stationary Windows

Lighting Systems Schematic Icons

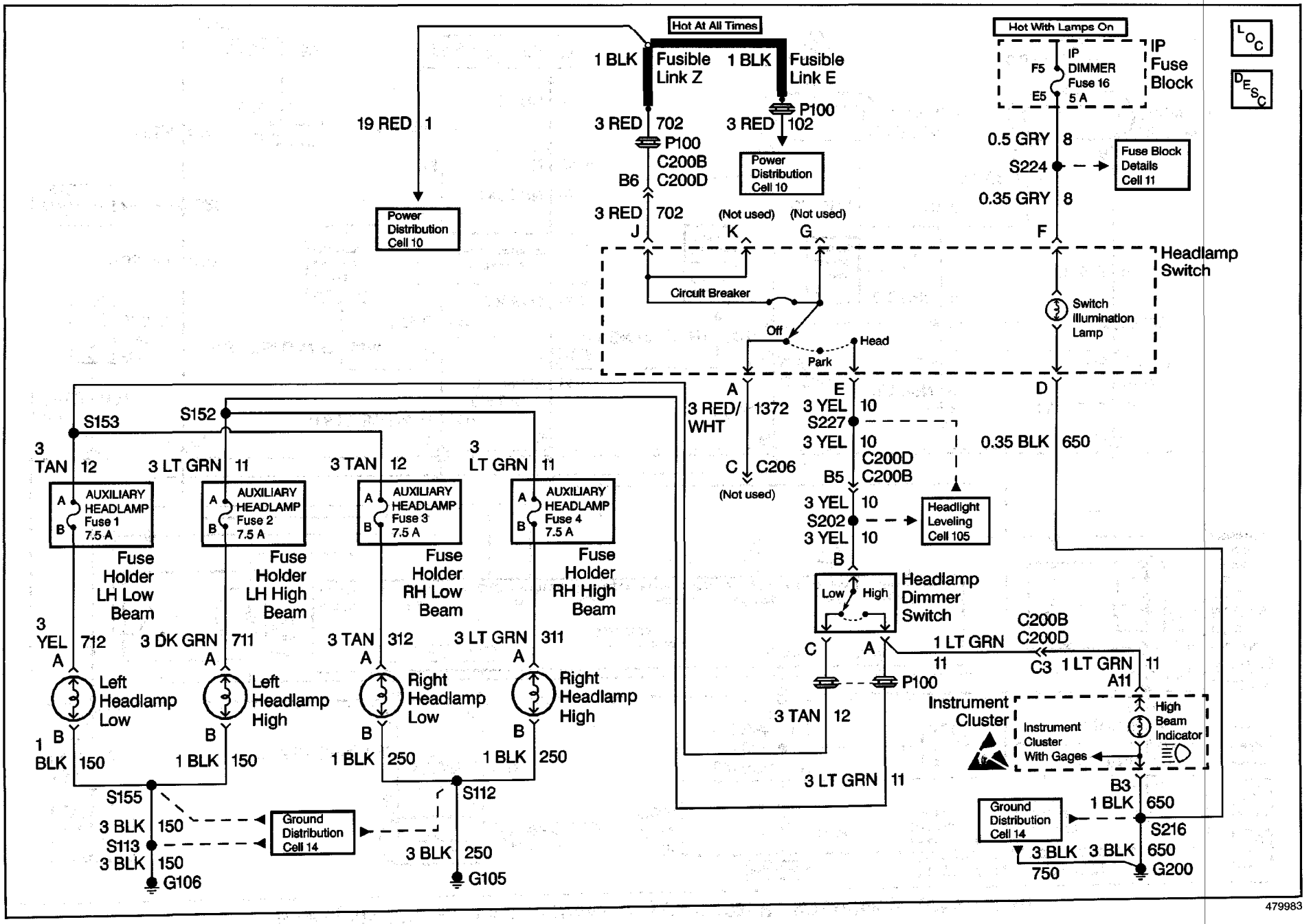
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.

Headlights Schematics (Japan) (Cell 100: Without Daytime Running Lights (Chevrolet))



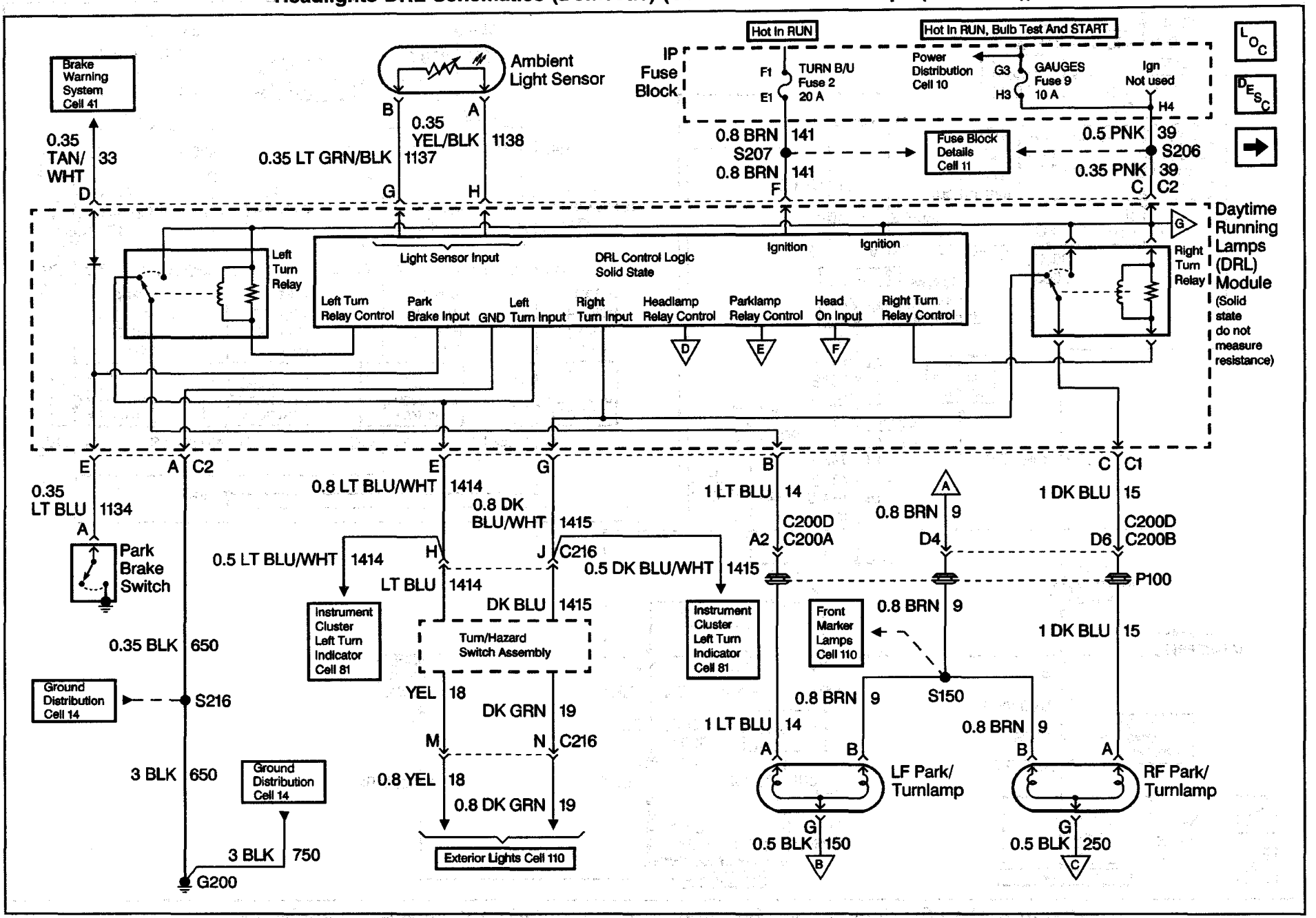
479979

Headlights Schematics (Europe) (Cell 100: Without Daytime Running Lights (Chevrolet))



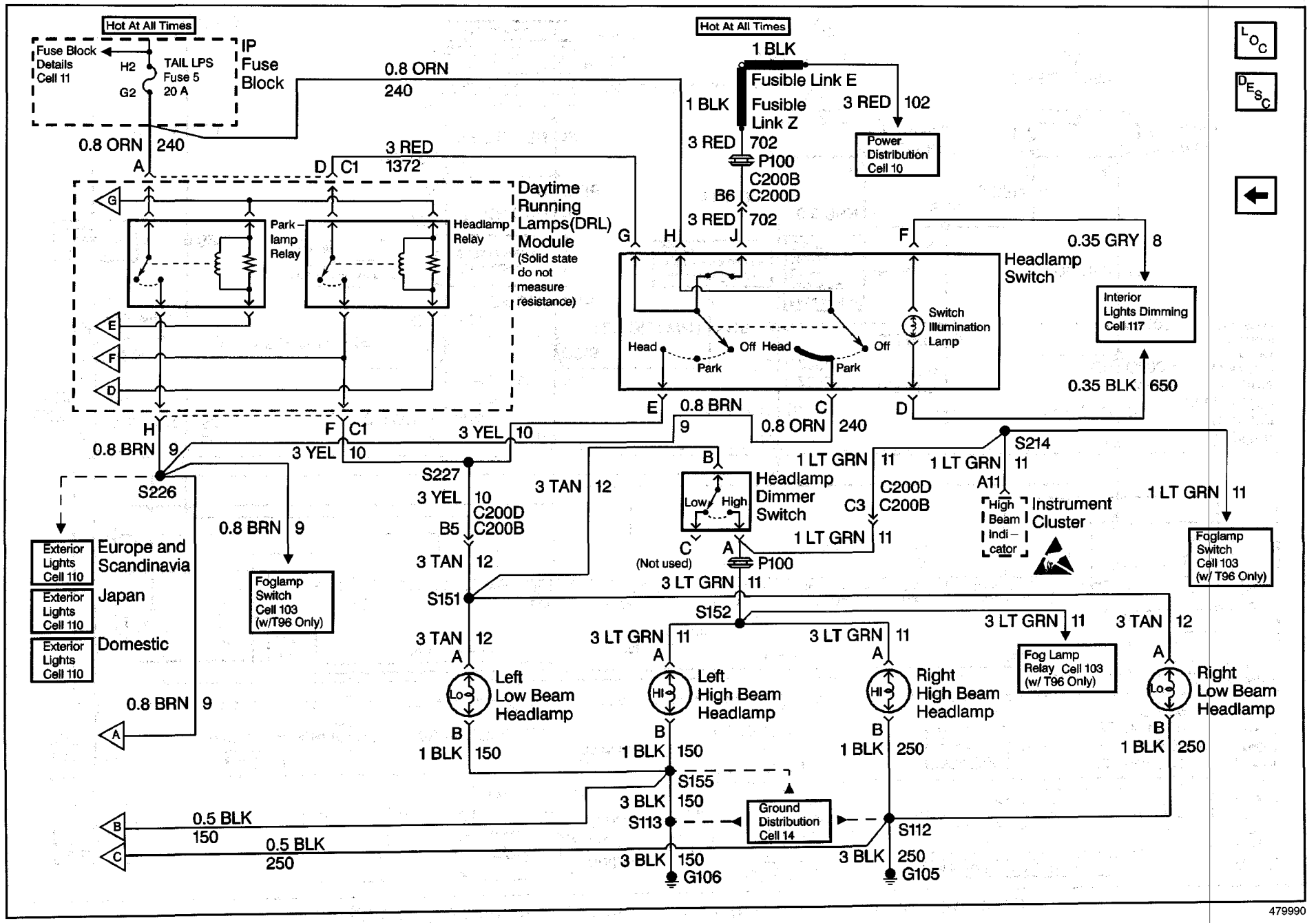
479983

Headlights DRL Schematics (Domestic) (Cell 102: Park/Turnlamps (Chevrolet))

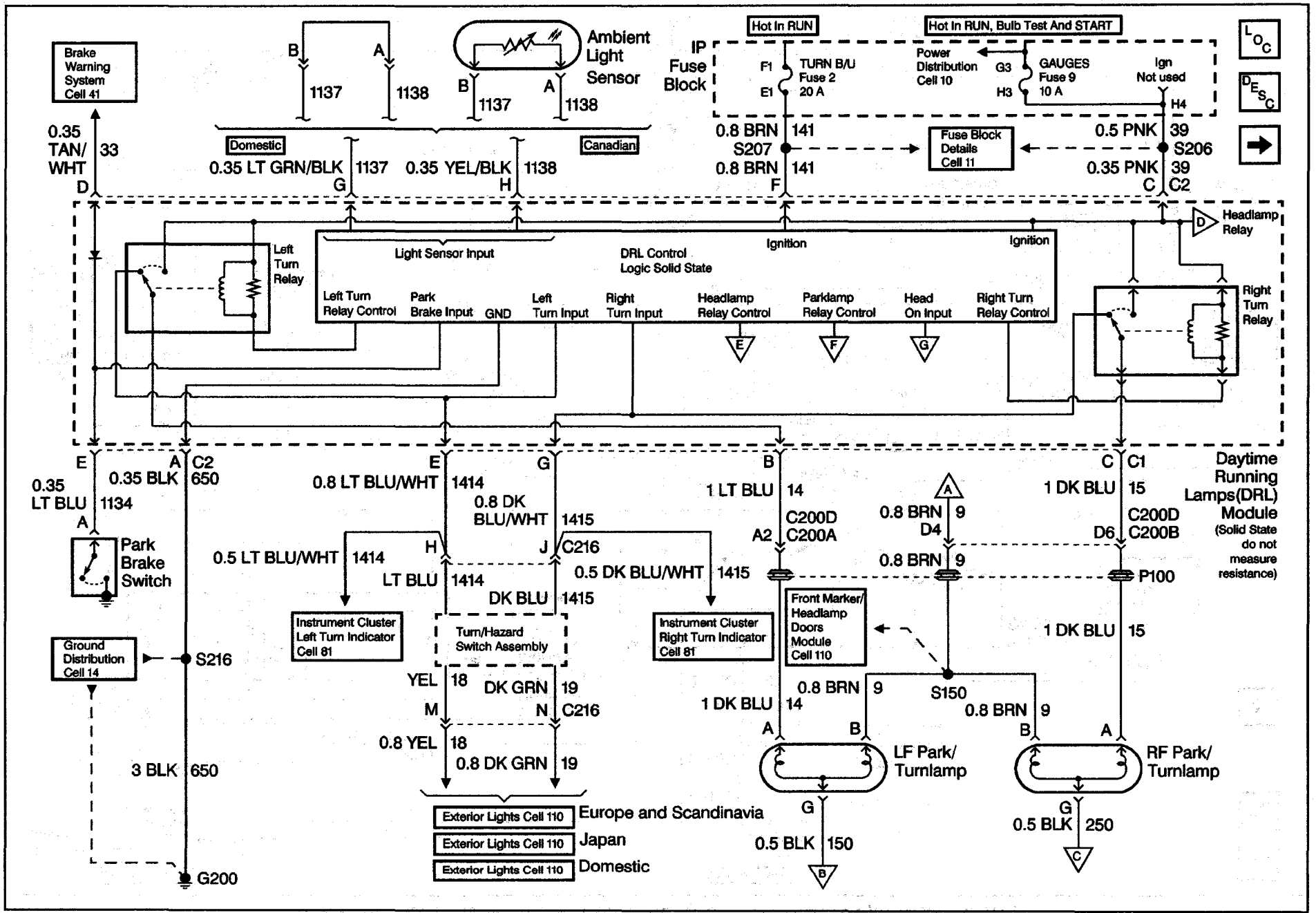


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Headlights DRL Schematics (Domestic) (Cell 102: Headlamps (Chevrolet))

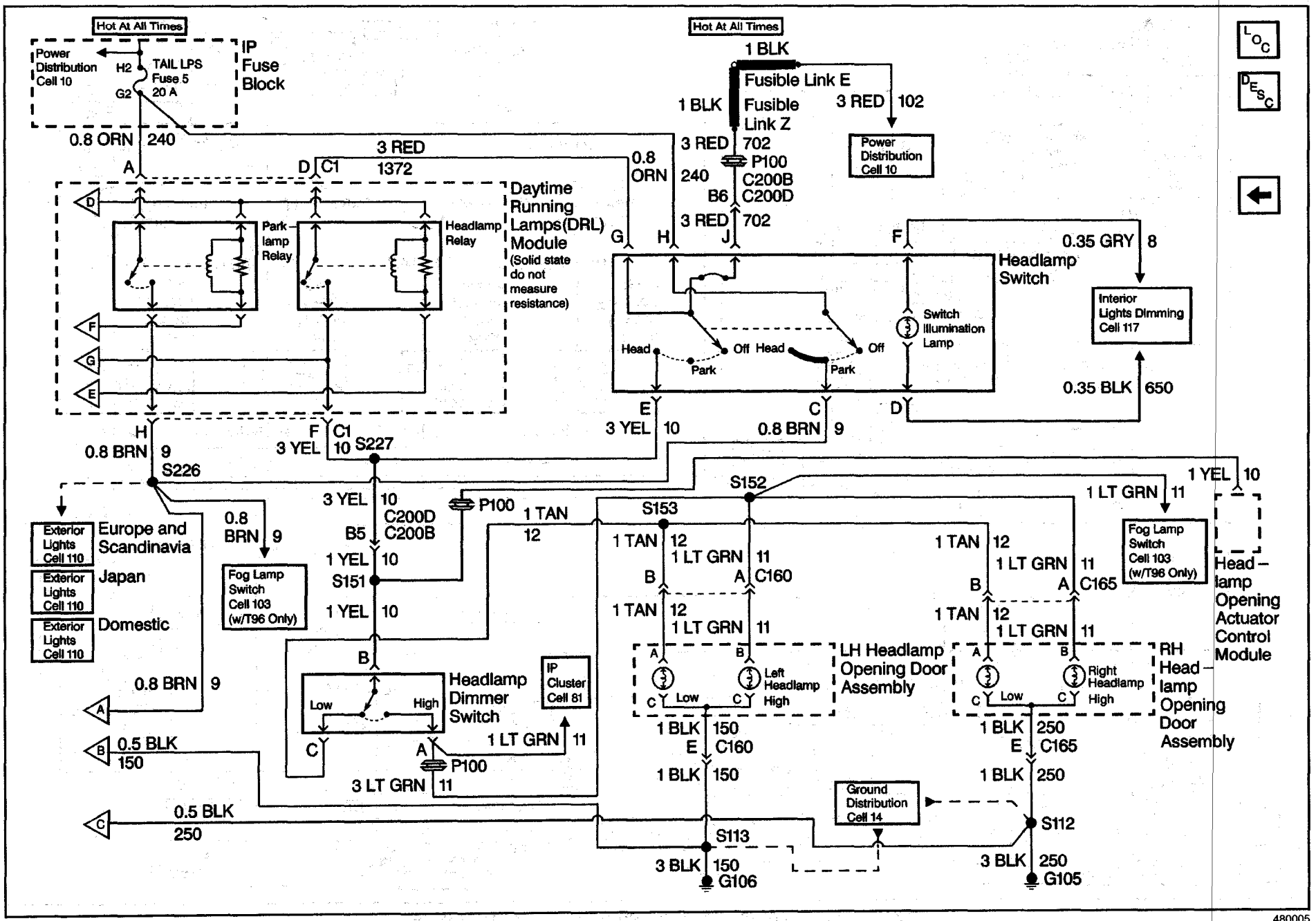


Headlights DRL Schematics (Domestic) (Cell 102: Park/Turnlamps (Pontiac))



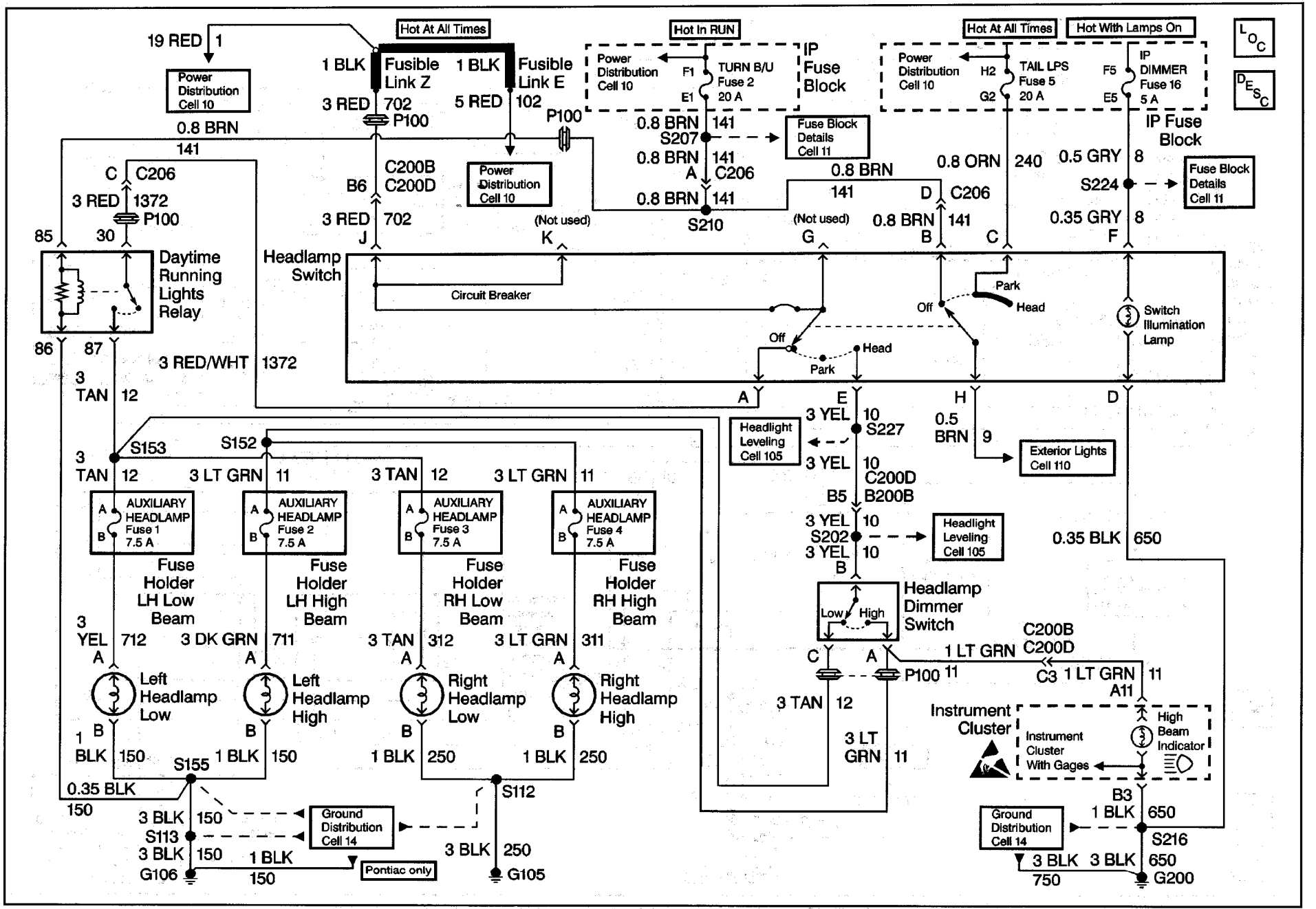
480012

Headlights DRL Schematics (Domestic) (Cell 102: Headlamps (Pontiac))



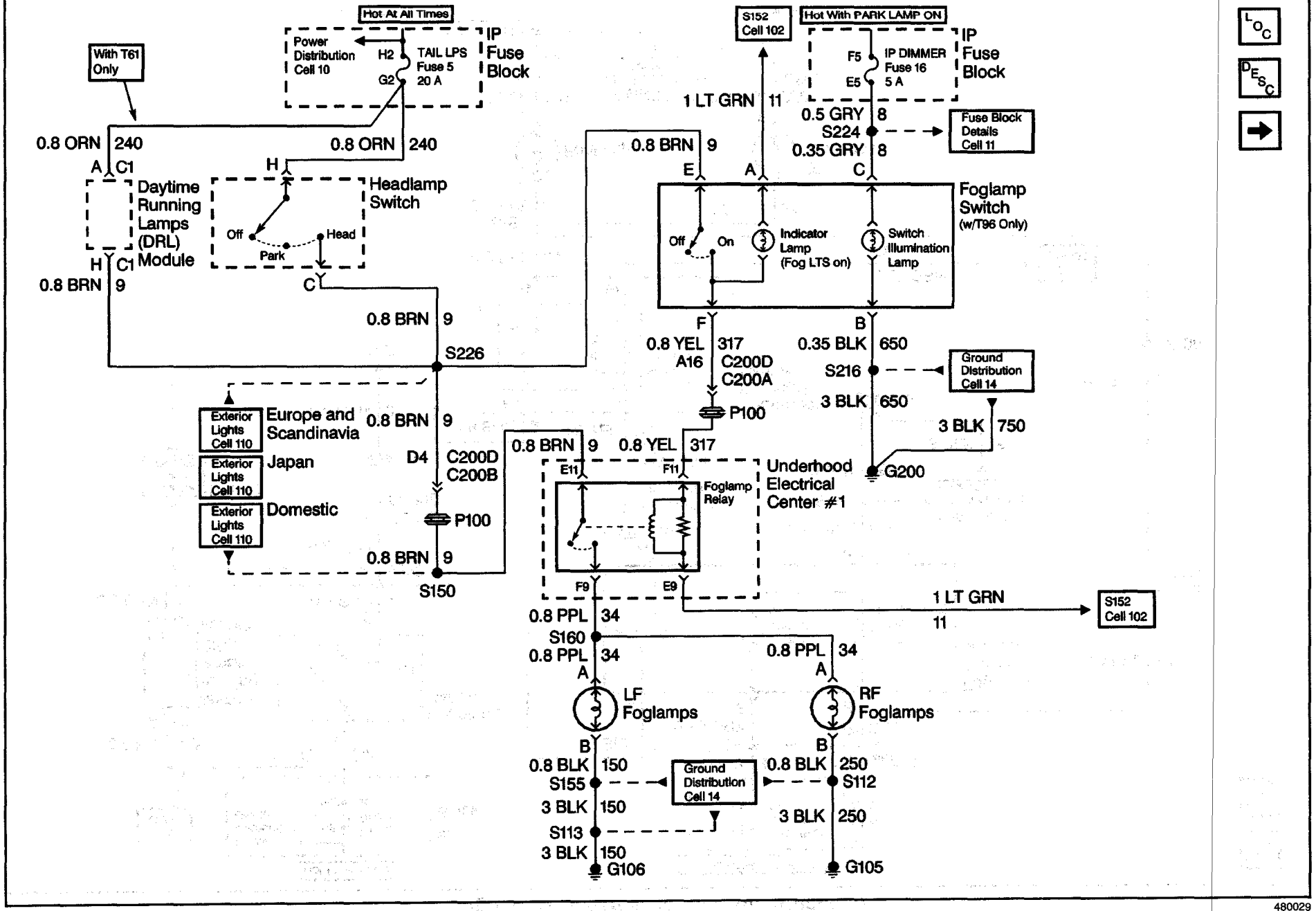
480005

Headlights DRL Schematics (Scandinavia) (Cell 102)



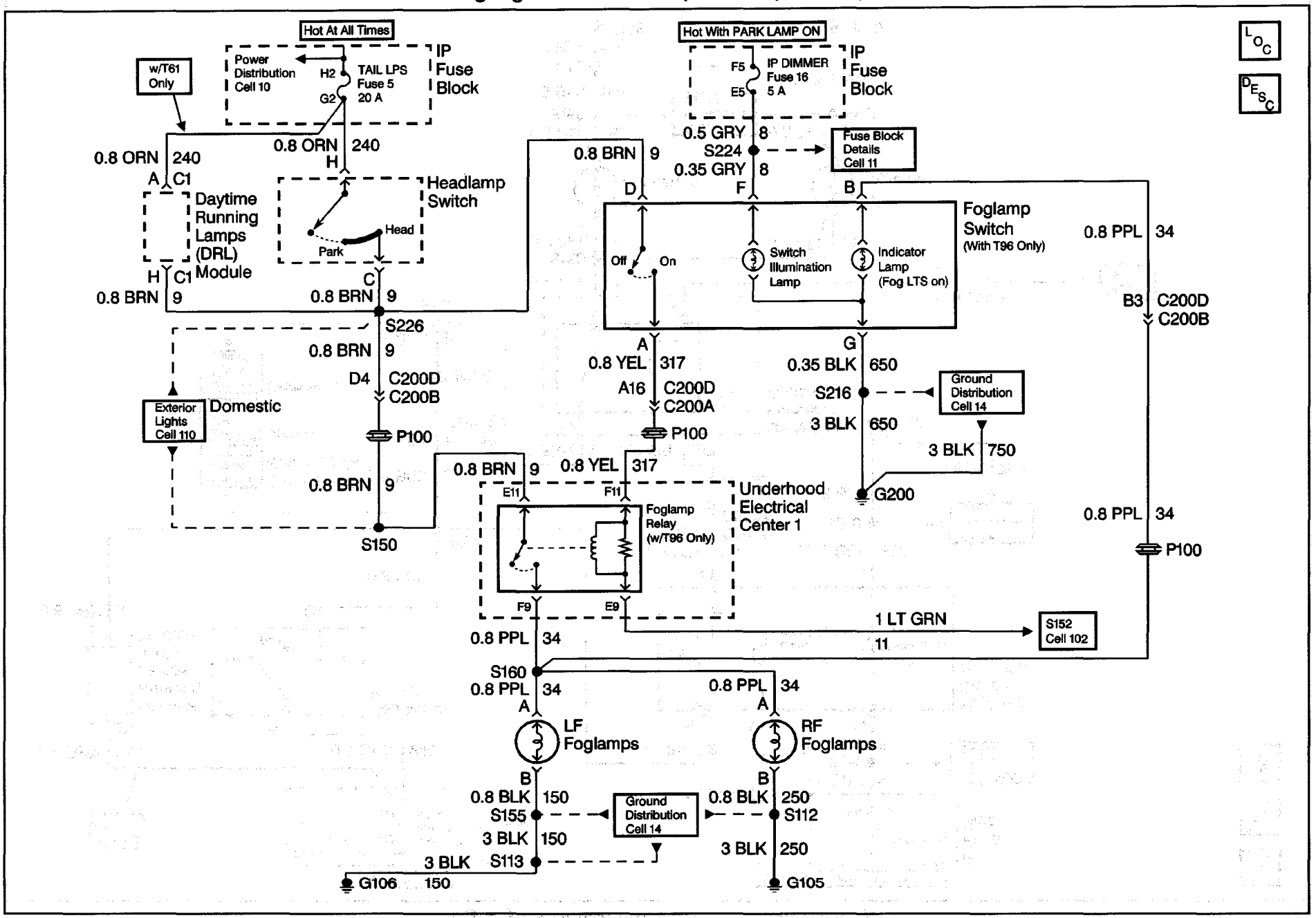
480021

Fog Lights Schematics (Cell 103 (Chevrolet))



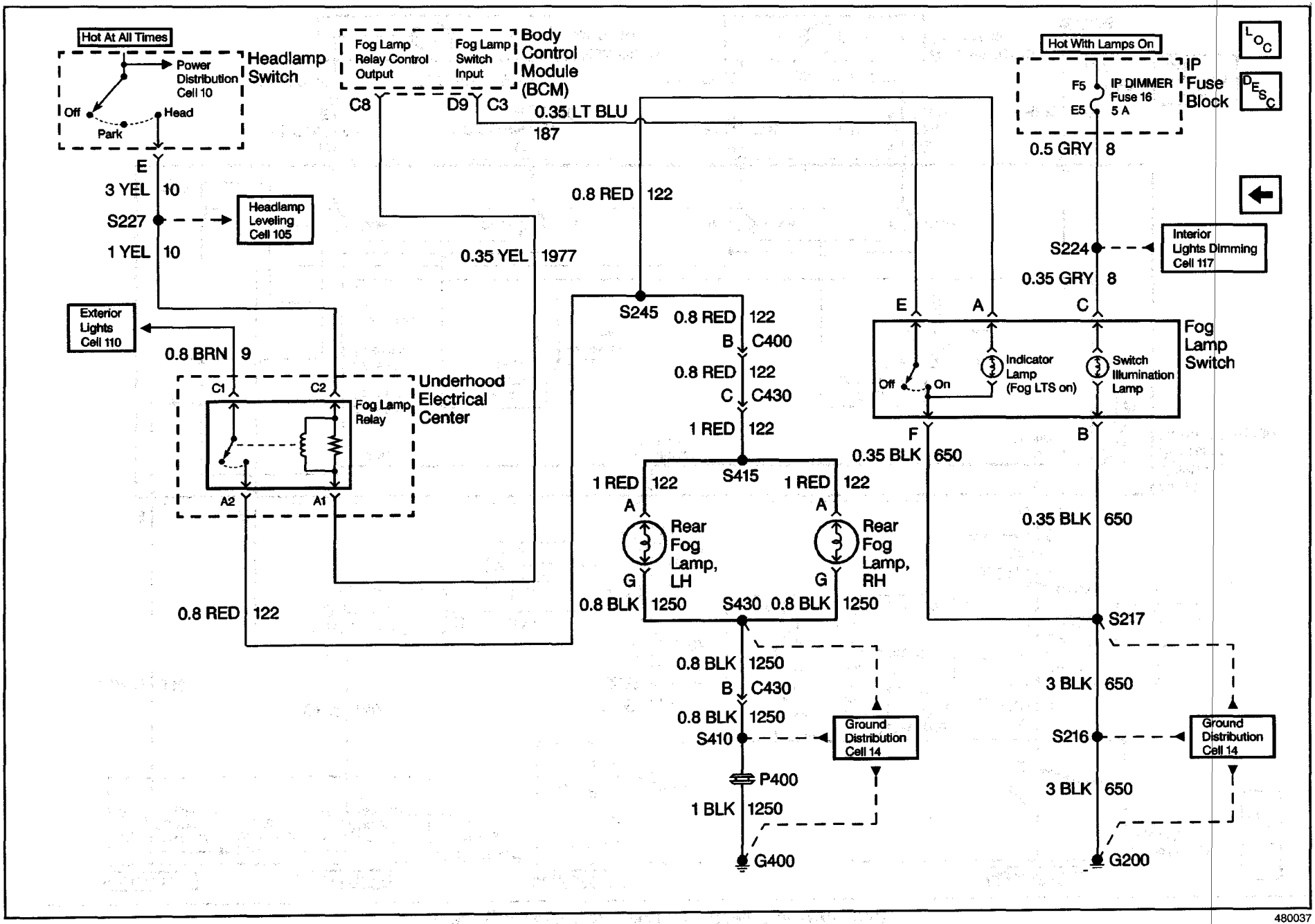
480029

Fog Lights Schematics (Cell 103 (Pontiac))

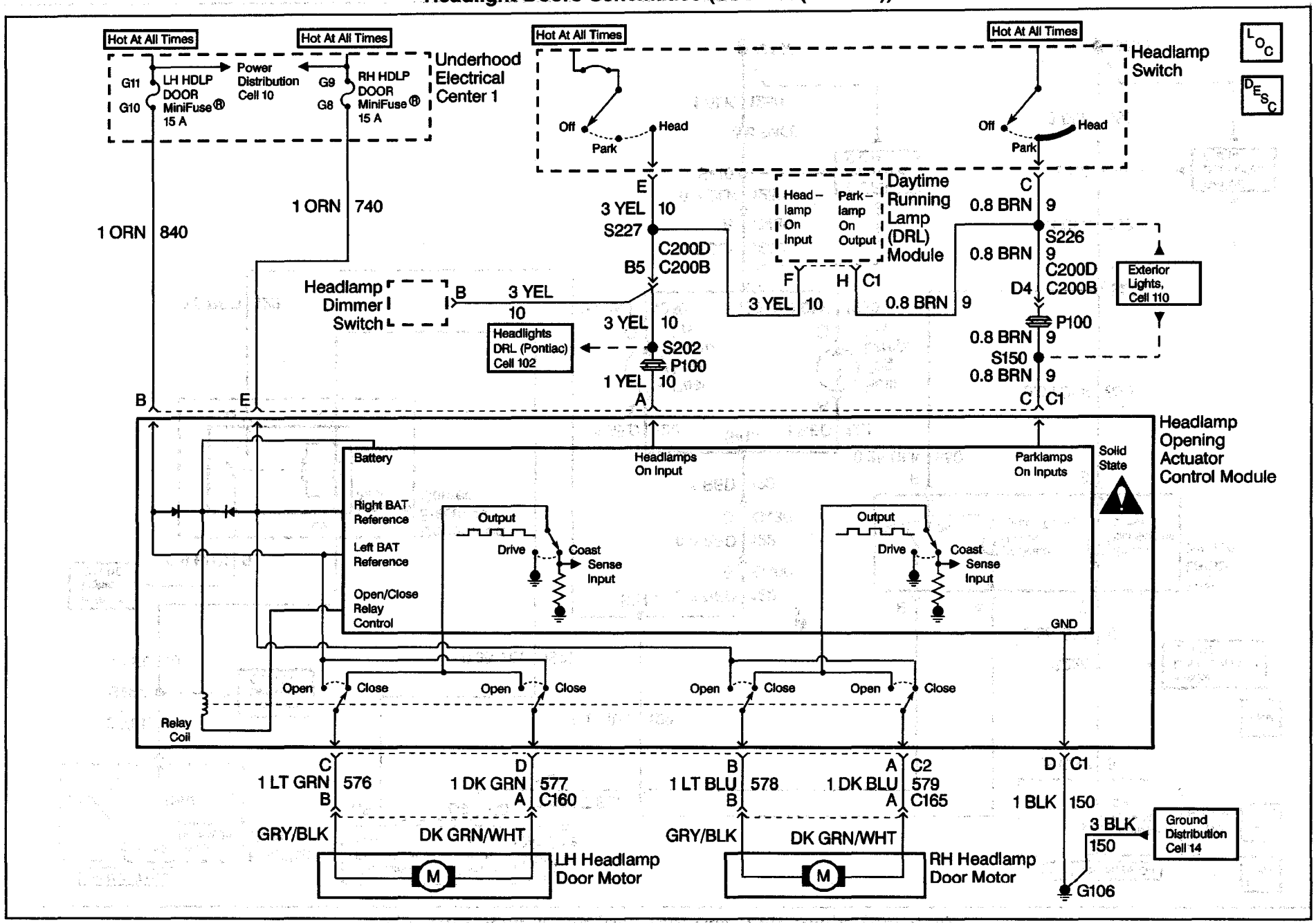


480035

Fog Lights Schematics (Cell 103: Rear Fog Lamps (Europe))

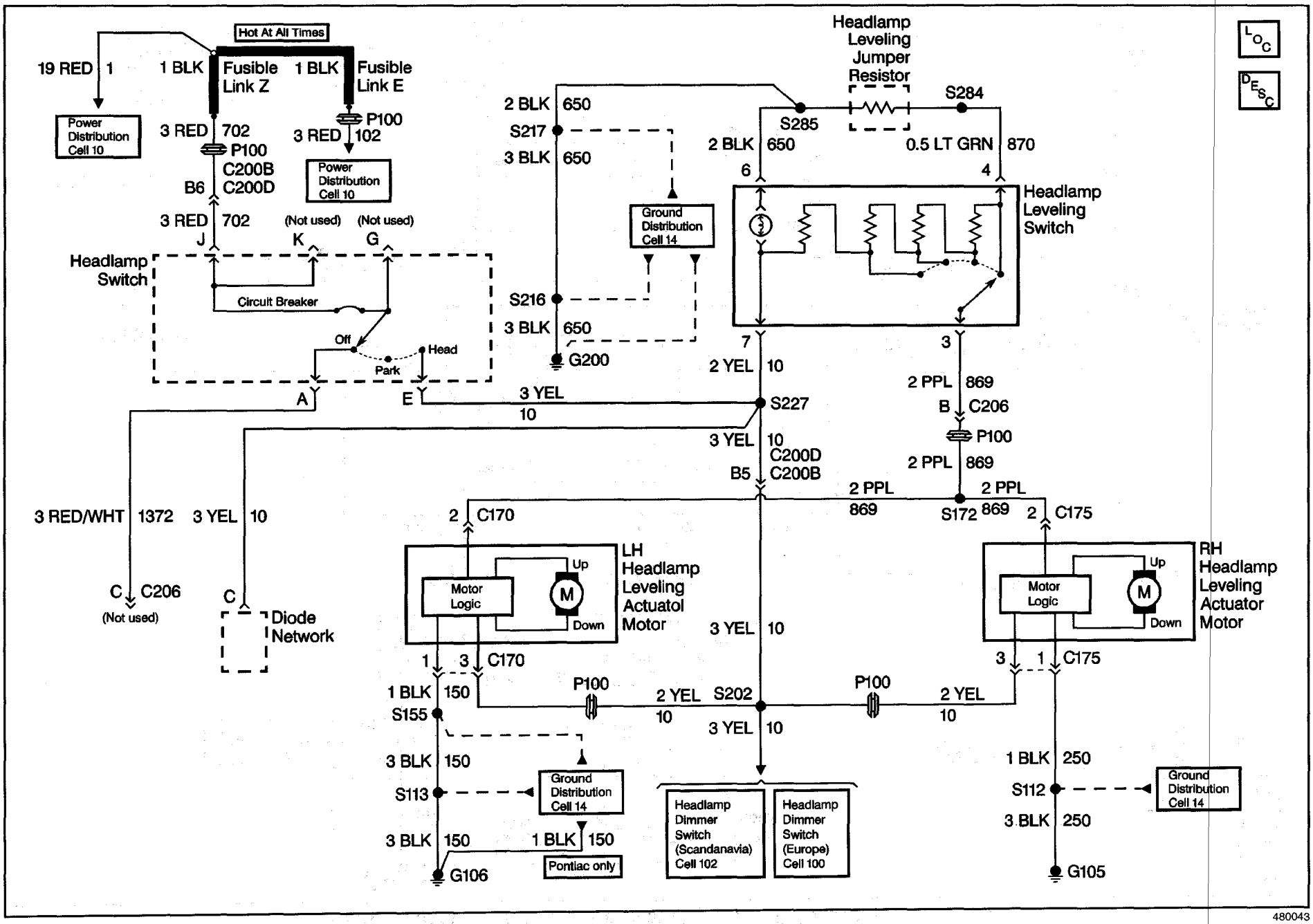


Headlight Doors Schematics (Cell 104 (Pontiac))

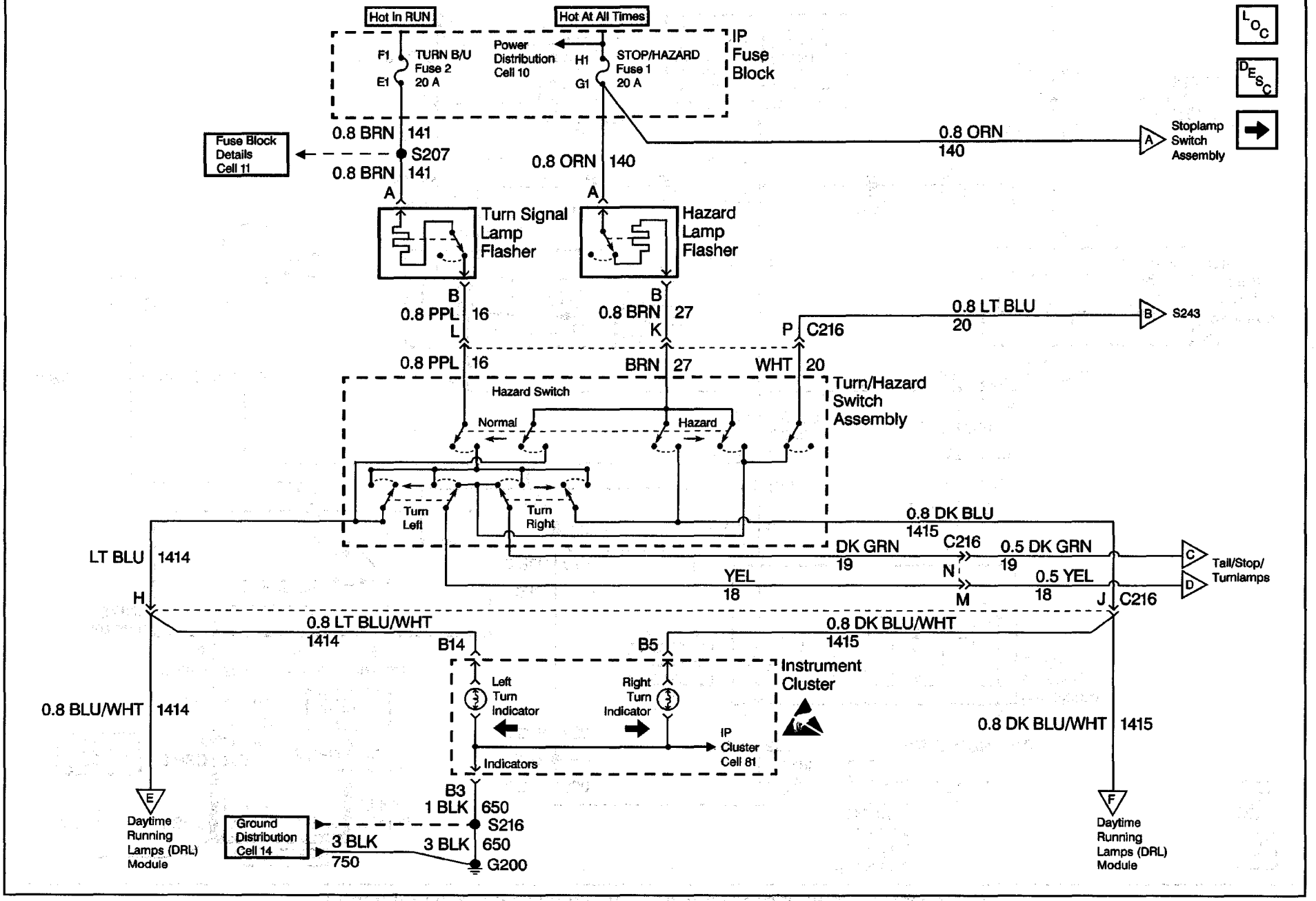


480039

Headlight Leveling Schematics (Cell 105 (Europe and Scandanavia))

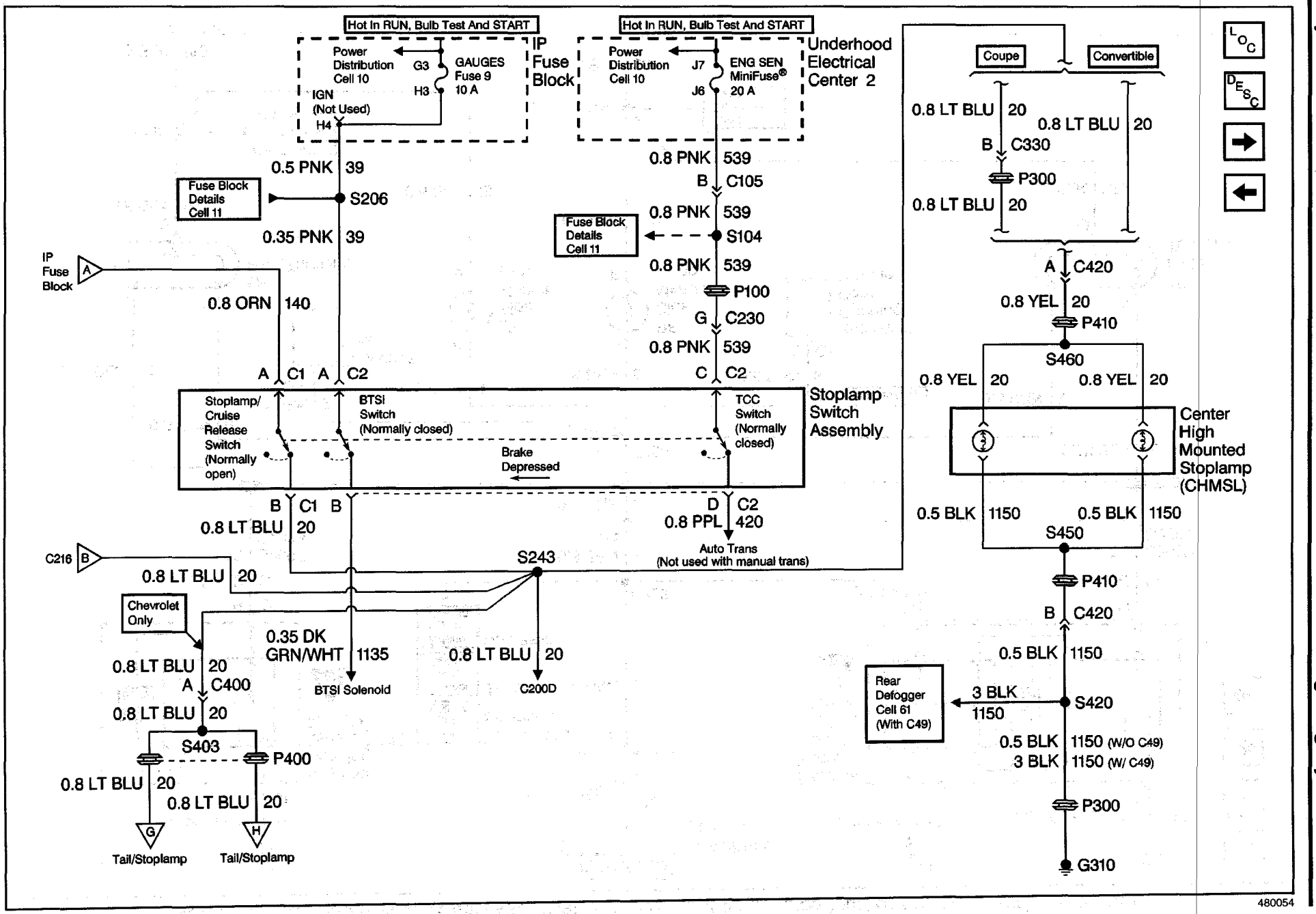


Exterior Lights Schematics (Domestic) (Cell 110: Tail/Stop/Turnlamps)



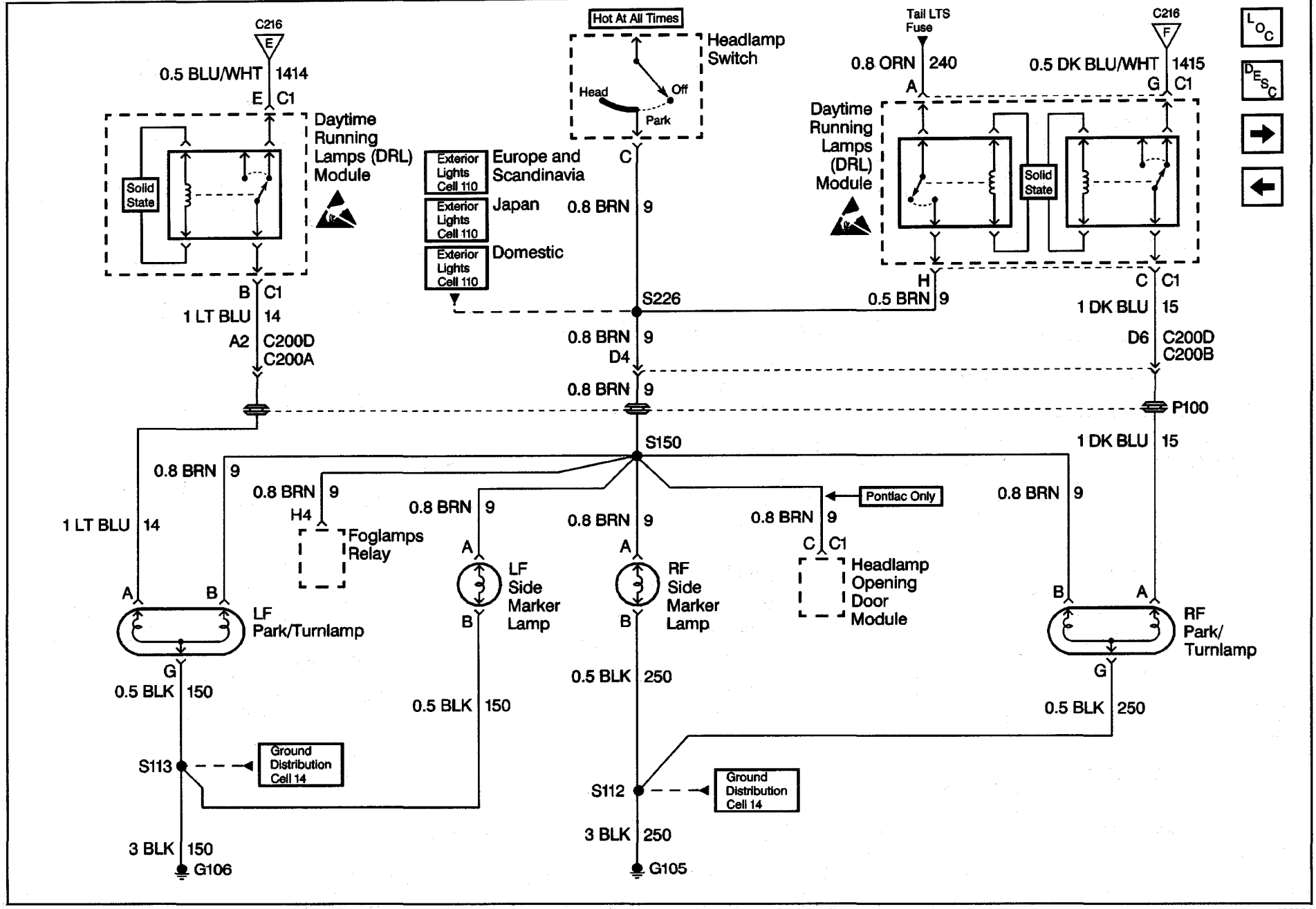
480048

Exterior Lights Schematics (Domestic) (Center High Mounted Stoplamp Cell 110)



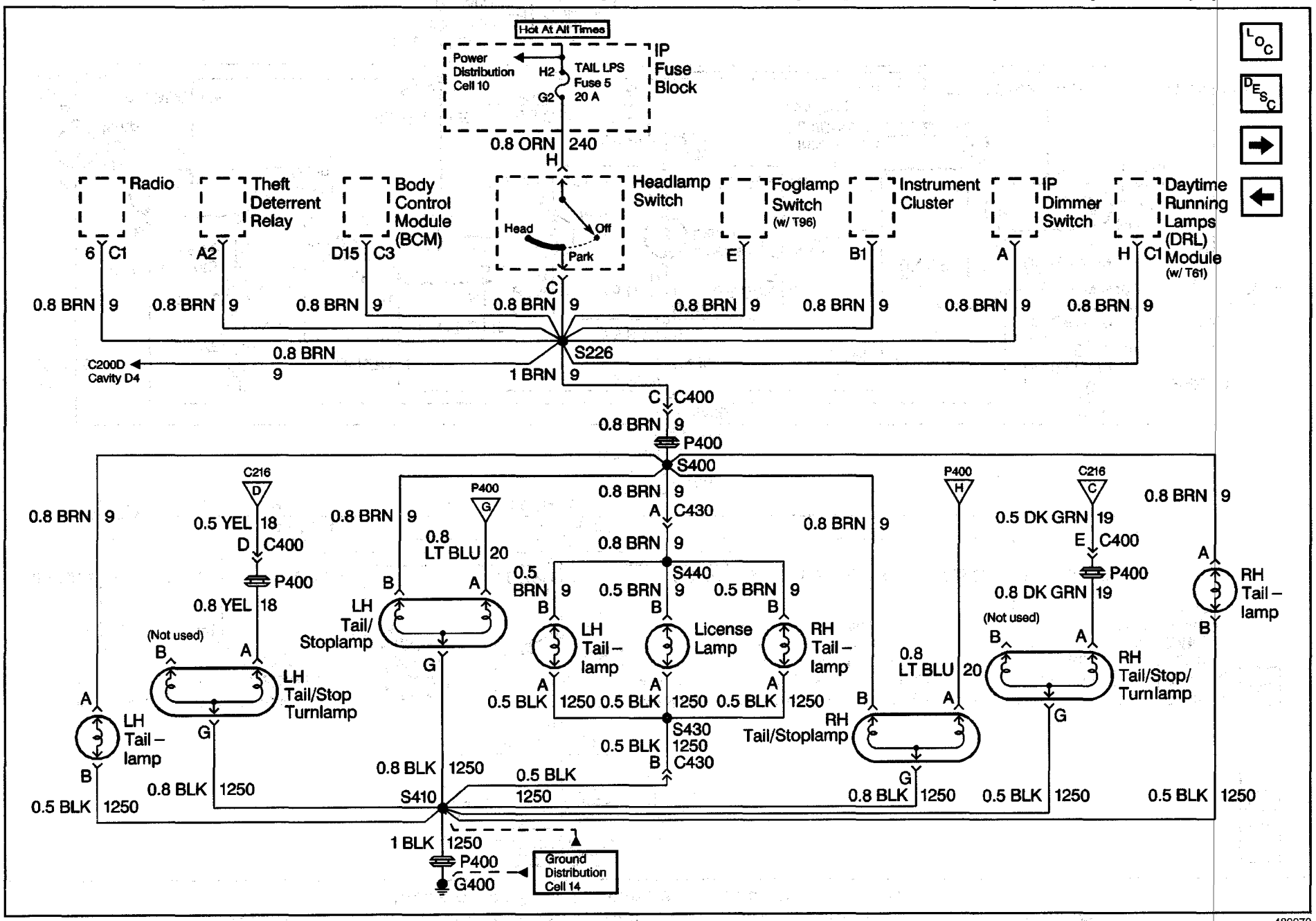
480054

Exterior Lights Schematics (Domestic) (Cell 110: Left and Right Side Marker Lamps, Park/Turnlamps)



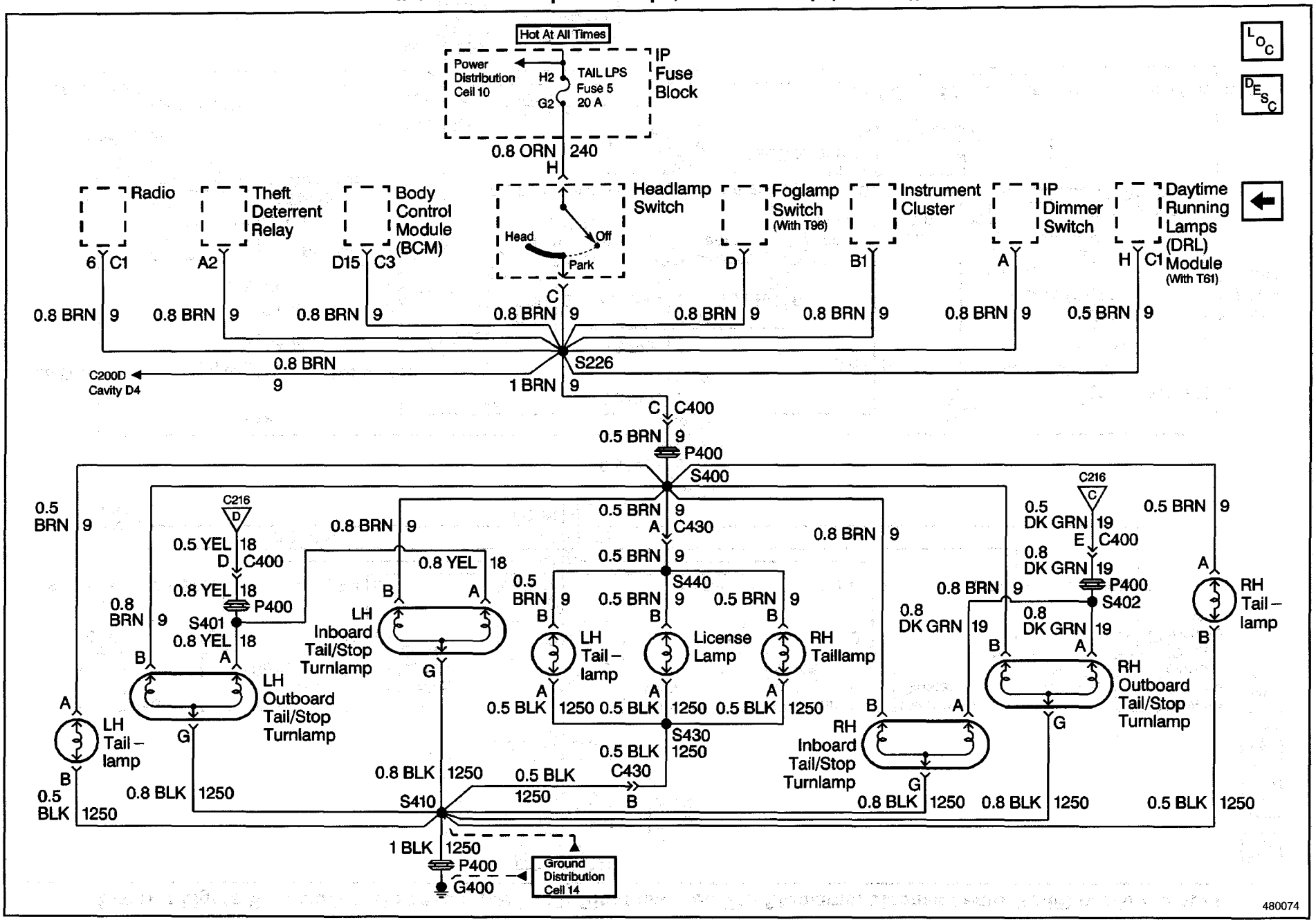
480064

Exterior Lights Schematics (Domestic) (Cell 110: Right and Left Tail/Stoplamp, License Lamp, Tail/Stop/Turnlamps)

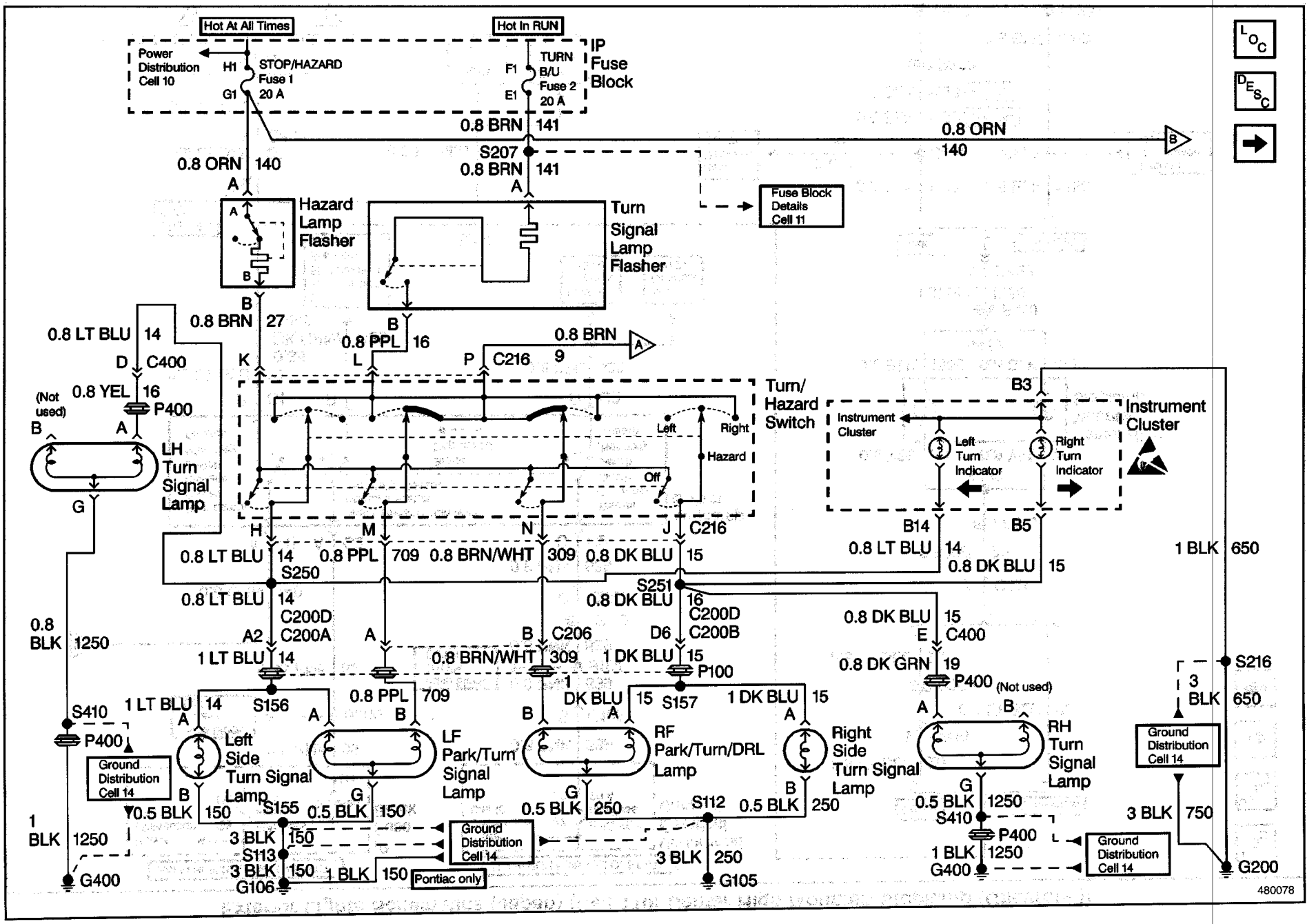


480070

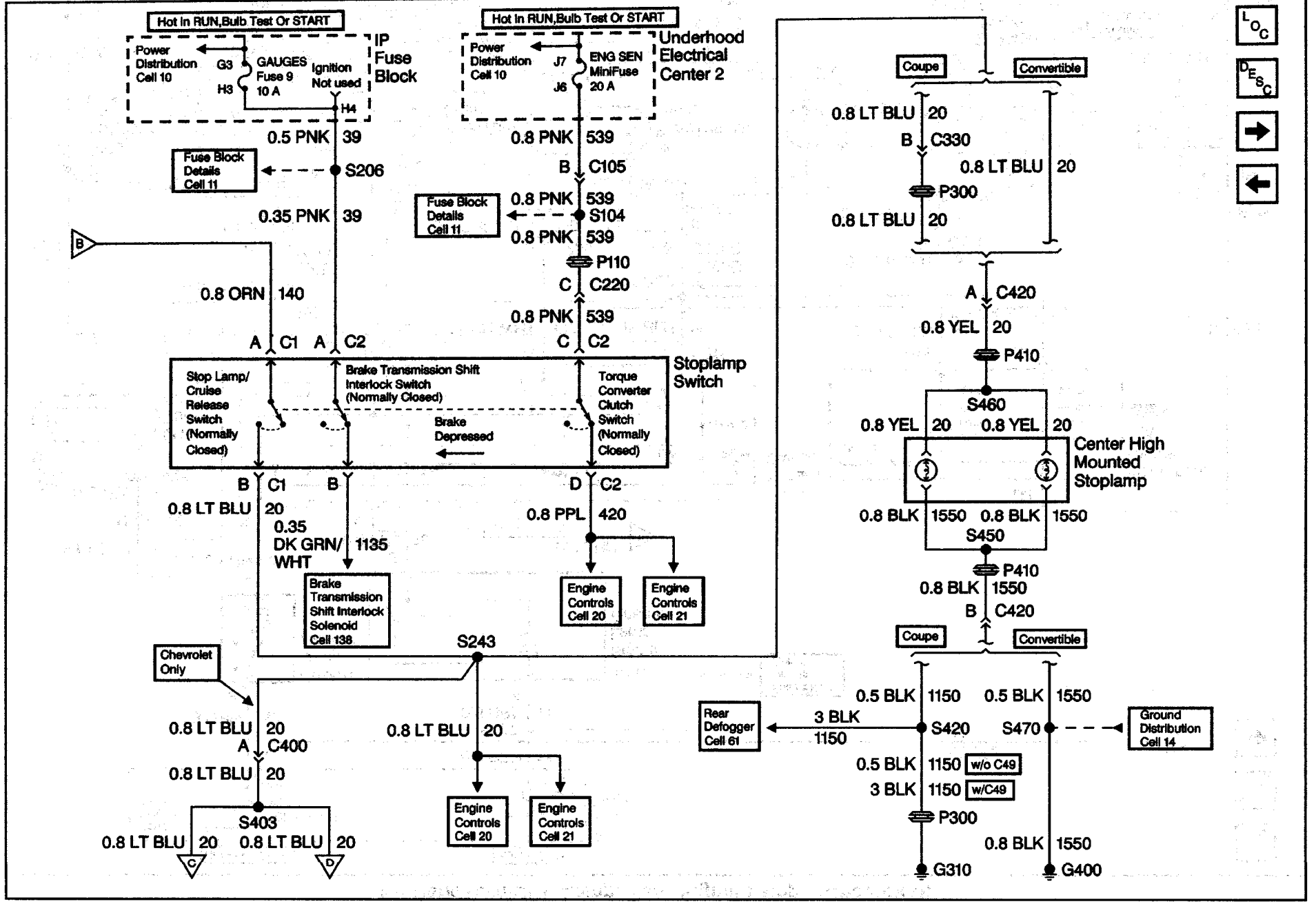
Exterior Lights Schematics (Domestic) (Cell 110: Taillamps, Outboard Tail/Stop Turnlamps, Inboard Tail/Stop Turnlamps, License Lamp (Pontiac))



Exterior Lights Schematics (Japan) (Cell 110: Side Turn Signal Lamps, Park/Turn Signal Lamps, RF Park/Turn/DRL Lamp, Turn Signal Lamps (Chevrolet))

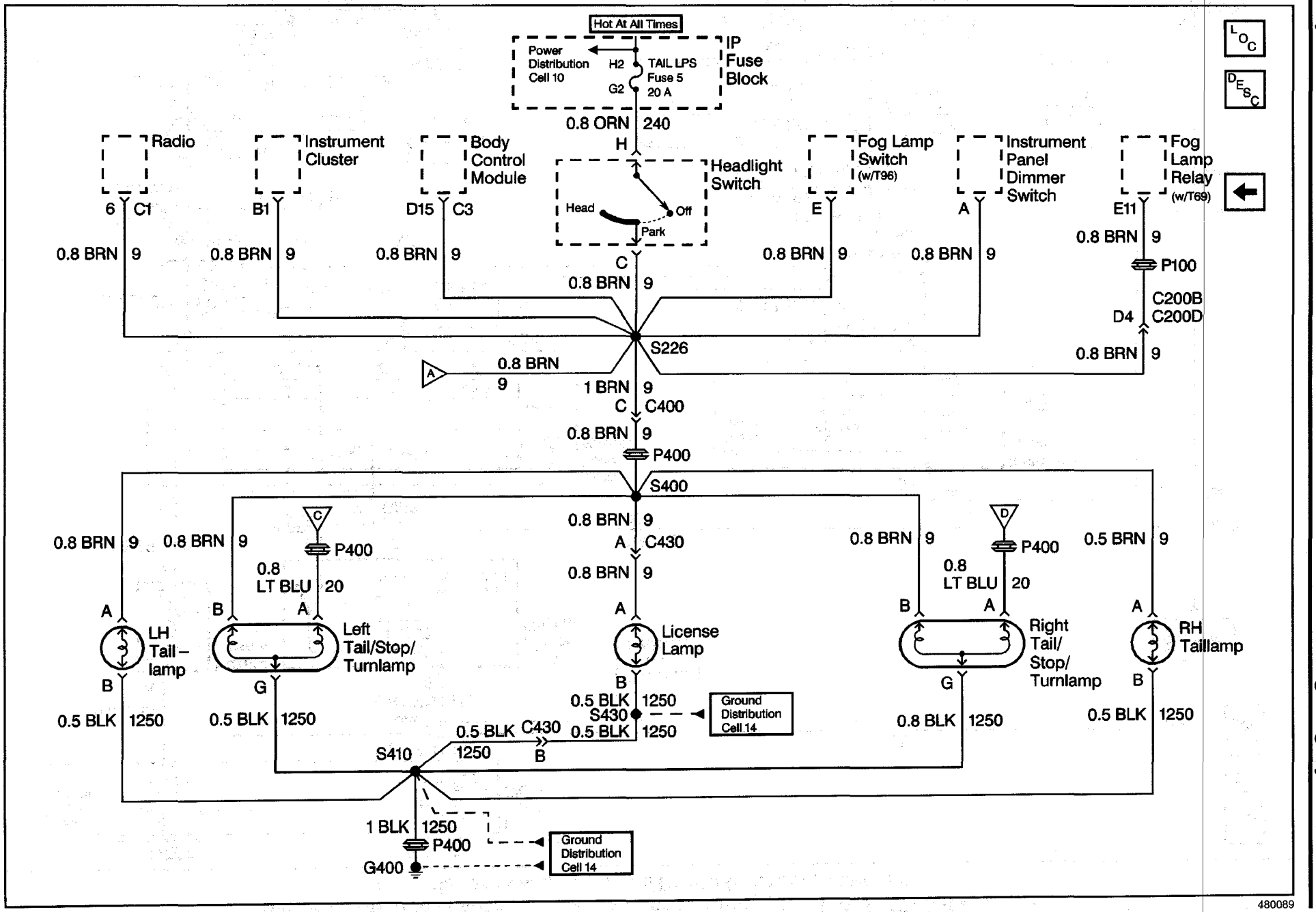


Exterior Lights Schematics (Japan) (Cell 110: Center High Mounted Stoplamp (Chevrolet))



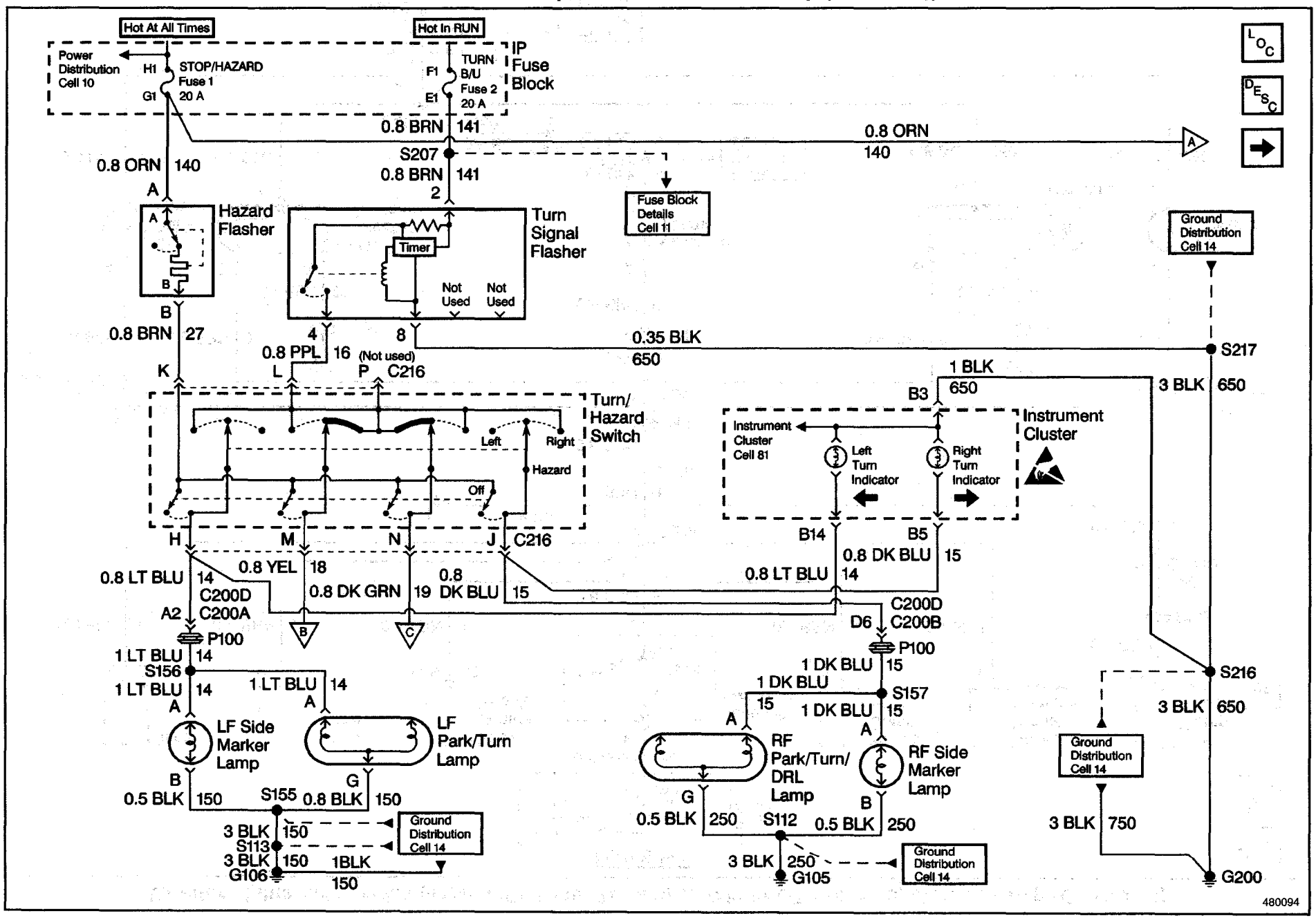
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Exterior Lights Schematics (Japan) (Cell 110: Taillamps, Tail/Stop/Turnlamps, License Lamp (Chevrolet))

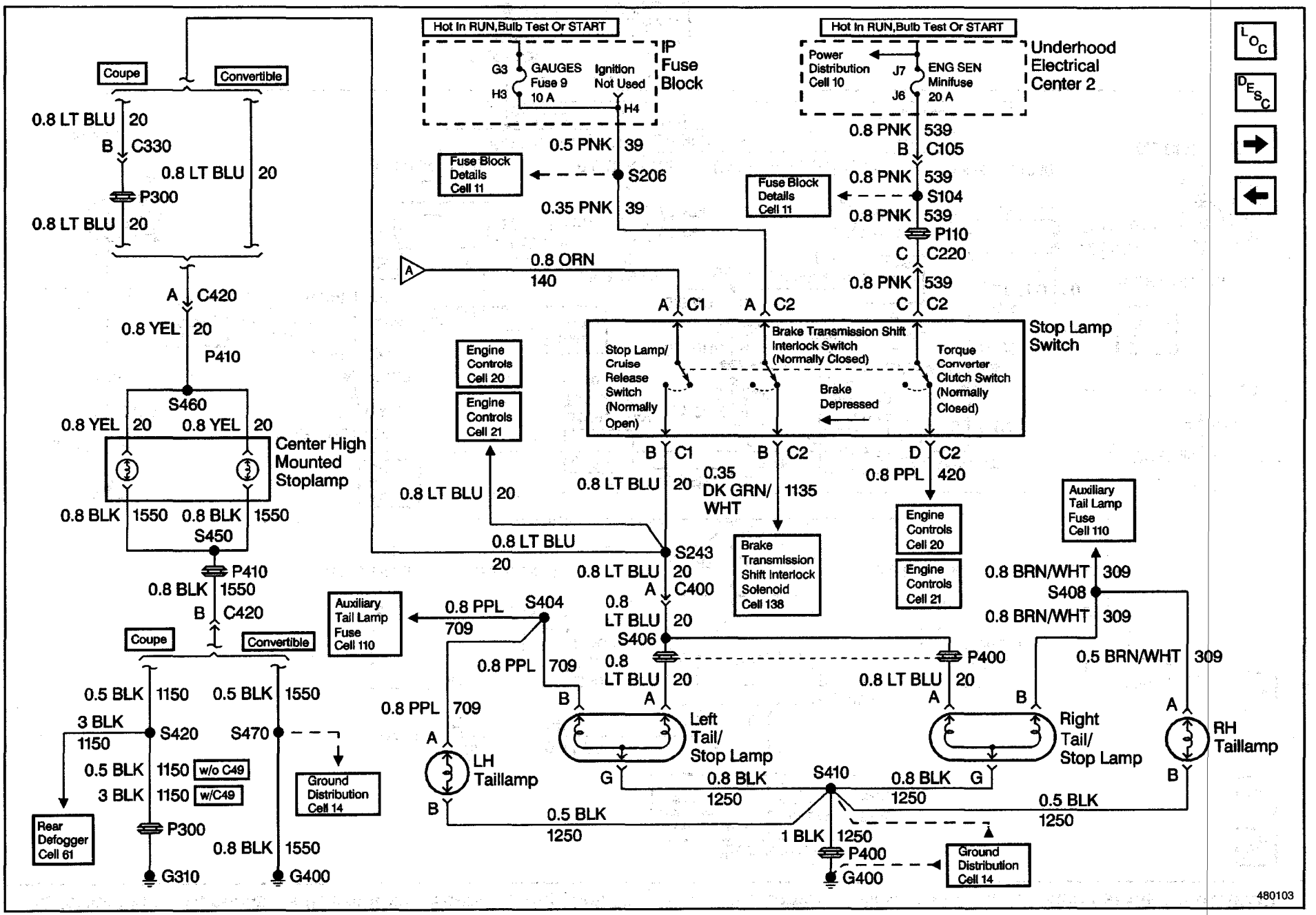


480089

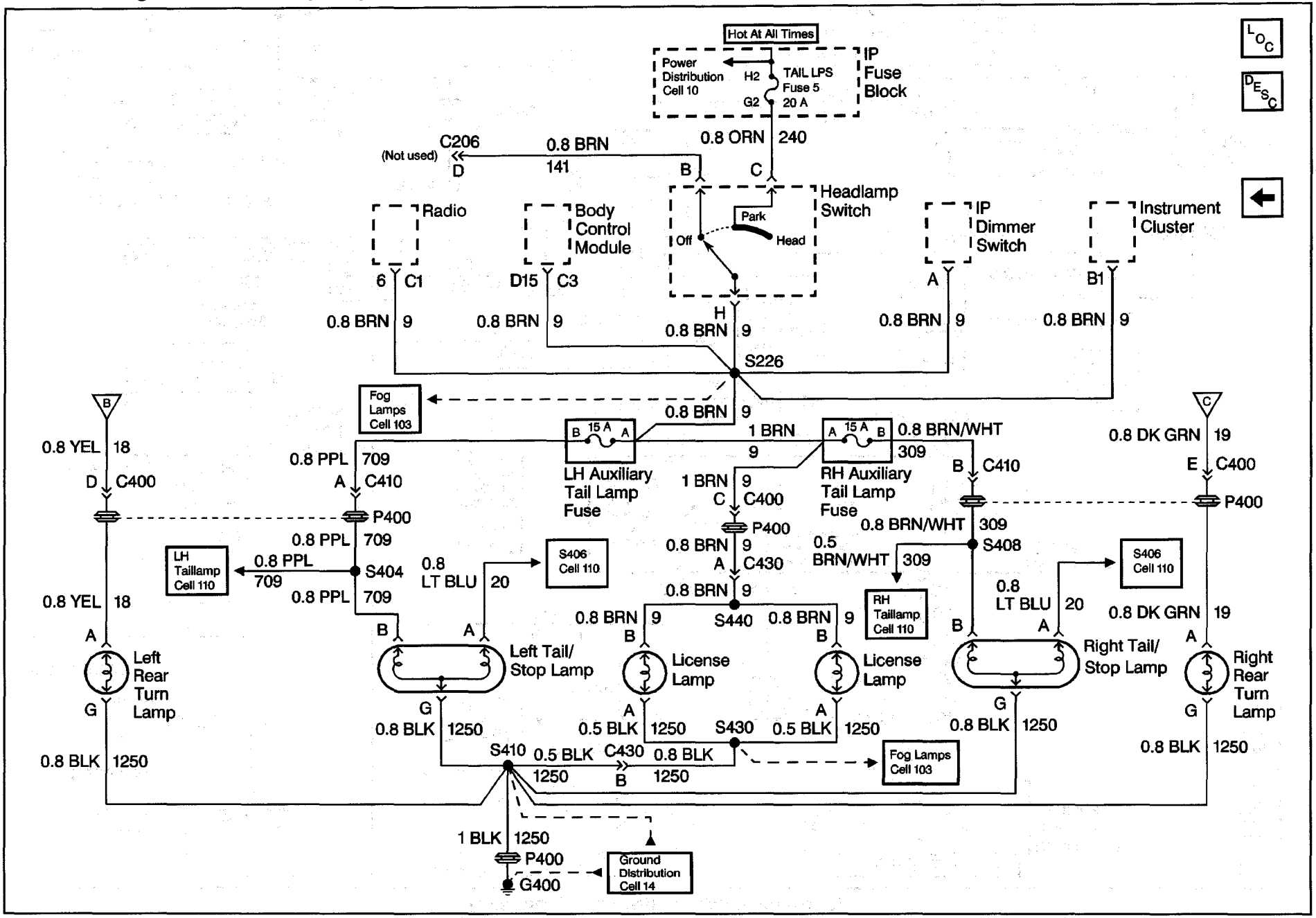
Exterior Lights Schematics (Europe and Scandinavia) (Cell 110: Side Marker Lamps, LF Park/Turn Lamp, RF Park/Turn/DRL Lamp (Chevrolet))



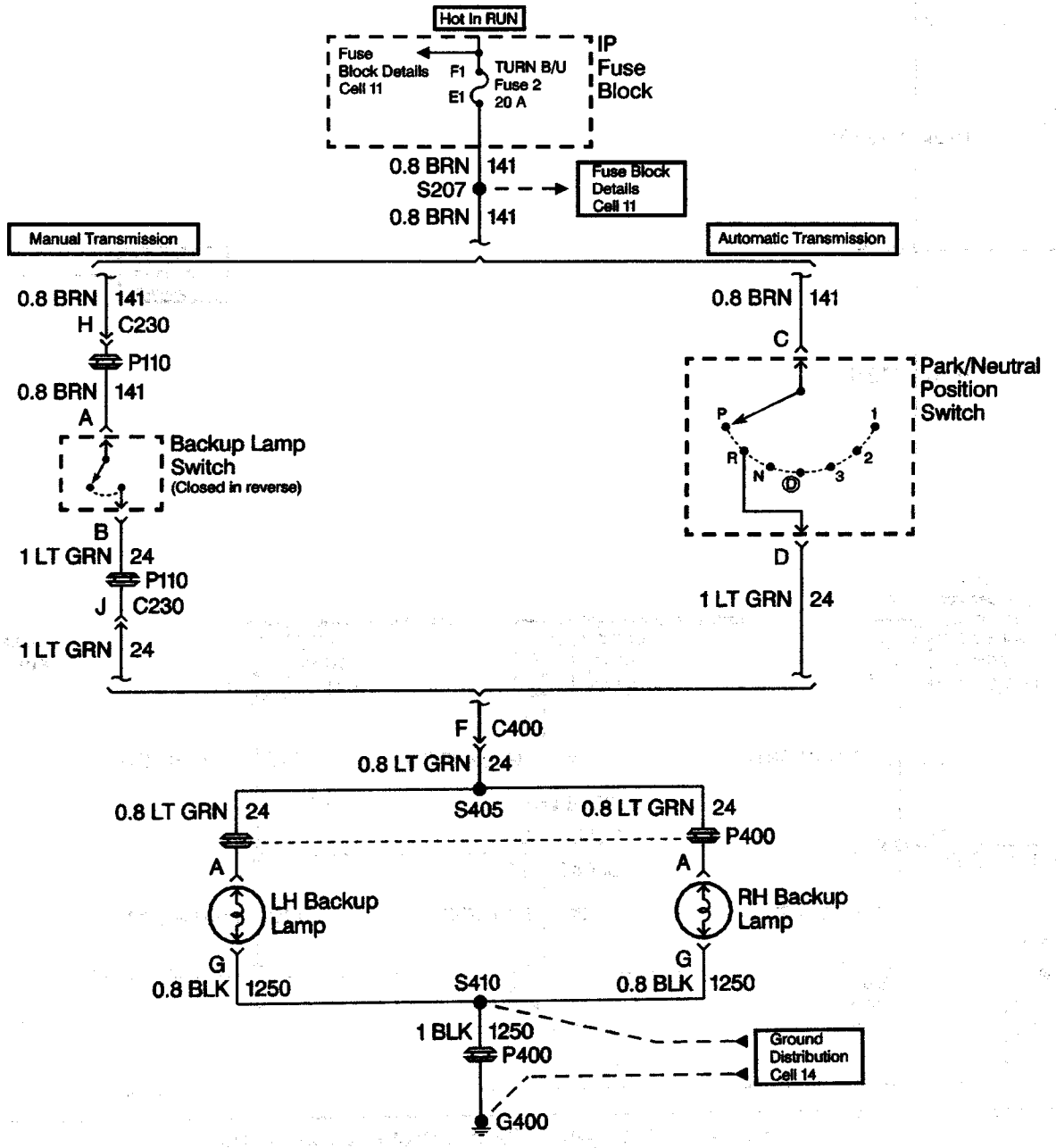
Exterior Lights Schematics (Europe and Scandinavia) (Cell 110: Center High Mounted Stoplamp, Taillamps, Tail/Stop Lamps (Chevrolet))



Exterior Lights Schematics (Europe and Scandinavia) (Cell 110: Rear Turn Lamps, Tail/Stop Lamps, License Lamps (Chevrolet))

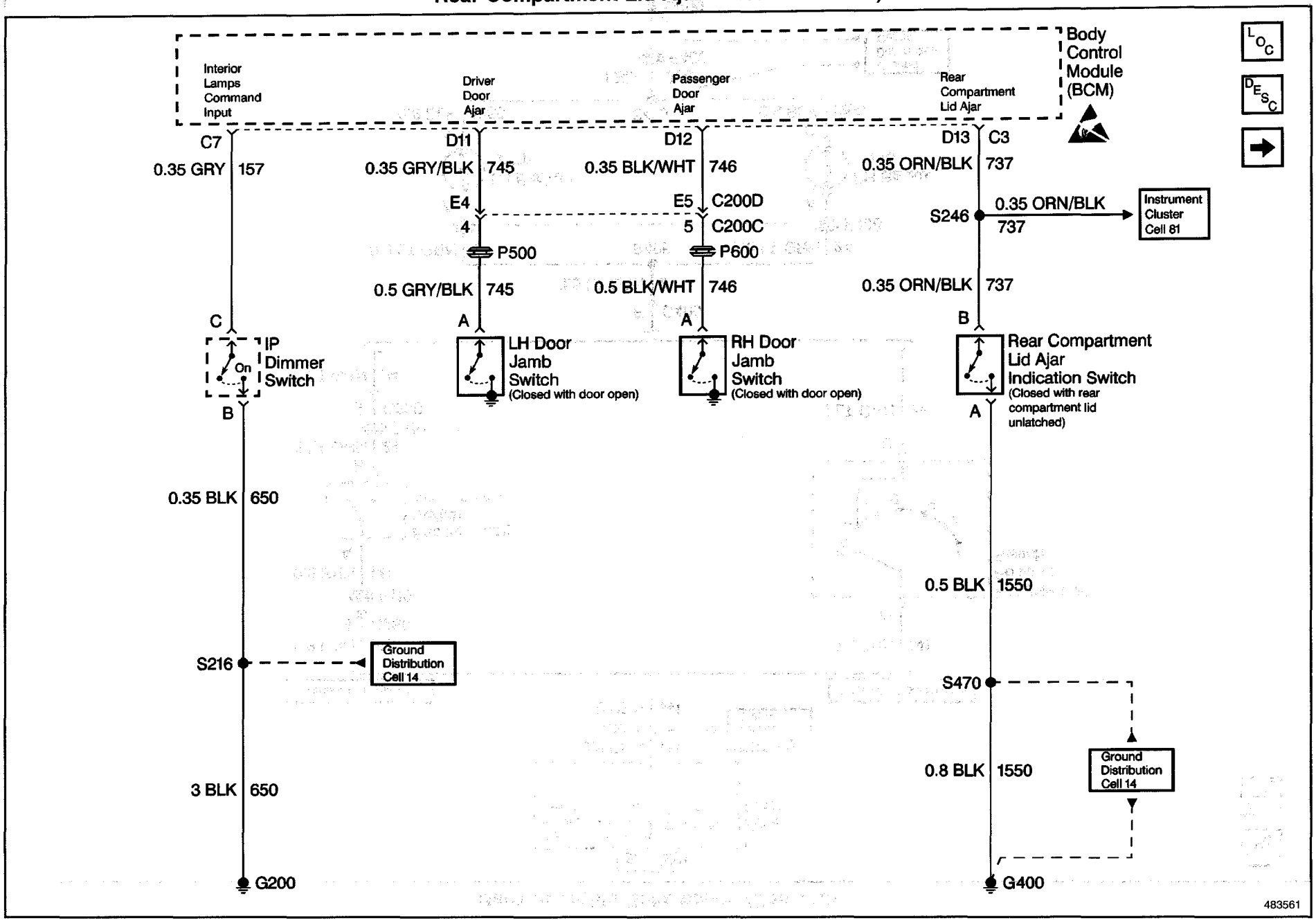


Backup Lights Schematics (Cell 112)

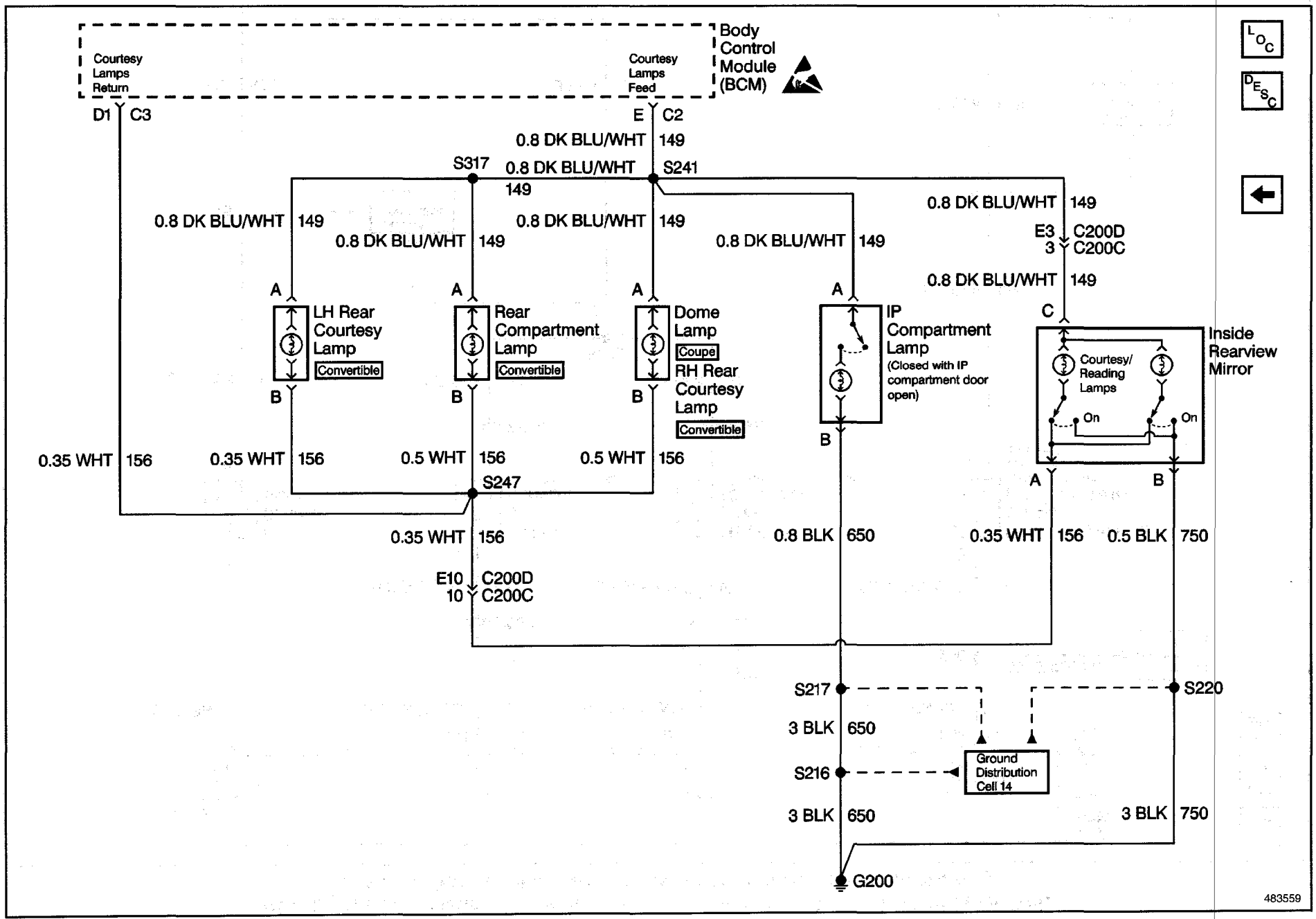


480117

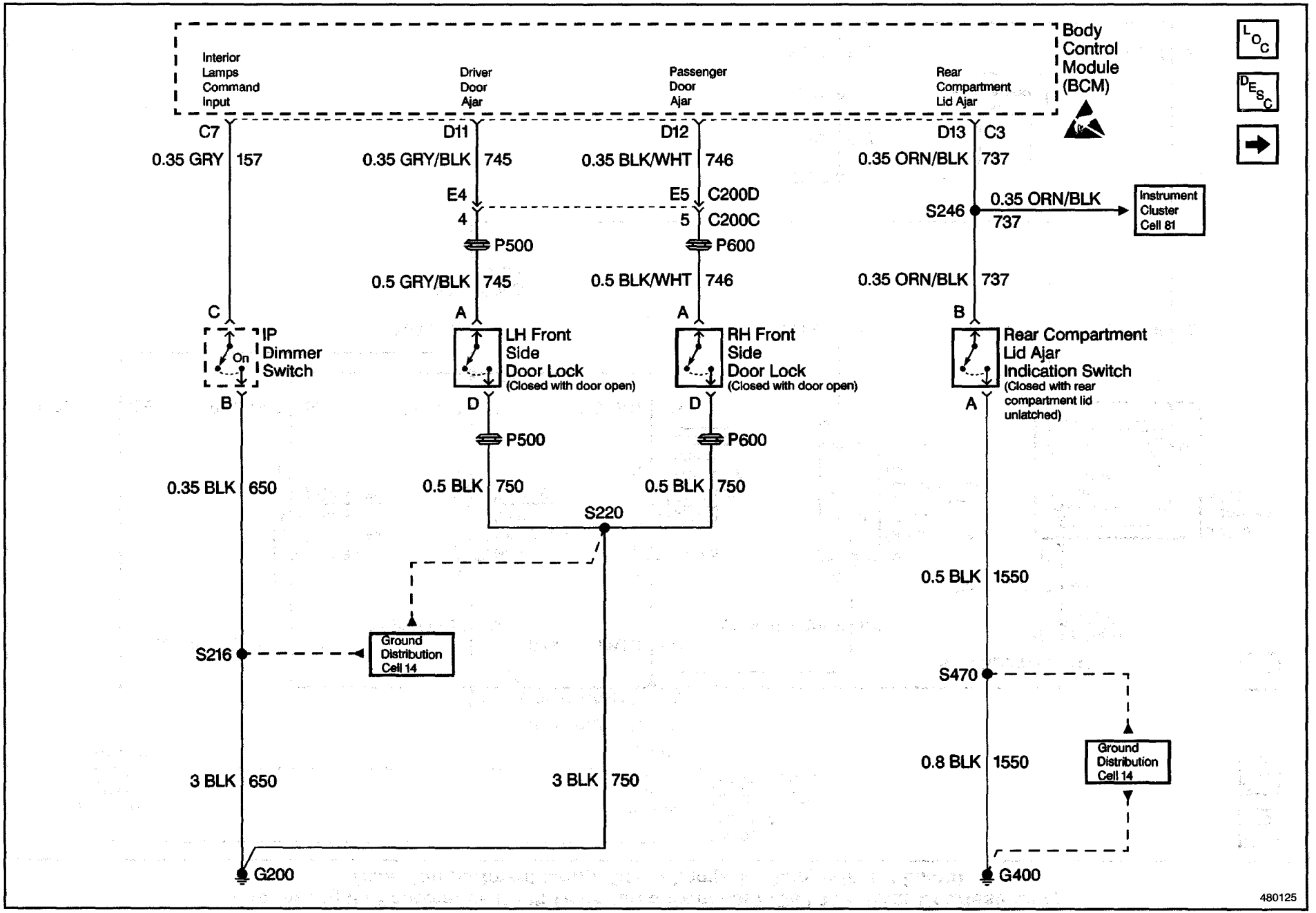
Interior Lights Schematics (With Door Jamb Switches) (Cell 114: IP Dimmer Switch, Door Jamb Switches, Rear Compartment Lid Ajar Indication Switch)



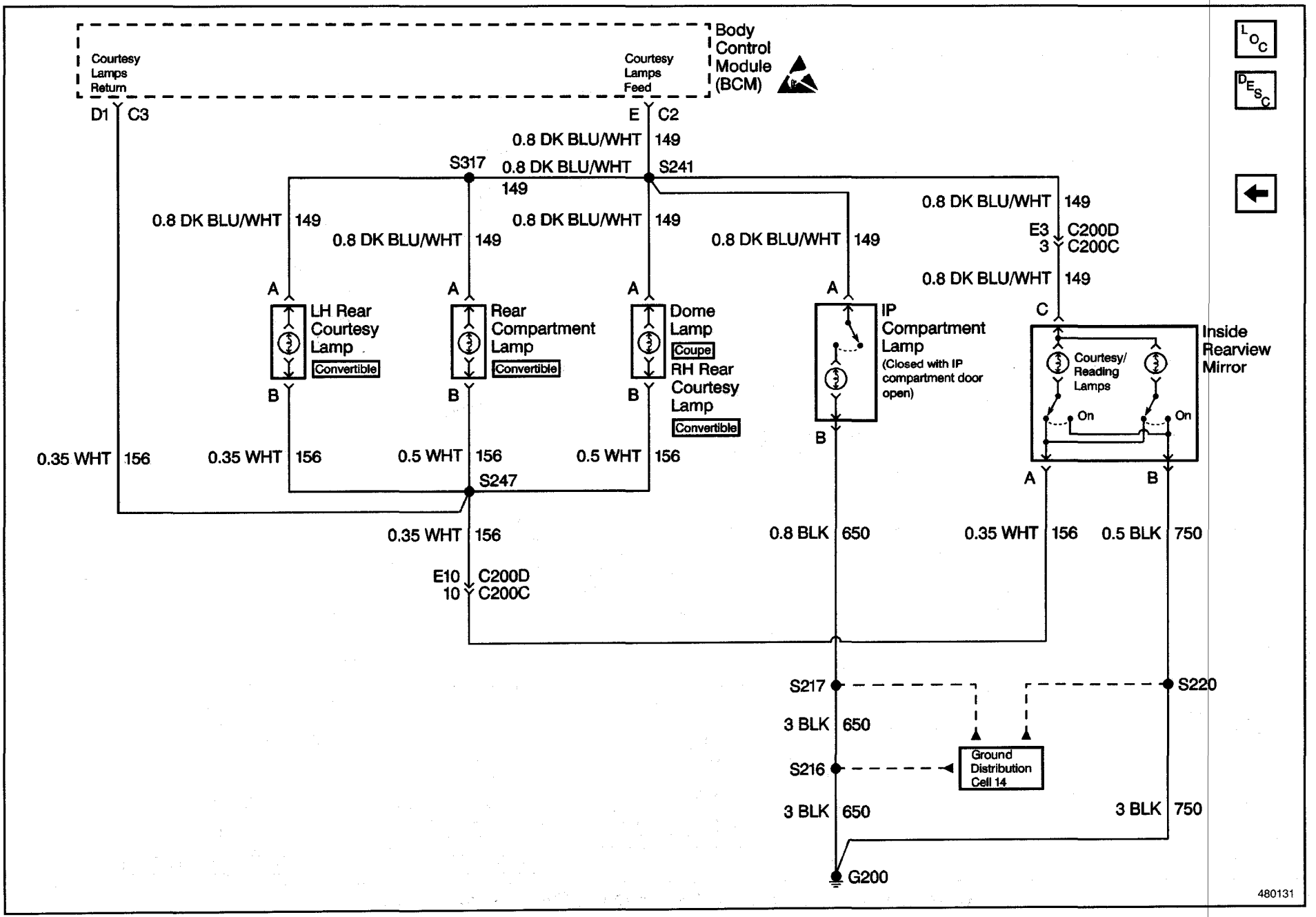
Interior Lights Schematics (With Door Jamb Switches) (Cell 114: Rear Courtesy Lamps, Rear Compartment Lamp, Dome Lamp, IP Compartment Lamp)



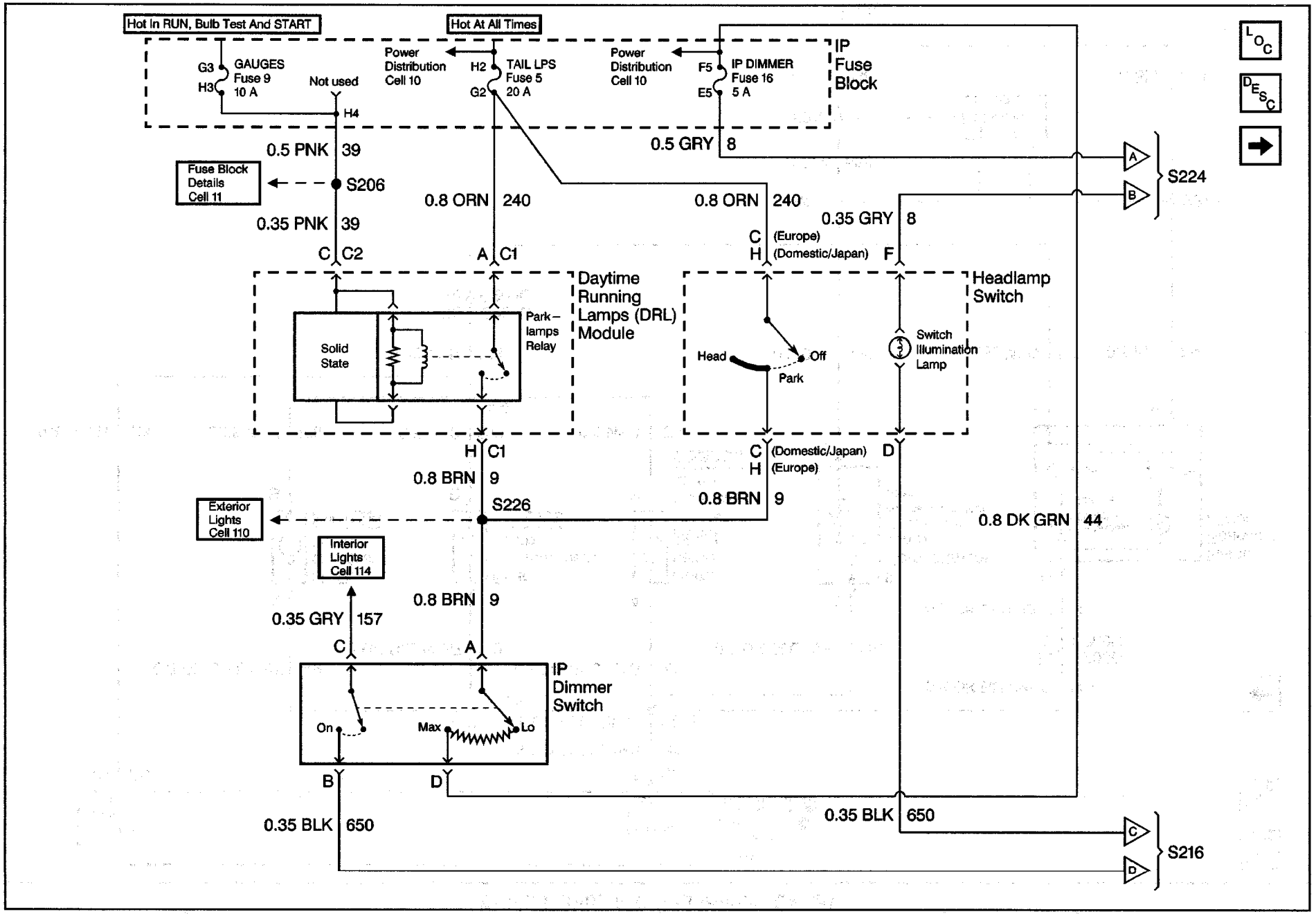
Interior Lights Schematics (Without Door Jamb Switches) (Cell 114: IP Dimmer Switch, Front Side Door Locks, Rear Compartment Lid Ajar Idication Switch)



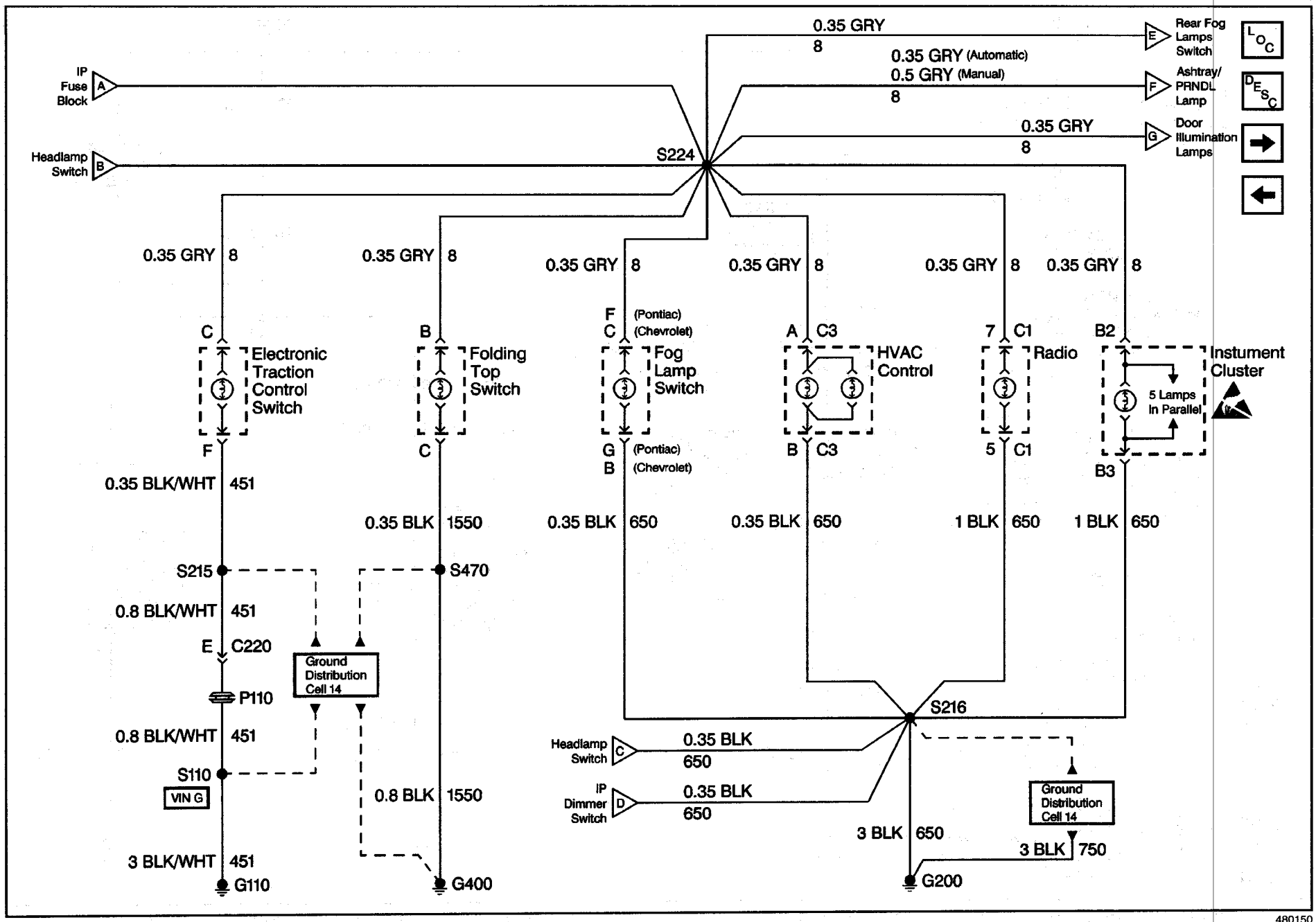
Interior Lights Schematics (Without Door Jamb Switches) (Cell 114: Rear Courtesy Lamps, Rear Compartment Lamp, Dome Lamp, IP Compartment Lamp)



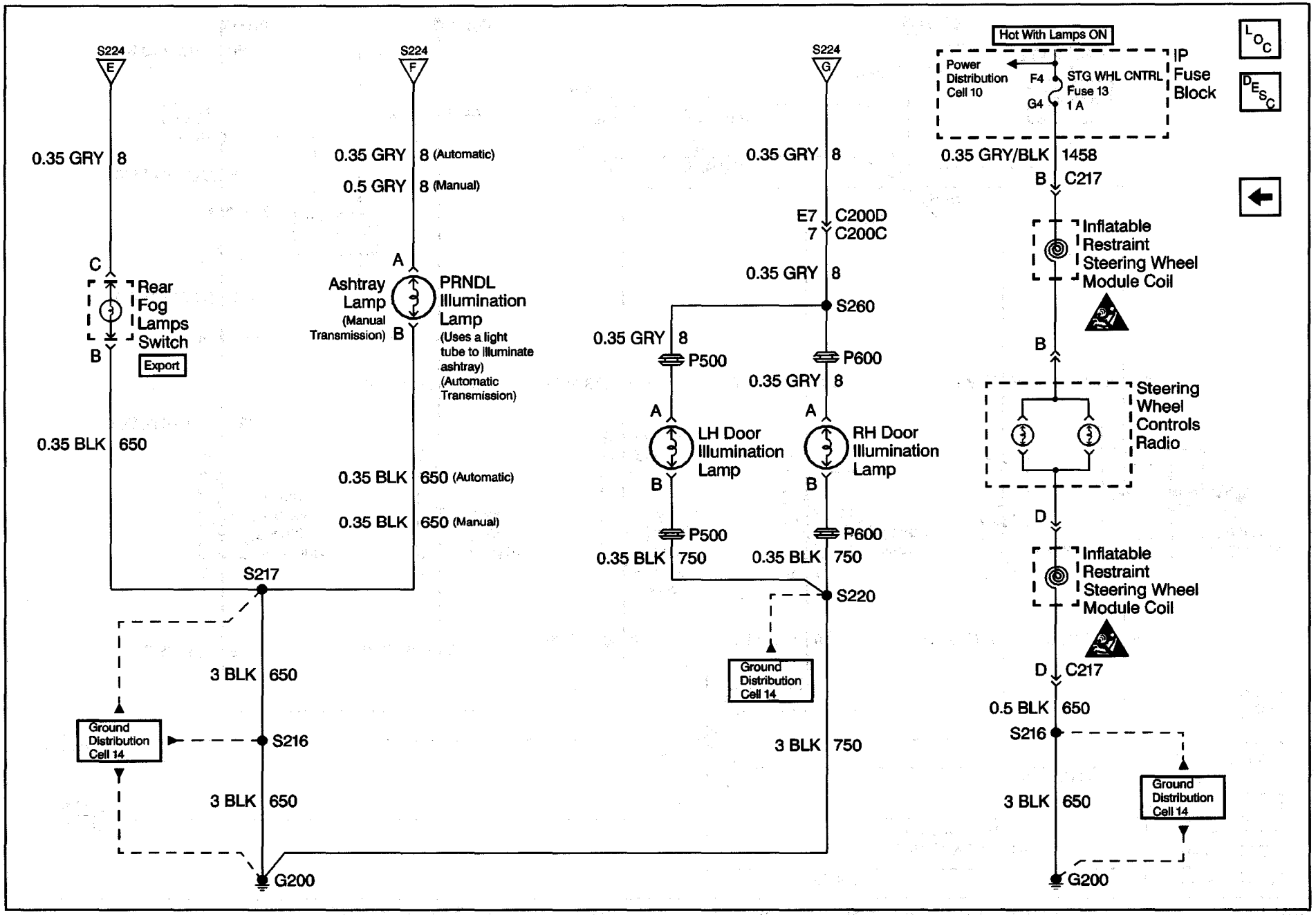
Interior Lights Dimming Schematics (Cell 117: IP Dimmer Switch)



Interior Lights Dimming Schematics (Cell 117: Instrument Cluster, Radio and Switches)



Interior Lights Dimming Schematics (Cell 117: Doors, PRNDL, Rear Fog Lamp Switch, Steering and Wheel Controls)



Component Locator

Lighting Systems Components

Name	Location	Locator View	Connector End View
Ashtray Lamp (Auto Trans)	In the lighting tube from the PRNDL lamp	—	—
Ashtray Lamp (Manual Trans)	Rearward of the shifter, in the ashtray	*Harness Routing Views* in Wiring Systems	—
Backup Lamp Switch (M49) (V6 VIN K)	In the middle of the manual transmission, on the left side	*Lighting Systems Component Views*	—
Backup Lamp Switch (MM6) (V8 VIN G)	In the middle of the manual transmission, on the right side	*Lighting Systems Component Views*	—
Backup Lamp, LH	Mounted in the taillamp assembly	*Lighting Systems Component Views*	—
Backup Lamp, RH	Mounted in the taillamp assembly	*Lighting Systems Component Views*	—
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Center High Mounted Stop Lamp (CHMSL)	In the rear center of the spoiler	—	—
Courtesy Lamp, Left Rear (Convertible)	Mounted in the left sail panel	—	—
Courtesy Lamp, Rear Compartment (Convertible)	In the center of the rear compartment, near the rear compartment lid release actuator	*Power Roof Systems Component Views* in Roof	—
Courtesy Lamp, Right Rear (Convertible)	Mounted in the right sail panel	—	—
Daytime Running Lamps (DRL) Ambient Light Sensor	Mounted in top of instrument panel, near defrost grill	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Daytime Running Lamps (DRL) Module (Headlamp Auto Control Module)	Mounted behind the radio and the HVAC control, left of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views*
Daytime Running Lights (DRL) Relay	Approximately 31 cm (12 in) back from the windshield wiper motor	—	—
Dome Lamp (Coupe)	On the roof, near the hatch	*Harness Routing Views* in Wiring Systems	—
Door Illumination Lamp	Mounted in the left and right door trim panel, above the armrest switches	—	—
Door Jamb Switch, LH	Near base of left A-pillar	*Harness Routing Views* in Wiring Systems	—
Door Jamb Switch, RH	Near base of right A-pillar	*Harness Routing Views* in Wiring Systems	—
Fog Lamp, Right Front	Lower right side of front fascia	—	—
Fog Lamp, Left Front	On the lower left side of the front fascia	—	—
Fog Lamp Relay	In the underhood electrical center 1	—	—
Fog Lamp Switch (Chevrolet)	In the center of the instrument panel, above the HVAC control	*Lighting Systems Component Views*	*Lighting Systems Connector End Views*
Fog Lamp Switch (Pontiac)	On the left steering column, below the headlamp switch	*Lighting Systems Component Views*	*Lighting Systems Connector End Views*

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
Folding Top Switch	On the left side of the upper console	*Power Roof Systems Connector End Views* in Roof	—
Front Side Door Lock	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Fusible Links	Forward of the left front wheelhouse, behind the underhood electrical center 2	—	—
Hazard Lamp Flasher	Left of the steering column, mounted to the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Headlamp (Pontiac)	On the front of the vehicle	—	—
Headlamp Dimmer Switch	Part of steering column, activated by multifunction lever	*Harness Routing Views* in Wiring	—
Headlamp Door Motor	In the front of the vehicle, near each headlamp door	—	—
Headlamp Leveling Actuator Motor, LH	Forward lamp harness to the left headlamp leveling motor harness	—	—
Headlamp Leveling Actuator Motor, RH	Forward lamp harness to the right headlamp leveling motor harness	—	—
Headlamp Leveling Jumper Resistor	In the IP harness, approximately 12 cm (4 in) fromG202 breakout, in inflatable restraint sensing and diagnostic module (SDM) breakout	—	—
Headlamp Leveling Switch (Export)	On the left side of the upper console	—	—
Headlamp Opening Door Actuator Control Module	On the front left side of the engine compartment, beside the underhood electrical center 2	*Power and Grounding Component Views* in Power and Grounding	*Lighting Systems Connector End Views*
Headlamp Switch	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views*
Headlamp, Low Beam (Chevrolet)	On the front of the vehicle	*Power and Grounding Component Views* in Power and Grounding	—
Headlamp, High Beam (Chevrolet)	On the front of the vehicle	—	—
HVAC Control	In the center of the instrument panel, above the radio	*HVAC Component Views* in HVAC	—
Inflatable Restraint Steering Wheel Module Coil	On the top of the steering column	*SIR Component Views* in SIR	—
Inside Rearview Mirror	Mounted to inside center of windshield	—	—
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Instrument Cluster Connector End Views* in Instrument Panel, Gauges and Console
IP Compartment Lamp	Inside the top center of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
IP Dimmer Switch	Left of the steering wheel, part of the headlamp switch	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views*
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
License Lamp	In the center of the rear fascia, above the license plate	*Lighting Systems Component Views*	—
Park Brake Switch	In the console, at the base of the park brake lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park Neutral Position Switch	Under the console, on the base of the shift control lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park/Turn Lamp, Front	On the left and right side of the exterior of the vehicle	—	—
PRNDL Illumination Lamp	Under the console, left of the shift control lever	*Harness Routing Views* in Wiring Systems	—
Radio	In the center of the instrument panel, below the HVAC control	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Entertainment Connector End Views* in Entertainment
Rear Compartment Lid Ajar Indication Switch	Part of the rear compartment lid latch	*Body Rear End Component Views* in Body Rear End	—
Rear Fog Lamp Relay (Export)	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Rear Turn Lamp	On the left and right rear exterior of the vehicle	—	—
Side Marker Lamp, Left Front	On the exterior, left front	*Lighting Systems Component Views*	—
Side Marker Lamp, Left Rear	On the exterior, left rear	*Lighting Systems Component Views*	—
Side Marker Lamp, Right Front	On the exterior, right front	*Lighting Systems Component Views*	—
Side Marker Lamp, Right Rear	On the exterior, right rear	*Lighting Systems Component Views*	—
Steering Wheel Controls	On the steering wheel	*Entertainment Component Views* in Entertainment	—
Stop Lamp Switch	Mounted on the brake pedal bracket	*Cruise Control Component Views* in Cruise Control	*Antilock Brakes System Connector End Views* in Antilock Brake System
Stop Lamp/TCC Switch (Automatic)	Mounted on the brake pedal bracket	—	*Lighting Systems Connector End Views*
Tail/Stop Lamp, LH (Chevrolet)	On the exterior, left rear of the vehicle	—	—
Tail/Stop Lamp, RH (Chevrolet)	On the exterior, right rear of the vehicle	—	—
Tail/Stop/Turn Lamp, LH Inboard (Pontiac)	On the exterior, left rear of the vehicle	—	—

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
Tail/Stop/Turn Lamp, LH Outboard (Pontiac)	On the exterior, left rear of the vehicle	*Lighting Systems Component Views*	—
Tail/Stop/Turn Lamp, RH Inboard (Pontiac)	On the exterior, right rear of the vehicle	—	—
Tail/Stop/Turn Lamp, RH Outboard (Pontiac)	On the exterior, right rear of the vehicle	*Lighting Systems Component Views*	—
Taillamp, LH	On the exterior, left rear of the vehicle	—	—
Taillamp, RH	On the exterior, right rear of the vehicle	—	—
Theft Deterrent Relay	Under the instrument panel, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Traction Control Switch (Chevrolet)	In the center of the instrument panel, above the HVAC control	*Lighting Systems Component Views*	*Lighting Systems Connector End Views*
Traction Control Switch (Pontiac)	On the left side of the upper console	*Lighting Systems Component Views*	*Lighting Systems Connector End Views*
Turn Signal Lamp Flasher	Under the instrument panel, right of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Turn Signal Lamp Flasher (Export)	Under the instrument panel, right of the steering column	—	—
Turn/Stop Lamp (Chevrolet)	On the right and left rear exterior of the vehicle	—	—
Underhood Electrical Center 1	On the Left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
Underhood Electrical Center 2	On the left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
C105 (8 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C160 (5 cavities) (Pontiac)	Left headlamp to the forward lamp harness, behind the headlamp door bracket	*Harness Routing Views* in Wiring Systems	—
C165 (5 cavities) (Pontiac)	Right headlamp to the forward lamp harness, behind the headlamp door bracket	*Harness Routing Views* in Wiring Systems	—
C170 (6 cavities) Pontiac (Export)	Left leveling headlamp to forward lamp harness, mounted to body, under left headlamp door	—	—
C175 (6 cavities) Pontiac (Export)	Right leveling headlamp to forward lamp harness, mounted to body, under right headlamp door	—	—
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
C205 (8 cavities) Pontiac (Export)	Forward lamp to instrument panel harness, between left kick panel and steering column	—	—
C206 (4 cavities) Chevrolet (Export)	Forward lamp to instrument panel harness, between left kick panel and steering column	—	—
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C217 (4 cavities)	Instrument panel to inflatable restraint steering wheel module coil harness, near the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C230 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C330 (2 cavities) Coupe	Hatch to instrument panel harness, center of roof near dome lamp	*Harness Routing Views* in Wiring Systems	—
C400 (6 cavities)	Instrument panel to rear body harness, left rear cargo compartment, between rear end panel and carpet	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C410 (2 cavities) (Export)	Instrument panel to rear body harness, in the left side of the rear compartment	—	—
C420 (2 cavities) (Coupe)	Hatch to CHMSL jumper harness, left side of the rear compartment lid, between the hatch frame and plastic panel	*Harness Routing Views* in Wiring Systems	—
C420 (2 cavities) (Convertible) (Chevrolet)	instrument panel to CHMSL jumper harness, left underside of the rear compartment lid	*Harness Routing Views* in Wiring Systems	—
C420 (2 cavities) (Convertible) (Pontiac)	instrument panel to CHMSL jumper harness, center underside of the rear compartment lid	*Harness Routing Views* in Wiring Systems	—
C430 (2 cavities)	Rear body to rear fascia harness, between the rear fascia and the rear panel, on the left side	*Harness Routing Views* in Wiring Systems	—
G105	Attached to the top right side of the radiator support	*Harness Routing Views* in Wiring Systems	—
G106	Attached to the top left side of the radiator support	*Harness Routing Views* in Wiring Systems	—
G110 (V8 VIN G)	Attached to the rear of the left cylinder head	*Harness Routing Views* in Wiring Systems	—
G110 (V6 VIN K)	In the front of the engine, bolted to the pulley above the A/C clutch connector	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G310	Bolted to the roof, left of the dome lamp	*Harness Routing Views* in Wiring Systems	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
P110	Right side in the dash panel, engine to the passenger compartment	—	—

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
P300	In the rear center of the roof, near the dome lamp	*Harness Routing Views* in Wiring Systems	—
P410	In the center underside of the rear compartment lid	*Harness Routing Views* in Wiring Systems	—
P400	In the rear of the cargo compartment, left of the rear compartment lid release actuator	*Harness Routing Views* in Wiring Systems	—
P500	Between the driver door and A-pillar	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S104 (V6 VIN K)	In the engine harness, approximately 15 cm (6 in) from the powertrain control module (PCM) breakout	—	—
S104 (V8 VIN G)	Engine harness, approximately 14 cm (6 in) from the powertrain control module (PCM) breakout	—	—
S110 (V8 VIN G)	In the engine harness, main branch, approximately 19 cm (7 in) from the powertrain control module (PCM) breakout	—	—
S110 (V6 VIN K)	In the engine harness, approximately 4 cm (2 in) from the powertrain control module (PCM) breakout	—	—
S112	In the forward lamp harness, approximately 9 cm (4 in) from the right lamps breakout	—	—
S113	In the forward lamp harness approximately 7 cm (3 in) from the engine coolant fans/cruise control	—	—
S150	Forward lamp harness, approximately 16 cm (6 in) from windshield washer pump breakout	—	—
S151	Forward lamp harness, approximately 28 cm (4 in) from C200	—	—
S152	Forward lamp harness, approximately 7 cm (3 in) from C120 (left front wheel speed sensor) breakout	—	—
S153	Forward lamp harness, approximately 13 cm (5 in) from C120 (left front wheel speed sensor) breakout	—	—
S155	Forward lamp harness, approximately 27 cm (10.6 in) from the engine coolant fans/cruise control module breakout	—	—
S156 (Export)	Forward lamp harness, approximately 7 cm (3 in) from G106 breakout	—	—
S157 (Export)	Forward lamp harness, approximately 8 cm (3 in) from G105 breakout	—	—
S160	Forward lamp harness, approximately 4 cm (2 in) from the engine coolant fans/cruise control module breakout	—	—
S172 (Export)	Forward lamp harness, approximately 28 cm (11 in) from G105	—	—
S202	Forward lamp harness, approximately 28 cm (11) from C200	—	—

Lighting Systems Components (cont'd)

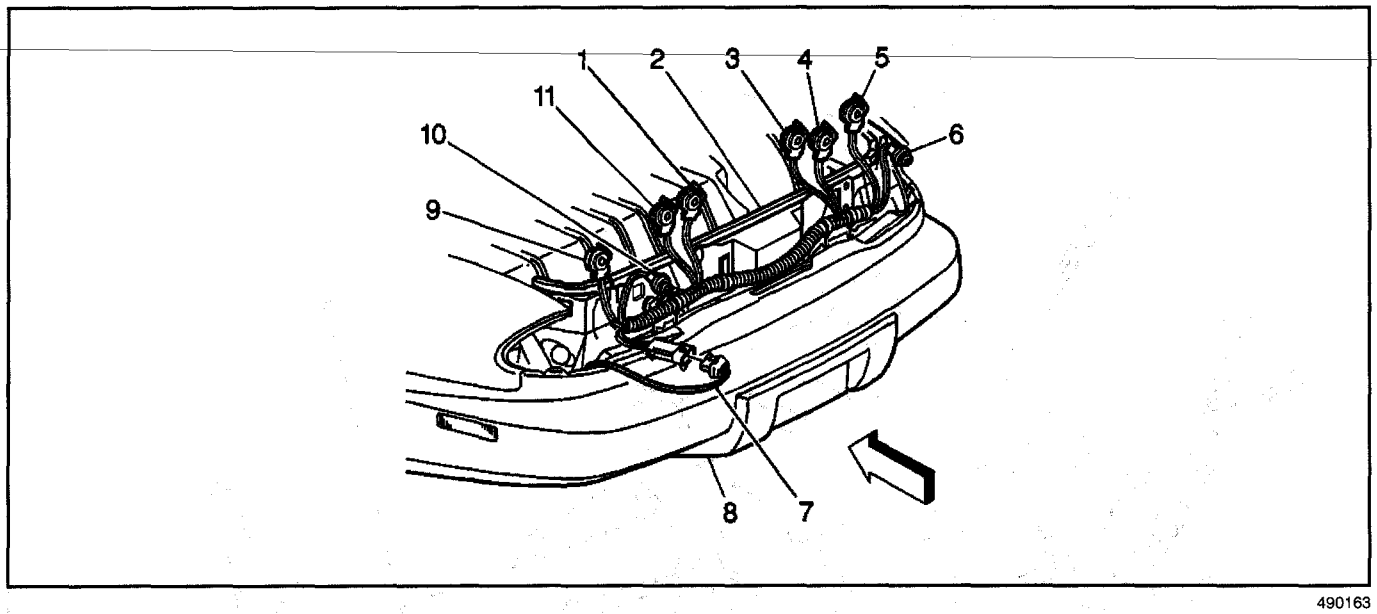
Name	Location	Locator View	Connector End View
S206	In the instrument panel harness, at the rear compartment lid release relay breakout	—	—
S207	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the data link connector (DLC) breakout	—	—
S210	Forward lamp harness, main branch, approximately 8 cm (3 in) from C211/C212 breakout, toward P100	—	—
S214 (Chevrolet)	instrument panel harness, approximately 8 cm (3 in) into instrument cluster breakout	—	—
S215	In the instrument panel harness, main branch, approximately 11 cm (4 in) from the antenna cable breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S224	In the instrument panel harness, main branch, approximately 17 cm (7 in) from the instrument cluster breakout	—	—
S226	Instrument panel harness, approximately 7 cm (3 in) into headlamp switch breakout	—	—
S227	Instrument panel harness, approximately 14 cm (6 in) into headlamp switch breakout	—	—
S241	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the antenna cable breakout	—	—
S243	Instrument panel harness, approximately 9 cm (4 in) from G200 breakout	—	—
S245	Instrument panel harness, approximately 22 cm (9 in) from G200 breakout	—	—
S246	In the instrument panel harness, approximately 3 cm (1.2 in) from the antenna cable breakout	—	—
S247	Instrument panel harness, approximately 16 cm (6 in) from G200 breakout	—	—
S250 (Chevrolet) (Export)	In the instrument panel harness, approximately 29 cm (11 in) from the G200 breakout	—	—
S251 (Chevrolet) (Export)	instrument panel harness, at instrument panel fuse block breakout	—	—
S260	Cross car harness, main branch, approximately 22 cm (9 in) from the C200C breakout	—	—
S284	In the instrument panel harness, approximately 11 cm (4.3 in) from the G202 breakout	—	—
S285	In the instrument panel harness, approximately 16 cm (6.3 in) from the G202 module	—	—
S317 (Convertible)	Instrument panel harness, main branch, approximately 40 cm (16 in) (from left rear courtesy lamp breakout	—	—

Lighting Systems Components (cont'd)

Name	Location	Locator View	Connector End View
S400 (Chevrolet)	Rear body harness, main branch, approximately 20 cm (8 in) from P400 breakout toward right taillamp	—	—
S400 (Pontiac)	Rear body harness, main branch, approximately 13 cm (5 in) from P400 breakout toward right taillamp	—	—
S401 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 16 cm (6 in) from P400	—	—
S402 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 13 cm (5 in) from P400	—	—
S403 (Chevrolet)	Rear body harness, between P400 and C400 in breakout, 11 cm (4 in) from P400	—	—
S404	Rear body harness, main branch, approximately 20 cm (8 in) from the P400 breakout	—	—
S405 (Chevrolet)	Rear body harness, between P400 and C400 in breakout, approximately 17 cm (7 in) from P400	—	—
S405 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 9 cm (4 in) from P400	—	—
S406	In the rear body harness, approximately 10 cm (4 in) from the rear compartment lid release actuator	—	—
S408 (Chevrolet) (Export)	Rear body harness, main branch, approximately 20 cm (8 in) from P400 breakout	—	—
S410	In the rear body harness, main branch, approximately 27 cm (11 in) from P400 breakout, toward the right taillamp	—	—
S415 (Export)	In the cross car harness, approximately 13 cm (5.1 in) from the license lamp breakout	—	—
S420	In the hatch harness, main branch, approximately 7 cm (3 in) from P300 breakout	—	—
S430	Rear fascia harness, main branch, approximately 12 cm (5 in) from the license lamp breakout	—	—
S430 (Export)	In the rear fascia harness, approximately 8 cm (3 in) from the main branch, in license lamp breakout	—	—
S440	Rear fascia harness, main branch, approximately 5 cm (2 in) from license lamp breakout	—	—
S440 (Export)	Rear fascia harness, main branch, approximately 7 cm (3 in from license lamp breakout	—	—
S450	CHMSL jumper harness, approximately 24 cm (9 in) from the bulbs	—	—
S460	CHMSL jumper harness, approximately 30 cm (12 in) from the bulbs	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—

Lighting Systems Component Views

Rear Body (Chevrolet, Pontiac Similar)

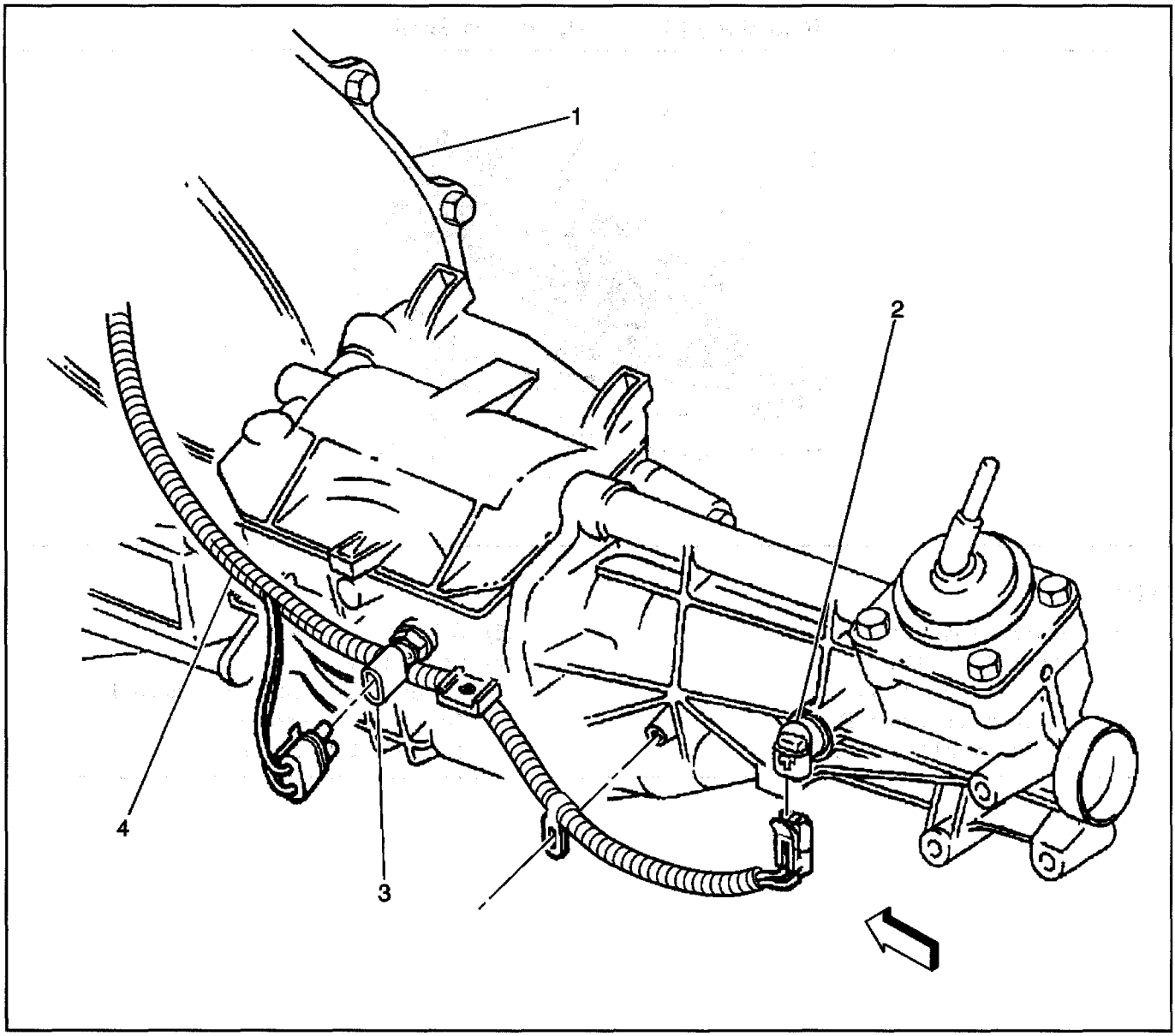


490163

Legend

(1) Backup Lamp, LH
(2) Backup Lamp, RH
(3) Tail Lamp RH Inboard
(4) Tail/Stop/Turn Lamp, RH
(5) Tail Lamp RH Outboard
(6) RR Fascia Harness
(7) Rear Fascia
(8) Tail/Stop/Turn Lamp, LH Outboard
(9) Tail Lamp LH Outboard
(10) Tail Lamp LH Inboard

Left Side of Manual Transmission (V6 VIN K)

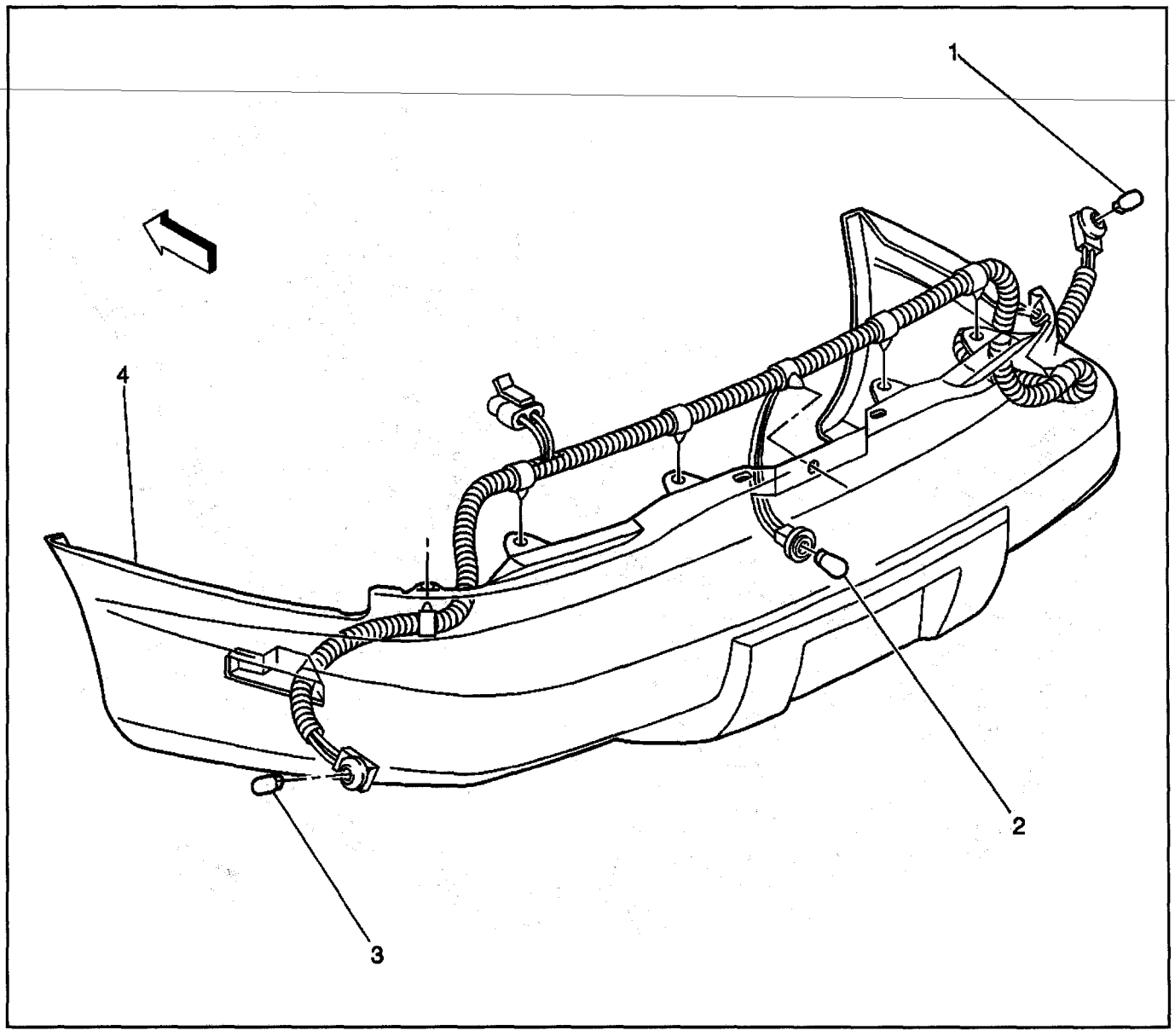


483484

Legend

(1) Manual Transmission
(2) Vehicle Speed Sensor
(3) Backup Lamp Switch
(4) Engine Wiring Harness

Rear Fascia

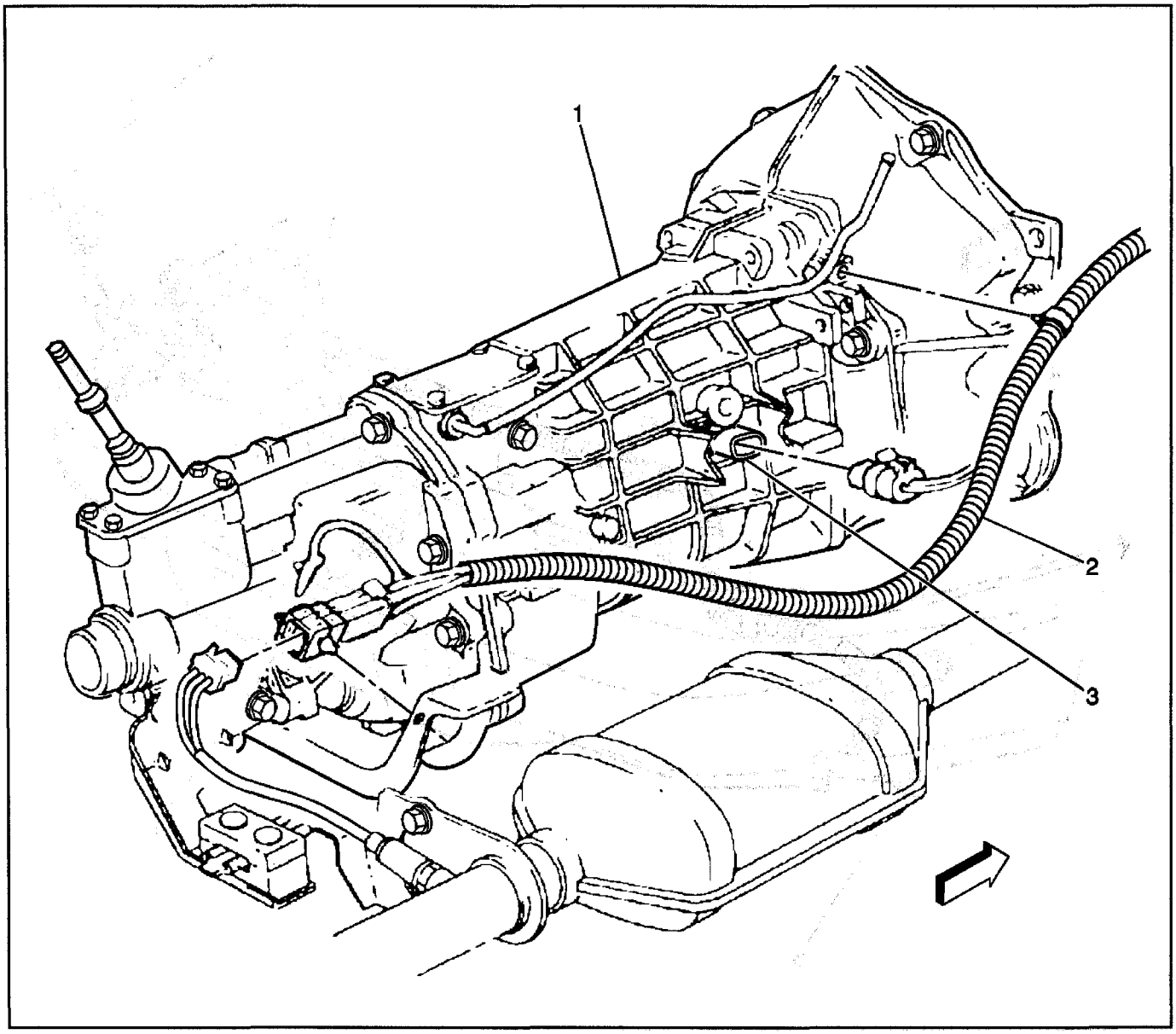


490178

Legend

(1) Side Marker Lamp, Right Rear
(2) License Lamp
(3) Side Marker Lamp, Left Rear
(4) Rear Fascia

Right Side of Manual Transmission (V8 VIN G)

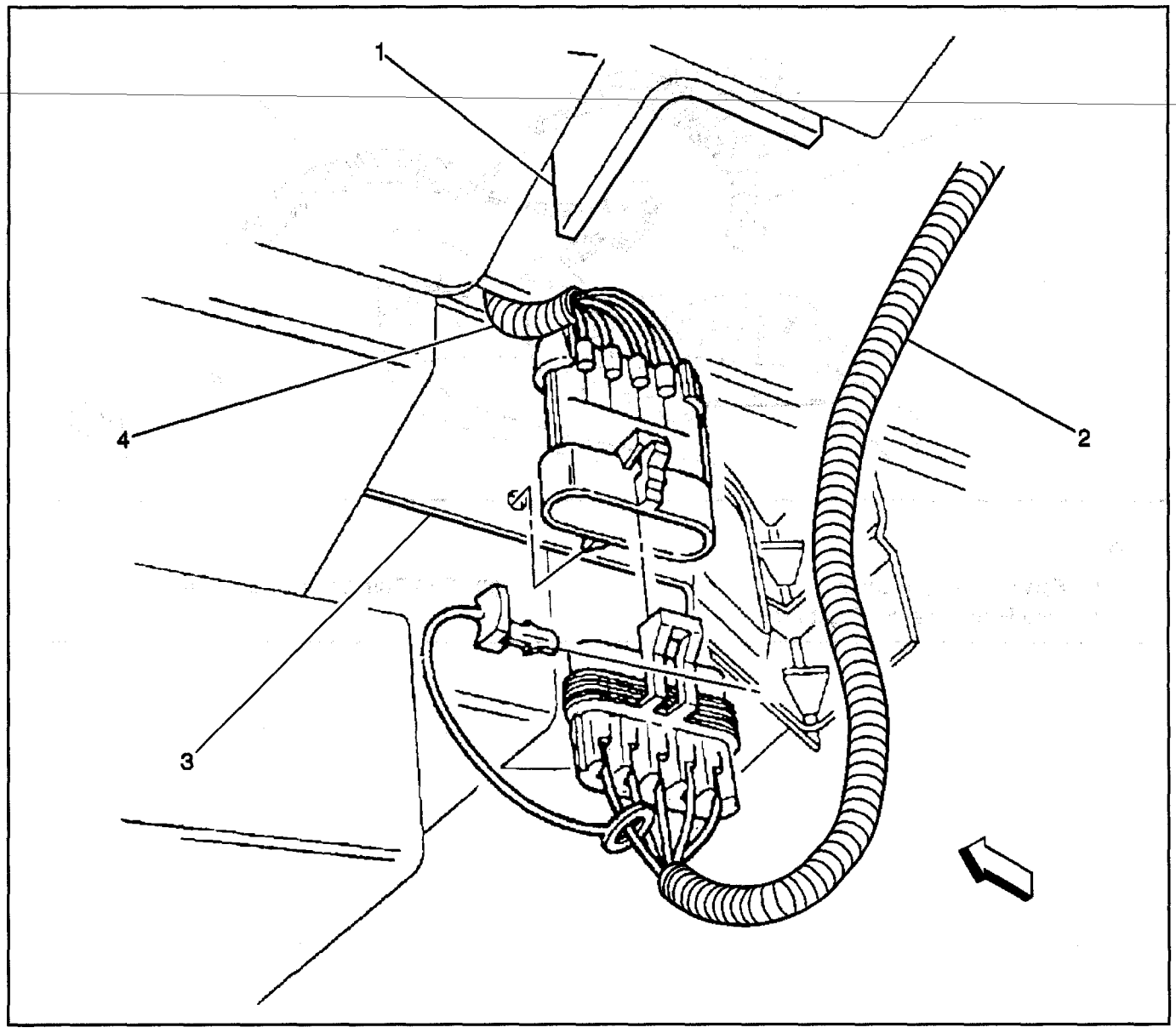


483486

Legend

(1) Manual Transmission
(2) Engine Wiring Harness
(3) Backup Lamp Switch

Right Front Engine Compartment (Left Side Similar)

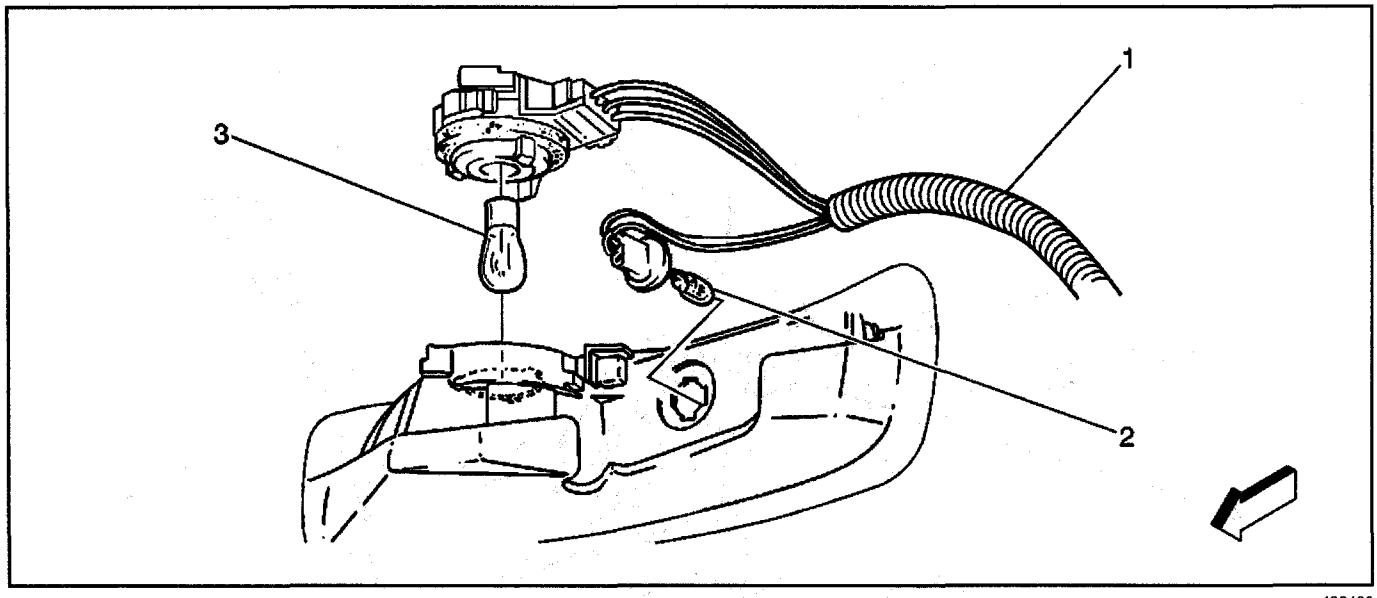


483487

Legend

(1) Headlamp Mounting Panel
(2) Forward Lamp Harness
(3) Body
(4) Headlamp Jumper Harness

Right Side of Front Fascia (Left Side Similar)

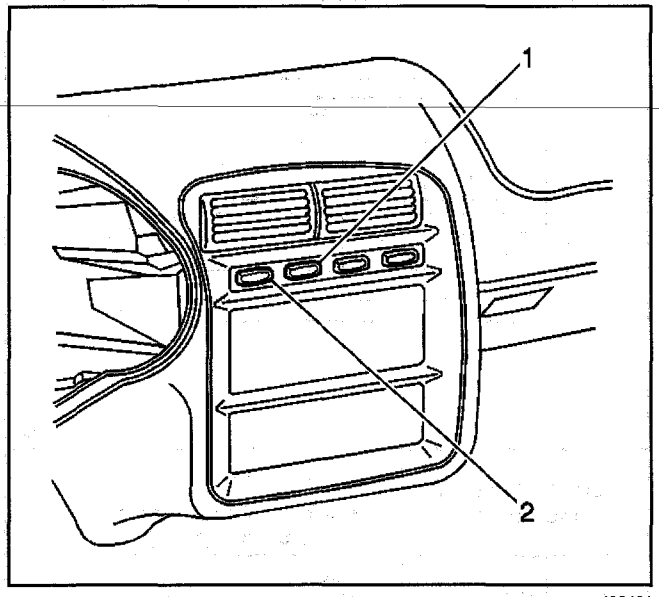


483490

Legend

(1) Forward Lamp Harness
(2) Side Marker Lamp, Right Front
(3) Park/Turn Lamp, Right front

Fog Lamp/Traction Control Switches

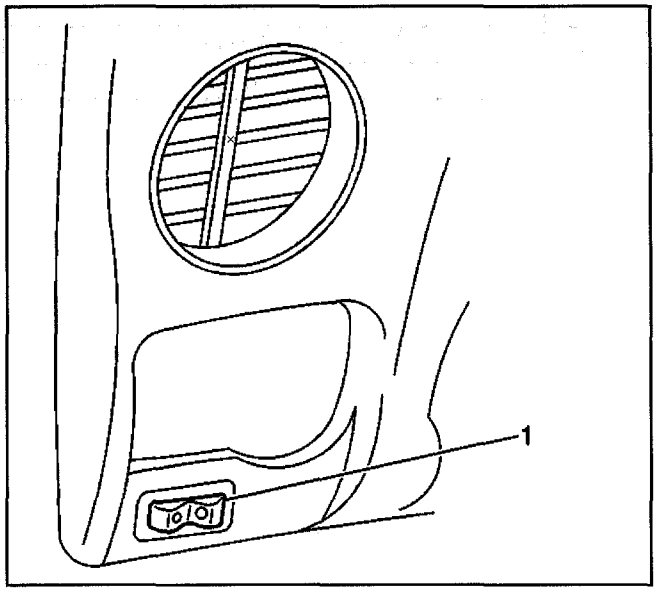


483491

Legend

(1) Second Gear Start Switch or Traction Control Switch
(2) Fog Lamp Switch or Second Gear Start Switch

Fog Lamp/Traction Control Switches



483492

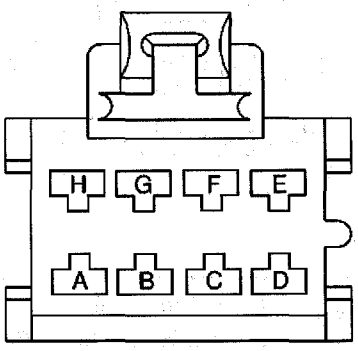
Legend

(1) Fog Lamp Switch (Pontiac)

Visual Identification

Lighting Systems Connector End Views

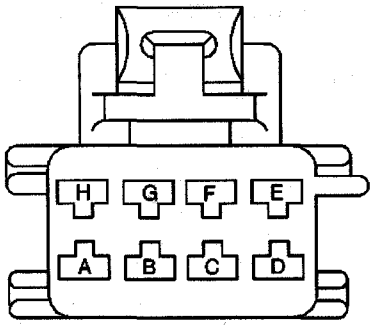
Daytime Running Lamps (DRL) Module C1



62469

Connector Part Information		• 12064998 • 8-Way F Metri-Pack Series 280 (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	ORN	240	Fuse output-battery-type III fuse
B	LT BLU	14	Turn signal lamp feed-left front
C	DK BLU	15	Turn signal lamp feed-right front
D	RED/WHT	1372	Fuse output-daytime running lamps-type III fuse
E	LT BLU/WHT	1414	Turn signal switch output-left front
F	YEL	10	Headlamp switch output
G	BLU/WHT	1415	Turn signal switch output-right front
H	BRN	9	Park lamp feed

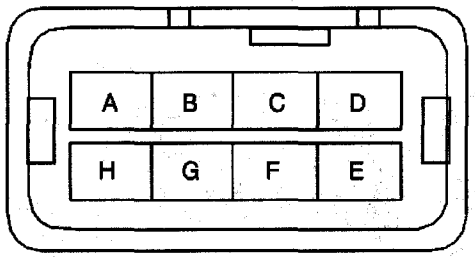
Daytime Running Lamps (DRL) Module C2



62463

Connector Part Information	• 12064766 • 8-Way F Metri-Pack Series 150 (BLU)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	650	Ground
B	—	—	Not used
C	PNK	39	Fuse output-ignition 1-type III fuse
D	TAN/WHT	33	Brake warning indicator lamp output
E	LT BLU	1134	Park brake switch signal
F	BRN	141	Fuse output-ignition 3-type III fuse
G	LT GRN/BLK	1137	Daytime running lamp photocell signal
H	YEL/BLK	1138	Daytime running lamp photocell return

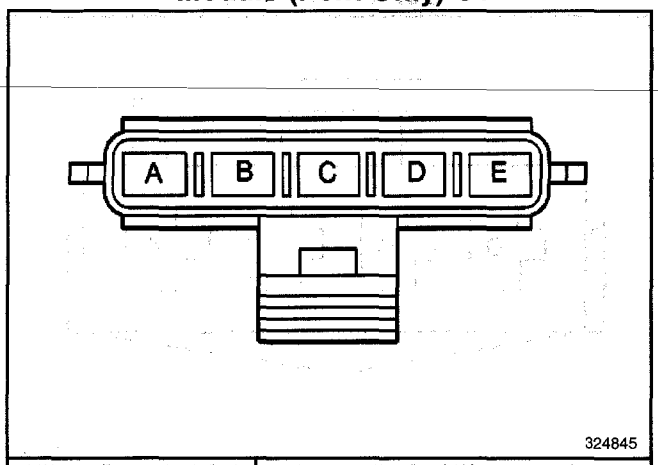
Fog Lamp Switch



62434

Connector Part Information	• 12045688 • 8-Way M Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	YEL	317	Fog lamp relay feed-coil
B	PPL	34	Fog lamp feed
C	—	—	Not used
D	BRN	9	Park lamp feed
E	—	—	Not used
F	GRY	8	Instrument panel lamp feed
G	BLK	650	Ground
H	—	—	Not used

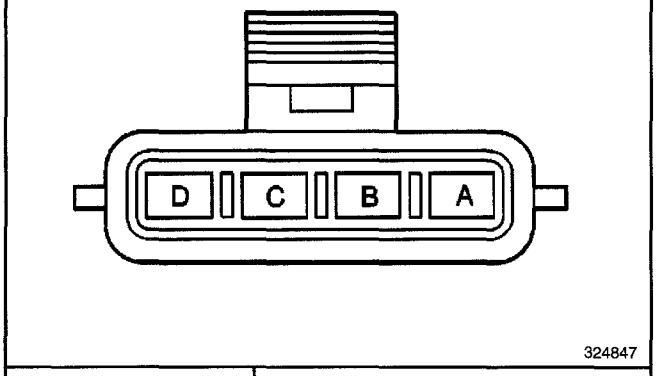
Headlamp Opening Door Actuator Control Module (Pont Only) C1



324845

Connector Part Information	• 15300030 • 5-Way F Metri-Pack 280 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	YEL	10	Headlamp switch output
B	ORN	840	Fuse output-battery-type III fuse
C	BRN	9	Park lamp feed
D	BLK	150	Ground
E	ORN	740	Fuse output-battery-type III fuse

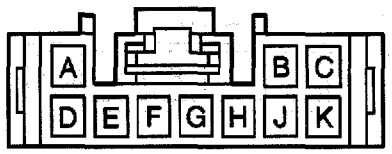
Headlamp Opening Door Actuator Control Module (Pont Only) C2



324847

Connector Part Information	• 15300029 • 4-Way F Metri-Pack 280 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	DK BLU	579	Headlamp door motor feed-right-down
B	LT BLU	578	Headlamp door motor feed-right-up
C	LT GRN	576	Headlamp door motor feed-left-up
D	DK GRN	577	Headlamp door motor feed-left-down

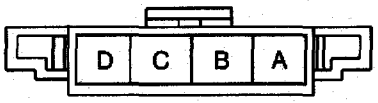
Headlamp Switch Connector



280780

Connector Part Information	• 12129077 • 10-Way F Metri-Pack 280 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A-B	—	—	Not Used
C	BRN	9	Park, tail, marker feed
D	BLK	650	Switch lamp ground
E	YEL	10	Headlamp switch output
F	GRY	8	Switch lamp feed
G	RED	1372	Feed to headlight relay
H	ORN	240	Fused feed to headlight switch
J	RED	702	Fuible link feed to headlight switch
K	BRN	9	Output to tail lamps

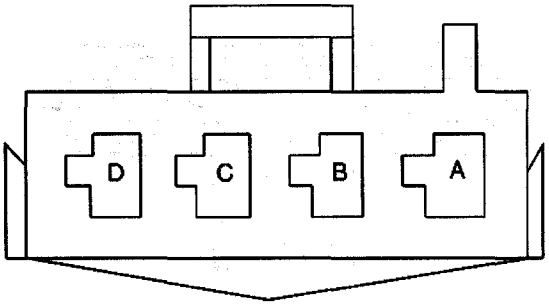
IP Dimmer Switch



38618

Connector Part Information		• 12034060 • 4-Way F Metri-Pack Series 480 (NAT)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN	9	Park lamp feed
B	BLK	650	Ground
C	GRY	157	Interior lamp output
D	DK GRN	44	Instrument panel lamps dimmer switch output

Stop Lamp/Torque Converter Control (SL/TCC)



40397

Connector Part Information		• 12033706 • 4-Way F Metri-Pack 208 Series (BLU)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	PNK	39	Fuse output-ignition 1-type III fuse
B	DK GRN/WHT	1135	Brake transmission shift interlock solenoid feed
C	PNK	539	Fuse output-ignition 1-type III fuse
D	PPL	420	Brake pedal switch output-torque converter clutch

Diagnostic Information and Procedures

Headlight System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position.	Only the low beam headlamps are on.	• *Headlamps Inoperative - Low Beams (Scandanavia)* • *Headlamps Inoperative - Low Beams (Chevrolet)* • *Headlamps Inoperative - Low Beams (Pontiac)* • *Headlamps Inoperative - One Lamp*
2	Turn the headlamp dimmer switch to the HIGH position.	• The high beam headlamps are on. • The high beam indicator is lit. • The low beam headlamps are off.	• *Headlamps Inoperative - High Beams* • *Headlamps Inoperative - One Lamp* • *High Beam Indicator Inoperative*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

DRL System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the headlamp switch OFF. 2. Apply a bright light to the daytime running lamps (DRL) ambient light sensor. 3. Turn the ignition to RUN.	The high beam headlamps turn on at a reduced intensity in approximately 30 seconds.	• *Headlamps On in Daylight Conditions (Domestic)* • *Headlamps, DRL Off, Ign RUN (Park Brake Applied) (Scandanavia: Headlamp Switch Off)* • *Headlamps Do Not Switch Intensity (Domestic or Canadian)*
2	Cover the DRL ambient light sensor with a dark cloth.	The following conditions occur in approximately 15 seconds: • The high beam headlamps turn off. • The low beam headlamps turn on. • The exterior lamps turn on.	• *Headlamps Inoperative in Low Light Conditions* • *Headlamps Do Not Switch Intensity (Domestic or Canadian)*
3	1. Turn the ignition OFF. 2. Apply the park brake. 3. Apply a bright light to the DRL ambient light sensor. 4. Turn the ignition to the RUN position.	• The headlamps are off. • The exterior lamps are off.	*Headlamps, DRL On With Park Brake Applied*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Fog Lights System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position. 3. Turn the fog lamp switch to the ON position.	• Both fog lamps are on. • The fog lamp switch indicator is ON.	• *Fog Lamps Inoperative - All (Domestic)* • *Fog Lamps Inoperative - One* • *Fog Lamp Indicator Inoperative (Domestic)* • *DRL Inoperative, Headlamp Switch Operates Normally*
2	Turn the headlamp dimmer switch to the HIGH position.	The fog lamps are off.	• *Fog Lamps Always On (Domestic)* • *Fog Lamps Always On (Europe)*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Headlight Doors System Check

Step	Action	Normal Result(s)	Abnormal result(s)*
1	Turn the headlamp switch to the ON position (headlamps on).	Headlight doors open.	*Headlamp Doors Inoperative - One Door*
2	Turn the headlamp switch to the OFF position.	Headlight doors close.	• *Headlamp Doors Do Not Close (Or Open)* • *Headlamp Doors Inoperative - One Door*
*Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Headlight Leveling System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Turn the headlamp leveling switch to all 4 positions.	The headlamp moves based on which position the switch is in.	• *Headlight Leveling Inoperative - One Actuator* • *Headlight Leveling Inoperative* • *Headlight Leveling Inop - Actuator Switch Illum*

Exterior Lights System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Turn the headlamp switch to the PARK position.	The following lamps are all on: • Tail/Stop • Rear Side Marker • License • Tail • Front side marker • Park/Turn	• *Exterior Lamps Inoperative (One)* • *Exterior Lamps Inoperative (All)*
2	1. Turn the ignition switch to the RUN position. 2. Operate the turn signal switch to the left or the right position.	• The park/turn and tail/stop/turn lamps flash continuously on and off. • The turn signal indicator flashes on the IP according to which position the turn signal switch is in.	• *Turn Signal Lamps Inoperative* • *Turn Signal Indicators Inoperative - Left (or Right)*
3	Turn the turn signal switch off.	The park/turn and tail/stop/turn lamps are off.	*Turn Signal Lamps Always On - One Side*

Exterior Lights System Check (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
4	1. Turn the Ignition to the OFF position. 2. Turn the hazard switch on.	• The park/turn and tail/stop/turn lamps flash continuously from minimum intensity to maximum intensity. • Both turn signal indicators flash on the IP.	• *Turn Signal and Hazard Lamps Inoperative* • *Turn Signal Indicators Inoperative* • *Hazard Lamps Inoperative*
5	1. Turn the hazard switch to the OFF position. 2. Turn the ignition switch to the RUN position. 3. Depress the brake pedal.	The center high mounted stop lamp, tail/stop/turn lamp, and tail/stop lamp (Chevrolet Only) are on.	• *Stop Lamps Inoperative - All* • *Stop Lamps Inoperative - CHMSL Operates* • *Stop Lamps Inoperative - Center High Mounted*
6	Release the brake pedal.	The stop lamps turn off.	*Stop Lamps Always On*
7	Turn the ignition to the RUN position.	The Daytime Running Lamps (DRL) turns on. • Daylight — the park/turn lamps are on (non-flashing). • Low light — the park/turn lamps, side marker lamps, and low beam headlamps are on.	*DRL Inoperative, Headlamp Switch Operates Normally*
8	1. Set the park brake. 2. Turn the ignition to the RUN position.	The Daytime Running Lamps (DRL) are off.	*DRL Inoperative, Headlamp Switch Operates Normally*

Backup Lights System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Apply the park brake. 2. Turn the ignition switch to the RUN position. 3. Shift the transaxle into REVERSE.	The backup lamps turn ON.	• *Backup Lamps Inoperative* • *Backup Lamp Inoperative - One Lamp*
2	Shift the transaxle into PARK or NEUTRAL.	The backup lamps are OFF.	*Backup Lamps Always On*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Interior Lamps System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn off the IP dimmer switch. 2. Turn off the left and right inside rearview mirror courtesy/reading lamps. Turn the ignition switch to the RUN position. 3. Lower the driver's door window in order to prevent lockout. 4. While observing the courtesy lights, open and close all the vehicle doors, and the rear compartment lid, one at a time.	• The courtesy lamps turn on when any door is open. • The courtesy lamps turn off when all doors are closed.	• *Courtesy Lamps Always On* • *Courtesy Lamps Inoperative* • *Courtesy Lamps Inoperative with Doors Open (With Door Jamb Switches)* • *Courtesy Lamps Inoperative with Doors Open (Without Door Jamb Switches)* • *Courtesy Lamps Inop with Rear Compartment Lid Open*
2	1. Close all the vehicle doors. 2. While observing the courtesy lights, turn on the IP dimmer switch. 3. Turn off the IP dimmer switch.	• The courtesy lamps turn on when the IP dimmer switch is in the ON position. • The courtesy lamps turn off when the IP dimmer switch is in the OFF position.	• *Courtesy Lamps Inoperative with IP Dimmer Switch* • *Courtesy Lamps Always On*

Interior Lamps System Check (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
3	1. Turn the ignition switch to the OFF position. 2. Open a vehicle door, then close the door. 3. Observe the courtesy lamps.	• With delayed illumination enabled, the courtesy lamps turn off approximately 25 seconds after the doors are closed. • If delayed illumination feature is disabled, the courtesy lamps turn off after the last door is closed.	• *Courtesy Lamps Always On* • *Courtesy Lamps Inoperative* • *Courtesy Lamps Inoperative with Doors Open (With Door Jamb Switches)* • *Courtesy Lamps Inoperative with Doors Open (Without Door Jamb Switches)* • *Courtesy Lamps Inop with Rear Compartment Lid Open*
4	1. Turn the ignition switch from OFF to RUN, then back to OFF. 2. Open a vehicle door, then close the door. 3. While observing the courtesy lamps, turn the ignition switch to the RUN position within 25 seconds after closing the door. 4. Turn the ignition switch to the OFF position. 5. Open a vehicle door, then close the door. 6. While observing the courtesy lamps, press any power door lock switch to the LOCK position within 25 seconds after the door is closed.	• With delayed illumination enabled, courtesy lamps turn off immediately when the ignition switch is turned to the RUN position, or when pressing LOCK on a power door lock switch. • With delayed illumination disabled, the courtesy lamps turn off when the door is closed.	• *Courtesy Lamps Always On* • *Courtesy Lamps Inoperative*
5	1. Close all the vehicle doors. 2. Turn the ignition switch to the RUN position, the to the OFF position. 3. While observing the courtesy lights, remove the key from the ignition switch.	• With the exit lighting feature enabled the courtesy lights turn on for 5 seconds after the key is removed from the ignition switch. • With the exit lighting feature disabled, the courtesy lights stay off when the key is removed from the ignition switch.	• *Courtesy Lamps Always On* • *Courtesy Lamps Inoperative*
6	1. Close all the vehicle doors. 2. Turn off the IP dimmer switch. 3. Turn the ignition switch to the RUN position. 4. Turn on, then turn off the switches for the inside rearview mirror courtesy/reading lamps.	• The inside rearview mirror courtesy/reading lamps turn on when switches are on. • The inside rearview mirror courtesy/reading lamps turn off when switches are off.	• *Courtesy/Reading Lamps Inoperative w/ Lamp Switch* • *Courtesy/Reading Lamps Always On* • *Courtesy/Reading Lamps Inoperative*
7	Open, Then close the IP compartment while observing the IP compartment lamp.	• The IP compartment lamp turns on when the IP compartment is open. • The IP compartment lamp turns off when the IP compartment is closed.	• The IP compartment lamp remains on at all times. Replace the IP compartment lamp. Refer to *IP Compartment Lamp Replacement.* • The IP compartment lamp does not illuminate. Refer to *IP Compartment Lamp Inoperative.*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Interior Lights Dimming System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to the RUN position. 2. Turn the I/Pdimmer switch to the low intensity position. 3. Turn the headlamp switch to the PARK position.	The following lamps are all illuminated: • The steering wheel radio control switches • The fog lamp switch • The door illumination • The HVAC control • The headlamp switch • The instrument cluster • The ashtray/PRNDL lamp • The fog lamp switch • The rear fog lamp switch (Export) • The driver seat heater switch • The electronic traction control switch • The folding top switch (Convertible) The vacuum fluorescent (VF) display (radio) step dim.	• *Instrument Panel Lamps Inoperative* • *Instrument Panel Lamps Inoperative - One*
2	Turn the I/P lamp dimmer switch slowly to the high intensity position.	1. The brightness of the I/P lamps slowly increase to high. 2. The VF brightness of the radio slowly increases to high.	Lamp intensity varies erratically. Refer to *Headlamp Switch Replacement (Chevrolet)* or *Headlamp Switch Replacement (Pontiac).*
3	1. Turn the I/P lamp dimmer switch to the low intensity position. 2. Turn the headlamp switch to the OFF position.	• The I/P lamps turn off. • The radio VF display turns off.	*Instrument Panel Lamps Do Not Dim*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Backup Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire backup lights system check performed?	—	Go to *Step 2*	Go to *Backup Lights System Check*
2	Inspect to determine if the backup lamps are damaged or open. Are the backup lamps damaged or open?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the backup lamps. Refer to Backup Lamp Bulb Replacement (Chevrolet) or Backup Lamp Bulb Replacement (Pontiac). Is the repair complete?	—	Go to *Step 17*	—
4	1. Place the ignition in the RUN position. 2. Set the park brake. 3. Apply the brake pedal. 4. Place the transmission in the REVERSE position. 5. Backprobe with a test light from connector C400 terminal F to ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*

Backup Lamps Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
5	Connect a test light between the LH backup lamp connector terminals A and G. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 15*
6	Determine if the vehicle has a manual transmission or an automatic transmission. Does the vehicle have a manual transmission?	—	Go to *Step 7*	Go to *Step 8*
7	Connect a test light between the backup lamp switch connector terminal B and ground. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 10*
8	Backprobe with a test light from park/neutral position switch connector terminal C to ground. Does the test light illuminate?	—	Go to *Step 13*	Go to *Step 12*
9	Repair a poor connection or open in circuit 24. Is the repair complete?	—	Go to *Step 17*	—
10	1. Make sure the vehicle is in the PARK position. 2. Turn the ignition swich to the OFF position. 3. Disconnect the backup lamp switch. 4. Turn the ignition switch to the RUN position. 5. Probe with a test light from the backup lamp connector terminal A to ground. Does the test light illuminate?	—	Go to *Step 11*	Go to *Step 12*
11	Replace the backup lamp switch. Refer to *Backup Lamp Switch Replacement* or *Backup Lamp Switch Replacement.* Is the repair complete?	—	Go to *Step 17*	—
12	Repair the open or poor connection in circuit 141. Is the repair complete?	—	Go to *Step 17*	—
13	Connect a test light between the park/neutral position switch connector terminal D and ground. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 14*
14	Adjust or replace the park/neutral position switch. Refer to *Park/Neutral Position Switch Replacement.* Is the repair complete?	—	Go to *Step 17*	—
15	Connect a test light between the LH backup lamp connector terminals A and ground. Does the test light illuminate?	—	Go to *Step 16*	Go to *Step 9*
16	Repair a poor connection or open in circuit 1250. Is the repair complete?	—	Go to *Step 17*	—
17	1. Turn the ignition swich to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Backup Lights System Check*	—

Backup Lamp Inoperative - One Lamp

Step	Action	Value(s)	Yes	No
1	Was the entire backup lights system check performed?	—	Go to *Step 2*	Go to *Backup Lights System Check*
2	1. Place the ignition in the RUN position. 2. Set the park brake. 3. Apply the brake pedal. 4. Place the transmission in the REVERSE position. 5. Probe with a test light from the backup lamp connector terminals A and G. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the inoperative backup lamp. Refer to Backup Lamp Bulb Replacement (Chevrolet) or Backup Lamp Bulb Replacement (Pontiac). Is the repair complete?	—	Go to *Step 7*	—
4	Connect a test light between the backup lamp connector terminal A and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Repair the open or poor connection in circuit 1250 between the backup lamp connector and S410. Is the repair complete?	—	Go to *Step 7*	—
6	Repair the open or poor connection in circuit 24 between the backup lamp connector and S405. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition swich to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Backup Lights System Check*	—

Backup Lamps Always On

Step	Action	Value(s)	Yes	No
1	Was the entire backup lights system check performed?	—	Go to *Step 2*	Go to *Backup Lights System Check*
2	Inspect to determine if the vehicle is equipped with manual or automatic transmission. Is the vehicle equipped with manual transmission?	—	Go to *Step 3*	Go to *Step 4*
3	Disconnect the backup lamp switch. Are the backup lamps on?	—	Go to *Step 5*	Go to *Step 6*
4	Disconnect the park/neutral positions switch. Are the backup lamps on?	—	Go to *Step 5*	Go to *Step 7*
5	Repair the short to B+ in circuit 24. Is the repair complete?	—	Go to *Step 8*	—
6	Replace the backup lamp switch. Refer to *Backup Lamp Switch Replacement* or *Backup Lamp Switch Replacement.* Is the repair complete?	—	Go to *Step 8*	—
7	Adjust or replace the park/neutral position switch. Refer to *Park/Neutral Position Switch Replacement.* Is the repair complete?	—	Go to *Step 8*	—
8	1. Turn the ignition swich to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Backup Lights System Check*	—

Courtesy Lamps Always On

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition switch to the OFF position. 2. Turn the rearview mirror courtesy reading lamps off. 3. Close the IP compartment. 4. Disconnect the body control module (BCM) connector C2 and connector C3. 5. Connect a test lamp from BCM connector C2 terminal B to BCM connector C3 terminal C7. Does the test lamp light?	—	*Go to Step 7*	*Go to Step 2*
2	Connect a test lamp from BCM connector C2 terminal B to BCM connector C3 terminal D1. Does the test lamp light?	—	*Go to Step 8*	*Go to Step 3*
3	1. Close the driver door. 2. Connect a test lamp from BCM connector C2 terminal B to BCM connector C3 terminal D11. Does the test lamp light?	—	*Go to Step 9*	*Go to Step 4*
4	1. Close the passenger door. 2. Connect a test lamp from BCM connector C2 terminal B to BCM connector C3 terminal D12. Does the test lamp light?	—	*Go to Step 10*	*Go to Step 5*
5	1. Close the rear compartment lid. 2. Connect a test lamp from BCM connector C2 terminal B to BCM connector C3 terminal D13. Does the test lamp light?	—	*Go to Step 11*	*Go to Step 6*
6	Replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—
7	1. Test circuit 175 for a short to ground. 2. If circuit 175 is OK, replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* or *Headlamp Switch Replacement (Pontiac)*	—	System OK	—
8	Repair the short to groun in circuit 156. Is the repair complete?	—	System OK	—
9	1. Test circuit 745 for a short to ground. 2. If circuit 745 is OK, replace the left front side door lock. Refer to *Lock Replacement - Door* Is the repair complete?	—	System OK	—
10	1. Test circuit 746 for a short to ground. 2. If circuit 746 is OK, replace the right front side door lock. Refer to *Lock Replacement - Door* Is the repair complete?	—	System OK	—
11	1. Test circuit 737 for a short to ground. 2. If circuit 745 is OK, replace the rear compartment lid ajar indication switch. Refer to *Lock Actuator Replacement - Liftgate* Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Test for body control module (BCM) trouble codes (DTCs). Refer to *Diagnostic Trouble Code (DTC) Displaying* Are any BCM DTCs set?	—	Go to *Diagnostic Trouble Code (DTC) List/Type*	*Go to Step 2*
2	1. Test for a poor connection at BCM connector C2 terminal E. 2. Test for a poor connection at BCM connector C3 terminal D1. 3. If the connections are OK, replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with IP Dimmer Switch

Step	Action	Value(s)	Yes	No
1	1. Disconnect the body control module (BCM) connector C3. 2. Turn the IP dimmer switch to the ON position. 3. Connect a test light from the BCM connector C3 terminal C7 to B+. Does the test lamp light?	—	Go to *Step 2*	Go to *Step 5*
2	Inspect for a poor connection at BCM connector C3 terminal C7. Does a poor connection exist?	—	Go to *Step 3*	Go to *Step 4*
3	Make the necessary repair. Is the repair complete?	—	System OK	—
4	Replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—
5	Backprobe with a test light from the IP dimmer switch connector terminal C to B+. Does the test lamp light?	—	Go to *Step 6*	Go to *Step 7*
6	Repair the open in circuit 157 between the IP dimmer switch and the BCM. Is the repair complete?	—	System OK	—
7	• Test for a poor connection at the IP dimmer switch connector terminal C. • Test for an open in circuit 650 between the IP dimmer switch and S216. Do either of these conditions exist?	—	Go to *Step 8*	Go to *Step 9*
8	Make the necessary repair. Is the repair complete?	—	System OK	—
9	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet) Headlamp Switch Replacement (Pontiac)* Is the repair complete?	—	System OK	—

Courtesy/Reading Lamps Inoperative w/ Lamp Switch

Step	Action	Value(s)	Yes	No
1	1. Disconnect the inside rearview mirror connector. 2. Connect a test lamp from inside rearview mirror connector terminal C to terminal B. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at the inside rearview mirror connector terminal C and terminal B. 2. If the connections are OK, replace the inside rearview mirror. Refer to *Rearview Mirror Replacement* Is the repair complete?	—	System OK	—
3	Repair the open in circuit 750 from the inside rearview mirror to S220 Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with Doors Open (With Door Jamb Switches)

Step	Action	Value(s)	Yes	No
Important: To prevent misdiagnosis, check for body control module (BCM) diagnostic trouble codes (DTCs). Refer to Body Control Systems.				
1	Open both of the doors. Are the courtesy lamps on?	—	Go to *Step 2*	Go to *Step 9*
2	1. Open each door, one at a time, in order to determine which is inoperative. 2. Using a fused jumper connected to ground, backprobe the body control module (BCM) connector C3 terminal D11 (driver door) or terminal D12 (passenger door). Are the courtesy lamps on?	—	Go to *Step 4*	Go to *Step 3*
3	1. Test for a poor connection at BCM connector C3 terminal D11 (driver door) or terminal D12. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—
4	Using a fused jumper connected to ground, backprobe connector C200C terminal 4 (driver door) or terminal 5 (passenger door). Are the courtesy lamps on?	—	Go to *Step 5*	Go to *Step 6*
5	1. Disconnect the inoperative door jamb switch. 2. Connect a fused jumper from the door jamb switch connector terminal to ground. Are the courtesy lamps on?	—	Go to *Step 8*	Go to *Step 7*
6	1. Test for a poor connection at connector C200. 2. If the connection is OK, repair the open in circuit 745 (driver door) or 746 (passenger door) between connector C200 and the BCM. Is the repair complete?	—	System OK	—
7	1. Test for a poor connection at connector C200. 2. If the connection is OK, repair the open in circuit 745 (driver door) or 746 (passenger door) between connector C200 and the front side door lock. Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with Doors Open (With Door Jamb Switches) (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Test for a poor connection at the door jamb switch. 2. Check the door jamb switch for a poor ground. 3. If the connection and ground are OK, replace the door jamb switch. Is the repair complete?	—	System OK	—
9	Turn on the rearview mirror courtesy/reading lamp switches. Are the courtesy/reading lamps on?	—	Go to *Step 10*	Go to *Step 11*
10	Repair the open in CKT 149 between the BCM and S241. Is the repair complete?	—	System OK	—
11	Repair the open in CKT156 between the BCM and S247. Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with Doors Open (Without Door Jamb Switches)

Step	Action	Value(s)	Yes	No
Important: To prevent misdiagnosis, check for body control module (BCM) diagnostic trouble codes (DTCs). Refer to Body Control Systems.				
1	Open both of the doors. Are the courtesy lamps on?	—	Go to *Step 2*	Go to *Step 11*
2	1. Open each door, one at a time, in order to determine which is inoperative. 2. Using a fused jumper connected to ground, backprobe the body control module (BCM) connector C3 terminal D11 (driver door) or terminal D12 (passenger door). Are the courtesy lamps on?	—	Go to *Step 4*	Go to *Step 3*
3	1. Test for a poor connection at BCM connector C3 terminal D11 (driver door) or terminal D12. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
4	Using a fused jumper connected to ground, backprobe connector C200C terminal 4 (driver door) or terminal 5 (passenger door). Are the courtesy lamps on?	—	Go to *Step 5*	Go to *Step 6*
5	1. Disconnect the inoperative front side door lock. 2. Connect a fused jumper from side door lock switch terminal A to ground. Are the courtesy lamps on?	—	Go to *Step 8*	Go to *Step 7*
6	1. Test for a poor connection at connector C200. 2. If the connection is OK, repair the open in circuit 745 (driver door) or 746 (passenger door) between connector C200 and the BCM. Is the repair complete?	—	System OK	—
7	1. Test for a poor connection at connector C200. 2. If the connection is OK, repair the open in circuit 745 (driver door) or 746 (passenger door) between connector C200 and the front side door lock. Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with Doors Open (Without Door Jamb Switches) (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Reconnect the front side door lock. 2. Open the inoperative door. 3. Using a fused jumper connected to ground, backprobe the front side door lock connector terminal D. Are the courtesy lamps on?	—	Go to *Step 9*	Go to *Step 10*
9	Repair the open in circuit 750 between the front side door lock and S220. Is the repair complete?	—	System OK	—
10	1. Test for a poor connection at the front side door lock. 2. If the connection is OK, replace the front side door lock. Is the repair complete?	—	System OK	—
11	Turn on the rearview mirror courtesy/reading lamp switches. Are the courtesy reading lamps on?	—	Go to *Step 12*	Go to *Step 13*
12	Repair the open in circuit 149 between the BCM and S241. Is the repair complete?	—	System OK	—
13	Repair the open in circuit 156 between the BCM and S247. Is the repair complete?	—	System OK	—

Courtesy Lamps Inop with Rear Compartment Lid Open

Step	Action	Value(s)	Yes	No
1	1. Disconnect the rear compartment lid ajar indication switch. 2. Connect a fused jumper between the switch connector terminal A and terminal B. Are the courtesy lamps on?	—	*Go to Step 3*	*Go to Step 2*
2	Connect a fused jumper from the switch connector terminal B to ground. Are the courtesy lamps on?	—	*Go to Step 5*	*Go to Step 4*
3	1. Check for a poor connection at the rear compartment lid ajar indication switch. 2. If the the connections are OK, replace the switch. Is the repair complete?	—	System OK	—
4	1. Check for an open in circuit 737 between the switch and the BCM. 2. Check for a poor connection at the BCM connector C3 terminal D13. 3. If the the connection and circuit are OK, replace the BCM. Refer to *BCM Programming/RPO Configuration* Is the repair complete?	—	System OK	—
5	Repair the open in circuit 1550 between the switch and S470. Is the repair complete?	—	System OK	—

Courtesy/Reading Lamps Always On

Step	Action	Value(s)	Yes	No
1	Are all of the courtesy lamps on at all times?	—	Go to *Courtesy Lamps Always On*	*Go to Step 2*
2	Replace the inside rearview mirror. Refer to *Rearview Mirror Replacement.* Is the repair complete?	—	System OK	—

Courtesy/Reading Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Use the courtesy/reading lamp switches to operate the lamps. Do the courtesy/reading lamps illuminate?	—	*Go to Step 2*	Go to *Courtesy/Reading Lamps Inoperative w/ Lamp Switch*
2	1. Disconnect the inside rearview mirror connector. 2. Connect a test lamp from inside rearview mirror connector terminal C to ground. 3. Open the driver door. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 5*
3	Connect a test lamp from inside rearview mirror connector terminal C to terminal A. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 6*
4	1. Test for a poor connection at the inside rearview mirror connector terminal C and terminal A. 2. If the connections are OK, replace the inside rearview mirror. Refer to *Rearview Mirror Replacement* Is the repair complete?	—	System OK	—
5	Repair the open or poor connection in circuit 149 between the inside rearview mirror and S241. Is the repair complete?	—	System OK	—
6	Repair the open or poor connection in circuit 156 between the inside rearview mirror and S247. Is the repair complete?	—	System OK	—

DRL Inoperative, Headlamp Switch Operates Normally

Step	Action	Value(s)	Yes	No
1	Was the entire exterior lights system check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Turn the ignition switch to the RUN position. 2. Make sure the park brake is off. 3. Apply a bright light to the DRL ambient light sensor. 4. Connect a test light between the DRL module connector C1 terminal H and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Repair a poor connection or an open in circuit 9. Is the repair complete?	—	Go to *Step 9*	—

DRL Inoperative, Headlamp Switch Operates Normally (cont'd)

Step	Action	Value(s)	Yes	No
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the ambient light sensor. 3. Turn the ignition switch to the RUN position. 4. Connect a 3A jumper acroos the ambient light sensor terminals A and B (harness side). Do the headlamps turn on?	—	Go to *Step 5*	Go to *Step 6*
5	Replace the ambient light sensor. Is the repair complete?	—	Go to *Step 9*	—
6	Check continuity in circuits 1137 and 1138. Is there continuity?	—	Go to *Step 7*	Go to *Step 8*
7	Replace the DRL module. Refer to *DRL Control Module Replacement.* Is the repair complete?	—	Go to *Step 9*	—
8	Repair the poor connection or open in circuit 1137 or 1138. Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Exterior Lamps Inoperative (One)

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Disconnect the inoperative lamp. 2. Turn the headlamp switch to the PARK position. 3. Connect a test light between the inoperative lamp connector terminal circuit 9 and the inoperative lamps ground circuit. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the inoperative lamp. Refer to *Marker Lamp Bulb Replacement - Side* or *Park/Turn Signal Lamp Bulb Replacement.* Is the repair complete?	—	Go to *Step 7*	—
4	Connect a test light between the inoperative lamp connector terminal circuit 9 and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Repair the poor connection or open in the inoperative lamps ground circuit. Is the repair complete?	—	Go to *Step 7*	—
6	Repair the poor connection or open in circuit 9. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors /components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Exterior Lamps Inoperative (All)

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Disconnect the headlamp switch. 2. Connect a test light between the headlamp switch connector terminal C and B+. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	1. Repair a short to ground in circuit 9. 2. Replace the TAIL LP fuse. Is the repair complete?	—	Go to *Step 9*	—
4	Connect a test light between the headlamp switch connector terminal H and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	1. Reconnect the headlamp switch. 2. Connect a test light between the headlamp switch terminal C and ground. 3. Turn the headlamp switch to the PARK position. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	Repair the poor connection or open in circuit 240. Is the repair complete?	—	Go to *Step 9*	—
7	Repair the poor connection or open in circuit 9. Is the repair complete?	—	Go to *Step 9*	—
8	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* or *Headlamp Switch Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors /components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Fog Lamps Always On (Domestic)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Place the fog lamp switch in the OFF position. 2. Disconnect the foglamp relay located in the underhood electrical center. Do the fog lamps turn off?	—	*Go to Step 3*	*Go to Step 4*
3	With a test light to ground, probe the foglamp relay cavity F11 in the underhood electrical center. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Repair the short to B+ in circuit 34 between the fog lamps and the foglamp relay. Is the repair complete?	—	*Go to Step 9*	—
5	1. Disconnect the connector from the fog lamp switch. 2. With a test light to ground, probe the fog lamp relay cavity F11 in the underhood electrical center. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*

Fog Lamps Always On (Domestic) (cont'd)

Step	Action	Value(s)	Yes	No
6	Replace the foglamp relay. Refer to Fog Lamp Relay Replacement Is the repair complete?	—	*Go to Step 9*	—
7	Repair the short to B+ in circuit 317 between the fog lamp switch and the fog lamp relay. Is the repair complete?	—	*Go to Step 9*	—
8	Replace the fog lamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front)* and/or *Fog Lamp Switch Replacement - Front (Front Pontiac).* Is the repair complete?	—	*Go to Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamps Always On (Europe)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	Repair the short to B+ in circuit 122. Is the repair complete?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamps Inoperative - All (Domestic)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the foglamp switch ON. 3. Turn the headlamp dimmer switch to the LOW position. 4. Use a test light to backprobe between the foglamp switch harness connector circuit 317 and ground. Did the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Use a test light in order to backprobe between the foglamp relay connector terminal F9 and ground. Did the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Use a test lamp to backprobe between the foglamp switch harness connector circuit 9 and ground. Did the test light illuminate?	—	Go to *Step 13*	Go to *Step 12*
5	Repair a poor connection or open in circuit 34. Is the repair complete?	—	*Go to step 14*	—
6	Connect a test light between the foglamp relay and terminals E11 and E9. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*
7	Connect a test light between the foglamp relay connector terminals F11 and E9. Does the test light illuminate?	—	*Go to Step 9*	*Go to Step 10*

Fog Lamps Inoperative - All (Domestic) (cont'd)

Step	Action	Value(s)	Yes	No
8	Connect a test light between the foglamp relay connector terminal E11 and ground. Does the test light illuminate?	—	*Go to Step 11*	*Go to Step 12*
9	Replace the foglamp relay. Refer to Fog Lamp Relay Replacement. Is the repair complete?	—	*Go to Step 14*	—
10	Repair a poor connection or open in circuit 317. Is the repair complete?	—	*Go to Step 14*	—
11	Repair a poor connection or open in circuit 11. Is the repair complete?	—	*Go to Step 14*	—
12	Repair a poor connection or open in circuit 9. Is the repair complete?	—	*Go to Step 14*	—
13	Replace the foglamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front)* and/or *Fog Lamp Switch Replacement - Front (Front Pontiac).* Is the repair complete?	—	*Go to Step 14*	—
14	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamps Inoperative - All (Europe)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the foglamp switch ON. 3. Turn the headlamp dimmer switch to the LOW position. 4. Use a test light to backprobe between the foglamp switch harness connector terminal E and B+. Did the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	Connect a test light at the BCM connector C3 terminal D9 and B+. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*
4	Use a test light to backprobe between the fog lamp switch harness connector terminal F and B+. Did the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
5	Replace the fog lamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front) Fog Lamp Switch Replacement - Front (Front Pontiac)* Is the repair complete?	—	*Go to Step 21*	—
6	Repair poor connection or open in circuit 650. Is the repair complete?	—	*Go to Step 21*	—
7	Connect a test light at the BCM connector C3 terminal C8 and B+. Does the test light illuminate?	—	*Go to Step 9*	*Go to Step 10*
8	Repair the poor connection or open in circuit 187. Is the repair complete?	—	*Go to Step 21*	—

Fog Lamps Inoperative - All (Europe) (cont'd)

Step	Action	Value(s)	Yes	No
9	Connect a test light at the fog lamp relay cavity A1 and B+. Does the test light illuminate?	—	*Go to Step 11*	*Go to Step 12*
10	Replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	*Go to Step 21*	—
11	Connect a test light between the fog lamp realy cavities C2 and A1. Does the test light illuminate?	—	*Go to Step 13*	*Go to Step 14*
12	Repair the poor connection or open in circuit 1977. Is the repair complete?	—	*Go to Step 21*	—
13	Connect a test light between the fog lamp relay cavaties A1 and C1. Does the test light illuminate?	—	*Go to Step 15*	*Go to Step 16*
14	Repair a poor connection or open in circuit 10. Is the repair complete?	—	*Go to Step 21*	—
15	Connect a test light between the fog lamp relay cavaties A1 and A2. Does the test light illuminate?	—	*Go to Step 17*	*Go to Step 18*
16	Repair a poor connection or open in circuit 9. Is the repair complete?	—	*Go to Step 21*	—
17	Connect a test light between one of the fog lamps connector terminal A and ground. Does the test light illuminate?	—	*Go to Step 19*	*Go to Step 20*
18	Replace the fog lamp relay. Refer to Fog Lamp Relay Replacement. Is the repair complete?	—	*Go to Step 21*	—
19	Repair a poor connection or open in circuit 1250. Is the repair complete?	—	*Go to Step 21*	—
20	Repair a poor connection or open in circuit 122. Is the repair compete?	—	*Go to Step 21*	—
21	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamps Inoperative - One

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LO position. 3. Turn the fog lamp switch to the ON position. 4. Using a test light, backprobe between terminal A of the inoperable fog lamp harness connector and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Using a test light, backprobe between the inoperable fog lamp harness connector terminal A and terminal B (Domestic) or G (Europe). Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Repair a poor connection or open in circuit 34 (Domestic) or 122 (Eurpoe). Is the repair complete?	—	Go to *Step 7*	—
5	Replace the faulty fog lamp. Refer to *Fog Lamp Bulb Replacement - Front.* Is the repair complete?	—	Go to *Step 7*	—
6	Repair a poor connection or an open in circuit 150/250 (Domestic) or 1250 (Europe) Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamp Indicator Inoperative (Domestic)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position. 3. Turn the fog lamp switch to the ON position. Is the vehicle a Pontiac?	—	Go to *Step 3*	Go to *Step 4*
3	Connect a test light between the foglamp switch connector terminals F and G. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Connect a test light between the foglamp switch connector terminal A and B+. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 9*
5	Replace the foglamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front)* or *Fog Lamp Switch Replacement - Front (Front Pontiac).* Is the repair complete?	—	*Go to Step 10*	—
6	Connect a test light between the foglamp switch connector terminal F and ground. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*
7	Repair a poor connection or open in circuit 650. Is the repair complete?	—	*Go to Step 10*	—

Fog Lamp Indicator Inoperative (Domestic) (cont'd)

Step	Action	Value(s)	Yes	No
8	Repair a poor connection or open in circuit 8. Is the repair complete?	—	*Go to Step 10*	—
9	Repair the poor connection or open in circuit 11. Is the repair complete?	—	*Go to Step 10*	—
10	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Fog Lamp Indicator Inoperative (Europe)

Step	Action	Value(s)	Yes	No
1	Was the entire Fog Lights System Check performed?	—	*Go to Step 2*	Go to *Fog Lights System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position. 3. Turn the fog lamp switch to the ON position. 4. Using a test light, backprobe the fog lamp switch harness connector terminal A and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the fog lamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front) Fog Lamp Switch Replacement - Front (Front Pontiac)* Is the repair compete?	—	*Go to Step 5*	—
4	Repair a poor connector or open in circuit 122. Is the repair compete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all components/connectors removed. Have all the repairs been made?	—	Go to *Fog Lights System Check*	—

Hazard Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Connect a test light between C216 terminal K and ground. 2. Turn the hazard switch on. Does the test light flash off and on?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 9*	—
4	Connect a test light between the hazard lamp flasher terminal B and ground. Does the test light flash off and on?	—	Go to *Step 5*	Go to *Step 6*
5	Repair a poor connection or open in CKT 27. Is the repair complete?	—	Go to *Step 9*	—
6	Connect a test light between the hazard lamp flasher terminal A and ground. Does the test light flash off and on?	—	Go to *Step 7*	Go to *Step 8*
7	Replace the hazard lamp flasher. Refer to *Hazard Lamp Flasher Replacement.* Is the repair complete?	—	Go to *Step 9*	—

Hazard Lamps Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
8	Repair a poor connection or open in CKT 140. Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Headlamps Inoperative - Low Beams (Chevrolet)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *Headlight System Check*
2	1. Ensure that the headlamp switch in in the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position. 3. Connect a test light from the headlamp switch connector terminal E to ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Repair a poor connection or open in circuit 10/12. Is the repair complete?	—	Go to *Step 5*	—
4	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* or *Headlamp Switch Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight System Check*	—

Headlamps Inoperative - Low Beams (Pontiac)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the LOW position. 3. Backprobe with a test light from the headlamp dimmer switch connector terminal B and ground. Does the test light illuminate?	—	Go to *Step 4*	Go to *Step 3*
3	Repair the poor connection or open in circuit 10. Is the repair complete?	—	Go to *Step 5*	—
4	Connect a test light between the headlamp dimmer switch connector terminal C and ground. Does the test light illuminate?	—	Go to *Step 6*	Go to *Step 7*
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—
6	Repair a poor connection or open in circuit 12. Is the repair complete?	—	Go to *Step 5*	—
7	Replace the headlamp dimmer switch. Refer to Headlamp Dimmer Switch Replacement. Is the repair complete?	—	Go to *Step 5*	—

Headlamps Inoperative - Low Beams (Scandanavia)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL system check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Ensure that the headlamps are on. 2. Turn the headlamp dimmer switch to the low beam position. 3. Connect a test light from the headlamp dimmer switch connector terminal B to ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Connect a test light at the headlamp dimmer switch connector terminal C and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Connect a test light between the headlamp switch connector terminal E and ground. Does the test light illuminate?	—	Go to *Step 8*	Go to *Step 9*
5	Repair a poor connection or open in circuit 12. Is the repair complete?	—	Go to *Step 7*	—
6	Replace the headlamp dimmer switch. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—
8	Repair a poor connection or open in circuit 10. Is the repair complete?	—	Go to *Step 7*	—
9	Connect a test light between the headlamp switch connector terminal J and ground. Does the test light illuminate?	—	Go to *Step 10*	Go to *Step 11*
10	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet) Headlamp Switch Replacement (Pontiac)* Is the repair complete?	—	Go to *Step 7*	—
11	Repair a poor connection or open in circuit 702. Is the repair complete?	—	Go to *Step 7*	—

Headlamps Inoperative - High Beams

Step	Action	Value(s)	Yes	No
1	Was the entire Headlight System Check performed?	—	Go to *Step 2*	Go to *Headlight System Check*
2	Do the low beam headlights operate properly?	—	Go to *Step 3*	Go to *Headlamps Inoperative - Low Beams (Chevrolet) Headlamps Inoperative - Low Beams (Pontiac) Headlamps Inoperative - Low Beams (Scandanavia)*
3	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the HIGH position. Does the high beam indicator light?	—	Go to *Step 4*	Go to *Step 5*

Headlamps Inoperative - High Beams (cont'd)

Step	Action	Value(s)	Yes	No
4	Repair a poor connection or an open in CKT 11. Is the repair complete?	—	Go to *Step 6*	—
5	Replace the headlamp dimmer switch. Is the repair complete?	—	Go to *Step 6*	—
6	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight System Check*	—

Headlamps Inoperative - One Lamp

Step	Action	Value(s)	Yes	No
1	Was the entire Headlight System Check performed?	—	Go to *Step 2*	Go to *Headlight System Check*
2	1. Check the inoperative headlamp bulb for a damaged or open filament. 2. Check the inoperative Headlamp connector to verify that the seal is not missing or damaged. Is the headlamp bulb and connectors OK?	—	Go to *Step 3*	Go to *Step 4*
3	1. Disconnect the inoperative headlamp. 2. Using a test light, backprobe between the inoperative headlamp harness connector terminal A and B or C. 3. Turn the headlamp switch to the HEAD position. 4. Turn the headlamp dimmer switch to the LOW position. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Replace the damaged component. Is the repair complete?	—	Go to *Step 9*	—
5	Replace the inoperative headlamp. Refer to *Headlamp Bulb Replacement* Is the repair complete?	—	Go to *Step 9*	—
6	Using a test light, backprobe between the inoperative headlamp connector terminal A circuit 11 (high beam) or circuit 12 (low beam) and ground. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
7	Repair a poor connection or an open in circuit 150 (LH) or 250 (RH). Is the repair complete?	—	Go to *Step 9*	—
8	Repair a poor connection or an open in circuit 11 (high beam) or circuit 10 (low beam) or circuit 12 (low beam). Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight System Check*	—

Headlamps Inoperative in Low Light Conditions

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Disconnect the DRL module connector C1. 2. Connect a test light between terminal D of the DRL module connector and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Connect a fused jumper between terminal F and terminal D of the DRL module connector C1. Do the headlamps turn on?	—	Go to *Step 5*	Go to *Step 6*
4	Inspect for an open in circuit 1372 between the headlamp switch and the DRL module. Does an open exist?	—	Go to *Step 7*	Go to *Step 8*
5	Replace the DRL module. Refer to *DRL Control Module Replacement.* Is the repair complete?	—	Go to *Step 9*	—
6	Repair the open in circuit 10 between the DRL module and S227. Is the repair complete?	—	Go to *Step 9*	—
7	Repair the poor connection or open in circuit 1372. Is the repair complete?	—	Go to *Step 9*	—
8	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* and/or *Headlamp Switch Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—

Headlamps On in Daylight Conditions (Domestic)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Turn the ignition OFF. 2. Turn the headlamp switch OFF. 3. Disconnect the headlamp switch. Do the headlamps turn off?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* and/or *Headlamp Switch Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 13*	—
4	Disconnect the ambient light sensor. Do the headlamps turn off?	—	Go to *Step 5*	Go to *Step 6*
5	Replace the ambient light sensor. Refer to *DRL Ambient Light Sensor Replacement.* Is the repair complete?	—	Go to *Step 13*	—
6	Disconnect the the DRL module. Do the headlamps turn off?	—	Go to *Step 7*	Go to *Step 8*
7	Replace the DRL module. Refer to *DRL Control Module Replacement.* Is the repair complete?	—	Go to *Step 13*	—
8	Disconnect the headlamp dimmer switch. Do the headlamps turn off?	—	Go to *Step 9*	Go to *Step 10*

Headlamps On in Daylight Conditions (Domestic) (cont'd)

Step	Action	Value(s)	Yes	No
9	Check for a short to B+ in circuit 10. Is a short to B+ present?	—	Go to *Step 11*	Go to *Step 12*
10	Repair a short to B+ in circuit 12. Is the repair complete?	—	Go to *Step 13*	—
11	Repair a short to B+ in circuit 10. Is the repair complete?	—	Go to *Step 13*	—
12	Replace the headlamp dimmer switch. Is the repair complete?	—	Go to *Step 13*	—
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—

Headlamps Do Not Switch Intensity (Domestic or Canadian)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	Is the DRL always in the daylight mode (the low beam headlights on at a reduced intensity)?	—	Go to *Step 3*	Go to *Step 4*
3	Disconnect the DRL ambient light sensor. Does the DRL change modes?	—	Go to *Step 5*	Go to *Step 6*
4	1. Disconnect the DRL ambient light sensor. 2. Attach a 3A fused jumper between the ambient light sensor harness connector terminal A and terminal B. Does the DRL change modes?	—	Go to *Step 5*	Go to *Step 9*
5	Replace the DRL ambient light sensor. Refer to *DRL Ambient Light Sensor Replacement.* Is the repair complete?	—	Go to *Step 13*	—
6	Inspect for a short to ground in CKT 1137. Is there a short to ground in CKT 1137?	—	Go to *Step 7*	Go to *Step 8*
7	Repair a short to ground in CKT 1137. Is the repair complete?	—	Go to *Step 13*	—
8	Replace the DRL module. Refer to *DRL Control Module Replacement.* Is the repair complete?	—	Go to *Step 13*	—
9	Inspect for the following conditions in CKT 1138: • A poor connection • An open Is there a poor connection or an open in CKT 1138?	—	Go to *Step 10*	Go to *Step 11*
10	Repair a poor connection or open in circuit 1138. Is the repair complete?	—	Go to *Step 13*	—
11	Inspect for the following conditions in CKT 1137: • A poor connection • An open Is there a poor connection or an open in CKT 1137?	—	Go to *Step 12*	Go to *Step 8*
12	Repair a poor connection or open in circuit 1137. Is the repair complete?	—	Go to *Step 13*	—
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—

Headlamps, DRL On With Park Brake Applied

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Turn the ignition OFF. 2. Apply the park brake. 3. Turn the ignition to RUN. Is the park indicator light in the instrument cluster on?	—	Go to *Step 3*	Go to *Instrument Cluster System Check*
3	Replace the DRL module. Refer to *DRL Control Module Replacement* Is the repair complete?	—	Go to *DRL System Check*	—

Headlamps, DRL Off, Ign RUN (Park Brake Applied) (Scandanavia: Headlamp Switch Off)

Step	Action	Value(s)	Yes	No
1	Was the entire DRL System Check performed?	—	Go to *Step 2*	Go to *DRL System Check*
2	1. Turn the headlamp switch to the OFF position. 2. Turn the ignition switch to the RUN position. 3. Connect a test light between the Daytime Running Lights (DRL) relay terminal 87 and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Repair the poor connection or open in circuit 12. Is the repair complete?	—	Go to *Step 11*	—
4	Connect a test light between the DRL relay terminals 85 and 86. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Connect a test light at the DRL relay terminals 30 and 86. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	Connect a test light at the DRL relay terminals 85 and ground. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 10*
7	Replace the DRL relay. Is the repair complete?	—	Go to *Step 11*	—
8	Repair a poor connection or open in circuit 1372. Is the repair complete?	—	Go to *Step 11*	—
9	Repair a poor connection or open in circuit 150. Is the repair complete?	—	Go to *Step 11*	—
10	Repair a poor connection or open in circuit 141. Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *DRL System Check*	—

Headlamp Doors Inoperative - One Door

Step	Action	Value(s)	Yes	No
1	Was the entire Headlight Door System Check performed?	—	*Go to Step 2*	Go to *Headlight Doors System Check*
2	1. Disconnect the headlamp opening door actuator control module connector C1. 2. Connect a test light between the headlamp connector terminal E or B and ground. 3. Turn the headlamp switch to the HEAD position. Does the test light illuminate?	9 - 14 V	*Go to Step 3*	*Go to Step 4*
3	1. Disconnect the headlamp opening door actuator control module connector C2. 2. Disconnect C160 (LH) or C165 (RH). 3. Check for a short to B+ in circuits 576 and 577 (LH) or 578 and 579 (RH). Is a short to B+ present?	—	*Go to Step 5*	*Go to Step 6*
4	Check for a short to ground in circuits 576 and 577 (LH) or 578 and 579 (RH). Is a short to ground present?	—	*Go to Step 7*	*Go to Step 8*
5	Repair a short to B+. Is the repair complete?	—	*Go to Step 13*	—
6	Check for continuity in circuits 576 and 577 (LH) or 578 and 579 (RH). Is there continuity?	—	*Go to Step 9*	*Go to Step 10*
7	Repair the short to ground. Is the repair complete?	—	*Go to Step 13*	—
8	Repair the open in circuit 840 or 740. Is the repair complete?	—	*Go to Step 13*	—
9	1. Reconnect the headlamp door actuator control module connectors C1 and C2. 2. Place the headlamp switch in the HEAD position. 3. Using a test light probe between the inoperative motor connector terminals A and B. Does the test light illuminate?	—	*Go to Step 11*	*Go to Step 12*
10	Repair the poor conection or open. Is the repair complete?	—	*Go to Step 13*	—
11	Replace the inoperative headlamp door motor. Is the repair complete?	—	*Go to Step 13*	—
12	Replace the headlamp opening door actuator control module. Refer to *Headlamp Door Module Replacement* Is the repair complete?	—	*Go to Step 13*	—
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Headlight Doors System Check*	—

Headlamp Doors Do Not Close (Or Open)

Step	Action	Value(s)	Yes	No
1	Was the entire Headlight Door System Check performed?	—	*Go to Step 2*	Go to *Headlight Doors System Check*
2	1. Disconnect the headlight opening door actuator control module connectors C1 and C2. 2. Turn the headlamp switch to the HEAD position. 3. Using a test light probe between the headlamp opening door actuator control module connector C1 terminals A and D. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	Using a test light probe between the headlamp opening door actuator control module connector C1 terminals C and D. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Using a test light probe between the headlamp opening door actuator control module connector C1 terminal A and ground. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*
5	Replace the headlamp opening door actuator control module. Refer to *Headlamp Door Module Replacement.* Is the replair complete?	—	*Go to Step 9*	—
6	Repair the poor connection or open in circuit 9. Is the repair complete?	—	*Go to Step 9*	—
7	Repair the poor connection or open in circuit 150. Is the repair complete?	—	*Go to Step 9*	—
8	Repair the poor connection or open in circuit 10. Is the repair complete?	—	*Go to Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Headlight Doors System Check*	—

Headlight Leveling Inoperative - One Actuator

Step	Action	Value(s)	Yes	No
1	Was the entire Headlamp Leveling System Check performed?	—	Go to *Step 2*	Go to *Headlight Leveling System Check*
2	1. Disconnect the inoperative headlamp leveling actuator connector at the back of the motor. 2. Place the ignition switch in the RUN position. 3. Turn the headlamp switch to the HEAD position. 4. Connect a test light between cavity 3 of the headlamp leveling actuator connector circuit 10 and ground. Does the test light illuminate?	—	Go to *Step 4*	Go to *Step 3*
3	Locate and repair the open in circuit 10. Is the repair complete?	—	Go to *Step 9*	—
4	Connect a test light between cavity 1 of the headlamp leveling acutator connector of circuit 150 (LH) or 250 (RH) and cavity 3 of circuit 10. Does the test light illuminate?	—	Go to *Step 6*	Go to *Step 5*
5	Locate and repair the open in circuit 150 (LH) or 250 (RH). Is the repair complete?	—	Go to *Step 9*	—

Headlight Leveling Inoperative - One Actuator (cont'd)

Step	Action	Value(s)	Yes	No
6	1. Place the headlamp leveling switch in the 0 position. 2. Connect a voltmeter between the following components: • The cavity 2 of the headlamp leveling actuator connector • Ground Does the voltmeter read less than the specified value?	4.5 Volts	Go to *Step 8*	Go to *Step 7*
7	Replace the headlamp leveling actuator. Refer to Headlamp Leveling Actuator Replacement. Is the repair complete?	—	Go to *Step 9*	—
8	Locate and repair the open in circuit 869. Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight Leveling System Check*	—

Headlight Leveling Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Headlamp Leveling System Check performed?	—	Go to *Step 2*	Go to *Headlight Leveling System Check*
2	1. Disconnect the connector at the headlamp leveling switch. 2. Place the ignition switch in the RUN position. 3. Turn the headlamp switch to the HEAD position. 4. Connect a test light between cavity 7 of the headlamp leveling switch connector on circuit 10 and ground. Does the test light illuminate?	—	Go to *Step 4*	Go to *Step 3*
3	Repair the poor connection or open in circuit 10. Is the repair complete?	—	Go to *Step 11*	—
4	1. Disconnect the connector at the headlamp leveling actuator. 2. Connect a test light between cavity 3 of the headlamp leveling actuator connector on circuit 10 and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Connect a test light between the headlamp leveling switch connector cavity 6 for circuit 650 and connector cavity 7 for circuit 10. Does the test light illuminate?	—	Go to *Step 8*	Go to *Step 7*
6	Repair the open in circuit 10 between S202 and S227. Is the repair complete?	—	Go to *Step 11*	—
7	Repair the poor connection or open in circuit 650. Is the repair complete?	—	Go to *Step 11*	—
8	1. Reconnect the headlamp leveling switch. 2. Connect a digital multimeter (DMM) to circuit 869 between cavity 3 of the headlamp leveling switch connector and ground. Is voltage present?	—	Go to *Step 9*	Go to *Step 10*

Headlight Leveling Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
9	Repair the open in circuit 869 between the headlamp leveling switch and S172. Is the repair complete?	—	Go to *Step 11*	—
10	Replace the headlamp leveling switch. Refer to Headlamp Leveling Switch Replacement. Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight Leveling System Check*	—

Headlight Leveling Inop - Actuator Switch Illum

Step	Action	Value(s)	Yes	No
1	Was the entire Headlamp Leveling System Check performed?	—	Go to *Step 2*	Go to *Headlight Leveling System Check*
2	1. Place the headlamp switch in the HEAD position. 2. Visually verify that the headlamps are operative. 3. Adjust the IP dimmer switch to a mid-range position. 4. Disconnect the connector at the headlamp leveling switch. 5. Connect a test light between cavities 7 and 6 of the headlamp leveling switch connector. Did the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the headlamp leveling switch. Refer to Headlamp Leveling Switch Replacement. Is the repair complete?	—	Go to *Step 5*	—
4	Repair the poor connection or open in circuit 650. Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight Leveling System Check*	—

High Beam Indicator Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Headlight System Check performed?	—	Go to *Step 2*	Go to *Headlight System Check*
2	Are the high beam headlights operating properly?	—	Go to *Step 3*	Go to *Headlamps Inoperative - High Beams*
3	1. Turn the headlamp switch to the HEAD position. 2. Turn the headlamp dimmer switch to the HIGH position. 3. Using a test light, backprobe between the instrument cluster harness connector terminals A11 and B5. Does the test light illuminate?	—	Go to *Step 4*	Go to *Step 5*
4	Service the instrument cluster. Refer to *Instrument Cluster System Check*. Is the repair complete?	—	Go to *Step 8*	—

High Beam Indicator Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
5	Using a test light, backprobe between the instrument cluster harness connector terminal A11 and ground. Does the test light illuminate?	—	Go to *Step 6*	Go to *Step 7*
6	Repair a poor connection or an open in circuit 650. Is the repair complete?	—	Go to *Step 8*	—
7	Repair a poor connection or an open in circuit 11. Is the repair complete?	—	Go to *Step 8*	—
8	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Headlight System Check*	—

IP Compartment Lamp Inoperative

Step	Action	Value(s)	Yes	No
1	1. Disconnect the IP compartment lamp. 2. Connect a fused jumper from the IP compartment lamp switch terminal A to terminal B. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at the IP compartment lamp. 2. If the connections are OK, replace the IP compartment lamp. Refer to *IP Compartment Lamp Replacement.* Is the repair complete?	—	System OK	—
3	Connect a test lamp from IP compartment lamp switch connector terminal A to ground. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 4*
4	1. Test for a poor connection at the IP compartment lamp connector terminal A. 2. If the connection is OK, repair the open in circuit 149 from the IP compartment lamp connector to S149. Is the repair complete?	—	System OK	—
5	1. Test for a poor connection at the IP compartment lamp connector terminal B. 2. If the connection is OK, repair the open in circuit 650 between the IP compartment lamp and S217. Is the repair complete?	—	System OK	—

Instrument Panel Lamps Do Not Dim

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition switch to the RUN position. 2. Disconnect the IP dimmer switch. 3. Connect a test lamp from the IP dimmer switch connector terminal D to ground. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Replace the headlamp switch. Refer to *Headlamp Switch Replacement (Chevrolet)* or *Headlamp Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
3	Repair the short to B+ in circuit 44 or circuit 8. Is the repair complete?	—	System OK	—

Instrument Panel Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	1. Turn the headlamp switch to park. 2. Set the IP dimmer switch to maximum intensity. 3. Using a test lamp connected to ground, backprobe the IP dimmer switch connector terminal D. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 2*
2	Using a test lamp connected to ground, backprobe the IP dimmer switch connector terminal A. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 3*
3	Repair the open in circuit 9 between the IP dimmer switch and S226. Is the repair complete?	—	System OK	—
4	1. Test for a poor connection at the IP dimmer switch. 2. If the connections are OK, replace the headlamp switch. Is the repair complete?	—	System OK	—
5	Using a test lamp connected to ground, connect a test lamp from the IP fuse block terminal E5 to ground. Does the test lamp light?	—	*Go to Step 6*	*Go to Step 7*
6	Repair the open in circuit 8 between the IP fuse block and S224. Is the repair complete?	—	System OK	—
7	Repair the open in circuit 44 between the IP fuse block and the IP dimmer switch. Is the repair complete?	—	System OK	—

Instrument Panel Lamps Inoperative - One

Step	Action	Value(s)	Yes	No
1	1. Turn the headlamp switch to the PARK position. 2. Turn the instrument panel lamp dimmer switch to maximum brightness. 3. Using a test lamp connected to ground, backprobe circuit 8 at the inoperative lamp connector. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Repair the open in circuit 8 between the inoperative component lamp and S224. Is the repair complete?	—	System OK	—
3	Backprobe with a test lamp between the inoperative component connector circuit 8 and the component lamp ground circuit. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 4*
4	Repair the open or poor connection the ground circuit to the inoperative component. Is the repair complete?	—	System OK	—
5	1. Test for a poor connection at the inoperative component. 2. If the connections are OK, replace the inoperative component Is the repair complete?	—	System OK	—

Stop Lamps Always On

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	Disconnect the stoplamp switch. Do the stop lamps turn off?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the stoplamp switch. Refer to *Stoplamp Switch Replacement.* Is the repair complete?	—	Go to *Step 7*	—
4	1. Disconnect the turn/hazard switch assembly. 2. Connect a test light between C216 terminal P and ground. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
5	Repair a short to B+ in circuit 20. Is the repair complete?	—	Go to *Step 7*	—
6	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Stop Lamps Inoperative - All

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	Do the hazard lamps operate properly?	—	Go to *Step 3*	Go to *Hazard Lamps Inoperative*
3	Using a test light, backprobe between the stop lamp switch harness connector C1 between terminal A and ground. Does the test light illuminate?	—	Go to *Step 4*	Go to *Step 5*
4	1. Using a test light, backprobe the stop lamp switch harness connector C1 terminal B and ground. 2. Depress and hold the brake pedal. Does the test light illuminate?	—	Go to *Step 6*	Go to *Step 7*
5	Repair a poor connection or open in circuit 140. Is the repair complete?	—	Go to *Step 8*	—
6	Repair a poor connection or an open in circuit 20. Is the repair complete?	—	Go to *Step 8*	—
7	Adjust/Replace the stop lamp switch. Refer to *Stoplamp Switch Adjustment* Is the repair complete?	—	Go to *Step 8*	—
8	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Stop Lamps Inoperative - CHMSL Operates

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Using a test light, backprobe between C216 terminal P and ground. 2. Depress and hold the brake pedal. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 5*	—
4	Repair a poor connection or open in circuit 20. Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Stop Lamps Inoperative - Center High Mounted

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Using a test light, backprobe between C420 terminal A and ground. 2. Depress and hold the brake pedal. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Using a test light, backprobe between the C420 terminal A and terminal B. Is the repair complete?	—	Go to *Step 5*	Go to *Step 6*
4	Repair a poor connection or an open in circuit 20. Is the repair complete?	—	Go to *Step 7*	—
5	Replace the CHMSL. Refer to *High Mounted Stoplamp Replacement (Chevrolet)* or *High Mounted Stoplamp Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 7*	—
6	Repair a poor connection in circuit 1150. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Turn Signal Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Turn the ignition switch to the RUN. 2. Using a test light, backprobe between C216 terminal L and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 9*	—
4	Connect a test light between the turn signal lamp flasher terminal B and ground. Does the test light flash off and on?	—	Go to *Step 5*	Go to *Step 6*
5	Repair a poor or an open connection in circuit 16. Is the repair complete?	—	Go to *Step 9*	—
6	Connect a test light between the turn signal lamp flasher terminal A and ground. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
7	Replace the turn signal lamp flasher. Refer to *Turn Signal Flasher Replacement* or *Turn Signal Flasher Replacement.* Is the repair complete?	—	Go to *Step 9*	—
8	Repair a poor or an open connection in circuit 141. Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Turn Signal and Hazard Lamps Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	Check for a poor connection or open at C216. Is C216 OK?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 5*	—
4	Repair a poor connection or open at C216. Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Turn Signal Lamps Always On - One Side

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Turn the ignition switch to the OFF position. 2. Place the turn signal in the OFF position. 3. Disconnect the turn signal switch C216. Are the turn signal lamps on?	—	Go to *Step 3*	Go to *Step 4*
3	• The LH turn signal is on at all times: Repair a short to B+ on CKT 18. • The RH turn signal is on at all times: Repair a short to B+ on CKT 19. Is the repair complete?	—	Go to *Step 5*	—
4	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle.* Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all of the connectors and components that were previously removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Turn Signal Indicators Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Connect a test light between the instrument cluster connector terminal B14 and ground. 2. Turn the ignition switch to the RUN position. 3. Place the turn signal switch to the TURN LEFT position. Does the test light flash on and off?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Step 5*	—
4	Replace the turn/hazard switch assembly. Refer to *Hazard Warning Switch Replacement - On Vehicle* Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

Turn Signal Indicators Inoperative - Left (or Right)

Step	Action	Value(s)	Yes	No
1	Was the entire Exterior Lights System Check performed?	—	Go to *Step 2*	Go to *Exterior Lights System Check*
2	1. Turn the ignition switch to the RUN position. 2. Connect a test light between the instrument cluster terminal B14 (left turn) or B5 (right turn) and ground. 3. Place the turn signal switch to the TURN LEFT or TURN RIGHT position depending on which is inoperative. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Step 5*	—
4	Repair the poor connection or open in circuit 1414 (left turn) or 1415 (right turn). Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Exterior Lights System Check*	—

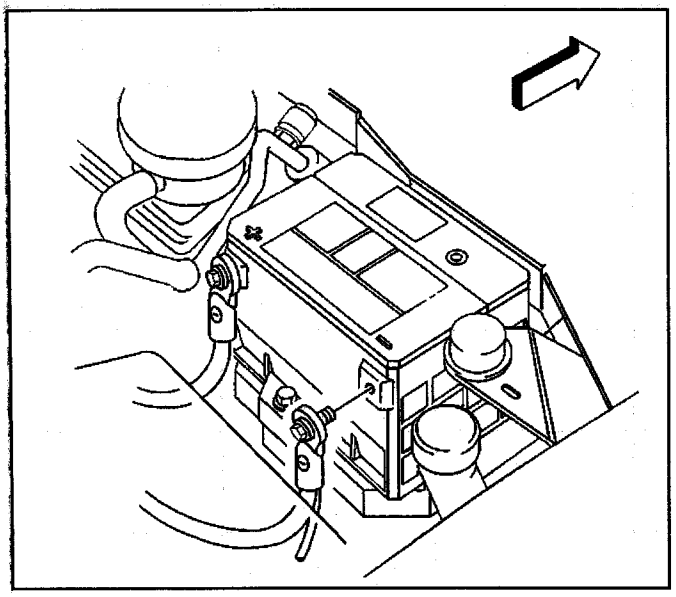
Repair Instructions

Headlamp Replacement (Chevrolet)

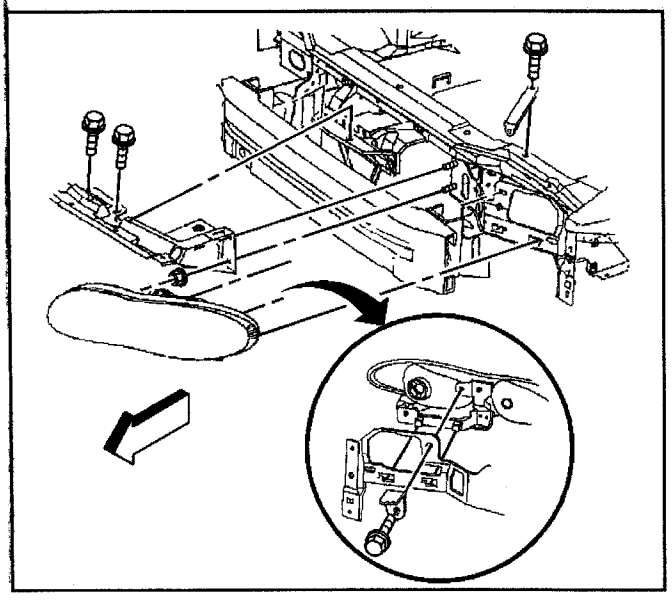
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure.*



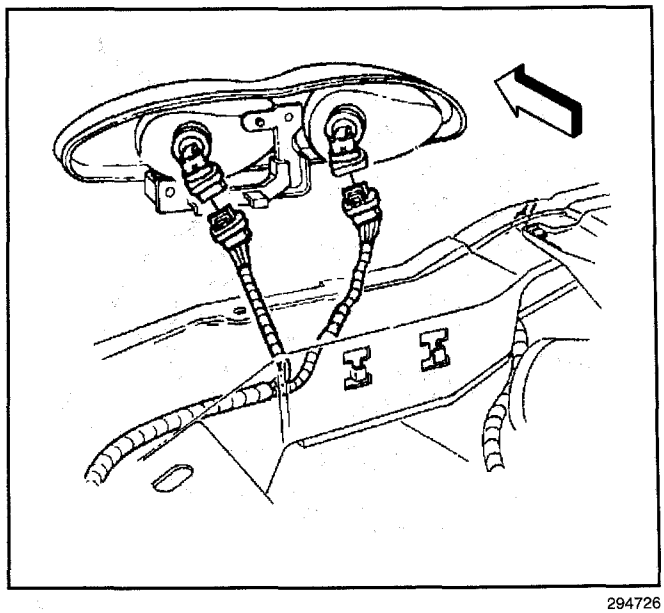
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2. Remove the headlamp housing bracket bolt attaching the headlamp to the headlamp bracket.
3. Slide the headlamp outboard to disengage the headlamp tabs from the headlamp brackets slots.

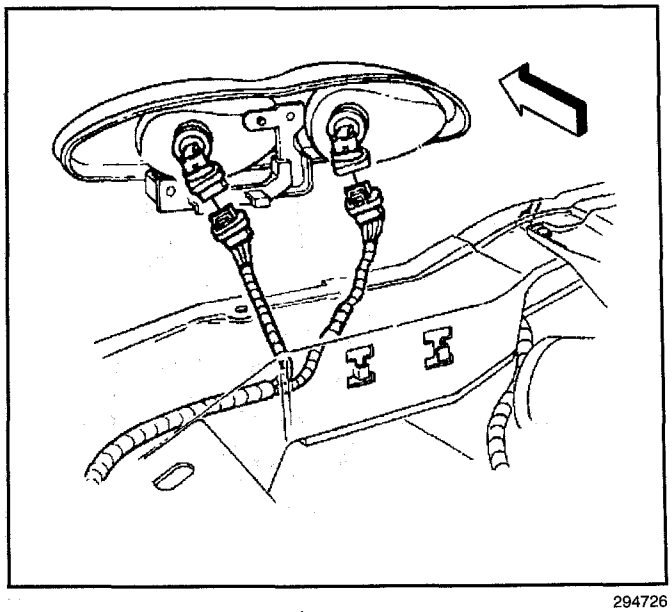
4. Pull the headlamp forward to access electrical connectors.
5. Disconnect the electrical connectors from the headlamp.
6. Remove the headlamp.



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Installation Procedure

1. Perform the following to install the headlamp:
   1.1. Connect the electrical connector to the headlamp.
   1.2. Engage tabs on back of headlamp into the slots in the headlamp bracket.



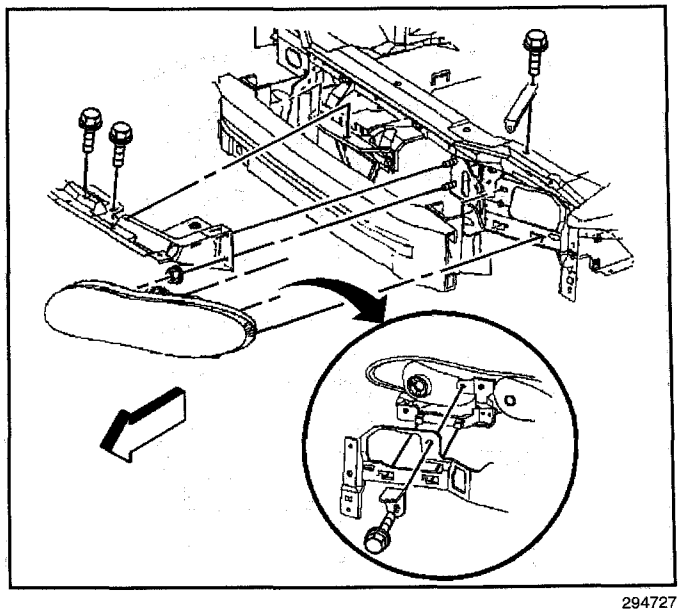
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Notice: Refer to *Fastener Notice* in Cautions and Notices.

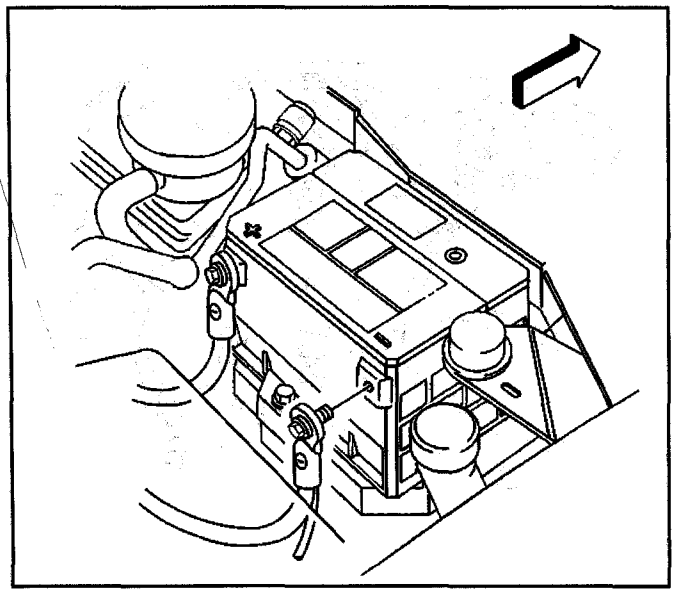
2. Install the headlamp housing bracket bolt attaching the headlamp to the headlamp bracket.

   Tighten

   Tighten the headlamp housing bracket bolt to 7 N·m (62 lb in).

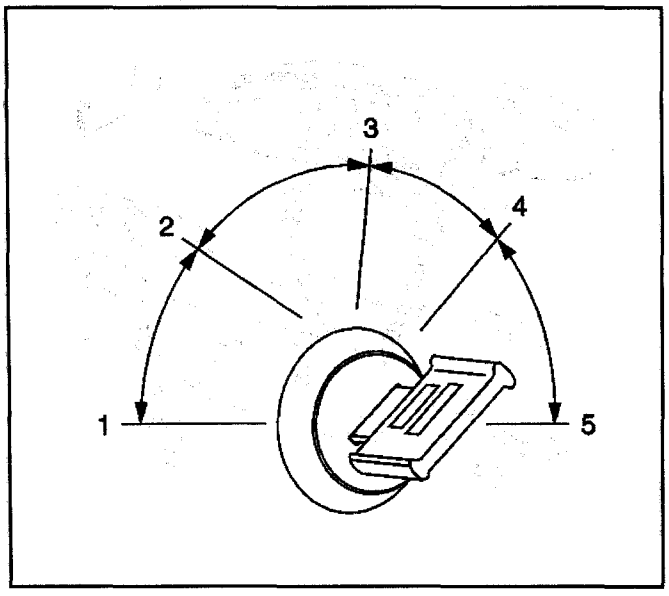


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3. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure*



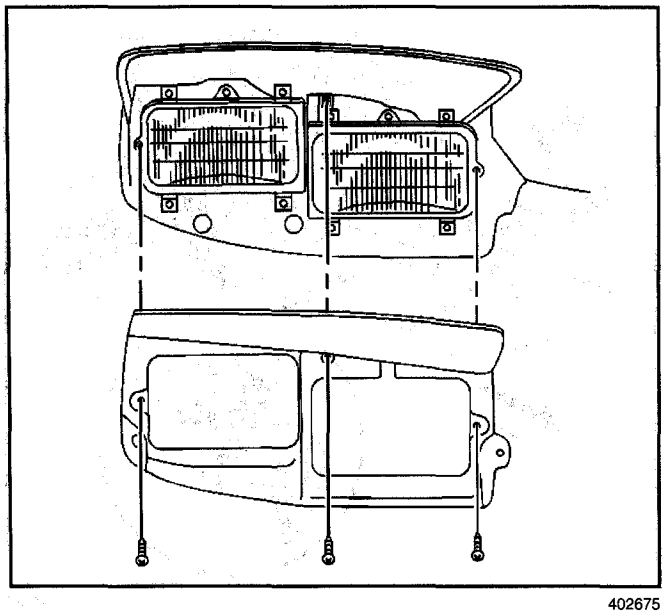
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Headlamp Replacement (Pontiac)

Removal Procedure

1. Turn the ignition key to the RUN position (4).
2. Turn the headlamps ON, then turn the switch back to park lamps.

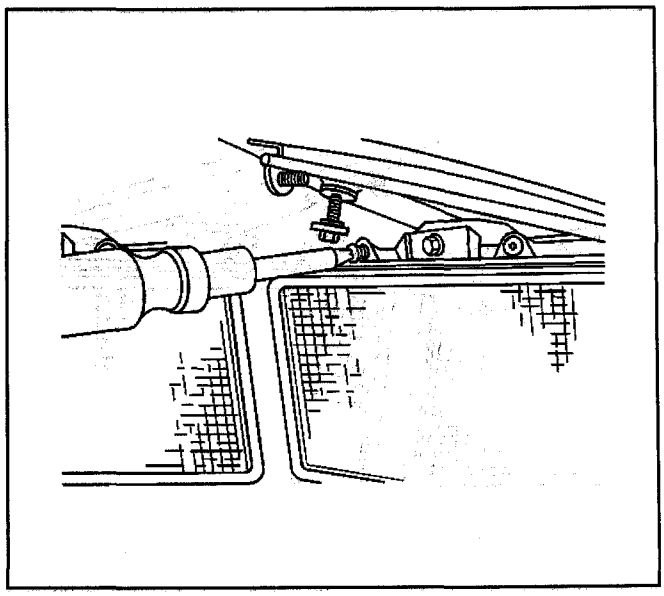
   This will leave the headlamps in the up position with the lamps off.
3. Turn the ignition key to the OFF position (1).



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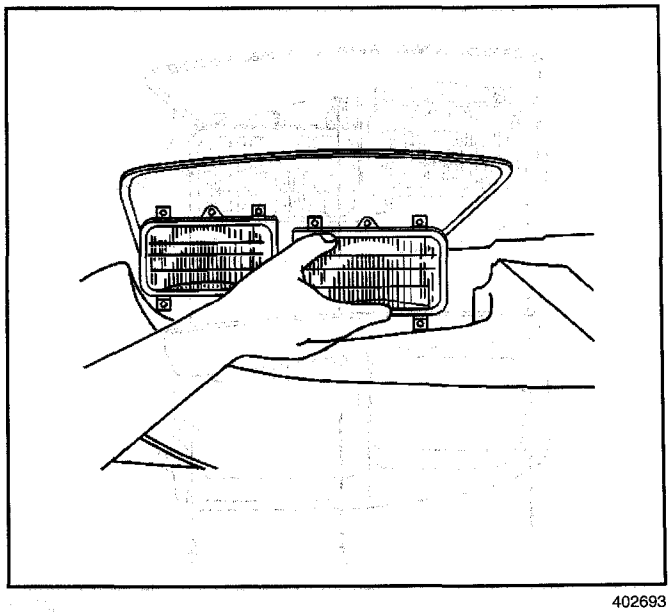
4. Open the hood.
5. Remove the headlamp bezel screws.
6. Remove the headlamp bezel.

7. Remove the headlamp screws that attach the mounting ring to the headlamp housing.
8. Remove the headlamp mounting ring.
9. Disconnect the electrical connector from the headlamp.



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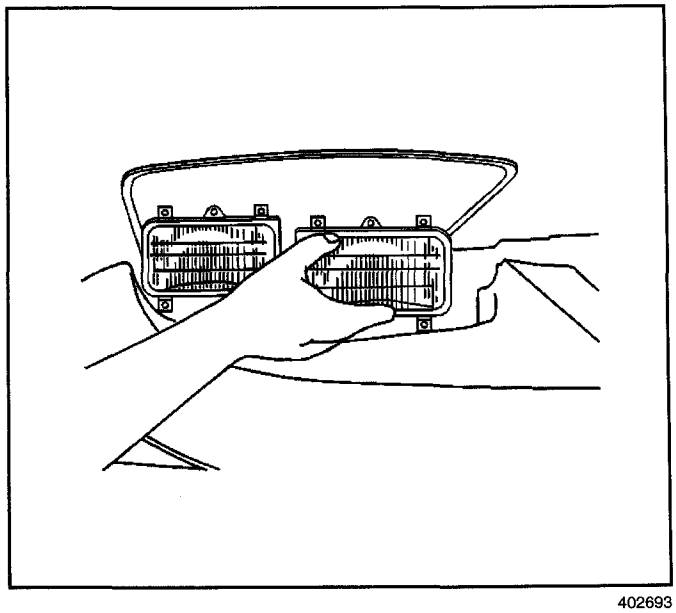
10. Remove the headlamp.



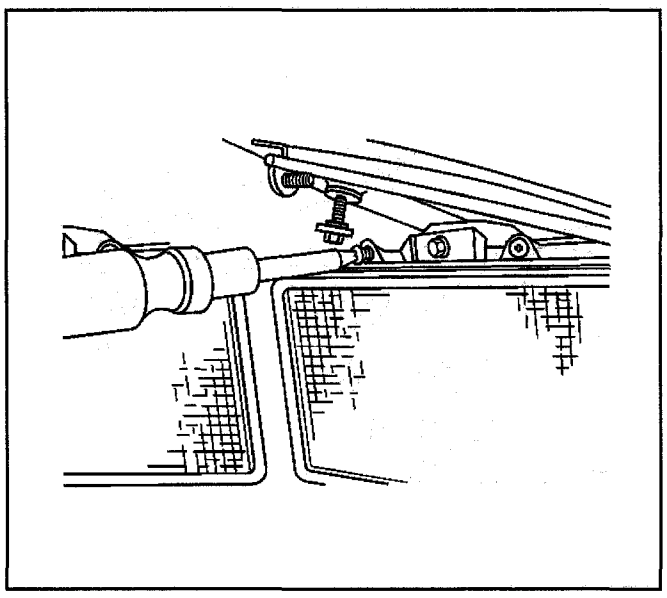
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Installation Procedure

1. Connect the electrical connector to the headlamp.
2. Install the headlamp.

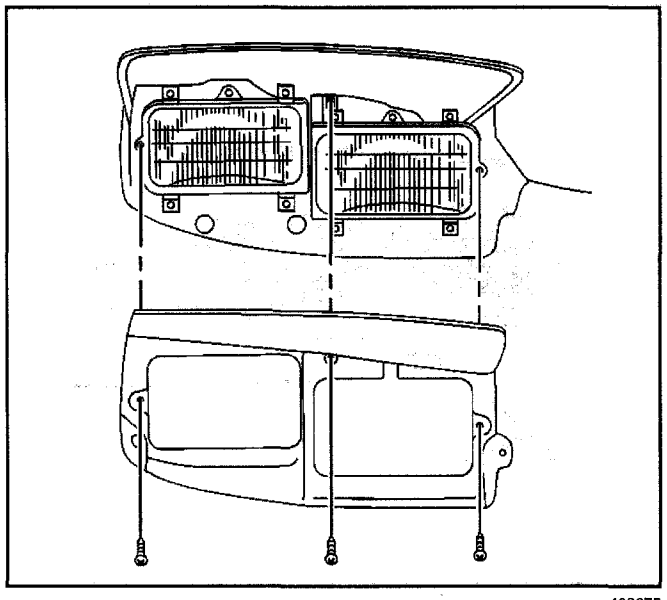


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3. Install the headlamp mounting ring.
4. Install the headlamp screws that attach the mounting ring to the headlamp housing.



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5. Install the headlamp bezel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

6. Install the headlamp bezel screws.

   Tighten

   Tighten the headlamp bezel screws to 1.7 N·m (15 lb in).

7. Close the hood.
8. Turn the headlamp switch off.

Headlamp Bulb Replacement

Removal Procedure

1. Raise the hood.
2. Twist the harness socket from the rear of the headlamp.
3. Remove the headlamp bulb from the harness socket.

Installation Procedure

Caution: Halogen bulbs contain gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

- ***Turn off the lamp switch and allow the bulb to cool before changing the bulb. Leave the lamp switch off until the bulb change is complete.***
- ***Always wear eye protection when changing a halogen bulb.***
- ***Handle the bulb only by its base. Avoid touching the glass.***
- ***Do not drop or scratch the bulb.***
- ***Keep dirt and moisture off the bulb.***
- ***Place the used bulb in the new bulb's carton and dispose of it properly.***
- ***Keep halogen bulbs out of the reach of children***

Notice: Avoid touching the bulb or letting the bulb come in contact with anything damp. Oil from your skin or moisture on the bulb can cause the bulb to explode when the bulb is turned on. If either comes in contact with the bulb, clean the bulb with alcohol or a suitable degreaser and wipe the bulb dry.

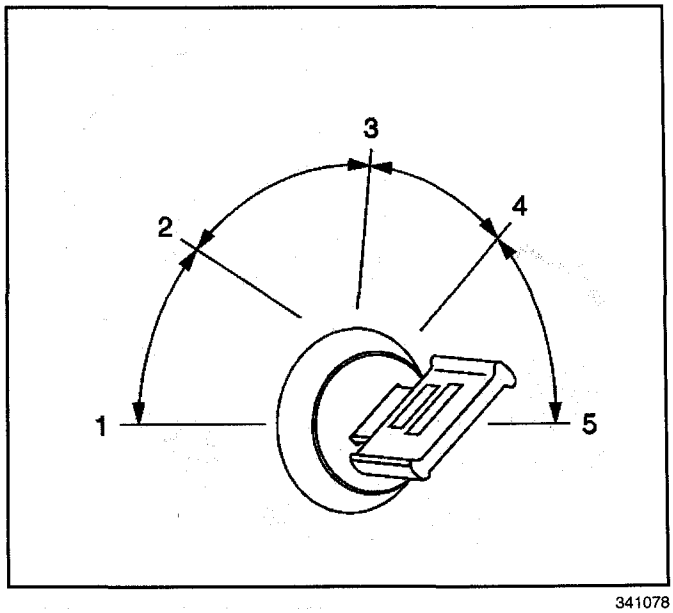
1. Install the headlamp bulb to the harness socket.
2. Install the harness socket to the rear of the headlamp.
3. Close the hood.

Headlamp Opening Door Replacement

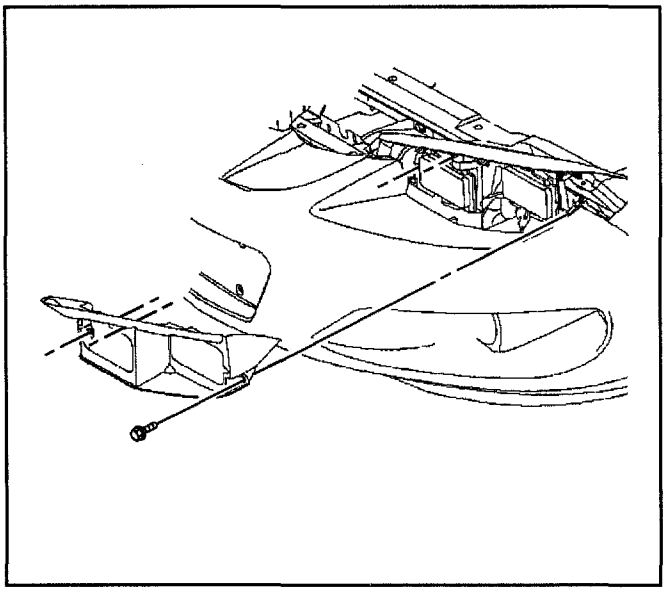
Removal Procedure

1. Turn the ignition key to the RUN position (4).
2. Turn the headlamps ON, then turn the switch back to park lamps.

   This will leave the headlamps in the up position with the lamps off.
3. Turn the ignition key to the OFF position (1).

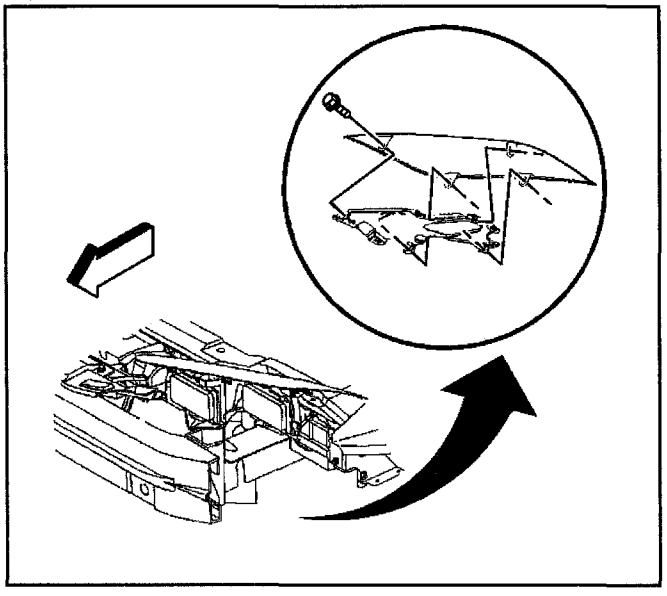


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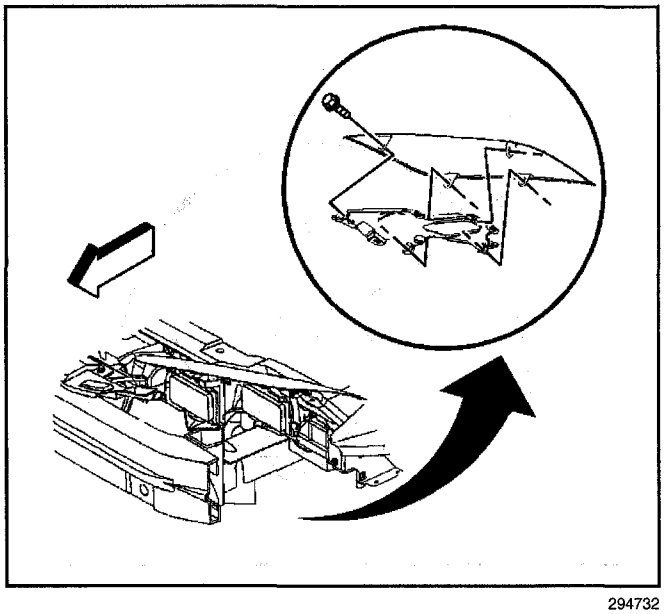
294737

4. Open the hood.
5. Remove the two rear headlamp door bolts.
6. Remove the headlamp bezel screws.
7. Remove the headlamp bezel.



294732

8. Remove the two front headlamp door bolts.
9. Turn the headlamp switch off to lower the headlamps.
10. Remove the headlamp door.



294732

Installation Procedure

1. Install the headlamp door.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install rear inboard headlamp door bolt first.

   Tighten

   Tighten the headlamp door bolt to 1.7 N·m (15 lb in).

3. Install the rear outboard headlamp door bolt next.

   Tighten

   Tighten the headlamp door bolt to 2.0 N·m (18 lb in).

4. Turn headlamp switch on, then turn switch back to park lamp.

   This will leave headlamps in the up position with lamps off.

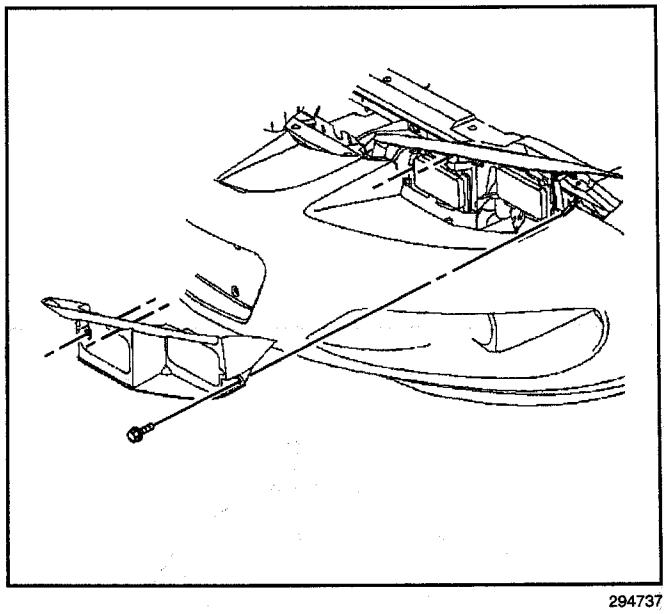
5. Install the front two headlamp door bolts.

   Tighten

   Tighten the headlamp door bolt to 1.7 N·m (15 lb in).
6. Install the headlamp bezel.
7. Install the headlamp bezel screws.

   Tighten

   Tighten the headlamp bezel screws to the 1.7 N·m (15 lb in).
8. Close the hood.
9. Turn the headlamp switch off to lower the headlamps.



294737

Headlamp Opening Door Adjustment

Important: A new headlamp door should be placed on the vehicle without any door inner adjustment.

1. Inspect the headlamp door for the following:
   - Gap
   - Flushness
   - Height
2. To adjust for gap and/or flushness relative to the hood, fascia, and fender, perform the following:
   2.1. Remove the headlamp door. Refer to *Headlamp Opening Door Replacement*.
   2.2. Loosen the intermediate bracket to headlamp housing screws (2).
   2.3. Place the headlamp door into position.
   2.4. Check gap and/or flushness.
   2.5. Repeat the previous 3 steps as necessary, until the correct gap and/or flushness is achieved.

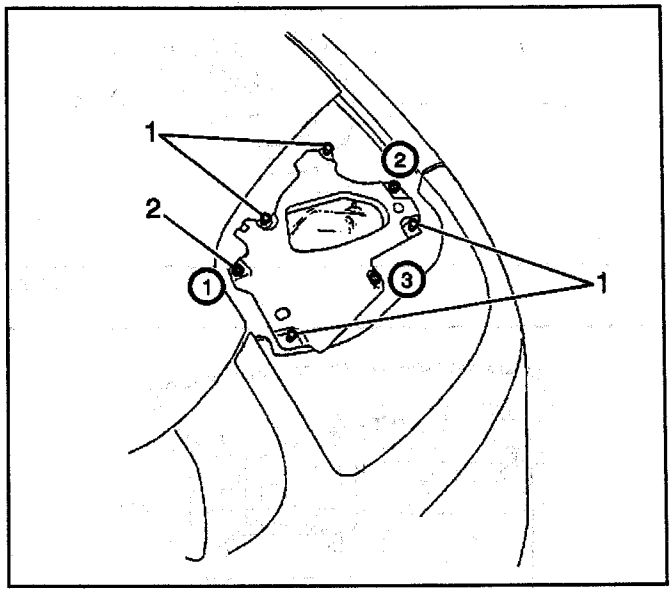
Notice: Refer to *Fastener Notice* in Cautions and Notices.

   2.6. Tighten the intermediate bracket headlamp housing screws (2) in the sequence shown.

   Tighten

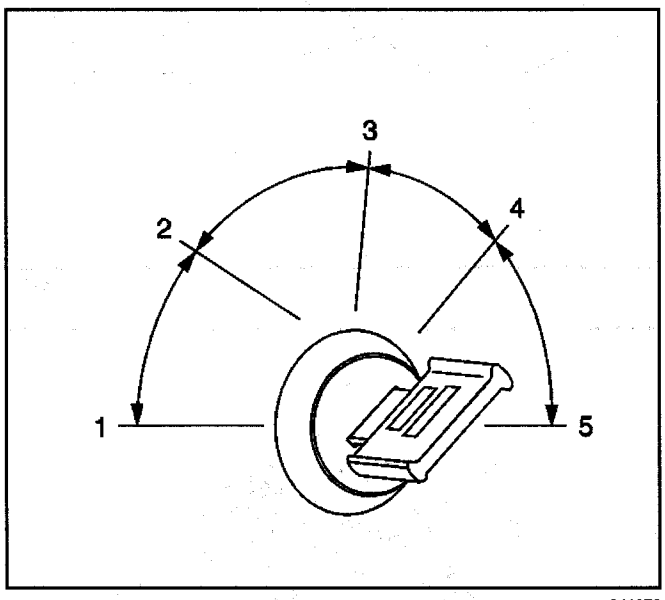
   Tighten the intermediate bracket headlamp housing screws to 2.0 N·m (18 lb in).

   2.7. Install the headlamp door. Refer to *Headlamp Opening Door Replacement*.



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3. To adjust the headlamp door height relative to the hood, fascia, and fender, perform the following:
   3.1. Remove the headlamp door. Refer to *Headlamp Opening Door Replacement.*
   3.2. Adjust the height by turning the adjustable set screws (1) located on the four corners of the intermediate bracket.
   3.3. Place the headlamp door into position.
   3.4. Check the height.
   3.5. Repeat the previous 3 steps as necessary, until the correct height is achieved.
   3.6. Install the headlamp door. Refer to *Headlamp Opening Door Replacement.*



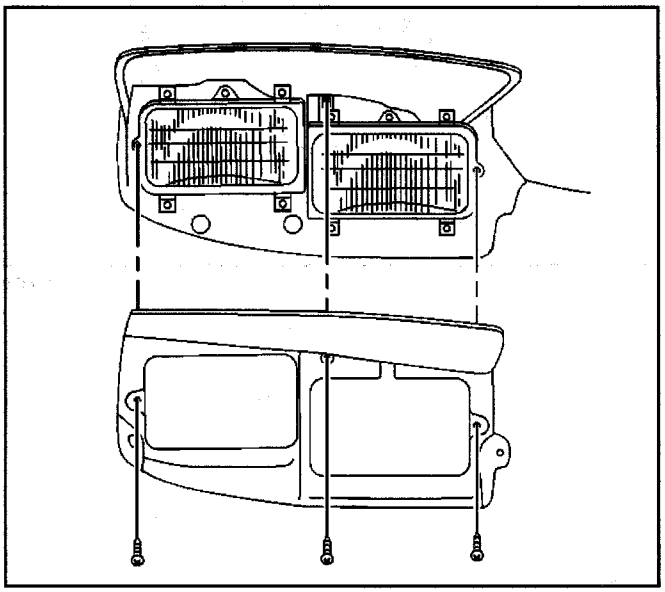
341078

Headlamp Bezel Replacement

Removal Procedure

1. Turn the ignition key to the RUN position (4).
2. Turn the headlamps ON, then turn the switch back to park lamps.

   This will leave the headlamps in the up position with the lamps off.
3. Turn the ignition key to the OFF position (1).


402675

4. Open the hood.
5. Remove the headlamp bezel screws.
6. Remove the headlamp bezel.

Installation Procedure

1. Install the headlamp bezel.

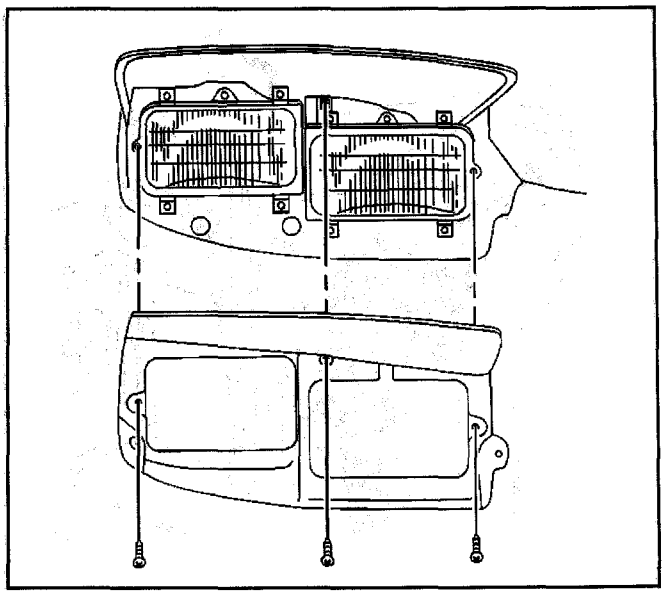
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the headlamp bezel screws.

   Tighten

   Tighten the headlamp bezel screws to 1.7 N·m (15 lb in).

3. Close the hood.
4. Turn the headlamp switch off.



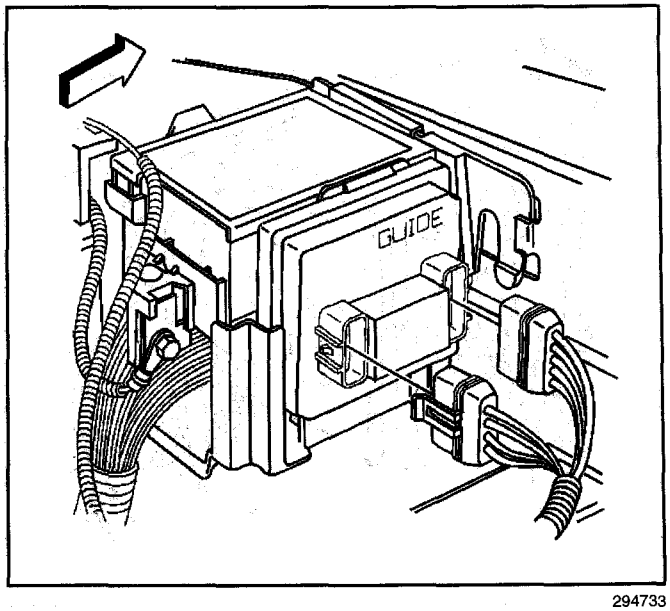
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Headlamp Door Module Replacement

Removal Procedure

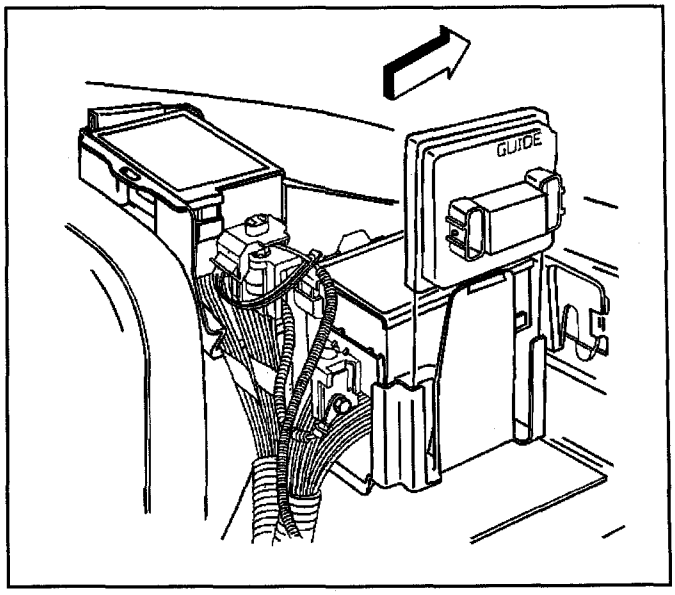
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.
2. Disconnect the headlamp door opening actuator control module electrical connectors.

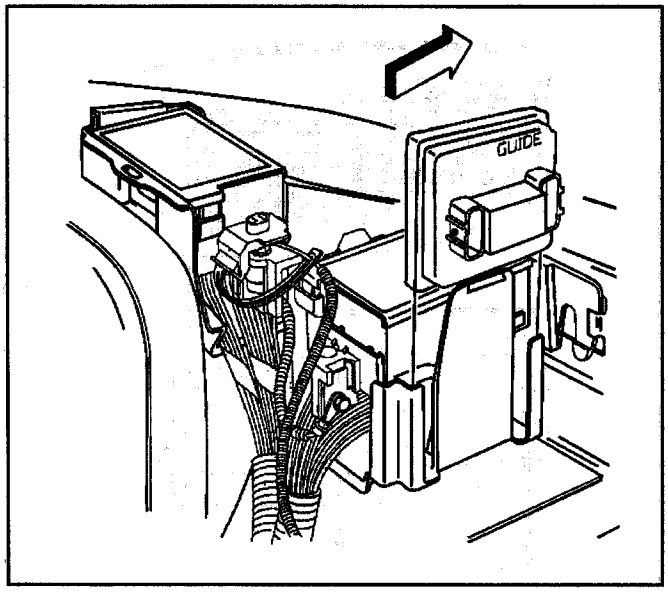


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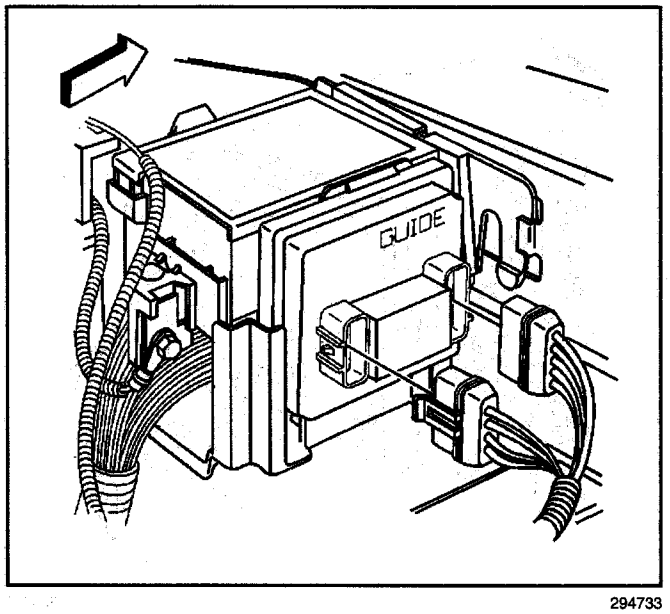
3. Remove the headlamp door opening actuator control module from the forward lamp harness bracket.



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Installation Procedure

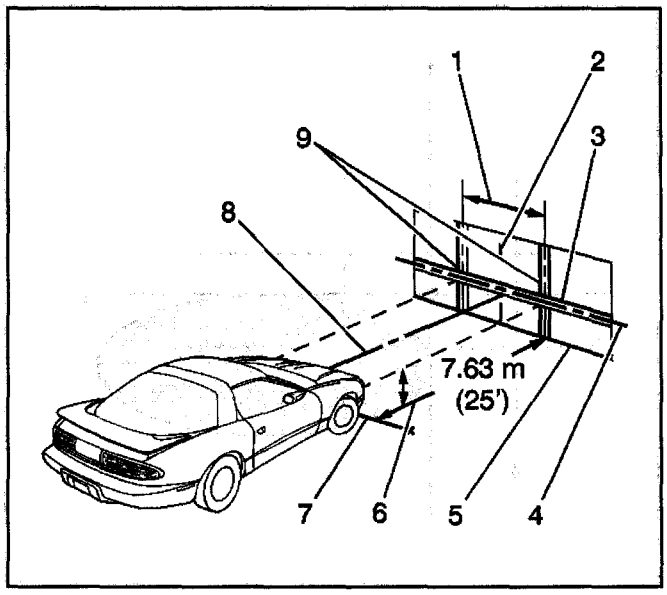
1. Install the headlamp opening door actuator control module to the forward lamp harness bracket.
2. Slide the module into the bracket until module locks into place.
3. Connect the headlamp opening door actuator control module electrical connectors.
4. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.

Headlamp Aiming (Screen Method)

Aiming By Screen Method

- To correct the horizontal aim use the adjusting screw located on the outer side of the headlamps.
- To correct the vertical aim by use the adjusting screw located in the top center of the headlamps.
- Use a specific aiming area in a darkened location. Ensure that the aiming area meets the followings:
  - The area used must accommodate the vehicle with a space of 7.6 m (25 ft) left over.
  - Measure the additional 7.6 m (25 ft) from the face of the headlamps to the front of the screen.
  - The floor that the vehicle rests on is level with the bottom of the screen.
  - If the floor is not level, then compensate for the unlevel floor.

- Ensure that the aiming screen meets the following:
  - The screen (2) is 1.5 m (5 ft) high and 3.6 m (12 ft) wide.
  - The surface of the screen (2) is a matte white.
  - The screen (2) is well shaded from outside light.
  - The screen (2) is correctly adjusted to the floor on which the vehicle stands.
  - The following items are present:
    - A vertical center line (2)
    - A horizontal center line (4) for the center line of the lamps
    - A horizontally adjustable horizontal tape (3)
    - 2 laterally adjustable vertical tapes (9)

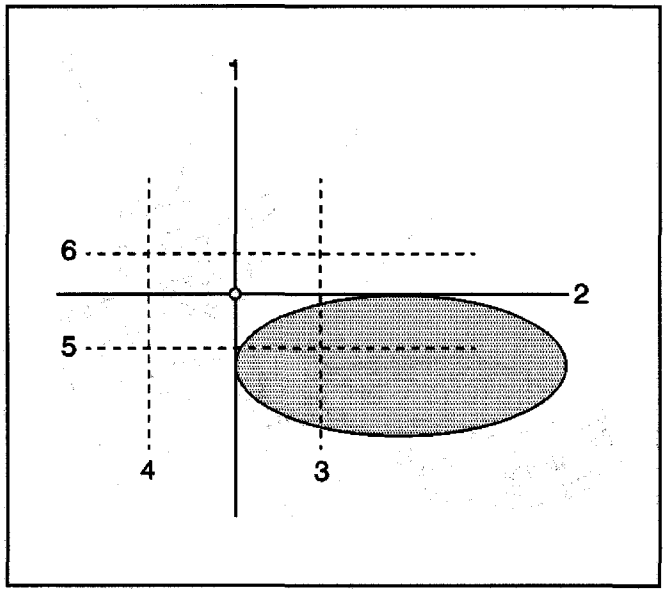


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Important: Adjust the horizontal lines or tape (3) on the screen (2) for each vehicle that you inspect. Vehicles of the same model and year may have different standing height for the headlamps.

- Make provisions for moving the aiming screen in order to align the aiming screen parallel with the rear axle of the vehicle.
  - This will allow for a horizontal line (4) drawn to pass through the center point between the two headlamp capsules.
  - The horizontal line (4) will be drawn perpendicular from the center line of the screen (2).
- Once you set up the screen (2) in a permanent location, paint a reference line (7) on the floor. The reference line (7) will identify the proper location of the headlamps when the headlamps are being aimed.
- If a regular commercial aiming screen is not available, the screen may consist of the following items:
- A vertical wall that has a clear, uninterrupted area.

  Ensure that the area is 1.8 m (6 ft) high and 3.6 m (12 ft) wide
- Ensure that the area is finished with a washable, nongloss white paint.



294751

Vehicle Preparation

Prepare the vehicle for inspecting the headlamp beam aim.

1. Perform the following to ensure an accurate headlamp aim.
   1.1. Completely assemble all of the components on the vehicle.
   1.2. Ensure that the fuel load is ½ tank or less.
   1.3. Ensure that the only other load in the vehicle is the driver.
   1.4. Mark the center of the front and rear windows with narrow tape.
   Use these sights to locate the center of the vehicle.
   1.5. Do this by moving the vehicle or the screen until the center line (2) of the screen comes into alignment with the two points.
   1.6. Close the doors.
   1.7. Rock the vehicle sideways in order to stabilize the suspension.
2. Position the vehicle so that the vehicle is square with the aiming screen.
3. Position the headlamps directly over the reference line (7) that you painted on the floor.
4. Locate the vertical line (4) on the aiming screen so that the vertical lines meets the following criteria:
   - The vertical line is aligned with the center of the rear window.
   - The vertical line is over the hood.

Domestic Low Beam

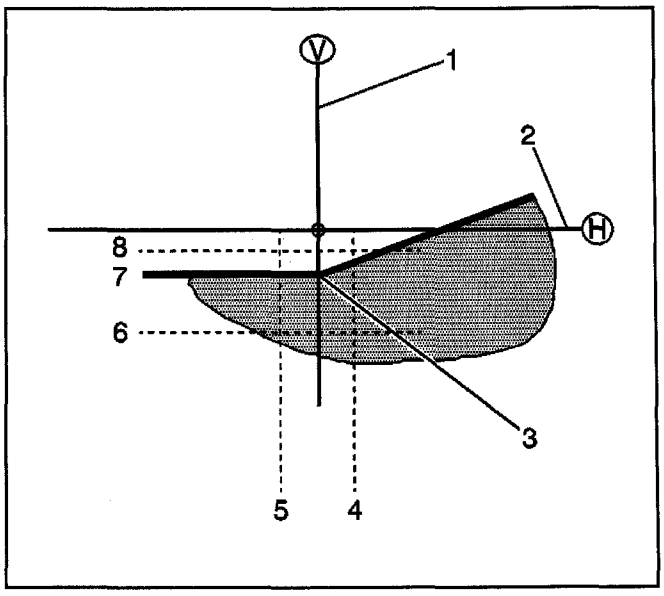
Check the following for the low beam headlamps.

1. With the low beams on, observe the beam's high intensity zone on the screen.
2. To adjust the headlamp aim perform the following:
   - For the horizontal aim the left edge of the high intensity zone should be on the vertical axis (1), or within +102 mm (+4.0 in) (3), or (4) –102 mm (–4.0 in) of the vertical axis (1).
   - For the vertical aim the top edge of the high intensity zone should be on the horizontal axis (2), or within –63.5 mm (–2.5 in) (5), or +51 mm (+2.0 in) (6) of the horizontal axis (2).
3. If the above specifications are not met adjust the headlamps accordingly.

European Low Beam (Right Hand Rule of Road) (Export Only)

Check the following for the European low beam headlamps.

1. With the low beams on, observe the beam's high intensity zone on the screen.
2. To adjust the headlamp aim perform the following:
   - For the horizontal aim the center beam's break point (3) should be on the vertical axis (1), or within –38.1 mm (–1.5 in) (5) or 38.1 mm (1.5 in) (4) of the vertical axis (1).
   - For the vertical aim set the beam's break point (3) at –92.25 mm (–3.75 in) (7) below the horizontal axis (2), or within –57.15 mm (–2.25 in) (8) or –171.45 mm (–6.75 in) (6) below the horizontal axis (2).
3. If the above specifications are not met adjust the headlamps accordingly.

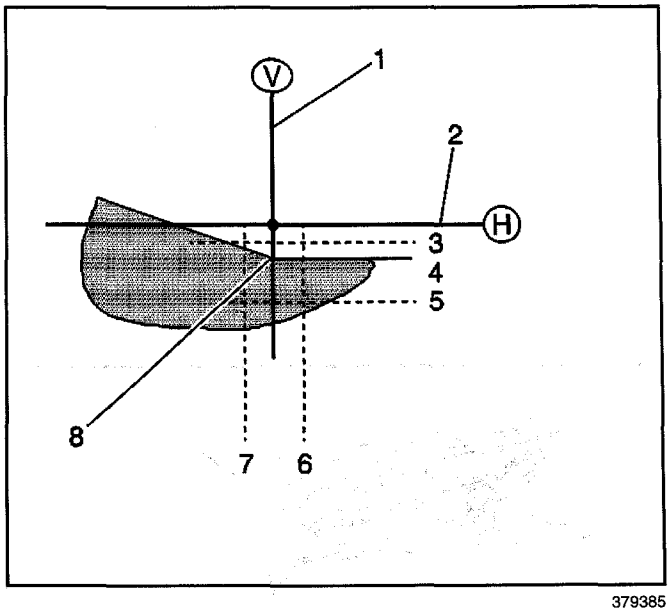


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United Kingdom (UK) and Japanese Low Beam (Left Hand Rule of Road) (Export Only)

Check the following for the UK and Japanese low beam headlamps.

1. With the low beams on, observe the beam's high intensity zone on the screen.
2. To adjust the headlamp aim perform the following:
   - For the horizontal aim the center beam's break point (8) should be on the vertical axis (1), or within +38.1 mm (+1.5 in) (6) or –38.1 mm (–1.5 in) (7) of the vertical axis (1).
   - For the vertical aim set the beam's break point (3) at –92.25 mm (–3.75 in) (4) below the horizontal axis (2), or within –57.15 mm (–2.25 in) (3) or –171.45 mm (–6.75 in) (5) below the horizontal axis (2).
3. If the above specifications are not met adjust the headlamps accordingly.



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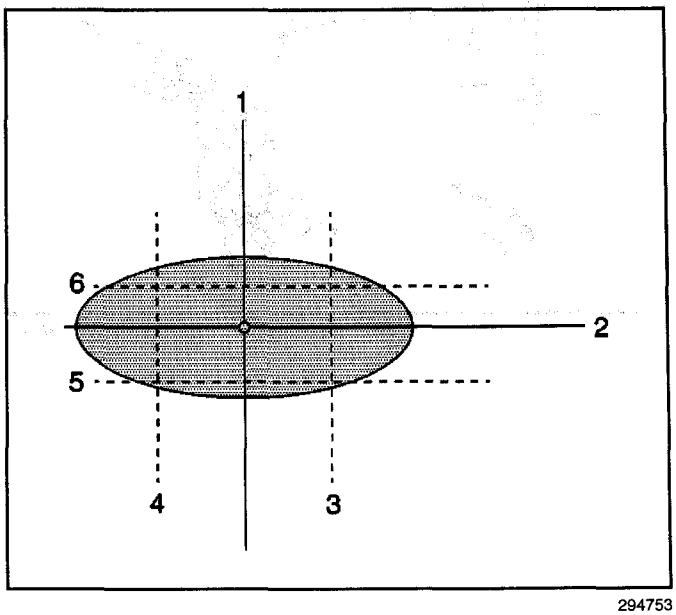
Domestic and Export High Beam

Check the following specifications for the high beam headlamps.

1. With the headlamps on high beam, observe the center of the high intensity zone on the screen.

Important: With composite headlamps (Chevrolet) it may not be necessary to aim the high beam lamps, the low beam adjustment may have taken care of the high beams.

2. To adjust the headlamp aim perform the following:
   - For the horizontal aim the center beam's high intensity zone should be on the vertical axis (1), or within +102 mm (+4.0 in) (3), or (4) –102 mm (–4.0 in) of the vertical axis (1).
   - For the vertical aim the center beam's high intensity zone should be on the horizontal axis (2), or within –63.5 mm (–2.5 in) (5), or +51 mm (+2.0 in) (6) of the horizontal axis (2).



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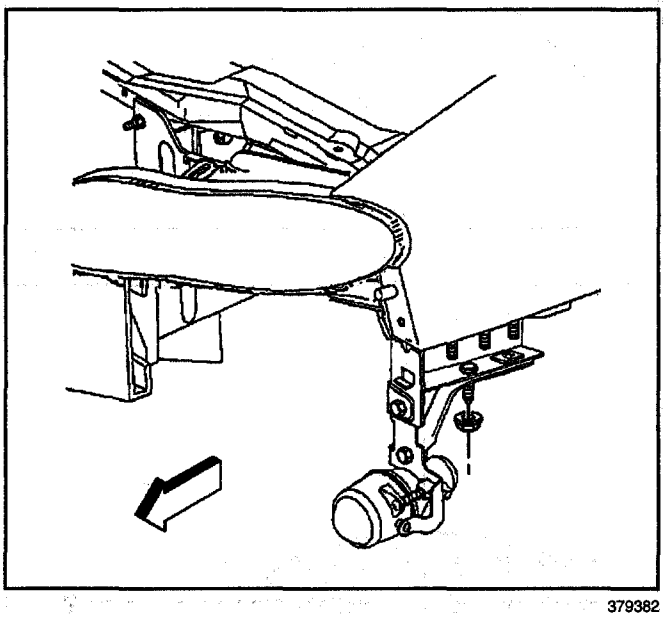
Headlamp Aiming (Alternate Procedure)

Tools Required

J 25300-E Headlamp Aimer (Mechanical Type), or equivalent

Important: When using headlamp aiming equipment which attaches to the headlamps with a suction cup type devise, DO NOT leave the headlamps on while the equipment is attached. On vehicles with plastic headlamps (body styled composite or sealed beam) having the headlamps illuminated when the equipment is attached, may cause heat build-up combined with the suction cup may cause the plastic headlamp lens to become distorted, requiring lamp replacement.

1. Prepare the vehicle for checking beam aim as follows:
   - Place the vehicle on a flat surface.
   - Remove large amounts of mud or ice from the underside of the fenders, if necessary.
   - Check whether tires are noticeably deflated and inflate if necessary.
   - Ensure there is no load in the vehicle other than the driver.
   - Rock the vehicle sideways to stabilize the suspension.
   - Clean the headlamp lenses and aiming pads.
2. Refer to the manufacture's instruction for the correct operation of the headlamp aiming equipment.



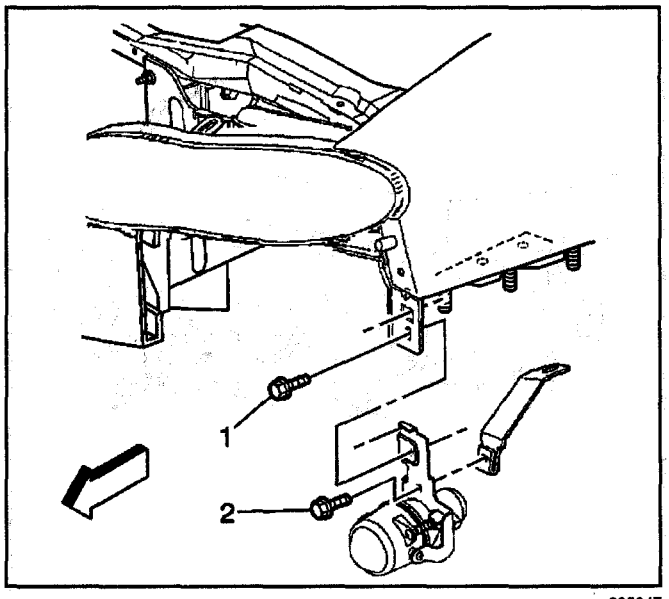
379382

Fog Lamp Replacement - Front (Chevrolet)

Removal Procedure

1. Remove the headlamp. Refer to *Headlamp Replacement (Chevrolet)*.
2. Loosen the front fender front reinforcement nut, if necessary.
3. Disconnect the electrical connector and bulb from the lamp socket.

4. Remove the fog lamp to headlamp bracket bolt (1).
5. Remove the fog lamp to fog lamp bracket bolt (2).
6. Remove the fog lamp from the vehicle.



295047

Installation Procedure

1. Install the fog lamp to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

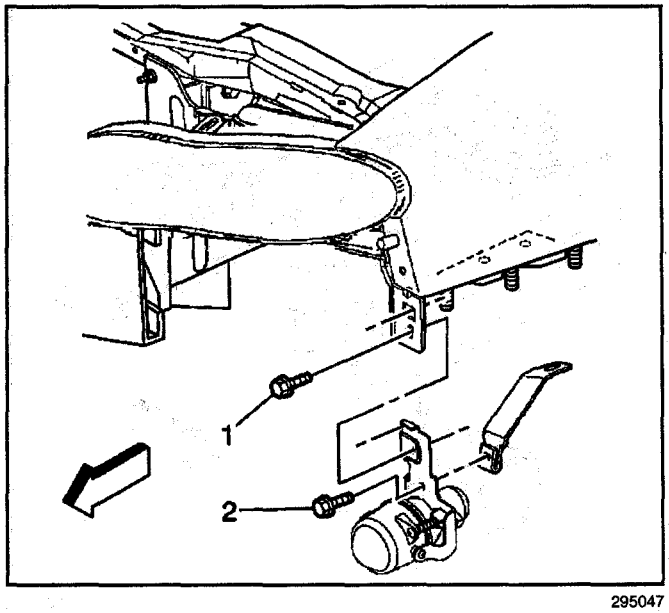
2. Install the fog lamp to fog lamp bracket bolt (2).

   Tighten

   Tighten the fog lamp to fog lamp bracket bolt (2) to 10 N·m (89 lb in).
3. Install the fog lamp to headlamp bracket bolt (1).

   Tighten

   Tighten the fog lamp to headlamp bracket bolt (1) to 10 N·m (89 lb in).

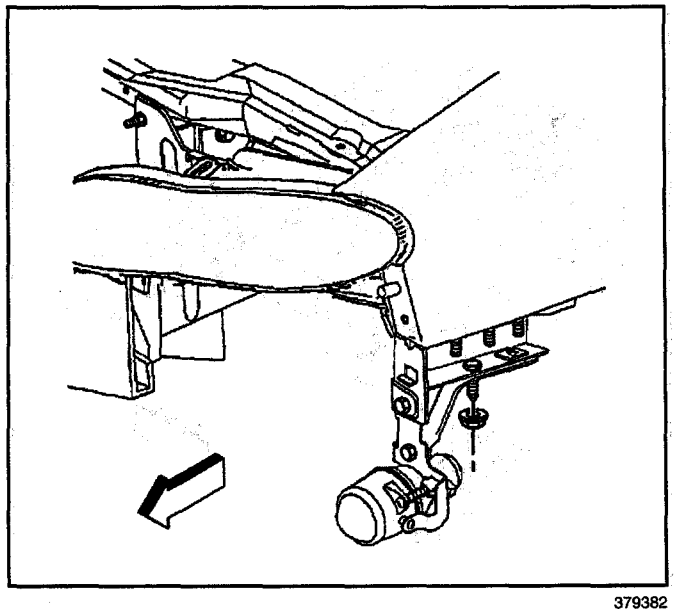


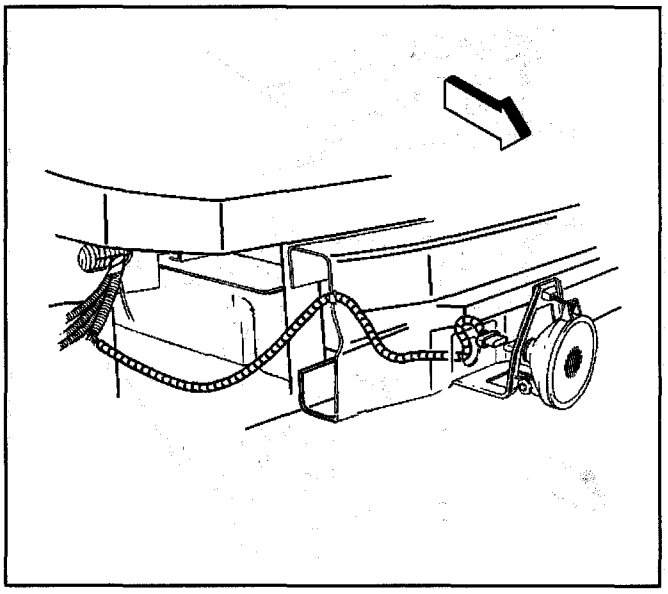
295047

4. Connect the electrical connector and the bulb to the lamp socket.
5. Tighten the front fender front reinforcement nut, if necessary.

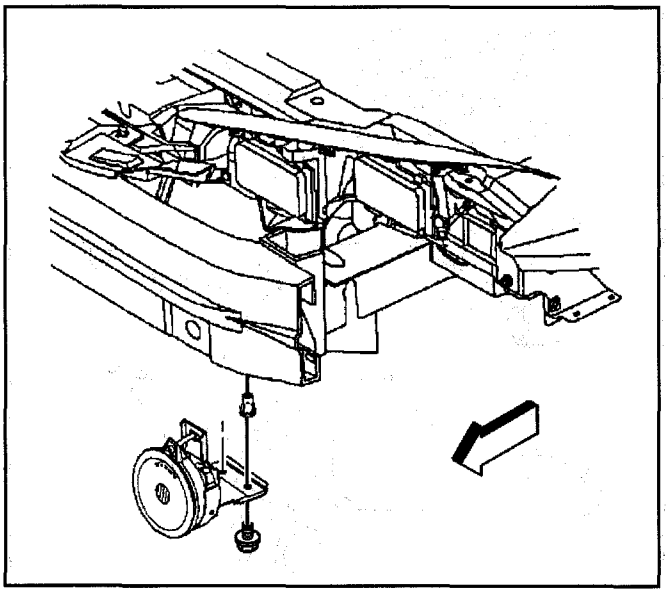
   Tighten

   Tighten the front fender front reinforcement nut to 10 N·m (89 lb in).
6. Install the headlamp. Refer to *Headlamp Replacement (Chevrolet).*

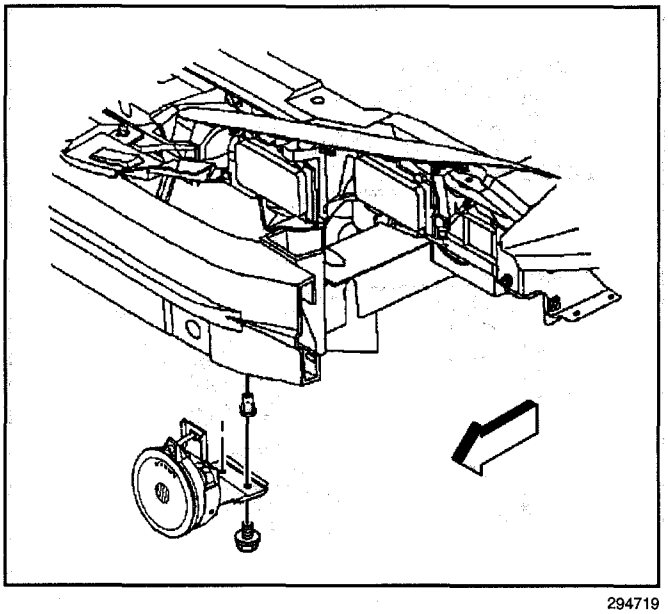

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294718



294719



294719

Fog Lamp Replacement - Front (Pontiac)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the push pin retainers that are located at the bottom center of the front fascia.
3. Disconnect the electrical connector from the fog lamp.
4. Remove the fog lamp bolts.
5. Remove the fog lamp and bracket.

Installation Procedure

1. Install the fog lamp and bracket.

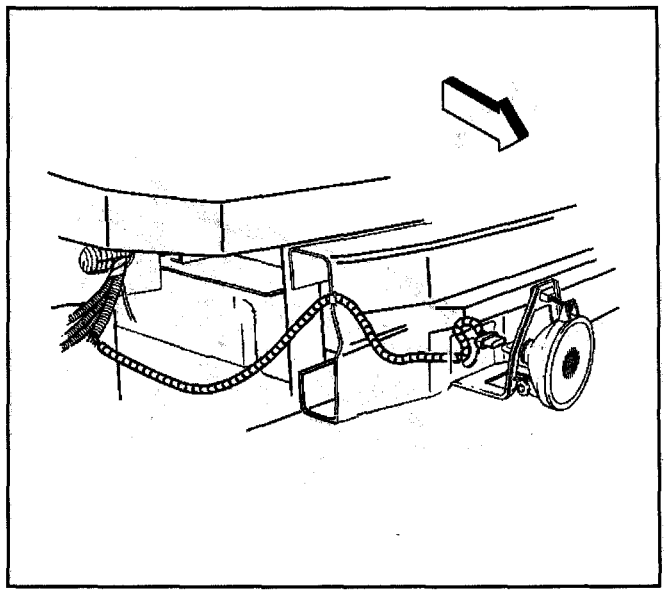
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the fog lamp bolts.

   Tighten

   Tighten the fog lamp bolt to 15 N·m (11 lb ft).

3. Connect the electrical connector to the fog lamp.
4. Install the push pin retainers at the bottom center of the front fascia.
5. Lower the vehicle.

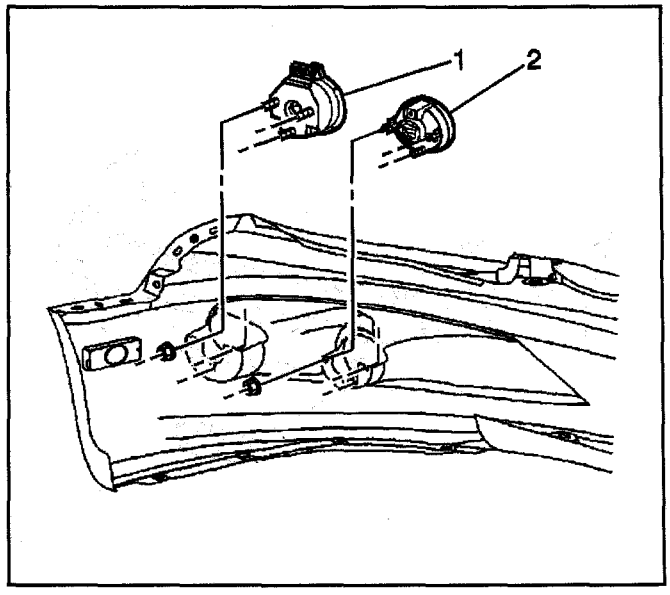


294718

Fog Lamp Replacement - Front (Pontiac Firebird/Formula)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Open the access door in the front bumper air deflector.
3. Disconnect the fog lamp electrical connector from the socket.
4. Remove the fog lamp nuts.
5. Remove the fog lamp (1).



294763

Installation Procedure

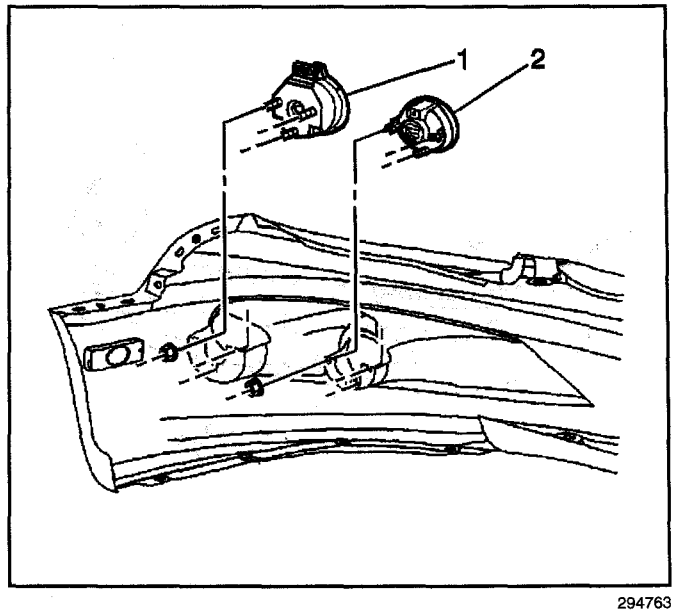
1. Install the fog lamp (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

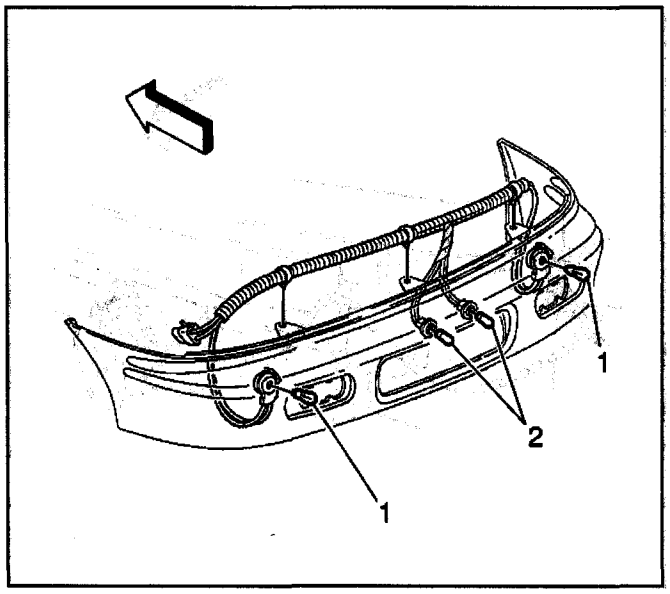
2. Install the fog lamp nuts.

   Tighten

   Tighten the fog lamp (1) nuts to 8.0 N·m (71 lb in).
3. Connect the fog lamp electrical connector to the socket.
4. Close the access door in the front bumper air deflector.
5. Lower the vehicle.



294763

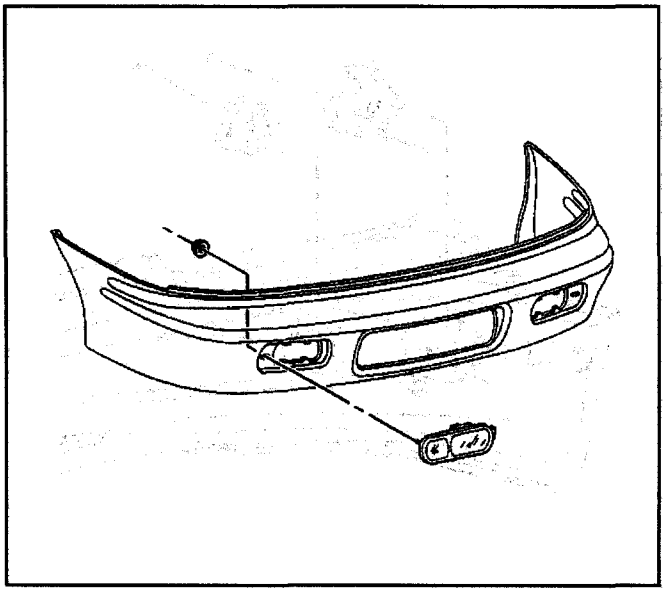


379383

Fog Lamp Replacement - Rear (Chevrolet)

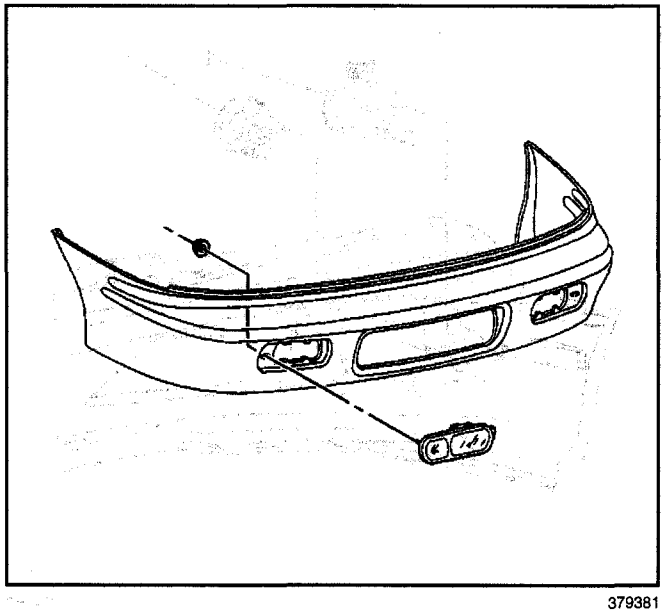
Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Disconnect the rear fog lamp electrical connector (1).



379381

3. Remove the rear fog lamp self threading nuts.
4. Remove the rear fog lamp from the rear fascia.



379381

Installation Procedure

1. Install the rear fog lamp to the rear fascia.

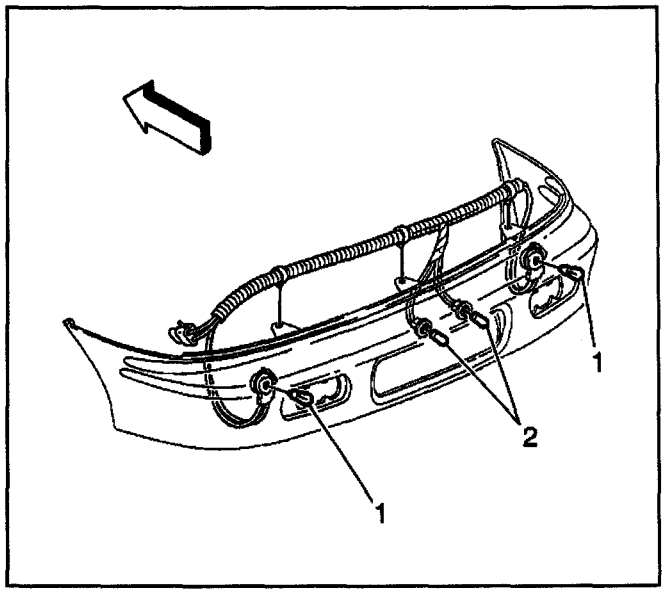
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the rear fog lamp self threading nuts.

   Tighten

   Tighten the rear fog lamp self threading nuts to 1.4 N·m (12 lb in).

3. Connect the rear fog lamp electrical connector.
4. Lower the vehicle.

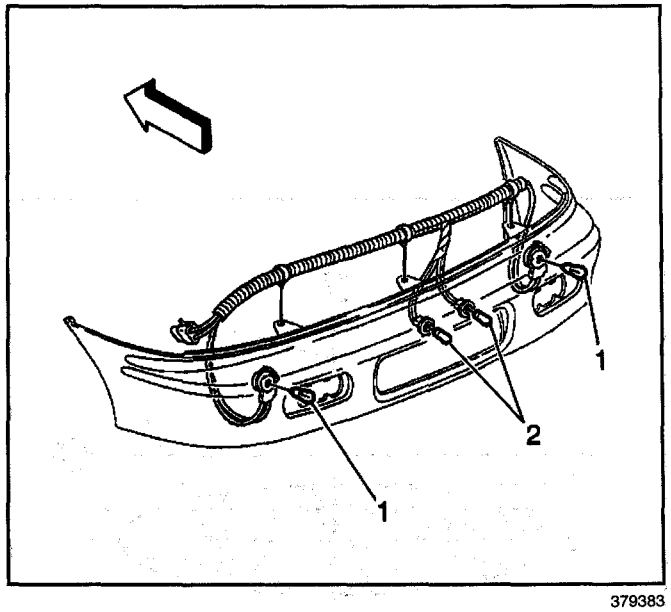


379383

Fog Lamp Replacement - Rear (Pontiac)

Removal Procedure

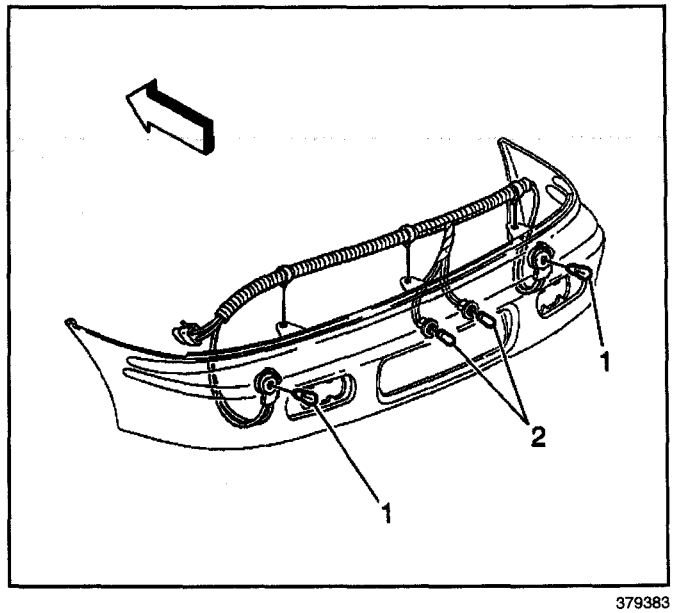
1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Disconnect the rear fog lamp electrical connector.
3. Remove the rear fog lamp bulb (1) from the harness socket.



379383

Installation Procedure

1. Install the rear fog lamp bulb (1) to the harness socket.
2. Connect the rear fog lamp electrical connector.
3. Lower the vehicle.



379383

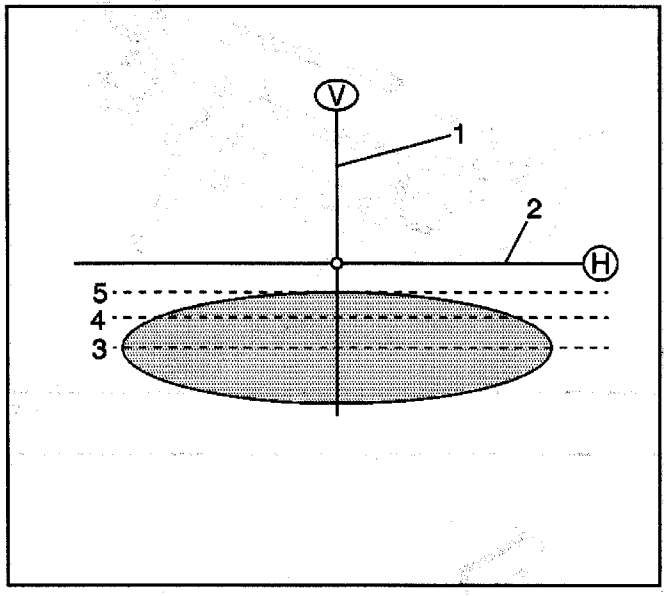
Fog Lamp Bulb Replacement - Front

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. On Camaro and Firebird vehicles, open the access door in the front bumper air deflector.
3. On Trans Am vehicles, remove the push pin retainers which are located at the bottom center of the front fascia.
4. Disconnect the electrical connector from the fog lamp.
5. Remove the fog lamp bulb from the electrical connector.

Installation Procedure

1. Install the fog lamp bulb to the electrical connector.
2. Connect the electrical connector to the fog lamp.
3. On Trans Am vehicles, install the push pin retainers to the bottom center of the front fascia.
4. On Camaro and Firebird vehicles, close the access door in the front bumper air deflector.
5. Lower the vehicle.



366726

Fog Lamp Aiming Procedure

You cannot adjust the horizontal aim of the fog lamps. The vertical aim can be adjusted with an adjusting screw:

- On Chevrolet vehicles, the adjusting screw is located on the outer edge of the fog lamp.
- On Pontiac vehicles, the adjusting screw is located at the top center of the fog lamp.

Perform the following steps in order to adjust the vertical aim on the fog lamps:

1. If other service has been performed on the vehicle, ensure that all of the components are in place.
2. Ensure that the vehicle has a ½ tank of fuel or less.
3. Move the vehicle to a level area.

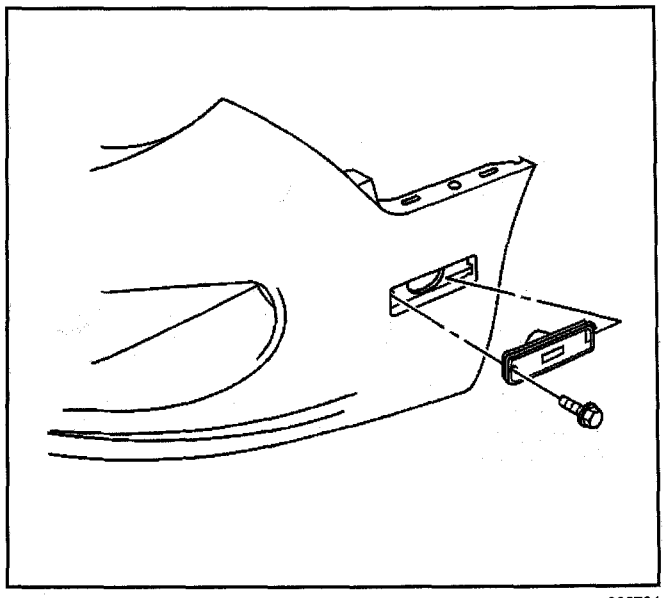
   Park 7.6 m (25 ft) away from the target screen.

   Measure from the center of the fog lamp to the ground line.
4. Turn on the fog lamps.
5. Set the top edge of the beams high intensity zone below the horizontal axis (2) 102 mm (4 in) (5) below the axis. Do not move the beam lower than 204 mm (8 in) (3) below the axis.

Marker Lamp Replacement - Side

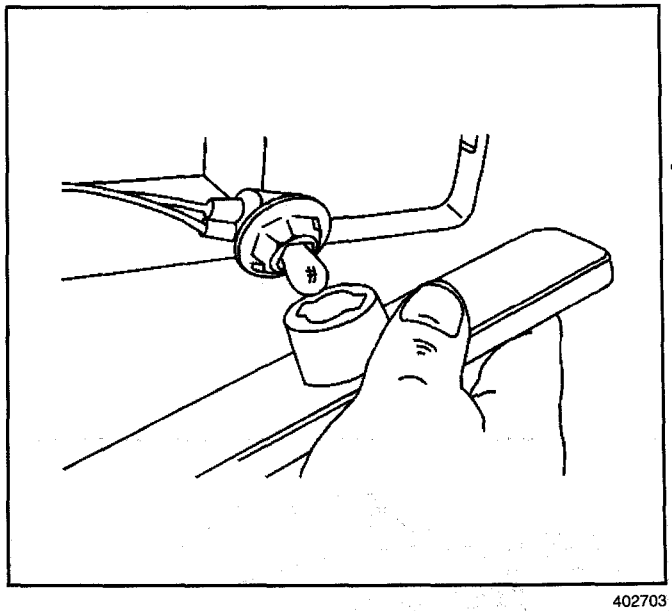
Removal Procedure

1. Remove the sidemarker lamp screw from the front fascia.



366724

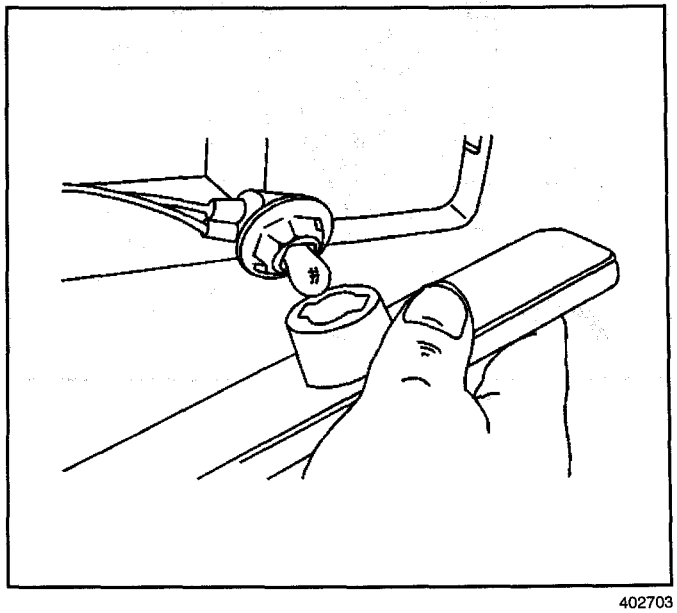
2. Disconnect the electrical connector from the sidemarker lamp.
3. Remove the side marker lamp.



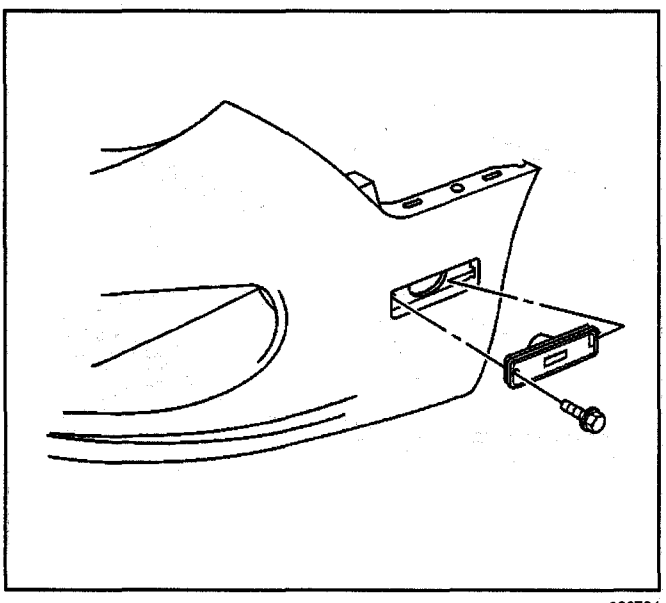
402703

Installation Procedure

1. Connect the electrical connector and bulb to the sidemarker lamp.
2. Install the side marker lamp.



402703



366724

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the sidemarker lamp screw to the front fascia.

   Tighten

   Tighten the sidemarker lamp screw to 1.4 N·m(12 lb in).

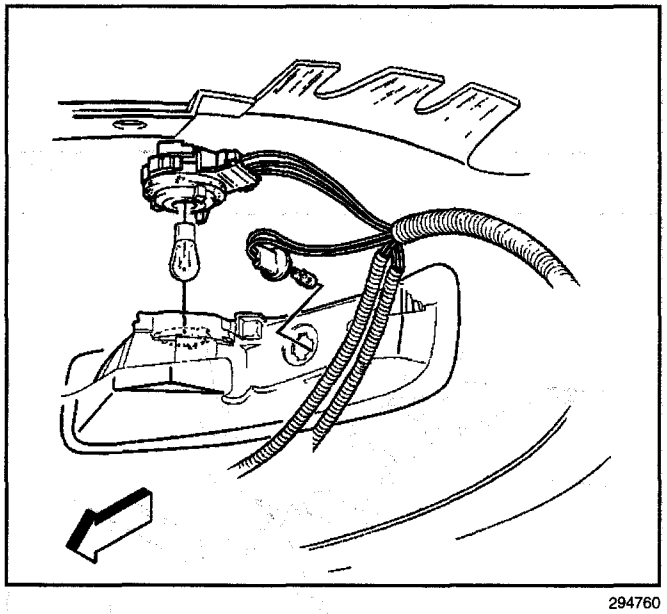
Marker Lamp Bulb Replacement - Side

Removal Procedure

1. Remove the side marker lamp. Refer to *Marker Lamp Replacement - Side.*
2. Remove the sidemarker lamp bulb from the electrical connector.

Installation Procedure

1. Install the sidemarker lamp bulb to the electrical connector.
2. Install the side marker lamp. Refer to *Marker Lamp Replacement - Side.*



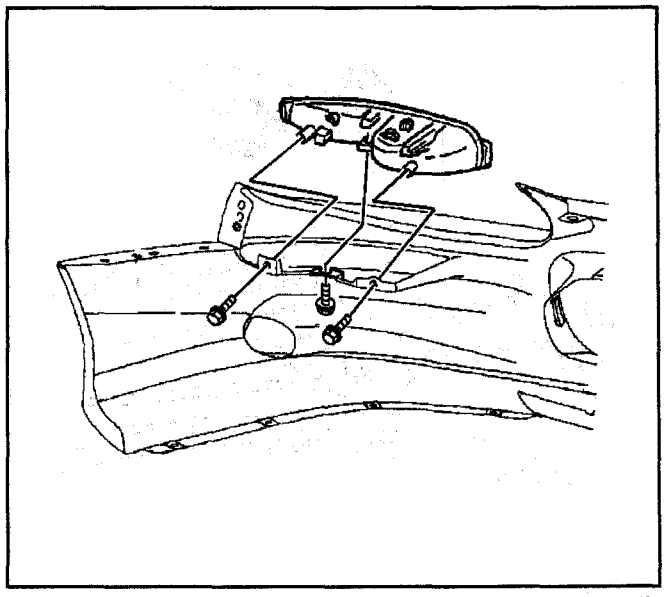
294760

Park/Turn Signal Lamp Replacement (Chevrolet)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Open the access door in the front bumper air deflector.
3. Disconnect the following connectors from the sockets:
   - The sidemarker lamp
   - The park and turn signal lamp

4. Remove the park and turn signal lamp bolts.
5. Remove the park and turn signal lamp from the front bumper fascia.



294761

Installation Procedure

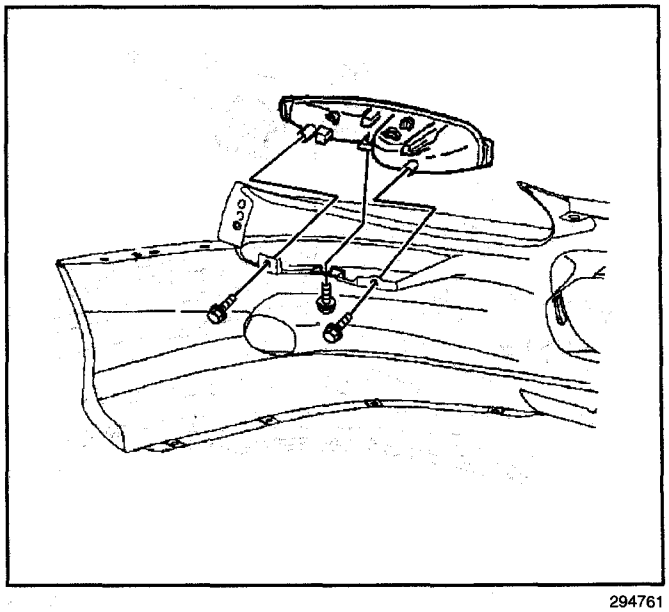
1. Install the park and turn signal lamp to the front bumper fascia.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the park and turn signal lamp bolts.

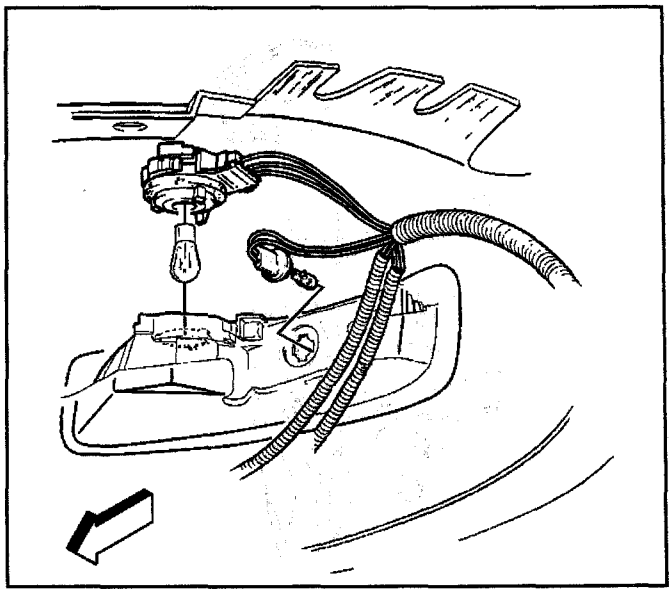
   Tighten

   Tighten the park and turn signal lamp bolts to 2.5 N·m (22 lb in).

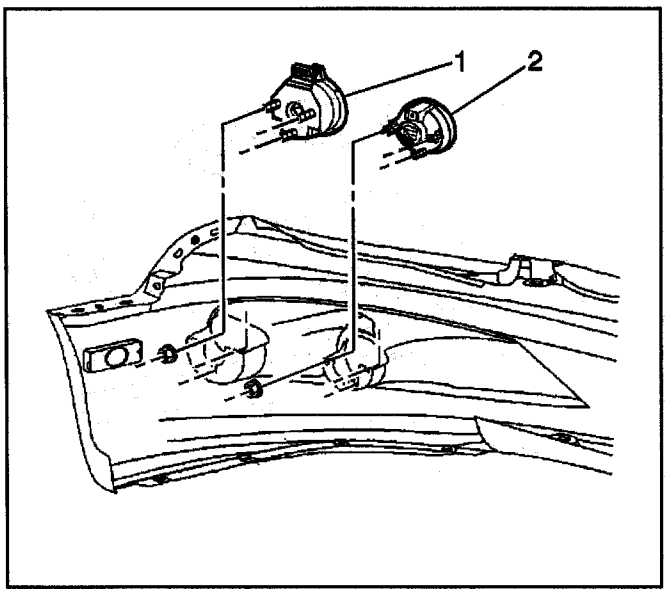


294761

3. Connect the following connectors to the sockets:
   - The sidemarker lamp
   - The park and turn signal lamp
4. Close the access door in the front bumper air deflector.
5. Lower the vehicle.



294760

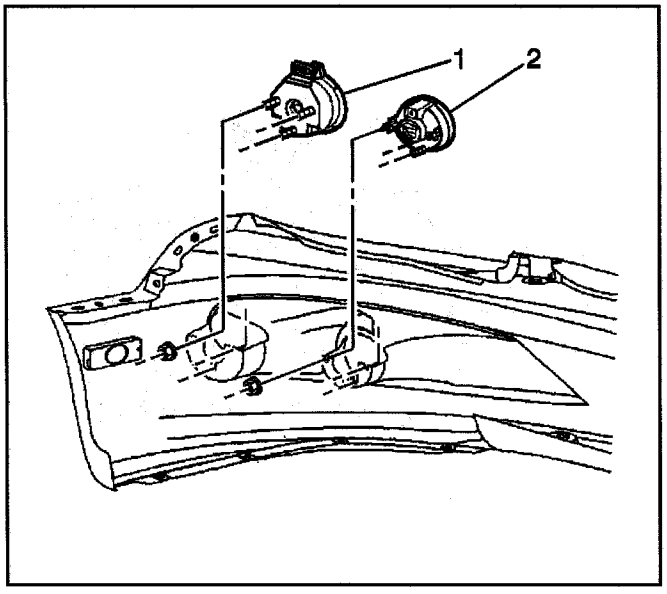


294763

Park/Turn Signal Lamp Replacement (Pontiac Firebird)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Open the access door in the front bumper air deflector.
3. Disconnect the electrical connector from the park and turn signal lamp.
4. Remove the park and turn signal lamp nuts.
5. Remove the park and turn signal lamp (2) from the fascia.



294763

Installation Procedure

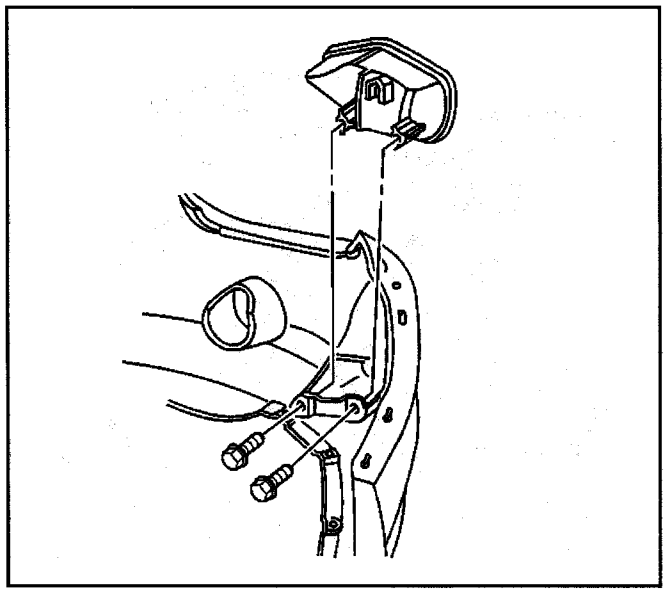
1. Install the park and turn signal lamp (2) to the fascia.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the park and turn signal lamp bolts.

   Tighten

   Tighten the park and turn signal lamp nuts to 4 N·m (35 lb in).
3. Connect the electrical connector to the park and turn signal lamp.
4. Close the access door in the front bumper air deflector.
5. Lower the vehicle.



366720

Park/Turn Signal Lamp Replacement (Pontiac Trans Am)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Open the access door in the front bumper air deflector.
3. Disconnect the electrical connector from the park and turn signal lamp.
4. Remove the park and turn signal lamp bolts.
5. Remove the park and turn signal lamp from the fascia.

Installation Procedure

1. Install the park and turn signal lamp to the fascia.

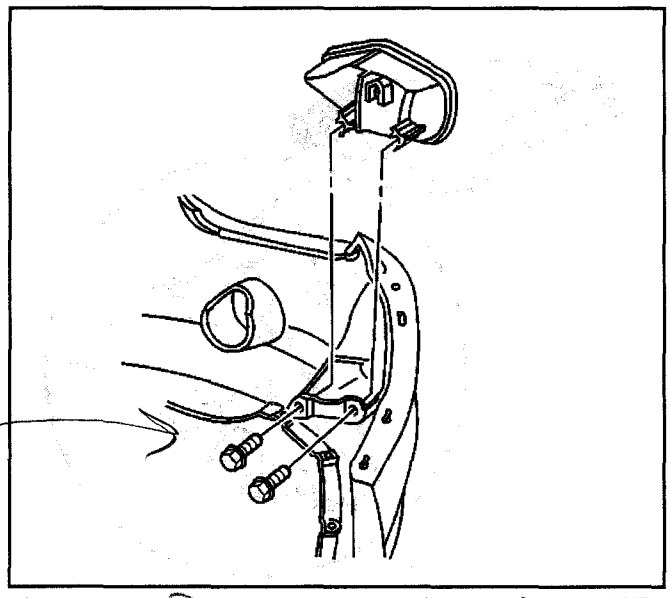
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the park and turn signal lamp bolts.

   Tighten

   Tighten the park and turn signal lamp bolts to 2.5 N·m (22 lb in).

3. Connect the electrical connector to the park and turn signal lamp.
4. Close the access door in the front bumper air deflector.
5. Lower the vehicle.



366720

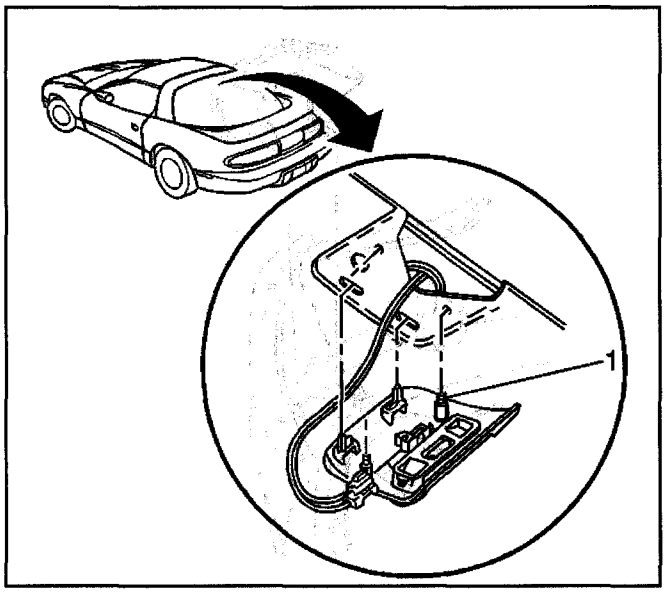
Park/Turn Signal Lamp Bulb Replacement

Removal Procedure

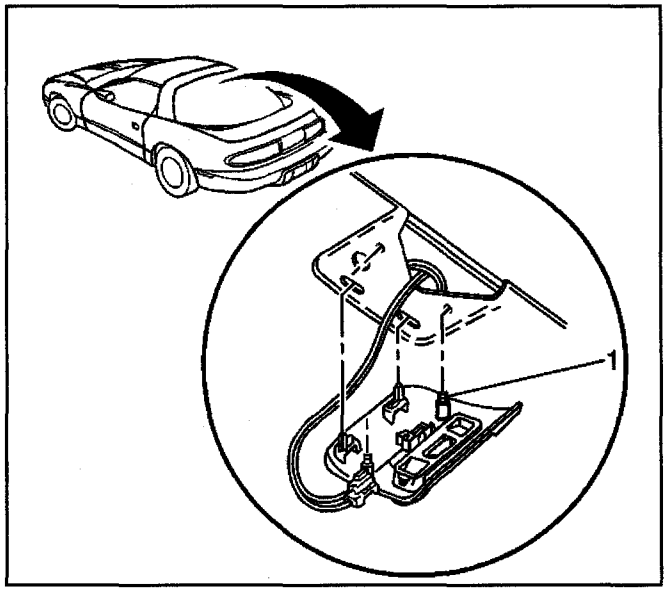
1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Open the access door in the front bumper air deflector.
3. Disconnect the electrical connector from the park and turn signal lamp.
4. Remove the park and turn signal lamp bulb from the socket.

Installation Procedure

1. Install the park and turn signal lamp bulb to the socket.
2. Connect the electrical connector to the park and turn signal lamp.
3. Close the access door in the front bumper air deflector.
4. Lower the vehicle.



294786



294786

Dome and Reading Lamp Bulb Replacement

Removal Procedure

1. Remove the dome lamp cover.
2. Using a flat-bladed tool gently remove the bulb.

Installation Procedure

1. Install the bulb to the socket.
2. Install the dome lamp cover.

Ashtray Lamp Bulb Replacement

Removal Procedure

1. Open the ashtray cover.
2. Remove the ashtray.
3. Pull the bulb, the socket and the shield through the opening in the front floor console.
4. Remove the bulb and the socket from the shield.
5. Remove the bulb from the socket.

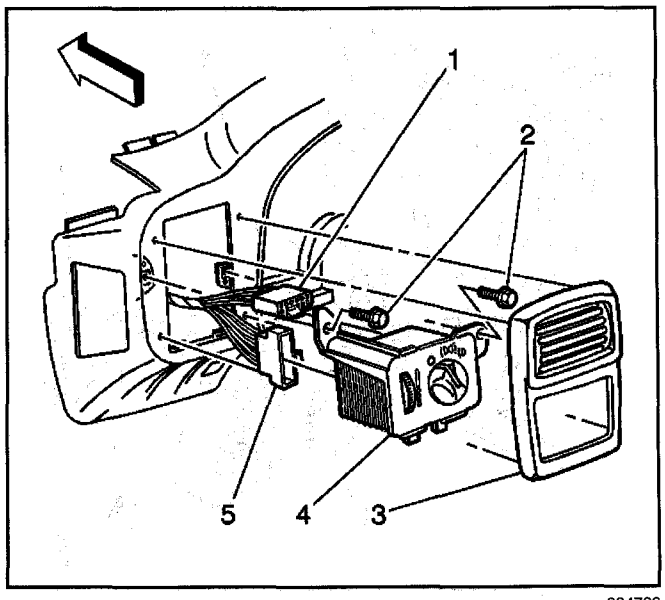
Installation Procedure

1. Install the bulb to the socket.
2. Install the shield to the bulb and the socket.
3. Install the bulb, the socket and the shield to the opening which is in the front floor console.
4. Install the ashtray.
5. Close the ashtray cover.

Headlamp Switch Replacement (Chevrolet)

Removal Procedure

1. Remove the left hand instrument panel accessory trim plate (3).
2. Remove the headlamp switch bolts (2)
3. Disconnect the headlamp switch connector (1) from the headlamp switch (4).
4. Disconnect the dimmer switch connector (5) from the headlamp switch (4).



294793

Installation Procedure

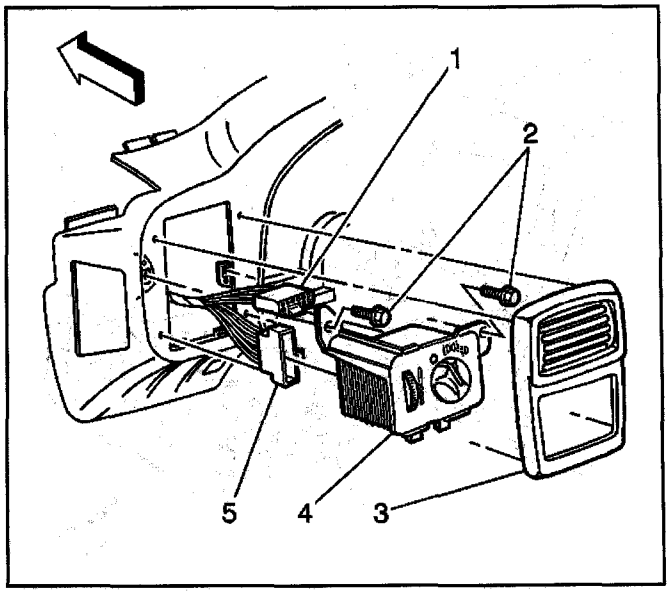
1. Connect the dimmer switch connector (5) to the headlamp switch (4).
2. Connect the headlamp switch connector (1) to the headlamp switch (4).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the headlamp switch bolts (2).

   Tighten

   Tighten the headlamp switch bolts (2) to 1.9 N·m (17 lb in).
4. Install the left hand instrument panel accessory trim plate (3).

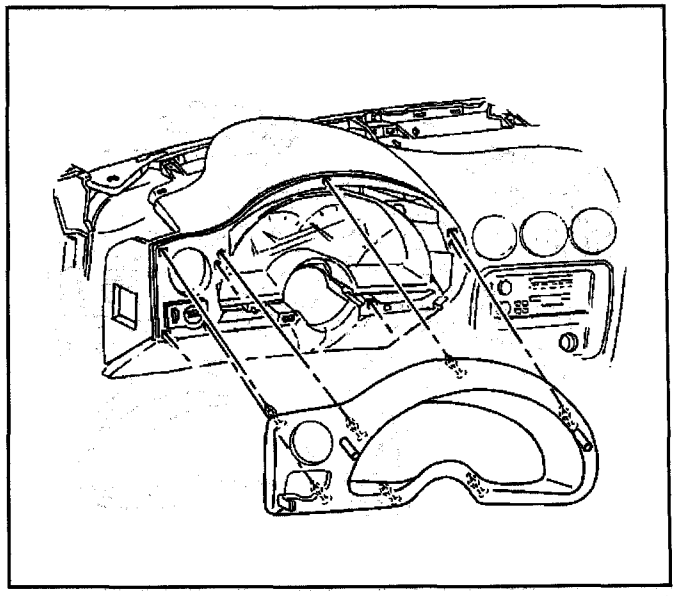


294793

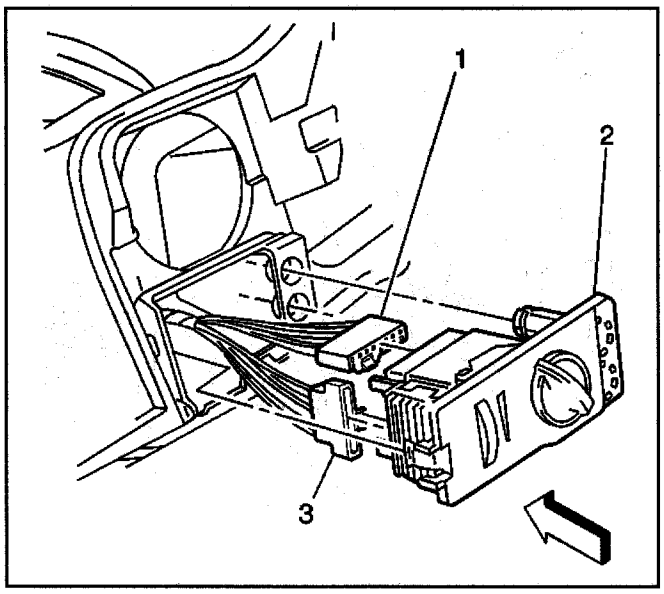
Headlamp Switch Replacement (Pontiac)

Removal Procedure

1. Remove the instrument panel cluster trim plate bezel.

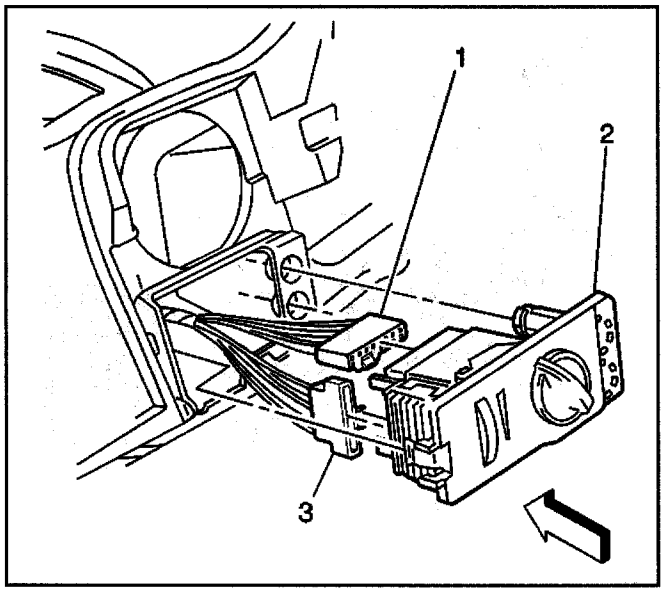


367399



294797

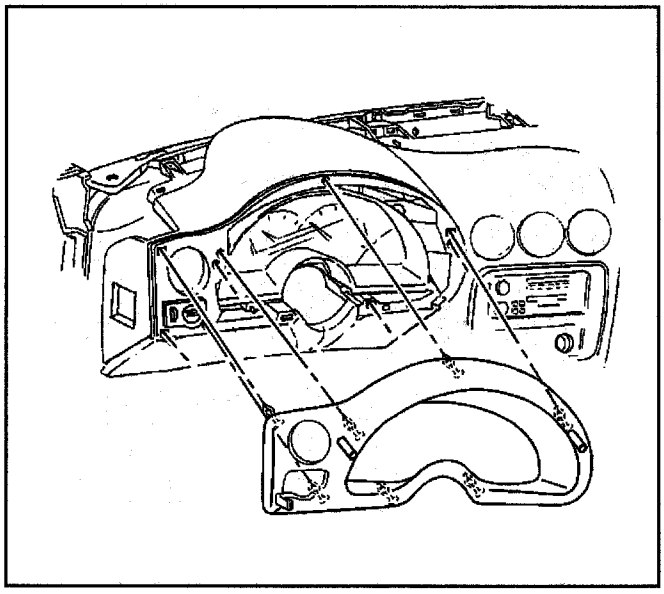
2. Unsnap the headlamp switch (2) from the instrument panel.
3. Disconnect the headlamp switch (1) connector from the headlamp switch (2).
4. Disconnect the dimmer switch connector (3) from the headlamp switch (2).



294797

Installation Procedures

1. Connect the dimmer switch connector (3) to the headlamp switch (2).
2. Connect the headlamp switch connector (1) to the headlamp switch (2).
3. Install the headlamp switch (2) to the instrument panel.



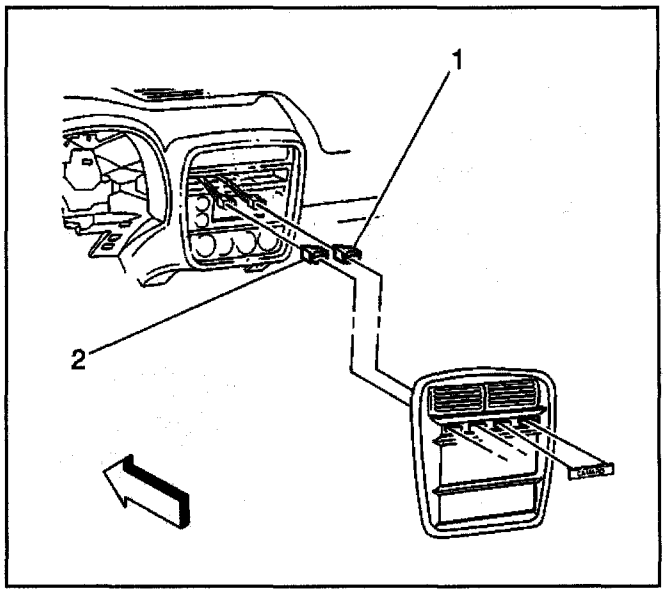
367399

4. Install the instrument panel cluster trim plate bezel.

Fog Lamp Switch Replacement - Front (Front)

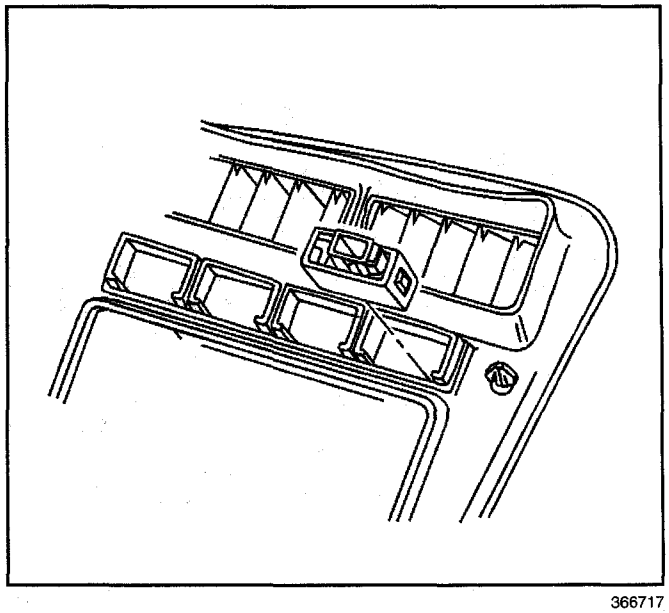
Removal Procedure

1. Remove the instrument panel accessory trim plate.
2. Disconnect the fog lamp switch (2) electrical connector.
3. Disconnect the electrical connector from one of the following switches (1), if equipped:
   - Traction control
   - Second gear start



294806

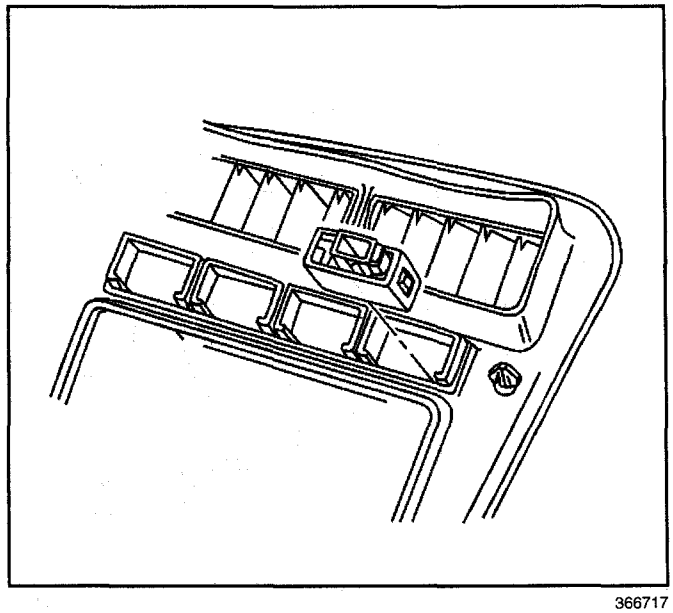
4. Unsnap the fog lamp switch from the instrument panel accessory trim plate.



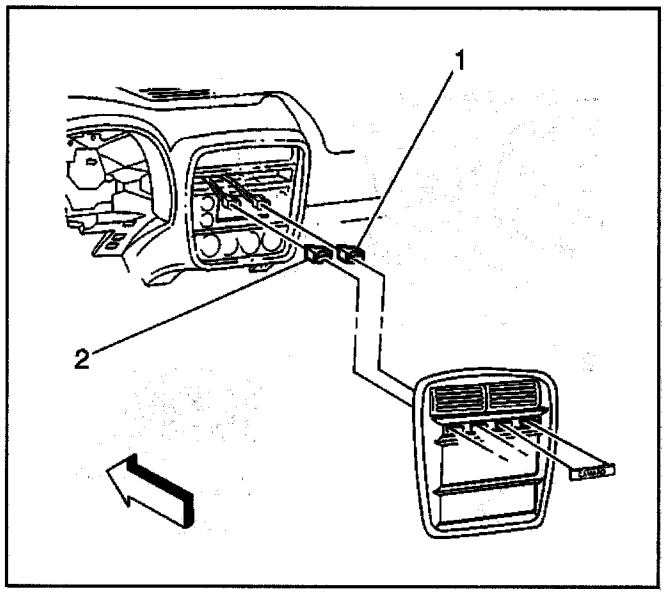
366717

Installation Procedure

1. Install the fog lamp switch to the instrument panel accessory trim plate.
2. Connect the electrical connector to one of the following switches (1), if equipped:
   - Traction control
   - Second gear start

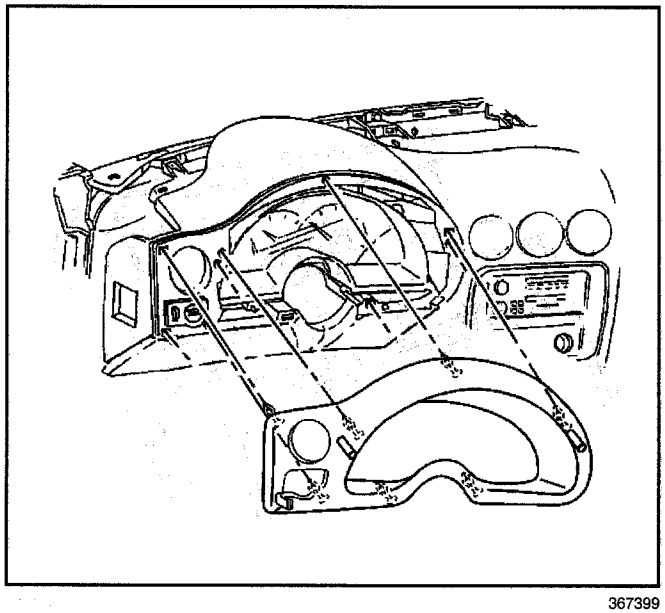


366717



294806

3. Connect the fog lamp switch (2) electrical connector.
4. Install the instrument panel accessory trim plate.

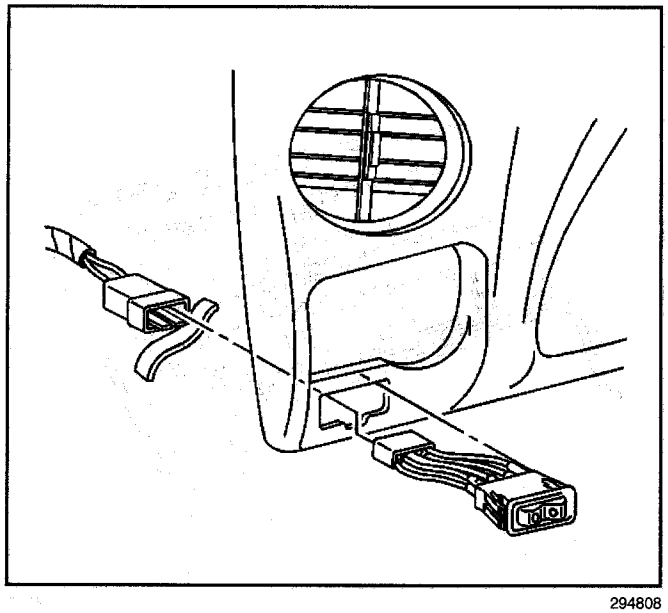


367399

Fog Lamp Switch Replacement - Front (Front Pontiac)

Removal Procedure

1. Remove the instrument panel cluster trim plate bezel.

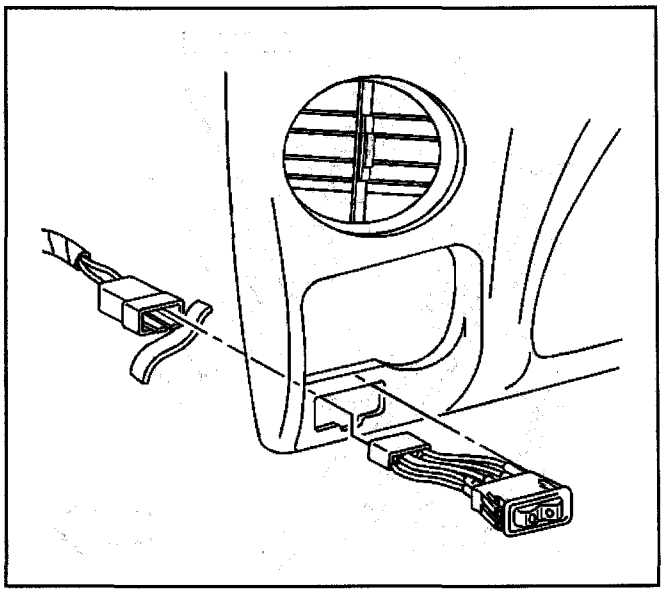


294808

2. Remove the foam tape from around the electrical connector.
3. Disconnect the fog lamp switch electrical connector.
4. Remove the fog lamp switch from the instrument panel cluster trim plate bezel.

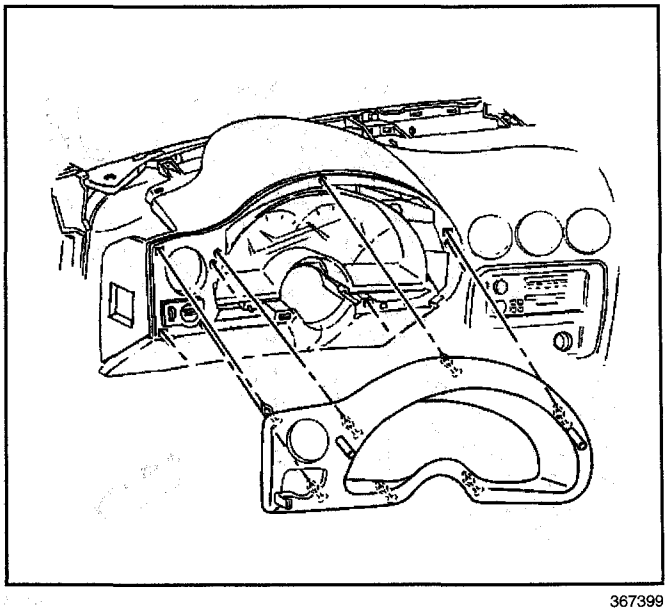
Installation Procedure

1. Install the fog lamp switch to the instrument panel cluster trim plate bezel.
2. Connect the fog lamp switch electrical connector.
3. Reinstall the foam tape around the electrical connector.



294808

4. Install the instrument panel cluster trim plate bezel.



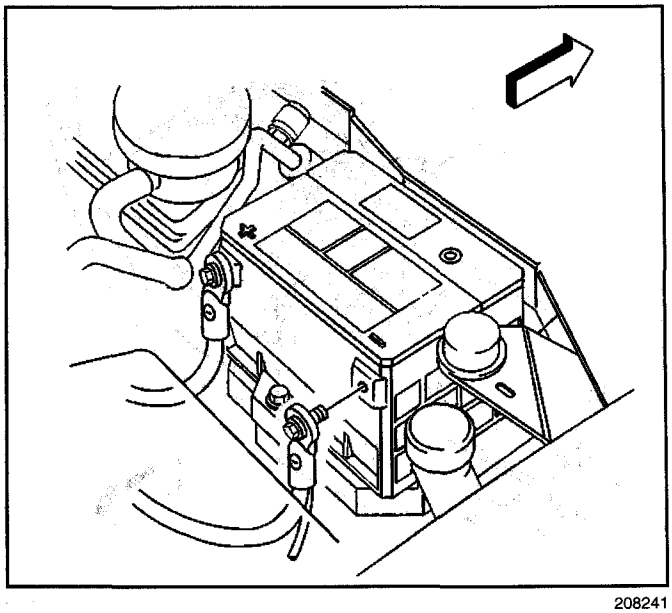
367399

DRL Control Module Replacement

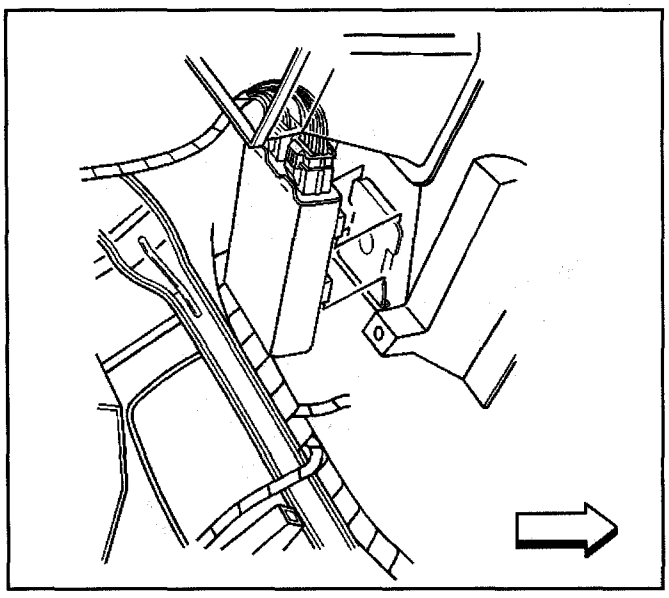
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.
2. Remove the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)* in Entertainment.

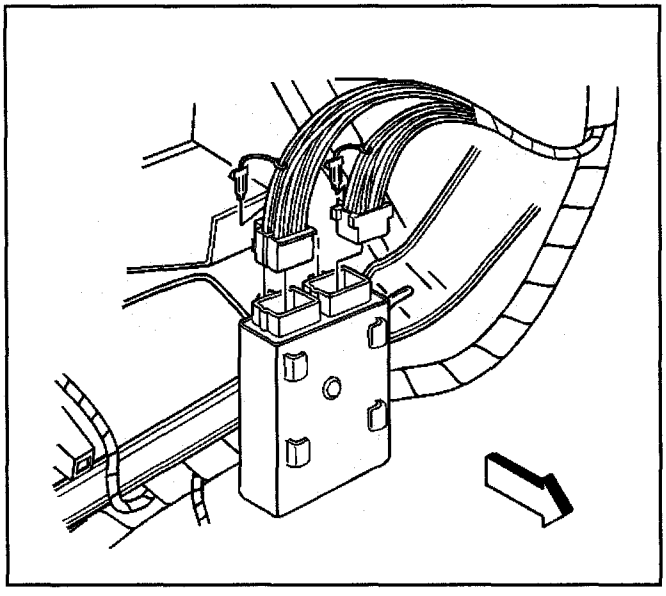


208241



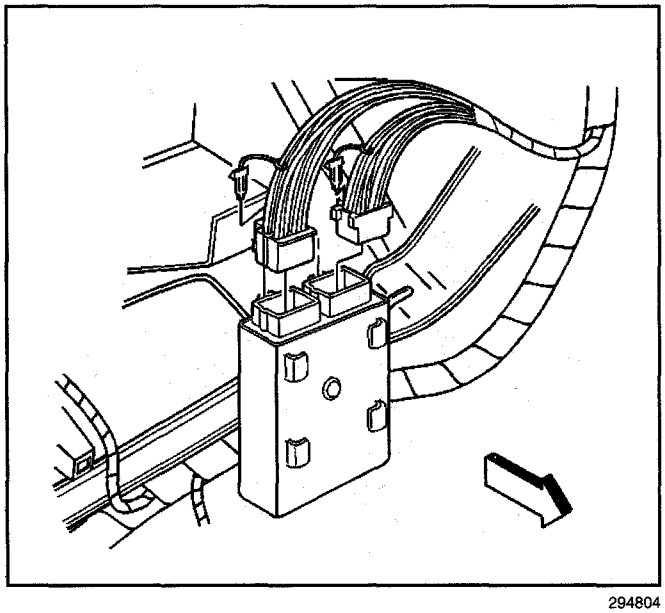
294803

3. Remove the daytime running light (DRL) ambient light sensor module from the HVAC duct.



294804

4. Disconnect the DRL module electrical connectors.
5. Remove the DRL module.

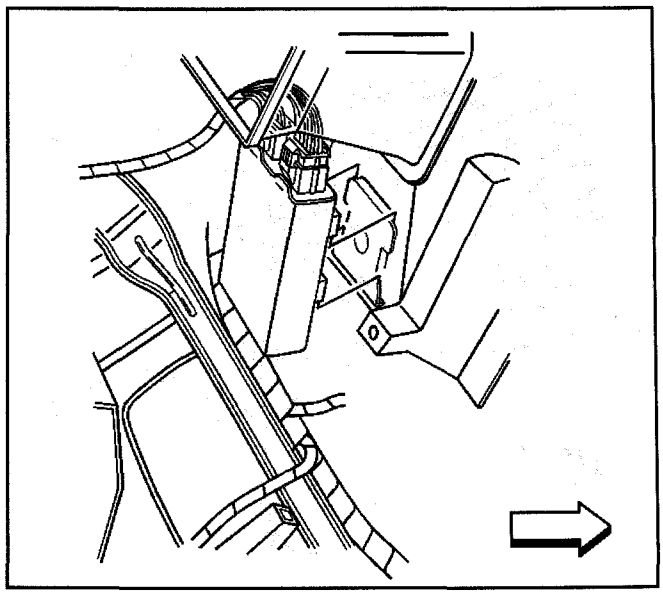


294804

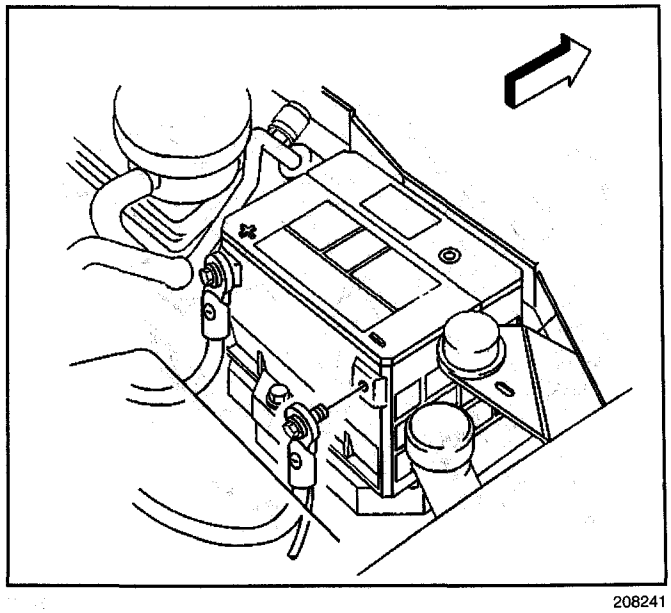
Installation Procedure

1. Install the DRL module.
2. Connect the DRL module electrical connectors.

3. Slide the module onto the HVAC duct retainers.
4. Install the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)* in Entertainment.


294803

5. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.

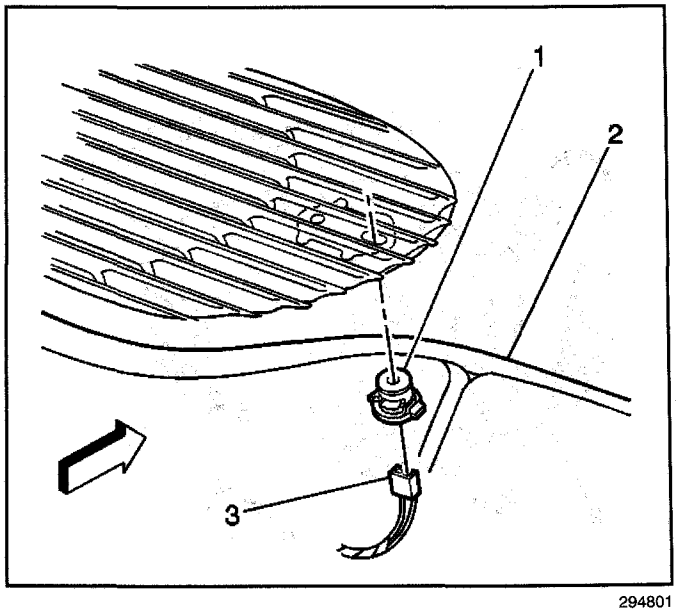

208241

DRL Ambient Light Sensor Replacement

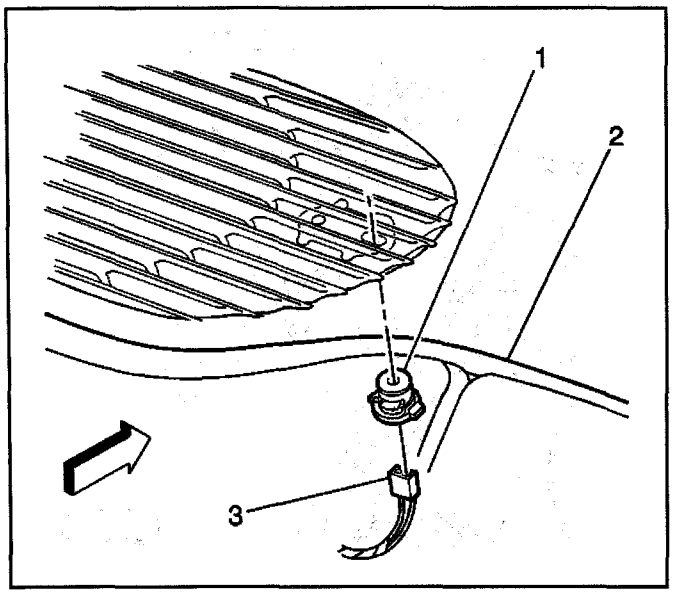
Removal Procedure

1. Remove the I/P upper trim pad. Refer to *Trim Pad Replacement - IP Upper* in Instrument Panel, Gauges and Console.
2. Remove the DRL ambient light sensor (1) from the trim pad (2).

   Twist the DRL ambient light sensor (1) counterclockwise.
3. Disconnect the DRL electrical connector (3) from sensor (1).



294801



294801

Installation Procedure

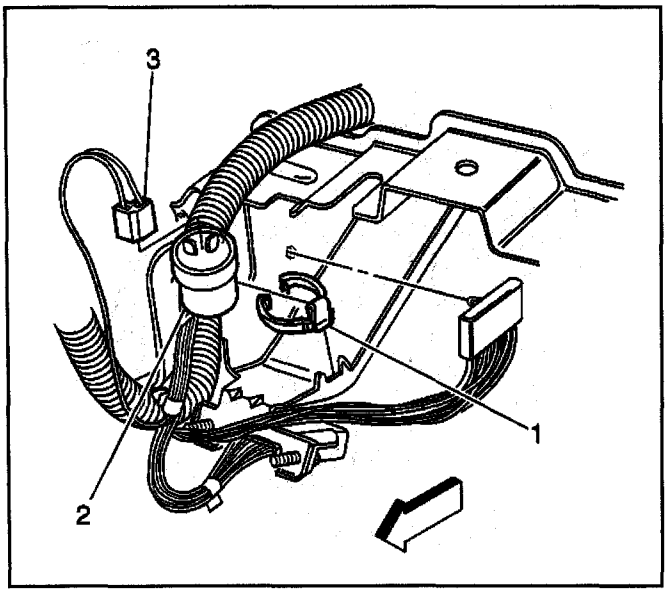
1. Connect the sensor (1) to the DRL electrical connector (3).
2. Install the DRL ambient light sensor (1) to the trim panel (2).

   Twist the DRL ambient light sensor (1) clockwise.
3. Install the IP upper trim pad. Refer to *Trim Pad Replacement - IP Upper* in Instrument Panel, Gauges and Console.

Turn Signal Flasher Replacement

Removal Procedure

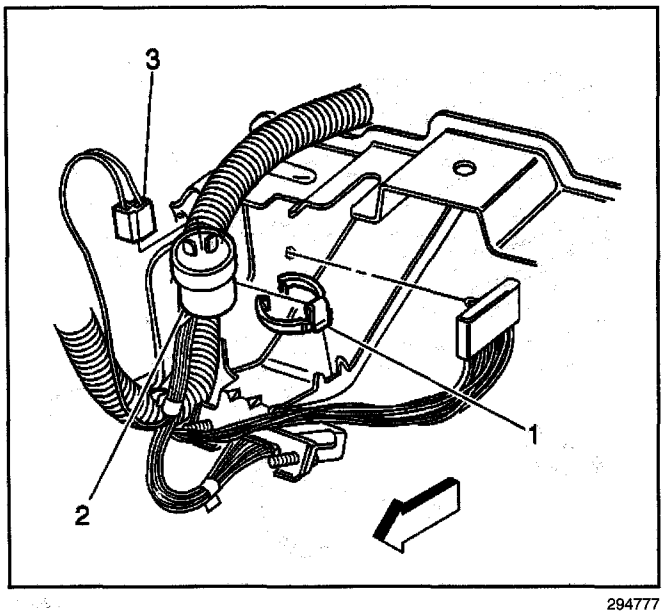
1. Remove the clip (1) from the instrument panel tie bar.
2. Disconnect the turn signal flasher (2) electrical connector (3).
3. Remove the clip (1) from the turn signal flasher (2).



294777

Installation Procedure

1. Install the clip (1) to the turn signal flasher (2).
2. Connect the turn signal flasher (2) electrical connector (3).
3. Install the clip (1) to the instrument panel tie bar.

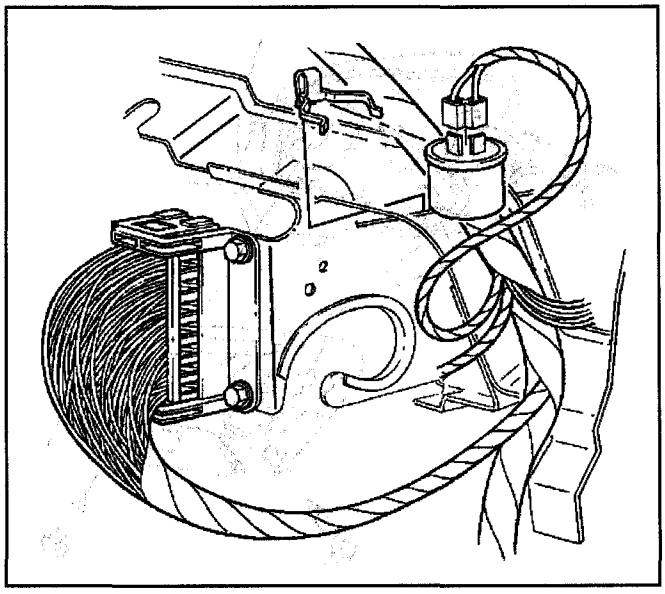


294777

Hazard Lamp Flasher Replacement

Removal Procedure

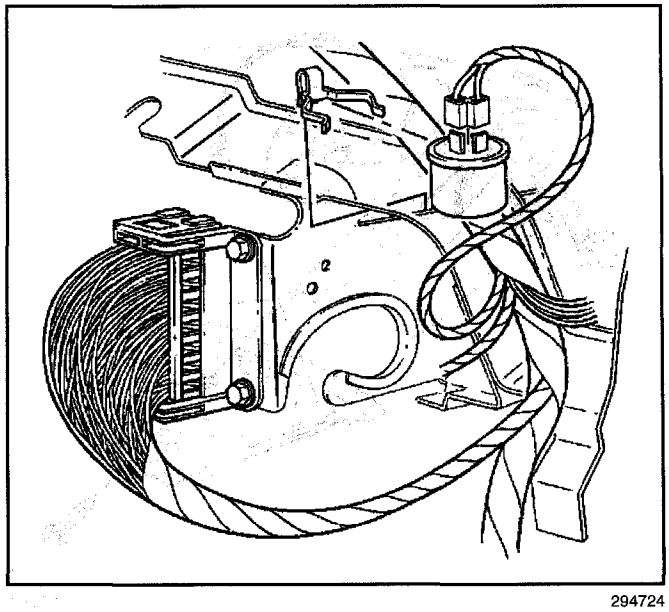
1. Remove the instrument panel driver knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges and Console.
2. Remove the retaining clip from the 48 way connector bracket.
3. Remove the hazard lamp flasher from the retaining clip.
4. Disconnect the hazard lamp flasher electrical connector.



294724

Installation Procedure

1. Connect the hazard lamp flasher electrical connector.
2. Install the hazard lamp flasher to the retaining clip.
3. Install the retaining clip to the 48 way connector bracket.
4. Install the instrument panel driver knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges and Console.

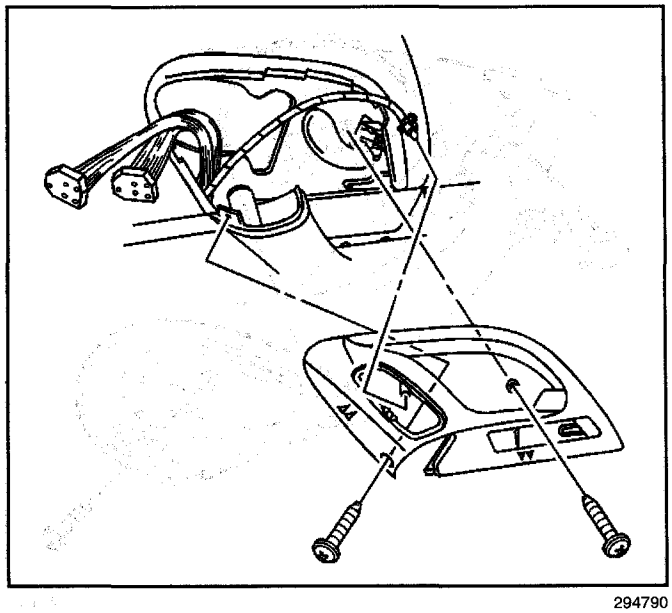


294724

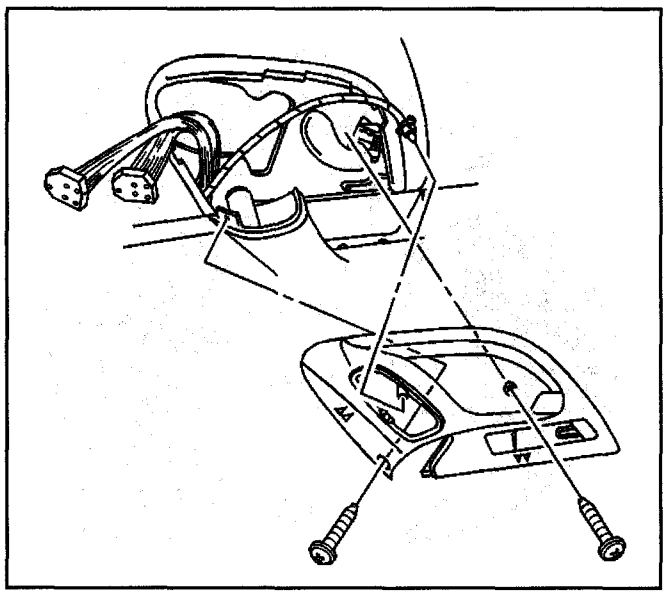
Door Lamp Replacement (Chevrolet)

Removal Procedure

1. Remove the door switch panel from the door.
2. Disconnect the switches electrical connectors.
3. Remove the inside handle bezel screws.
4. Remove the inside handle bezel.
5. Disconnect the harness socket from the bezel.
6. Remove the bulb from the socket.



294790



294790

Installation Procedure

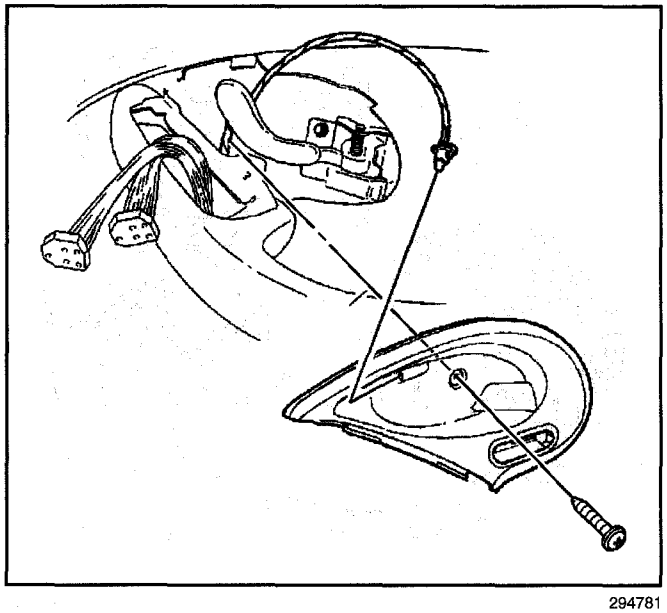
1. Install the bulb to the socket.
2. Connect the harness socket to the bezel.
3. Install the inside handle bezel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the inside handle bezel screws.

   Tighten

   Tighten the inside handle bezel screws to 1.4 N·m (12 lb in).
5. Connect the switches electrical connectors.
6. install the door switch panel to the door.

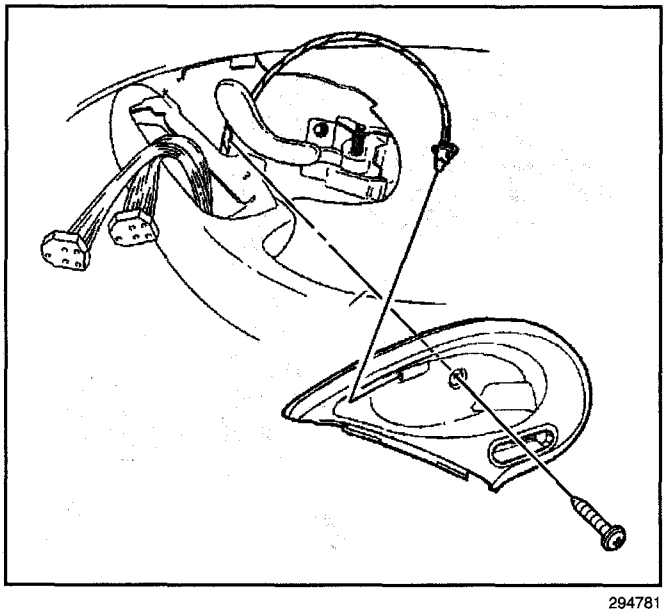


294781

Door Lamp Replacement (Pontiac)

Removal Procedure

1. Remove the door switch panel from the door.
2. Disconnect the switches electrical connectors.
3. Remove the inside handle bezel screw.
4. Remove the inside handle bezel.
5. Disconnect the socket from the inside handle bezel.
6. Remove the bulb from the socket.



294781

Installation Procedure

1. Install the bulb to the socket.
2. Install the socket to the inside handle bezel.
3. Install the inside handle bezel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the inside handle bezel screw.

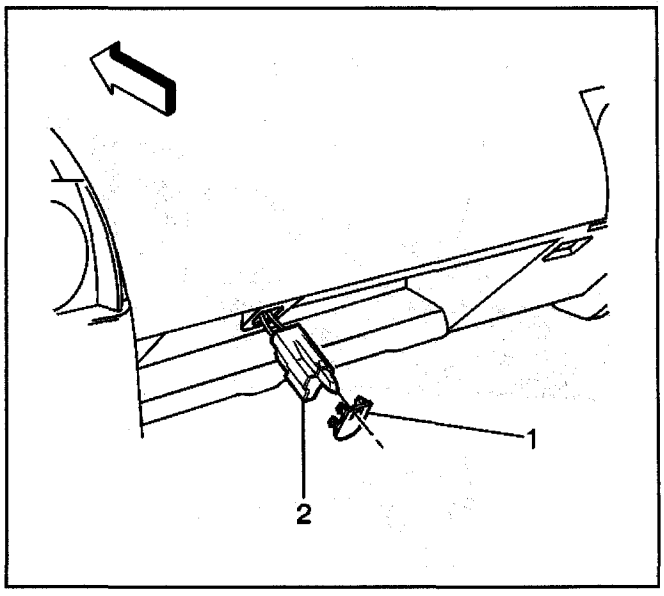
   Tighten

   Tighten the inside handle bezel screw to 1.4 N·m (12 lb in).
5. Install the door switch panel to the door.
6. Connect the switches electrical connectors.

IP Compartment Lamp Replacement

Removal Procedure

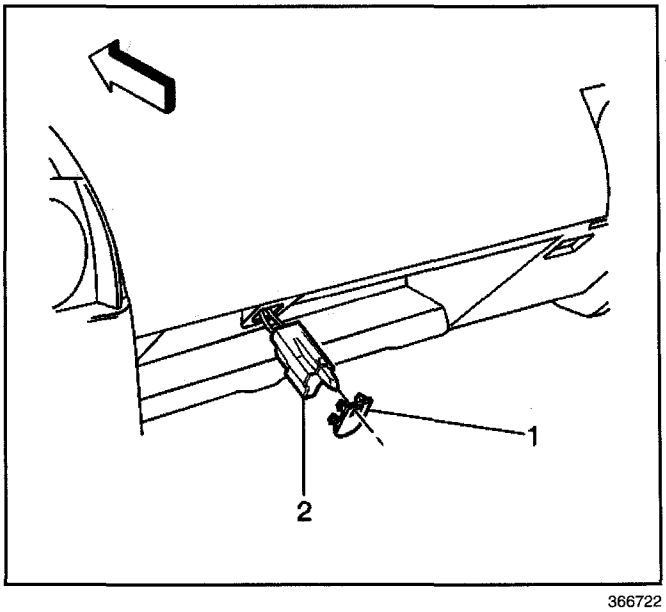
1. Open the I/P compartment door.
2. Remove the bulb from the harness connector (2).
3. Remove the retainer (1) and connector (2) from the I/P compartment, if necessary.



366722

Installation Procedure

1. Install the retainer (1) and connector (2) to the I/P compartment, if necessary.
2. Install the bulb to the harness connector (2).
3. Close the I/P compartment door.

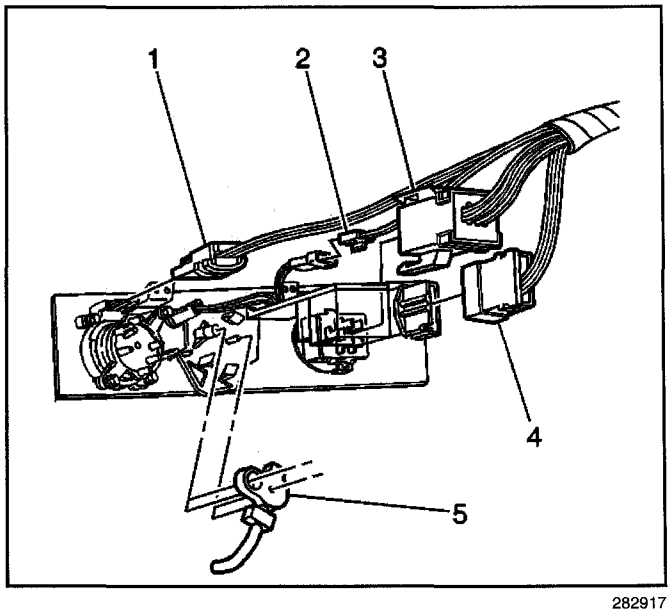


366722

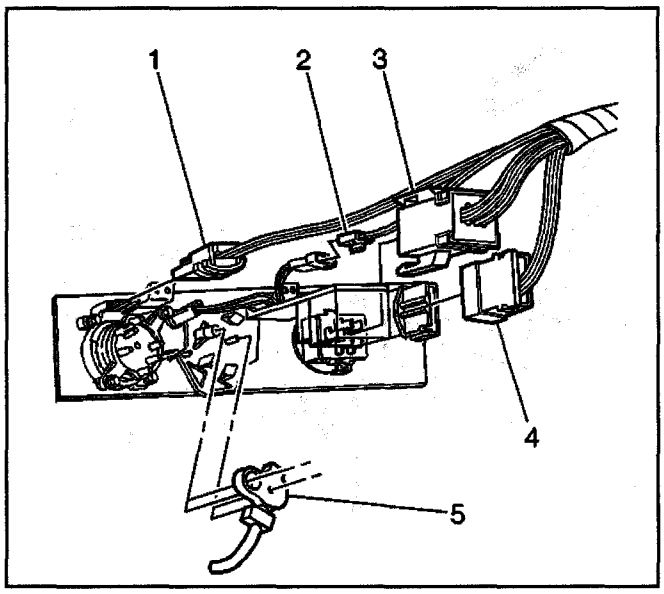
HVAC Control Lamp Replacement

Removal Procedure

1. Remove the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems With AC-Manual
2. Disconnect the HVAC bulb jumper connector (2).
3. Disconnect the harness socket from the HVAC control.
4. Remove the bulb from the socket.



282917



282917

Installation Procedure

1. Install the bulb to the socket.
2. Connect the harness socket to the HVAC control.
3. Cconnect the HVAC bulb jumper connector (2).
4. Install the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems With AC-Manual

Courtesy Lamp Replacement - Rear Quarter

Removal Procedure

1. Remove the rear courtesy lamp from the quarter trim finishing panel.
2. Disconnect the electrical connector from the courtesy lamp.

Installation Procedure

1. Connect the electrical connector to the courtesy lamp.
2. Install the rear courtesy lamp to the quarter trim finishing panel.

Trans Flr Shift Control Indicator Lamp Replacement

Removal Procedure

1. Remove the front floor console transmission opening trim plate.
2. Remove the bulb and socket from the front floor console transmission opening trim plate.
3. Remove the bulb from the socket.

Installation Procedure

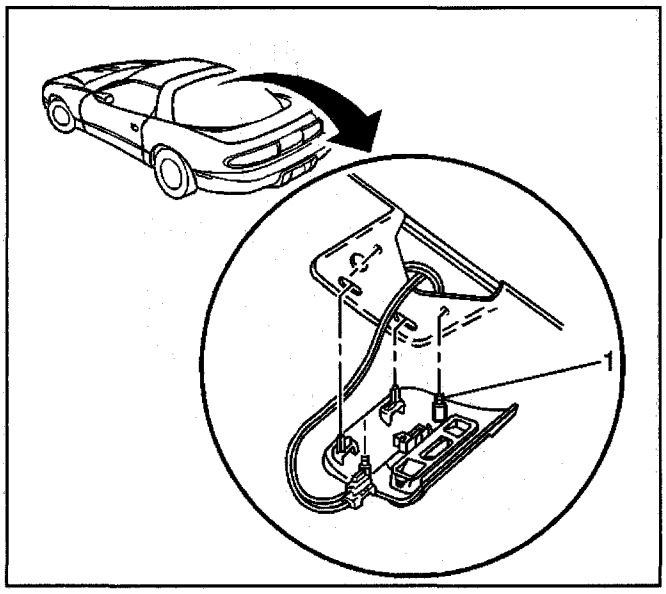
1. Install the bulb to the socket.
2. Install the bulb and socket to the front floor console transmission opening trim plate.
3. Install the front floor console transmission opening trim plate.

   Snap the trim plate in place to secure the trim plate.

Dome Lamp Replacement

Removal Procedure

1. Remove the dome lamp bolts (1).
2. Disconnect the electrical connector from the dome lamp.
3. Remove the dome lamp bulb from the dome lamp.



294786

Installation Procedure

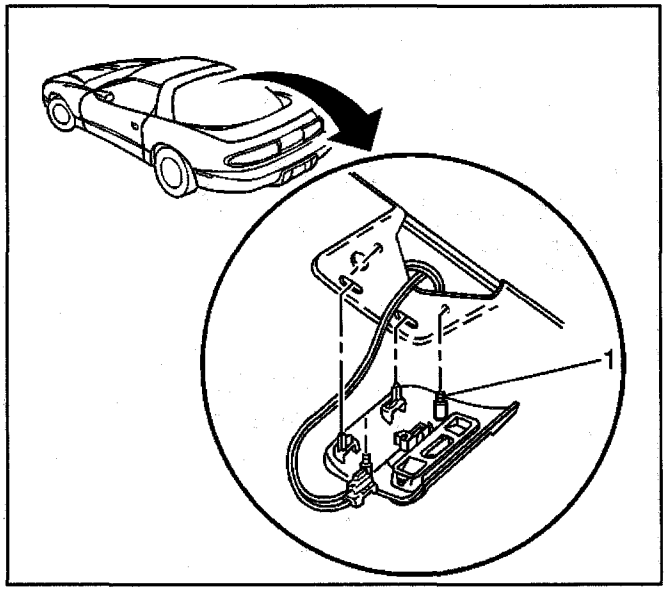
1. Install the dome lamp bulb to the dome lamp.
2. Connect the electrical connector to the dome lamp.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the dome lamp bolts (1).

   Tighten

   Tighten the dome lamp bolts (1) to 1.7 N·m (15 lb in).

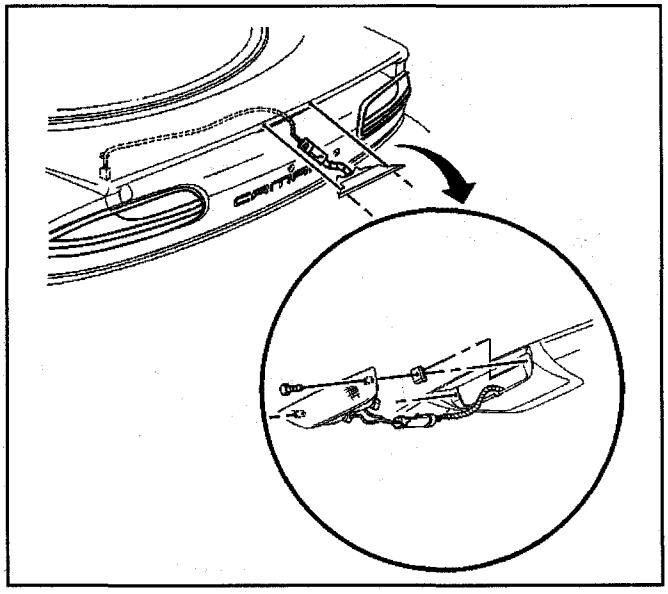


294786

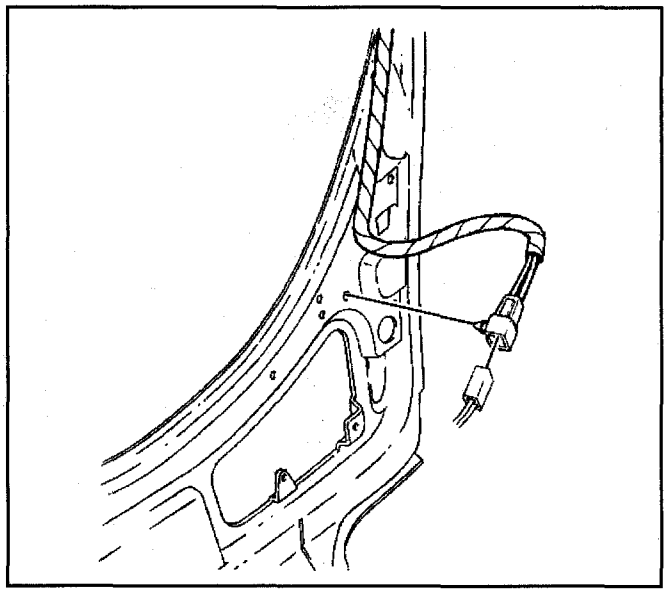
High Mounted Stoplamp Replacement (Chevrolet)

Removal Procedure

1. Remove the high mount stoplamp screws.
2. Remove the liftgate window trim panel. Refer to *Trim Panel Replacement - Liftgate*

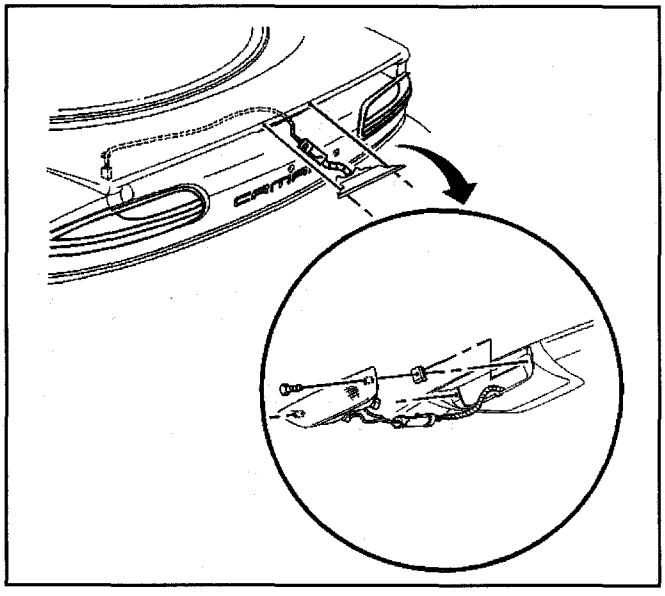


294755



294758

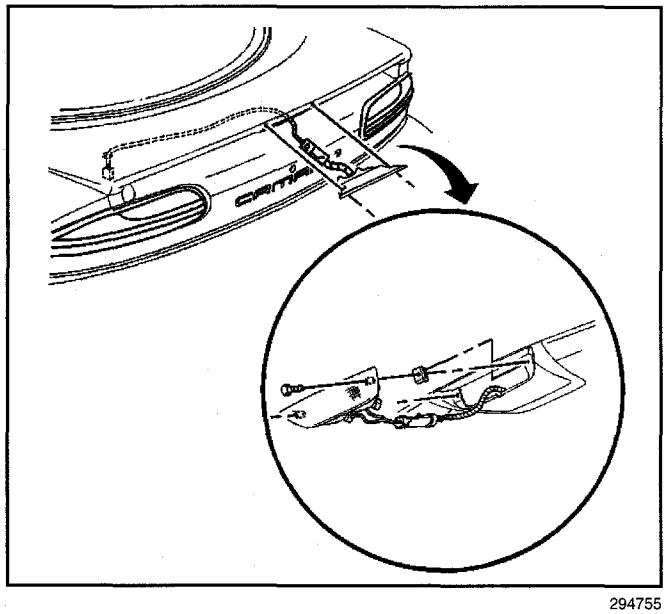
3. Disconnect the high mount stoplamp connector from the electrical harness.



294755

4. Remove the high mount stoplamp from the rear end spoiler.

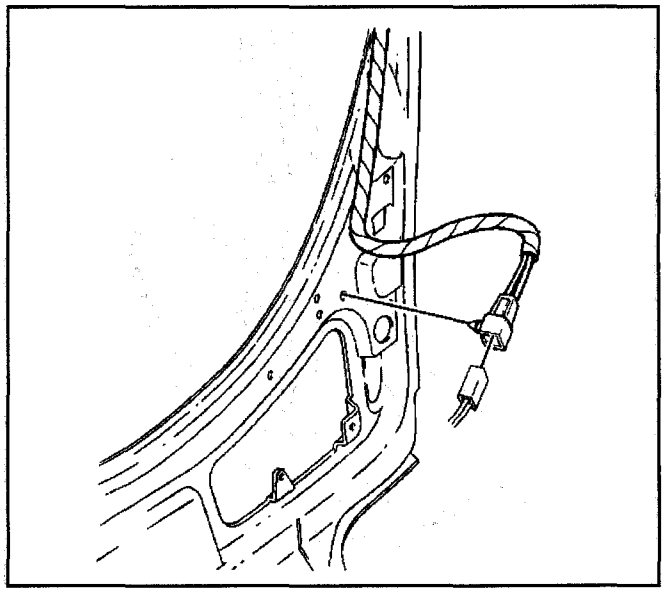
Installation Procedure



294755

1. Install the high mount stoplamp to the rear end spoiler.

2. Connect the high mount stoplamp connector to the electrical harness.
3. Install the liftgate window finishing lace. Refer to *Trim Panel Replacement - Liftgate*



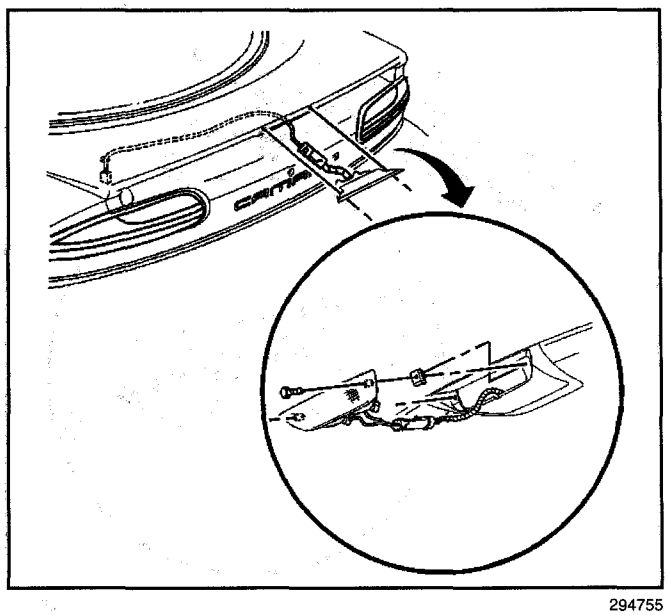
294758

Notice: Refer to *Fastener Notice*

4. Install the high mount stoplamp screws.

   Tighten

   Tighten the high mount stoplamp screws to 1.7 N·m (15 lb in).

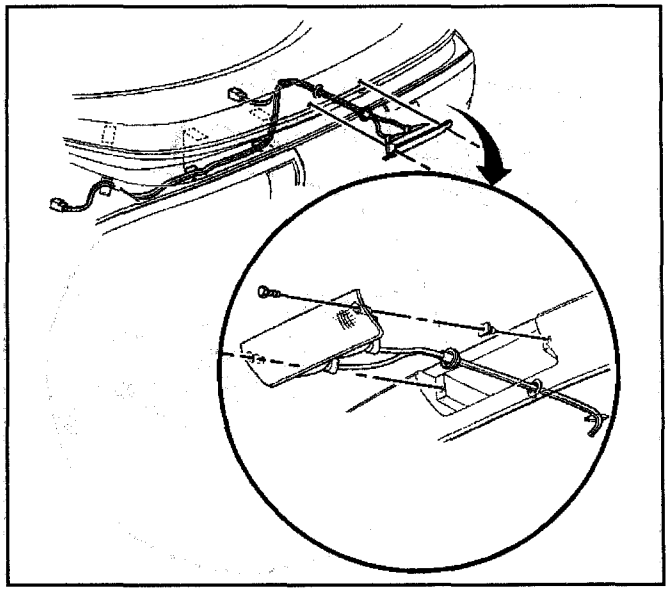


294755

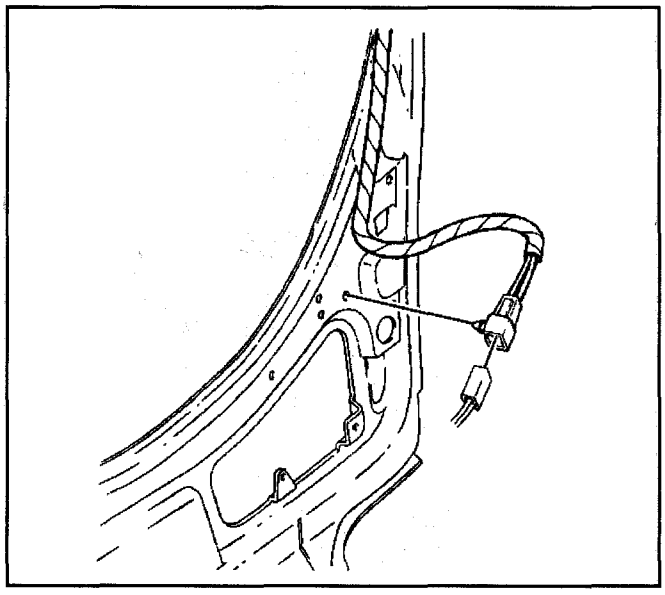
High Mounted Stoplamp Replacement (Pontiac)

Removal Procedure

1. Remove the high mount stoplamp screws.
2. Remove the liftgate window finishing lace. Refer to *Trim Panel Replacement - Liftgate*

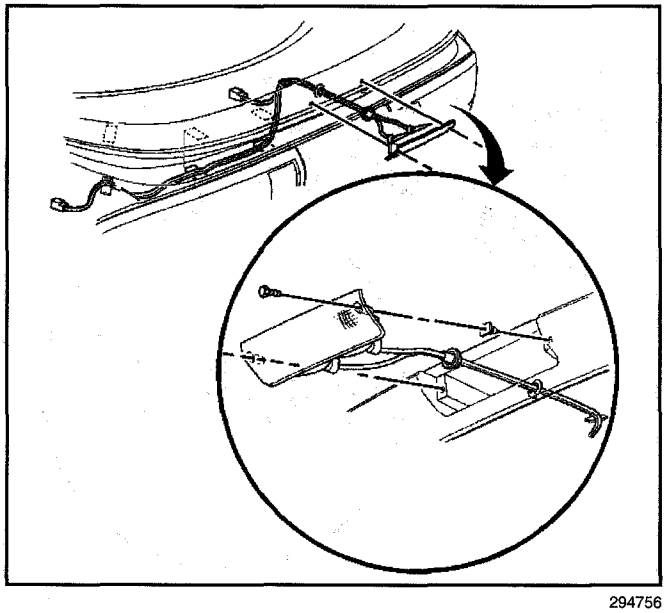


294756



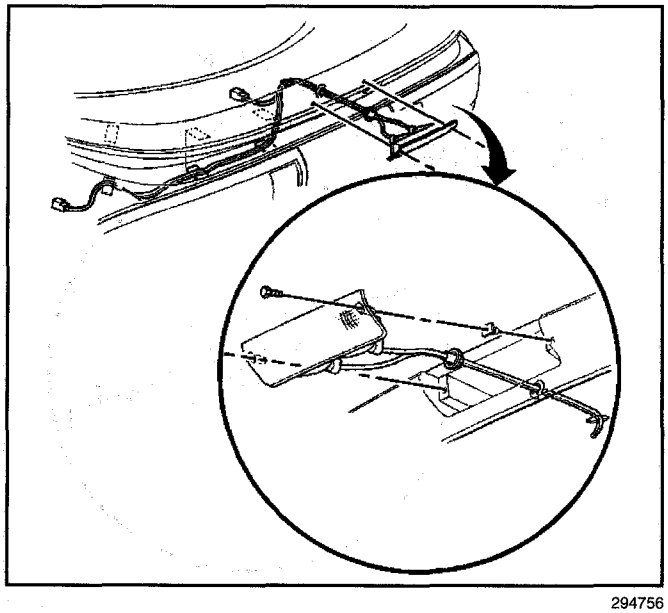
294758

3. Disconnect the high mount stoplamp connector from the electrical harness.



294756

4. Remove the high mount stoplamp from the rear end spoiler.

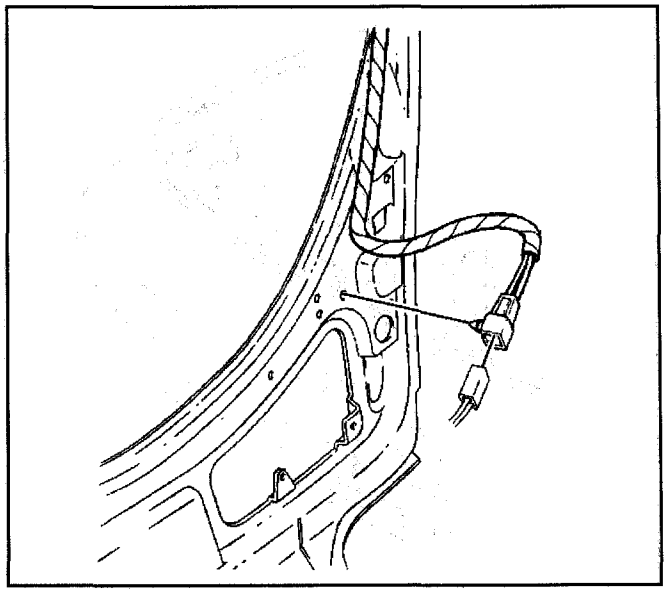


294756

Installation Procedure

1. Install the high mount stoplamp to the rear end spoiler.

2. Connect the high mount stoplamp connector to the electrical harness.
3. Install the liftgate window finishing lace. Refer to *Trim Panel Replacement - Liftgate*

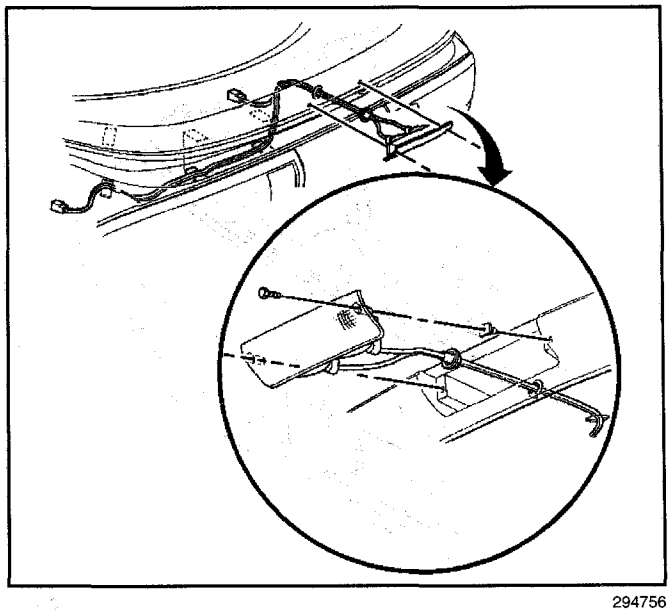

294758

Notice: Refer to *Fastener Notice*

4. Install the high mount stoplamp screws.

   Tighten

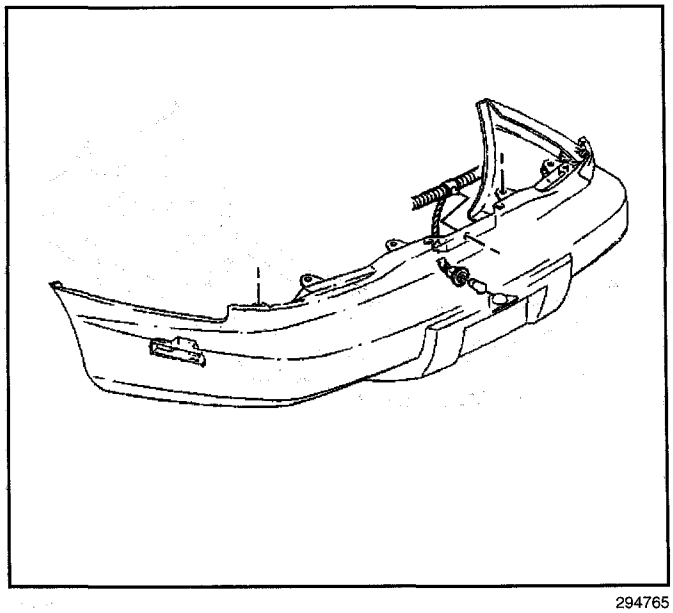
   Tighten the high mount stoplamp screws to 1.7 N·m (15 lb in).

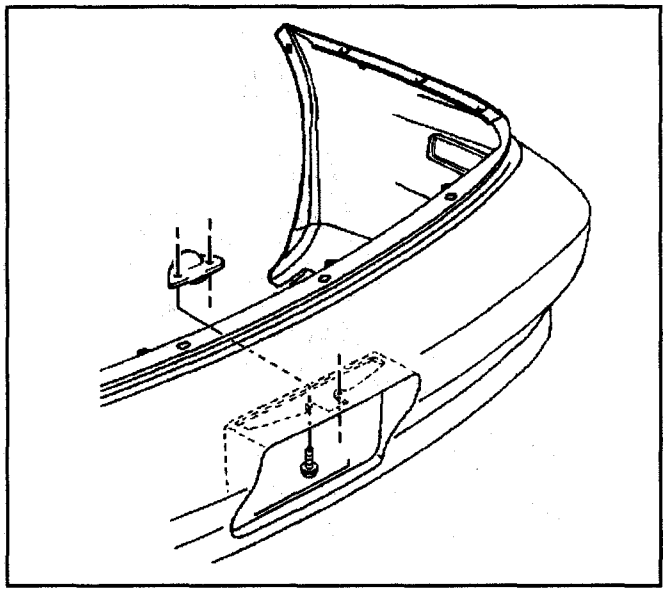

294756

License Lamp Replacement

Removal Procedure

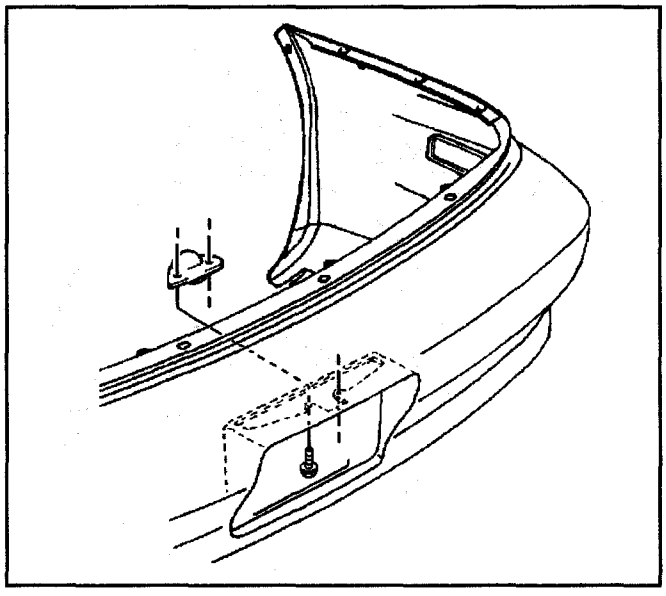
1. Disconnect the rear license lamp electrical connector.


294765



294766

2. Remove the rear license lamp screws.
3. Remove the rear license lamp from the rear bumper fascia.



294766

Installation Procedure

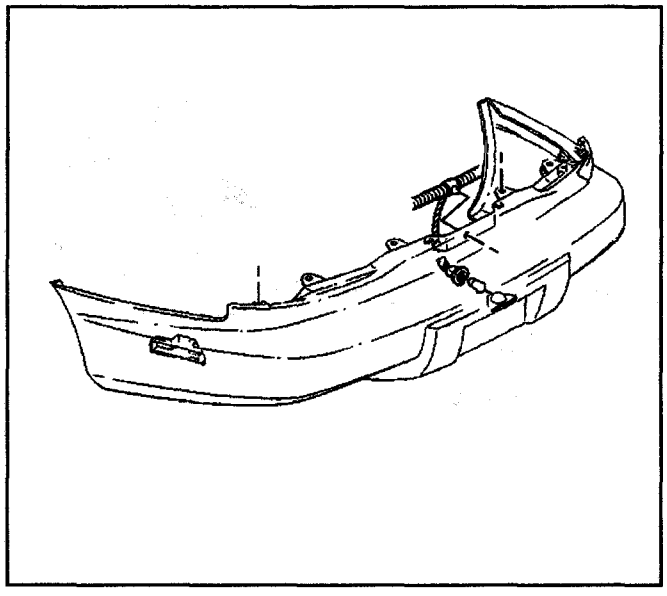
1. Install the rear license lamp to the rear bumper fascia.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the rear license lamp screws.

   Tighten

   Tighten the rear license lamp screws to 1.9 N·m (17 lb in).



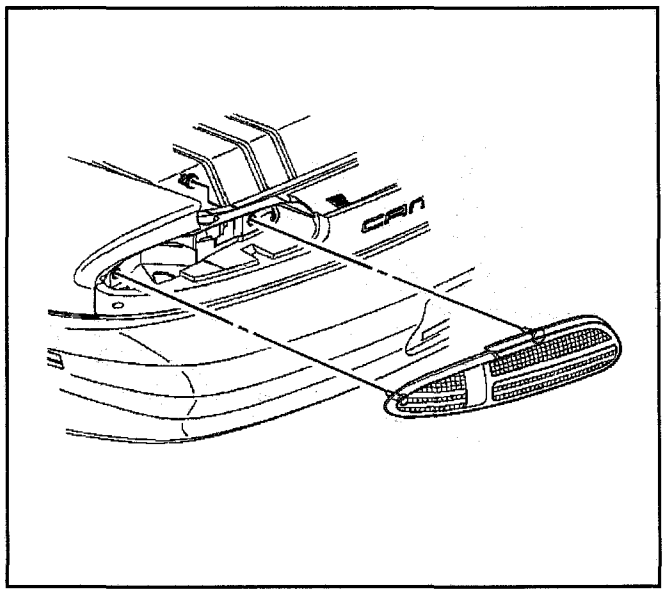
294765

3. Connect the rear license lamp electrical connector.

Tail Lamp Replacement (Chevrolet)

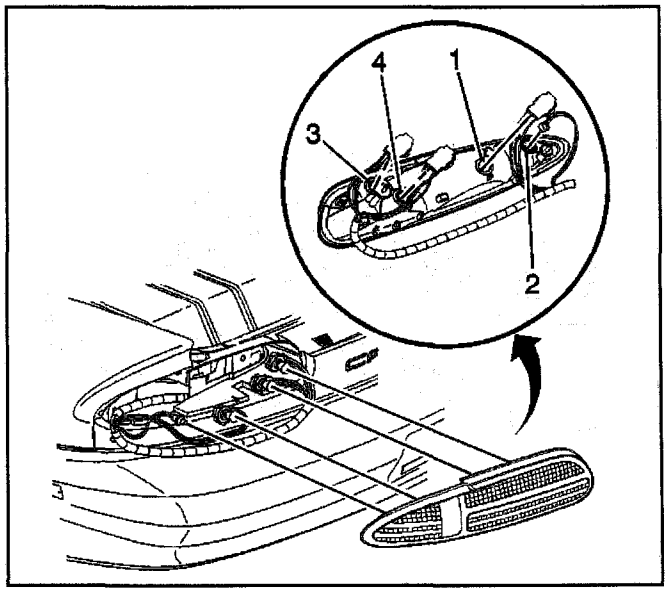
Removal Procedure

1. Reposition the rear compartment trim to access the taillamp nuts.
2. Remove the taillamp nuts.
3. Pull the taillamp outward from the rear end finishing panel.



294768

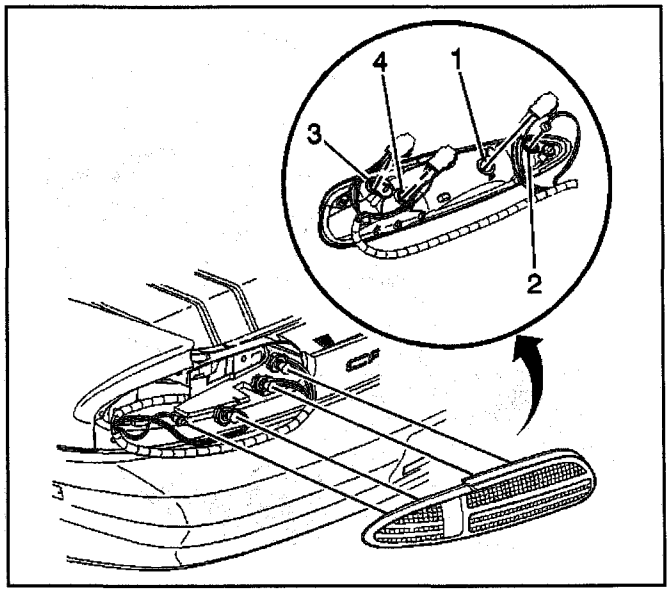
4. Remove the following wiring harness sockets from the taillamp:
   - The taillamp/stoplamp socket (1)
   - The taillamp socket (2)
   - The back-up lamp socket (3)
   - The turn signal socket (4)



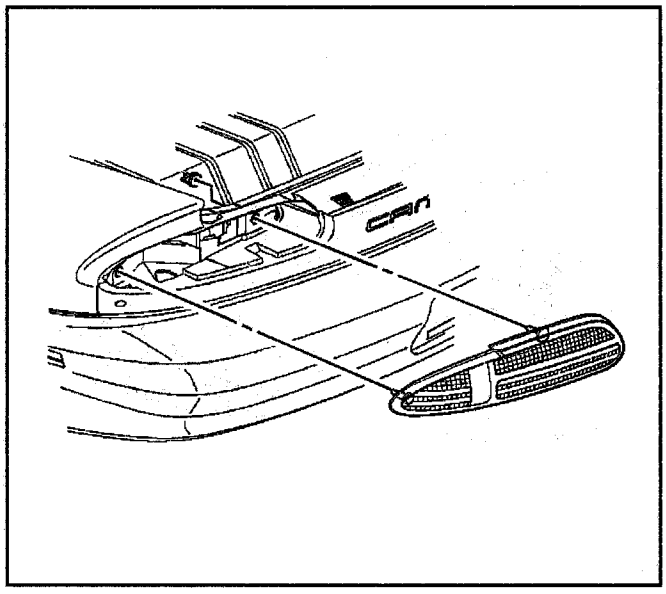
294769

Installation Procedure

1. Install the following wiring harness sockets to the taillamp.
   - The turn signal socket (4)
   - The back-up lamp socket (3)
   - The taillamp socket (2)
   - The taillamp/stoplamp socket (1)



294769



294768

2. Install the taillamp to the rear end finishing panel.

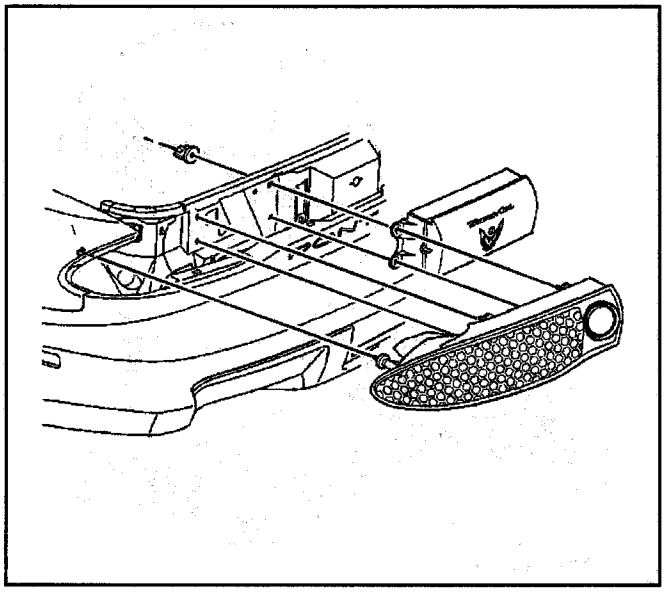
Notice: Refer to *Fastener Notice*

3. Install the taillamp nuts.

   Tighten

   Tighten the taillamp nuts to 3 N·m (27 lb in).

4. Reinstall the rear compartment trim.



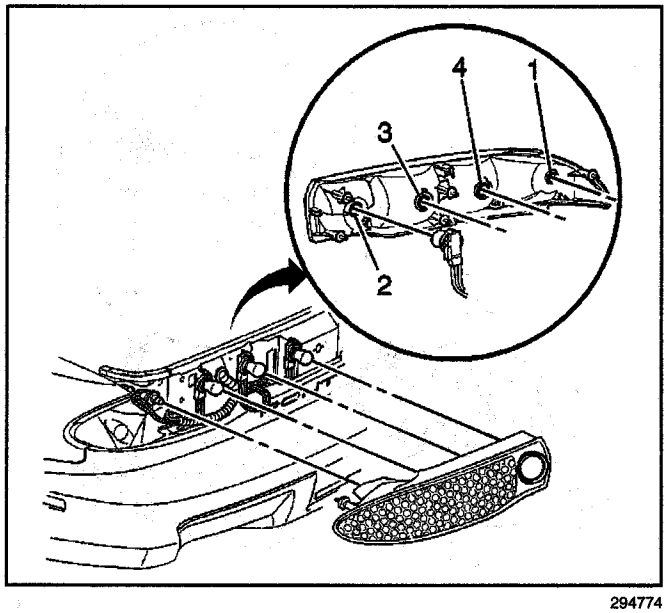
294772

Tail Lamp Replacement (Pontiac)

Removal Procedure

1. Reposition the rear compartment trim to access the taillamp nuts.
2. Remove the taillamp nuts.
3. Remove the taillamp from the rear end panel.
4. Remove the taillamp filler, if needed.

   Remove both taillamps in order to replace the taillamp filler.

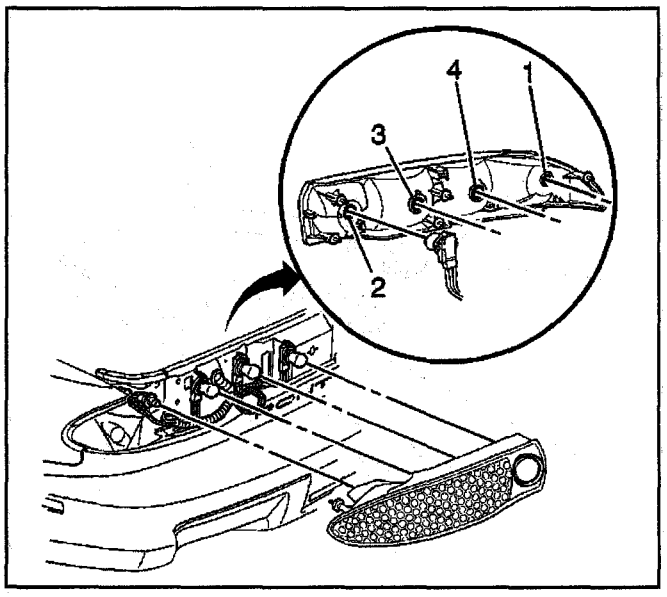


294774

5. Remove the following wiring harness sockets remove the taillamp:
   - The taillamp socket (1)
   - The taillamp/stoplamp/turn signal sockets (3, 4)
   - The back-up lamp socket (2)

Installation Procedure

1. Install the following wiring harness sockets to the taillamp.
   - The back-up lamp socket (2)
   - The taillamp/stoplamp/turn signal sockets (3, 4)
   - The taillamp socket (1)
2. Install the taillamp filler, if needed.



294774

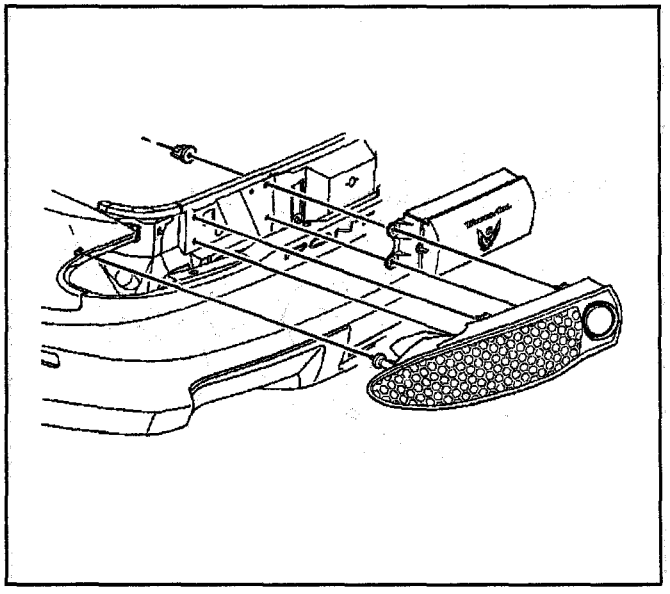
3. Install the taillamp to the rear end panel.

Notice: Refer to *Fastener Notice*

4. Install the taillamp nuts.

   Tighten

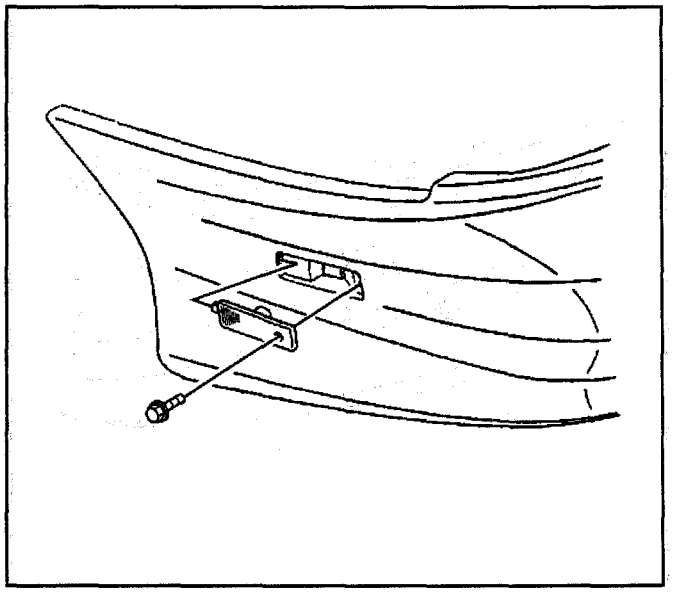
   Tighten the taillamp nuts to 3 N·m (27 lb in).
5. Reinstall the rear compartment trim.

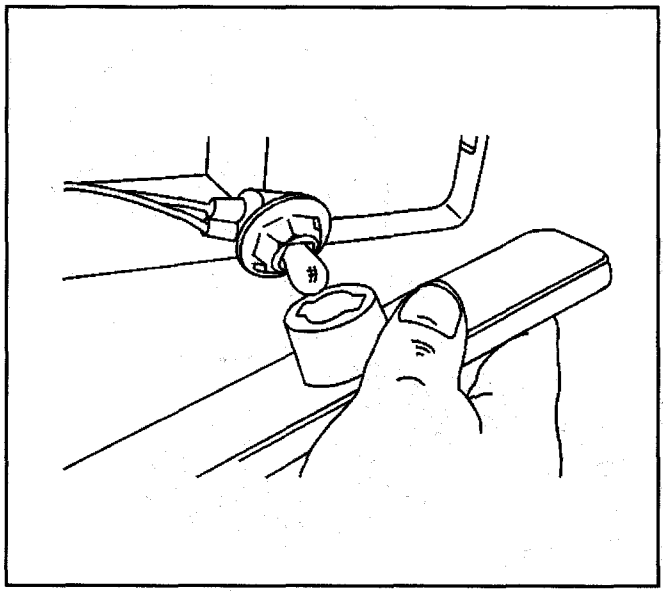

294772

Side Marker Lamp Replacement

Removal Procedure

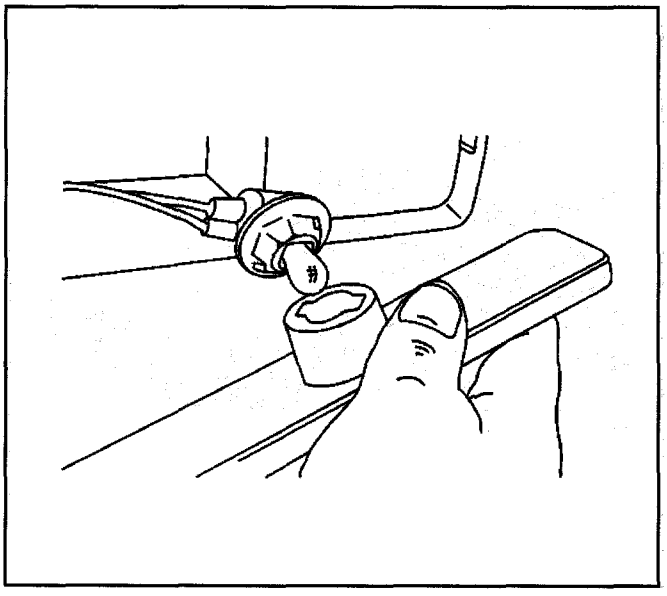
1. Remove the rear sidemarker lamp screw from the rear sidemarker lamp.


294767



402703

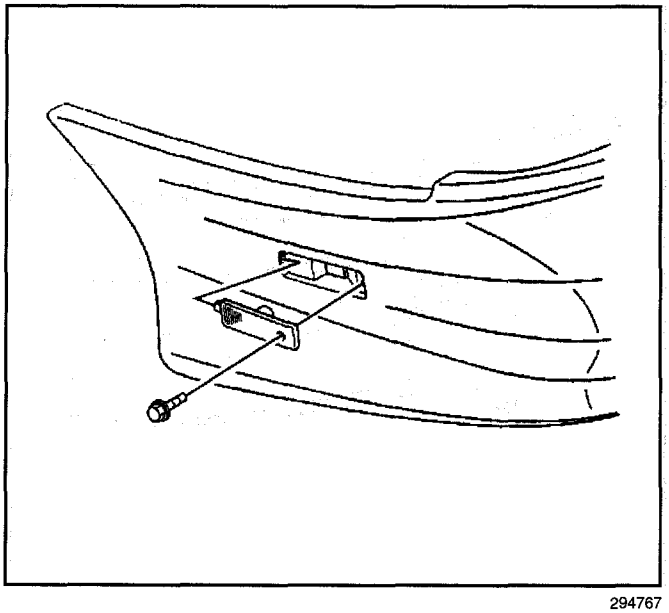
2. Remove the harness socket from the rear sidemarker lamp.
3. Remove the rear sidemarker lamp from the rear fascia.



402703

Installation Procedure

1. Install the rear sidemarker lamp from the rear fascia.
2. Install the harness socket from the rear sidemarker lamp.



294767

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the rear sidemarker lamp screw to the rear sidemarker lamp.

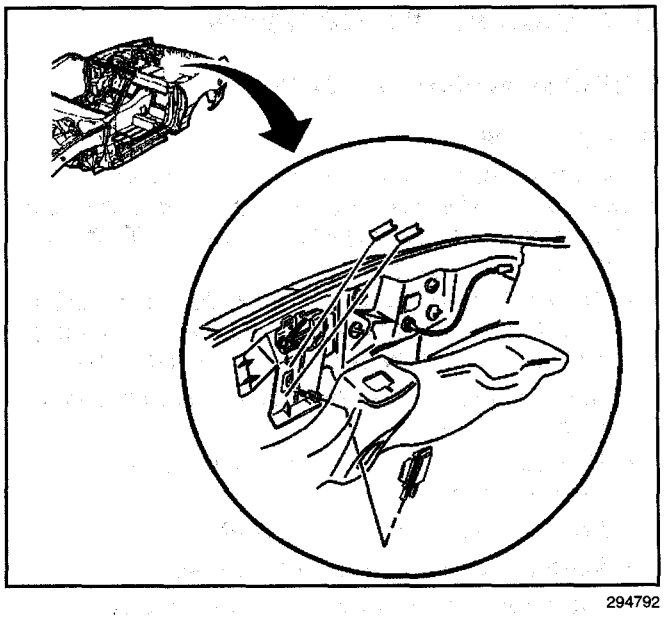
   Tighten

   Tighten the rear sidemarker lamp screw to 1.4 N·m (12 lb in).

Rear Compartment Lamp Replacement

Removal Procedure

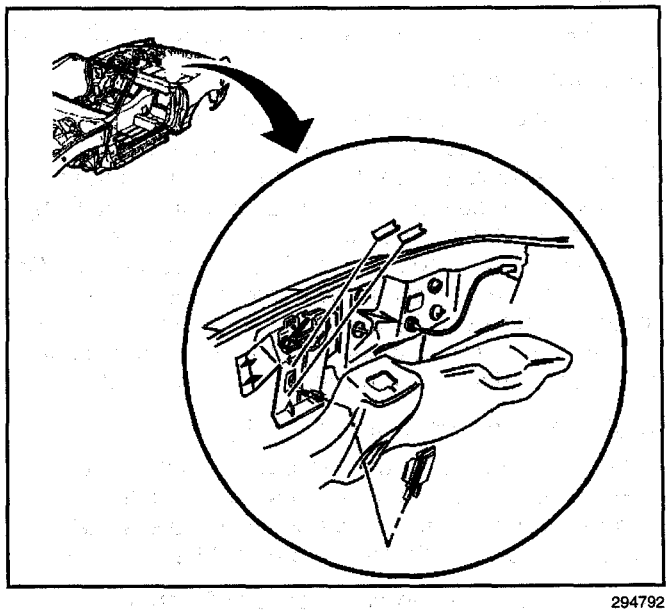
1. Unsnap the rear compartment lamp from the rear finish panel.
2. Disconnect the electrical connector from the lamp.
3. Push the top of the rear compartment lamp bulb down in order to remove the bulb from the clips.



294792

Installation Procedure

1. Install the rear compartment lamp bulb to the lamp by performing the following actions:
   1.1. Push the top of the metal strip down.
   1.2. Attach the bulb to the clips.
2. Connect the electrical connector to the lamp.
3. Snap the rear compartment lamp to the rear finish panel.



294792

Description and Operation

Lighting System Description

Halogen Bulbs

Caution: Halogen bulbs contain gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

- ***Turn off the lamp switch and allow the bulb to cool before changing the bulb. Leave the lamp switch off until the bulb change is complete.***
- ***Always wear eye protection when changing a halogen bulb.***
- ***Handle the bulb only by its base. Avoid touching the glass.***
- ***Do not drop or scratch the bulb.***
- ***Keep dirt and moisture off the bulb.***
- ***Place the used bulb in the new bulb's carton and dispose of it properly.***
- ***Keep halogen bulbs out of the reach of children***

Back-up Lamps

On Chevrolet vehicles, the back-up lamps are located on the upper, innermost side of the taillamp. On Pontiac vehicles, the back-up lamps are located on the innermost side of the taillamp, next to the taillamp filler. The back-up lamps will come on when the transmission is placed into the REVERSE position. On vehicles with automatic transmissions, the back-up lamps are activated by the park/neutral position switch. On vehicles with a manual transmission, the back-up lamps are activated by the back-up lamp switch.

Daytime Running Lamps (DRL)

All vehicles are equipped with daytime running lamps (DRL). The DRL system includes a solid state module, and on Chevrolet vehicles only the system includes an automatic control ambient light sensor.

Chevrolet and Canadian Chevrolet/Pontiac

The light sensor is located on the I/P, inside of the vent grille. The light sensor triggers the DRL module to turn on the turn signal lamps when all of the following conditions apply:

- The vehicle has been started.
- The vehicle is in daylight.
- The headlamp switch is in the OFF position.

Turning the headlamps on manually overrides the DRL system. The following lights are not on when the DRL are on:

- The I/P lights
- The taillamps

The car light sensor triggers the module to turn the headlamps ON under the following conditions:

- At dusk
- If the car is started in the darkness

The light sensor will perform the following actions after sunrise, or when the vehicle is in a bright enough area:

- Turn OFF the headlamps
- Turn ON the turn signal lamps

Pontiac

The DRL system turns the turn signal lamps ON when the vehicle is started. The turn signal lamps will stay on until the headlamps are turned on manually in order to override the system.

Front Fog Lamps

On Chevrolet vehicles equipped with fog lamps, the fog lamp switch is located above the radio and to the right of the steering wheel. On Pontiac vehicles, the fog lamp switch is located below the headlamp and instrument panel dimmer switch, to the left of the steering column. Perform the following steps in order to use the fog lamps:

1. Turn on the headlamps or the parking lamps.
2. Push the right side of the fog lamp switch in order to turn on the fog lamps.
3. Push the left side of the fog lamp switch in order to turn off the fog lamps.

Do not use the fog lamps as a substitute for the headlamps.

Switching to the high-beam headlamps will turn the fog lamps off. Switching back to low-beam headlamps will turn the fog lamps on again.

Aim the fog lamps for proper illumination of the road. Inspect the fog lamp aim after the following situations:

- When a new bulb is installed
- If service repairs to the front end area may have disturbed the fog lamp mounting

Front Sidemarker Lamps

On Chevrolet vehicles, the front sidemarker lamps are part of the park and turn signal lamp. On Pontiac vehicles, the front side marker lamp on the outer sides of the front fascia. The front sidemarker lamps will come on when either of the following lamps are on:

- The headlamps
- The parking lamps

The front sidemarker lamps also have reflectors that will shine when light strikes the reflectors. The reflectors will shine whether or not the vehicle lamps are on.

The appropriate front sidemarker lamps will flash in unison with the front turn signal lamp on the same side when one of the following situations occurs:

- The headlamps are off when a turn is signaled.
- The parking lamps are off when a turn is signaled.

The front sidemarker lamp and the front turn signal lamp will flash alternately when one of the following situations exists:

- The headlamps are on and a turn is signaled.
- The parking lamps are on and a turn is signaled.

Hazard Lamp Flasher

The hazard warning flashers are part of the turn signal circuit. The hazard warning switch is on the right side of the steering column. Pressing in on the hazard warning switch button causes the following lamps to flash:

- The front turn signal lamps
- The rear turn signal lamps
- The front sidemarker lamps

Pulling on the hazard warning switch knob will turn off the hazard warning flashers.

The hazard warning flashers will work with the ignition switch in any position. When the hazard warning flashers are on, the turn signals do not work.

Headlamps

The headlamps are controlled by the headlamp switch. The headlamp switch is located in the headlamp and instrument panel lamp dimmer switch to the left of the steering column. The headlamps will come on with the ignition switch in any position. The headlamps are turned on by rotating the headlamp switch completely to the right. The headlamps are turned off by turning the headlamp switch completely to the left.

The following headlamps beams are controlled by the multi-function lever (turn signal lever) that is located on the left side of the steering column:

- The headlamp low-beam
- The headlamp high-beam

Once the headlamps are on, the headlamp beam can be changed as described below:

- From high-beam to low-beam
- From low-beam to high-beam

Change the headlamp beam by pulling the lever toward the driver seat until the switch clicks. An indicator lamp on the instrument cluster will come on when the high-beam headlamps are on.

Important: Some state and local laws specify requirements for headlamp aim. You must follow these laws.

Aim the headlamps for proper illumination of the road. Inspect the headlamp aim when one of the following situations occurs:

- A new headlamp is installed.
- Service repairs are made to the front end area that may have disturbed the headlamp or the headlamp mounting.

High-Mount Stoplamp

The high-mount stoplamp is located in the center of the rear end spoiler. The high-mount stoplamp illuminates whenever the brake pedal is pushed down. The lamp is powered separately from the taillamps through a circuit in the stoplamp switch.

Parking and Turn Signal Lamps

When the turn signals are activated, the appropriate front parking lamp flashes to signal a turn. The turn signal works only when the following conditions apply:

- The ignition switch is on.
- The hazard lamp flashers are turned off.

The turn signals are controlled by the mulit-function lever. The multi-function lever is located on the left side of the steering column. Moving the lever up or down (past the detent) will activate the turn signals. When the turn is complete the following actions will occur:

- The multi-function lever will return to the horizontal position.
- The turn signals will stop flashing.

Move the signal only to the first detent and hold it there during the following actions:

- Changing lanes
- Shallow turns where the steering wheel does not turn far enough to cancel the signal

When you release the lever, the lever will return to the horizontal and the turn signal will cancel.

Rear License Lamp

The rear license lamp will come on when the headlamps are on. The rear license lamp is mounted on the rear bumper fascia above the license plate.

Rear Sidemarker Lamps

The rear sidemarker lamps are mounted on the rear bumper fascia. The rear sidemarker lamps will come on when the headlamps are on. The rear sidemarker lamps also have reflectors that shine when the reflectors are struck by light. The reflectors will shine whether or not the vehicle's lamps are on.

Taillamps

The following lamps are part of the taillamp:

- The taillamps
- The back-up lamps
- The turn signal lamps

Turning on the headlamps will also turn on the taillamps. When the brake pedal is pushed down, the taillamps will glow brighter in order to function as stoplamps.

If the brake pedal is held down when a turn is signaled, the following situations will occur:

- One side will flash
- The other side will stay on brightly

Turn Signal Lamp Flasher

The turn signal lamp flasher is mounted behind the instrument panel above the data link connector to the knee bolster bracket.

Ashtray Lamp

On vehicles equipped with a manual transmission, the ashtray lamp is mounted beneath the ashtray. The ashtray lamp will come on when the headlamps are turn on. On vehicles equipped with an automatic transmission, the ashtray light comes from the automatic transmission range selector indicator lamp through a small tunnel. The ashtray lamp will come on when the headlamps are turned on.

Automatic Transmission Range Selector Indicator Lamp

On vehicles with an automatic transmission, the automatic transmission range selector indicator lamp will illuminate the transmission control indicator lamp. The transmission control indicator lamp is located on the front floor console. The automatic transmission range selector indicator lamp will come on when one of the following lamps are turned on:

- The parking lamps
- The headlamps

Dome and Reading Lamps

On coupes and T-top equipped vehicles, the dome lamp is located on the roof, above the rear seat. The dome lamp will come on when one of the following conditions apply:

- A door is opened.
- The interior lamps are turned on.

To turn on the interior lamps, rotate the thumbwheel switch, located to the left of the headlamp switch, full up.

The front reading lamps are part of the inside rearview mirror on the following types of vehicles:

- Coupes
- Convertibles
- Vehicles equipped with T-tops

When the doors are closed, use the lamp switch in order to turn a reading lamp on or off. When the doors are open, the reading lamps will come on and stay on until the doors are closed.

Front Side Door Courtesy Lamps

The front side door courtesy lamps are mounted behind the front side door inside handle bezels. The front side door courtesy lamps come on when the driver turns on the parking lamps or the headlights. The front side door courtesy lamps illuminate the door handles and controls.

Heater, Ventilation, and Air Conditioning

The HVAC control lamp is mounted on the back of the HVAC control. The HVAC control lamp will come on when the headlamps are turned on. The HVAC control lamp illuminates the HVAC control knobs.

Instrument Panel Compartment Lamp

The instrument panel compartment lamp lights when the instrument panel compartment door is opened.

Rear Quarter Courtesy Lamps

Convertible

The rear quarter courtesy lamps are mounted in the following areas:

- The right quarter inner rear trim finishing panel
- The left quarter inner rear trim finishing panel

The rear quarter courtesy lamps come on during either of the following situations:

- A door is opened
- The interior lamps are turned on

Rear Compartment Lamp

Convertible

The rear compartment lamp is located in the rear compartment, below the rear compartment lid latch. The rear compartment lamp will come on when the rear compartment lid is opened.

Headlights Circuit Description (Chevrolet)

When the headlamp switch is in the HEAD position voltage is applied through circuit 10 /12 to the headlamp dimmer switch and the right and left low beam headlamp. Ground is always applied to the headlamps through circuit 150 (left) or 250 (right). When the voltage is applied through circuit 12, the low beam headlamps turn on.

When the headlamp dimmer switch is moved to the HIGH position, voltage is also applied through circuit 11 to the right and left high beam headlamps turning them on. When the dimmer switch is in the HIGH position voltage is also applied to the instrument cluster through circuit 11 turning the HIGH BEAM indicator on. Ground is applied to the instrument cluster at all times through circuit 650.

Headlights Circuit Description (Pontiac)

When the headlamp switch is in the HEAD position voltage is applied through circuit 10 to the headlamp dimmer switch. When the dimmer switch is in the LOW position, voltage is applied through circuit 12 to the right and left low beam headlamp. Ground is always applied to the headlamps through circuit 150 (left) or 250 (right). When the voltage is applied through circuit 12, the low beam headlamps turn on.

When the headlamp dimmer switch is moved to the HIGH position, voltage is no longer applied through circuit 12 and the low beam headlamps turn off. Voltage is now applied through circuit 11 to the right and left high beam headlamps turning them on. When the dimmer switch is in the HIGH position, voltage is also applied to the instrument cluster through circuit 11 turning the HIGH BEAM indicator on. Ground is applied to the instrument cluster at all times through circuit 650.

DRL Circuit Description (Chevrolet and Pontiac/Canadian)

The Daytime Running Lamps (DRL) module is designed to automatically operate the exterior lights depending on the outside light conditions.

The DRL module operates in 2 modes:

- The day mode

  In the day mode, the DRL module turns on the low beam headlamps at a reduced intensity when the DRL ambient light sensor detects daylight under the following conditions:

  - The ignition switch is in the RUN position.
  - The headlamps are OFF.
  - The park brake is OFF.

- The low light mode

  In the low light mode, the DRL ambient light sensor detects darkness, turning on the low beam headlamps to full intensity through CKT 10.

  Additionally, the DRL ambient light sensor turns on the following lamps through CKT 9:

  - The park lamps
  - The tail/stop lamps
  - The license lamps
  - The tail lamps
  - The park/turn lamps
  - The tail/stop/turn lamps

If the engine stalls with the DRL module in the low light mode, the DRL module turns off the headlamps while the engine is being cranked. The DRL module turns on the following lamps while the engine is being cranked:

- The park/turn lamps
- The park lamps
- The license lamps
- The tail lamps
- The tail/stop lamps
- The tail/stop/turn lamps

The following lamps operate in the usual manner:

- The headlamp
- The instrument panel lamp dimmer switch

The DRL module receives voltage from the following fuses:

- The TAIL LPS fuse through CKT 240
- The TURN B/U fuse through CKT 141

The following lamps may be operated manually at any time by using the headlamp and the instrument panel lamp dimmer switch:

- The park lamps
- The headlamps

The DRL module does not operate if the system voltage is less than 9 volts or greater than 18 volts.

Daytime Running Lamps (DRL) Ambient Light Sensor

The DRL ambient light sensor is a light sensitive variable resistor. The DRL ambient light sensor's resistance decreases as the outside light intensity increases. The DRL module performs the following functions:

- Measures the voltage drop across the DRL ambient light sensor.
- Determines whether the DRL ambient light sensor should operate in the day mode or the low light mode.

Park Brake Input

The DRL module will not operate any headlamps or exterior lamps if the park brake is applied before the ignition switch is turned to the RUN position. This allows the driver to start the vehicle and keep the headlamps OFF, as long as the park brake is applied. The DRL module activates the headlamps when the park brake is released with the ignition switch in the RUN position. This feature functions only when the park brake is applied before the ignition switch is turned to the RUN position. The headlamps will not turn OFF, if the park brake is applied after the ignition switch is turned to the RUN position.

DRL Circuit Description (Pontiac Domestic)

Daytime Running Lamps (DRL)

The Daytime Running Lamps (DRL) module is designed to automatically operate the exterior lights depending on the outside light conditions. The ambient light sensor is replaced by a jumper.

The DRL module operates when the following occurs:

- The ignition switch is in the RUN position.
- The headlamps are OFF.
- The park brake is OFF.

The DRL module applies voltage to the front turn signal bulbs. Whenever the left or the right turn input is received at the DRL module, the front turn signal bulbs operate normally. When the park lamps or the head lights are on, the DRL removes voltage from the front turn bulbs.

Fog Lights Circuit Description (Domestic)

With the Headlamp Swith in the HEAD or PARK position, voltage is applied to one side of the Fog Lamp Switch. When the Fog Lamp Switch is closed, voltage is applied to one side of the Fog Lamp Relay Coil, energizing the relay (the other side of the coil is grounded through the HI Beam Filament of the Headlamps).

When energized, the normally open contacts of the Fog Lamp Relay close, allowing voltage to be applied to the Fog Lamps.

When the HI Beams are activated, ground is removed to one side of the Fog Lamp Relay Coil, de-energizing the relay and turning off the Fog Lamps.

Fog Lights Circuit Description (European)

With the headlamp switch in the HEAD position voltage is applied to the fog lamp relay circuit 10. When the foglamp switch is turn on a ground is inputted to the BCM through circuit 187. When the BCM recieves this ground from circuit 187, it then sends an output ground signal to the fog lamp relay through circuit 1977. At this point the relay in the fog lamp relay is energized closing the internal switch. Voltage is supplied through circuit 9, the fog lamp relay and then circuit 122 to both fog lamps. The fog lamps turn on when a ground voltage is applied through circuit 122 and ground is provided through circuit 1250.

Headlight Doors Circuit Description

When the headlamp switch is turned to the HEAD position, battery voltage is applied to the headlamp opening door actuator control module through circuit 10. The LH head lamp door opens when battery voltage is applied to the LH headlamp opening door assembly through circuit 576 and ground is applied to circuit 577. The RH headlamp door opens when battery voltage is applied to the RH headlamp opening door assembly through circuit 578 and ground is applied to circuit 579. When the headlamp switch is moved to the OFF position battery voltage is no longer applied to the headlamp opening door actuator module through circuit 10. The LH headlamp door closes when battery voltage is applied to the LH headlamp opening door assembly through circuit 577 and ground is applied to circuit 576. The RH headlamp door closes when battery voltage is applied to the RH headlamp opening door assembly through circuit 579 and ground is applied to circuit 578. Battery voltage is constantly applied to the headlamp opening door actuator control module from the LH HDLP DOOR MiniFuse® (circuit 840) and from the RH HDLP DOOR, MiniFuse (circuit 740). The headlamp opening door actuator control module is grounded by circuit 150 to G106.

Headlight Leveling Circuit Description

Voltage is supplied to the headlamp leveling switch with the headlamp switch in the HEAD position. Circuit 150/250 provides ground under the same conditions.

The headlamp leveling switch provides 4 headlamp leveling positions. When a position is selected a different resistance value is provided to the headlamp leveling actuators. The actuators have a motor logic internally driving a motor to move the headlamps based on the resistance it receives. Ground is provided through circuit 150 (LH) and 250 (RH) to the actuators. Power is also supplied to the actuators through circuit 10 when the headlamp switch is in the HEAD position.

The driver controls both headlamp beams with the headlamp leveling actuators which are mount under the headlamp assembly. This feature is especially useful when the vehicle carries load changes drastically because the use of a switch helps maintain a focused and level headlamp beam.

Exterior Lights Circuit Description

Daytime Running Lamps

The Daytime Running Lamps (DRL) module is designed to automatically operate the exterior lights, depending on the outside light conditions. The DRL control module operates in 2 modes:

- The day mode allows the two front turn signal lamps to be on and non-flashing.
- The night mode allows the following components to be on:
  - Low beam headlamps
  - Front side marker
  - Park/turn lamps
  - Tail lamps

The DRL module operates in the night mode when the DRL ambient light sensor senses darkness. When this happens, the night mode contacts close and voltage is applied to the headlamps and other exterior lights through the same circuit path as when the headlamp switch is in the HEAD position.

The DRL module turns off the headlamps when the engine stalls with the DRL in the night mode. The side marker, park/turn and tail lamps are on while the engine is being cranked. The headlamp switch operates as usual.

Daytime Running Lamps (DRL) Ambient Light Sensor Input

The DRL ambient light sensor is a light sensitive variable resistor. The DRL ambient light sensor decreases in resistance as outside light intensity increases. The DRL module measures the voltage drop across the DRL ambient light sensor. The DRL module then determines whether the day mode or the night mode should be in operation.

Park Brake Input

The DRL module will not operate any headlamps or exterior lamps if the park brake is applied before the ignition switch is turned to RUN. This allows the operator to start the vehicle and keep the headlamps off as long as the park brake is applied. The DRL module will activate the headlamps when the park brake is released with the ignition switch in RUN.

The park brake input feature will only function when the park brake is applied before the ignition switch is turned to RUN. The headlamps will not turn off if the park brake is applied after the ignition switch is turned to RUN.

Front Park/Turn and Front Side Marker

Whenever the park lamps are on, voltage is applied from the TAIL LPS fuse through the headlamp switch through circuit 9 to both the front side marker lamps and the front park/turn lamps.

Rear Park/Turn, Rear Side Marker, Tail and License Plate Lamps

Voltage is applied at all times from the TAIL LPS fuse to the headlamp switch and the Daytime Running Lamps (DRL) module through circuit 240. Voltage is applied to circuit 9 when the headlamp switch is in the PARK or the HEAD position. Voltage then flows to all rear park/turn, rear side marker, tail and license plate lamps, turning then on.

Turn Signal Lamps

Voltage is applied from the TURN B/U fuse to the normally closed pole of the hazard switch in the turn signal switch when the ignition is in the RUN position. The voltage then flows through circuit 141, which feeds the turn signal lamp flasher. With the turn signal switch in the turn left position, voltage is applied through 2 circuits. Voltage flows through the turn signal switch circuit 1414 at terminal H of harness connector C216 and circuit 18 at terminal M of C216.

For circuit 1414, voltage flows through circuit 1414 to the instrument cluster for the left turn indicator, and to the daytime running lamps module. Voltage then flows through circuit 14 to the left front turn signal lamp.

For circuit 18, voltage flows through circuit 18 to the left rear turn signal lamp. Current flow heats the timing element in the hazard lamp/turn signal flasher. The timing element continuously opens and closes the circuit for the right turn signal lamps, circuit 1415 terminal J of C216 and circuit 19 terminal N of C216.

Tail/Stop/Turn Lamps

Voltage is applied when the ignition is in the RUN position through the TURN B/U Fuse in the fuse block, to the turn signal lamp flasher through circuit 141. Then voltage is applied from the flasher to the turn/hazard switch through circuit 16. When the turn signal switch is placed in the TURN LEFT position, voltage is applied through the closed contacts of the turn signal switch, to the LH tail/stop/turn lamp through circuit 18. The LH tail/stop/turn lamp is grounded through circuit 1250. When the turn signal switch is placed in the TURN RIGHT position, voltage is applied through the closed contacts of the turn signal switch, to the RH tail/stop/turn lamp through circuit 19. The RH tail/stop/turn lamp is grounded through circuit 1250.

Hazard Lamps

Voltage is applied at all times from the STOP/HAZARD fuse to the hazard lamp flasher through circuit 140. The current flow heats the timing element in the hazard lamp flasher. The voltage continuously opens and closes circuit 27 to the turn/hazard switch and then to all the turn signal lamps and both of the turn telltale lamps. All of the turn signal lamps and both of the turn telltale lamps flash on and off.

Stop Lamps

Voltage is applied at all times from the STOP/HAZARD fuse to the stop lamp switch through circuit 140. Voltage is applied from the stop lamp switch to the turn/hazard switch through circuit 20 when the brake pedal is depressed. The voltage turns on the left and the right tail/stop/turn signal lamps and the center high mounted stop lamp.

Backup Lights Circuit Description

With the ignition switch in the RUN position, voltage is applied through the TURN B/U Fuse 2 to the backup lamp switch (manual transmission) or the transmission range switch (automatic transmission) through circuit 141. When either transmission is shifted into reverse, voltage is applied through circuit 24 to the backup lamps turning them on provided they have ground circuit 1250.

Interior Lights Circuit Description

Circuit Operation

Body Control Module

The body control module (BCM) controls the interior lights based on inputs it receives from the following switches:

- Right and left side door lock, or right and left door jamb switches
- I/P dimmer switch
- Rear compartment lid ajar indication switch

Dome Lamp, Courtesy Lamps and Reading Lamps

Voltage is applied through circuit 149 from the BCM to the following lamps on coupes:

- Dome
- Inside rearview mirror courtesy/reading lamps

Voltage is applied through circuit 149 from the BCM to the following lamps on convertibles:

- Right and left rear courtesy lamps
- Rear compartment lamp
- Inside rearview mirror courtesy/reading lamps

The BCM provides a ground through circuit 156 and the lamps illuminate when actions occur:

- The driver door is opened
- The rear compartment is opened
- The I/P dimmer switch is moved to the on position
- The vehicle is unlocked using the keyless entry function

The inside rearview mirror contains switches which provide ground through circuit 750 to allow manual operation of the reading lamps.

I/P Compartment Lamp

Ground is applied from G200 through circuit 650 to the I/P compartment lamp. When the I/P compartment door is opened, voltage is applied by the BCM through circuit 149 to the I/P compartment lamp.

Delayed Illumination

The BCM keeps the interior lights on for approximately 25 second after the doors and rear compartment are closed. The BCM gradually decreases the voltage on circuit 149 until the lamps are off. The lamps immediately go out under either of the following conditions:

- The ignition switch is turned to the run or start position
- The vehicle doors are locked

Exit Lighting

The BCM illuminates the courtesy lamps for approximately five seconds after the ignition key is remove from the ignition switch. The lamps immediately go out under either of the following conditions:

- The ignition key is reinserted into the ignition switch
- The vehicle doors are locked

Illuminated Entry

When the remote control door lock transmitter is used to access the vehicle, the BCM applies voltage through circuit 149 to the interior lights. The lights remain illuminated for approximately 40 seconds or until the ignition is turned to the start position.

Inadvertent Power Control

The BCM turns off lamps that are left on to conserve battery power. The BCM removes voltage from circuit 149 and all lamps are turned off 10 minutes after the ignition switch is turned to the off position. After the 10 minute period, the BCM turns the lamps back on under any of the following conditions:

- Either door is opened
- The rear compartment is opened
- The I/P compartment is opened
- Either of the courtesy/reading lamp switches are turned on.
- The remote control door lock transmitter is used to perform any function

Interior Lights Dimming Circuit Description

Circuit Operation

The I/P dimmer switch controls the brightness of the following:

- The incandescent illumination lamps of the instrument cluster
- The vacuum fluorescent (VF) displays of the radio

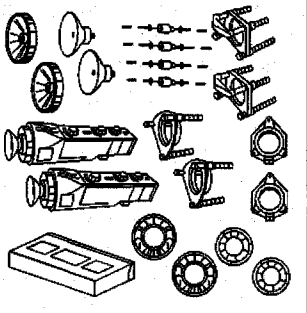
Incandescent Dimming

When the headlamp switch is in the PARK or HEAD position or in a low light condition with DRL active, voltage is applied through circuit 9 to the I/P dimmer switch. Voltage from the I/P dimmer switch is applied through circuit 44, the I/P dimmer fuse and circuit 8 to the incandescent lamps. Turning the I/P dimmer switch changes the voltage on circuit 8. The changing voltage varies the intensity of the lamps.

Vacuum Fluorescent Dimming

When the headlamp switch is in the PARK or HEAD position or in a low light condition with DRL active, voltage is applied through circuit 9 to the I/P dimmer switch. Voltage from the I/P dimmer switch is applied through circuit 44, the I/P dimmer fuse and circuit 8 to the radio VF display. The radio VF display dims for night viewing. Turning the I/P dimmer switch changes the voltage on circuit 8. The changing voltage varies the intensity of the radio VF display.

Special Tools and Equipment

Illustration	Tool Number/ Description
 6302	J 25300-D Headlamp Aimer

Wipers/Washer Systems

Specifications

Fastener Tightening Specifications

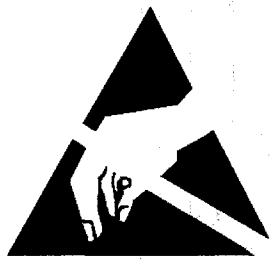
Application	Specification	
	Metric	English
Linkage Assembly Nut	10 N·m	7.5 lb ft
Linkage Assembly Screws	10 N·m	7.5 lb ft
Wiper Arm Nuts	23 N·m	17 lb ft
Wiper Motor Assembly Screw	10 N·m	7.5 lb ft
Wiper Motor Cover Assembly Screws	3 N·m	26 lb in

Schematic and Routing Diagrams

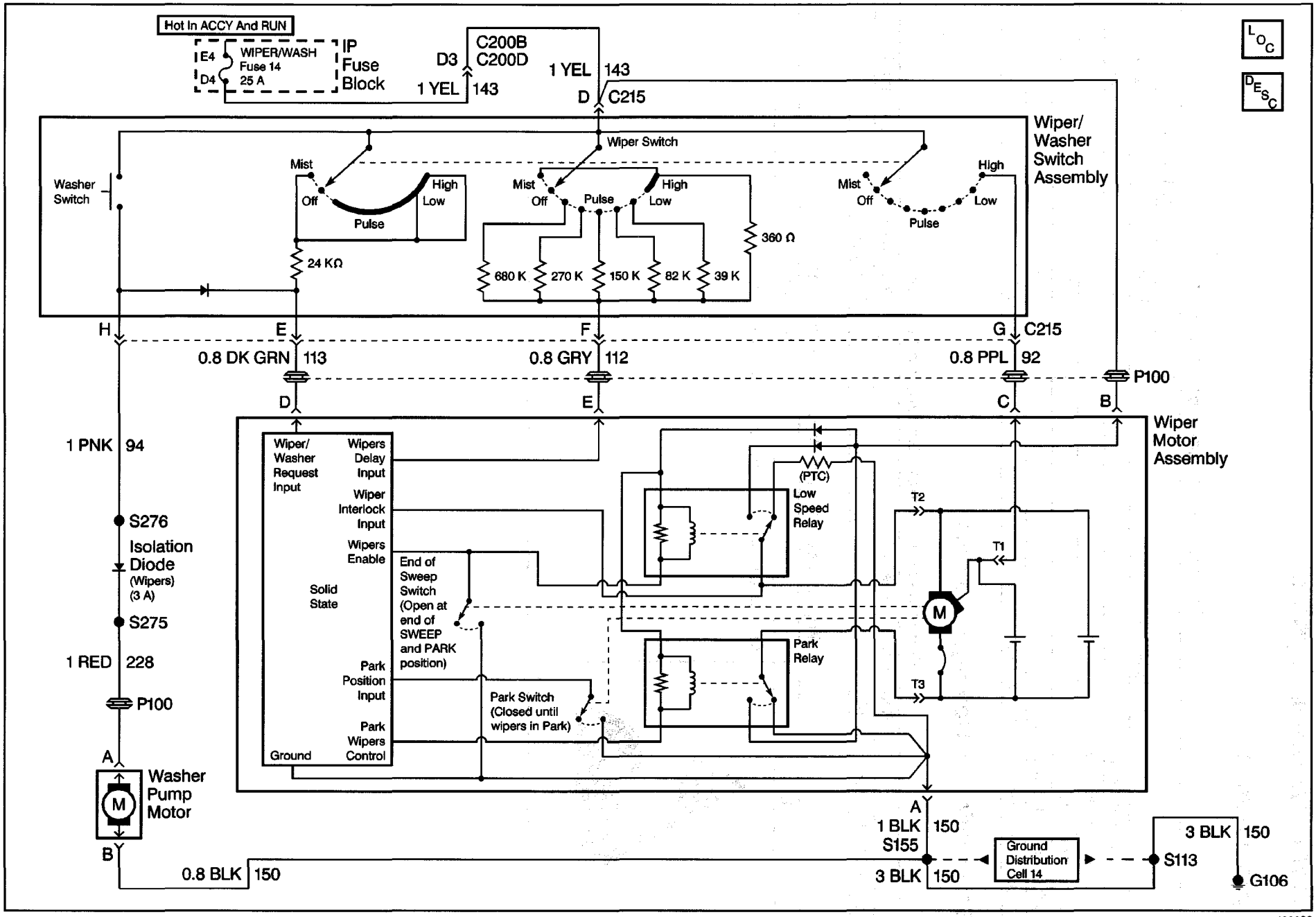
Wiper/Washer System Schematic References

Reference on Schematic	Section Number - Subsection Name
Ground Distribution - Cell 14	8-Wiring Systems

Wiper/Washer System Schematic Icons

Icon	Icon Definition
 19384	***Notice:*** Refer to *ESD Notice* in Cautions and Notices.

Wiper/Washer System (Pulse) Schematics (Cell 91)



499028

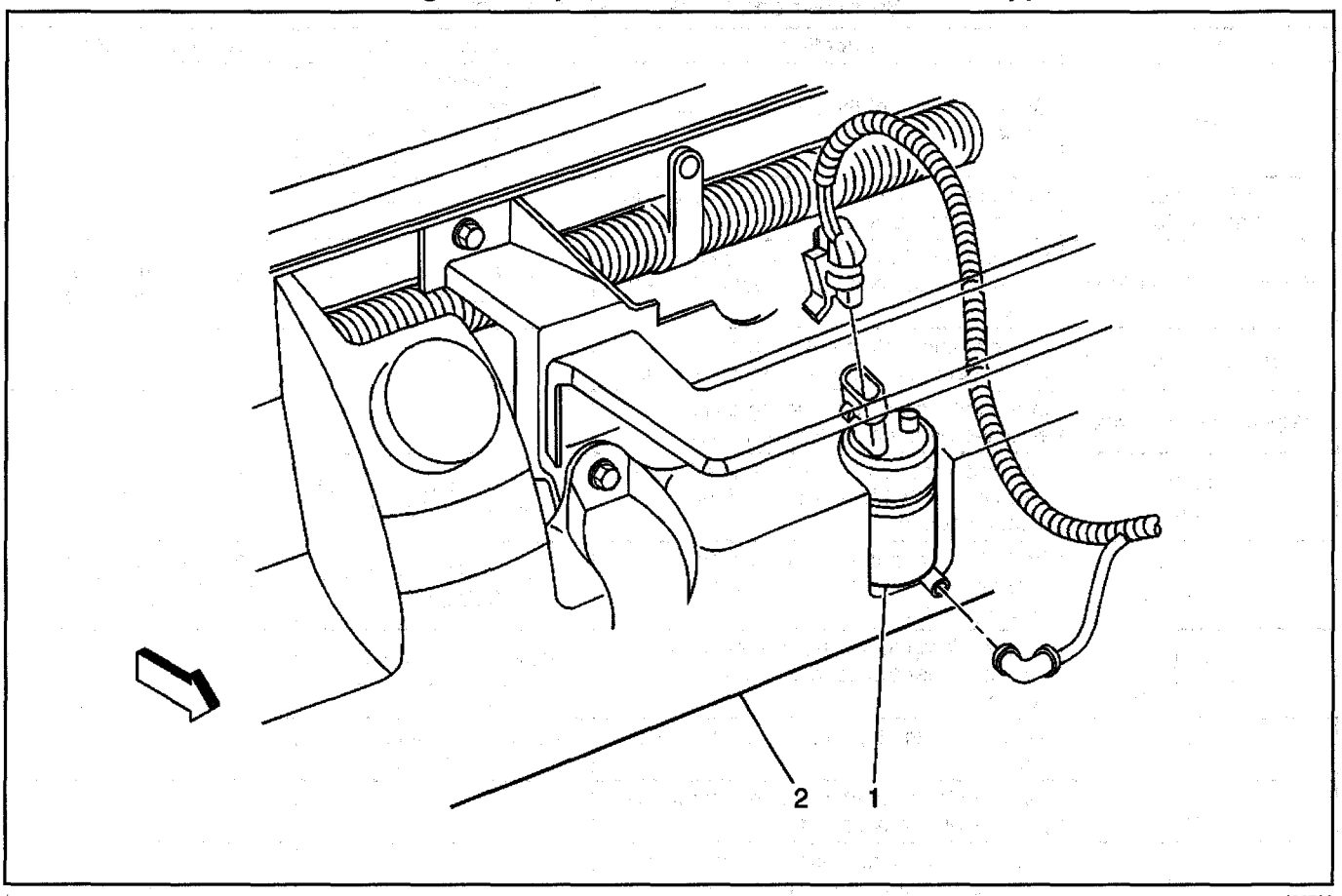
Component Locator

Wiper/Washer System Components

Name	Location	Locator View	Connector End View
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Windshield Washer Pump	On the front of the vehicle, forward of the top radiator support	*Wiper/Washer System Component Views*	—
Windshield Wiper Motor	On the rear of the left front wheelhouse, mounted to the dash panel below the left wiper mount	*Wiper/Washer System Component Views*	*Wiper/Washer System Connector End Views*
Wiper Isolation Diode	Approximately 10 cm (4 in) from C215 breakout, in forward lamp harness	—	—
Wipers/Washer Switch	In the left side of the steering column, actuated by the multi-function lever	—	—
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C215 (11 cavities)	Forward lamp to the steering column harness, near the base of the steering column	*Harness Routing Views* in Wiring Systems	—
G106	Attached to the top left side of the radiator support	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
S113	In the forward lamp harness approximately 7 cm (3 in) from the engine coolant fans/cruise control	—	—
S155	Foward lamp harness, approximately 27 cm (10.6 in) from the engine coolant fans/cruise control module breakout	—	—
S275	Forward lamp harness, approximately 30 cm (12 in) back from ignition switch connector	—	—
S276	Forward lamp harness, approximately 25 cm (10 in) back from ignition switch connector	—	—

Wiper/Washer System Component Views

Front of Engine Compartment, Forward of Radiator Support



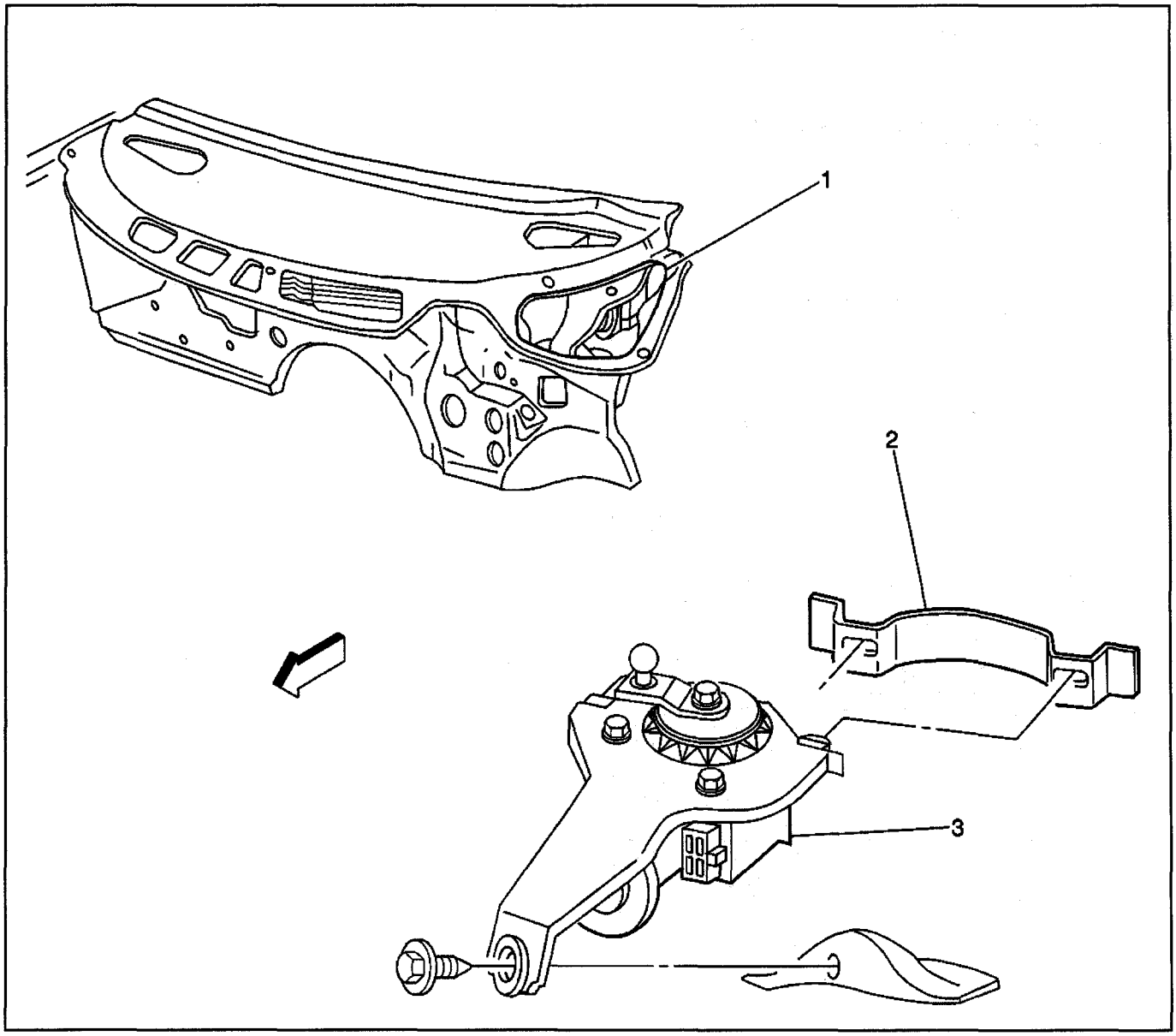
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Legend

(1) Windshield Washer Pump

(2) Washer Bottle

Windshield Wiper Motor, Inside Left Side of Cowl



483493

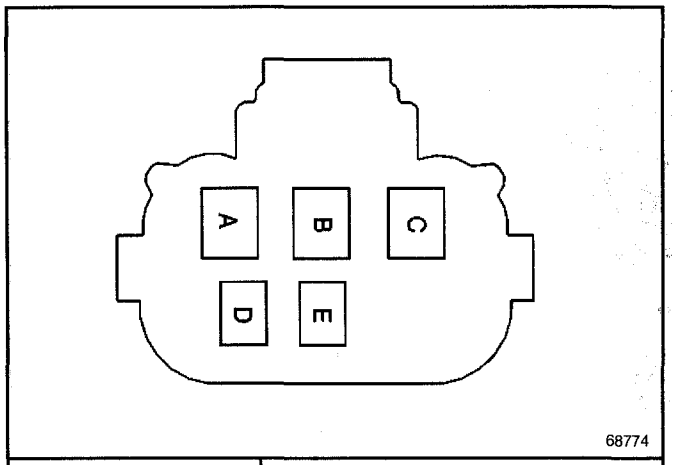
Legend

(1) Inside Left of Cowl
(2) Windshield Wiper Motor Bracket
(3) Winshield Wiper Motor

Visual Identification

Wiper/Washer System Connector End Views

Wiper Motor Assembly Connector



Connector Part Information		• 1212-9126 • 5-Way Metri-Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	150	Ground
B	YEL	143	Fuse output-accessory
C	PPL	92	Windshield wiper motor feed-high speed
D	DK GRN	113	Windshield wiper switch signal-on
E	GRY	112	Windshield wiper switch signal-low/pluse

Diagnostic Information and Procedures

Wiper/Washer System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to RUN. 2. Hold the washer switch in the ON position.	The wipers operate at LO speed. The washer sprays the windshield as long as the washer switch is held in the ON position. After releasing the switch, the washer stops and the wipers return to the park position after 2–4 sweeps.	• *Washers Inoperative.* • *Wipers Mist, Delay, and Low Modes Inoperative.*
2	Turn the wiper switch to DELAY (pulse mode).	The wipers make one complete sweep, then pause for 1–22 seconds before making the next sweep. The pause time is adjusted by turning the wiper switch through the delay range.	*Wipers Delay Mode Inoperative.*
3	1. Turn the wiper switch to DELAY. 2. Hold the wiper switch ON for 1–2 seconds.	The washer sprays as long as the washer switch is held ON. The wipers run at low speed during spray period and continue for 2–4 sweeps after the washer switch is released. The wipers then return to pulse operation.	• *Washers Inoperative.* • *Wipers Mist, Delay, and Low Modes Inoperative.*
4	Turn the wiper switch to LO.	The wipers run continuously at low speed.	*Wipers Mist, Delay, and Low Modes Inoperative.*
5	Turn the wiper switch to HI.	The wipers run continuously at high speed.	*Wipers High Mode Inoperative, Low Mode Operates.*
6	Turn the wiper switch to OFF.	The wipers return to the park position at low speed.	• *Wipers Always On.* • *Wipers Blades Do Not Park with Switch Off.*
7	Turn the wiper switch to MIST, then release.	The wipers make one complete sweep, then return to the park position.	*Wipers Mist, Delay, and Low Modes Inoperative.*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Wipers All Modes Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Set ignition switch to RUN. 2. Backprobe from the wiper/washer switch connector C215, terminal D to ground, with a test light. Is the test light on?	—	Go to *Step 4*	Go to *Step 3*
3	Repair the open or poor connection in CKT 143 to the wiper/washer switch. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
4	1. Set the wiper switch to HI. 2. Connect the test light from connector C215, terminal G, to ground. Is the test light on?	—	Go to *Step 7*	Go to *Step 5*
5	Check for a poor connection at connector C215, terminal D or for an open in the pigtail (CKT 143) to the wiper/washer switch. Is a poor connection or an open present?	—	Go to *Step 6*	Go to *Step 14*
6	Repair the poor connection or the open in the pigtail (CKT 143). Is the repair complete?	—	Go to *Wiper/Washer System Check*	—

Wipers All Modes Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
7	1. Disconnect the wiper motor connector. 2. Connect the test light from the wiper motor connector terminal C to ground. Is the test light on?	—	Go to *Step 9*	Go to *Step 8*
8	Repair the open or the poor connection in CKT 92 between connection C215 and the wiper motor. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
9	Connect the test light from the wiper motor connector terminal C to terminal A. Is the test light on?	—	Go to *Step 11*	Go to *Step 10*
10	Repair the open or poor connection in CKT 150. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
11	Check for a poor connection to the wiper motor assembly. Is a poor connection present?	—	Go to *Step 13*	Go to *Step 12*
12	Replace the wiper motor. Refer to *Wiper Motor Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
13	Repair the poor connection. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
14	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—

Wipers Delay Mode Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Turn the ignition to OFF. 2. Disconnect wiper/washer switch connector C215. 3. Turn the wiper switch to DELAY. 4. Measure the resistance through the wiper/washer switch from connector C215, terminal C to terminal A, with a DMM set to the Ω scale. 5. Move the wiper switch through the entire delay range, one notch at a time. Does the resistance vary within the specified values?	39 KΩ to 680 KΩ	Go to *Step 4*	Go to *Step 3*
3	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
4	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Turn the ignition switch to RUN. 4. Turn the wiper switch to DELAY. 5. Measure the voltage from the wiper motor connector, terminal E, to ground with a DMM. Is the measurement within the specified values?	10.5–15 V	Go to *Step 7*	Go to *Step 5*

Wipers Delay Mode Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
5	Check for a poor connection or an open in CKT 112. Is a poor connection or an open present?	—	Go to *Step 6*	Go to *Step 7*
6	Repair the poor connection or the open in CKT 112. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
7	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—

Wipers High Mode Inoperative, Low Mode Operates

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	Do the wipers operate at all with the wiper switch in HI?	—	Go to *Step 4*	Go to *Step 3*
3	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
4	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to HI. 3. Backprobe from the wiper/washer switch connector C215, terminal G, to ground with a test light. Is the test light on?	—	Go to *Step 8*	Go to *Step 5*
5	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or open present?	—	Go to *Step 7*	Go to *Step 6*
6	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
7	Repair the poor connection or the open. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
8	1. Disconnect the wiper motor connector. 2. Connect the test light from the wiper motor connector, terminal C, to ground. Is the test light on?	—	Go to *Step 10*	Go to *Step 9*
9	Repair the open in CKT 92. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
10	Check for a poor connection condition to the wiper motor. Is a poor connection condition present?	—	Go to *Step 11*	Go to *Step 12*
11	Repair the poor connection to the wiper motor. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
12	Replace the wiper motor. Refer to *Wiper Motor Replacement.* Is the repair complete?	—	Go to *Wiper/Washer System Check*	—

Wipers Mist, Delay, and Low Modes Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to LO. 3. Measure the voltage by backprobing from the wiper/washer switch connector C215, terminal E, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 6*	Go to *Step 3*
3	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or an open present?	—	Go to *Step 4*	Go to *Step 5*
4	Repair the poor connection or the open circuit. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
5	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
6	Measure the voltage by backprobing from the wiper/washer switch connector C215, terminal F, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 10*	Go to *Step 7*
7	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or an open present?	—	Go to *Step 8*	Go to *Step 9*
8	Repair the poor connection or the open circuit. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
9	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
10	1. Disconnect the wiper motor connector. 2. Measure the voltage from the wiper motor connector, terminal D to ground, with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 12*	Go to *Step 11*
11	Repair the open in CKT 113. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
12	Measure the voltage from the wiper motor connector, terminal E, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 14*	Go to *Step 13*
13	Repair the open in CKT 112. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
14	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—

Wipers Always On

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Set the ignition switch to RUN. 2. Set the wiper switch to OFF. 3. Disconnect the wiper/washer switch connector C215. Does the wiper keep running?	—	Go to *Step 6*	Go to *Step 3*
3	Check for a short to voltage in the pigtail wires to the wiper/washer switch. Is a short to voltage present?	—	Go to *Step 5*	Go to *Step 4*
4	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
5	Repair the short to voltage in the pigtail wires to the wiper/washer switch. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
6	Measure the voltage from connector C215 (vehicle side), terminal E, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 14*	Go to *Step 7*
7	Measure the voltage from connector C215 (vehicle side), terminal F, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 11*	Go to *Step 8*
8	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal C, to ground with a DMM. Is the measurement within the specified range?	10.5–15 V	Go to *Step 9*	Go to *Step 10*
9	Repair the short to voltage in CKT 92. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
10	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
11	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal E, to ground with a DMM. Is measurement greater than the specified value?	1.0 V	Go to *Step 12*	Go to *Step 13*
12	Repair the short circuit to battery voltage condition in CKT 112. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
13	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
14	1. Reconnect the wiper/washer switch connector C201. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal D, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 16*	Go to *Step 15*

Wipers Always On (cont'd)

Step	Action	Value(s)	Yes	No
15	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
16	Repair the short to voltage in CKT 113. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—

Wipers Blades Do Not Park with Switch Off

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to OFF. 3. Disconnect the wiper/washer switch connector C215. Do the wipers park?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
4	Measure the voltage from connector C215 (vehicle side), terminal E, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 10*	Go to *Step 5*
5	Measure the voltage from connector C215 (vehicle side), terminal F, to ground with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 7*	Go to *Step 6*
6	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
7	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from the wiper motor connector, terminal E, to ground, with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 12*	Go to *Step 11*
8	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
9	Repair the short to voltage in CKT 112. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
10	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from the wiper motor connector, terminal D, to ground, with a DMM. Is the measurement greater than the specified value?	1.0 V	Go to *Step 8*	Go to *Step 7*
11	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
12	Repair the short to voltage in CKT 113. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—

Washers Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	Check the washer solvent container fluid level. Is the washer solvent container filled?	—	Go to *Step 3*	Go to *Step 4*
3	Fill the washer solvent container. Is the washer solvent container filled?	—	Go to *Wiper/Washer System Check*	—
4	Check the hoses to ensure that they are correctly attached and that they are not pinched or kinked. Are the hoses OK?	—	Go to *Step 6*	Go to *Step 5*
5	Repair the hoses. Are the hoses repaired?	—	Go to *Wiper/Washer System Check*	—
6	Check for clogged windshield washer nozzles. Are the nozzles clogged?	—	Go to *Step 7*	Go to *Step 8*
7	Replace the clogged nozzles. Are the nozzles replaced?	—	Go to *Wiper/Washer System Check*	—
8	Check WIPER/WASH fuse 14 in the IP Fuse Block. Is the fuse open?	—	Go to *Step 9*	Go to *Step 10*
9	Replace the open fuse. Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
10	1. Disconnect the washer pump connector. 2. Turn the ignition switch to ON. 3. Connect a test light between terminals A and B of washer pump connector (harness side). 4. Activate the washer switch while observing the test light. Is the test light on?	—	Go to *Step 11*	Go to *Step 14*
11	Check for a poor connection at the washer pump connector. Is a poor connection present?	—	Go to *Step 12*	Go to *Step 13*
12	Repair the poor connection. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
13	Replace the washer pump. Refer to *Washer Pump Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
14	1. Connect the test light between the washer pump connector (harness side) terminal A and ground. 2. Activate the washer switch while observing test light. Is the test light on?	—	Go to *Step 15*	Go to *Step 16*
15	Repair the poor connection or open in CKT 150. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
16	1. Backprobe wiper/washer switch connector C215, terminal H, to ground with a test light. 2. Activate the washer switch. Is the test light on?	—	Go to *Step 17*	Go to *Step 19*

Washers Inoperative (cont'd)

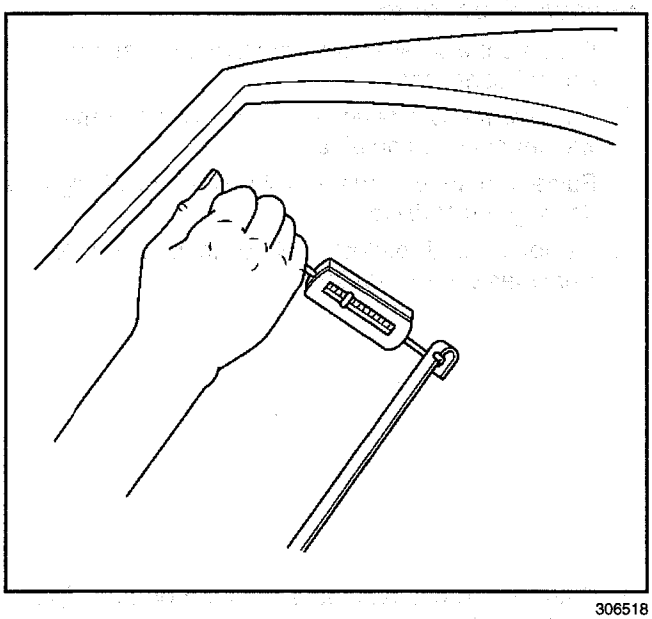
Step	Action	Value(s)	Yes	No
17	Check for a poor connection or an open in CKTs 94 and 228, or in the Isolation Diode. Is a poor connection or an open present?	—	Go to *Step 18*	Go to *Step 20*
18	Repair the poor connection or the open. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
19	Replace the wiper motor cover. Refer to *Wiper Motor Cover Replacement.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—
20	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—

Washers Always On

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to *Step 2*	Go to *Wiper/Washer System Check*
2	1. Set the ignition switch to RUN. 2. Set the wiper switch to OFF. 3. Disconnect the wiper/washer switch connector C215. Does the washer keep running?	—	Go to *Step 3*	Go to *Step 4*
3	Repair the short to voltage in CKT 94 or CKT 228. Is the repair complete?	—	Go to *Wiper/Washer System Check*	—
4	Replace the wiper/washer switch. Refer to *Turn Signal and Multifunction Switch Assembly - Disassemble - Off Vehicle* and *Turn Signal and Multifunction Switch Assembly - Assemble - Off Vehicle.* Is the replacement complete?	—	Go to *Wiper/Washer System Check*	—

Wiper Arm Tip Pressure Check, Blade Element Check

Wiper Arm Tip Pressure Check



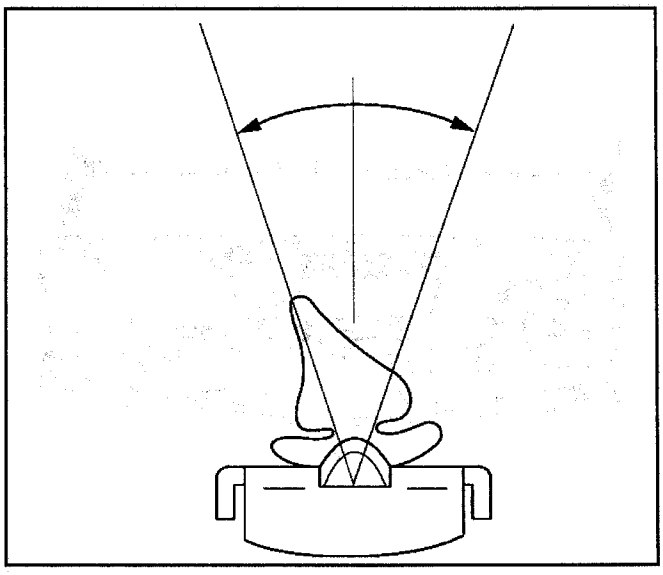
306518

1. Run the wiper arms to the mid-wipe position.
2. Remove the wiper blades from the wiper arms. Refer to *Wiper Arm Blade Replacement*.
3. Attach a scale to the end of the wiper arm and measure the force required to lift the wiper arm perpendicular to the windshield to normal working height (height with the blade attached).
4. Replace the wiper arm if the measurement is not within the specification. Refer to *Wiper Arm Replacement*.

   Tip Pressure

   7.3–9.3 Newtons (26–33 oz)
5. Install the wiper blades on the wiper arms. Refer to *Wiper Arm Blade Replacement*.

Blade Element Check



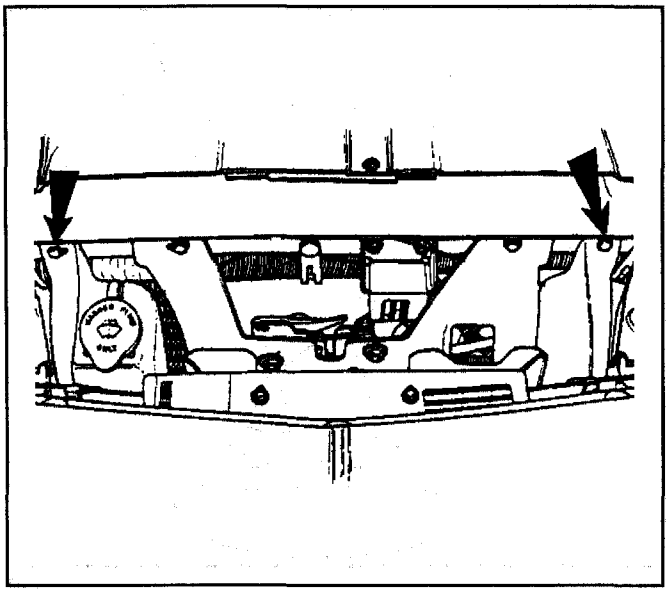
334256

1. Remove the wiper blades from the wiper arms. Refer to *Wiper Arm Blade Replacement*.
2. Look down the length of the blade element.
3. Replace the wiper blades if the rubber element which contacts the glass is not on the centerline of the blade +/–15 degrees. Refer to *Wiper Arm Blade Replacement*.

Repair Instructions

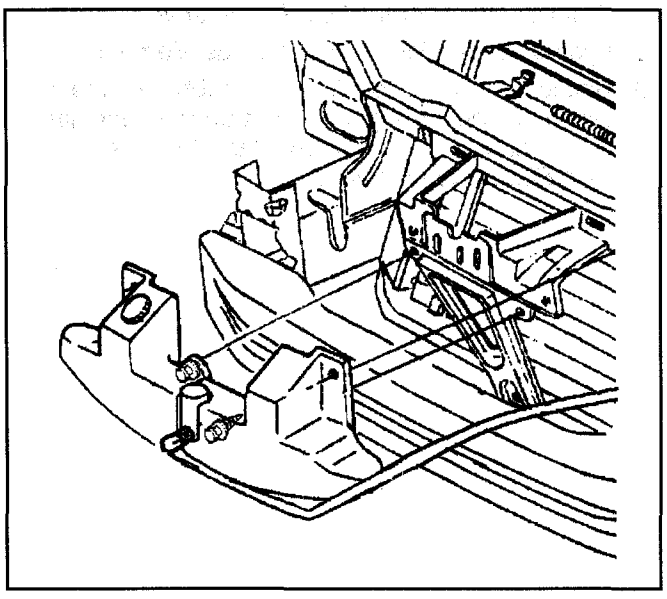
Washer Solvent Container Replacement

Removal Procedure



532060

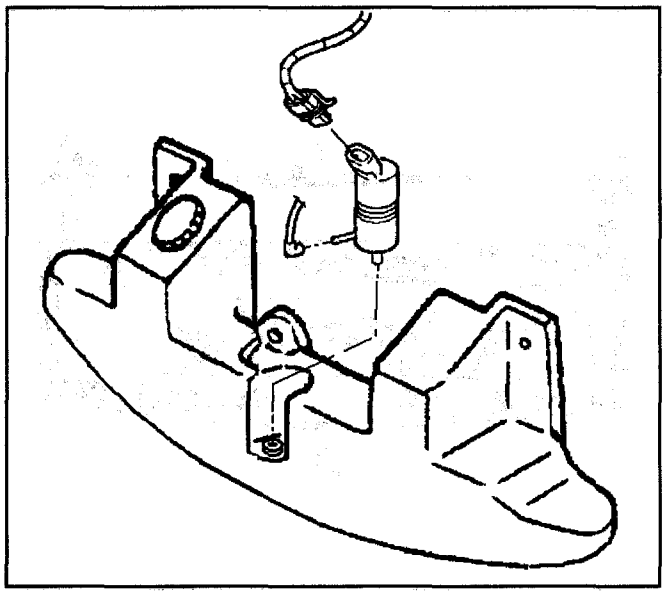
1. Remove the washer solvent from the washer solvent container.
2. Remove the two fasteners from the top of the washer solvent container.
3. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle*.
4. Remove the air deflector. Refer to *Air Deflector Replacement - Radiator*.



532061

5. Remove the two fasteners from the bottom of the washer solvent container.
6. Remove the washer solvent container.

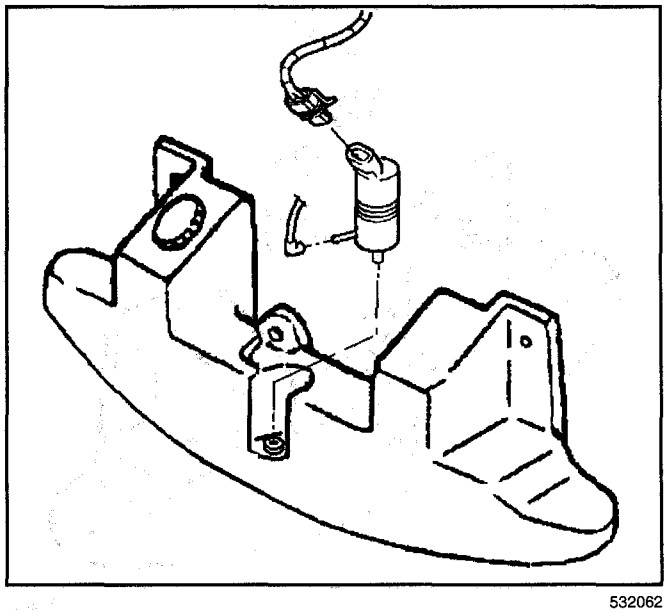
7. Disconnect the electrical connector from the washer pump.
8. Disconnect the washer hose from the washer pump.
9. Remove the washer pump from the washer solvent container.



532062

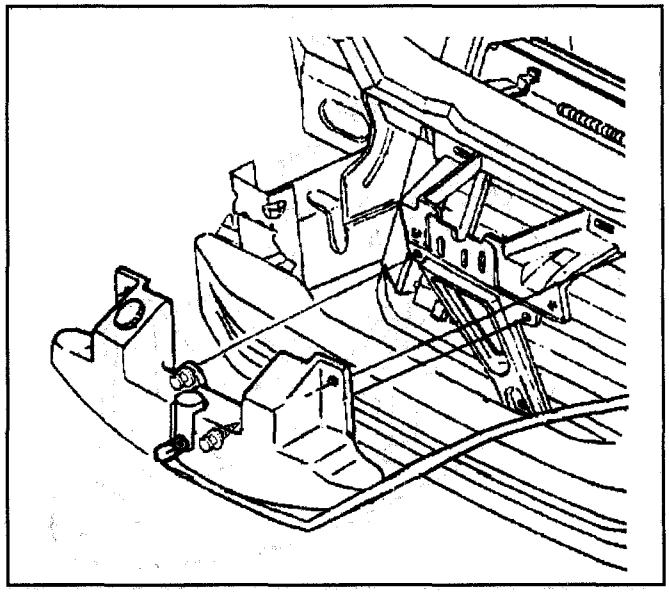
Installation Procedure

1. Install the washer pump into the washer solvent container.
2. Connect the washer hose to the washer pump.
3. Connect the electrical connector to the washer pump.

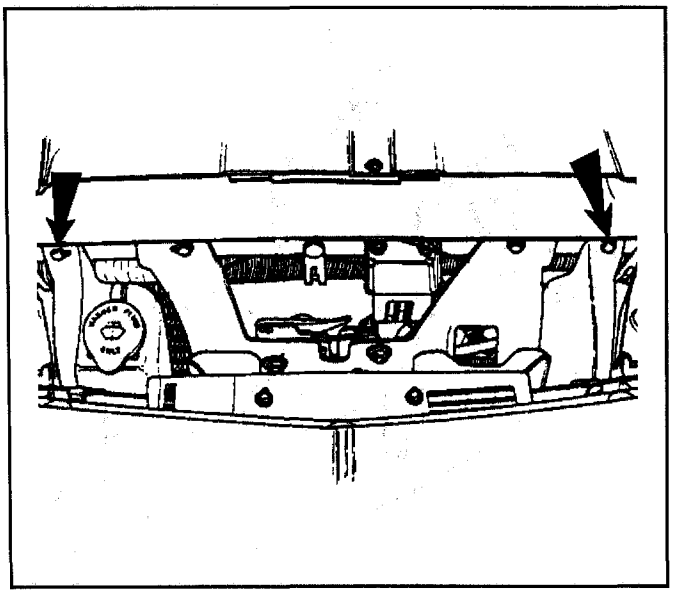


532062

4. Install the washer solvent container.
5. Install the two fasteners at the bottom of the washer solvent container

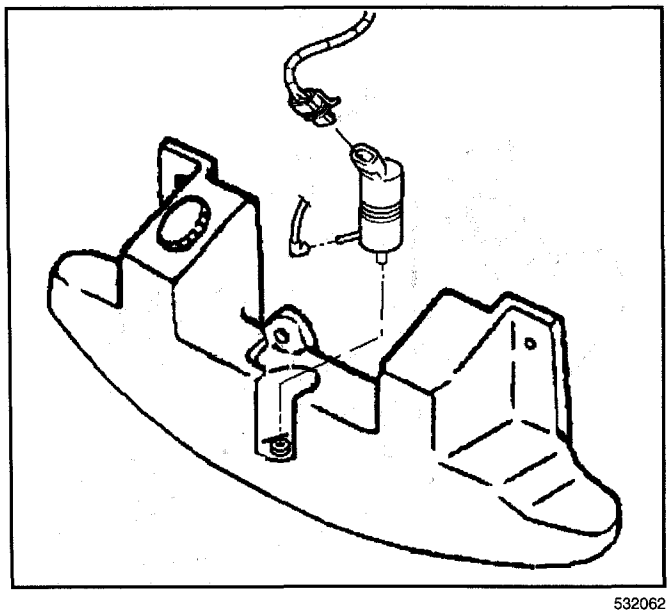


532061



532060

6. Install the air deflector. Refer to *Air Deflector Replacement - Radiator.*
7. Lower the vehicle. Refer to *Lifting and Jacking the Vehicle.*
8. Install the two fasteners at the top of the washer solvent container.
9. Refill the washer solvent container.

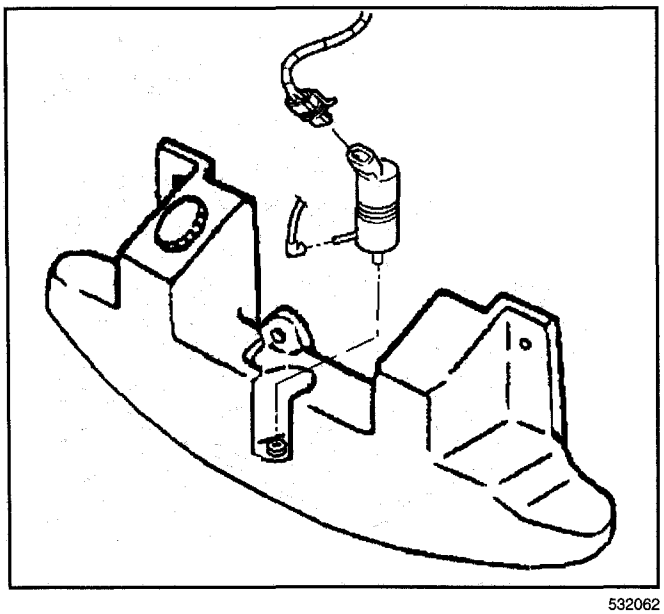


532062

Washer Pump Replacement

Removal Procedure

1. Remove the washer solvent from the washer solvent container.
2. Disconnect the electrical connector from the washer pump.
3. Remove the washer pump from the washer solvent container.
4. Remove the washer hose from the washer pump.



532062

Installation Procedure

1. Install the washer hose on the washer pump.
2. Install the washer pump into the washer solvent container.
3. Connect the electrical connector to the washer pump.
4. Refill the washer solvent container with washer solvent.

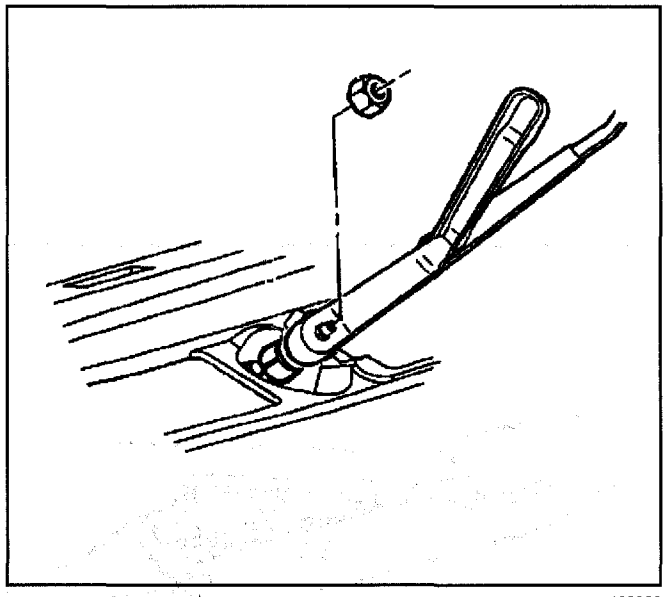
Wiper Arm Replacement

Removal Procedure

Tools Required:

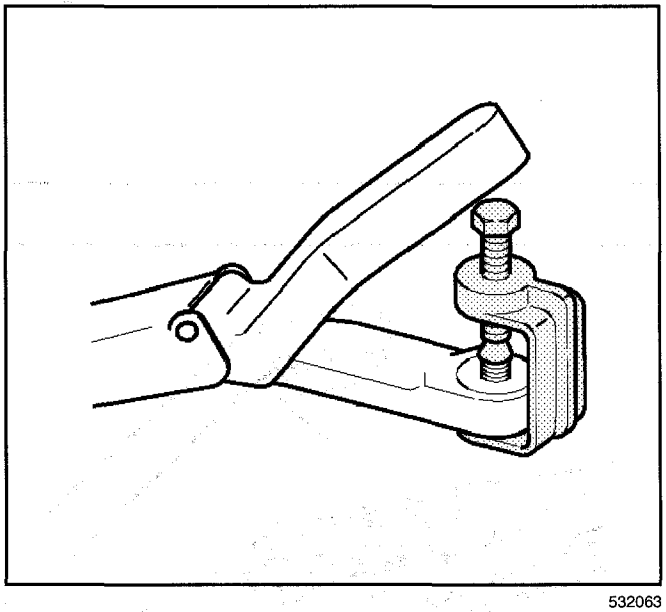
J 39637 Wiper Arm Puller

1. Turn the ignition switch to RUN.
2. Set the wipers to the lowest DELAY setting.
3. Turn the ignition to OFF when the wipers are at the innerwipe (end of sweep) position.
4. Mark the postion of the wiper blade on the windshield with a suitable marker or masking tape.
5. Raise the hood.
6. Lift the wiper arm nut cover.
7. Remove the nut.



429883

8. Remove the wiper arm from the transmission drive shaft with the *J 39637*.
9. Remove the wiper blade, if required. Refer to *Wiper Arm Blade Replacement*.



532063

Installation Procedure

1. Install the wiper blade assembly, if removed. Refer to *Wiper Arm Blade Replacement*.
2. Install the wiper arm onto the transmission drive shaft, with the wiper blade aligned with the mark made during removal.

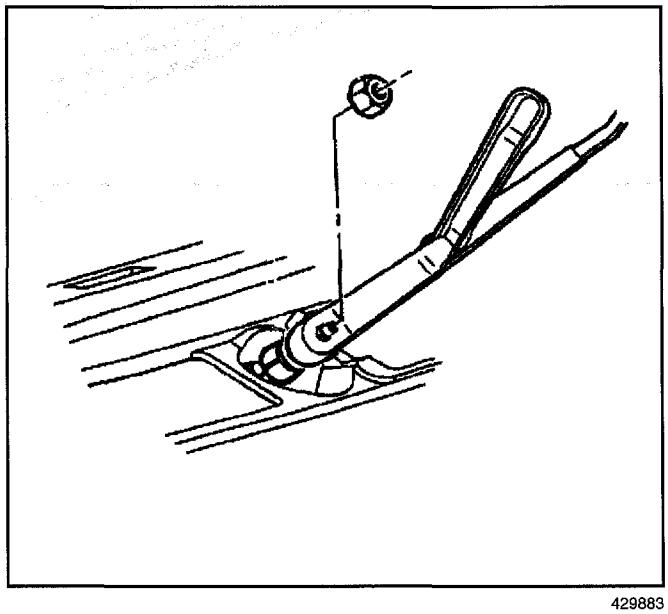
Important: It may be necessary to allow for some movement of a wiper arm when its nut is being tightened. If the wiper arm moves away from the desired alignment mark, loosen the nut and reposition the wiper arm.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the nut onto the transmission drive shaft.

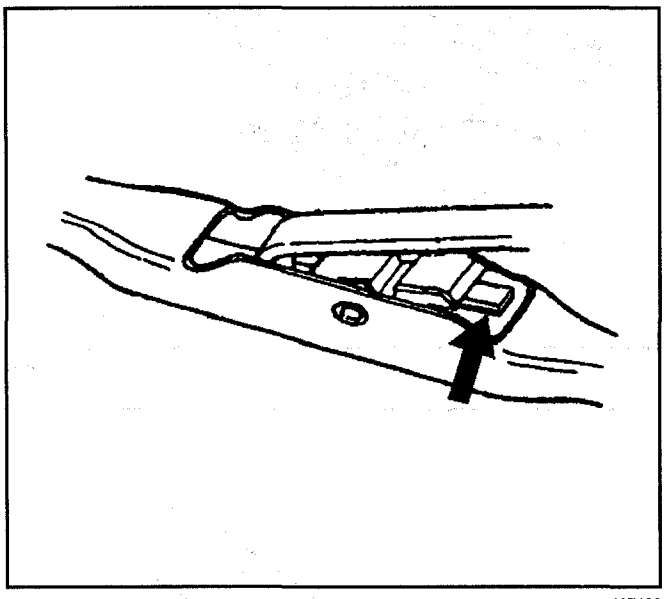
   Tighten

   Tighten the nut to 23 N·m (17 lb ft) while holding the wiper arm.



429883

4. Close the nut cover.
5. Close the hood.
6. Clean the position marks from the windshield.
7. Run the wipers and check for proper wipe pattern.
8. Turn off the wipers and check for the correct park position.

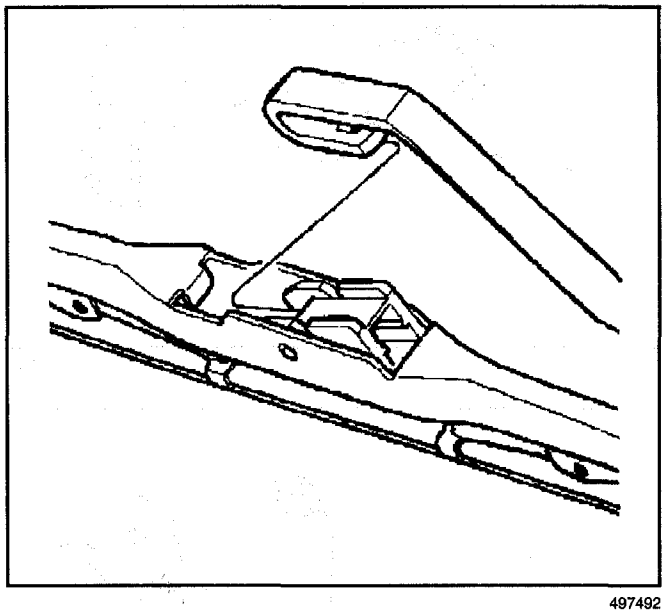


497480

Wiper Arm Blade Replacement

Removal Procedure

1. Push in the button of the wiper blade clip and remove the wiper blade from the inside radius of the wiper arm.

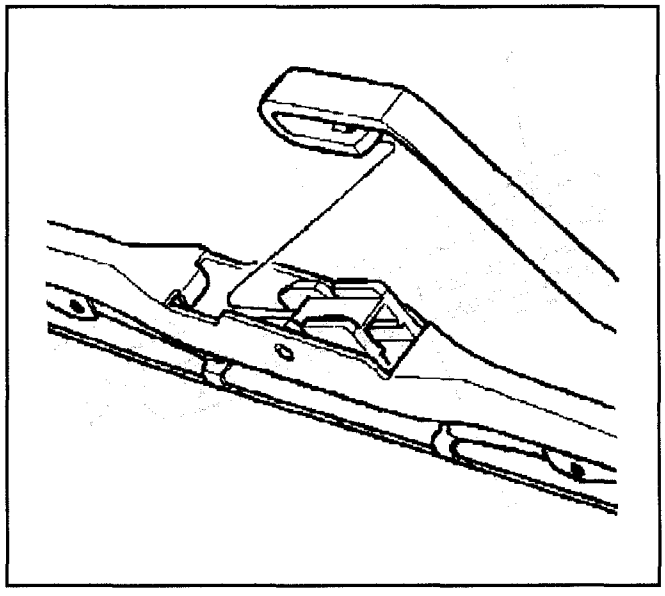


497492

2. Bring the wiper arm out through the opening in the wiper blade.

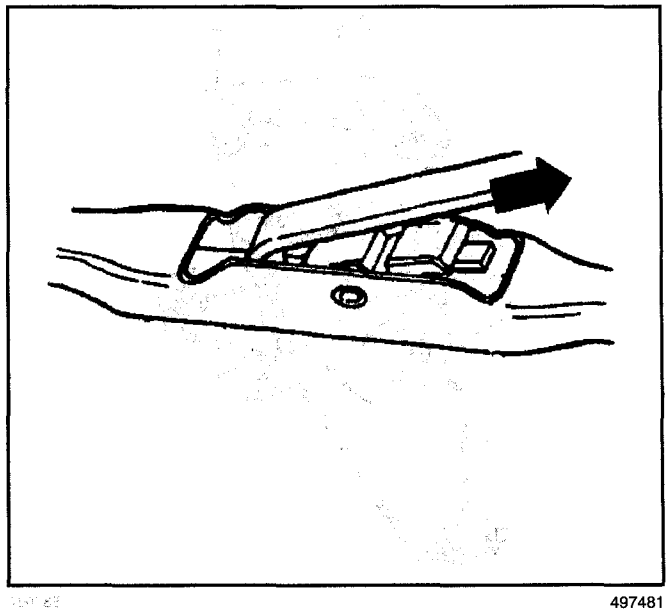
Installation Procedure

1. Insert the hook of the wiper arm through the opening in the wiper blade.



497492

2. Position the wiper blade pivot in the inside radius of the wiper arm hook.
3. Pull the wiper blade pivot into the wiper arm hook until the pivot locks into the hook.
4. Operate the wipers and check for proper operation.



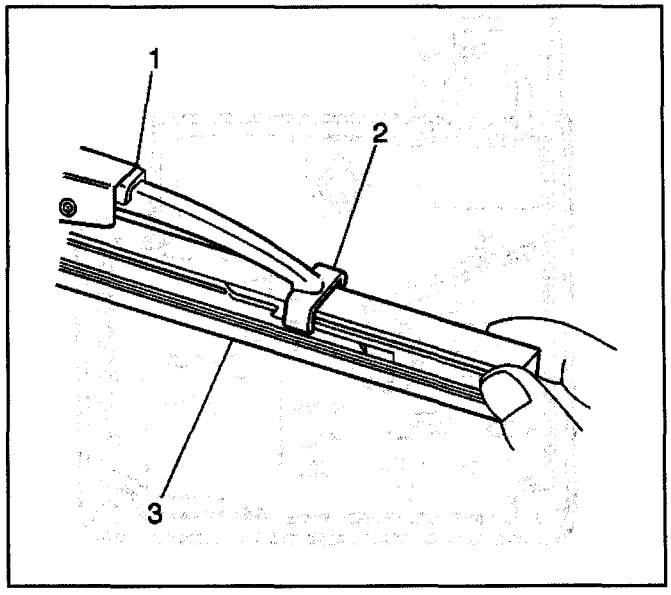
497481

Wiper Blade Element Replacement

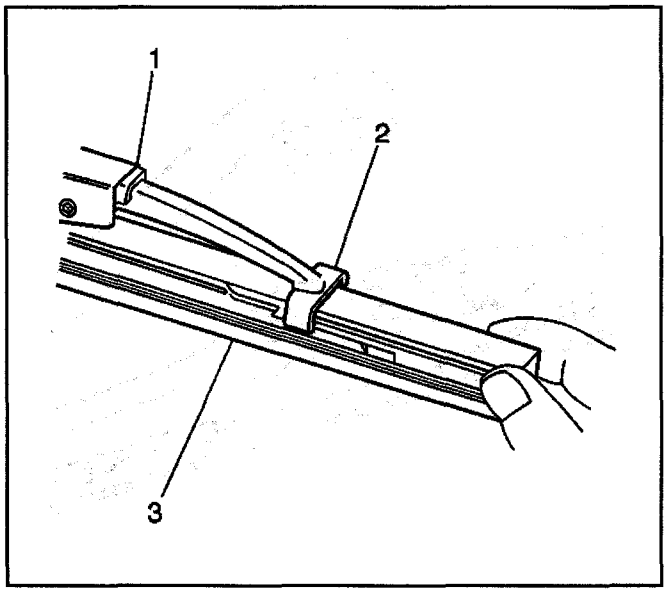
Removal Procedure

Important: Replace the wiper blade element if it is removed from the wiper blade.

1. Remove the wiper blade from the wiper arm. Refer to *Wiper Arm Blade Replacement.*
2. Remove the bottom claws (2) of the wiper blade (1) from the notches in the wiper blade element (3).
3. Pull the wiper blade element (3) out through the wiper blade claws (2).



430069

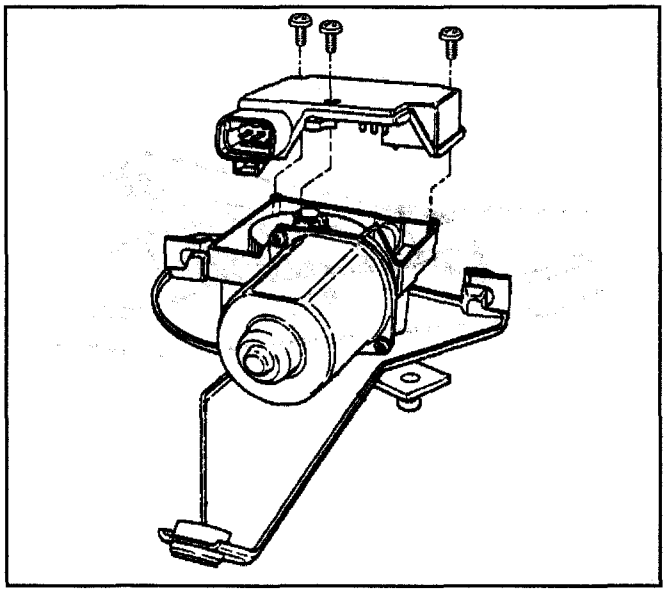


430069

Installation Procedure

Important: Keep the wiper blade claws in the rubber claw channel of the wiper blade element. Do not allow the claws of the wiper blade to contact the metal spline of the wiper blade element.

1. Insert the open end of the wiper blade element (3) into the bottom claws of the wiper blade (2).
2. Guide the wiper blade element (3) through the wiper blade (1) claw sets.
3. Engage the bottom claw (2) of the wiper blade (1) into the notches in wiper blade element (3).
4. Install the wiper blade onto the wiper arm. Refer to *Wiper Arm Blade Replacement*.

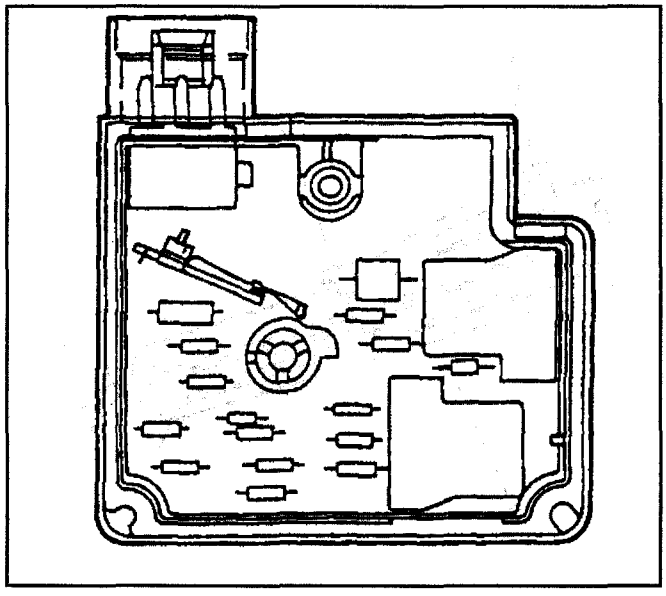


532064

Wiper Motor Cover Replacement

Removal Procedure

1. Remove the wiper motor. Refer to *Wiper Motor Replacement*.
2. Remove three screws from the wiper motor cover.
3. Remove the wiper motor cover.



532065

Installation Procedure

Important: Before installing the wiper motor cover, be sure that the inner wipe cam is positioned as shown.

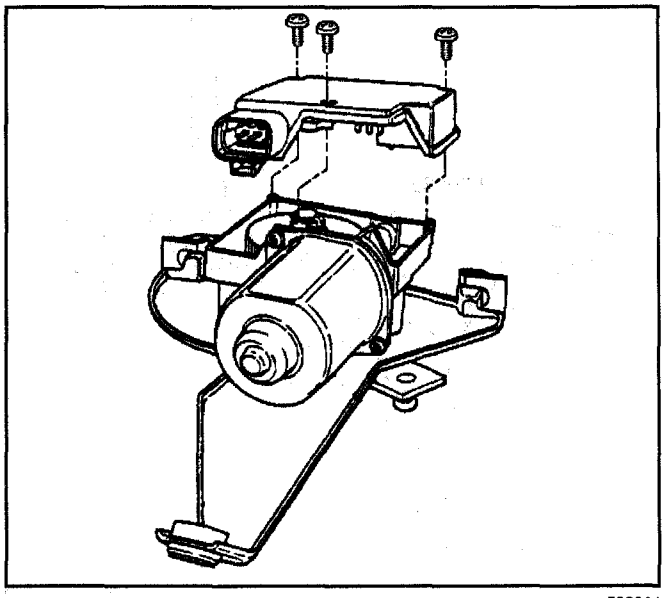
1. Install the wiper motor cover on the wiper motor.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install three screws.

   Tighten

   Tighten the screws to 3 N·m (26 lb in)
3. Install the wiper motor. Refer to *Wiper Motor Replacement.*



532064

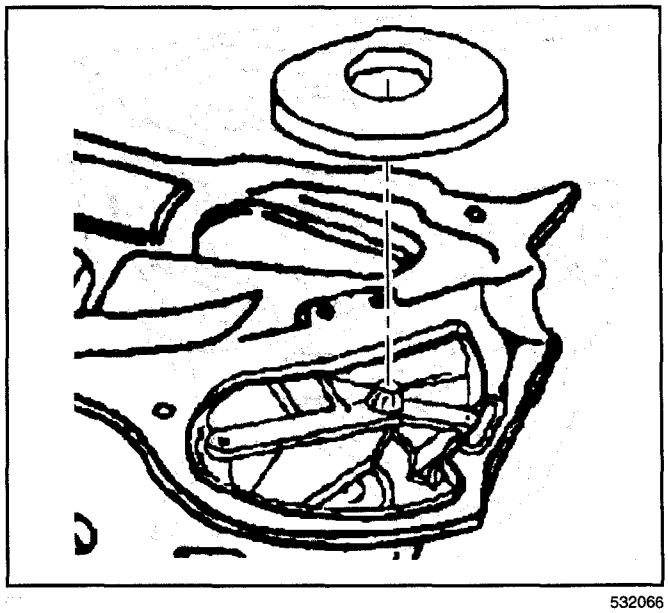
Wiper Motor Replacement

Removal Procedure

Tools Required

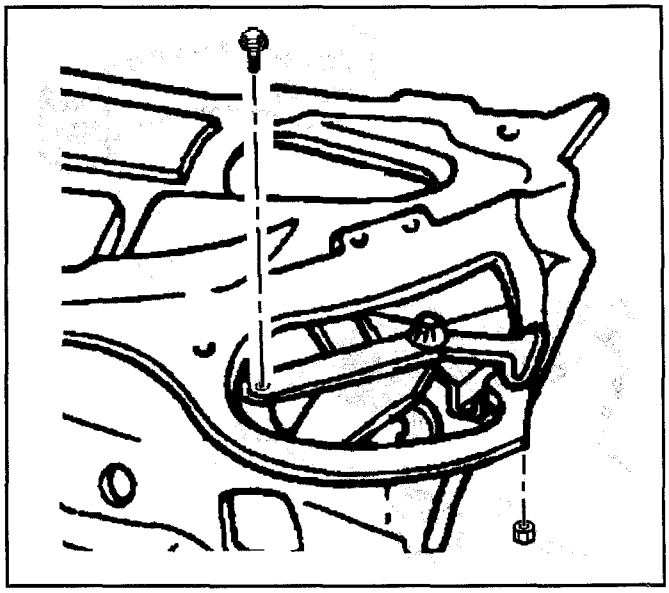
J 39232 Wiper Linkage Separator

1. Remove the wiper arms. Refer to *Wiper Arm Replacement.*
2. Remove the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement.*
3. Remove the water shield.

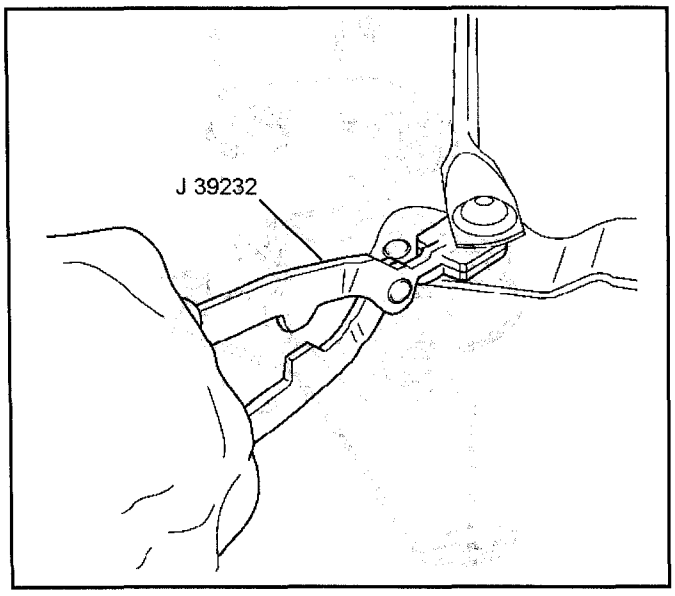


532066

4. Remove the screw and the nut.

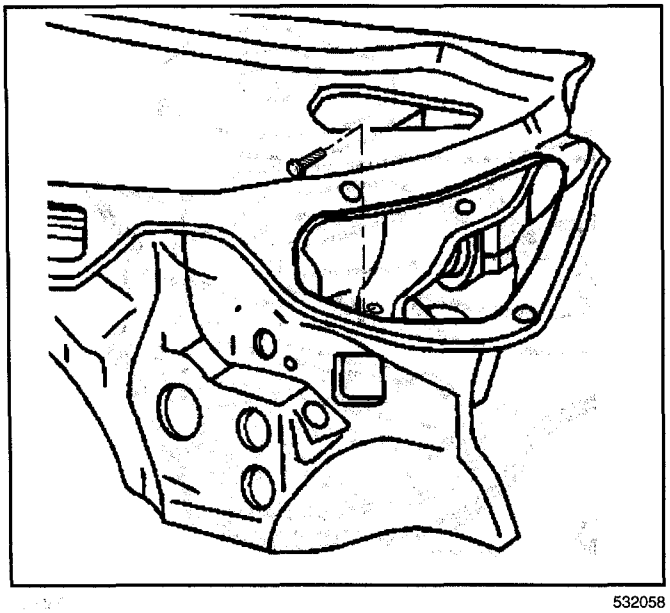


532057



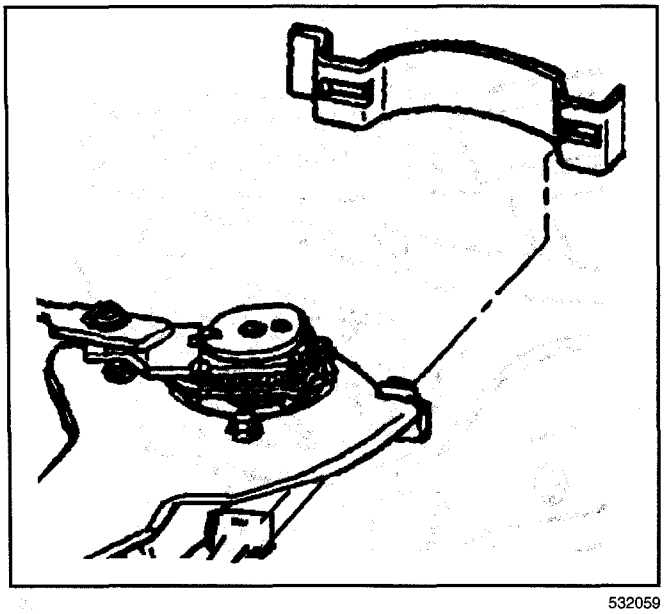
306506

5. Disconnect the RH linkage assembly from the LH linkage assembly with the *J 39232*.
6. Remove the LH linkage assembly.



532058

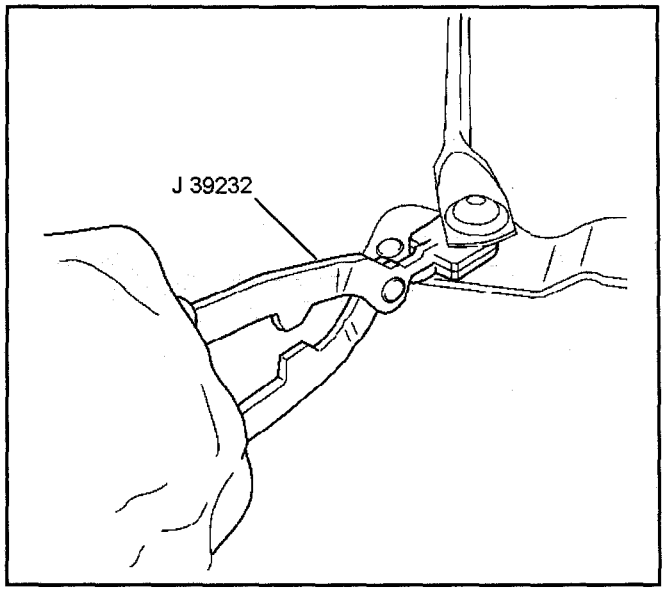
7. Remove the screw from the wiper motor.



532059

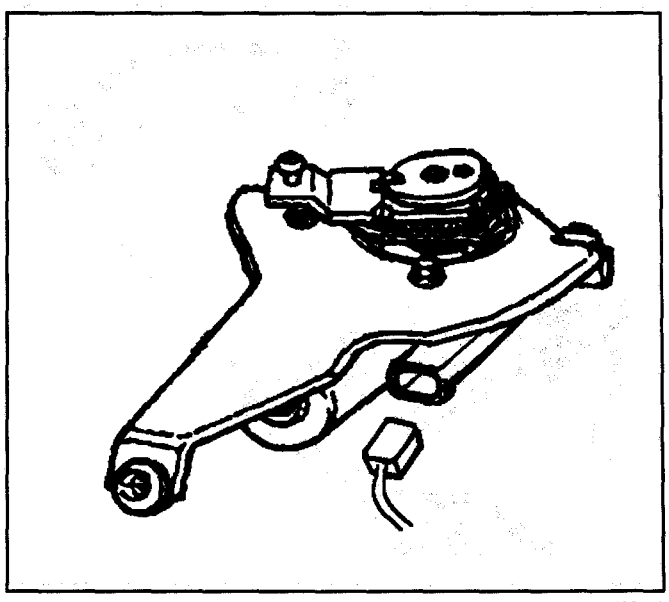
8. Pull the wiper motor free from the slots of the bracket.

9. Disconnect the RH linkage assembly from the wiper motor with the *J 39232*.



306506

10. Disconnect the electrical connector from the wiper motor.



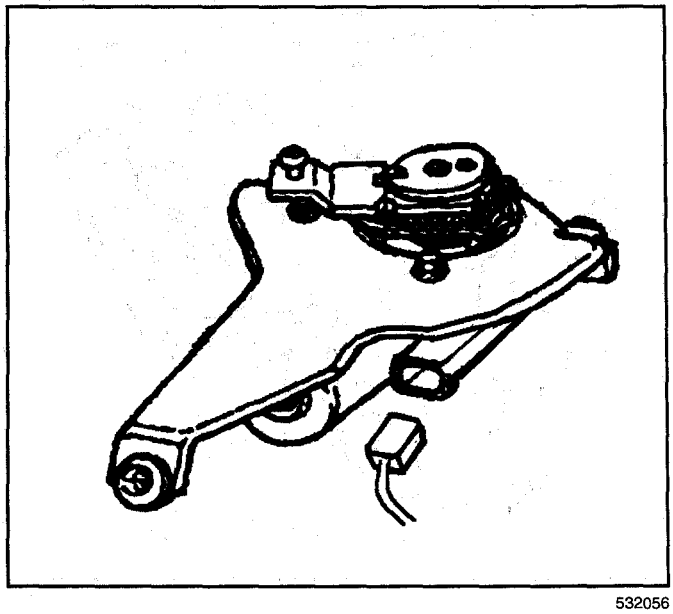
532056

Installation Procedure

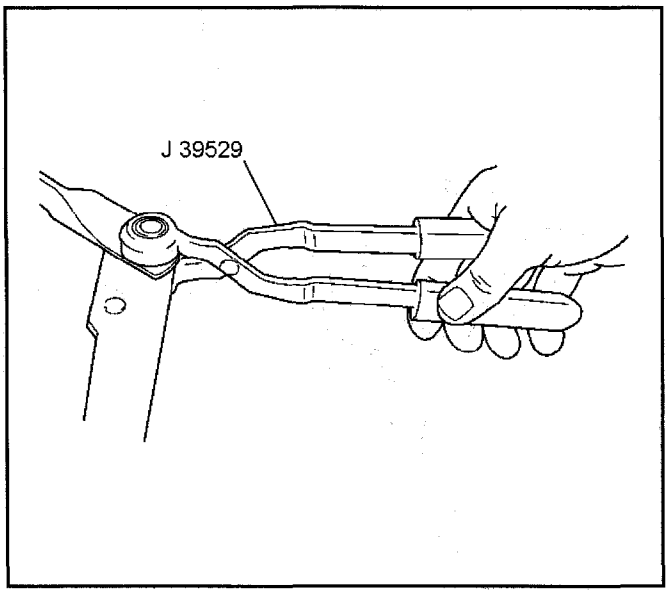
Tools Required

J 39529 Wiper Linkage Installer

1. Connect the electrical connector to the wiper motor.

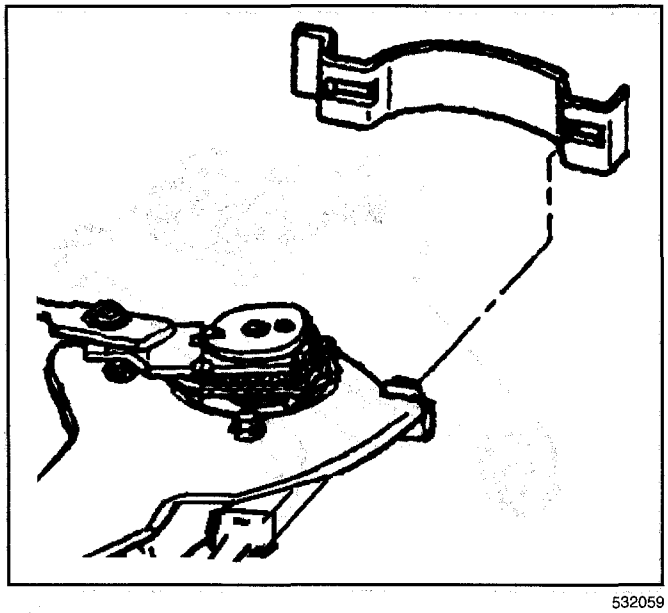


532056



306515

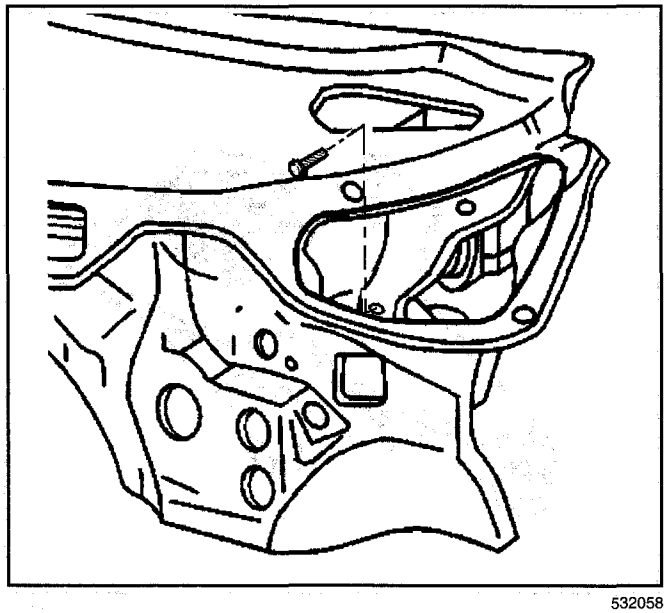
2. Connect the RH linkage assembly to the wiper motor with the *J 39529*.



532059

Important: When installing the wiper motor, be sure that the crank arm is in the innerwipe position. The crank arm drive pin must be engaged in the cam pocket.

3. Install the wiper motor with two locator pads pressed into the slots of the bracket.



532058

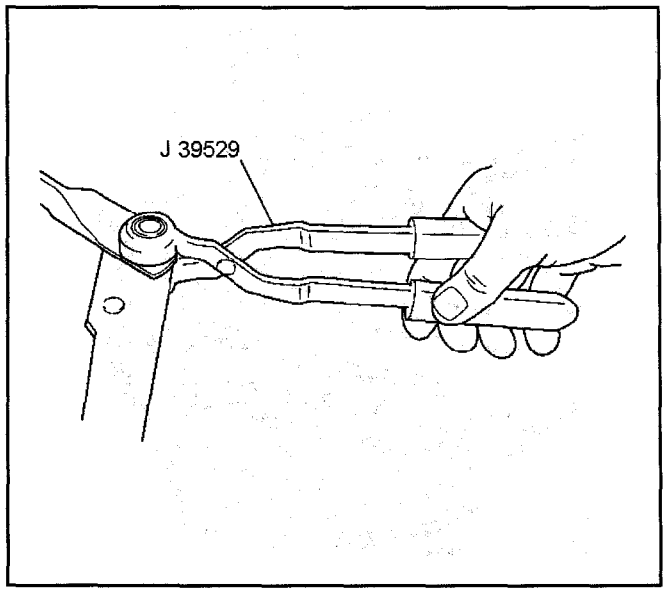
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the screw.

   Tighten

   Tighten the screw to 10 N·m (7.5 lb ft).

5. Connect the RH linkage assembly to the LH linkage assembly with the *J 39529*.

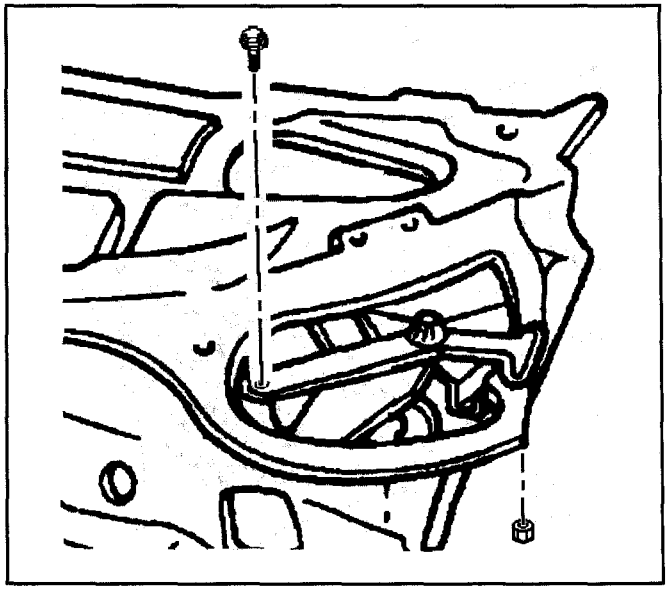


306515

6. Install the LH linkage assembly with the screw and nut.

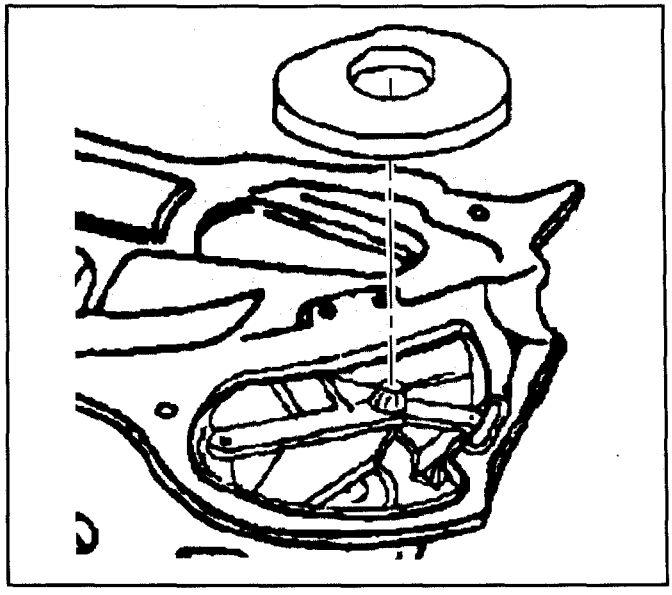
   Tighten

   Tighten the screw and the nut to 10 N·m (7.5 lb ft).

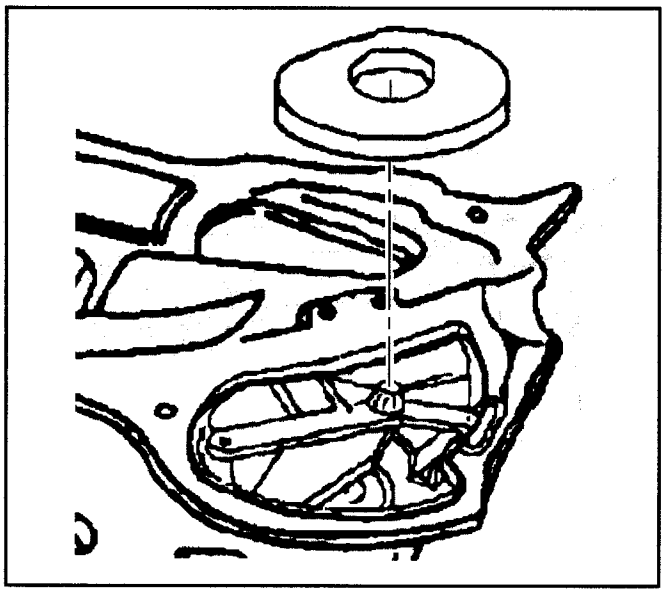


532057

7. Install the water shield on the LH linkage assembly with the flat side of the water shield under the windshield.
8. Install the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement*.
9. Install the wiper arms. Refer to *Wiper Arm Replacement*.



532066



532066

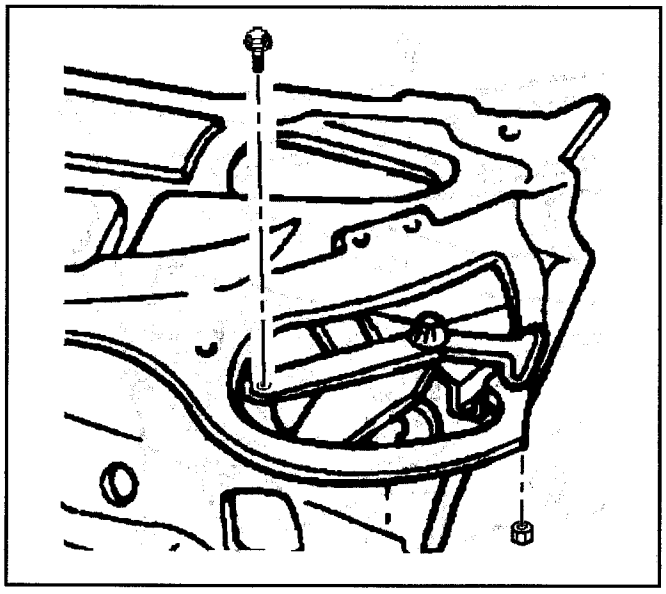
Wiper Transmission Replacement

Removal Procedure

Tools Required

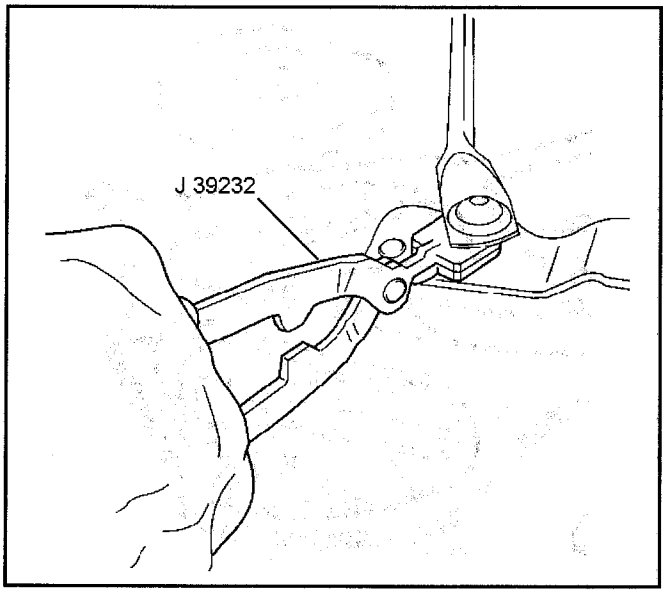
J 39232 Wiper Linkage Separator

1. Remove the wiper arms. Refer to *Wiper Arm Replacement.*
2. Remove the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement.*
3. Remove the water shield.



532057

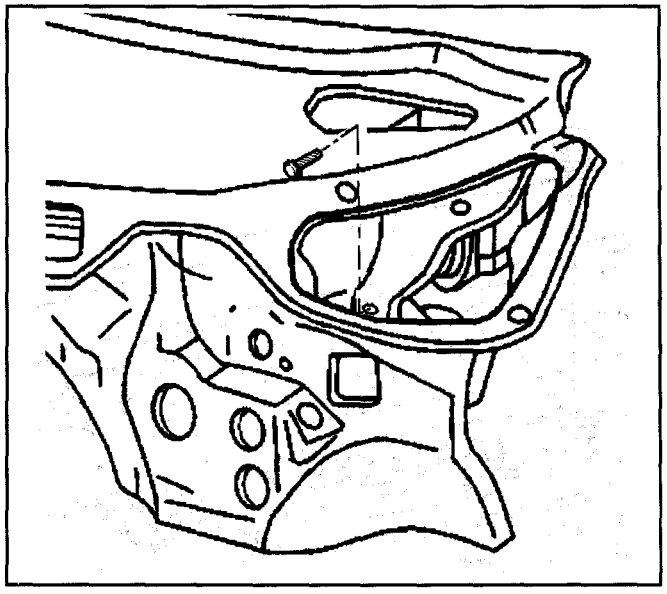
4. Remove the screw and nut.



306506

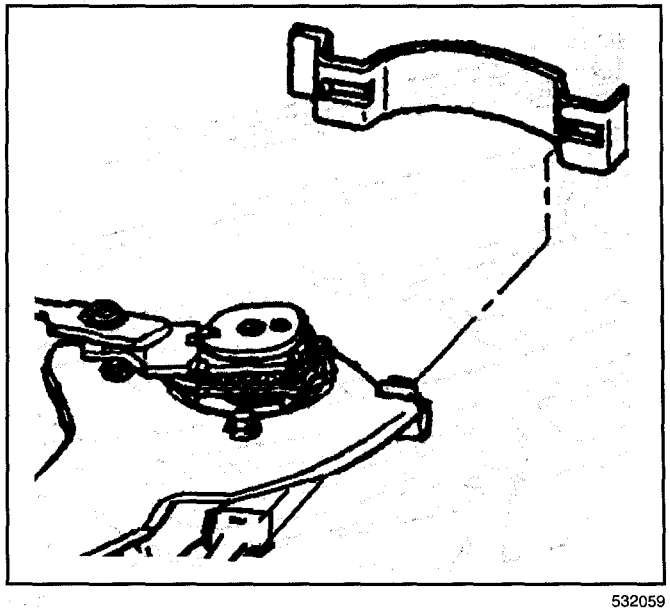
5. Disconnect the RH linkage assembly from the LH linkage assembly with the *J 39232.*
6. Remove the LH linkage assembly.

7. Remove the screw from the wiper motor.



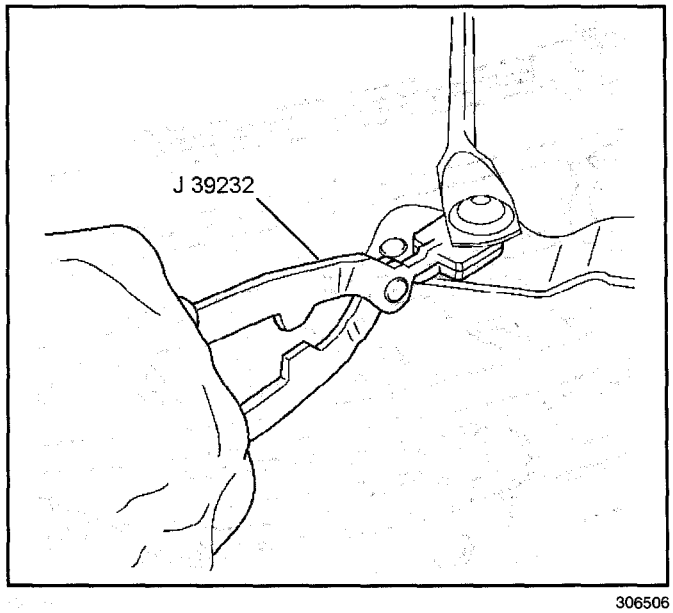
532058

8. Pull the wiper motor free from the slots of the bracket.

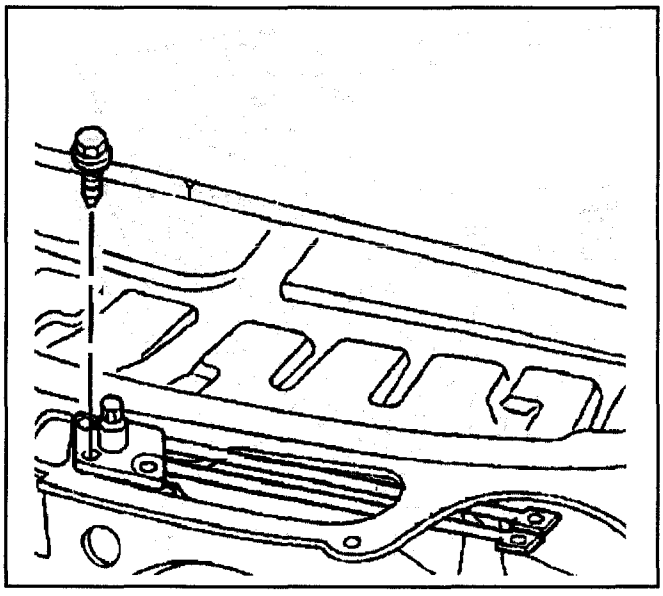


532059

9. Disconnect the RH linkage assembly from the wiper motor with the *J 39232*.

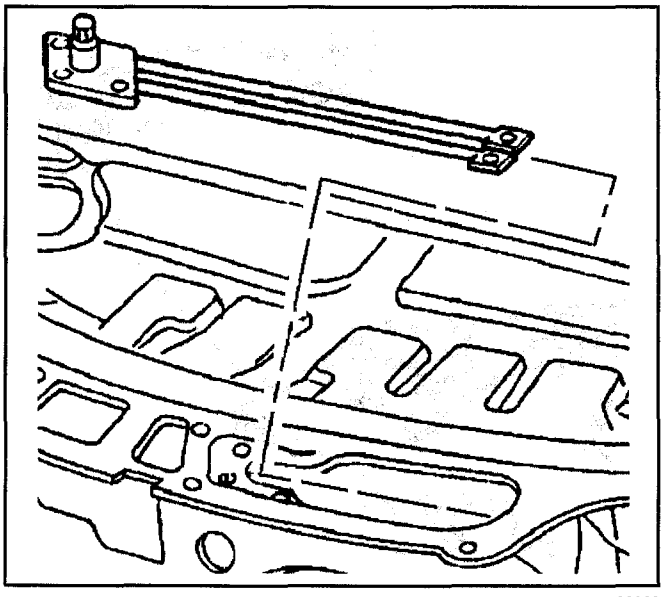


306506



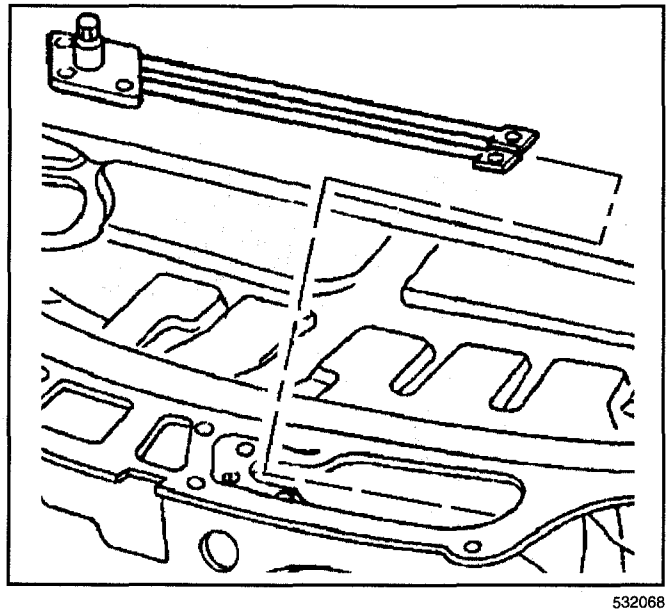
532067

10. Remove the three screws from the RH linkage assembly.



532068

11. Remove the RH linkage assembly from the plenum access hole.



532068

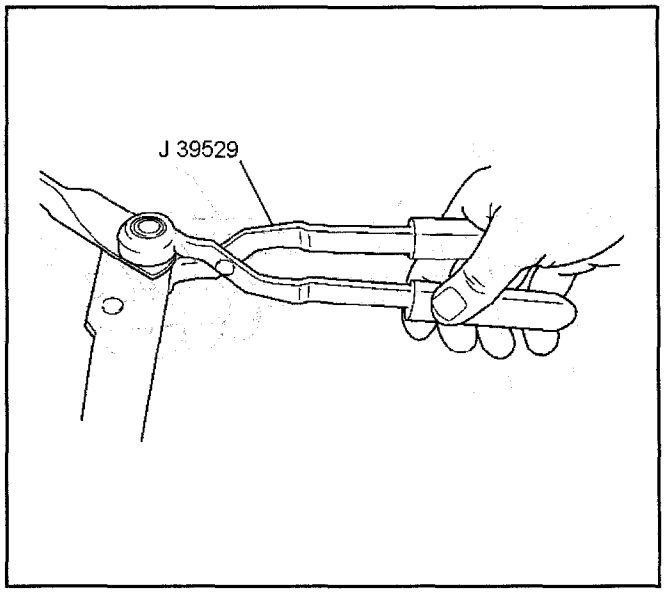
Installation Procedure

Tools Required

J 39529 Wiper Linkage Installer

1. Install the RH linkage assembly through the plenum access hole.

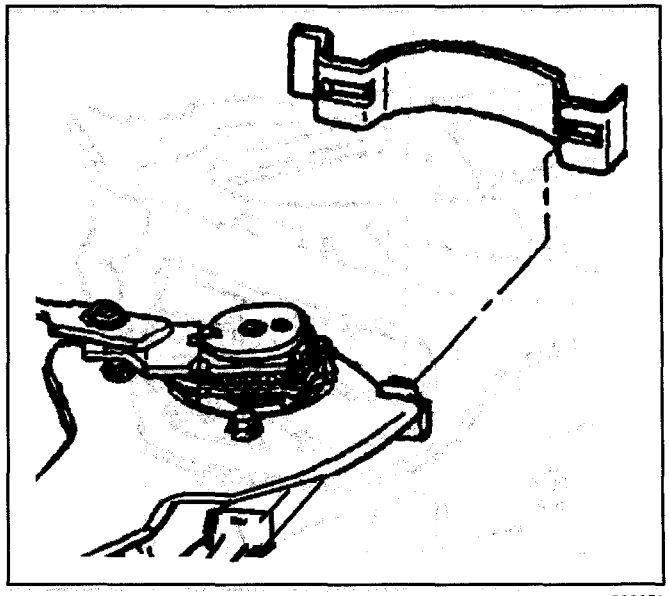
2. Connect the RH linkage assembly to the wiper motor with the *J 39529*.



306515

Important: When installing the wiper motor, be sure that the crank arm is in the innerwipe position. The crank arm drive pin must be engaged in the cam pocket.

3. Install the wiper motor with two locator pads pressed into the slots of the bracket.



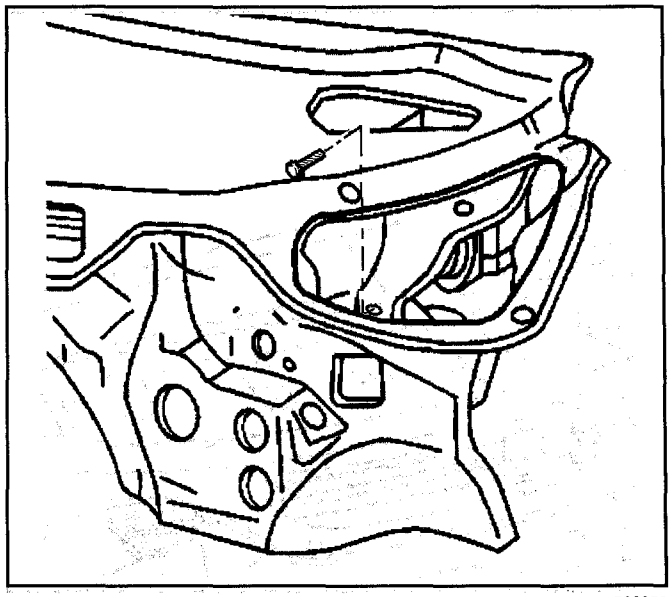
532059

Notice: Refer to *Fastener Notice* in Cautions and Notices.

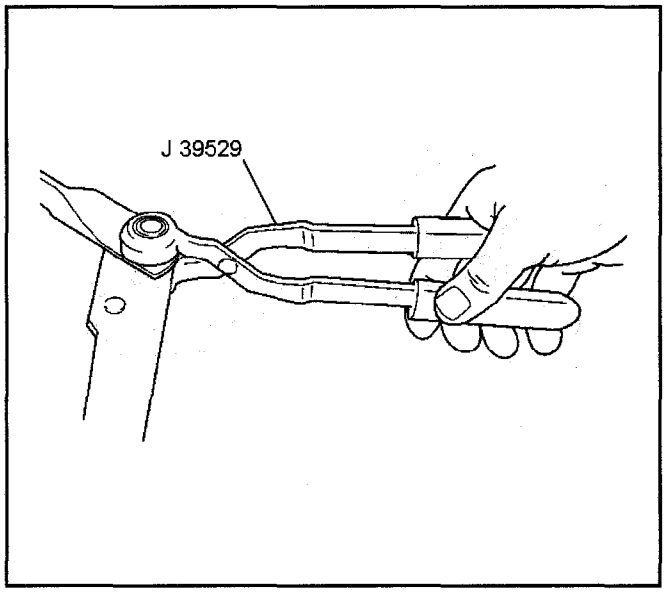
4. Install the screw.

   Tighten

   Tighten the screw to 10 N·m (7.5 lb ft).

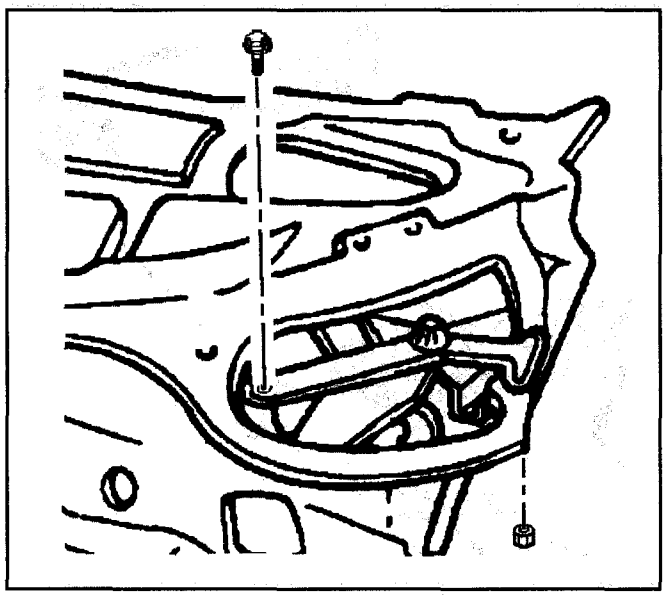


532058



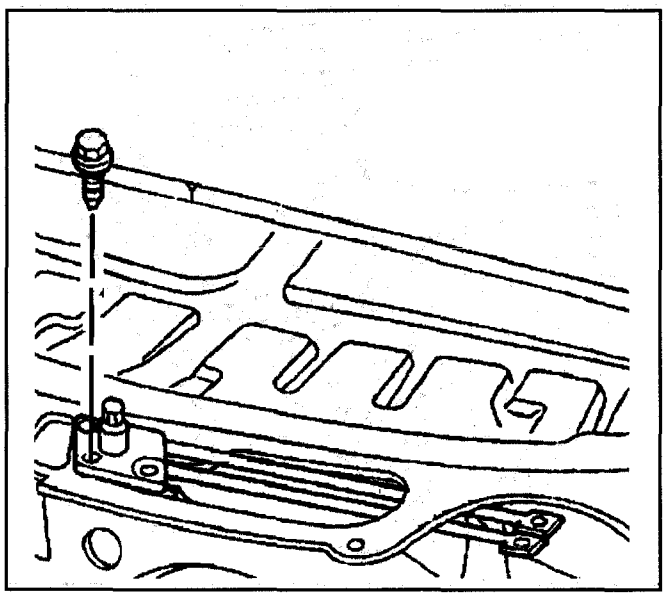
306515

5. Connect the RH linkage assembly to the LH linkage assembly with the *J 39529*.



532057

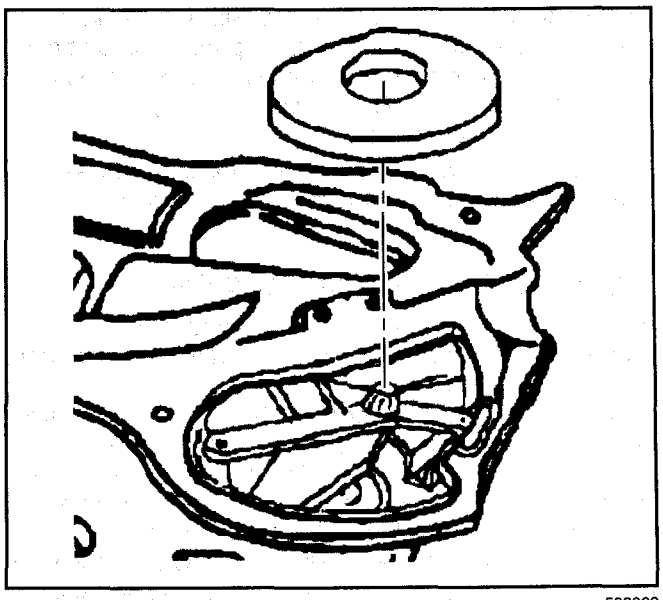
6. Install the LH linkage with the screw and the nut.
   Tighten
   Tighten the screw and the nut to 10 N·m (7.5 lb ft).



532067

7. Install three screws to the RH linkage assembly.
   Tighten
   Tighten the screws to 10 N·m (7.5 lb ft).

8. Install the water shield on the LH linkage assembly with the flat side of the water shield under the windshield.
9. Install the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement.*
10. Install the wiper arms. Refer to *Wiper Arm Replacement.*



532066

Wiper Chatter Repair

Some vehicles may exhibit a condition where the windshield wipers chatter and/or wipe unevenly. Several items may contribute to this condition. To completely repair this condition, ALL of the items listed should be tested and repaired as necessary.

- Clean the windshield glass.
- Clean the wiper blade elements
- Perform the wiper arm pressure test
- Inspect the wiper blade element set

Windshield Glass Cleaning

Clean the windshield with windshield cleaner, GM PN 1050011 or equivalent. The cleaner should not harm the paint finish or scratch the glass. The glass is clean when the water no longer beads, but sheets across the entire glass surface.

Blade Element Cleaning

Lift each blade assembly off of the windshield and clean the element with a cloth saturated with full strength washer solvent. Then rinse the blade assemblies with water.

Description and Operation

Windshield Wipers/Washer System Description

The windshield wiper/washer system consists of a permanent-magnet, depressed-park, wiper motor assembly, wiper linkage assemblies, wiper arm and blade assemblies, a washer pump mounted on a washer fluid reservoir, and a wiper/washer switch assembly.

Pulse and timing functions, along with the demand wash function, are controlled by a printed circuit board in the wiper motor cover assembly. The wiper motor also is equipped with RFI (radio frequency interference) suppression.

Depressed-park positioning is accomplished by an external drive mechanism on the wiper motor assembly.

Wiper/Washer System Operation

In addition to the features of a conventional (non-pulse) wiper system (mist, low and high speeds), the pulse-type windshield wiper/washer system includes an operating mode in which the wipers make single sweeps with an adjustable time interval between sweeps. The time interval is controlled by a solid-state timer in the wiper motor assembly. The duration of the delay interval is determined by the delay resistor in the wiper/washer switch assembly.

When the wiper switch is turned off, the wiper motor returns the wipers to the end of the sweep (innerwipe) position and then reverses, activating its external depressed-park mechanism to lower the wipers to the park position.

Pulse Operation

With the wiper switch in DELAY (pulse), battery voltage is applied to the wiper motor at terminal B through CKT 143. Voltage also is applied to terminal D through CKT 113 and terminal E through CKT 112.

The length of delay time between sweeps is controlled by the variable-pulse delay resistor. The delay is adjustable from 1–22 seconds.

Low-Speed Operation

In the LO position of the wiper switch, battery voltage is applied to the wiper motor connector at terminal B through CKT 143, terminal E through CKT 112, and terminal D through CKT 113.

High-Speed Operation

In the HI position of the wiper switch, battery voltage is applied at terminal B, C, and E of the wiper motor assembly through CKTs 143, 92, and 112. Voltage also is applied at terminal D through CKT 113.

Park Position Operation

When turned OFF from any position, the wipers complete the last sweep and park. When the wiper switch is in OFF, the wiper motor assembly has battery voltage applied to terminal B only, from CKT 143. When the end-of-sweep switch opens, the control circuit reverses the wiper motor which activates the external depressed-park mechanism. The wiper motor continues to run until the park switch opens.

Washer Operation

When the washer switch is turned ON, battery voltage is applied to terminal D of the wiper motor assembly through CKT 113. The washer switch also applies voltage to terminal A which turns on the washer pump through CKTs 94 and 228. The wiper motor has voltage applied through the low-speed relay and operates at low speed for 2–4 wipes after the washer switch is released.

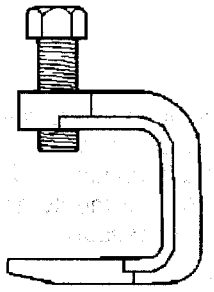
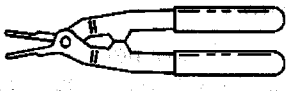
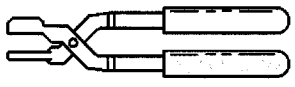
When the washer switch is held in the ON position, the wiper motor circuitry keeps the washer pump on only as long as the washer switch is held ON.

If the wipers had been in DELAY, LO, or HI, they would return to that operation after the wash cycle. If in OFF, they then return to the park position after 2–4 wipes.

Mist Operation

When the wiper switch is moved to MIST and released, the wipers make one sweep at low speed and return to the park position. If the wiper switch is held in MIST, the wipers continue to operate until the switch is released. The circuit operation is the same as that of LO.

Special Tools and Equipment

Illustration	Tool Number/ Description
 532070	Wiper Arm Puller
 306527	Wiper Linkage Separator
 477018	Wiper Linkage Installer

Entertainment

Specifications

Fastener Tightening Specifications

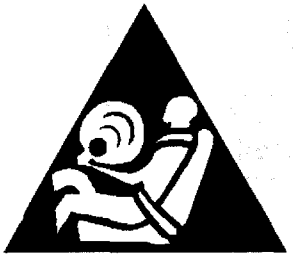
Application	Specification	
	Metric	English
Antenna Bracket Bolt	5 N·m	44 lb in
Antenna Mast	5 N·m	44 lb in
Amplifier Bolt	4 N·m	35 lb in
Compact Disc Changer Bracket Bolt	1.9 N·m	17 lb in
Compact Disc Changer Mounting Nut	2.5 N·m	22 lb in
Door Speaker Bolt	2.5 N·m	22 lb in
Radio Bracket Bolt	1.8 N·m	16 lb in
Radio Speaker Bolts	1.9 N·m	17 lb in

Schematic and Routing Diagrams

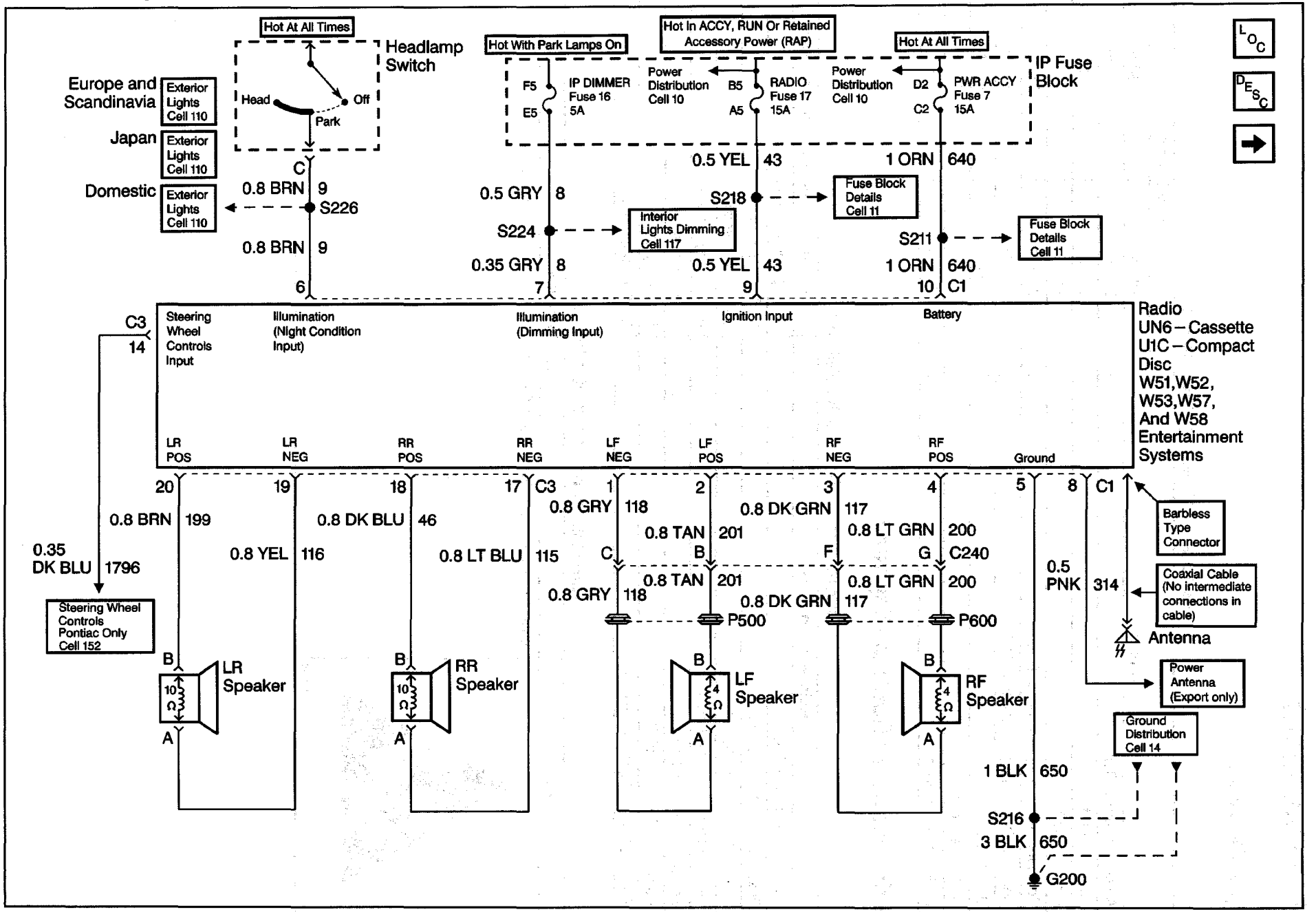
Entertainment Schematic References

Reference on Schematic	Section Number - Subsection Name
Exterior Lights Cell 110	8 - Lighting Systems
Fuse Block Details Cell 11	8 - Wiring Systems
Ground Distribution Cell 14	8 - Wiring Systems
Interior Lights Dimming Cell 117	8 - Lighting Systems
Power Antenna Cell 151	8 - Entertainment
Power Distribution Cell 10	8 - Wiring Systems
Steering Wheel Controls Cell 152	8 - Entertainment

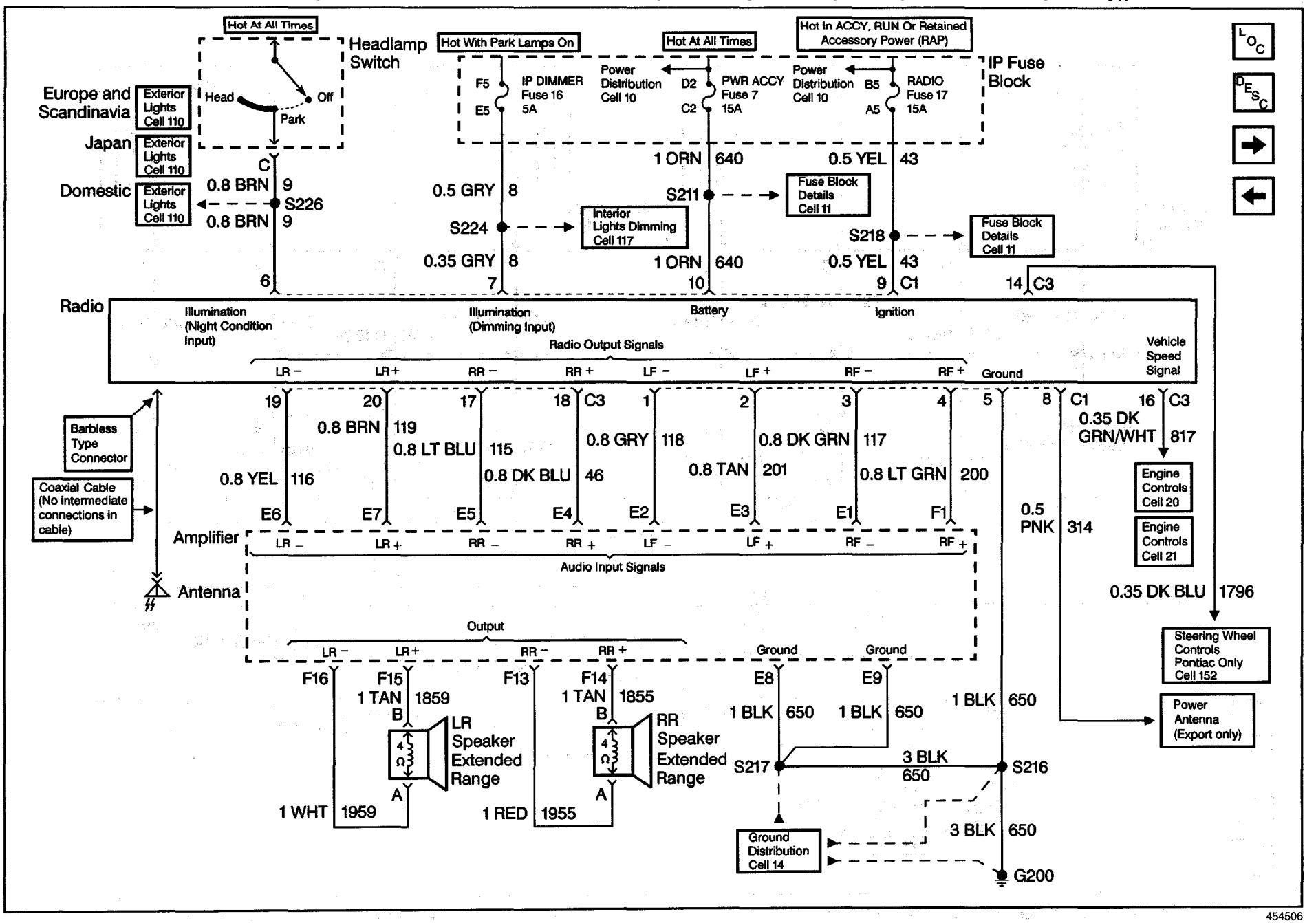
Entertainment Schematic Icons

Icon	Icon Definition
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.

Radio/Audio System Schematics (Cell 150: UL0, UM6, UN0 w/UQ0 or U62 (Chevrolet), and W52, W53 (Pontiac) Entertainment Systems)

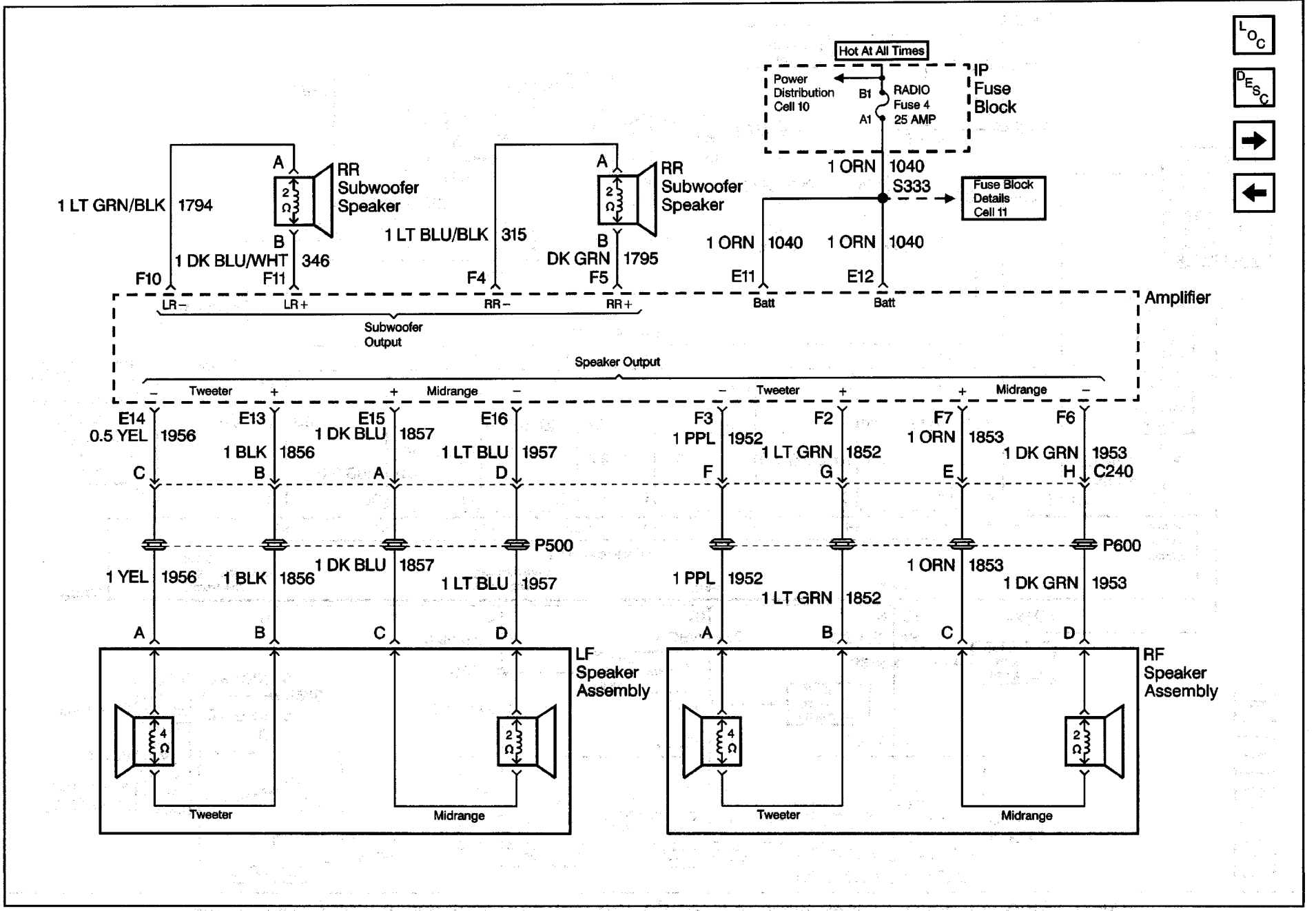


Radio/Audio System Schematics (Cell 150: UZ7 Up-Level Speaker System (Chevrolet Coupe Only))



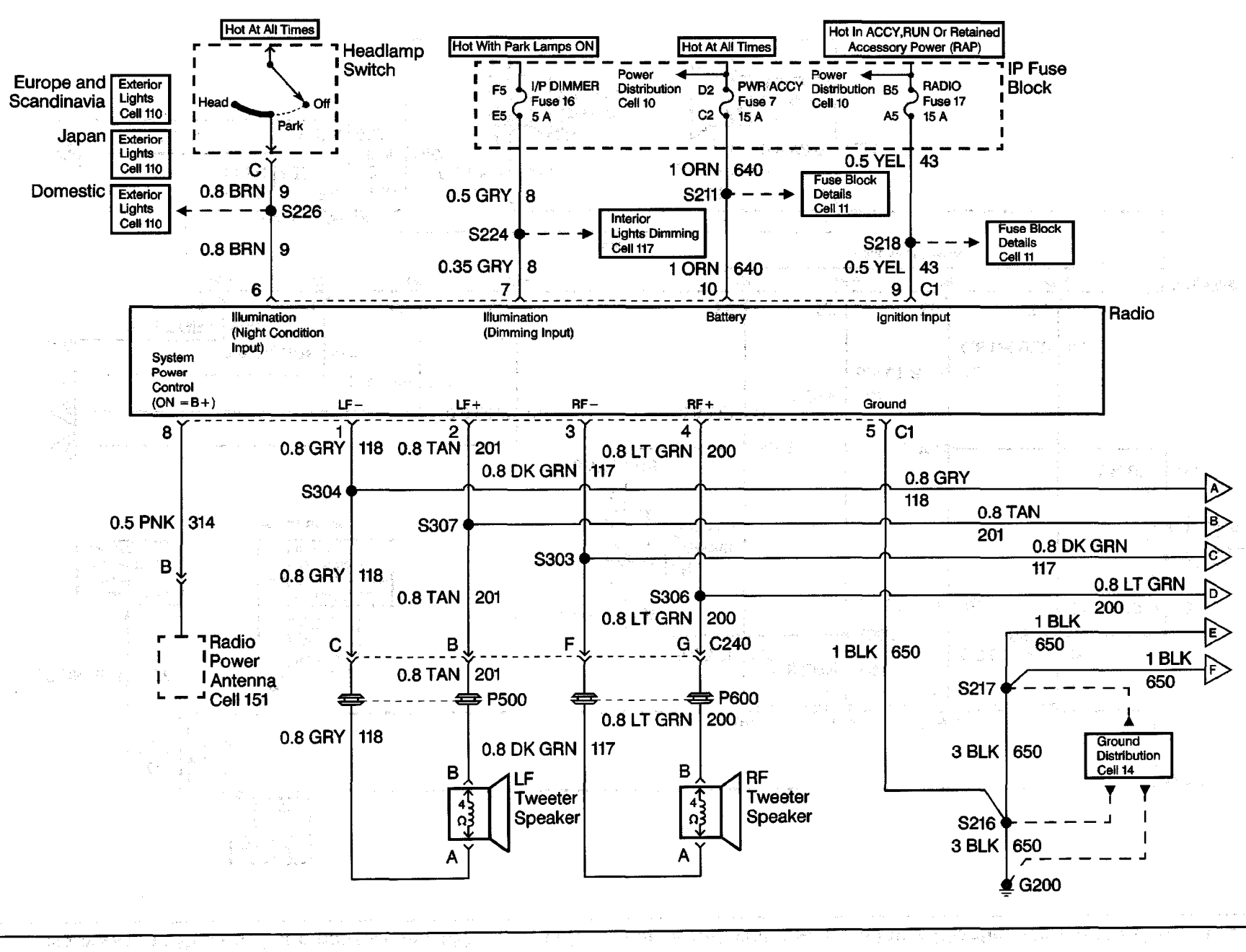
454506

Radio/Audio System Schematics (Cell 150: UZ7 Up-Level Speaker System (Chevrolet Coupe Only) Continued)



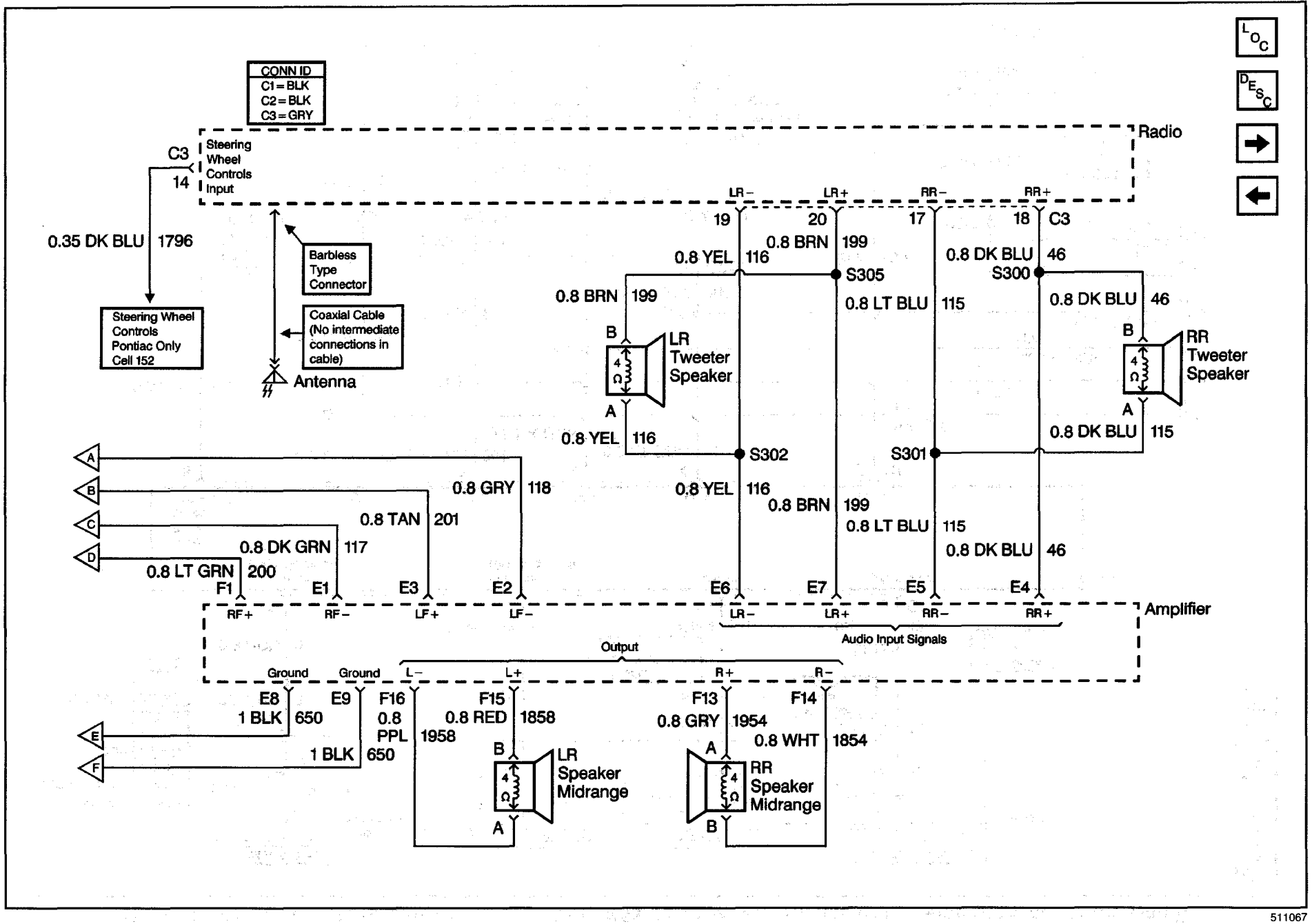
454410

Radio/Audio System Schematics (Cell 150: W54, W55 Up-Level Entertainment Systems (Pontiac Coupe Only))



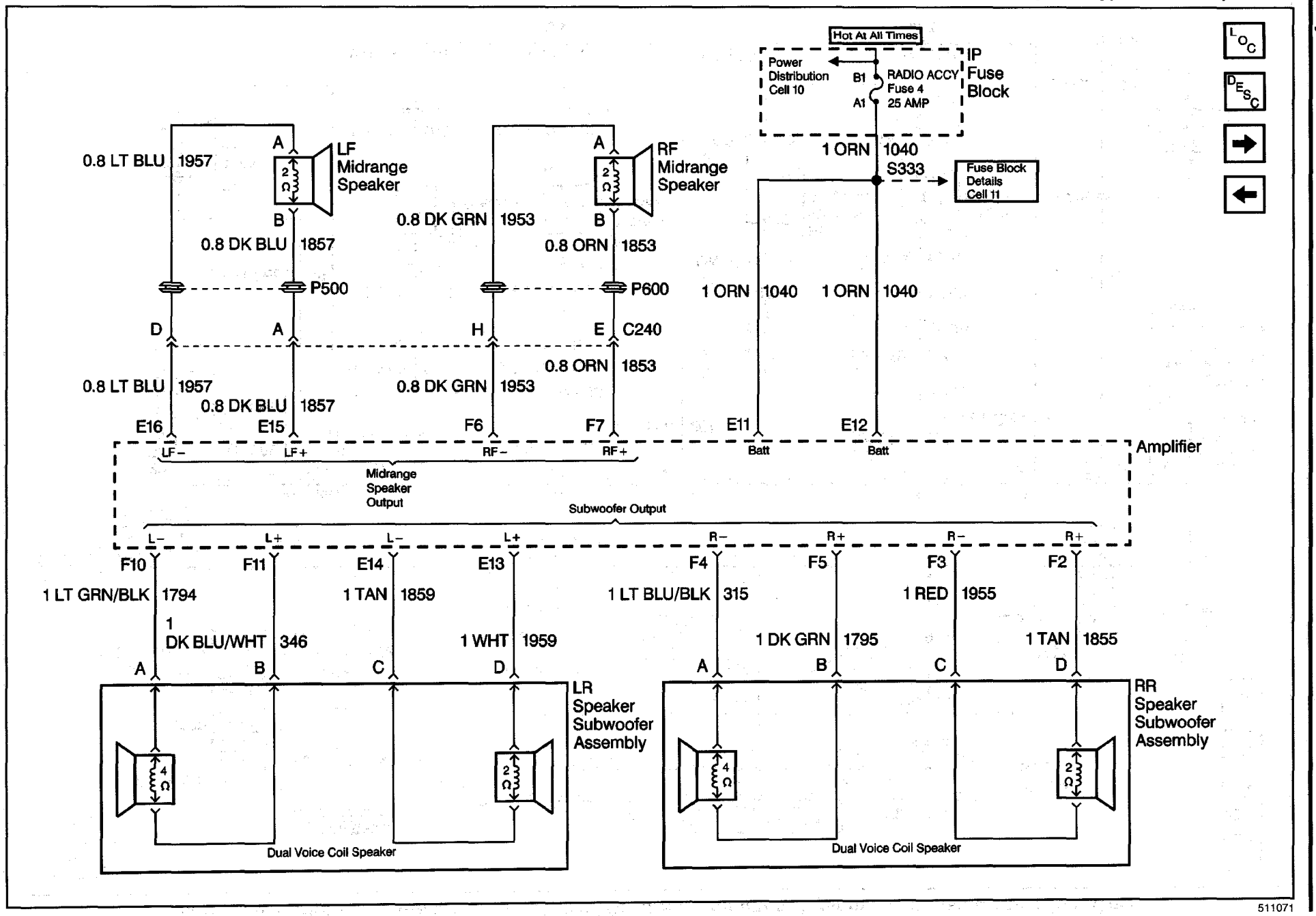
511065

Radio/Audio System Schematics (Cell 150: W54, W55 Up-Level Entertainment Systems (Pontiac Coupe Only) Continued)



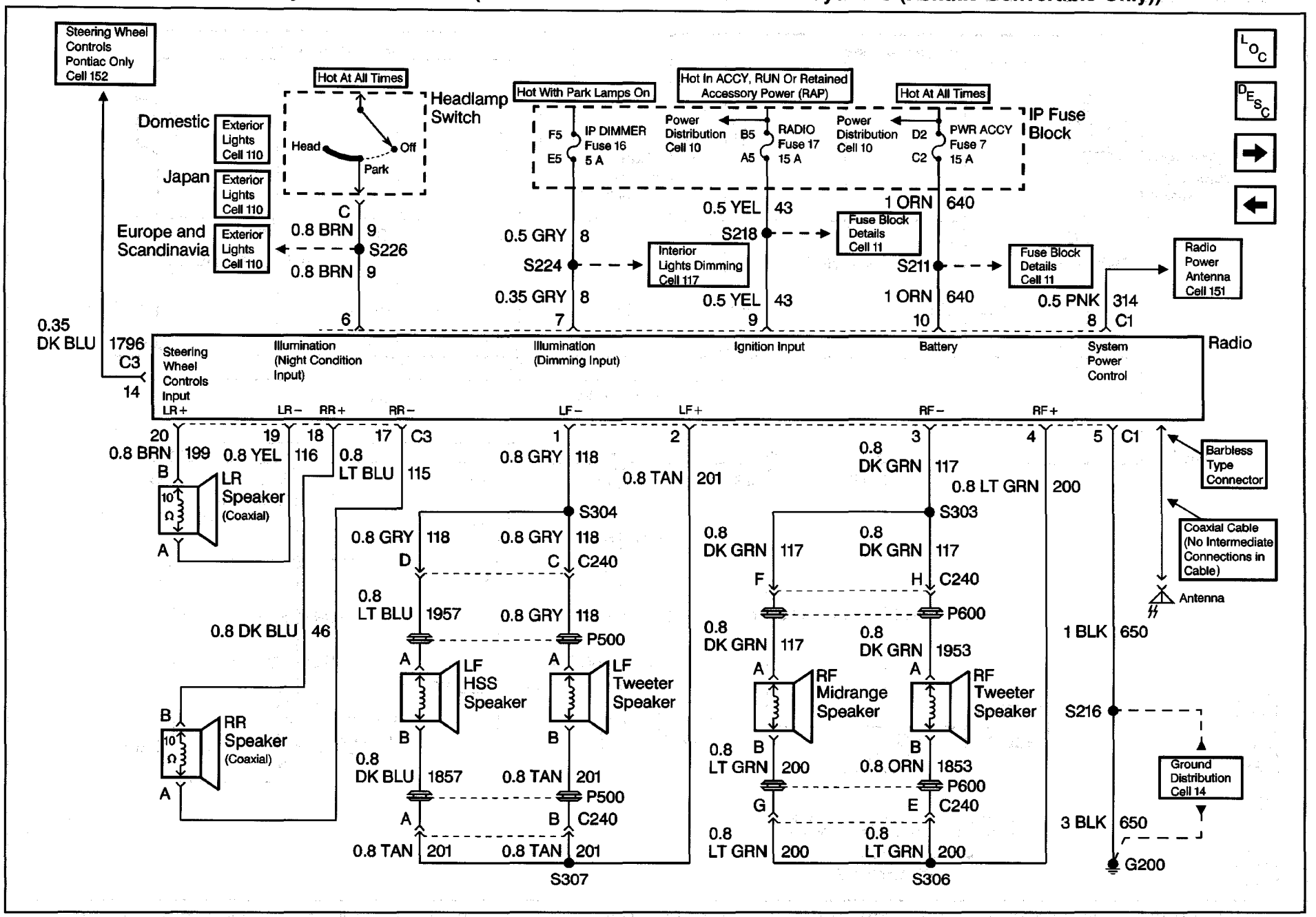
511067

Radio/Audio System Schematics (Cell 150: W54, W55 Up-Level Entertainment Systems (Pontiac Coupe Only) Continued)

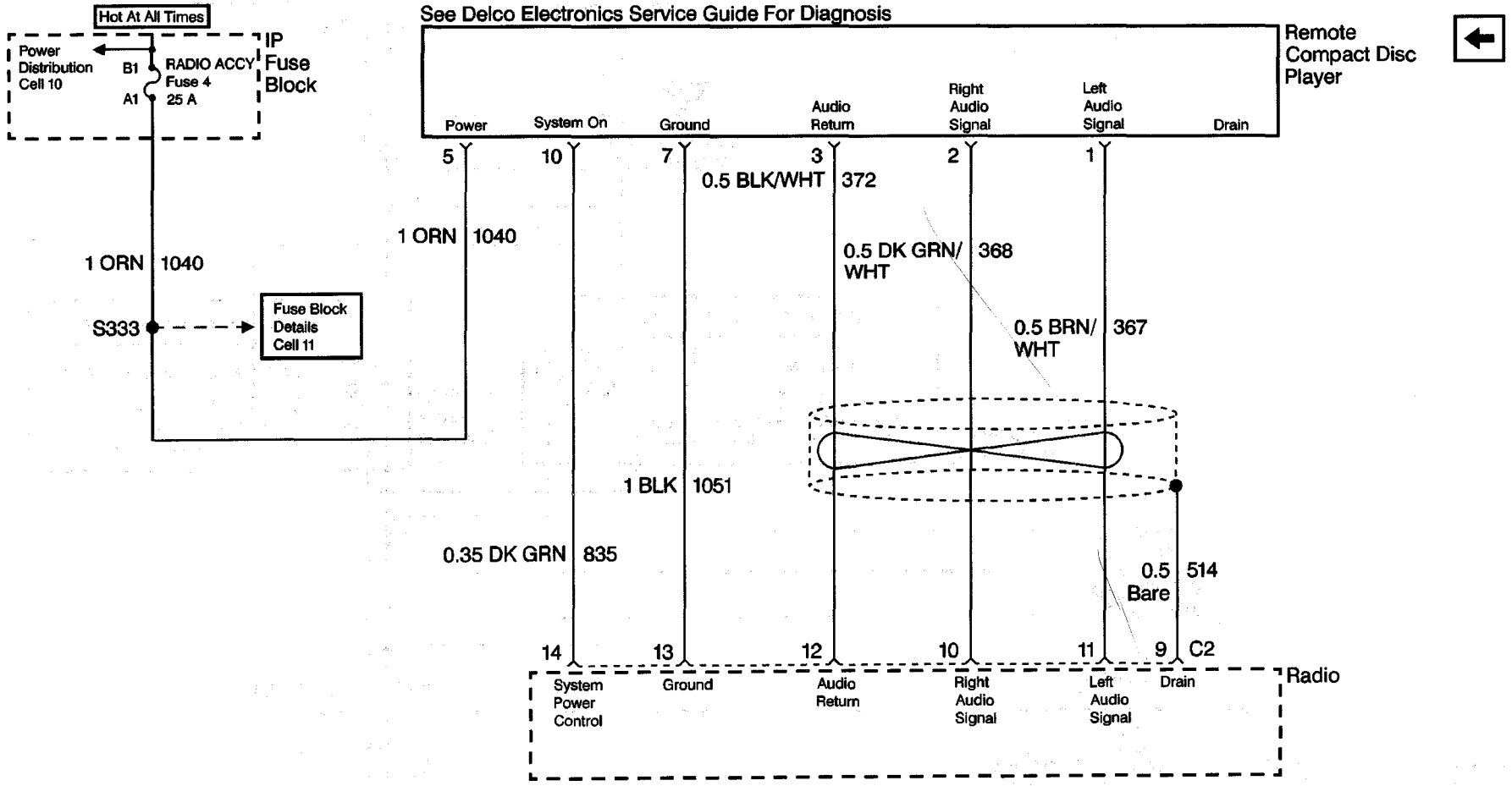


511071

Radio/Audio System Schematics (Cell 150: W59/W73 Entertainment Systems (Pontiac Convertible Only))

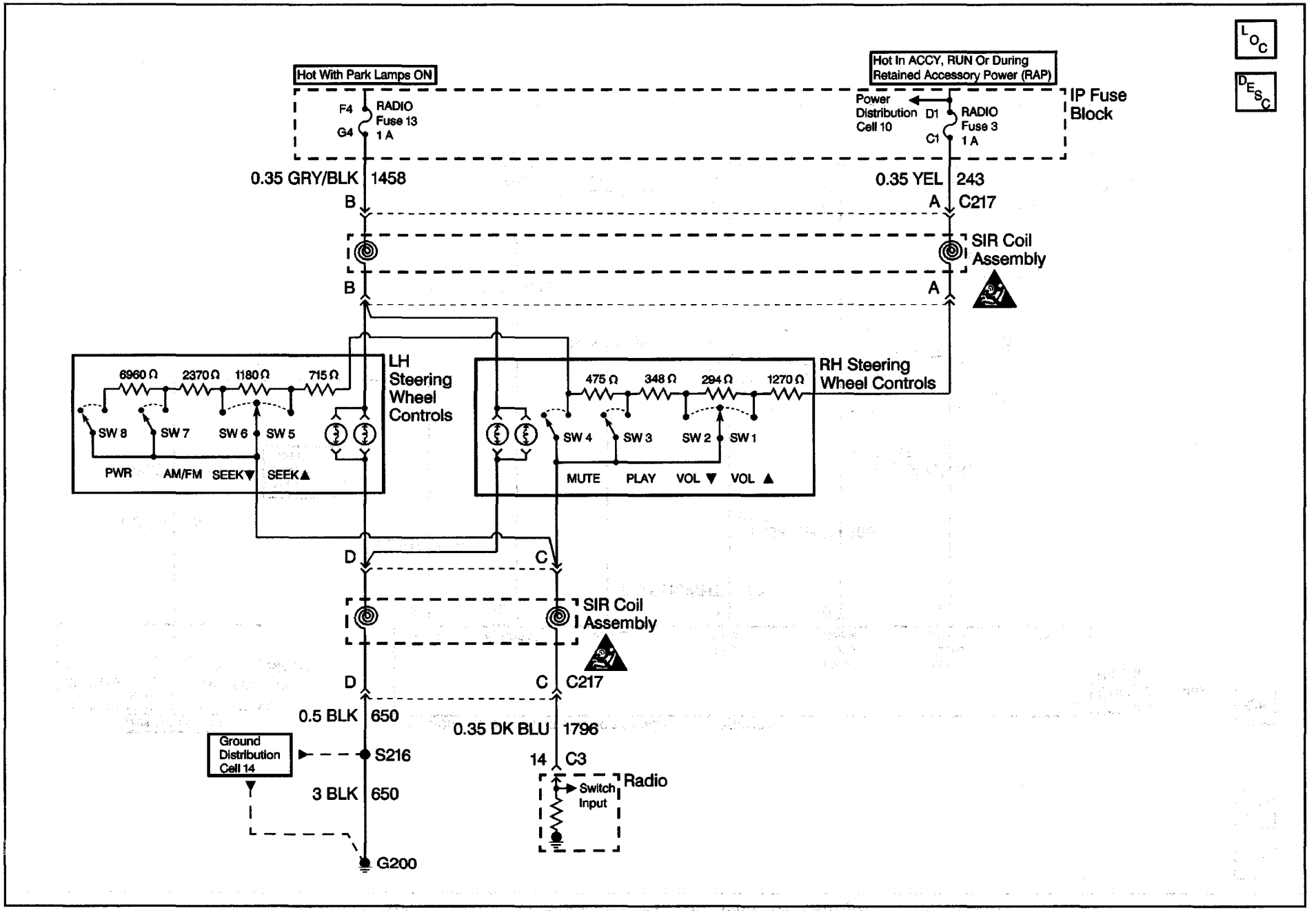


Radio/Audio System Schematics (Cell 150: Remote Compact Disc Player)

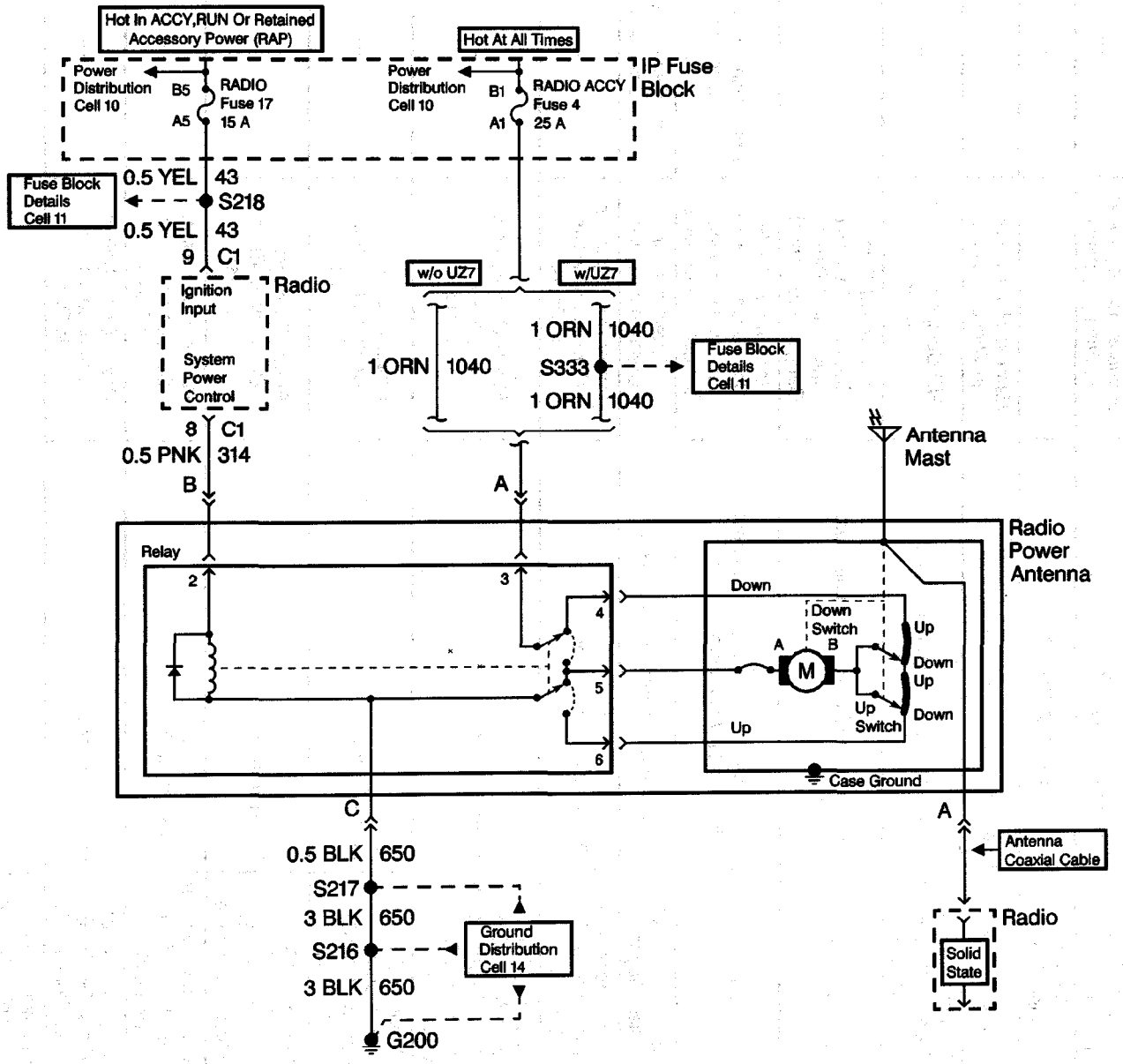


454490

Steering Wheel Controls Schematics (Cell 152)



Power Antenna Schematics (Cell 151: Pontiac Coupe With UW2, Pontiac Convertible With UW6)



480221

Component Locator

Entertainment Components

Name	Location	Locator View	Connector End View
Amplifier	Mounted behind the right rear quarter inner trim panel	*Entertainment Component Views*	*Entertainment Connector End Views*
Headlamp Switch	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems
Ignition Key Lock Cylinder	Part of steering column	*Harness Routing Views* in Wiring Systems	—
Ignition Key Warning Switch	Part of steering column	—	—
Ignition Switch	Part of the steering column	*Harness Routing Views* in Wiring Systems	—
Inflatable Restraint Steering Wheel Module Coil	On the top of the steering column	*SIR Component Views* in SIR	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Radio	In the center of the instrument panel, below the HVAC control	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Entertainment Connector End Views*
Remote Compact Disc Player	In the left rear cargo compartment	*Entertainment Component Views*	*Entertainment Connector End Views*
Speaker Assembly, Front (with UZ7) (Chevrolet)	On the lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front (UL0, UM6, UN0 with UQ0 or U62 (Chevrolet), and W51, W52, and W53) (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Midrange (with W54, W55) (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Midrange (with W59, W73) (Pontiac Convertible)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Tweeter (with W54, W55) (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Tweeter (with W59, W73) (Pontiac Convertible)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Rear (UL0, UM6, UN0 with UQ0 or U62 (Chevrolet), and W51, W52, and W53) (Pontiac)	Mounted in sail panel	*Entertainment Component Views*	—

Entertainment Components (cont'd)

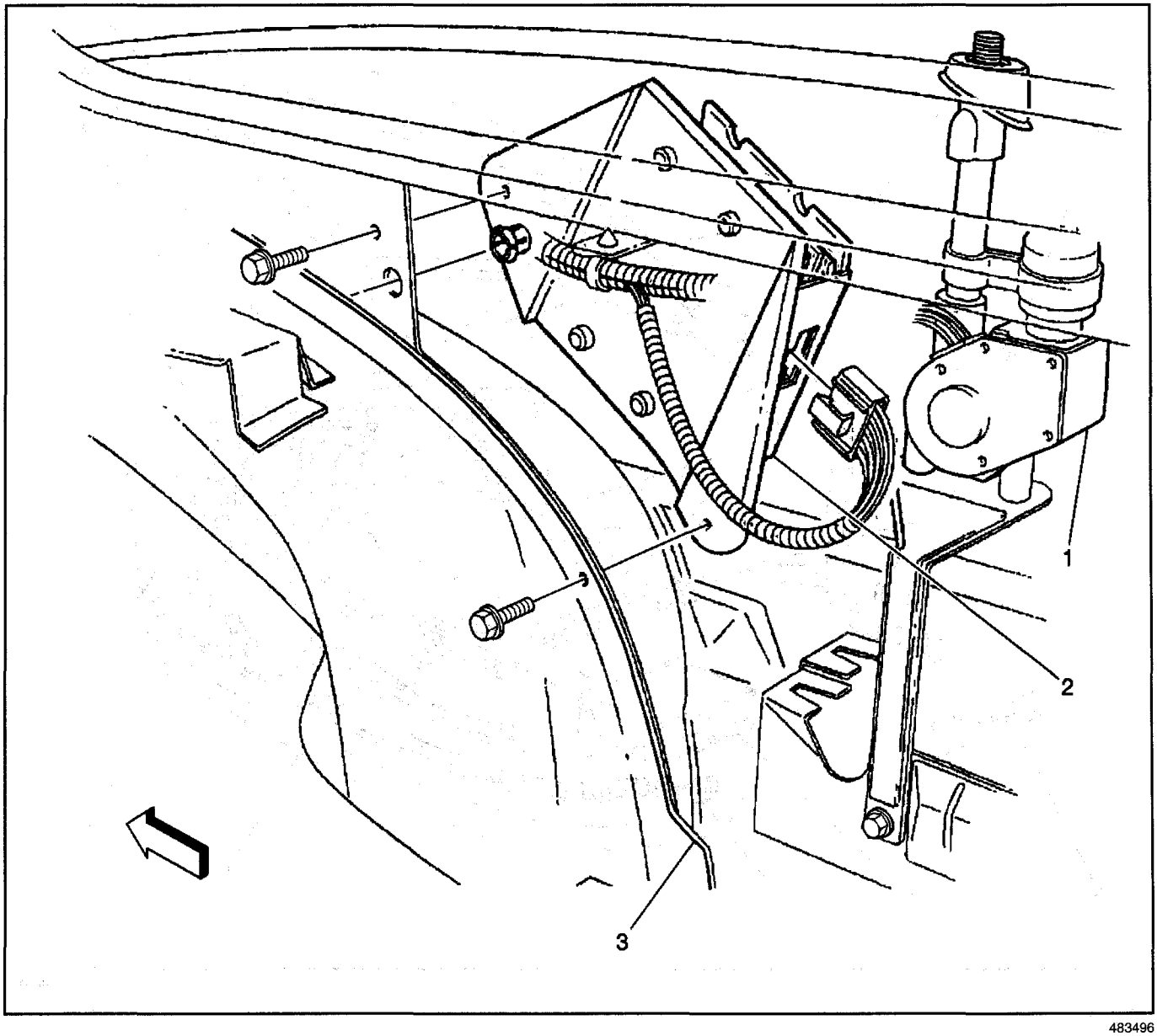
Name	Location	Locator View	Connector End View
Speaker, Rear Coaxial (with W59, W73) (Pontiac Convertible)	Mounted in sail panel	*Entertainment Component Views*	—
Speaker, Rear Extended Range (with UZ7) (Chevrolet)	Mounted in rear quarter inner trim panel	*Entertainment Component Views*	—
Speaker, Rear Midrange (with W54, W55) (Pontiac)	Mounted in rear quarter inner trim panel	*Entertainment Component Views*	—
Speaker, Rear Subwoofer (with UZ7) (Chevrolet)	Mounted in sail panel	*Entertainment Component Views*	—
Speaker, Rear Tweeter (with W54, W55) (Pontiac)	Mounted in rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	—
Steering Wheel Controls	On the steering wheel	*Entertainment Component Views*	—
C217 (4 cavities)	Instrument panel to inflatable restraint steering wheel module coil harness, near the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C240 (8 cavities)	Cross car to instrument panel harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P500	Between the driver door and A-pillar	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S218	In the instrument panel harness, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S224	In the instrument panel harness, main branch, approximately 17 cm (7 in) from the instrument cluster breakout	—	—
S226	Instrument panel harness, approximately 7 cm (3 in) into headlamp switch breakout	—	—
S300 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 4 cm (2 in) from theft deterrent shock sensor breakout	—	—
S301 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 7 cm (3 in) from theft deterrent shock sensor breakout	—	—

Entertainment Components (cont'd)

Name	Location	Locator View	Connector End View
S302 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 13 cm (5 in) from remote compact disc player/left rear speaker breakout	—	—
S303 (Pontiac Convertible)	Instrument panel harness, main branch, approximately 11 cm (4 in) from body control module (BCM) breakout	—	—
S303 (Pontiac)	Instrument panel harness, main branch, approximately 18 cm (7 in) from C220 breakout	—	—
S304 (Pontiac)	Instrument panel harness, main branch, approximately 18 cm (7 in) from body control module (BCM) breakout	—	—
S304 (Pontiac Convertible)	Instrument panel harness, main branch, approximately 18 cm (7 in) from body control module (BCM) breakout	—	—
S305 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 7 cm (3 in) from remote compact disc player/left rear speaker breakout	—	—
S306 (Pontiac)	Instrument panel harness, main branch, approximately 14 cm (6 in) from G201 breakout	—	—
S307 (Export)	In the instrument panel harness, main branch, at the rear fog lamp relay breakout	—	—
S307 (Pontiac)	In the instrument panel harness, main branch, approximately 7 cm (3 in) from G201 breakout	—	—
S333 (Convertible))	In the instrument panel harness, main branch, approximately 23 cm (9 in) from the remote compact disc player/left rear speaker breakout	—	—
S333 (Coupe)	In the instrument panel harness, approximately 11 cm (4 in) (4.3 in) from the body control module (BCM) breakout	—	—

Entertainment Component Views

Right Side of Rear Compartment, Rear of Wheelhouse

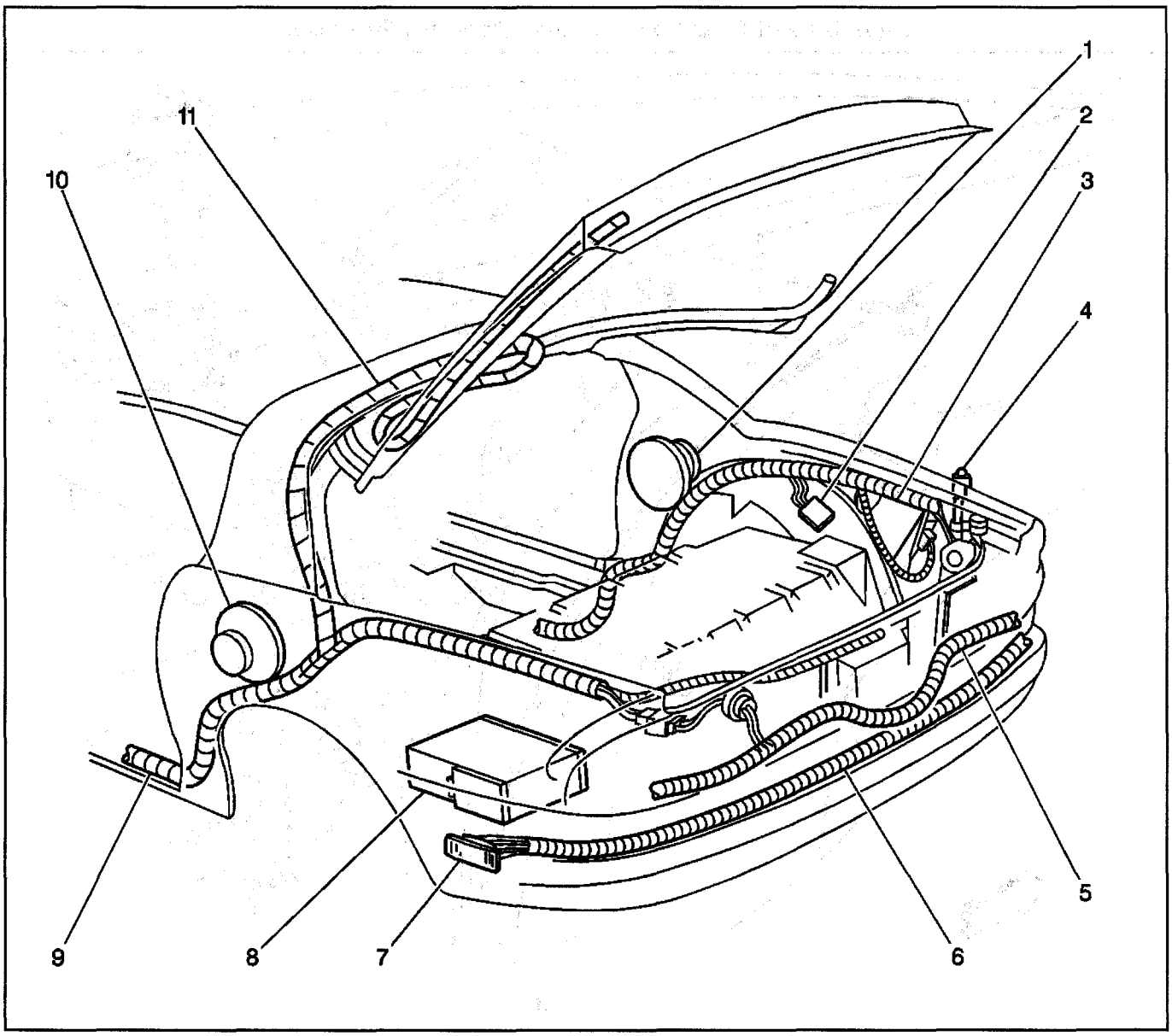


483496

Legend

(1) Power Antenna
(2) Amplifier
(3) Rear Wheelhouse

Rear Compartment (Coupe)

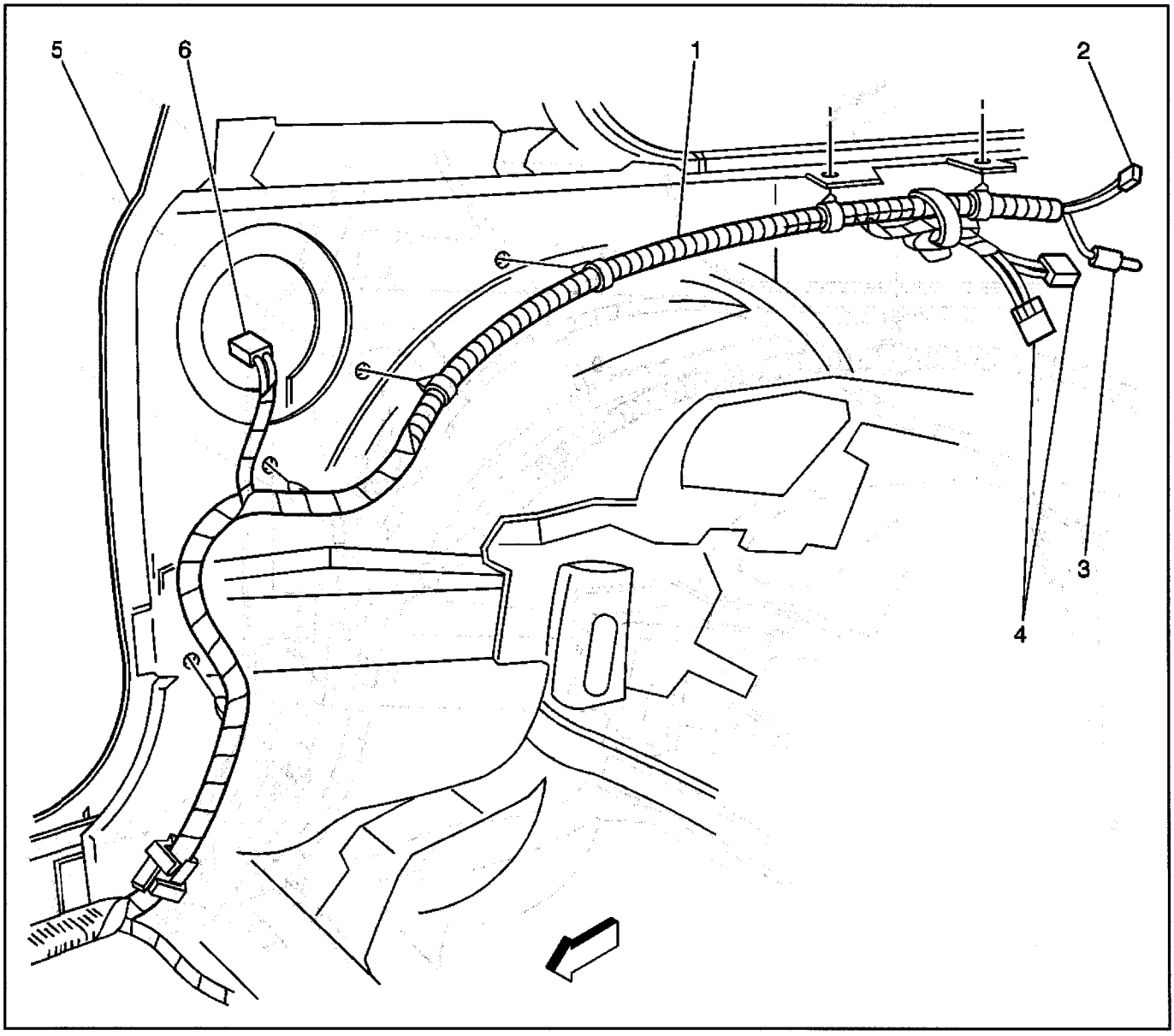


483497

Legend

(1) Rear Speaker
(2) Theft Deterrent Shock Sensor
(3) Amplifier
(4) Antenna
(5) Rear Body Harness
(6) Rear Fascia Harness
(7) Side Marker Lamp
(8) Remote Compact Disc Player
(9) IP Wiring Harness
(10) Rear Speaker
(11) Hatch Harness

Right Rear Quarter Panel

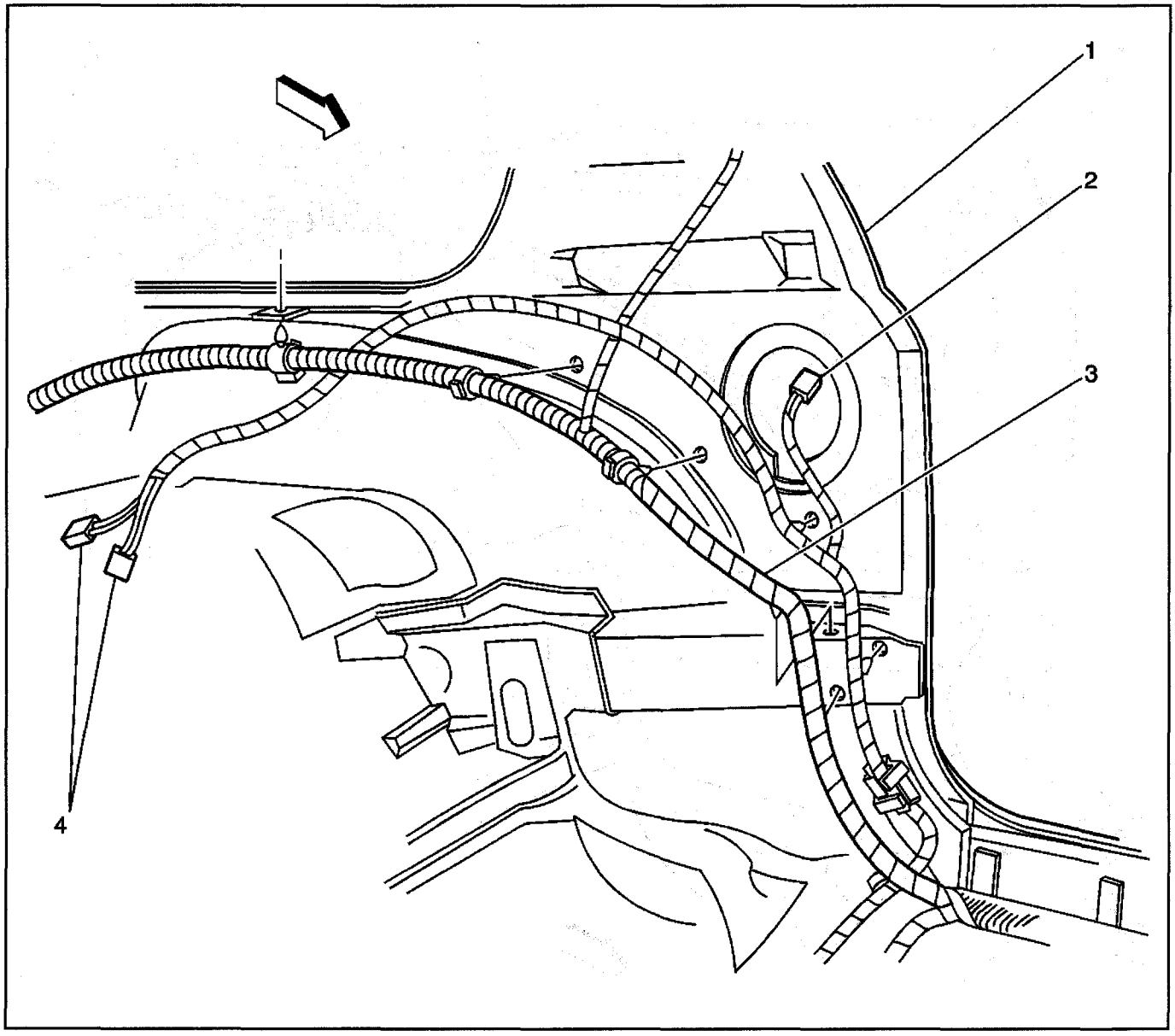


483498

Legend

(1) IP Wiring Harness
(2) Power Antenna Connector
(3) Antenna Coaxial Cable
(4) Speaker Connectors
(Pontiac W54/W55: 2 Connectors Used)
(Chevrolet U27: 1 Connector Used)
(5) Rear Quarter Panel
(6) Speaker Connector

Left Rear Quarter Panel

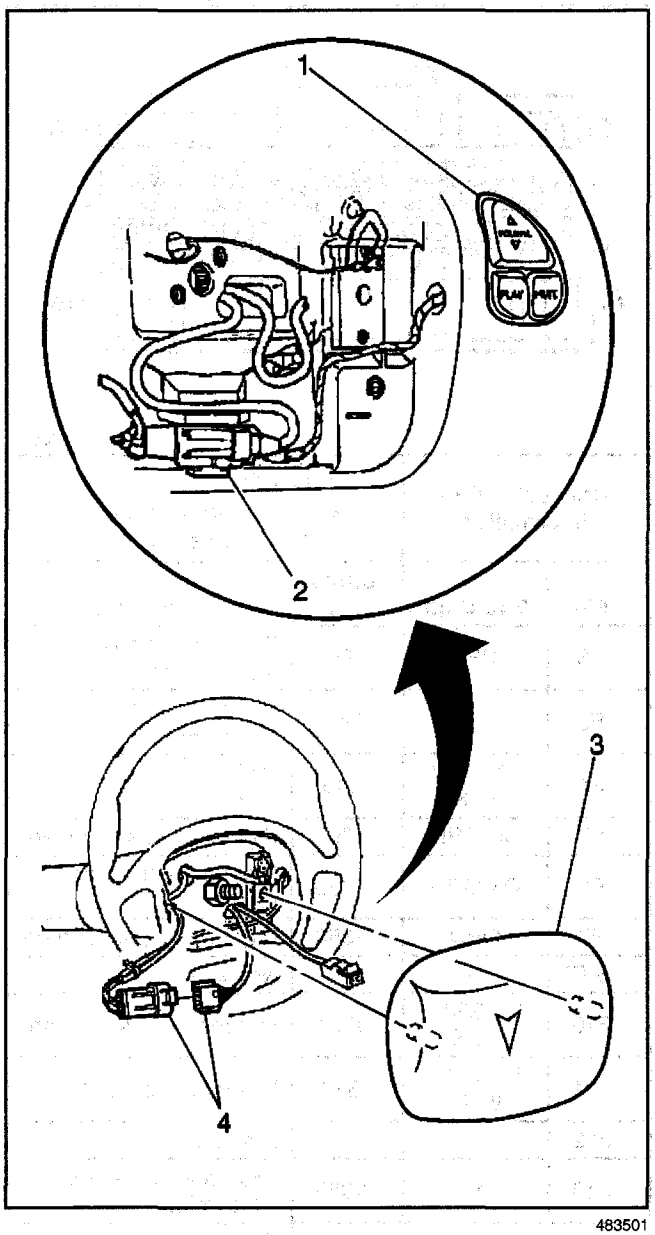


483499

Legend

(1) Rear Quarter Panel
(2) Speaker Connector
(3) IP Wiring Harness
(4) Speaker Connectors
(Pontiac W54/W55: 2 Connectors Used)
(Chevrolet U27: 1 Connector Used)

Steering Wheel (Pontiac) View A

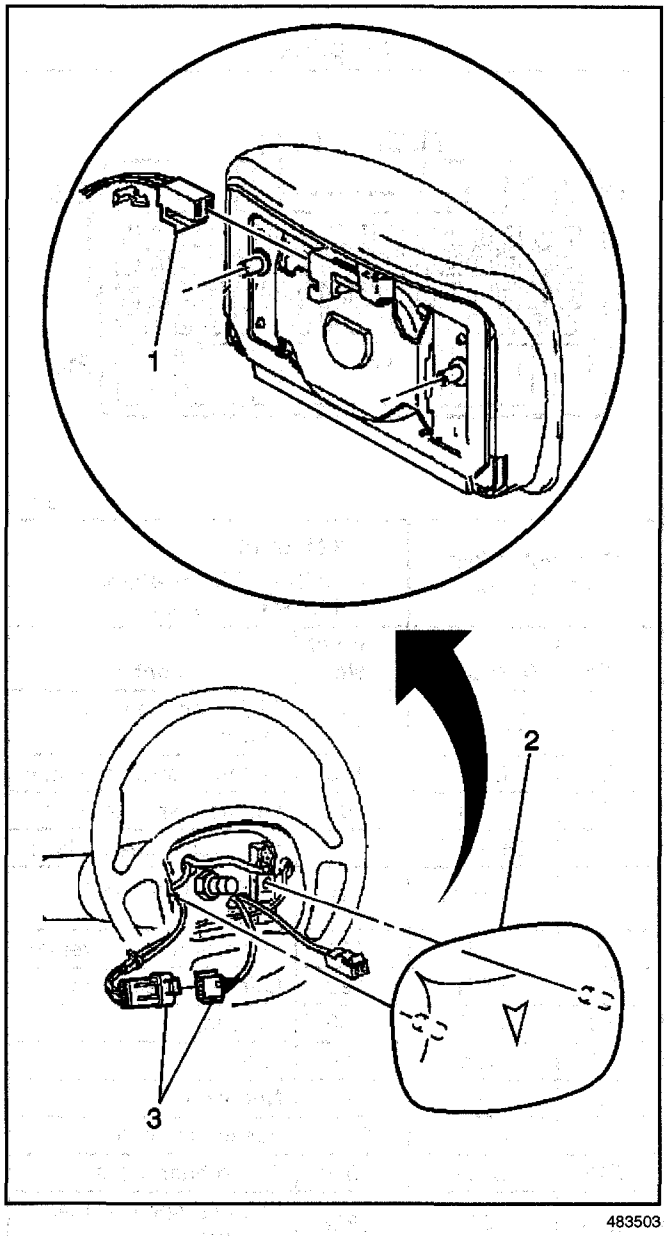


483501

Legend

(1) Steering Wheel Controls
(2) Steering Wheel Controls Connectors
(3) Inflatable Restraint Steering Wheel Module
(4) Steering Wheel Controls Connector

Steering Wheel (Pontiac) View B



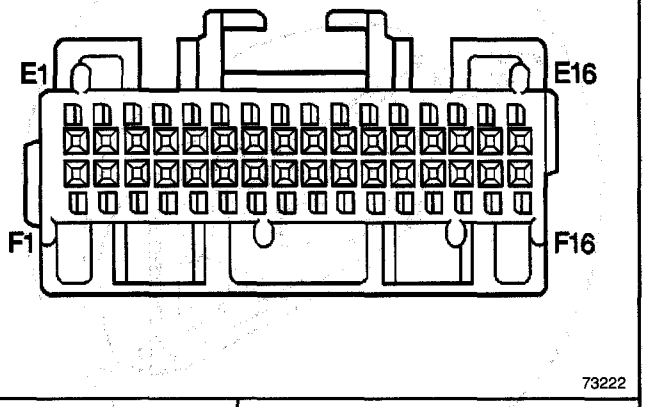
483503

Legend

(1) Inflatable Restraint Steering Wheel Module Connector
(2) Inflatable Restraint Steering Wheel Module
(3) Steering Wheel Controls Connector

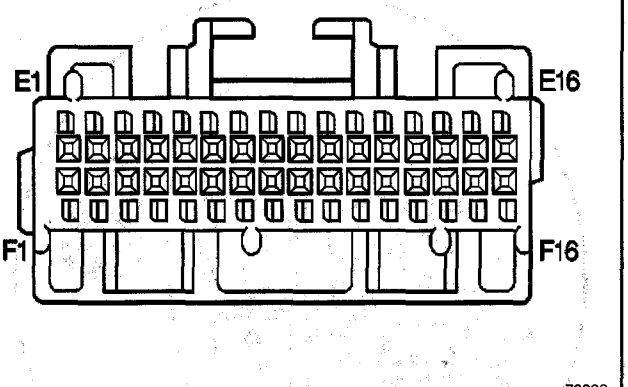
Entertainment Connector End Views

Amplifier



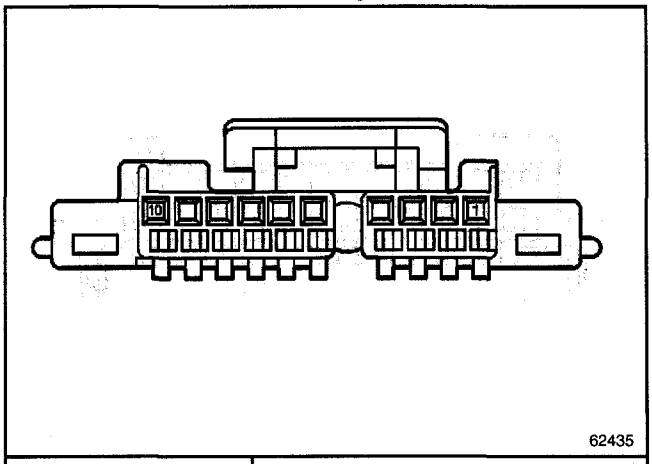
Connector Part Information	• 12110115 • 32-Way F Micro-Pack 100 Series (BLU)		
Pin	**Wire Color**	**Circuit No.**	**Function**
E1	DK GRN	117	Right front speaker return
E2	GRY	118	Left front speaker return
E3	TAN	201	Left front speaker feed
E4	DK BLK	46	Right rear speaker feed
E5	LT BLU	115	Right rear speaker return
E6	YEL	116	Left rear speaker return
E7	BRN	199	Left rear speaker feed
E8	BLK	650	Ground
E9	BLK	650	Ground
E10	—	—	Not used
E11	ORN	1040	Fused battery feed
E12	ORN	1040	Fused battery feed
E13	BLK	1856	Left rear speaker feed (Chevrolet)
E13	WHT	1959	Left rear speaker feed (Pontiac)
E14	YEL	1956	Left rear speaker return (Chevrolet)
E14	TAN	1859	Left rear speaker return (Pontiac)
E15	DK BLU	1857	Left front speaker feed
E16	LT BLU	1957	Left front speaker return
F1	LT GRN	200	Right front speaker feed
F2	LT GRN	1852	Right rear speaker feed (Chevrolet)
F2	TAN	1855	Right rear speaker feed (Pontiac)

Amplifier (cont'd)



Connector Part Information	• 12110115 • 32-Way F Micro-Pack 100 Series (BLU)		
Pin	**Wire Color**	**Circuit No.**	**Function**
F3	PPL	1952	Right rear speaker return (Chevrolet)
F3	RED	1955	Right rear speaker return (Pontiac)
F4	LT BLU/ BLK	315	Right rear speaker return
F5	DK GRN	1795	Right rear speaker feed
F6	DK GRN	1953	Right front speaker return
F7	ORN	1853	Right front speaker feed
F8-F9	—	—	Not used
F10	LT GRN/ BLK	1794	Left rear speaker return
F11	DK BLU/ WHT	346	Left rear speaker feed
F12	—	—	Not used
F13	RED	1955	Right rear speek return (Chevrolet)
F13	GRY	1954	Right rear speaker feed (Pontiac)
F14	TAN	1855	Right rear speaker feed (Chevrolet)
F14	WHT	1854	Right rear speaker return (Pontiac)
F15	TAN	1859	Left rear speaker feed (Chevrolet)
F15	RED	1858	Left rear speaker feed (Pontiac)
F16	WHT	1959	Left rear speaker return (Chevrolet)
F16	PPL	1958	Left rear speaker return (Pontiac)

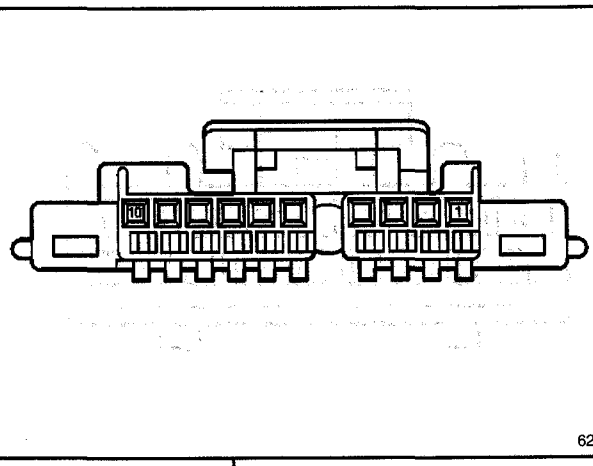
CD Player



62435

Connector Part Information		• 12047531 • 10-Way F Micro-Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	BRN/WHT	367	Left audio signal
2	GRN/WHT	368	Right audio signal
3	BLK/WHT	372	Audio return
4	—	—	Not used
5	ORN	1040	Fused battery feed
6	—	—	Not used
7	BLK	1051	Ground
8-9	—	—	Not used
10	DK GRN	835	System ON (Signal from radio)

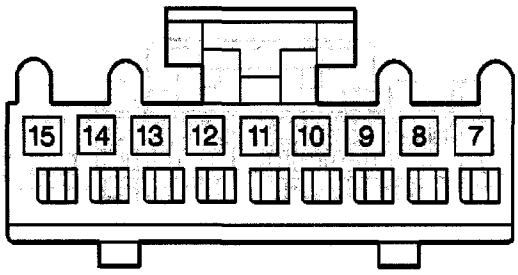
Radio C1



62435

Connector Part Information		• 12047531 • 10-Way F Micro-Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	GRY	118	Left front speaker return
2	TAN	201	Left front speaker feed
3	DK GRN	117	Right front speaker return
4	LT GRN	200	Right front speaker feed
5	BLK	650	Ground
6	BRN	9	Park lamp feed
7	GRY	8	I/P dimming input
8	PNK	314	Radio ON signal to power antenna (Pontiac)
9	YEL	43	Fused ignition feed
10	ORN	640	Fused battery feed

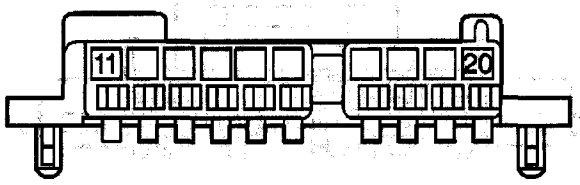
Radio C2



62467

Connector Part Information		• 12064980 • 9-Way F Micro-Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
7-8	—	—	Not used
9	Bare	514	Drain wire
10	DK GRN/ WHT	368	Right audio signal
11	BRN/WHT	367	Left audio signal
12	BLK/WHT	372	Audio return
13	BLK	1051	Ground
14	DK GRN	853	System power control
15	—	—	Not used

Radio C3



62477

Connector Part Information		• 1206-5785 • 10 Way F Micro-Pack 100 Series (GRA)	
Pin	**Wire Color**	**Circuit No.**	**Function**
11-13	—	—	Not used
14	DK BLU	1796	Steering wheel controls input (Pontiac)
15	—	—	Not used
16	DK GRN/ WHT	817	Vehicle speed signal (Chevrolet)
17	LT BLU	115	Right rear speaker return
18	DK BLU	46	Right rear speaker feed
19	YEL	116	Left rear speaker return
20	BRN	199	Left rear speaker feed

Diagnostic Information and Procedures

Radio/Audio System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to the RUN position. 2. Turn the radio on.	• The radio is on. • All of the speakers are operating correctly.	• *Speakers Inoperative - One or More (General)* • *Speakers Inoperative - One or More (Tweeter or Midrange at Front)* • *Speakers Inoperative - One or More (Both Rear)* • *Speakers Inoperative - One or More (No Sound, Radio Oper. Normally)* • *Speakers Inoperative - One or More (One Front Tweeter Inoperative)* • *Speakers Inoperative - One or More (One Rear Tweeter Inoperative)* • *Speakers Inoperative - One or More (One Front Midrange Inoperative)* • *Speakers Inoperative - One or More (One Rear Midrange Inoperative)* • *Speakers Inoperative - One or More (One Rear Speaker Inoperative)* • *Speakers Inoperative - One or More (One Front Speaker Inoperative)* • *Speakers Inoperative - One or More (Both LF Speakers Inoperative)* • *Speakers Inoperative - One or More (Both RF Speakers Inoperative)* • *Power Antenna System Check* • *Speakers Inoperative - Subwoofer* • *Speaker Noise - General* • *Radio Display Inoperative, No Sound from Speakers* • *Radio Display Inoperative, Speakers Operative* • *Radio Memory Inoperative*
2	Turn the headlamp switch to the PARK position.	• The radio display dims. • The radio face lights.	*Radio Illumination Inoperative with Park Lamps On*
3	Insert a test compact disc or tape into the radio and/or CD changer.	The CD changer or tape functions normally.	• *Compact Disc Inoperative* • *Tape Player Inoperative*
4	Operate the radio from the radio control switches on the steering wheel.	The radio functions normally.	*Steering Wheel Control System Check*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Steering Wheel Control System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	• Turn the ignition switch to the RUN position. • Turn the radio on. • Operate the radio from the radio control switches on the steering wheel.	The radio controls function normally.	• *Steering Wheel Controls Inoperative* • *Steering Wheel Controls Illumination Inoperative*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Power Antenna System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to the RUN position. 2. Turn the radio on.	The power antenna mast extends to the full height. The radio receives strong broadcast signals.	• *Antenna Inoperative* • *Radio/Audio System Check*
2	Turn the radio off.	The power antenna mast retracts into the fender.	*Power Antenna Motor Replacement*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Radio Memory Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Connect a test light. 2. Backprobe between the radio harness connector C1 terminal 10 and ground. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 5*	—
4	Repair a poor connection or open in circuit 640. Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Radio Display Inoperative, Speakers Operative

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the parklamps on. 2. Connect a test light. 3. Backprobe between the radio harness connector C1 terminal 6 to ground. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	Repair the open in CKT 9. Is the repair complete?	—	*Go to Step 5*	—
4	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Radio Display Inoperative, No Sound from Speakers

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the radio harness connector C1. 2. Connect a test light. 3. Probe between the radio harness connector C1 terminal 10 and ground. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	1. Connect a test light. 2. Probe between the radio harness connector C1 terminal 10 and 5. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Repair a poor connection or open in circuit 640. Is the repair complete?	—	*Go to Step 9*	—
5	1. Connect a test light. 2. Probe between the radio harness connector C1 terminal 5 and 9. 3. Turn the ignition switch to the RUN position. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 8*
6	Repair a poor connection or open in circuit 650. Is the repair complete?	—	*Go to Step 9*	—
7	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac).* Is the repair complete?	—	*Go to Step 9*	—
8	Repair the poor connection or open in circuit 43. Is the repair complete?	—	*Go to Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Radio Illumination Inoperative with Park Lamps On

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the headlamp switch to the PARK position. 2. Connect a test light. 3. Backprobe between the radio harness connector C1 terminal 7 to ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 5*	—
4	Repair a poor connection or open in circuit 8. Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Tape Player Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	Insert the tape. Does the tape play?	—	*Go to Step 3*	*Go to Step 4*
3	Inspect the tape player for the following conditions: • Weak • Slow • Garbled Does the tape play in any of the above manners?	—	*Go to Step 5*	*Go to Step 12*
4	Inspect the tape player for an obstruction through the tape door. Is an obstruction present?	—	*Go to Step 6*	*Go to Step 7*
5	1. Clean the moving parts and the tape head using a cleaning cassette from *J 39916*. 2. Inspect the system. Is the symptom still present?	—	*Go to Step 8*	*Go to Step 12*
6	1. Remove the obstruction. 2. Inspect the system. Is the symptom still present?	—	*Go to Step 10*	*Go to Step 12*
7	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 12*	—
8	Perform the motor speed test with the diagnostic test tape from *J 39916*. Is the motor speed OK?	—	*Go to Step 9*	*Go to Step 7*
9	Play a known good tape. Is the symptom still present?	—	*Go to Step 7*	*Go to Step 12*
10	1. Clean the moving parts and the tape head or use a cleaning cassette. 2. Inspect the system. Is the symptom still present?	—	*Go to Step 11*	*Go to Step 12*
11	Play the diagnostic test tape from J 39916. Refer to *J 39916*. Does the test tape operate?	—	*Go to Step 12*	*Go to Step 7*
12	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Compact Disc Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	Insert the Compact Disc (CD) and operate. Is the CD skipping or mute?	—	*Go to Step 3*	*Go to Step 4*
3	Inspect the disc for one of the following conditions: • Improper insertion • Scratches • Dirt • Finger prints Are any of the conditions present?	—	*Go to Step 5*	*Go to Step 6*
4	Observe the CD player for the following conditions: • ERR is displayed • The disc is ejected Do either of the conditions exist?	—	*Go to Step 7*	*Go to Step 3*
5	Clean or replace the disc. Is the repair complete?	—	*Go to Step 13*	—
6	Drive the vehicle on a usual route. Is the road rough (dirt)?	—	*Go to Step 8*	*Go to Step 9*
7	Inspect the disc for one of the following conditions: • Improper insertion • Scratches • Dirt • Wet Are any of those conditions present?	—	*Go to Step 5*	*Go to Step 11*
8	Drive the vehicle on a good road surface. Is the symptom still present?	—	*Go to Step 10*	*Go to Step 13*
9	Test the player with a known good disc. Is the symptom still present?	—	*Go to Step 10*	*Go to Step 13*
10	Service the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 13*	—
11	Inspect the disc for condensation. Is condensation present?	—	*Go to Step 12*	*Go to Step 10*
12	Allow up to an hour in order for the condensation to evaporate. Is the symptom still present?	—	*Go to Step 10*	*Go to Step 13*
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

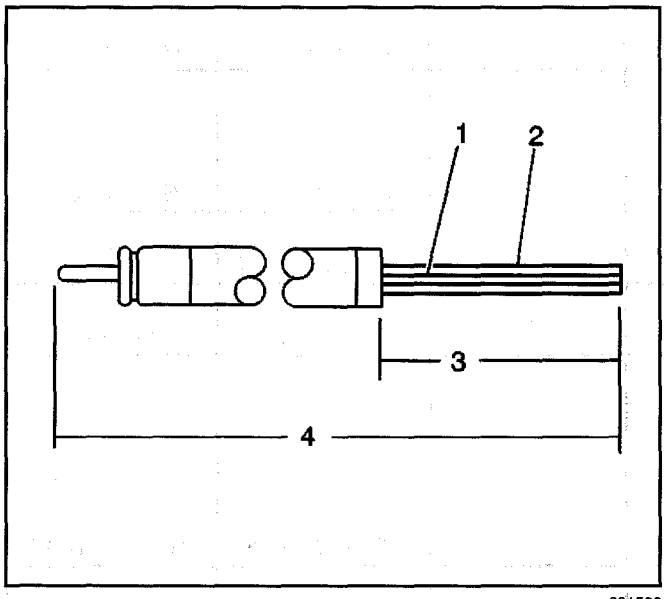
Speaker Noise - General

Use And Construction Of A Noise Sniffer

The noise sniffer can be used with the vehicle radio in order to locate hot spots generating radio noise interference. Hot spots can be found in the following locations:

- The harness
- The upper part of the dash
- Between the hood and the windshield

Making The Sniffer

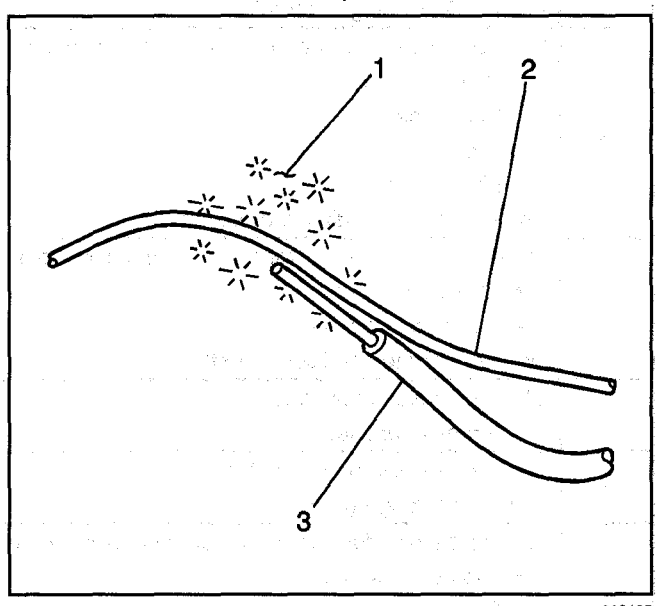


291536

1. Make the sniffer from an old piece of antenna lead-in from a mast or a power antenna
2. Remove the antenna base connector from the antenna lead-in (4)
3. Cut away 2 inches of the coax shield (3).
   The 2 inch section with the braided shield stripped back becomes the antenna when plugged into the radio antenna socket.

To Use The Noise Sniffer:

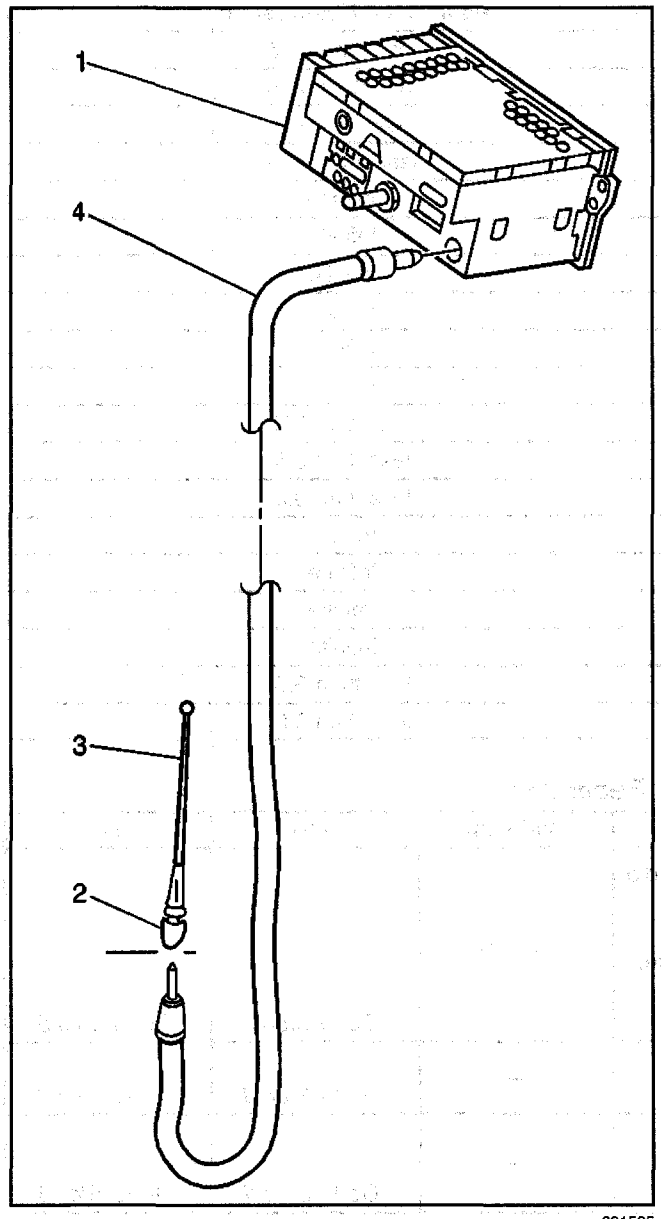
1. Listen to the complaint noise.
2. Disconnect the antenna.
3. Plug the antenna into the antenna socket in order to probe and search out hot spots.
4. Turn the radio volume up.



209125

5. Search for the noise (1).
   Keep fingers off the 2 inch probe. For best results place the sniffer (3) parallel to the wire (2).

Antenna Poor Reception



291535

Important: Remove the negative lead of the battery and zero the meter before measuring the resistance of the antenna. Wiggle the following components cautiously during inspection:

- The antenna mast (3)
- The lead-in tip (2)
- The lead-in cable (4)

Important: The following readings must be obtained. If the readings are other than those listed some portion of the lead-in is intermittent. Replace the lead-in.

Antenna Poor Reception

Digital Multimeter Probe Points	Resistance Measured in Ω
A and B	less than 0.15
A and G	less than 0.15
B and C	less than 0.15
B and G	less than 0.15
A and D	Infinite
B and D	Infinite
B and E	Infinite
B and H	Infinite
A and E	Infinite
A and H	Infinite
A and C	less than 0.15
D and H (RG-62 and RG-62M)	less than 3.5
D and H (RG-58 and RG-59)	less than 0.2
D and B	Infinite
D and G	Infinite
D and C	Infinite
E and C	Infinite
D and E (RG-62 and RG-62M)	less than 3.5
D and E (RG-58 and RG-59)	less than 0.2

Antenna Poor Reception

Step	Action	Value(s)	Yes	No
1	1. Disconnect the antenna lead-in connector at the radio receiver. 2. Measure the resistance between the coax (outer conductor) connector and the negative battery cable, with the DMM. Is the resistance value greater than the specified value?	0.15 Ω	Go to *Step 2*	Go to *Step 5*
2	Inspect the base of the antenna. Is the connection good to the body ground?	—	Go to *Step 3*	Go to *Step 6*
3	Inspect the coaxial cable interconnects for a poor connection or corrosion. Is either symptom present?	—	Go to *Step 4*	Go to *Step 6*
4	Inspect the ground connection from the battery negative cable to the body. Is the connection good?	—	Go to *Step 5*	Go to *Step 6*
5	1. Grasp the antenna mast. 2. Wiggle the antenna while observing the DMM. Does the meter indicate intermittent continuity?	—	Go to *Step 2*	Go to *Step 7*
6	Repair the antenna ground circuit. Refer to *Antenna Mast Cleaning*. Is the repair complete?	—	Go to *Power Antenna System Check*	—
7	Measure the resistance between the radio coax lead-in connector (center conductor) and the antenna mast, with the DMM. Does the measured resistance approximately equal the specified values?	RG-58/RG-59: Less than 0.2 Ω RG-62/RG-62M: Less than 3.5 Ω	Go to *Step 8*	Go to *Step 3*

Antenna Poor Reception (cont'd)

Step	Action	Value(s)	Yes	No
8	Wiggle the antenna coax while observing the DMM. Does the meter indicate intermittent continuity?	—	Go to *Step 9*	System OK
9	Inspect the coaxial cable interconnects for a poor connection or corrosion. Is either symptom present?	—	Go to *Step 10*	System OK
10	Repair/Replace the antenna coaxial circuit. Refer to *Power Antenna Motor Replacement.* Is the repair complete?	—	Go to *Power Antenna System Check*	—

Steering Wheel Controls Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Steering Wheel Control System check performed?	—	Go to *Step 2*	Go to *Steering Wheel Control System Check*
2	Turn the radio on. Are all of the radio functions operating normally?	—	Go to *Step 3*	Go to *Step 4*
3	1. Disconnect Connector C217. 2. Measure the resistance with a DMM, probing between connector C217 (female side) terminals A and term C while pressing each of the steering wheel radio control buttons. 3. Compare the resistance values to the chart following the diagnosis table. Are the resistance values approximately equal?	—	Go to *Step 5*	Go to *Step 6*
4	1. Disconnect the radio connector C3. 2. Inspect circuit 1796 for a short to B+ or ground. Is a short present?	—	Go to *Step 7*	Go to *Step 10*
5	Inspect circuit 1796 for an open or a poor connection. Is there an open or a poor connection?	—	Go to *Step 8*	Go to *Step 10*
6	Inspect the SIR coil for an open or a poor connection. Refer to *Disabling the SIR System.* Is there an open or a poor connection?	—	Go to *Step 8*	Go to *Step 9*
7	Repair the short to B+ or ground. Is the repair complete?	—	Go to *Step 11*	—
8	Repair the open or the poor connection in circuit 1796. Is the repair complete?	—	Go to *Step 11*	—
9	Replace the steering wheel controls. Refer to *Steering Wheel Control Switches Replacement.* Is the repair complete?	—	Go to *Step 11*	—
10	Repair the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac).* Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Steering Wheel Control System Check*	—

Steering Wheel Controls Inoperative

Controls	Value
VOL (UP)	1270Ω
VOL (DOWN)	1564Ω
PLAY	1912Ω
MUTE	2387Ω
SEEK (UP)	3102Ω
SEEK (DOWN)	4282Ω
AM/FM	6652Ω
PRESET	13632Ω

Steering Wheel Controls Illumination Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Steering Wheel Control System check performed?	—	Go to *Step 2*	Go to *Steering Wheel Control System Check*
2	1. Disconnect connector C217. 2. Turn the park lights on. 3. Turn the IP dimmer switch to the brightest setting. 4. Connect a test light across C217 (male side) from terminal B to terminal D. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	1. Reconnect the connector C217. 2. Disable the SIR. Refer to *Disabling the SIR System.* 3. Remove and disconnect the inflate module from the steering module. 4. Backprobe the steering wheel controls connector from terminal B to terminal D. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Connect a test light from C217 terminal B to ground. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
5	Replace the steering wheel radio controls. Refer to *Steering Wheel Control Switches Replacement.* Is the repair complete?	—	Go to *Step 11*	—
6	Inspect for a poor connection in the steering wheel controls connector terminals B and D. Is there a poor connection present?	—	Go to *Step 10*	Go to *Step 9*
7	Repair the poor connection or open in circuit 650. Is the repair complete?	—	Go to *Step 11*	—
8	Repair the poor connection or open in circuit 1458. Is the repair complete?	—	Go to *Step 11*	—
9	Replace the SIR Coil Assembly. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Is the repair complete?	—	Go to *Step 11*	—
10	Repair the poor connection in the steering wheel controls connector terminals B and D. Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Steering Wheel Control System Check*	—

Antenna Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Power Antenna System Check performed?	—	*Go to Step 2*	Go to *Power Antenna System Check*
2	1. Disconnect the radio power antenna connector. 2. Turn the ignition switch to the ACCY position. 3. Turn the radio on. 4. Connect a test light between terminal A of the radio power antenna connector and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Connect the test light between the radio power antenna connector terminals A and C. Does the test light illuminate?	—	Go to *Step 5*	*Go to Step 6*
4	Repair the poor connection or open in circuit 1040. Is the repair complete?	—	*Go to Step 11*	—
5	Connect the test light between the radio power antenna connector terminals B and C. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	Repair the poor connection or open in circuit 650. Is the repair complete?	—	Go to *Step 11*	—
7	Replace the radio power antenna. Refer to *Power Antenna Mast Replacement.* Is the repair complete?	—	*Go to Step 11*	—
8	Check for an open in circuit 314. Is an open present?	—	*Go to Step 9*	*Go to Step 10*
9	Repair the poor connection or open in circuit 314. Is the repair complete?	—	*Go to Step 11*	—
10	Replace the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac).* Is the repair complete?	—	*Go to Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Antenna System Check*	—

Speakers General Diagnosis

Tools Required

J 39916 CD and Cassette Diagnostic Audio Kit

Important: Always compare the front speakers to the front, and the rear speakers to the rear. Do not compare the front speaker to the rear speaker for the following reasons:

- The front speaker and the rear speaker may be different speakers.
- The speakers mounting environment could cause them to sound different.

Tones are used to test and evaluate coaxial speakers or other complex speaker systems. The following basic tones are used:

- 50 Hz tone
- 500 Hz warble tone
- 9 kHz spectral tone

The combination tone is a blend of the above three tones.

Bass/Sub-Woofer Test (50 Hz Sine Tone)

The 50 Hz tone is used to evaluate the bass response of an audio system. This tone is helpful in evaluating audio systems which have separate subwoofer amplifiers and speakers.

Midrange Speaker Test (500 Hz Warble Tone)

The 500 Hz warble tone is used for the evaluation of midrange speaker response. This tone is qualified as a warble tone because it has different audio characteristics than a sine tone. The warble tone produces a warble sound. It is best to use a warble tone than a sine wave at these tone midrange frequencies, because the location of a warble tone source (such as a speaker) is easier to identify. A normal sine tone can set up a standing wave within a vehicle which can make it difficult to determine its source location.

Tweeter Test (9 kHz Spectral Tone)

The 9 kHz spectral tone is used for tweeter or high frequency evaluation. This tone is a section of frequencies of equal amplitudes, ranging from 8.5–9.5 kHz. The 9 kHz spectral tone sounds similar to a group of crickets chirping.

The 9 kHz spectral tone is used for the following reasons:

- It is easy to locate the source of the 9 kHz spectral tone. The tone sounds much like a warble tone.
- The 9 kHz spectral tone is easy to identify, especially for people with high-end, hearing loss problems.

All Speaker Test

The combination tone can be used in order to diagnose numerous audio conditions, such as the following conditions:

- Distortion from the speakers
- No sound emitting

You can use the combination tone in order to make comparative AC voltage measurements on the speaker terminals. Before you make these measurements, ensure that the fade and balance controls are in the detent position. A determination can be made in the diagnosis of the speaker or the amplifier.

Speaker/Grill Rattle Test (50 Hz to 8 kHz Swept Sine)

The next portion of the tape can be used in order to diagnose rattle noises in the speaker and the grill. This portion of the tape has 2 tests:

- Two tones played back to back.
- Variable frequency tone.

  Frequency change is at a much slower rate than the two tones played back to back test.

Both tests can be used in order to repair a speaker rattle or a buzz sound.

If you have already identified the specific problem area, you may complete the following actions:

- Set the fade and balance controls to the correct location.
- Play the test tones in the problem area.

Motor Speed Test

There is a 2 minute time period marked in this portion of diagnostic tape for the purpose of evaluating the cassette tape motor speed. This portion of the diagnostic tape can be used to verify complaints of abnormal sound from the cassette tape player. Improper tape motor speed can cause audio abnormalities, in some cases. If it takes 116-120 seconds in order to plat this portion of the tape, the tape motor speed is acceptable.

Nose Diagnosis (Dead Space)

This portion of diagnostic tape can be used for noise diagnosis, such as alternator whine, switch pops, etc. These conditions can be easily detected during the dead space (the blank space in between subsequent songs). This portion of the diagnostic tape may be used in conjunction with *Speaker Noise - General.*

Speakers Inoperative - One or More (General)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the amplifier connector. 2. Turn the ignition switch to the ACCY position. 3. Turn the radio on. 4. Insert a cassette or compact disc from J 39916-A. Refer to *J 39916*. 5. Set the radio balance and fade controls to the detent (center) position. 6. Set the radio volume at the normal listening level. 7. Measure and record the AC voltage between the amplifier connector terminals E2 and E3 with a DMM while playing the combination test tone from the cassette or the compact disc. 8. Measure and record the AC voltage between the amplifier connector terminals E1 and F1. Are the recorded voltages approximately the same?	—	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the amplifier connector terminals E2 and E3 (left) or E1 and F1 (right). 2. Replace the amplifier if the connection is OK. 3. Inspect the system. Refer to *Amplifier Replacement (Coupe)* or *Amplifier Replacement (Convertible)*. Is the repair complete?	—	*Go to Step 7*	—
4	1. Backprobe the radio connector C1 between terminals 1 and 2 and record AC voltage with a DMM. 2. Backprobe the radio connector C1 between terminals 3 and 4 and record the AC voltage. Are the recorded voltages approximately the same?	—	*Go to Step 5*	*Go to Step 6*
5	1. If the left speaker is inoperative, repair the open in the circuit 118 or circuit 201 between the radio and the amplifier. 2. If the right speaker is inoperative, repair the open in the circuit 117 or circuit 200 between radio and amplifier. Is the repair complete?	—	*Go to Step 7*	—
6	1. If the left speaker is inoperative, inspect for the following conditions: • A short to B+ or ground in circuits 118 and 201 between the radio and the amplifier • A poor connection at the radio connector C1 terminal 1 and terminal 2 2. If the right speaker is inoperative, inspect for the following conditions: • A short to B+ or ground in circuits 117 and 200 between the radio and the amplifier • A short to B+ or ground at the radio connector C1 terminal 3 and terminal 4 3. Replace the radio if the inspections are OK. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (Tweeter or Midrange at Front)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916*. 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the combination test tone from the cassette or CD. 7. Backprobe the speaker assembly connector between terminals A and B (tweeter) or terminals C and D (midrange) with a DMM. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the inoperative speaker assembly. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement - Front* Is the repair complete?	—	*Go to Step 7*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the amplifier connector. 3. Probe the amplifier connector between the feed (+) and return (-) circuits of the inoperative speaker with a DMM. Is the resistance approximately 2-4Ω?	2-4Ω	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the speaker feed (+) and the return (-) circuits for a short to B+ or ground between the speaker assembly and the amplfier. 2. Inspect for a poor connection at the amplifier. 3. Replace the amplifier if the connections are OK. Refer to *Amplifier Replacement (Coupe) Amplifier Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
6	1. Inspect for a poor connection at the speaker. 2. Repair open or a poor connection in the speaker assembly feed or the return circuit. Is the repair compete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (Both Rear)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio system System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the amplifier connector. 2. Turn the ignition switch to ACCY. 3. Turn the radio on. 4. Insert a cassette or compact disc from *J 39916*. 5. Set the radio balance and fade controls to the detent (center) position. 6. Set the radio volume at the normal listening level. 7. Play the combination test tone from the cassette or CD. 8. Use a DMM in order to measure the AC voltage between the amplifier connector terminals E6 and E7. 9. Measure the AC voltage between the amplifier connector terminals E4 and E5. Record the voltage Are the voltage readings approximately the same?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the amplifier connector terminals E6 and E7 (left) or terminals E4 and E5 (right). 2. Replace the amplifier if the connection is OK. Refer to *Amplifier Replacement (Coupe) Amplifier Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
4	1. Use a DMM in order to backprobe the radio connector C3 between terminal 19 and terminal 20 2. Probe the radio connector C3 between the terminal 17 and terminal 18. 3. Record the voltage reading. Is the resistance approximately the same?	—	*Go to Step 5*	*Go to Step 6*
5	1. For left inoperative speakers, repair the open in circuit 116 or circuit 119 between the radio and amplifier. 2. For right inoperative speakers, repair the open in circuit 115 or circuit 46 between the radio and amplifier. Is the repair complete?	—	*Go to Step 7*	—
6	1. If the left speaker is inoperative, inspect the for the following conditions: • A short to B+ or ground in circuits 116 or 119 • A poor connection at the radio connector C3 terminal 19 and terminal 20 2. If the right speaker is inoperative, inspect for the following conditions: • A short to B+ or ground in circuits 115 and 46. • A poor connection at the radio connector C3 terminal 17 and terminal 18. 3. Replace the radio if none of these conditions exist. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (No Sound, Radio Oper. Normally)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the amplifier connector. 2. Turn the ignition switch to the ACCY position. 3. Turn the radio on. 4. Insert a cassette or compact disc from *J 39916*. 5. Set the radio balance and fade controls to the detent (center) position. 6. Set the radio volume at the normal listening level. 7. Play the combination test tone from the cassette or CD. 8. Backprobe the speaker assembly connector between terminals E6 and E7. 9. Record the voltage reading. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	Replace the amplifier. Refer to *Amplifier Replacement (Coupe) Amplifier Replacement (Convertible)* Is the repair complete?	—	*Go to Step 5*	—
4	Replace the radio. Refer to *Radio Replacement (Chevrolet) Radio Replacement (Pontiac)* Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Front Tweeter Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the connector C240. 2. Turn the ignition switch to the ACCY position. 3. Turn the radio on. 4. Insert a cassette or compact disc from *J 39916*. 5. Set the radio balance and fade controls to the detent (center) position. 6. Set the radio volume at the normal listening level. 7. Play the tweeter test tone from the cassette or CD. 8. Use a DMM in order to measure the AC voltage between C240 connector terminal B and terminal C (left) or terminal F and terminal G (right). Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Reconnect the connector C240. 2. Disconnect the inoperative speaker connector. 3. Use a DMM in order to measure the AC voltage between the speaker connector terminal A and terminal B on the harness side. Is the voltage greater than 0V AC?	0V AC	*Go to Step 5*	*Go to Step 6*

Speakers Inoperative - One or More (One Front Tweeter Inoperative) (cont'd)

Step	Action	Value(s)	Yes	No
4	• If the left front tweeter is inoperative repair an open or a poor connection in circuit 118 or circuit 201, between the radio and C240. • If the right front tweeter is inoperative repair an open or poor connection in circuit 117 or circuit 200, between the radio and C240. Is the repair complete?	—	*Go to Step 7*	—
5	1. Inspect for a poor connection at the speaker connector terminals A and B. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
6	• If the left front tweeter is inoperative repair an open in circuit 118 or circuit 201, between the speaker and C240. • If the right front tweeter is inoperative repair an open in circuit 117 or circuit 200, between the speaker and C240. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Rear Tweeter Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the amplifier connector. 2. Turn the ignition switch to the ACCY position. 3. Turn the radio on. 4. Insert a cassette or compact disc from *J 39916*. 5. Set the radio balance and fade controls to the detent (center) position. 6. Set the radio volume at the normal listening level. 7. Play the combination test tone from the cassette or CD. 8. With a DMM backprobe the inoperative speaker connector between terminal A and terminal B on the harness side. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the speaker terminal A and terminal B. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)* Is the repair complete?	—	*Go to Step 5*	—

Speakers Inoperative - One or More (One Rear Tweeter Inoperative) (cont'd)

Step	Action	Value(s)	Yes	No
4	• If the left rear tweeter is inoperative perform the following actions: 1. Inspect for an open in circuit 199 between speaker terminal B and S305. 2. If OK, repair the open in circuit 116 between speaker terminal A and S302. • If the right rear tweeter is inoperative perform the following actions: 1. Inspect for the open in circuit 46 between speaker terminal B and S300. 2. If OK, repair an open in circuit 115 between the terminal A and S301. Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Front Midrange Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916*. 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the midrange test tone from the cassette or CD. 7. Use a DMM in order to backprobe the inoperative speaker connector between terminal A and terminal B. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the inoperative speaker assembly. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
4	1. Turn the ignition switch to OFF. 2. Disconnect the amplifier connector. 3. Use a DMM in order to measure the resistance between the amplifier connector terminals E15 and E16 (left) or terminals F6 and F7 (right). Is the resistance approximately 2Ω?	2Ω	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the feed (+) and the return (-) circuits for a short to B+ or ground between the speaker and the amplfier. 2. Inspect for a poor connection at the amplifier. 3. Replace the amplifier if the connections are OK. Refer to *Amplifier Replacement (Coupe)* or *Amplifier Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—

Speakers Inoperative - One or More (One Front Midrange Inoperative) (cont'd)

Step	Action	Value(s)	Yes	No
6	1. Inspect for a poor connection at the speaker. 2. Repair open or a poor connection in the speaker feed (+) or the return (-) circuit between the inoperative speaker and the amplifier. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Rear Midrange Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916*. 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the midrange test tone from the cassette or CD. 7. Use a DMM in order to backprobe the inoperative speaker connector between terminal A and terminal B. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the inoperative speaker assembly. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the amplifier connector. 3. Measure the resistance between the amplifier connector terminals F15 and F16 (left) or terminals F13 and F14 (right). Is the resistance approximately 4Ω?	4Ω	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the feed (+) and the return (-) circuits for a short to B+ or ground between the speaker and the amplfier. 2. Inspect for a poor connection at the amplifier. 3. Replace the amplifier if the connections are OK. Refer to *Amplifier Replacement (Coupe)* or *Amplifier Replacement (Convertible)* Is the repair complete?	—	*Go to Step 7*	—
6	1. Inspect for a poor connection at the speaker. 2. Repair open or a poor connection in the speaker feed (+) or the return (-) circuit between the inoperative speaker and the amplifier. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Rear Speaker Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916*. 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the combination test tone from the cassette or CD. 7. Use a DMM in order to backprobe the inoperative speaker connector between terminal A and terminal B. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the inoperative speaker assembly. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)* Is the repair complete?	—	*Go to step 7*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the radio connector C3. 3. Probe the radio connector C3 between terminal 19 and terminal 20 (left) or terminal 17 and terminal 18 (right) in order to measure the resistance with a DMM. Is the resistance approximately 10Ω?	10Ω	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the feed (+) and the return (-) circuits for a short to B+ or ground between the speaker and the radio. 2. Inspect for a poor connection at the radio connector C3 terminal 19 and terminal 20 (left) or terminal 17 and terminal 18 (right). 3. Replace the radio if the connections are OK. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)* Is the repair complete?	—	*Go to Step 7*	—
6	Repair the open or the poor connection in the speaker feed (+) or the return (-) circuit between the inoperative speaker and the radio connector C3. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (One Front Speaker Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check Performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916*. 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the combination test tone from the cassette or CD. 7. Use a DMM in order to backprobe the inoperative speaker connector between terminal A and terminal B. Is the voltage greater than 0V AC?	0V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the inoperative speaker assembly. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible)*. Is the repair complete?	—	*Go to Step 5*	—
4	1. Inspect for an open or a poor connection in the speaker return circuit between speaker connector terminal A (harness side) and CKT 118 (left) or CKT 117 (right). 2. Repair the open or the poor connection in the speaker feed circuit between the speaker connector terminal B (harness side) and CKT 201 (left) or CKT 200 (right). Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (Both LF Speakers Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the radio connector C1. 2. Measure the resistance between the radio connector C1 terminal 1 and terminal 2, with a DMM. Is the resistance less than 10Ω?	<10Ω	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the radio connector C1 terminal 1 and terminal 2. 2. Replace the radio if the connection is OK. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 5*	—

Speakers Inoperative - One or More (Both LF Speakers Inoperative) (cont'd)

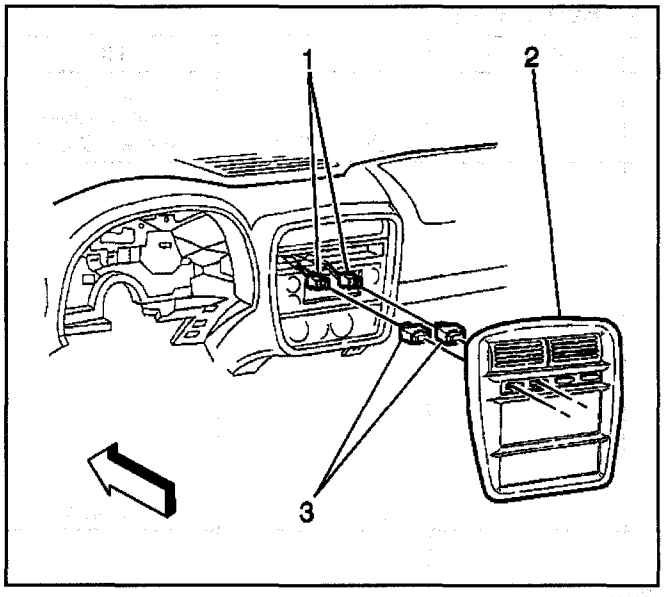
Step	Action	Value(s)	Yes	No
4	1. Inspect the speaker feed and return circuits between the radio connector C1 terminals 1 and 2 and the speakers for a short to ground. 2. Inspect for an open in CKT 201 between the radio connector C1 terminal 1 and S304. 3. Repair the open in CKT 201 between radio connector C1 terminal 2 and 307. 4. Inspect the system. Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - One or More (Both RF Speakers Inoperative)

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Disconnect the radio connector C1. 2. Measure the resistance between the radio connector C1 terminal 3 and terminal 4, with a DMM. Is the resistance less than 10Ω?	<10Ω	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the radio connector C1 terminals 3 and 4. 2. Replace the radio if the connection is OK. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)*. Is the repair complete?	—	*Go to Step 5*	—
4	1. Inspect the speaker feed and return circuits between the radio connector C1 terminal 3 and terminal 4 and the speakers for a short to ground. 2. Inspect for an open in circuit 117 between the radio connector C1 terminal 3 and S303. 3. If OK, repair the open in circuit 200 between radio connector C1 terminal 4 and S306. Is the repair complete?	—	*Go to Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—

Speakers Inoperative - Subwoofer

Step	Action	Value(s)	Yes	No
1	Was the entire Radio/Audio System Check performed?	—	*Go to Step 2*	Go to *Radio/Audio System Check*
2	1. Turn the ignition switch to the ACCY position. 2. Turn the radio on. 3. Insert a cassette or compact disc from *J 39916* 4. Set the radio balance and fade controls to the detent (center) position. 5. Set the radio volume at the normal listening level. 6. Play the combination test tone from the cassette or CD. 7. Backprobe with a DMM between terminal A and terminal B of the inoperative speaker. Does the meter reading vary above 3V AC?	3V AC	*Go to Step 3*	*Go to Step 4*
3	1. Inspect for a poor connection at the speaker. 2. Replace the speaker if the connection is OK. Refer to *Speaker Replacement (Coupe)* or *Speaker Replacement (Convertible).* Is the repair complete?	—	*Go to Step 7*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the amplifier connector. 3. Probe the amplifier connector between the feed (+) and return (-) circuits of the inoperative speaker with a DMM. Is the resistance approximately 2-4Ω?	2-4Ω	*Go to Step 5*	*Go to Step 6*
5	1. Inspect the speaker feed and the return circuits for a short to B+ or ground. 2. Inspect for a poor connection at the amplifier. 3. Replace the amplifier if the connections are OK. Refer to *Amplifier Replacement (Coupe)* or *Amplifier Replacement (Convertible).* Is the repair complete?	—	*Go to Step 7*	—
6	1. Inspect for a poor connection at the speaker. 2. Repair open in the speaker feed or the return circuit between the speaker and the amplifier. Is the repair complete?	—	*Go to Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Radio/Audio System Check*	—



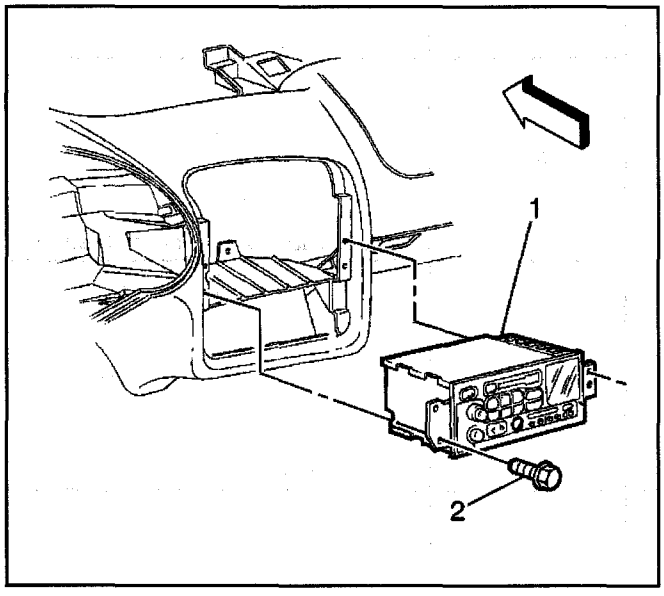
296691

Repair Instructions

Radio Replacement (Chevrolet)

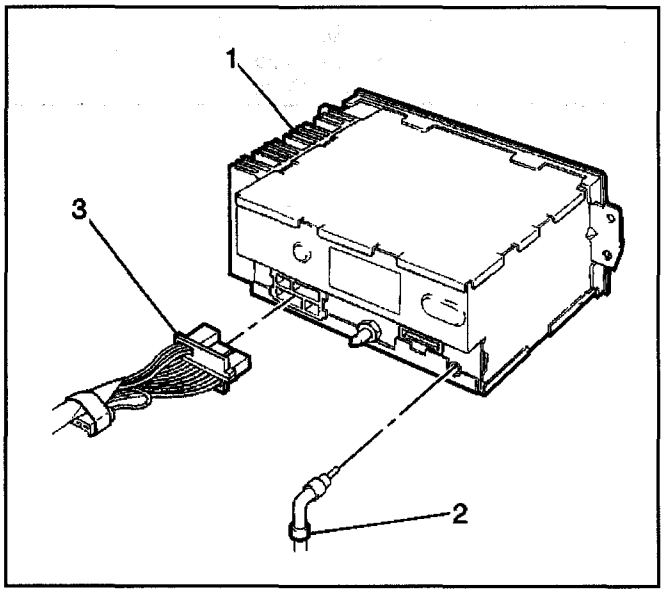
Removal Procedure

1. Unsnap the instrument panel accessory trim plate (2).
2. Disconnect the electrical connectors (1) from the switches (3), if equipped.



296692

3. Remove the radio bracket bolts (2).
4. Slide the radio (1) out from the instrument panel.

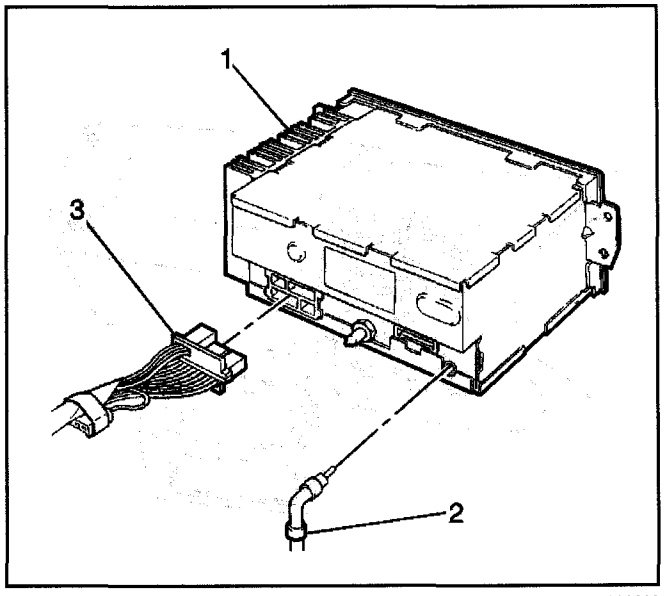


296693

5. Disconnect the following components from the radio (1):
   - The antenna cable (2)
   - The I/P wiring harness connector (3)
6. Remove the radio (1) from the vehicle.

Installation Procedure

1. Install the radio (1) to the vehicle.
2. Connect the following components to the radio (1):
   - The antenna cable (2)
   - The I/P wiring harness connector (3)



296693

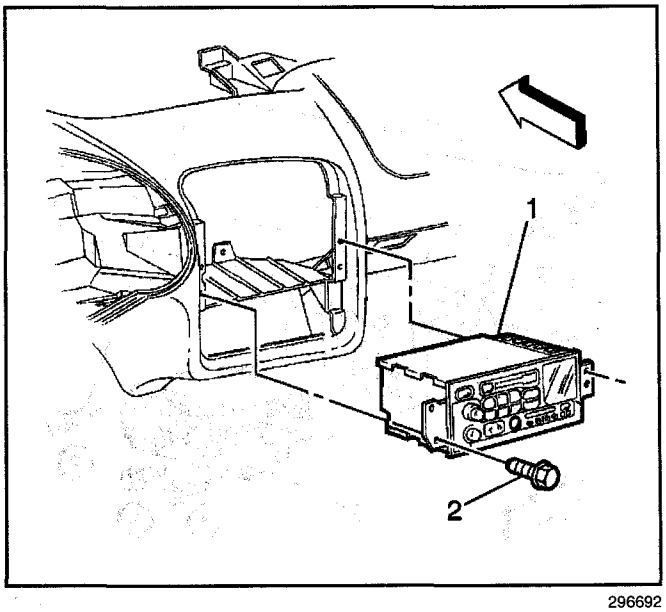
3. Slide the radio (1) into the instrument panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the radio bracket bolts (2).

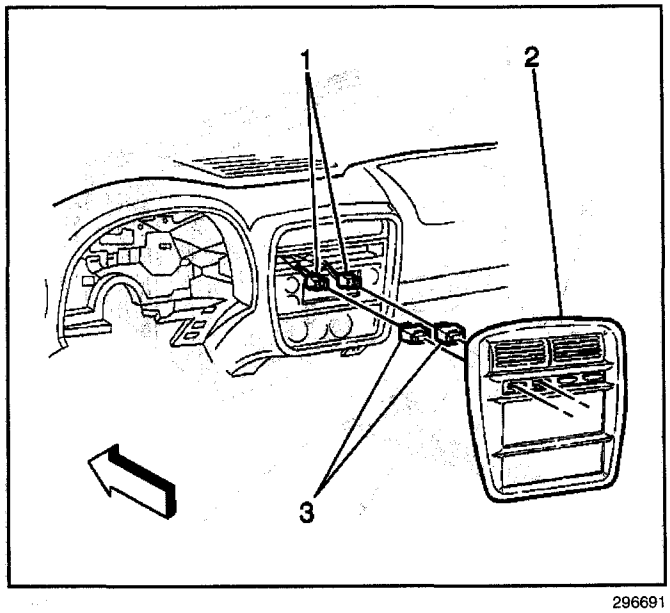
   Tighten

   Tighten the radio bracket bolts (2) to 1.8 N·m (16 lb in).

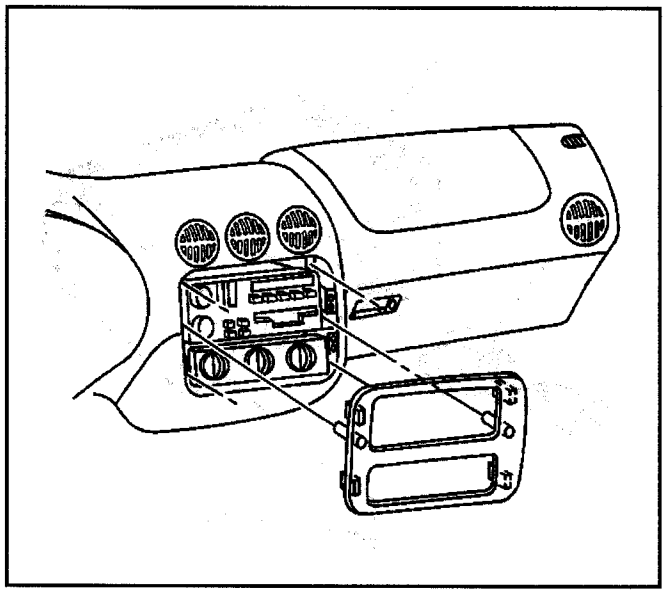


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5. Connect the electrical connectors (1) to the switches (3), if equipped.
6. Install the instrument panel accessory trim plate (2).



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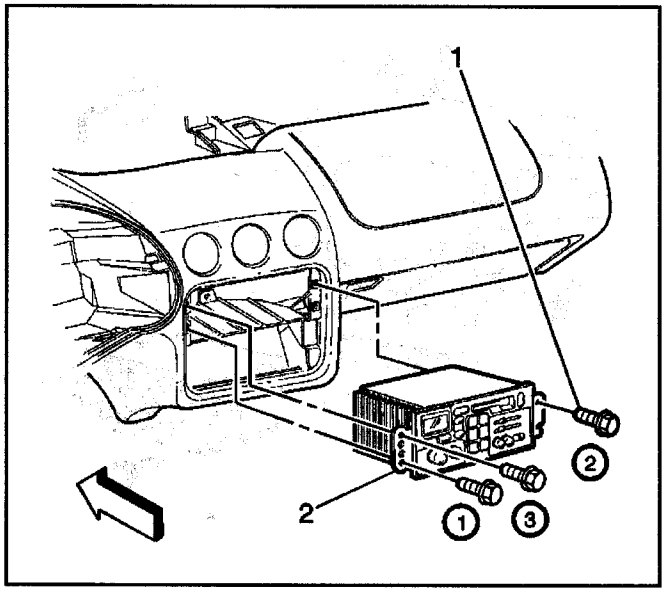


362238

Radio Replacement (Pontiac)

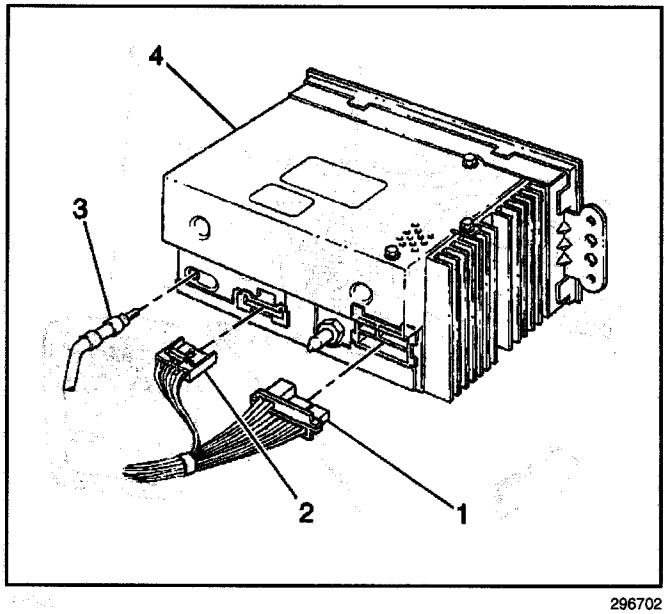
Removal Procedure

1. Unsnap the instrument panel accessory trim plate.



296695

2. Remove the radio bracket bolts (1).
3. Slide the radio (2) out from the instrument panel.

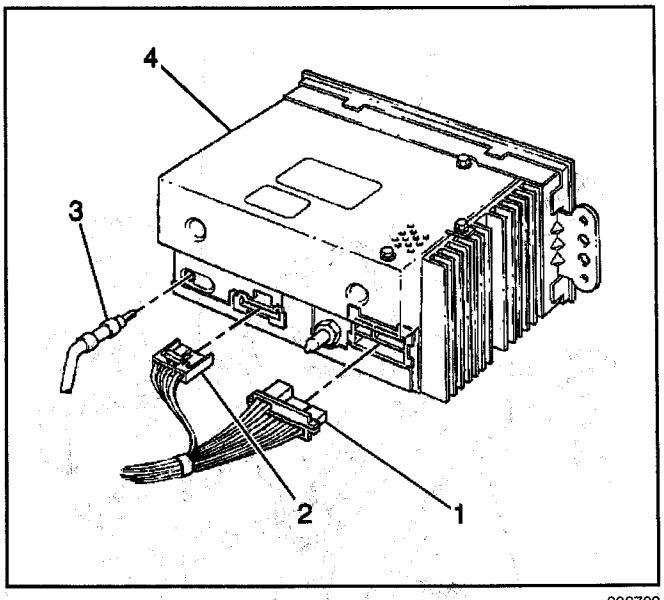


296702

4. Remove the following components from the radio (4):
   - The I/P wiring harness connector (1)
   - The remote CD connector (2)
   - The antenna cable (3)
5. Remove the radio (4) from the vehicle.

Installation Procedure

1. Install the radio (4) to the vehicle.
2. Install the following components to the radio (4):
   - The antenna cable (3)
   - The remote CD connector (2)
   - The I/P wiring harness connector (1)



296702

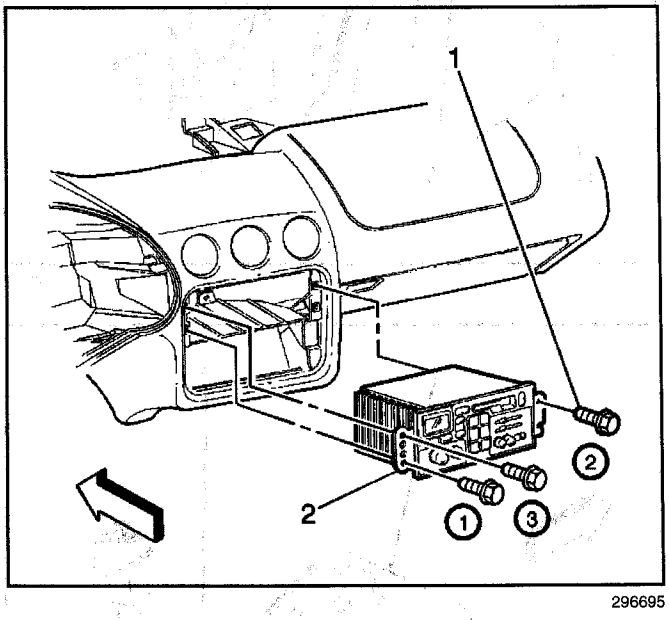
3. Slide the radio (2) into the instrument panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the radio bracket bolts (1) in the following sequence:
   4.1. Lower left
   4.2. Upper right
   4.3. Upper left

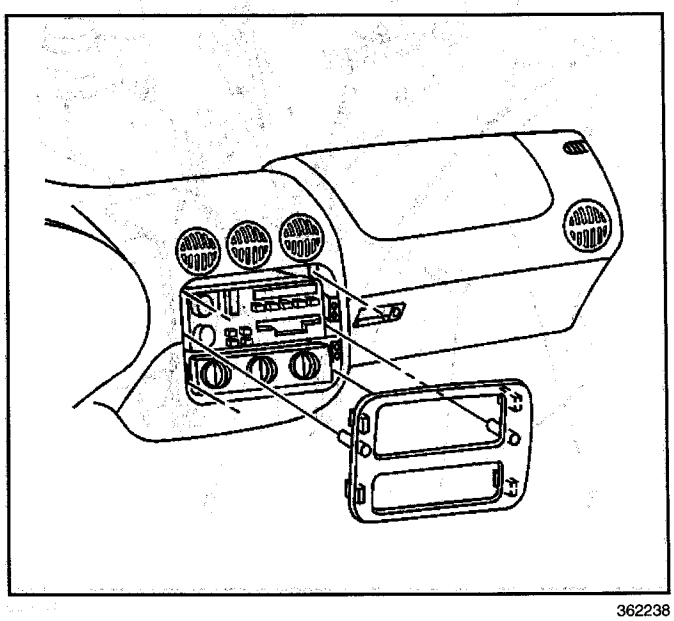
   Tighten

   Tighten the radio bracket bolts (1) to 1.8 N·m (16 lb in).

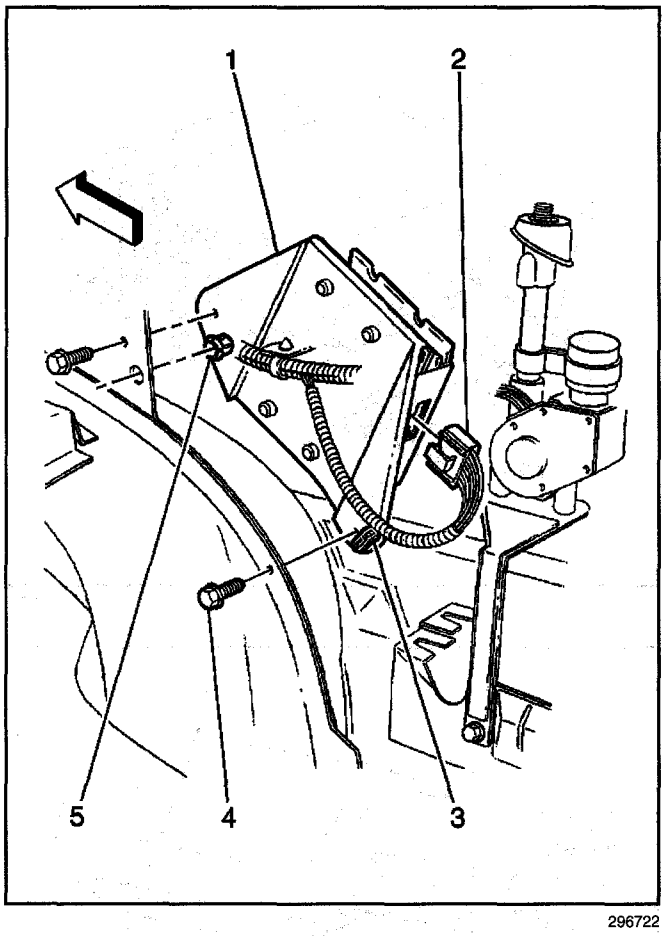


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5. Install the instrument panel accessory trim plate.



362238

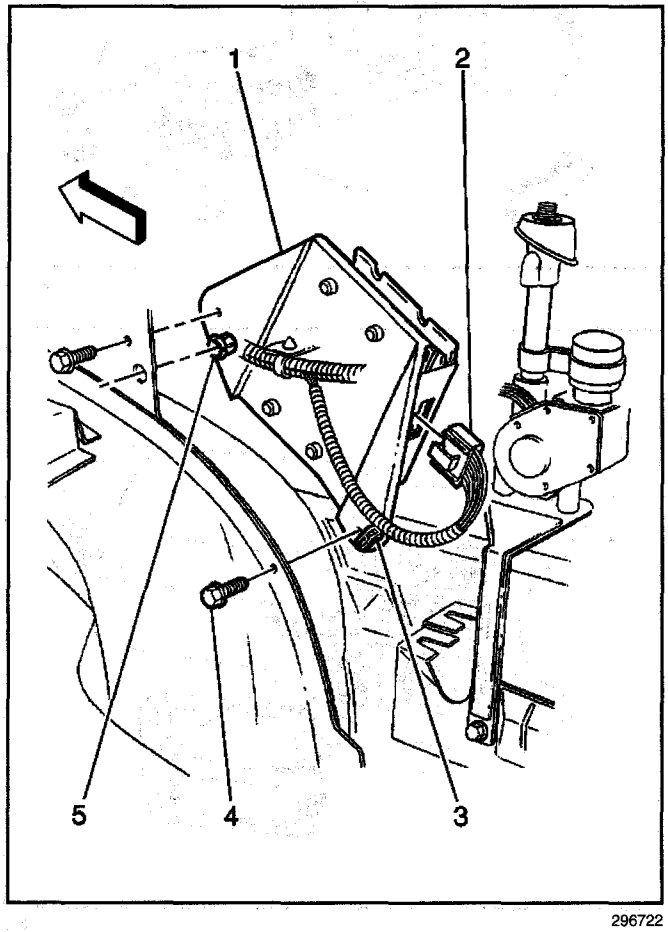


296722

Amplifier Replacement (Coupe)

Removal Procedure

1. Remove the right quarter inner rear trim finishing panel.
2. Disconnect the amplifier electrical connector (2).
3. Remove the radio amplifier bolts (4).
4. Squeeze the pin (5) together.
5. Unsnap the pin (5) from the quarter inner panel.
   Lift amplifier clip (3) off wheelhouse flange.
6. Remove the amplifier (1).



296722

Installation Procedure

1. Install the amplifier (1).
2. Place clip (3) over wheelhouse flange.
   Snap pin (5) into hole in quarter inner panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the amplifier bolts (4).

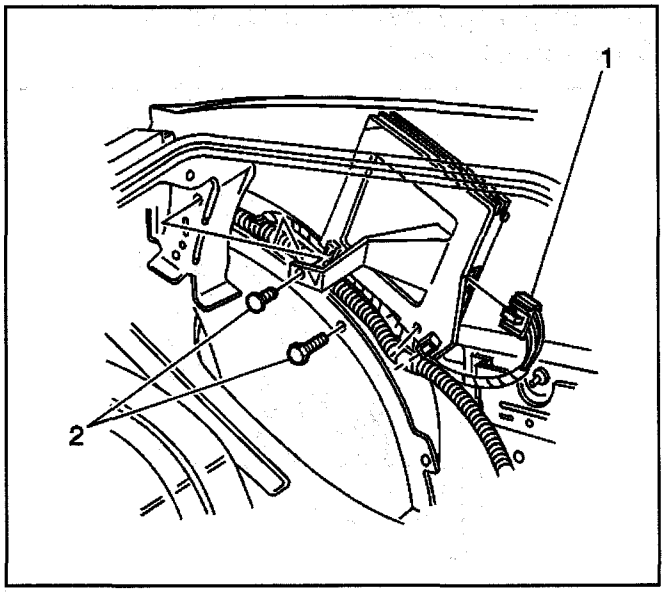
   Tighten

   Tighten the amplifier bolts (4) to 4 N·m (35 lb in).
4. Connect the amplifier electrical connector (2).
5. Install the right quarter inner trim finishing panel.

Amplifier Replacement (Convertible)

Removal Procedure

1. Remove the right quarter inner trim finish panel.
2. Disconnect the amplifier electrical connector (1).
3. Remove the amplifier bolts (2).
4. Remove the amplifier, lift the amplifier up to remove the tabs from the wheelhouse flange.



362239

Installation Procedure

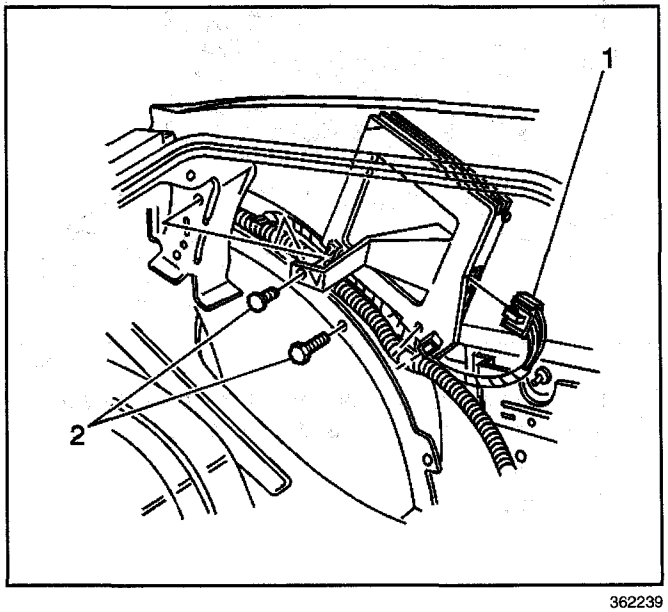
1. Install the amplifier, place the tabs over the wheelhouse flange.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the amplifier bolts (2).

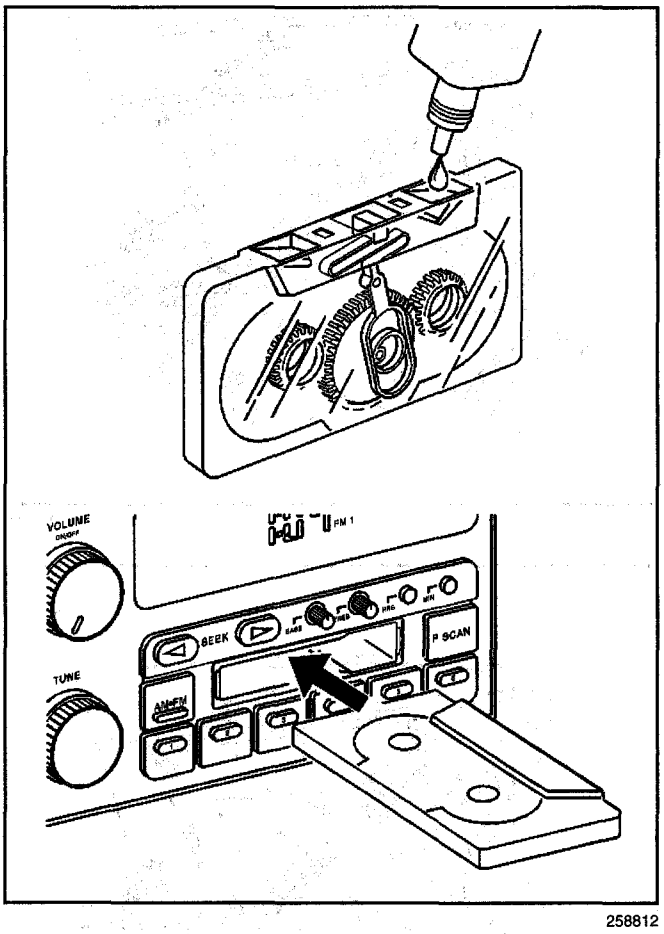
   Tighten

   Tighten the amplifier bolts (2) to 4 N·m (35 lb in).
3. Connect the amplifier electrical connector (1).
4. Install the right quarter inner trim finish panel.



362239

Cleaning Tape Head and Capstan, Cassette Cleaning



258812

Clean the following components of the tape player after every 50 hours of cassette operation:

- The head
- The capstan

Leave the radio in the vehicle when you clean the above components. You can access the components through the tape door.

Use one of the following items in order to clean the head and the capstan:

- A cotton swab dipped in rubbing alcohol
- A cassette cleaning kit

  Follow the instructions with the kit to clean the tape player.

Do not contact the tape head with magnetized tools. If the head becomes magnetized, it will degrade every cassette tape played in the tape player.

The tape deck has an added function that helps prevent damage if the cassette tape breaks or becomes jammed. The tape deck may eject the scrubbing-type, cleaning cartridge after about 5 seconds. Therefore, insert the scrubbing-type cleaner at least 3 times in order to clean the deck thoroughly.

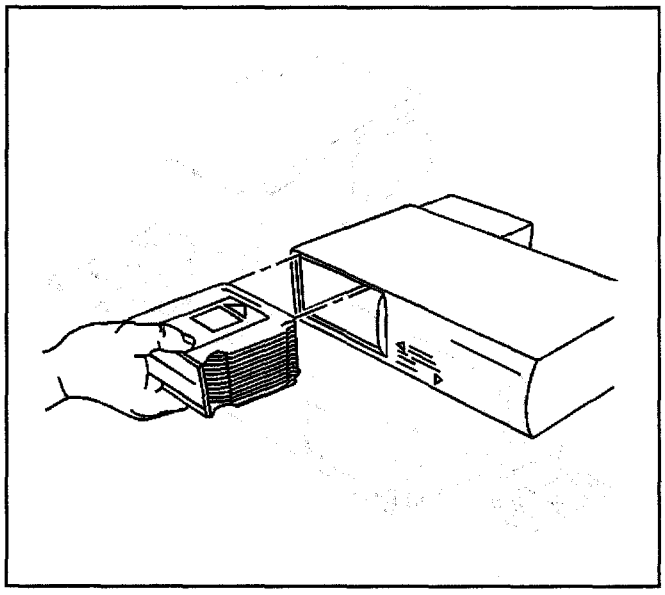
A non-scrubbing, wet type tape cleaner can be used in place of the scrubbing type. The non-scrubbing, wet type uses a fabric belt in place of the tape and will not eject after 5 seconds. However, the non-scrubbing, wet type tape cleaner may not provide a thorough cleaning, such as the scrubbing type cleaner.

No service is provided on tape cassettes. The cassette manufacturer handles the warranties of the cassettes. The test cassette used by the dealer should be stored in its container in order to remain clean. Store the cassettes away from extreme heat and direct sunlight.

Remote CD Changer Replacement (Coupe)

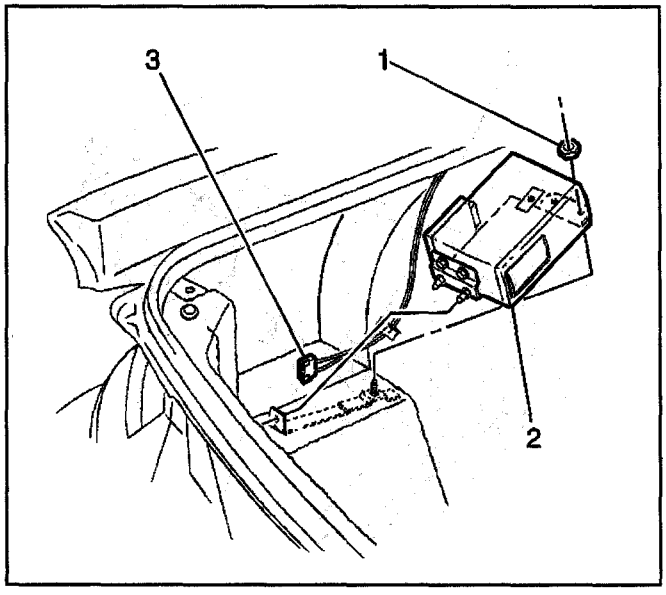
Removal Procedure

1. Open the rear compartment lift window panel.
2. Remove the CD magazine from the CD player.



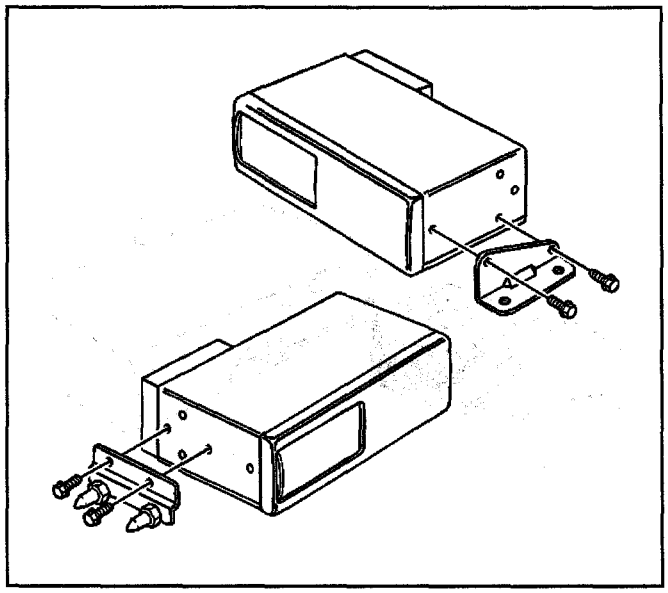
379387

3. Remove the CD changer mounting nut (1).
4. Disconnect the CD changer electrical connector (3).
5. Remove the CD changer (2).

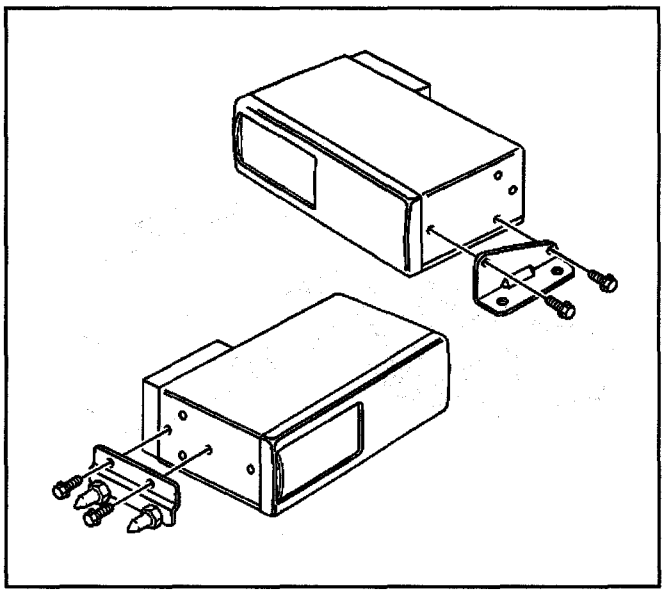


296690

6. Remove the bolts and the brackets from the CD changer, as needed.
7. If you will transport or ship the CD changer, reinstall the shipper pin. Insert the pin into the top of the changer. Use tape in order to fix the pin in place.
8. If you install a new CD changer, remove the shipper pin. Cover the hole with the supplied adhesive material.



379386



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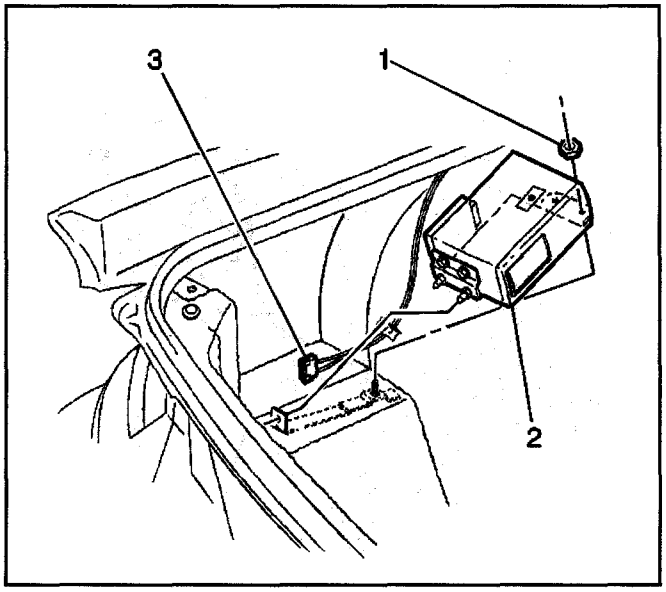
Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

1. Install the brackets and the bolts to the CD changer, as needed.

   Tighten

   Tighten the CD changer bracket bolts to 1.9 N·m (17 lb in).

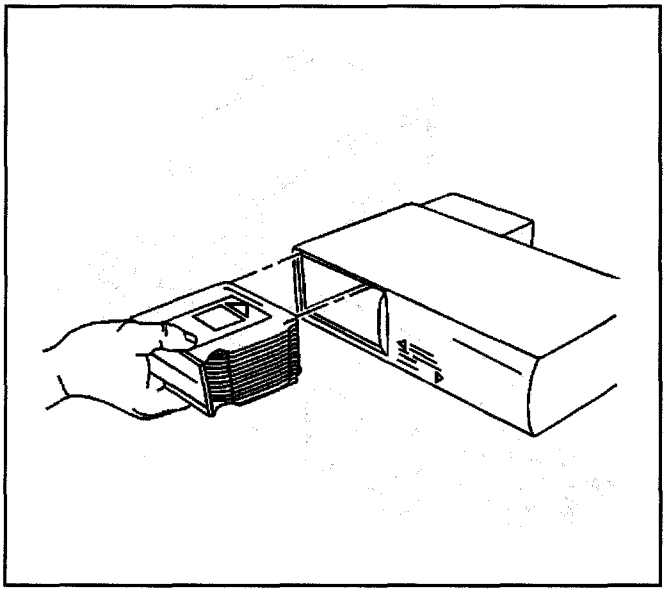


296690

2. Install the CD changer (2).
3. Connect the CD changer electrical connector (3).
4. Position the outboard stud through the bracket hole.
5. Position the outboard hole over the stud.
6. Install the CD changer mounting nut (1).

   Tighten

   Tighten the CD changer mounting nut (1) to 2.5 N·m (22 lb in).



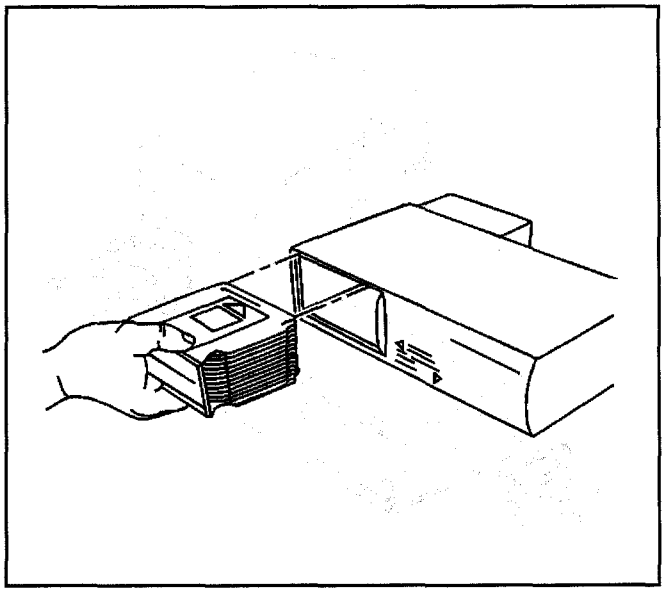
379387

7. Install the CD magazine to the CD changer.
8. Close the rear compartment lift window panel.

Remote CD Changer Replacement (Convertible)

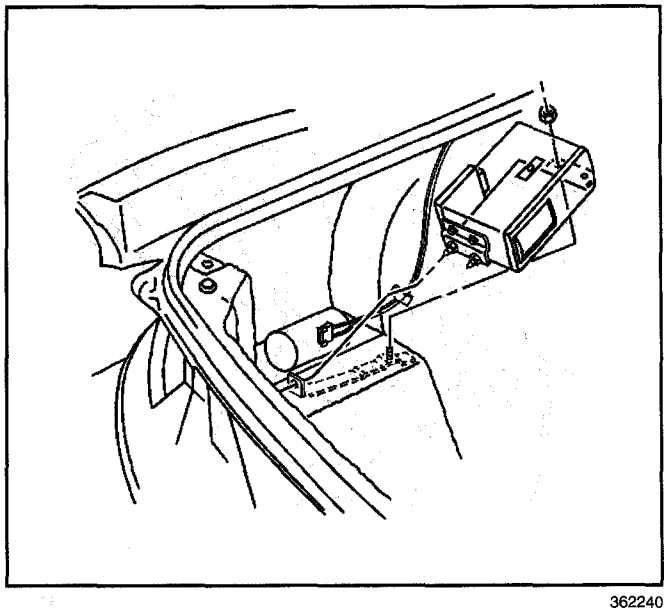
Removal Procedure

1. Open the trunk.
2. Remove the CD magazine from the CD player.



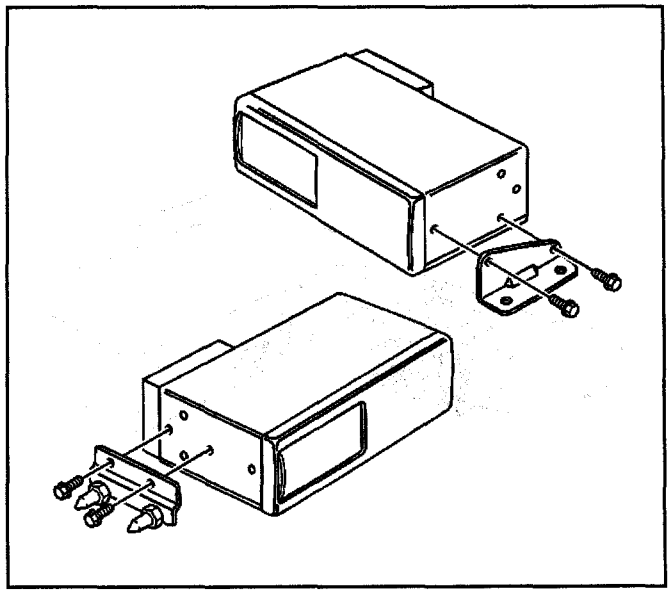
379387

3. Remove the CD changer mounting nut.
4. Disconnect the CD changer electrical connector.
5. Remove the CD changer.

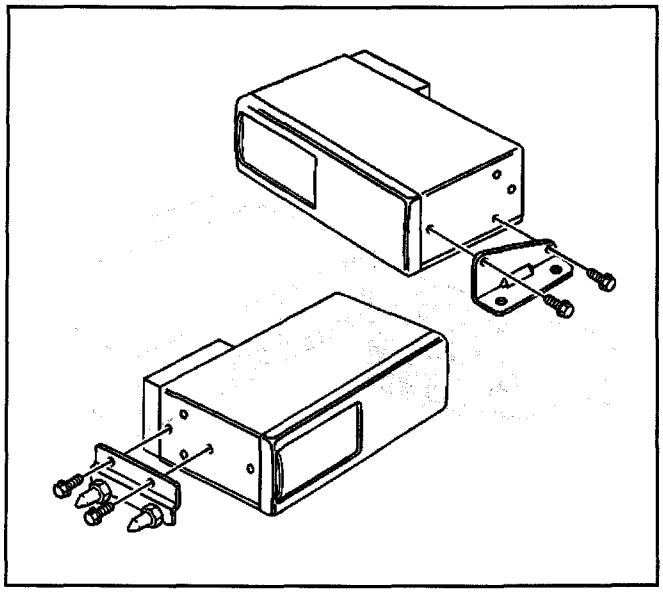


362240

6. Remove the bolts and brackets from the CD changer, as needed.
7. If you will transport or ship the CD changer, reinstall the shipper pin. Insert the pin into the top of the changer. Use tape in order to fix the pin in place.
8. If you install a new CD changer, remove the shipper pin. Cover the hole with the supplied adhesive material.



379386



379386

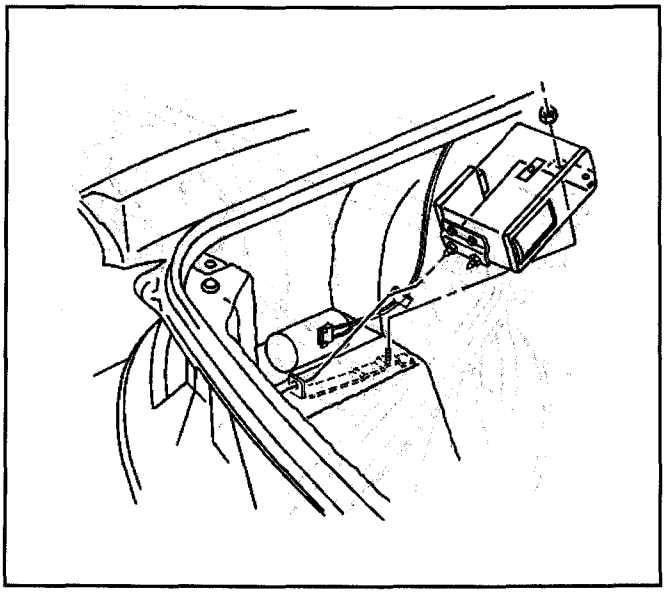
Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

1. Install the brackets and the bolts to the CD changer, as needed.

   Tighten

   Tighten the CD changer bracket bolts to 1.9 N·m (17 lb in).

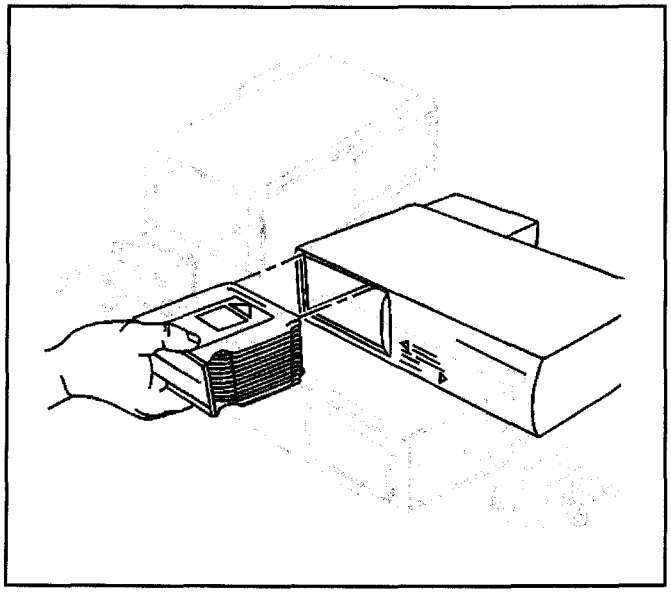


362240

2. Install the CD changer.
3. Connect the CD changer electrical connector.
4. Position the inboard stud through the bracket hole.
5. Position the inboard hole over the stud.
6. Install the CD changer mounting nut.

   Tighten

   Tighten the CD changer mounting nut to 2.5 N·m (22 lb in).



379387

7. Install the CD magazine to the CD changer.
8. Close the trunk.

Compact Disc Care and Cleaning

Handle the compact discs carefully. Store the compact discs in a protective case. Keep the compact discs away from the sun, heat and dust.

Clean the CDs if the surfaces become soiled:

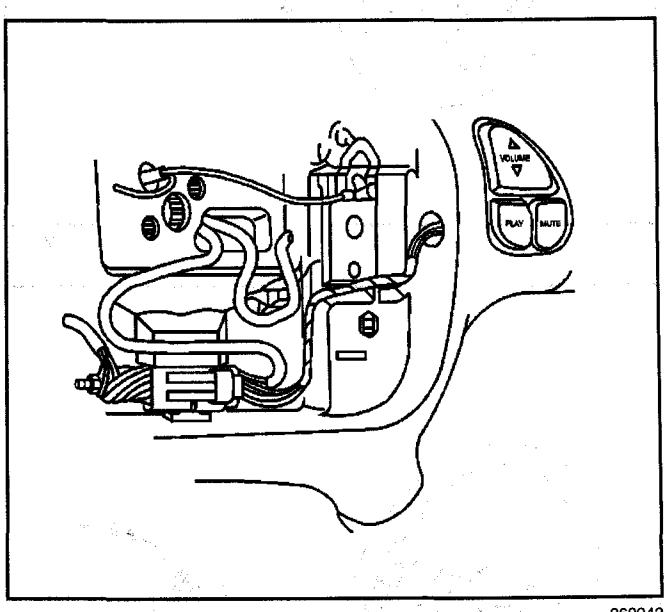
- Dampen a clean, soft cloth in a mild, neutral detergent solution.
- Wipe the compact disc clean.

Mini discs, or singles, measure 8 cm. Singles will not eject from the CD player and should not be used.

Steering Wheel Control Switches Replacement

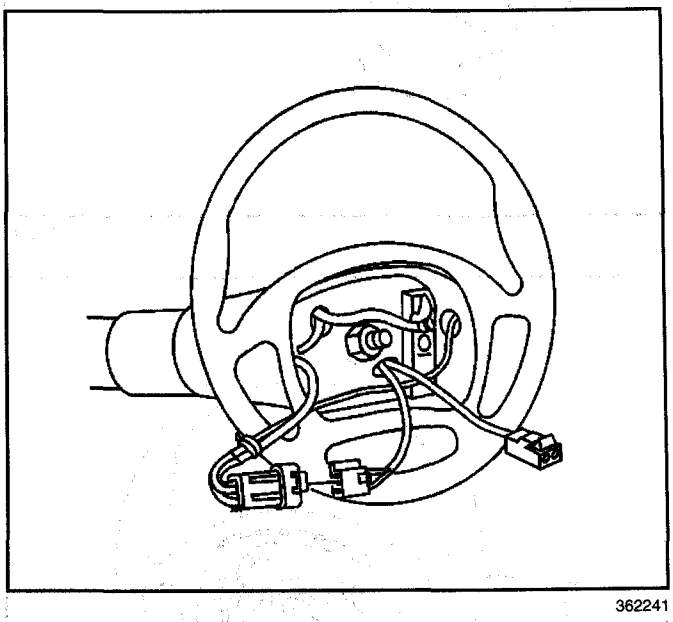
Removal Procedure

1. Remove the inflatable restraint steering wheel module. Refer to *Steering Wheel Inflator Module Replacement* in Steering Wheel and Column - Tilt.
2. Remove the redundant radio control connector from the steering wheel retainer.

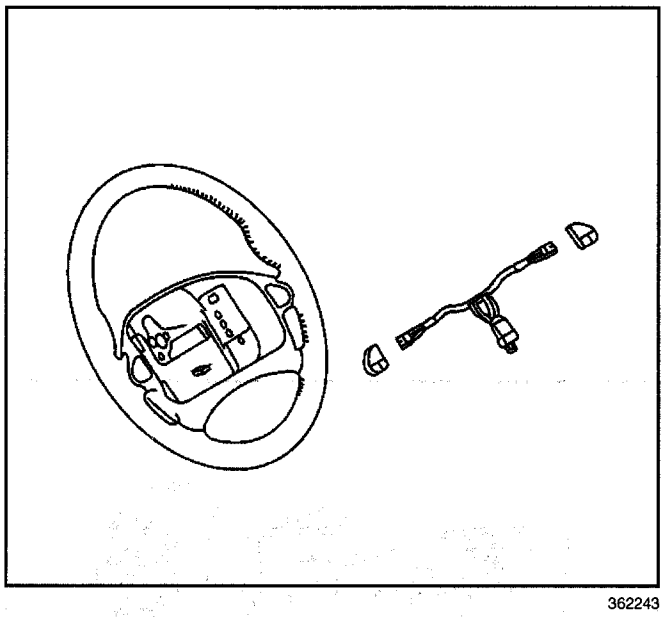


362242

3. Disconnect the redundant radio control electrical connector.



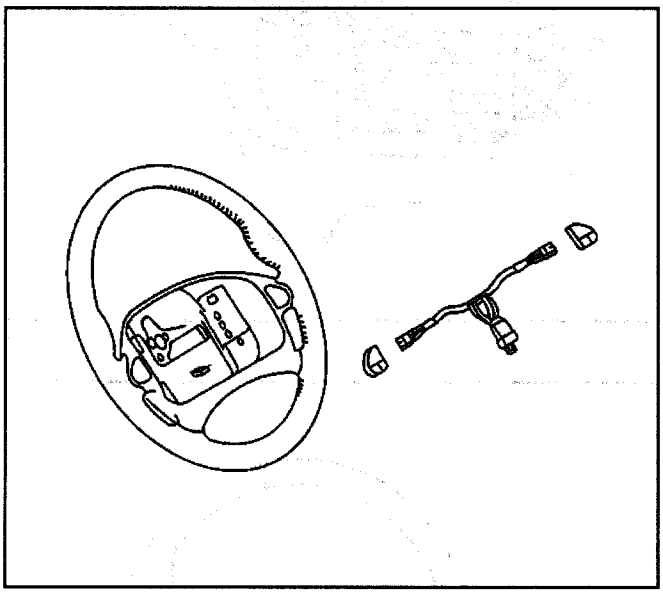
362241



362243

4. Pry out the radio control switch at the lower edge.
5. Remove the radio control switch from the steering wheel.

   Remove the wire harness connector from the control(s).

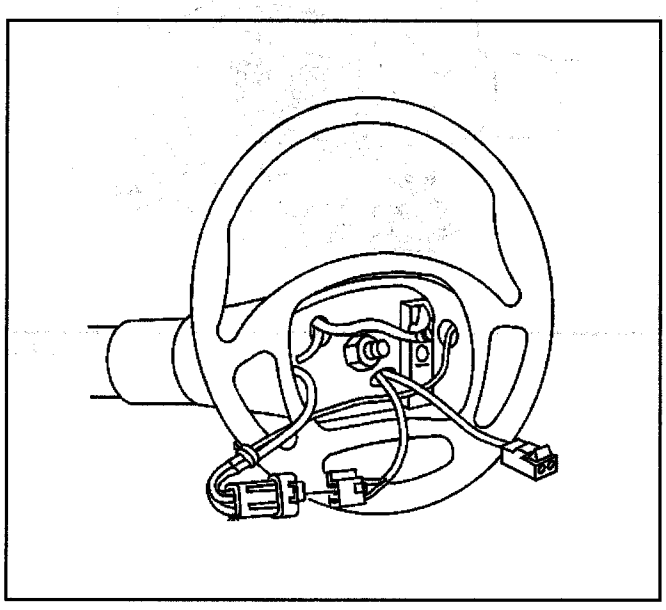


362243

Installation Procedure

1. Install the wire harness connector to the control(s).
2. Install the radio control switch to the steering wheel.

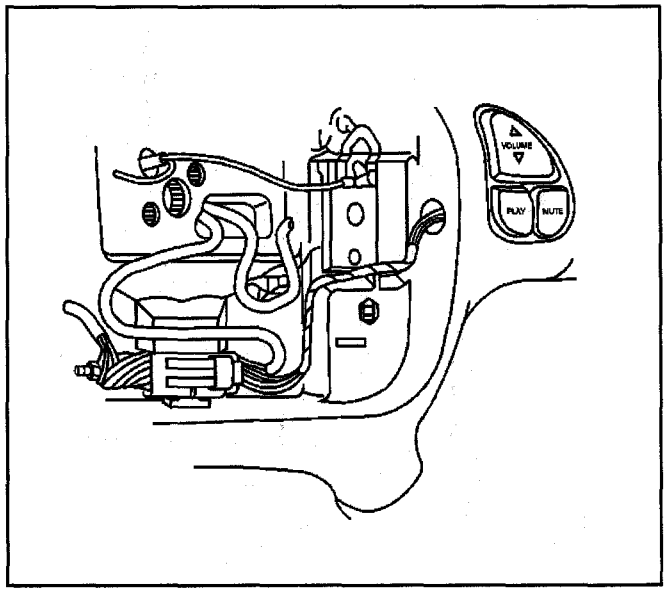
   Press the radio control switch in at the lower edge.



362241

3. Connect the redundant radio control electrical connector.

4. Install the redundant radio control connector to the steering wheel retainer.
5. Install the inflatable restraint steering wheel module. Refer to *Steering Wheel Inflator Module Replacement* in Steering Wheel and Column - Tilt.

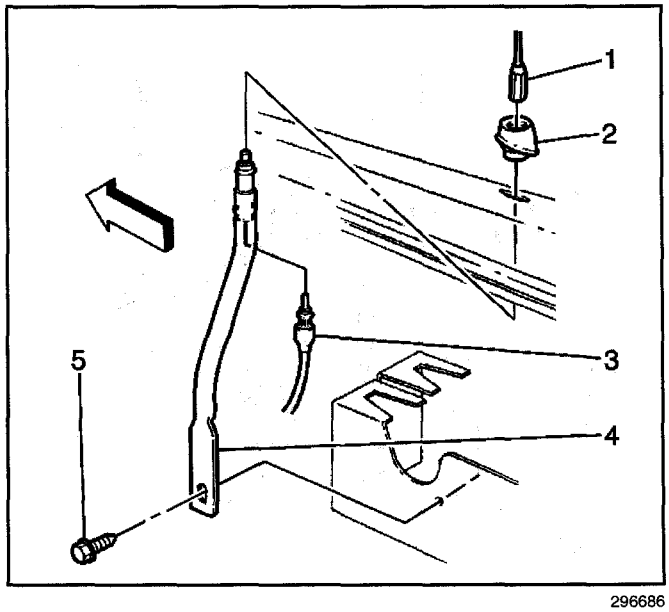


362242

Fixed Antenna Mast Replacement

Removal Procedure

1. Unscrew the antenna mast (1) from the antenna bracket (4).
2. Remove the antenna from the vehicle.



296686

Installation Procedure

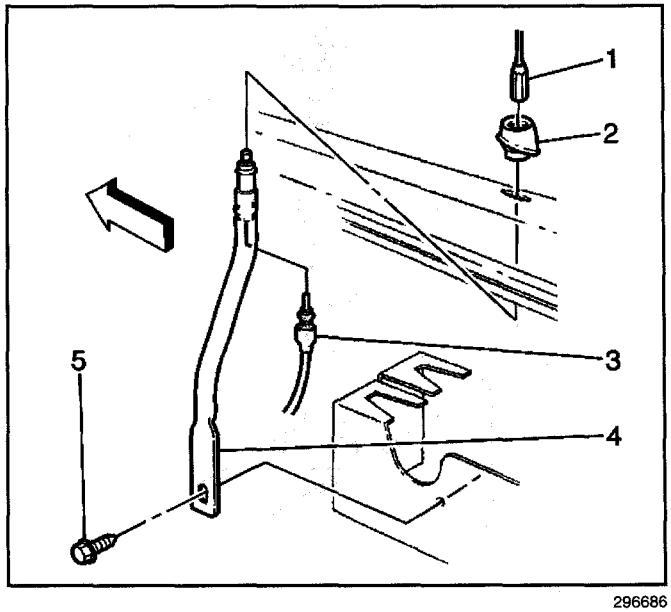
1. Install the antenna to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

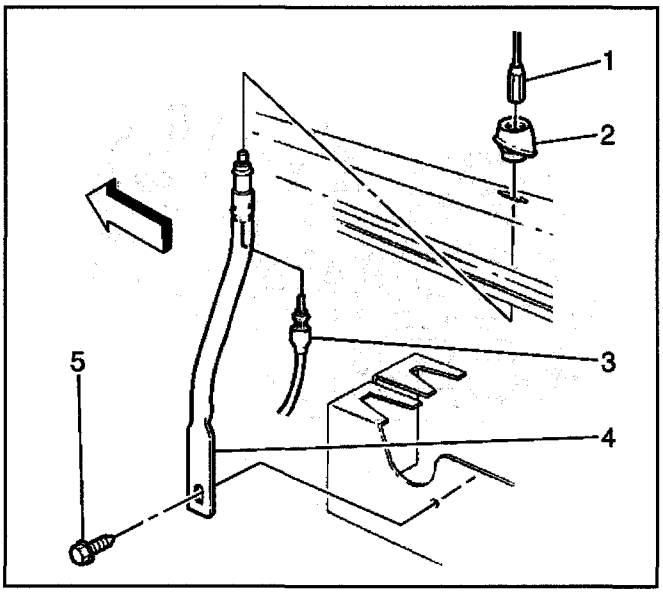
2. Install the antenna mast (1) to the antenna bracket (4).

   Tighten

   Tighten the antenna mast (1) to 5 N·m (44 lb in).



296686

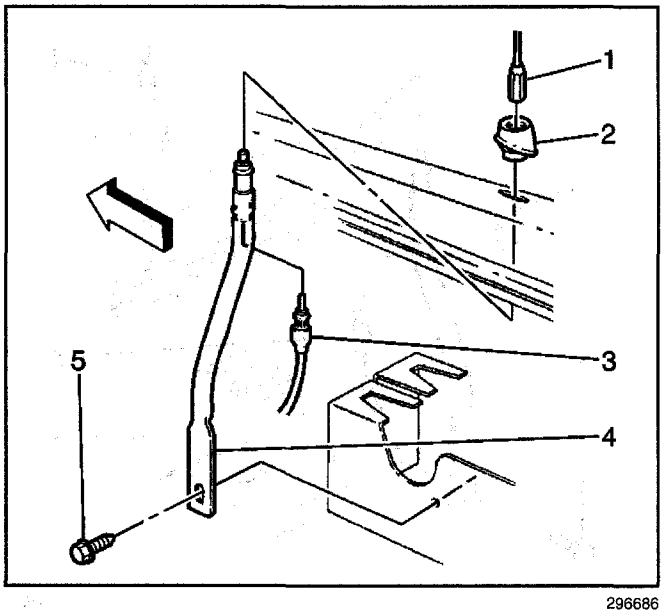


296686

Fixed Antenna Replacement

Removal Procedure

1. Remove the mast antenna. Refer to *Fixed Antenna Mast Replacement.*
2. Remove the quarter inner rear trim finishing panel.
3. Remove the spare tire and the jack.
4. Remove the antenna cable (3) from the antenna bracket (4).
5. Remove the antenna bracket bolt (5).
6. Pull down the antenna bracket (4) from the antenna bezel (2). Disengage the bracket.
7. Remove the antenna bracket (4).
8. Unsnap the bezel (2) from the rear quarter panel.
9. Remove the antenna bezel (2).



296686

Installation Procedure

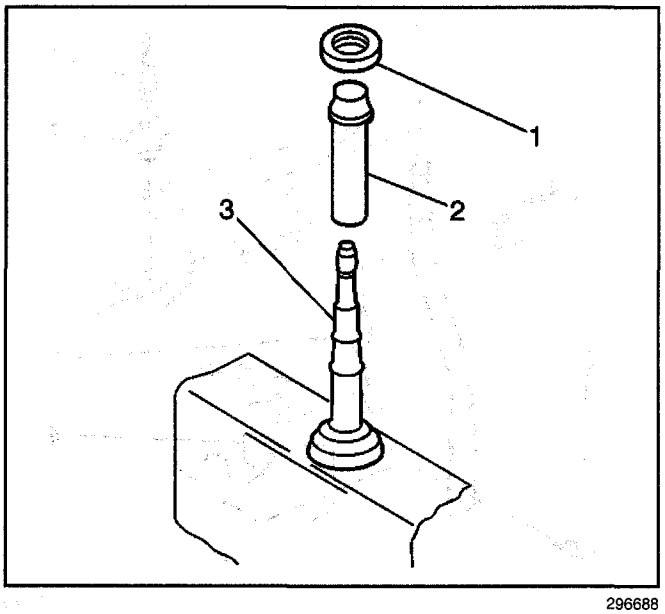
1. Snap the bezel (2) into the rear quarter panel by aligning the bezel.
2. Install the antenna bezel (2).
3. Install the antenna bracket (4).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the antenna bracket bolt (5).

   Tighten

   Tighten the antenna bolt (5) to 5 N·m (44 lb in).
5. Install the antenna cable (3) to the antenna bracket (4).
6. Install the spare tire and the jack.
7. Install the quarter inner rear trim finishing panel.
8. Install the mast antenna. Refer to *Fixed Antenna Mast Replacement.*



296688

Power Antenna Mast Replacement

Removal Procedure

1. Turn the ignition switch to the ON position.
2. Turn the radio ON.

Important: Note the orientation of the serrated side of the plastic cable in order to install the cable correctly.

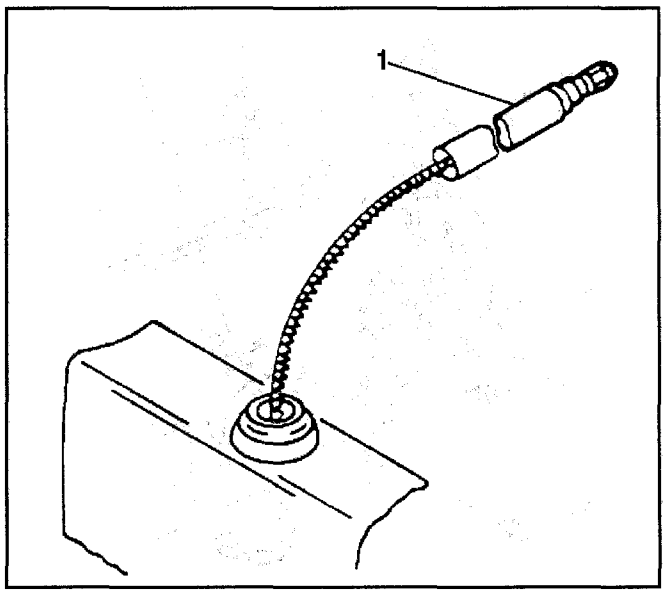
3. Remove the antenna mast (3) and the contact spring (2).
4. Use contact cleaner in order to clean the contact spring (2).

Installation Procedure

1. Insert the plastic cable into the housing. You will feel resistance after inserting about 30 cm (12 in) of the cable. Stop inserting the cable when you feel resistance.
2. Turn the radio OFF.

   Ensure that the plastic cable retracts into the housing and catches onto the gear mechanism of the drum housing.

   If the cable does not retract into the housing, rotate the cable until the cable rotates into the housing with the motor operating.

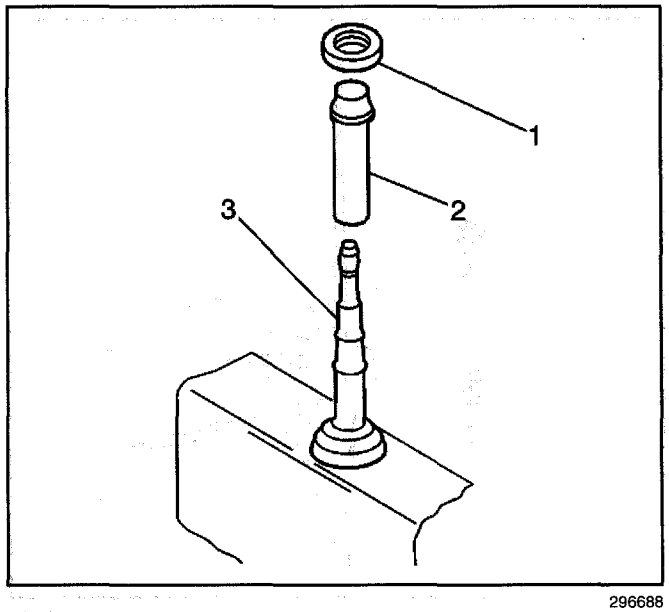


296689

3. Install the contact spring onto the antenna mast (3).

   Ensure that the flanged end of the contact spring (2) faces upward.
4. Inspect the antenna operation by turning the radio On and OFF several times.

   The antenna mast may only extend or retract halfway.
5. Continue to operate the antenna until the antenna mast (3) fully extends and retracts.

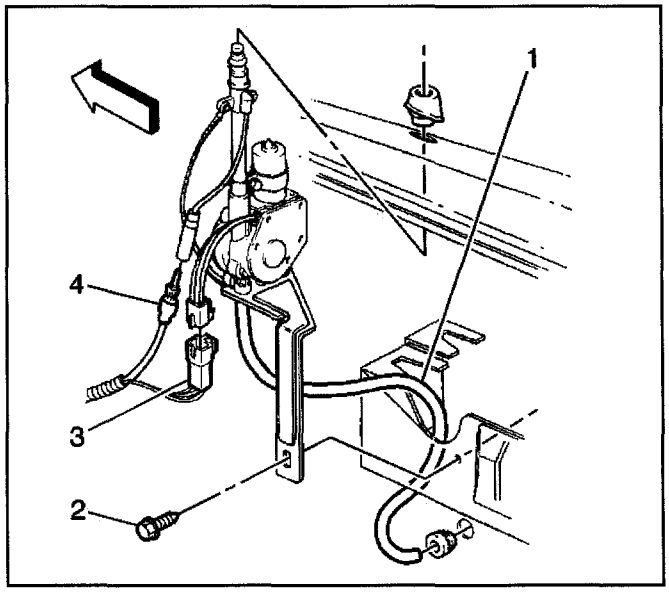


296688

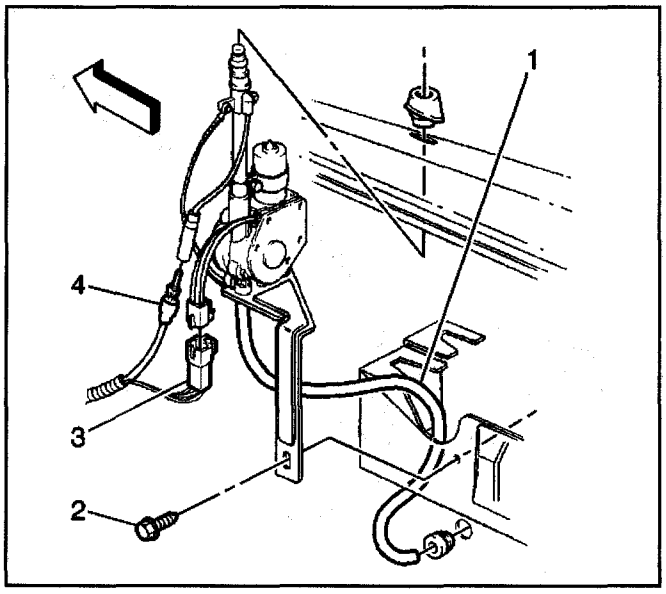
Power Antenna Motor Replacement

Removal Procedure

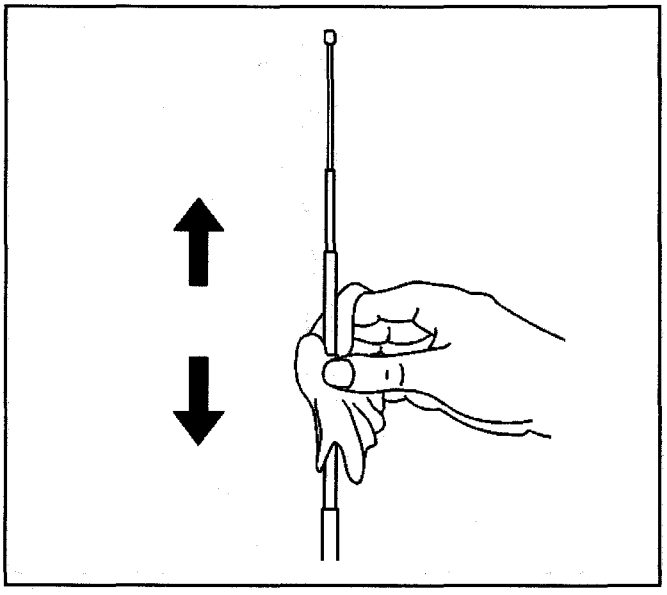
1. Remove the quarter inner rear trim finishing panel.
2. Remove the spare tire and jack.
3. Disconnect the antenna cable (4) from the power antenna.
4. Disconnect the power antenna electrical connector (3).
5. Remove the drain tube (1) from the grommet in the rear quarter panel.
6. Remove the power antenna bracket bolt (2).
7. Pull down the bracket. Disengage the power antenna from the antenna bezel.
8. Remove the power antenna.
9. Unsnap the bezel from the rear quarter panel.
10. Remove the antenna bezel.



296687



296687



280586

Installation Procedure

1. Snap the bezel into the rear quarter panel in order to install the antenna bezel.
2. Install the power antenna.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the power antenna bracket bolt (2).

   Tighten

   Tighten the power antenna bracket bolt to 5 N·m (44 lb in).
4. Install the drain tube (1) to the grommet in the rear quarter panel.
5. Connect the power antenna electrical connector (3).
6. Connect the antenna cable (4) to the power antenna.
7. Install the jack and the spare tire.
8. Install the quarter inner rear trim finishing panel.

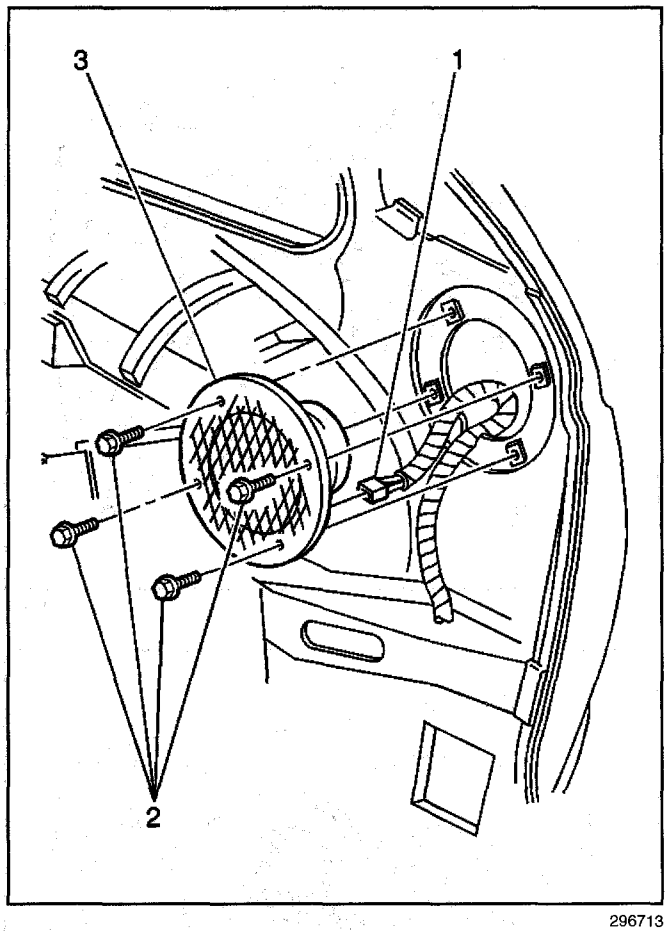
Antenna Mast Cleaning

1. Fully extend the antenna.
2. Dampen a clean cloth with mineral spirits.
3. Wipe the cloth over the antenna. Remove any dirt.
4. Retract and extend the antenna through one complete cycle.
5. Repeat Steps 1 through 4 two more times.

Speaker Replacement (Coupe)

Removal Procedure

1. Remove the quarter inner trim finishing panel.
2. Remove the radio quarter speaker bolts (2).
3. Gently pull the speaker (3) forward to access the connector (1).
4. Disconnect the radio quarter speaker electrical connector (1).
5. Remove the radio quarter speaker (3) from the vehicle.



296713

Installation Procedure

1. Connect the radio quarter speaker electrical connector (1).
2. Install the speaker (3) into the opening in the sail panel.

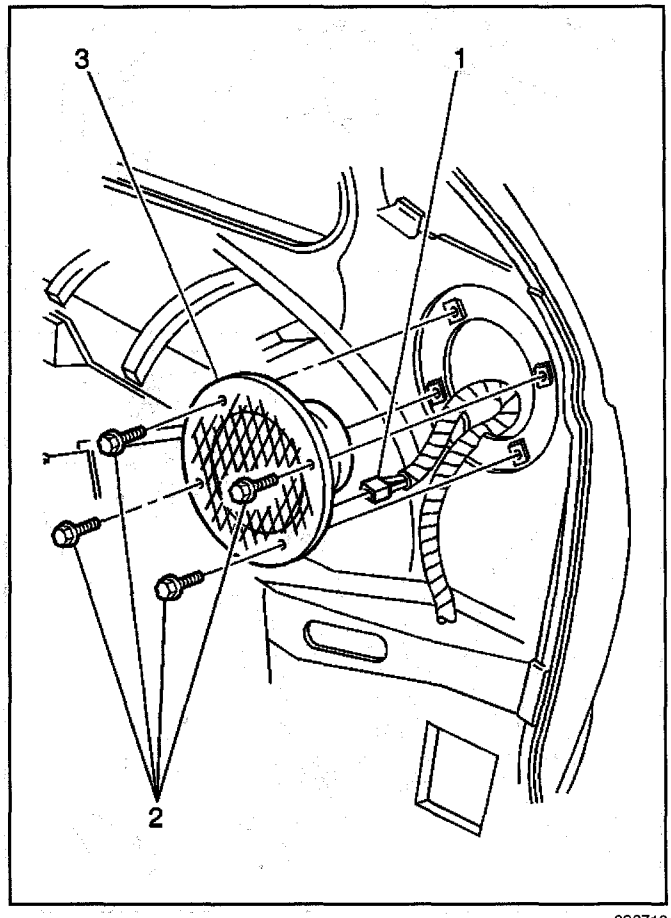
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the radio quarter speaker bolts (2).

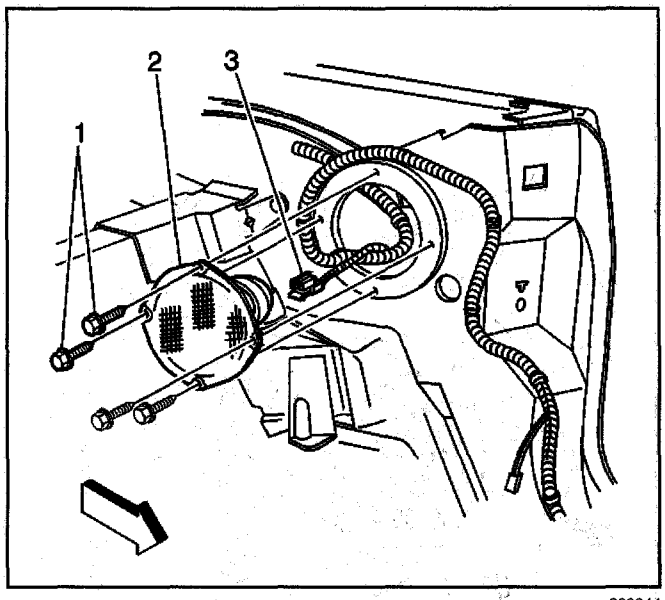
   Tighten

   Tighten the radio quarter speaker bolts (2) to 1.9 N·m (17 lb in).

4. Install the quarter inner trim finishing panel.



296713

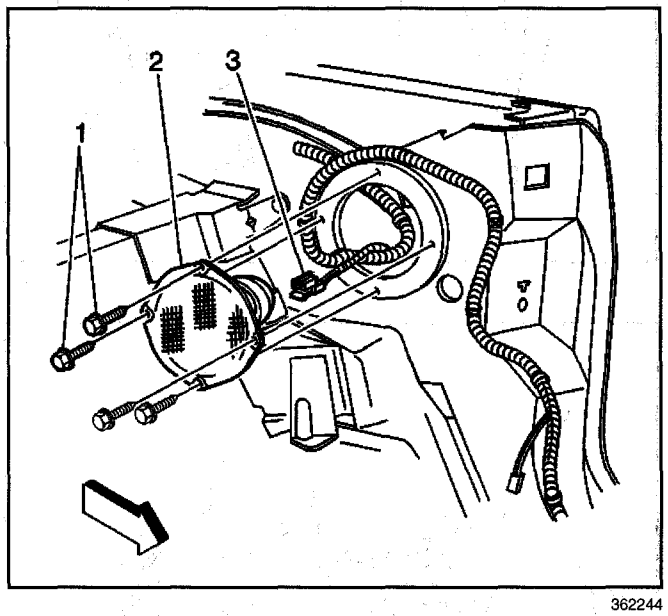


362244

Speaker Replacement (Convertible)

Removal Procedure

1. Remove the quarter inner trim finishing panel.
2. Remove the radio quarter speaker bolts (1).
3. Gently pull the speaker (2) forward to access the connector (3).
4. Disconnect the radio quarter speaker electrical connector (3).
5. Remove the radio quarter radio speaker (2) from the vehicle.



362244

Installation Procedure

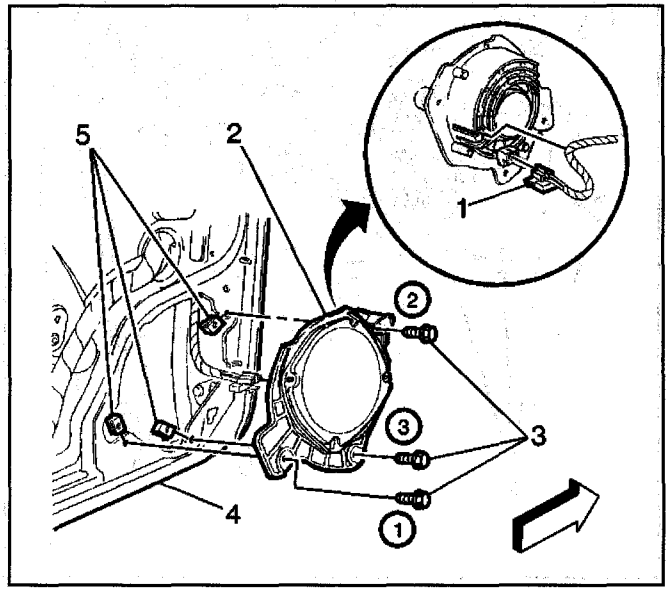
1. Connect the radio quarter speaker electrical connector (3).
2. Install the speaker (2) into the opening in the sail panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the radio quarter speaker bolts (1).

   Tighten

   Tighten the radio quarter speaker bolts (1) to 1.9 N·m (17 lb in).
4. Install the quarter inner trim finishing panel.



296707

Speaker Replacement - Front

Removal Procedure

1. Remove the front side door trim.
2. Remove the front side door water deflector, as needed.
3. Remove the door speaker bolts (3).
4. Gently pull the door speaker (2) forward to access the connector (1).
5. Disconnect the door speaker electrical connector (1).
6. Remove the side door speaker (2) from the vehicle.

Installation Procedure

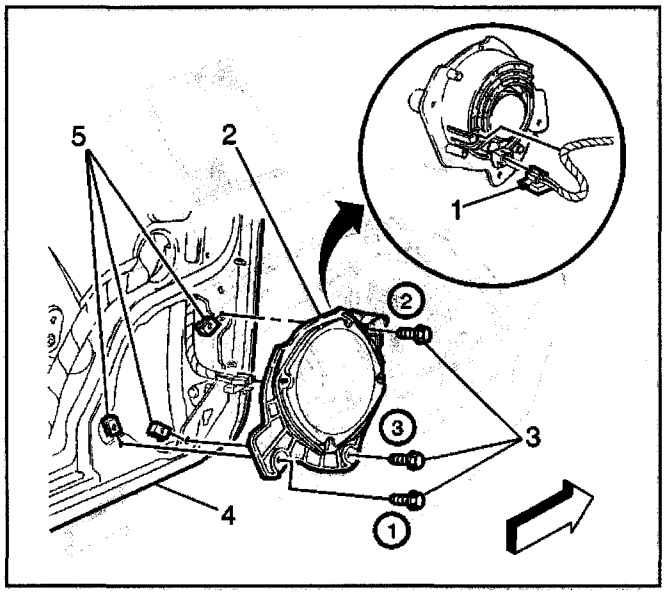
1. Connect the side door speaker electrical connector (1).
2. Install the side door speaker (2) to the door.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the side door speaker bolts (3).

   Tighten

   Tighten the side door speaker bolts (3) to 2.5 N·m (22 lb in).
4. Install the front side door water deflector.
5. Install the front side door trim.

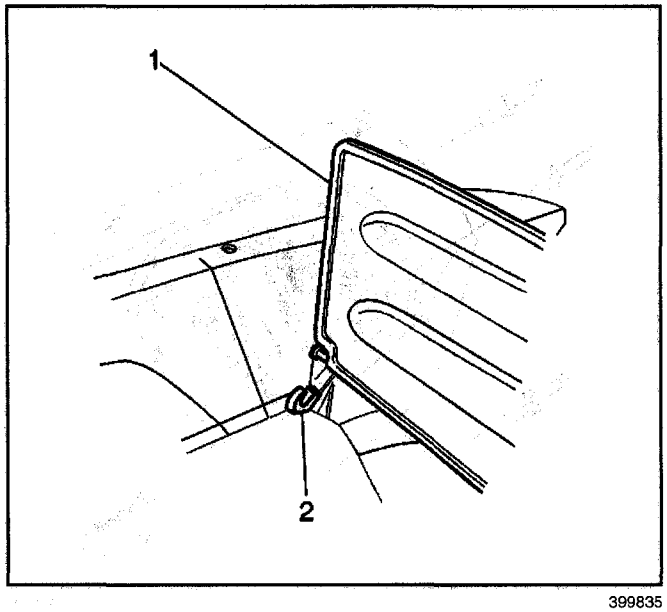


296707

Speaker Replacement - Rear

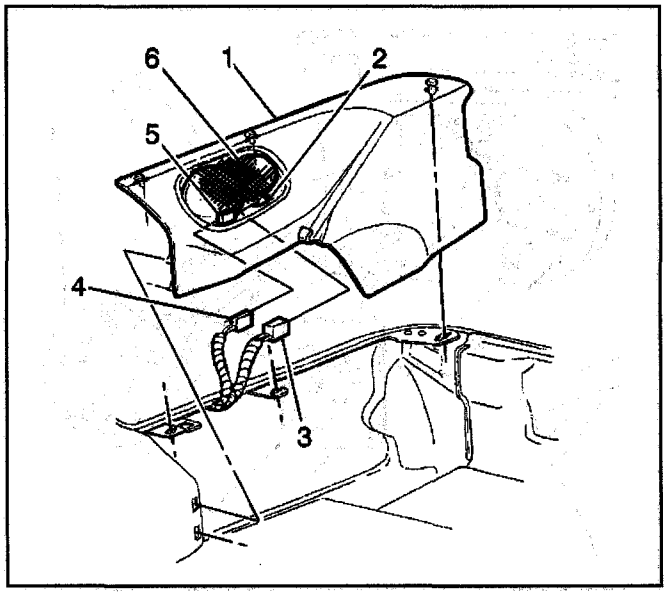
Removal Procedure

1. Remove the rear compartment closeout panel (1), if equipped, from the rear trim finish panel (2).

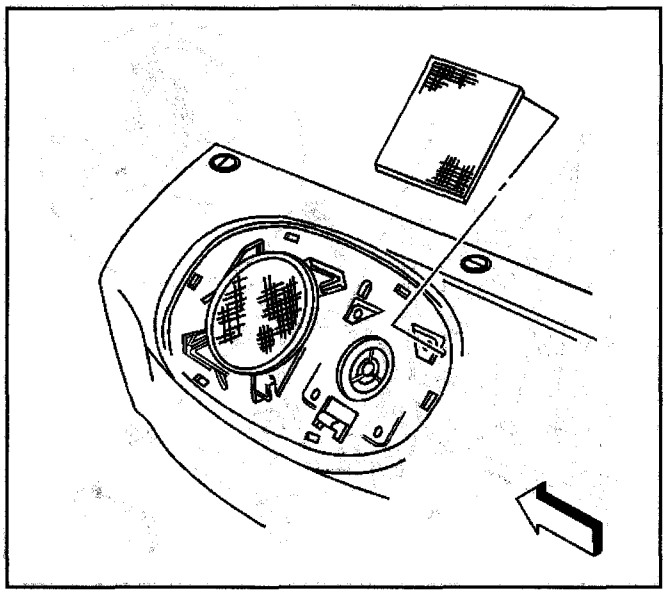


399835

2. Remove the quarter inner rear trim finishing panel (1) perform the following:
   - Loosen the retainers.
   - Pull the rear trim finish panel (1) up.
   - Disconnect the wiring harness connectors (3 and 4) from the speaker connectors (2 and 5).
3. Remove the speaker grille (6).

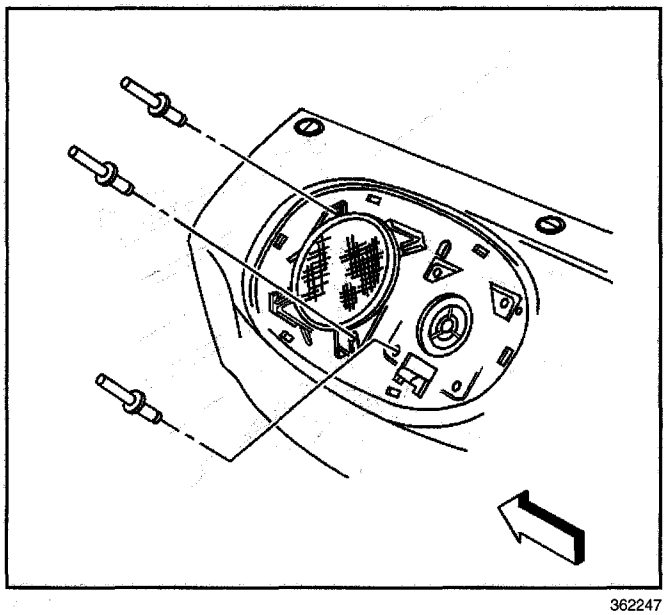


399837



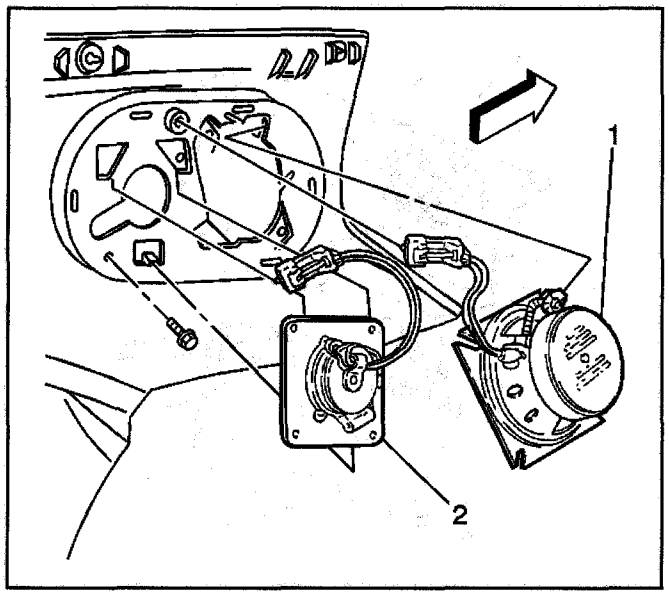
362246

4. Reposition the radio quarter speaker insulator, if necessary.



362247

5. Drill out the 2 speaker rivets, if replacing the mid range speaker.
6. Drill out the single rivet, if replacing the tweeter.

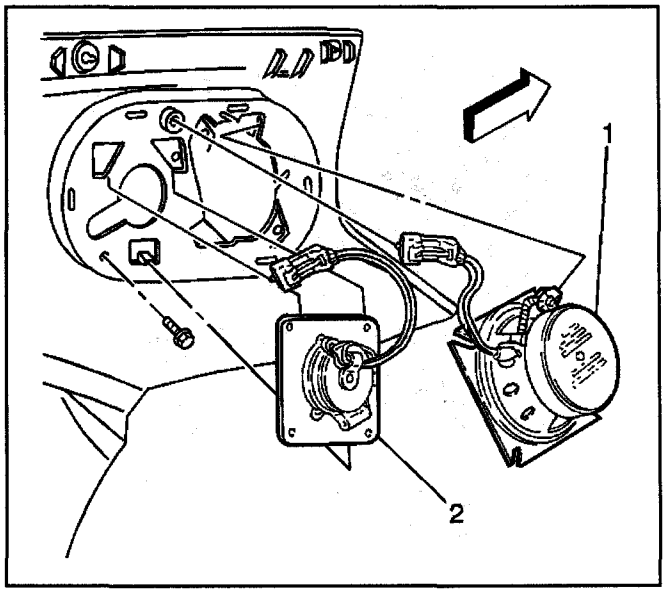


296717

7. Remove the electrical connectors from the trim panel.
8. If replacing the mid-range speaker (1) perform the following:
   - Rotate the speaker (1) counterclockwise.
   - Unseat the speaker (1) from the panel.
9. If replacing the tweeter (2) perform the following:
   - Push the retainer tab down.
   - Unsnap the tweeter (2) from the trim panel.

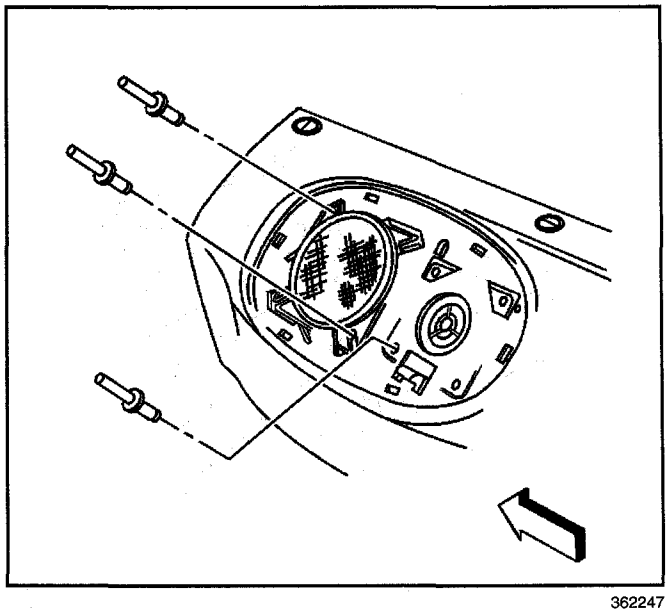
Installation Procedure

1. If installing the tweeter (2) perform the following:
   - Place the top of the tweeter (2) flange under the tab on the panel.
   - Push the bottom of the tweeter (2) against the panel until secured by retainer tab.
2. If installing the mid-range speaker (1) perform the following:
   - Align the speaker (1) to the trim panel.
   - Twist the speaker (1) clockwise until seated in panel.

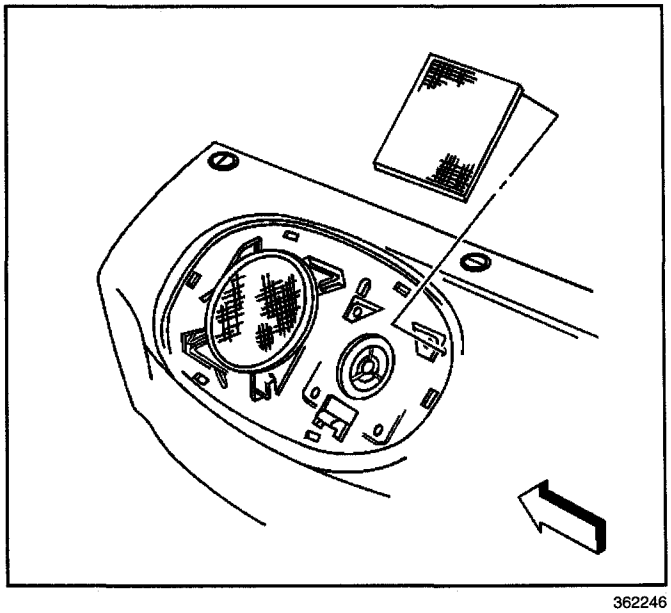


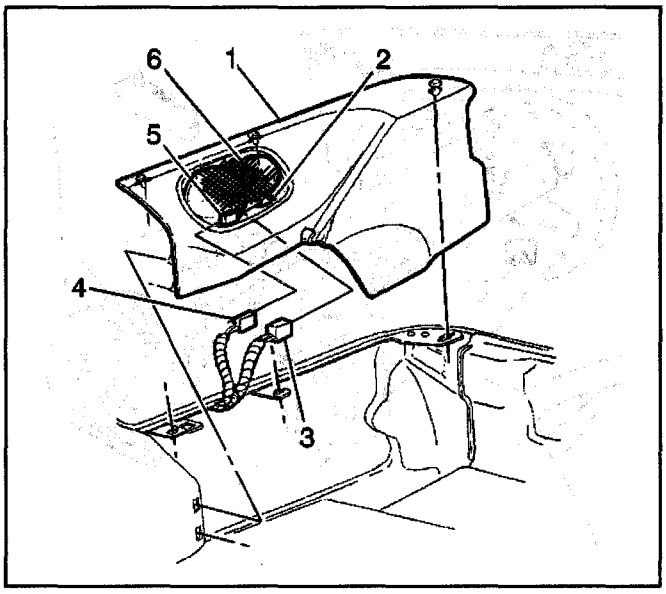
296717

3. If replacing the tweeter install the rivet.
4. If replacing the mid range speaker install 2 rivets.


362247

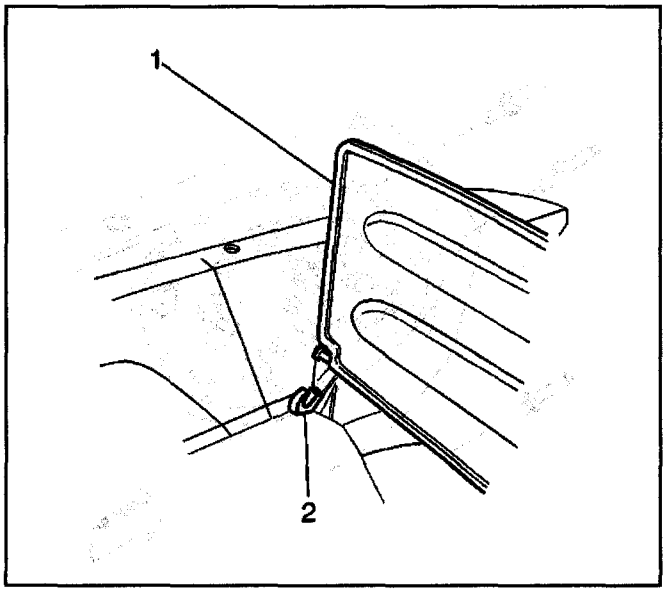
5. Position the radio quarter speaker insulator, if required.


362246



399837

6. Install the speaker grille (6).
7. Install the quarter inner rear trim finishing panel (1) perform the following:
   - Connect the wiring harness connectors (3 and 4) to the speaker connectors (2 and 5).
   - Place the rear trim finish panel (1) into place.
   - Tighten the retainers.



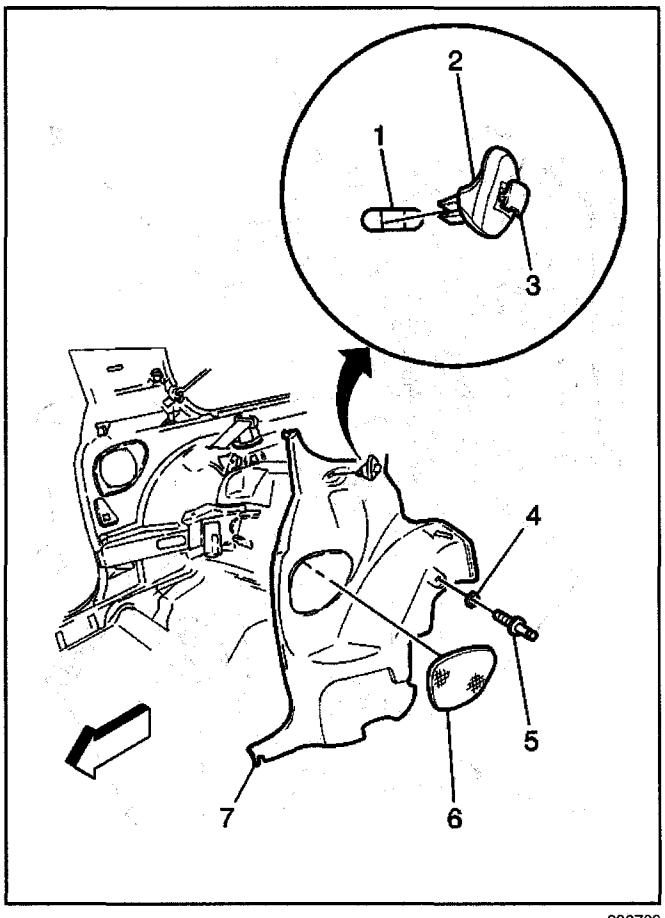
399835

8. Install the rear compartment closeout panel (1), if equipped, to the rear trim finish panel (2).

Speaker Grille Replacement - Rear (Coupe)

Removal Procedure

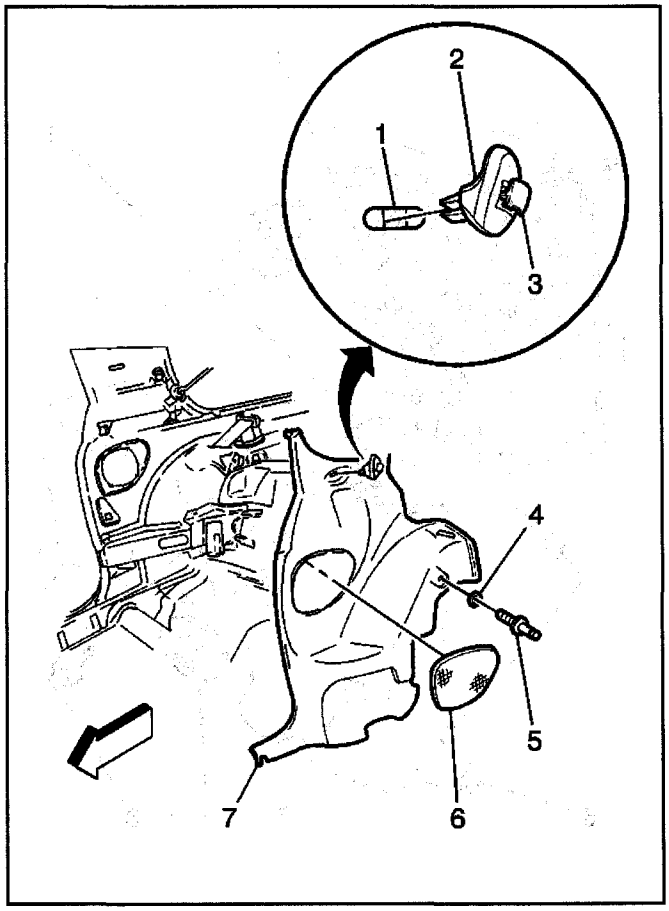
1. Squeeze the outer edges of the speaker grille (6).
2. Pull out and remove the speaker grille (6).



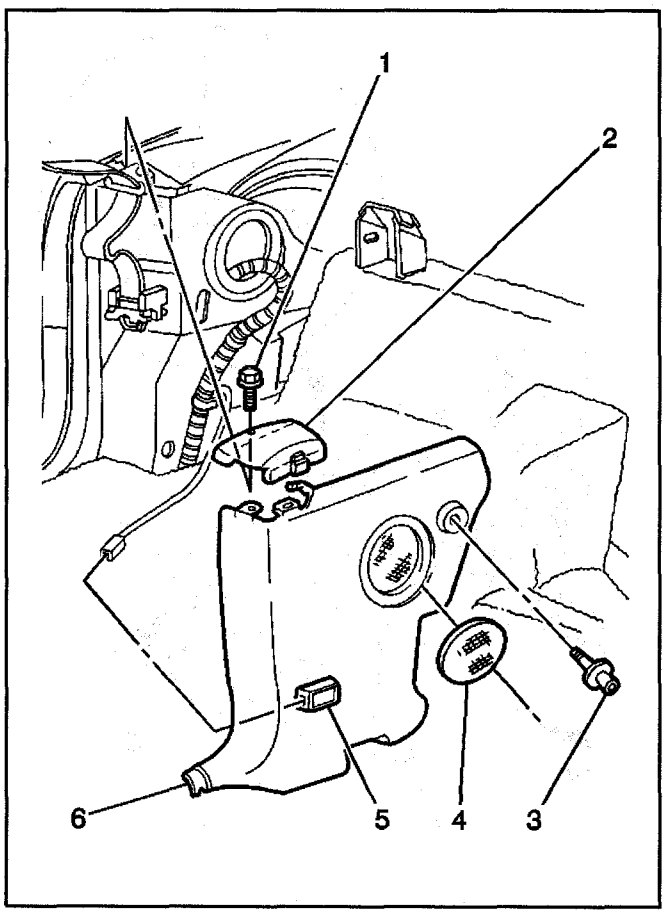
296709

Installation Procedure

1. Squeeze the outer edges of the speaker grille (6).
2. Place the speaker grille (6) into position and release the pressure.



296709

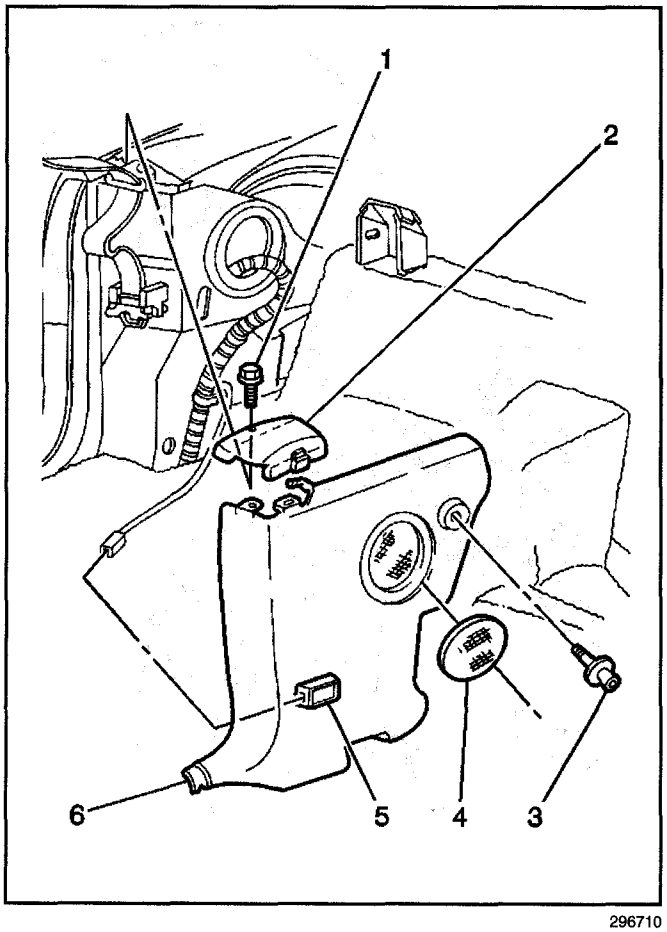


296710

Speaker Grille Replacement - Rear (Convertible)

Removal Procedure

1. Remove the trim finishing panel (6).
2. Use a soldering iron to melt the heat stakes that attach the speaker grille (4).
3. Remove the speaker grille (4) from the trim finishing panel (6).



296710

Installation Procedure

1. Install the speaker grille (4) to the trim finishing panel (6).
2. Insert the heat stakes through the holes in the trim finishing panel (6).
3. Use a soldering iron to melt the heat stakes.
4. Press the melted heat stakes flat using a suitable surface.
5. Install the trim finishing panel (6).

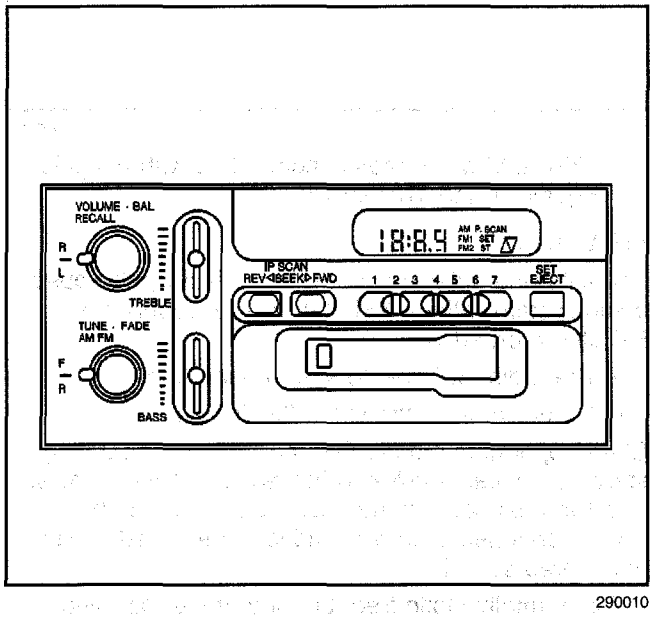
Description and Operation

Radio/Audio System Description (Chevrolet)

Chevrolet radios include the following components and features:

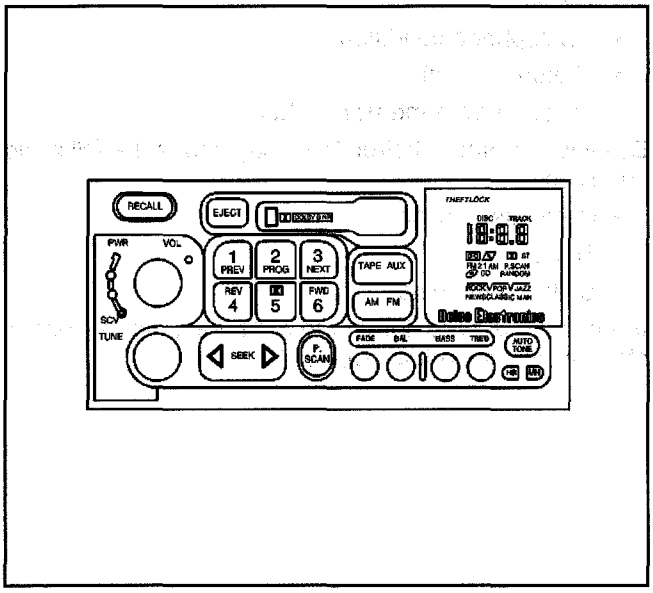
- An electronically tuned receiver (ETR)
- A vacuum fluorescent display
- An AM/FM stereo
- Seek and scan tuning
- A digital clock display

Radio Description



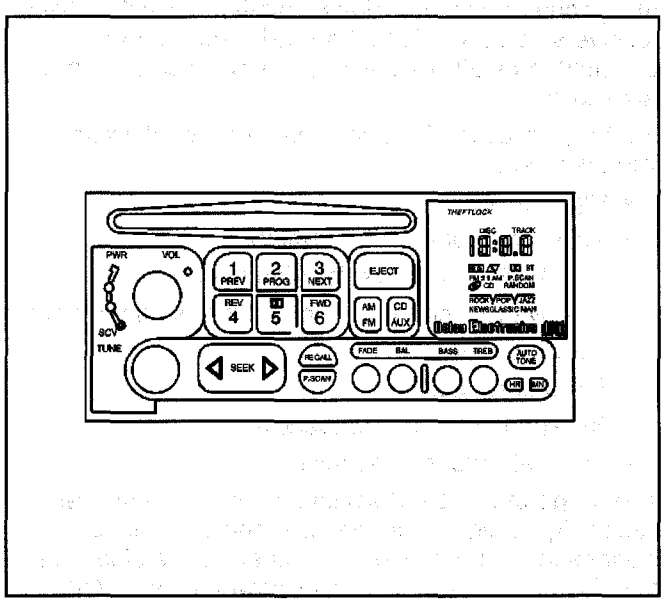
290010

- ETR AM/FM Stereo/Cassette



65126

- ETR AM/FM Stereo/Compact Disc with Theftlock™



65127

- ETR AM/FM Stereo/Compact Disc with Theftlock™

FM Stereo

The following actions occur when a factory-equipped audio system with an FM stereo radio receives an FM stereo broadcast:

- The radio switches to stereo operation.
- An indicator on the radio illuminates.

Stereo operation means that the radio is separating the stereo broadcast back into the two original channels. The two channels are the LEFT channel and the RIGHT channel. Stereo sound is more realistic than non-stereo sound.

FM is normally static-free, but any of the following factors may limit reception:

- Terrain
- Atmospheric conditions
- Station strength
- Distance from the transmitter

Buildings or other obstructions may cause the following conditions:

- Momentary static
- Flutter
- Station swapping

If reception is poor, turning to a different station that is stronger will bring improvement.

AMAX Stereo Certification

All optional radios are AMAX certified. AMAX certified receivers can reproduce the fidelity sound that is transmitted by all AM stations but not received on all AM radios.

AMAX certification includes some of the following improvements:

- High fidelity
- Adjustable receiver bandwidth:
  - Wide bandwidth for high fidelity
  - Narrow bandwidth for cutting out interference
- Noise cancellation
- Full stereo sound
- Reception of more frequencies
- External antenna capability

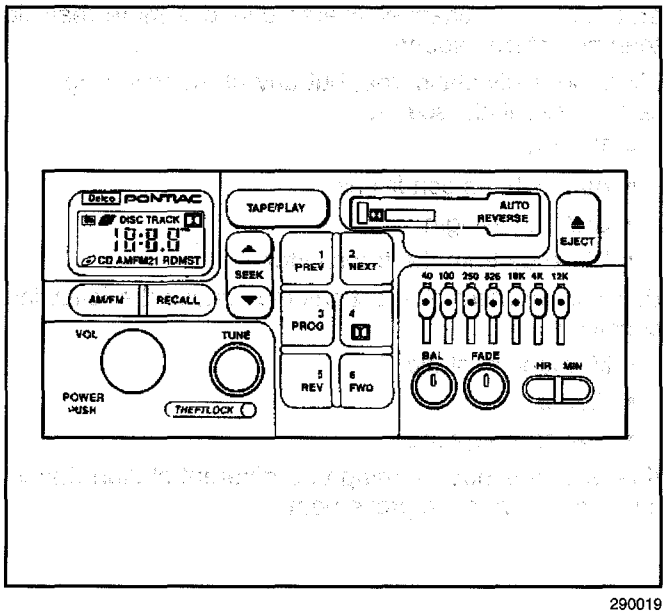
The range of most AM stations is greater than FM, especially at night. The longer range can cause stations to interfere with each other. AM is also subject to noise pickup from storms or power lines. AMAX certification reduces many of these types of conditions.

Radio/Audio System Description (Pontiac)

Pontiac radios include the following components and features:

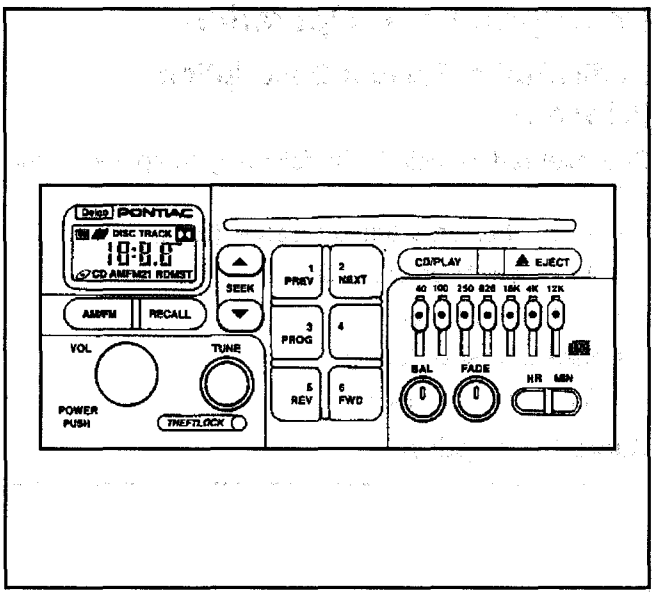
- An electronically tuned receiver (ETR)
- A vacuum fluorescent display
- An AM/FM stereo
- The seek and scan tuning
- A digital clock display

Radio Description



290019

- ETR AM/FM Stereo/Cassette with Graphic Equalizer and Theftlock™



290017

- ETR AM/FM Stereo/Compact Disc with Graphic Equalizer and Theftlock™

FM Stereo

The following actions occur when a factory-equipped audio system with an FM stereo radio receives an FM stereo broadcast:

- The radio switches to stereo operation.
- An indicator on the radio illuminates.

Stereo operation means that the radio is separating stereo broadcast back into the two original channels. The two channels are the LEFT channel and the RIGHT channel. Stereo sound is more realistic than non-stereo sound.

FM is normally static-free, but any of the following factors may limit reception:

- Terrain
- Atmospheric conditions
- Station strength
- Distance from the transmitter

Buildings or other obstructions may cause the following conditions:

- Momentary static
- Flutter
- Station swapping

If reception is poor, turning to a different station that is stronger will bring improvement.

AMAX Stereo Certification

All optional radios are AMAX certified. AMAX certified receivers can reproduce the fidelity sound that is transmitted by all AM stations but not received on all AM radios.

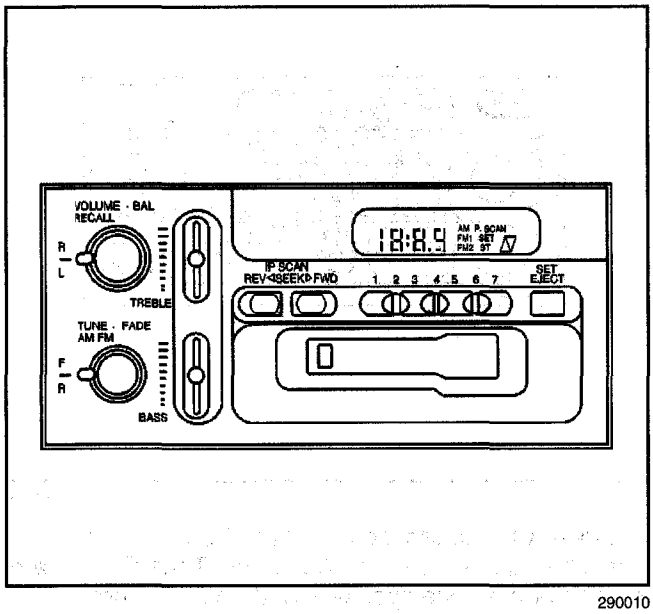
AMAX certification includes some of the following improvements:

- High fidelity
- Adjustable receiver bandwidth:
  - Wide bandwidth for high fidelity
  - Narrow bandwidth for cutting out interference
- Noise cancellation
- Full stereo sound
- Reception of more frequencies
- External antenna capability

The range of most AM stations is greater than FM, especially at night. The longer range can cause stations to interfere with each other. AM is also subject to noise pickup from storms or power lines. AMAX certification reduces many of these types of conditions.

Radio/Audio System Operation-Radio Controls (Standard)

Radio Controls



290010

The following actions occur when the radio is first turned on:

- The frequency appears on the display for 5 seconds.
- The time displays.
- If equipped, the power antenna raises

Volume Knob

This knob knob turns the radio ON and OFF. Rotating this knob also controls the radio volume. The control ring behind this knob is for the radio balance control.

Turning the ring clockwise moves the speaker balance to the right side speakers. Turning the ring counterclockwise moves the speaker balance to the left side speakers. Press the knob in order to recall the station currently being played or for the clock display. When playing a cassette, press the knob in order to select the opposite side of the cassette being played.

Tune Knob

Turning this knob will manually select the radio stations. When the radio is ON and the cassette player is OFF, press this knob in order to choose either the AM, FM1 or the FM2 band. The control ring behind this knob fades the sound between the front and the rear speakers.

PSCAN

Press and hold both SEEK buttons (the buttons that point to the left or right) for 2 seconds. PSCAN will appear on the display. Use PSCAN in order to listen to each of the preset stations for a few seconds. The radio will go to the first preset station, stop for a few seconds, and then continue to the next station. If a preset station has weak reception, it will not stop.

Press one of the following buttons in order to stop the scanning:

- Either SEEK arrow
- The upper knob
- A preset station button

Bass Control

Slide the lower lever up to increase the bass and down to decrease the bass.

Treble Control

Slide the upper lever up to increase the treble and down to decrease the treble. Slide the lever down to reduce the background noise, if a station is too weak and noisy.

SEEK

When you press the SEEK button, the radio will tune to the next higher or the next lower station with enough signal strength to be heard clearly. The tuner will remain at the chosen station.

Clock

Complete the following steps in order to set the clock:

1. Place the ignition in either the ACCESSORY or the RUN position.
2. Ensure that the radio is OFF.
3. Press SET/EJECT.
4. Within 5 seconds, press and hold SEEK (the button that points to the left) until the correct hour appears.
5. Press and hold SEEK (the button that points to the right) until the correct minute appears.

Push Buttons

You may preset the following combination of stations:

- 4 AM stations
- 4 FM1 stations
- 4 FM2 stations

Complete the following steps in order to preset the above combination of stations:

1. Tune in to the desired station.
2. Press SET/EJECT.
3. Within 5 seconds, press a station button.

You may preset the following combination of additional stations:

- 3 AM stations
- 3 FM1 stations
- 3 FM2 stations

Complete the following steps in order to preset the above combination of stations:

1. Tune in to the desired station.
2. Press SET/EJECT.
3. Within 5 seconds, simultaneously press 2 adjacent station buttons.

The radio tunes to the preset station when you press the push button or the pair of push buttons.

Button pairing allows for 21 preset stations:

- 7 AM stations
- 7 FM1 stations
- 7 FM2 stations

You must reset the stations if one of the following conditions interrupts electrical power:

- A blown fuse
- A discharged or disconnected battery

Cassette Tape Player

The tape player is designed to work best with tapes that are 30 minutes long on each side. Tapes longer than 30 minutes are thin and may not work well in the player.

If you hear nothing or hear just garbled sound, it may not be in squarely. Press EJECT to remove the tape and start over.

While the tape is playing, use the VOL, FADE, BAL, BASS, and TREB controls just as you do for the radio.

CLN

Cln will appear on the display when a cassette is inserted and the cassette player needs to be cleaned. The player will still play tapes. Clean the player in order to prevent damage to the tape and the player. Refer to *Cleaning Tape Head and Capstan, Cassette Cleaning*

After you clean the tape player, press and hold EJECT for 5 seconds. The radio will display four dashes to show that the clean feature is reset.

Tape Direction Indicators

The direction in which the tape is being played is shown by the indicator arrows. When the indicator arrow on the left side is activated, the tape direction is to the left. When the indicator arrow on the right side is activated, the tape direction is to the right.

REV

Press the SEEK arrow pointing to the left and the tape will reverse rapidly until you press this button again lightly.

FWD

Press the SEEK arrow pointing to the right and the tape will rapidly advance until you press this button again lightly.

RECALL

Press this knob to hear the other side of a tape that is playing.

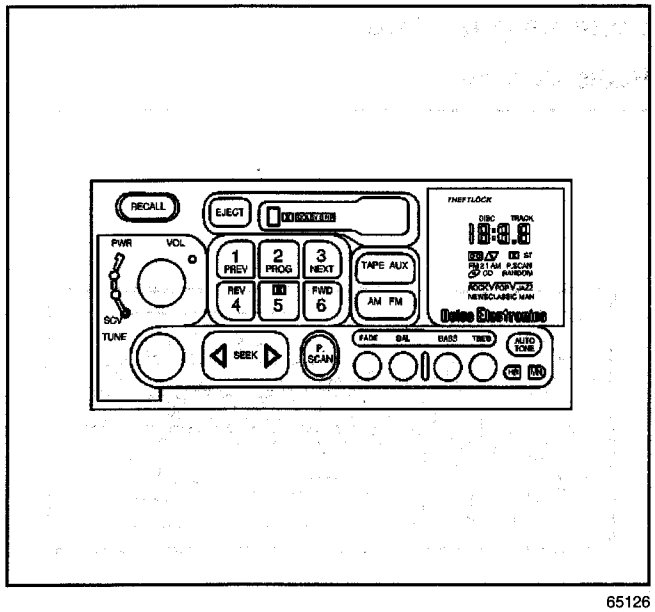
EJECT

Press SET/EJECT in order to complete either of the following functions:

- Eject a cassette tape
- Stop the tape and switch to the radio

Radio/Audio System Operation-Radio Controls (Theftlock)

Radio Controls



65126

Included with the Monsoon® AM-FM Stereo with Cassette Tape Player and Automatic Tone Control are 8 high performance speakers and an 8 channel amplifier.

The following actions occur when the radio is first turned on:

- The frequency appears on the display for 5 seconds.
- The time displays.
- If equipped, the power antenna raises

Power-Vol Knob

Press this knob in order to turn the radio ON and OFF. Rotate the knob clockwise in order to increase the volume. Rotate the knob counterclockwise in order to decrease the volume. This knob is capable of rotating continuously.

AM-FM

Press this button in order to choose either the AM, FM1 or FM2 band. The lighted display shows the selection.

Tune Knob

Lightly press this knob in order to extend the knob. Rotate the knob in order to choose the desired radio station. Push the knob back into the stored position when not in use.

RECALL

Press this button in order to recall the station currently being displayed or the clock display. Press this button in order to display the time when the ignition is in the OFF position.

SEEK

Press this button (right or left arrows), in order to tune to the next higher or the next lower station. The sound will mute while seeking.

SCAN

Press and hold one of the SEEK buttons for 2 seconds. SCAN will appear on the display. Use SCAN in order to listen to stations for a few seconds. The radio will go to a station, stop for a few seconds, and then continue to the next station. Press SEEK again to stop scanning. The sound will mute while scanning. If a preset station has a weak reception, it will not stop.

PSCAN

Press this button in order to listen to each of the preset stations for a few seconds. The radio will scan through each of the stations stored, except those stations with weak reception. The AUTO TONE setting stored for that station also will be chosen. Press PSCAN or one of the stations again to stop scanning. PSCAN will be displayed whenever the tuner is in the PSCAN mode. The station number will appear momentarily just before the frequency is displayed. In FM mode, this function will scan through both FM1 andFM2 presets, FM1 and FM2 will appear on the display.

SCV

The audio system has a feature called speed compensated volume (SCV). With SCV, the audio system adjusts automatically to make up for road and wind noise. Set the volume at the desired level. Turn the control ring behind the upper knob clockwise to adjust the SCV. SCV automatically increases the volume, as necessary, to overcome noise at any particular speed. The volume level should always sound the same as the vehicle is driven. If SCV is not wanted, rotate the control all the way down. Each notch on the control ring allows for more volume compensation at faster vehicle speeds.

AUTO TONE

The audio system has a feature called auto tone. Press the AUTO TONE button in order to choose a preset bass and treble equalization setting.

AUTO TONE was designed for stations that play the following music formats:

- Country and western music
- Classical music
- News
- Rock and pop music
- Jazz music

C/W (Country Western) will appear on the display when you first press AUTO TONE. Each time its pressed another setting will appear on the display. Press it again after JAZZ appears and the AUTO TONE display will go blank.

When the TREB and BASS knobs are used, control will return to them and the AUTO TONE display will go blank. Use PUSH BUTTONS and AUTO TONE button to program AUTO TONE for station presets.

Bass

Lightly press the BASS knob in order to extend the knob. Rotate the knob clockwise in order to increase the bass. Rotate the knob counterclockwise in order to decrease the bass. When this knob is used, the radio's AUTO TONE setting will switch to manual and the AUTO TONE display will go blank.

Treble

Lightly press the TREB knob in order to extend the knob. Rotate the knob clockwise in order to increase the treble. Rotate the knob counterclockwise in order to decrease the treble. If the station is too weak or noisy, turn the TREB knob down. When this knob is used, the radio's AUTO TONE setting will switch to manual and the AUTO TONE display will go blank.

Push these knobs back into their stored positions when not in use.

Clock

Press and hold HR until the correct hour appears on the radio display. Press and hold MIN until the correct minute appears. There will be a 2 second delay before the clock goes into the time set mode. The colon on the display will blink while the display is in this mode.

Station Preset Buttons

18 stations may be preset using the station preset buttons see the following

- 6 AM stations
- 6 FM1 stations
- 6 FM2 stations

Complete the following steps in order to preset the above stations:

1. Turn the radio on.
2. Press the AM-FM button to select the correct band.
3. Manually tune in to the desired station.
4. Press AUTO TONE in order to select the equalization that best suits the type of station selected.
5. Press and hold 1 of the 6 station preset buttons.
   The sound will mute. When the sound returns, release the button.
6. Repeat the steps for each preset button.

Speaker Adjustment

BAL Knob

Lightly press the BAL knob in order to extend the knob. Rotate the knob clockwise to send the sound to the right speakers. Rotate the knob counterclockwise to send the sound to the left speakers. The middle position balances the sound between the right and left speakers.

FADE Knob

Lightly press the FADE knob in order to extend the knob. Rotate the knob clockwise in order to fade the sound to the front speakers. Rotate the knob counterclockwise in order to fade the sound to the rear speakers. The middle position balances the sound between the front and rear speakers.

Push these knobs back into their stored positions when not in use.

Cassette Tape Player

The cassette tape player is designed to work best with tapes that are up to 30 to 45 minutes long on each side. Tapes that play longer than 30 minutes are thin and may not work well in the player. When the tape is playing the following controls in the same manner as for the radio:

- VOLUME
- BAL
- FADE
- TREBLE
- BASS

The display will show an arrow to show which side of the tape is playing. When the down indicator arrow is lit, selections listed on the bottom side of the cassette are playing. When the up arrow is lit, selections listed on the top side of the cassette are playing. The tape player automatically begins playing the other side when it reaches the end of the tape.

PREV

Press this button or the left SEEK arrow to go to the previous selection on the tape, if the current selection has been playing for less than 8 seconds. If the PREV button is pressed and the current selection has been playing for more then 8 second, it will go to the beginning of the current selection. The tape must have at least 3 seconds of silence between each selection for PREV or SEEK to work. The tape direction arrow blinks during PREV or SEEK operation. The sound will mute during PREV or SEEK operation. Press this button or one of the SEEK arrows again to return to normal play.

PROG

Press this button in order to play the other side of the tape.

Press the Dolby® symbol in order to reduce background noise. The double D symbol will appear in the display.

NEXT

Press this button or the right SEEK arrow in order to go to the next selection on the tape. Holding the button or pressing it more than once will cause the player to continue moving forward through the tape. The tape must have at least 3 seconds of silence between each selection for PREV or SEEK to work. The tape direction arrow blinks during NEXT or SEEK operation. Press this button or one of the SEEK arrows again to return to normal play.

REV

Press the REV button in order to reverse the tape rapidly. Press it again to return to playing speed. The radio will play the last selected station while the tape reverses.

FWD

Press the FWD button in order to advance quickly to another part of the tape. Press the button again to return to playing speed. The radio will play the last selected station while the tape advances.

AM-FM

Press the AM-FM button in order to play the radio when a tape is in the player.

TAPE AUX

Press the TAPE AUX button in order to change to the tape function when the radio is on. The tape symbol with an arrow will appear on the display when the tape is active. If the system is equipped with a remote playback devise, pressing this button a second time will allow the remote devise to play.

EJECT

Press the EJECT in order to remove a tape. The radio will play. EJECT may be activated with either the ignition OFF or the radio OFF. Cassettes may be loaded with the radio OFF, if EJECT is pressed first.

CLN

CIn appears on the display when a cassette is inserted and the cassette player needs to be cleaned. The player will still play tapes. Clean the player in order to prevent damage to the tape and the player. Refer to *Cleaning Tape Head and Capstan, Cassette Cleaning*

Tape Direction Indicators

The direction in which the tape is being played is shown by the indicator arrows. The tape direction is to the left when the indicator arrow on the left side is on. The tape direction is to the right when the indicator arrow on the right side is on.

Cassette Tape Error Indicator

The cassette player may detect an error in the tape just after the tape is loaded or while the tape is playing. When the cassette player detects a condition, the cassette player will attempt to work around the error. The cassette player will eject the tape and switch to the radio mode if the cassette player cannot continue to play the tape.

The radio will display the following data if a condition is present:

- One of the following error messages:
  - E10

    The cassette tape is wound too tightly.
  - E11

    The cassette tape is broken.

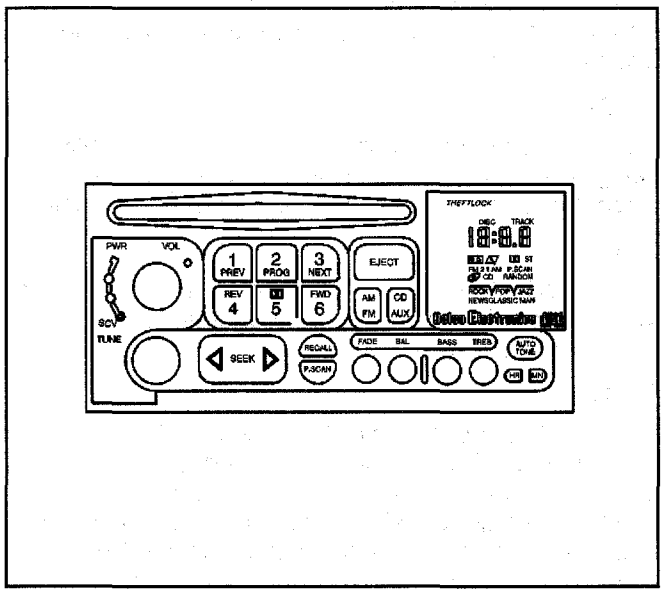
    If there is not tension on the reels of the tape player, the tape player will interpret the tape as broken and eject the tape.
  - E13

    There is a communication problem.
- The radio frequency that is playing
- The time

Each message will appear for 5 seconds.

The error indicator feature may not work with certain types of adapters for add-on compact disc (CD) players.

Radio/Audio System Operation-Radio Controls (CD)



65127

Included with the Monsoon® AM-FM Stereo with Compact Disc Player and Automatic Tone Control are 8 high performance speakers and 8 channel amplifier.

The following actions occur when the radio is first turned on:

- The frequency appears on the display for 5 seconds.
- The time displays.
- If equipped, the power antenna rises

Power-Vol Knob

Press this knob in order to turn the radio ON and OFF. Rotate the knob clockwise in order to increase the volume. Rotate the knob counterclockwise in order to decrease the volume. This knob is capable of rotating continuously.

AM-FM

Press this button in order to choose either the AM, FM1 or FM2 band. The lighted display shows the selection.

Tune Knob

Lightly press this knob in order to extend the knob. Rotate the knob in order to choose the desired radio station. Press the knob back into the stored position when not in use.

RECALL

Press this button in order to recall station currently being played or the clock display. Press this button when the ignition is OFF in order to display the time.

SEEK

Press this button (right or left arrows), in order to tune to the next higher or the next lower station. The sound will mute while seeking.

SCAN

Press and hold one of the SEEK buttons for 2 seconds. SCAN will appear on the display. Use SCAN in order to listen to stations for a few seconds. The radio will go to a station, stop for a few seconds, and then continue to the next station. Press SEEK again to stop scanning. The sound will mute while scanning. If a preset station has a weak reception, it will not stop.

PSCAN

Press this button in order to listen to each of the preset stations for a few seconds. The radio will scan through each of the stations stored, except those stations with weak reception. The AUTO TONE setting stored with that station also will be chosen. Press PSCAN or one of the stations again to stop scanning. PSCAN will be displayed whenever the tuner is in the PSCAN mode. The station number will appear momentarily just before the frequency is displayed. In FM mode, this function will scan through both FM1 and FM2 presets, FM1 and FM2 will appear on the display.

SCV

The audio system has a feature called speed compensated volume (SCV). With SCV, the audio system adjusts automatically to make up for road and wind noise. Set the volume at the desired level. Turn the control ring behind the upper knob clockwise to adjust the SCV. SCV automatically increases the volume, as necessary, to overcome noise at any particular speed. The volume level should always sound the same as the vehicle is driven. If SCV is not wanted, rotate the control all the way down. Each notch on the control ring allows for more volume compensation at faster vehicle speeds.

AUTO TONE

The audio system has a feature called auto tone. Press the AUTO TONE button in order to choose a preset treble and bass equalization setting.

AUTO TONE was designed for the following station formats:

- Country and western music
- Classical music
- News
- Rock and pop music
- Jazz music

C/W (Country Western) will appear on the display when you first press AUTO TONE. Each time its pressed another setting will appear on the display. Press it again after JAZZ appears and the AUTO TONE display will go blank.

When the TREB and BASS knobs are used, control will return to them and the AUTO TONE display will go blank. Use PUSH BUTTONS and AUTO TONE button to program AUTO TONE for station presets.

Bass

Lightly press the BASS knob in order to extend the knob. Rotate the knob clockwise in order to increase the bass. Rotate the knob counterclockwise in order to decrease the bass. When this knob is used, the radio's AUTO TONE setting will switch to manual and the AUTO TONE display will go blank.

Treble

Lightly press the TREB knob in order to release the knob. Rotate the knob clockwise in order to increase the treble. Rotate the knob counterclockwise in order to decrease the treble. If a station is too weak or noisy, turn the TREB knob down. When this knob is used, the radio's AUTO TONE setting will switch to manual and the AUTO TONE display will go blank.

Push these knobs back into their stored positions when you're not using them.

Clock

Press and hold the HR (hour) button until the correct hour appears on the radio display. Press and hold the MIN (minute) button until the correct minute appears. There will be a 2 second delay before the clock goes into the time set mode, and the colon on the display will blink while in this mode.

Station Preset Buttons

18 stations may be preset using the station preset buttons see the following:

- 6 AM stations
- 6 FM1 stations
- 6 FM2 stations

Complete the following steps in order to preset the above stations:

1. Turn the radio on.
2. Press the AM-FM button to select the correct band.
3. Manually tune to the desired station.
4. Press AUTO TONE in order to select the equalization that best suits the type of station selected.
5. Press and hold 1 of the 6 station preset buttons. The sound will mute. When the sound returns, release the button.
6. Repeat the step for each preset button.

Speaker Adjustment

Balance Knob

Lightly press the BAL knob in order to release the knob. Rotate the knob clockwise to send the sound to the right speakers. Rotate the knob counterclockwise to send the sound to the left speakers. The middle position balances the sound between the right and left speakers.

Fade Knob

Lightly press the FADE knob in order to release the knob. Rotate the knob clockwise in order to fade the sound to the front speakers. Rotate the knob counterclockwise in order to fade the sound to the rear speakers. The middle position balances the sound between the front and rear speakers.

Push these knobs back into their stored positions when not in use.

Compact Disc Player

Ensure that the label side is up. Insert the CD partway into the slot. The CD player will pull the CD in. The disc should begin playing. The display will show CD and the CD symbol. If there is a need to insert a CD with the ignition off, first press RECALL or EJECT.

PREV

Press PREV or the left SEEK arrow in order to go to the previous track if the current selection has been playing for less that 8 seconds. If the PREV button is pressed and the current selection has been playing for more than 8 seconds, it will go th the beginning of the currect selection. If you hold the button or press it more than once, the player will continue moving back through the disc. The sound will mute while seeking.

RDM

Press RDM when you want the CD player to play the tracks in random order rather than sequential, order. RANDOM will show on the display. Press RDM again to turn off random play. RDM is reset to off when the disc is ejected.

NEXT

Press NEXT or the right SEEK arrow to go to the next track, If you hold the button or press it more than once, the player will continue moving forward through the disc. The sound will mute while seeking.

REV

Press and hold REV in order to quickly reverse with in a track. Release REV in order to resume playing. The counter reading on the display can be used to locate a track easily. The counter reading on the display can be used to locate a track easily.

FWD

Press and hold FWD in order to advance quickly within a track. Release FWD in order to resume playing. The radio will play during this operation. The counter reading on the display can be used to locate a track easily.

RECALL

Press RECALL in order to see the current track number. Press RECALL again within 5 seconds in order to see the time elapsed in the current track. The track number also appears when the volume is changed or a new track starts to play.

AM-FM

Press this button in order to play the radio when a CD is playing. The CD will stop, but remain in the player.

CD AUX

Press this button in order to change to the CD when the radio is on. A CD icon will appear on the display when the disc is in the player, whether it is active or not. If the system is equipped with a remote playback devise, pressing this button a second time will allow the remote devise to play.

EJECT

Press EJECT in order to eject the disc. The radio will play during this operation. The disc will start at the first track when you reinsert it.

Compact Disc Error Indicator

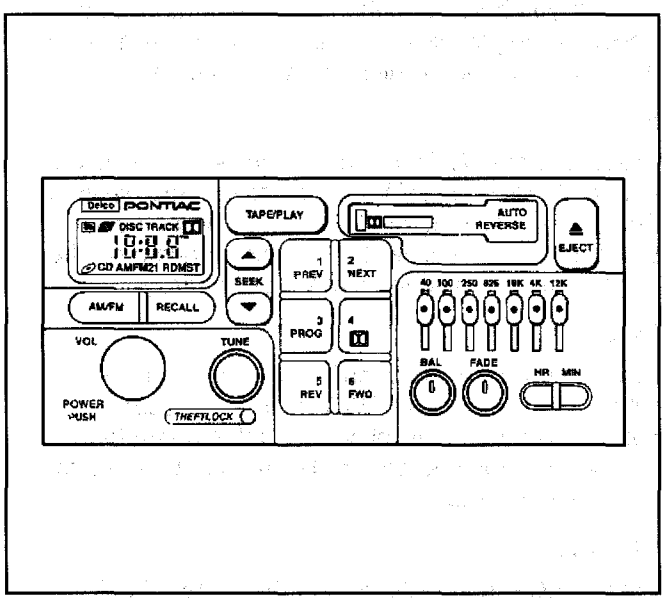
The radio will display an error message when the CD player detects a condition with a CD while it is playing.

Inspect the compact disc player for the following conditions:

- The CD may be dirty, scratched or wet.
- There may be too much moisture in the air.
- The temperature may be too hot or too cold.

If the CD ejects and ERR appears on the display the CD is in the CD player upside down.

Radio/Audio System Operation-Radio Controls (Graphic Equalizer)



290019

Included with the Monsoon® AM-FM Stereo with Cassette Tape Player and Equalizer are 8 (convertibles only) or 10 high performance speakers and a powerful 8 channel amplifier. This feature require power windows and door locks.

The following actions occur when the radio is first turned on:

- The frequency appears on the display for 5 seconds.
- The time displays.
- If equipped, the power antenna raises

Power–Vol Knob

Press this knob in order to turn the radio ON or OFF. Rotate the knob clockwise in order to increase the volume. Rotate the knob counterclockwise in order to decrease the volume.

AM-FM

Press this button in order to choose either the AM, FM1 or FM2 band. The lighted display shows the selection.

Tune Knob

Lightly press this knob in order to extend the knob. Rotate the knob in order to choose the desired radio station. Press the knob back into the stored position when not in use.

RECALL

Press this button in order to recall the station currently being played or the clock display. Press this button when the ignition is OFF in order to display the time.

SEEK

Press this button (up or down arrows), in order to tune to the next higher or next lower station.

Clock

Press and hold HR (hour) button until the correct hour appears on the radio display. Press and hold the MIN (minute) button until the correct minute appears. There will be a 2 second delay before the clock goes into the time set mode. The colon on the display will blink while in this mode.

Station Preset Buttons

18 stations may be preset using the station preset buttons see the following:

- 6 AM stations
- 6 FM1 stations
- 6 FM2 stations

Complete the following steps in order to set the above stations:

1. Turn the radio on.
2. Press AM–FM button to select the correct band.
3. Manually tune to the desired station.
4. Press and hold 1 of the 6 push buttons until the display shows SET.
5. Repeat the above steps for each station preset button.

Speaker Adjustment

Balance Knob

Lightly press this knob in order to extend the knob. Rotate the knob clockwise to send the sound to the right speakers. Rotate the knob counterclockwise to send the sound to the left speakers. The middle position balances the sound between the right and left speakers.

Fade Knob

Lightly press this knob in order to extend the knob. Rotate the knob clockwise in order to fade the sound to the front speakers. Rotate the knob counterclockwise in order to fade the sound to the rear speakers. The middle position balances the sound between the speakers.

Push these knobs back into their stored positions when not in use.

Graphic Equalizer

A 7 band equalizer is part of this radio. Use the levers to set the bass, midrange and treble until the desired sound quality is achieved. Slide the levers up to boost or down to reduce frequency range.

- The bass
- The midrange
- The treble

The following levers adjust the bass:

- The 40
- The 100
- The 250
- The 625

The 4K and the 12K control the treble.

1.6K is midrange. The 1.6K lever may be set in the middle position and then the other levers may be moved until a satisfactory amount of bass and treble is achieved.

Cassette Tape Player

The cassette tape player is designed to work best with tapes that are up to 30 to 45 minutes long on each side. Tapes that play longer than 30 minutes are thin and may not work well in the player. When the tape is playing, the following controls are used in the same manner as for the radio:

- VOLUME
- BAL
- FADE
- TREBLE
- BASS

The display will show an arrow to show which side of the tape is playing. When the down indicator arrow is lit, selections listed on the bottom side of the cassette are playing. When the up arrow is lit, selections listed on the top side of the cassette are playing. The tape player automatically begins playing the other side when it reaches the end of the tape.

PREV

Press the PREV button or SEEK down arrow in order to search for the previous selection on the tape. The tape must have at least 3 seconds of silence between each selection for PREV or SEEK to work. The tape direction arrow blinks during PREV or SEEK operation. Press PREV or the SEEK down arrow to stop searching. The sound will mute during PREV or SEEK operation.

NEXT

Press the NEXT button or SEEK up arrow to search for the next selection on the tape. If the button is held, the player will continue moving forward through the tape. The tape must have at least 3 seconds of silence between each selection for NEXT or SEEK to work. The tape direction arrow blinks during NEXT or SEEK operation. Press NEXT or the SEEK up arrow to stop searching. The sound will mute during NEXT or SEEK Operation.

PROG

Press the PROG button in order to play the other side of the tape.

Press the Dolby® symbol in order to reduce background noise. The double D symbol will appear in the display.

REV

Press the REV button in order to reverse the tape rapidly. Press it again to return to playing speed. The radio will play the last selected station while the tape reverses. Stations may be selected during REV operation by using SEEK or TUNE.

FWD

Press the FWD button in order to advance quickly to another part of the tape. Press the button again to return to playing speed. The radio will play the last selected station while the tape advances. Stations may be selected during FWD operation by using SEEK or TUNE.

AM–FM

Press the AM–FM button in order to play the radio when a tape is in the player.

TAPE/PLAY

Press the TAPE/PLAY button in order to change the tape function when the radio is on. The tape symbol with an arrow will appear on the display when the tape is active. To return to playing the radio, press the AM–FM button.

EJECT

Press EJECT in order to remove a tape. The radio will play. EJECT may be activated with either the ignition OFF or the radio OFF. Cassettes may be loaded with the radio OFF, if EJECT is pressed first.

CLN

Cln appears on the display when a cassette is inserted and the cassette player needs to be cleaned. The player will still play tapes. Clean the player in order to prevent damage to the tape and the player. Refer to *Cleaning Tape Head and Capstan, Cassette Cleaning*

After you clean the tape player, press and hold EJECT for 5 seconds. The radio will display four dashes to show that the clean feature is reset.

Cassette Tape Error Indicator

The cassette player may detect an error in the tape just after the tape is loaded or while the tape is playing. When the cassette player detects a condition, the cassette player will attempt to work around the error. The cassette player will eject the tape and switch to the radio mode if the cassette player cannot continue to play the tape.

- The radio will display the following data if a condition is present.
- One of the following error messages:
  - E10

    The tape is tight and the player can not turn the tape hubs.
  - E11

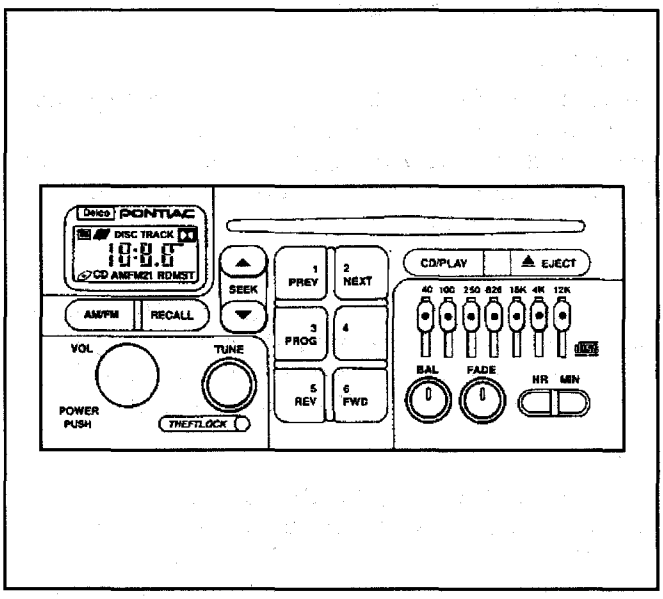
    The cassette tape is broken. Try a new tape.

    If there is not tension on the reels of the tape player, the tape player will interpret the tape as broken and eject the tape.

Each message will appear for 5 seconds.

The error indicator feature may not work with certain types of adapters for add-on compact disc (CD) players.

Radio/Audio System Operation-Radio Controls (Graphic Equalizer CD)



290017

If equipped, with the AM–FM Stereo with Compact Disc Player and Equalizer, included are 4 speakers.

If equipped, with the Monsoon® AM–FM Stereo with Compact Disc Player and Equalizer, included are 8 (convertibles only) or 10 high performance speakers and a powerful 8 channel amplifier. This feature requires power windows and door locks.

The following actions occur when the radio is first turned on:

- The frequency appears on the display for 5 seconds.
- The time displays.
- If equipped, the power antenna raises

Power–Vol Knob

Press this knob in order to turn the radio ON or OFF. Rotate the knob clockwise in order to increase the volume. Rotate the knob counterclockwise in order to decrease the volume.

AM–FM

Press this button in order to choose either the AM, FM1 or FM2 band. The lighted display shows the selection.

Tune Knob

Lightly press this knob in order to extend the knob. Rotate the knob in order to choose the desired radio station. Press the knob back into the stored position when not in use.

RECALL

Press this button in order to recall the station currently being played or the clock display. Press this button when the ignition is OFF in order to display the time.

SEEK

Press this button (up or down arrows), in order to tune to the next higher or next lower station.

Clock

Press and hold the HR (hour) button until the correct hour appears on the display. Press and hold the MIN (minute) button until the correct minute appears. There will be a 2 second delay before the clock goes into the time set mode. The colon on the display will blink while in this mode.

Station Preset Buttons

18 stations may be preset using the station preset buttons see the following:

- 6 AM stations
- 6 FM1 stations
- 6 FM2 stations

Complete the following steps in order to set the above station presets.

1. Turn the radio on.
2. Press the AM–FM button to select the correct band.
3. Manually tune to the desired station.
4. Press and hold 1 of the 6 station preset buttons until the display shows SET.

   Repeat the above steps for each station preset button.

Speaker Adjustment

Balance Knob

Lightly press this knob in order to extend the knob. Rotate the knob clockwise to send the sound to the right speakers. Rotate the knob counterclockwise to send the sound to the left speakers. The middle position balances the sound between the right and left speakers.

Fade Knob

Lightly press this knob in order to extend the knob. Rotate the knob clockwise in order to fade the sound to the front speakers. Rotate the knob counterclockwise in order to fade the sound to the rear speakers. The middle position balances the sound between the front and rear speakers.

Push these knobs back into their stored positions when not in use.

Graphic Equalizer

A 7 band graphic equalizer is part of this radio. Use the levers to set the bass, midrange and treble until the desired sound quality is achieved. Slide the levers up to boost or down to reduce the frequency range.

The following levers will adjust the bass:

- The 40
- The 100
- The 250
- The 625

The 4K and the 12K control the treble.

The 1.6K is midrange. The 1.6K lever may be set in the middle position and then the other levers may be moved until a satisfactory amount of bass and treble is achieved.

Compact Disc Player

Insert a CD partway into the slot. Ensure that the label side is up. The CD player will pull the CD in. The disc should begin playing. The display will show CD and the CD symbol. If there is a need to insert a CD with the ignition OFF, first press RECALL or EJECT.

PREV

Press this button or the SEEK down arrow in order to begin the current track if more than 8 seconds have played. If the button is held or pressed more than once, the player will continue moving back through the disc.

NEXT

Press this button or the SEEK up arrow in order to advance to the next track. If the button is held or pressed more than once, the player will continue moving forward through the disc.

RDM

Press this button in order to hear the CD tracks in random, rather than sequential, order. The disc will play the same random selection again, when the last random track has been played. The display will show RDM. Press RDM again to turn off random play.

REV

Press and hold this button in order to quickly reverse within a track. Release REV to play the track. The sound will be at a reduced volume. The display will show elapsed time.

FWD

Press and hold this button in order to quickly advance within a track. Release FWD to play the track. The sound will be at a reduced volume. The display will show elapsed time.

RECALL

Press RECALL in order to see the current track number. Press RECALL again within 5 seconds in order to see the time elapsed in the current track. When a new track starts to play, the track number will also appear. Press RECALL a third time and the time of day will be displayed.

AM–FM

Press this button in order to play the radio when a CD is playing. The CD will stop, but remain in the player.

CD/PLAY

Press this button in order to change to the disc function when the radio is on.

EJECT

Press this button in order to remove the CD or stop the CD and switch to the radio. EJECT will also work with the radio off.

Compact Disc Error Indicator

The radio will display an error message when the CD player detects a condition with a CD while it is playing.

Inspect the compact disc player for the following conditions:

- The CD may be dirty, scratched or wet.
- There may be too much moisture in the air.
- The temperature may be too hot or too cold.

If the CD ejects and ERR appears on the display the CD is in the CD player upside down.

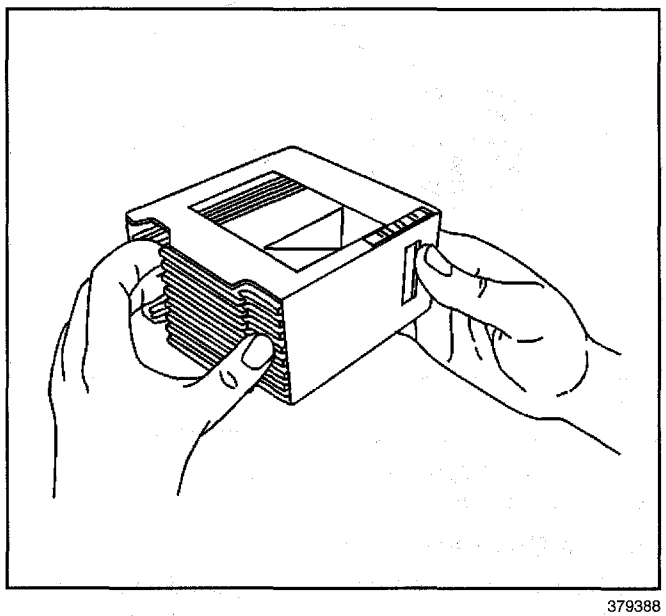
Radio/Audio System Operation-Compact Disc Player

The multiple compact disc (CD) changer is available on both the Chevrolet and Pontiac vehicles. The CD changer is located on the left side of the rear compartment floor pan. The CD changer features a 12 disc removable magazine. The disc numbers are listed on the front of the disc magazine. The radio control buttons control all of the CD changer functions except for ejecting the disc magazine. The compact disc symbol appears on the radio display when a disc magazine is loaded in the changer.

Loading Multiple Compact Discs

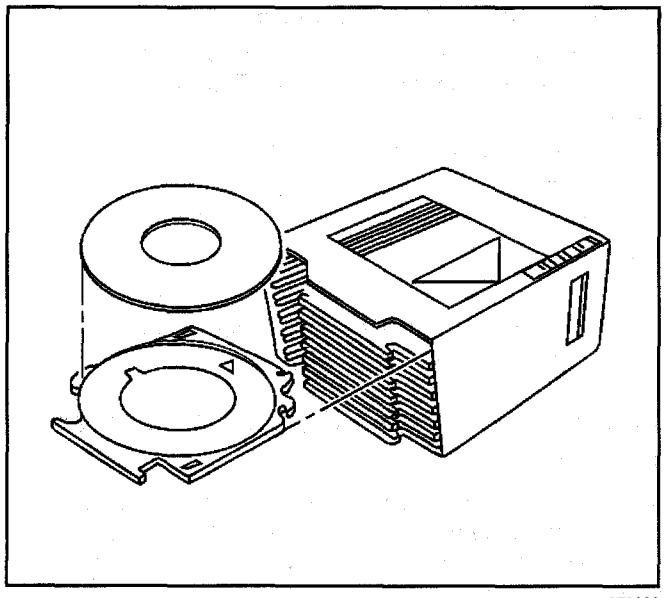
Normal size discs may be played using the magazine trays supplied. However the smaller discs (8 cm) require a specially designed magazine tray.

Perform the following steps in order to load multiple compact discs into the CD changer:



379388

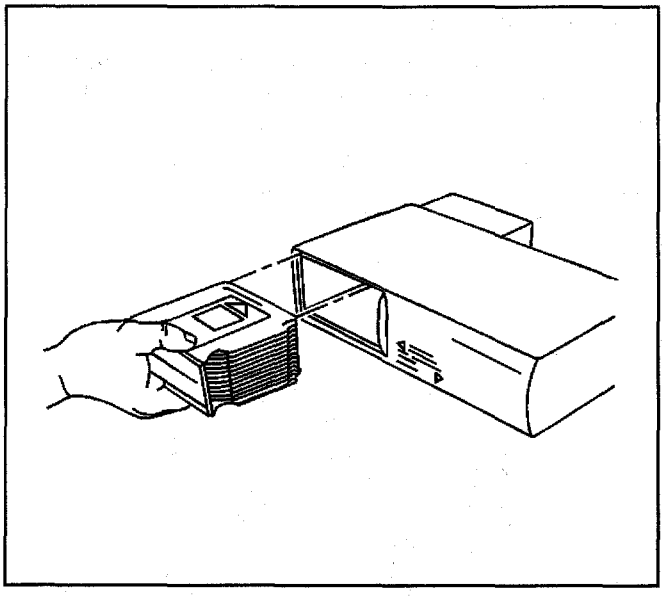
Press the button on the back of the disc magazine while gently pulling out one of the trays.



379389

Place a disc with the label side faced down on the tray. A disc loaded with the label side up will not play. An error message will appear on the radio display.

Load the disc magazine trays beginning at the bottom of the tray.



379387

Gently press the tray back into the magazine slot.

Repeat these steps in order to insert as many as 12 compact discs.

Playing Compact Discs

The CD will play when the following conditions exist:

- The ignition switch is in the ACCESSORY or the RUN position.
- The stereo is ON.

The compact disc symbol will flash on the radio display while the CD changer inspects the magazine for discs. The symbol will stop flashing when the changer is ready. The disc and track number appear on the bottom left corner of the radio display when a disc begins to play.

TAPE/AUX or TAPE/PLAY

Press TAPE/AUX (Chevrolet) or TAPE/PLAY (Pontiac) in order to play a compact disc. Press AM/FM in order to play the radio. Press AM/FM in order to play a tape if a tape is loaded in the player.

RECALL

Press RECALL in order to see the current track number of the CD. Press the RECALL button again within 5 seconds in order to see the time elapsed on the current track on the display. The track number also appears when the CD is activated.

PROG

Press PROG in order to select the next CD in the CD changer. If PROG is held or pressed more than once, the changer will advance even farther.

TO PLAY THE NEXT SELECTION

Press NEXT when you want to hear the next CD track (before the present track is finished.) If NEXT is held or pressed more than once, the CD will advance even farther.

TO REPLAY CURRENT SELECTION

Press PREV to replay a CD track again. If PREV is held or pressed more than once, the CD will return to other previous tracks.

SEEK

For the Chevrolet vehicle, press the SEEK button (the button that points to the left) in order to start at the beginning of the track being played. For the Pontiac vehicle, press the SEEK button (the button that points downward) in order to start at the beginning of the track being played. Press the buttons again, in order to go to the beginning of previous tracks. For the Chevrolet vehicle, press the SEEK button (the button that points to the right) in order to advance to the beginning of the next track. For the Pontiac vehicle, press the SEEK button (the button that points upward) to advance to the beginning of the next track.

FWD

Press and hold the FWD button to quickly advance within a track. The track will be heard at a reduced volume and the display will indicate the elapsed time while advancing. Release FWD in order to resume play.

REV

Press and hold REV to quickly reverse within a track. The track will be heard at a reduced volume and the display will indicate the elapsed time while reversing. Release REV in order to resume play.

RANDOM

Press the PSCAN in order to play the tracks of all of the loaded CDs in random order. Press PSCAN again in order to stop the random play. RANDOM will appear on the radio display. Press SEEK while RANDOM is displayed in order to scan randomly through the tracks on all of the CDs.

EJECT

Slide the door completely open on the CD changer. The CD magazine will automatically eject. Keep the door closed whenever possible in order to prevent any dirt or dust from getting into the changer.

Multiple Compact Disc Error Indicator

If the CD player detects an error while the CD is playing, the radio displays an error message.

The error messages indicate the following conditions:

- E30
  Focus error
- E31
  Tracking error
- E32
  Motor error
- E33
  CD changer communication error
- E34
  CD changer door open
- E35
  CD changer cartridge empty

The following conditions are common causes of CD changer errors:

- The CD is upside down in the changer.
- The CD is dirty, scratched or wet.
- There is too much moisture in the air.
- The temperature is too hot or too cold.

Radio/Audio System Operation-Theftlock

Setting The Radio With Theftlock

Theftlock™ is a security feature which may or may not be used. If Theftlock is not used, the radio will play normally. If Theftlock™ is used, the radio will be useless if stolen because it will be inactive.

If the battery power is lost for any reason, a secret code must be entered again before the radio will turn ON.

Complete the following steps in order to enter a security code into the system. Do not pause for more than 15 seconds between each step:

1. Write down any number from 000 to 1999. Keep the number in a safe place.
2. Turn the ignition switch to the ACCESSORY or RUN position.
3. Turn the radio system OFF.
4. Press and hold the buttons 1 and 4 together for approximately 6 seconds until a series of dashes show on the radio display.
5. Press MIN.
   000 will appear on the display.
6. Press MIN again. Hold the MIN button until the last 2 digits of the code appear.
   Release the button.
7. Press HR until the first 1 or 2 digits of the code appear.
8. Press AM/FM. REP will appear on the radio display.
9. Repeat Steps 5 through 7.
10. Press AM/FM. SEC will appear on the display. SEC means that the audio system is secured.

The indicator light will also flash when the ignition is OFF. If the display shows a series of dashes, the verification steps were not successful. Repeat the procedure.

Unlocking The Secured Radio

If the radio system is secured, SEC shows on the display. Complete the following steps in order to disable Theftlock™. Do not pause for more than 15 seconds between the steps:

1. Turn the ignition ON. Ensure that the radio system is OFF.
   The time will show on the display.
2. Press the buttons 1 and 4 together until SEC shows on the display.
3. Press MIN and 000 will appear on the display.
4. Press MIN again and hold until the last two digits of the code appear. Release the button.
5. Press HR until the first one or two digits appear.
6. Press AM/FM radio. If a series of dashes display, you have disabled the theft deterrent feature.
   If SEC shows, the audio system is still secured.

Unlocking The Secured Radio After A Power Loss

The following actions occur when battery power is applied to a secured radio after a power loss:

- The radio does not turn on.
- LOC appears on the display when the ignition is ON.

Complete the following steps in order to unlock the unit:

1. Turn the ignition to the ACCESSORY or ON position.
2. Turn the radio to the OFF position.
3. Press MIN.
   000 will appear on the display.
4. Press MIN again. Hold the MIN button until the last 2 digits of the code appear. Release the button.
5. Press HR until the first one or two digits appear.
6. Press AM/FM. SEC will appear and the unit will operate.
   If LOC shows, the numbers did not match. The unit is still locked.

Determining Factory Backup Code

If the security is activated and the radio is disconnected from the battery power, the radio will display LOC. The radio turns ON when the correct unlocking code is entered. If the customer's code is lost or unavailable, refer to the Dealer Communications System Bulletin or call Technical Assistance.

Radio/Audio System Circuit Description

For DELCO-LOC 2 Anti-Theft feature or for radio features and controls operations refer to *Vehicle Theft Deterrent (VTD)Circuit Description* in Theft Deterrent.

For THEFTLOCK Anti-Theft feature or for radio features and control operations refer to *Vehicle Theft Deterrent (VTD)Circuit Description* in Theft Deterrent.

The radio receives battery voltage at all times on circuit 640 from the PWR ACCY Fuse 7 to keep clock and preset station memory enabled when the ignition is off. With the ignition switch in ACCY, RUN or Retained Accessory Power (RAP), voltage is applied to circuit 43 from the RADIO Fuse 17 to enable radio operation.

When the park lights or headlights are turned on, voltage is applied to the radio on circuit 9 from the headlamp switch. When voltage is applied to circuit 9 at the radio, the radio will illuminate the display. With the headlights or park lights on, the radio display may be dimmed manually using the IP dimmer switch. The IP dimmer switch varies the voltage on circuit 8 to the radio to control display dimming.

Speakers: Chevrolet UQ0, U62 or UW6 and Pontiac W52, W53, W54, W55, W56, W57 Entertainment Systems

With the base speaker system, the audio signals are amplified within the radio, and the output signals go directly to the speakers.

Speakers: Pontiac W59 and W73 Entertainment Systems (6 Speaker-Convertible Only)

Similar to the base speaker system, the audio signals are amplified within the radio, and the output signals go directly to the 6 speakers.

Speakers: Chevrolet UZ7 (6 Speaker Sound System)

All radio audio output signals are connected directly to the amplifier. All of the 6 speakers in the system are connected to the amplifier outputs, and are driven by the amplified radio audio signals. The amplifier is used to drive two front speaker assemblies consisting of one tweeter and one midrange speaker, two rear extended range speakers, and two rear subwoofers.

Speakers: Pontiac W54 and W55 Entertainment Systems (10 Speaker Sound System)

Radio audio output signals for two front and two rear tweeters are amplified within the radio and the output signals go directly to the speakers.

All radio audio output signals are also connected to the amplifier. The other six speakers in the system are connected to the amplifier outputs, and are driven by the amplified radio audio signals. The amplifier is used to drive front midrange, two rear midrange, and two rear subwoofers with dual voice coils.

Steering Wheel Controls System Operation

Steering wheel controls enable remote control of the following sound system functions (if equipped):

- PLAY

  Starts playing the cassette tape player or the compact disc player
- VOL

  Adjusts the volume of the AM/FM stereo, cassette tape player or the compact disc player
- PRE-SET

  Presets radio stations
- AM/FM

  Switches between the AM and the FM bands
- SEEK

  Seeks the next station, either up or down
- MUTE

  Mutes the volume of the AM/FM stereo, cassette tape player or the compact disc player.

Steering Wheel Controls System Circuit Description

Steering Wheel Radio Control Switches

The steering wheel control switches control the following radio features:

- Radio power
- The volume
- The station frequency

Voltage is supplied to the RH steering wheel controls through the RADIO Fuse 3, circuit 243, the SIR coil assembly when the ignition switch is in ACCY, RUN or the RAP mode is active. The switches are a ladder network consisting of the switches and a series of resistors. The ladder network allows each switch to have a different resistance. The different resistances allow a different voltage output to the radio for each switch pressed.

Voltage is supplied to both steering wheel controls through the RADIO Fuse 13, circuit 1458, through the SIR coil assembly. Ground is supplied to both steering wheel controls from G200, circuit 650 through the SIR coil assembly. The steering wheel control (SWC) switches use incandescent backlighting. The illumination signal circuit 1458 is a pulse width modulated (PWM) signal from the headlight switch. The bulbs are serviceable.

SIR Coil Assembly

The SIR Coil Assembly contains 6 wires, four of which are used by the SWC. The SWC allows voltage to be sent from the steering wheel switches to the radio while the steering wheel is being turned.

Power Antenna System Description

The rear-mounted, telescoping, rod-type antenna fully extends whenever the radio is in use. The antenna retracts when the following conditions exist:

- The radio is off.
- The ignition switch is in the OFF position.
- The retained accessory power (RAP) is inactive.

The antenna mast is attached to a plastic cable that is driven up and down by an electric motor. The motor is automatically shut off by the limit switches when the antenna reaches the full up or full down position.

Power Antenna System Circuit Description

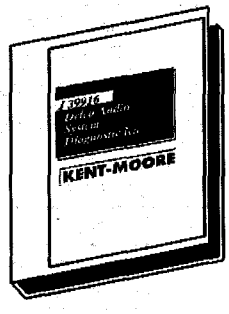
When the radio is turned on voltage is applied from the radio (circuit 314) to the radio power antenna internal relay coil. The relay contacts close, and battery voltage is applied to the motor. Terminal B of the motor is grounded through the UP switch and the relay contacts. The motor drives the antenna mast up. When the antenna is at its full height, the UP switch opens and the motor stops.

When the radio or ignition switch is turned off, voltage is removed from the relay coil. The relay contacts open, applying battery voltage to the motor. The motor terminal A is now grounded. The DOWN switch at the antenna now has voltage applied through the relay, the voltage of the motor has reversed polarity. It runs in the opposite direction, retracting the antenna mast.

At the end of the antenna's travel, the DOWN switch opens and breaks the current flow. Both sets of switches are now in the places shown in the schematic, the radio is off and the antenna mast is down.

The antenna is connected to the radio by coaxial cable.

Special Tools and Equipment

Illustration	Tool Number/ Description
 65874	J 39916-A Delco Audio System Diagnostic Kit

Wiring Systems

Diagnostic Information and Procedures

Where to Find Electrical Schematics

Because more than one electrical system is located in each subsection, each electrical system's schematics are further broken down into operating systems, or cells. Each set of electrical system schematics will have a cell number that remains common across all vehicle platforms. Cells are organized by subsystems with most containing a circuit schematic and the associated text. For example, the cruise control schematic will be located in the cruise control subsection and the schematic title will begin with cell 34.

Some subsections may have more than one circuit schematic such as Power Distribution, Interior Lights and Air Conditioning.

Electrical Schematic Locations

Cell No.	System Name	Section	Subsection
10	Power Distribution Schematics	Body and Accessories	Wiring Systems
14	Ground Distribution Schematics	Body and Accessories	Wiring Systems
15	Retained Accessory Power Schematics	Body and Accessories	Retained Accessory Power
17	Auxiliary Battery Schematics	Body and Accessories	Wiring Systems
18	Upfitter Provision Schematics	Body and Accessories	Wiring systems
19	Cigar Lighter/Auxiliary Outlet Schematics	Body and Accessories	Wiring Systems
20	Engine Controls Schematics	Engine	Engine Controls
30	Starting and Charging Schematics	Engine	Engine Electrical
31	Cooling fan Schematics	Engine	Engine Cooling
32	Radiator Shutter Schematics	Engine	Engine Cooling
33	Engine Exhaust Brake Schematics	Brakes	Engine Exhaust
34	Cruise Control Schematics	Body and Accessories	Cruise Control
35	Manual Transmission Schematics	Transmission Transaxle	Manual Transmission
36	Inter-Axle Differential Lock Schematics	Driveline/Axle	Rear Axle Controls
37	Two Speed Rear Axle Schematics	Driveline/Axle	Rear Axle Controls
38	Transfer Case Control Schematics	Driveline/Axle	Transfer Case
39	Automatic Transmission Controls Schematics	Transmission/Transaxle	Automatic Transmission or Automatic Transaxle
40	Horn Schematics	Body and Accessories	Horns
41	Brake Warning System Schematics	Brakes	Hydraulic Brakes or Air Brakes
42	ALC Suspension Schematics	Suspension	Automatic Level Control
43	Suspension Controls Schematics	Suspension	Road Sensing Suspension - RSS Real Time Dampening - RTD Air Suspension
44	ABS Schematics ABS/ TCS Schematics	Brakes	ABS Traction Control
45	Steering Control Schematics	Steering	Variable Effort Steering

Electrical Schematic Locations (cont'd)

Cell No.	System Name	Section	Subsection
46	Park Brake System Schematics	Brakes	Park Brakes
47	SIR Schematics SRS Schematics	Restraints	SIR
48	Tire Pressure Monitor System	Suspension	Tire Pressure Monitor
49	Tilt/Telescoping Steering Column Schematics	Steering	Steering Wheel and Column Tilt
50	Data Link Connector (DLC) Schematics	Body and Accessories	Data Link Communications
51	Body Control Module Schematics	Body and Accessories	Body Control System
55	Door Control Module Schematics	Body and Accessories	Doors
57	Brake Booster Pump Schematics	Brakes	Hydraulic Brakes
58	Air Brake System Schematics	Brakes	Air Brakes
60	Heater Blower Controls Schematics	HVAC	Heater and Ventilation (Non-A/C)
61	Defogger Schematics	Body and Accessories	Stationary Windows
62	Heated Windshield Schematics	Body and Accessories	Stationary Windows
63	HVAC Blower Controls Schematics	HVAC	HVAC Systems with A/C Manual
64	HVAC Compressor Controls Schematics HVAC Compressor/Condenser Fan Controls Schematics	HVAC	HVAC Systems with A/C Manual
65	HVAC Air Delivery Controls Schematics	HVAC	HVAC Systems with A/C Manual
66	HVAC Blower Controls Schematics	HVAC	HVAC Systems with A/C-Automatic (Includes Electronic and Dual Zone)
67	HVAC Compressor Controls Schematics HVAC Compressor/Condeners Fan Controls Schematics	HVAC	HVAC Systems with A/C Automatic (Includes Electronic and Dual Zone)
68	HVAC Air Delivery Controls Schematics	HVAC	HVAC Systems with A/C-Automatic (Includes Electronic and Dual Zone)
70	Collision Avoidance Schematic	Body and Accessories	Collision Avoidance
76	Audible Warnings Schematics	Body and Accessories	Instrument Panel, Gauges and Console
79	Backup Alarm System Schematics	Body and Accessories	Backup Alarm
81	Instrument Cluster: Analog Schematics	Body and Accessories	Instrument Panel, Gauges and Console
82	Instrument Cluster: Digital Schematics	Body and Accessories	Instrument Panel, Gauges and Console
83	Head Up Display Schematics	Body and Accessories	Instrument Panel, Gauges and Console
85	Navigation System Schematic	Body and Accessories	Instrument Panel, Gauges and Console

Electrical Schematic Locations (cont'd)

Cell No.	System Name	Section	Subsection
86	Driver Information System Schematics	Body and Accessories	Instrument Panel, Gauges and Console
90	Wiper/Washer System (Standard) Schematics	Body and Accessories	Wiper/Washer Systems
91	Wiper/Washer System (Pulse) Schematics	Body and Accessories	Wiper/Washer Systems
92	Wiper/Washer System (Rear) Schematics	Body and Accessories	Wiper/Washer Systems
93	Headlamp Washer Schematics	Body and Accessories	Wiper/Washer Systems
100	Headlights Schematics	Body and Accessories	Wiper/Washer Systems
101	Headlights Twilight Sentinel/DRL Schematics	Body and Accessories	Lighting Systems
102	Headlights DRL Schematics	Body and Accessories	Lighting Systems
103	Fog Lights Schematics	Body and Accessories	Lighting Systems
104	Headlight Doors Schematics	Body and Accessories	Lighting Systems
105	Headlight Leveling Schematics	Body and Accessories	Lighting Systems
110	Exterior Lights Schematics	Body and Accessories	Lighting Systems
112	Backup Lights Schematics	Body and Accessories	Lighting Systems
114	Interior Lights Schematics	Body and Accessories	Lighting Systems
117	Interior Lights Dimming Schematics	Body and Accessories	Lighting Systems
120	Power Windows Schematics	Body and Accessories	Doors
121	Power Folding Top Schematics	Body and Accessories	Roof
122	Power Sunroof Schematics	Body and Accessories	Roof
130	Door Locks Schematics	Body and Accessories	Door Locks
132	Keyless Entry Schematics	Body and Accessories	Keyless Entry
133	Theft Deterrent System Schematics	Body and Accessories	Theft Deterrent
134	Release System Schematics	Body and Accessories	Body Rear End
135	Pull down Systems Schematics	Body and Accessories	Body Rear End
136	Garage Door Opener Schematics	Body and Accessories	Garage Door Opener
137	Power Sliding Door (PSD) Schematics	Body and Accessories	Doors
138	BTSI Schematics	Steering	Steering Wheel and Column Standard Steering Wheel and Column Tilt
139	Column/Ignition	Steering	Steering Wheel and Column Standard Steering Wheel and Column Tilt
140	Power Seat Schematics	Body and Accessories	Seats
141	Memory Seats Schematics	Body and Accessories	Seats
142	Lumbar Support Schematics	Body and Accessories	Seats
143	Heated Seats Schematics	Body and Accessories	Seats
146	Power Seat Schematics	Restraints	Seat Belts
147	Outside Mirrors Schematics	Body and Accessories	Doors
148	Automatic Day-Night Mirror	Body and Accessories	Stationary Windows

Electrical Schematic Locations (cont'd)

Cell No.	System Name	Section	Subsection
150	Radio/Audio Systems Schematics	Body and Accessories	Entertainment
151	Power Antenna Schematics	Body and Accessories	Entertainment
152	Steering Wheel Controls Schematics	Body and Accessories	Entertainment
153	Cellular Telephone Schematics	Body and Accessories	Cellular Communications
154	On Star Schematics	Body and Accessories	Cellular Communications

How to Use Electrical Diagnosis

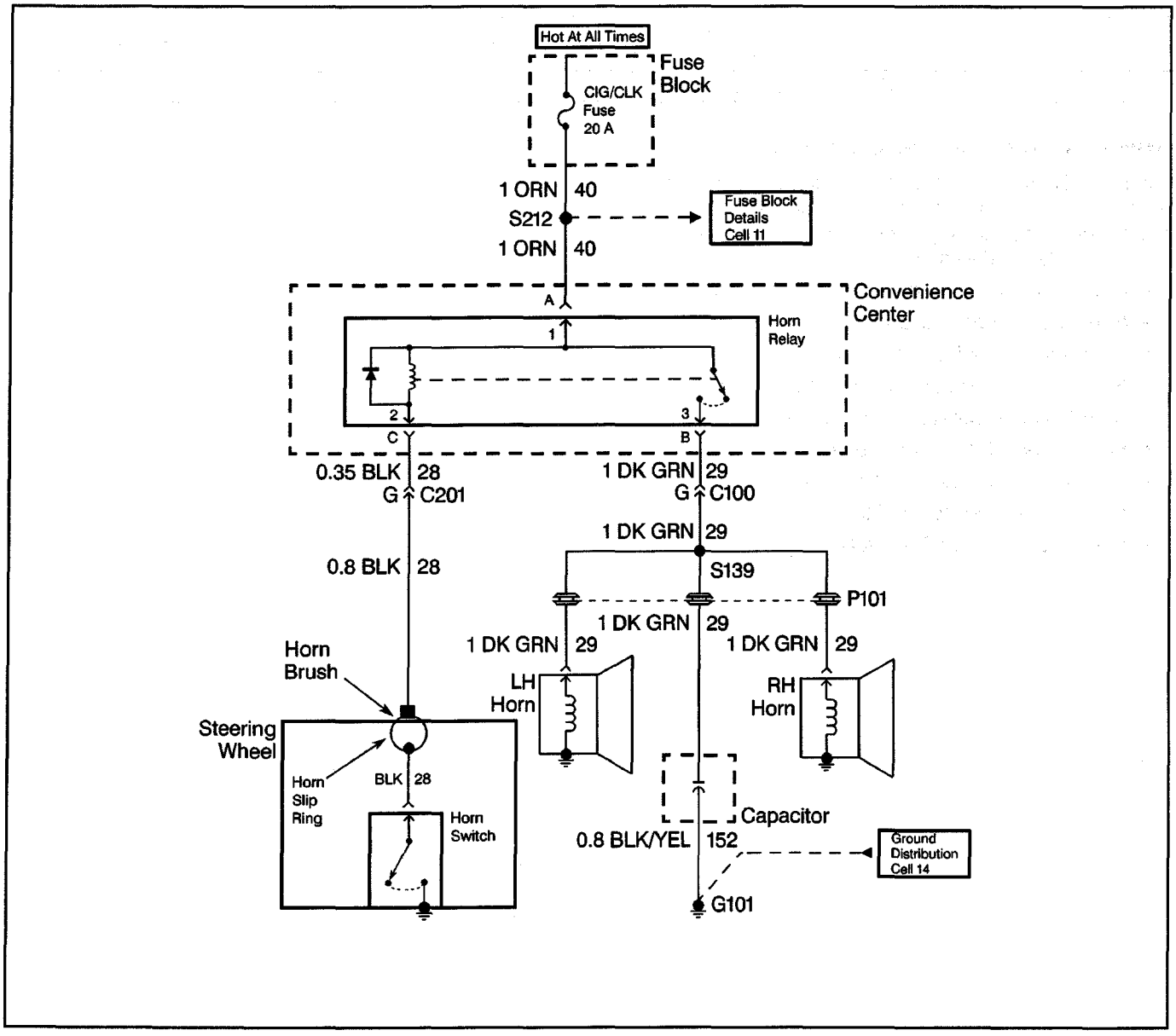
Electrical Diagnosis contains the following types of diagnostic information. Using these elements together makes the electrical diagnosis of the various vehicle systems faster and easier:

- *How to Use Schematic Reference Tables*
- *How to Use Schematic Icon Tables*
- *Where to Find Electrical Schematics*
- *How to Use Component Location Tables*
- *How to Use Connector End Views*
- *How to Use Component Location Views*
- *How to Use Diagnostic System Checks*
- *How to Use Diagnostic Tables*
- *How to Use Circuit Descriptions*

How to Use Electrical Schematics

Important: The schematic does not represent the components and wiring as they physically appear on the vehicle. For example, a 4-foot length of wire is treated no differently in a schematic from one which is only a few inches long.

When diagnosing a horn problem use the service information located in the Horns (cell 40) service category. The following schematic is a typical example of a schematic with its supporting text.



61199

The wiring schematic is the cornerstone of electrical diagnosis. Schematics break the entire electrical system into individual circuits, showing the electrical current paths when a circuit is operating properly. Wiring which is not part of the circuit of interest is referenced to another page where the circuit is shown complete. Schematics use a top (power) to bottom (ground) sequence to present electrical information.

How to Use Schematic Reference Tables

The schematic reference table is used when a circuit continues into another electrical system's schematic. The schematic reference table matches all references made on schematics to the appropriate service category type number and service category where the schematic's continuation is shown.

How to Use Schematic Icon Tables

The schematic icon table shows all icons on schematic with their definition or references.

How to Use Component Location Tables

The component location table shows a list of all the electrical components within a systems electrical schematics. The table consists of the following information within a system's electrical schematic:

- All components
- Grounds
- Pass-through grommets
- Splices

The table consists of 4 columns which describe the following information:

- The component name
- The component location
- The reference to the component view
- The reference to the connector end view (if applicable)

Name

The name cells provide the name of the components that are used on the schematic(s). If a connector is listed the number of cavities are also provided. This represents the total number of cavities in the connector regardless of how many connectors are actually used.

Location

The location cell provides a written location of where the component is in the vehicle with respect to vehicle landmarks. Nearly all of the following information shown on a schematic can be pinpointed visually using the component location view illustrations:

- Components
- Connectors
- Grounds
- Splices

Locator View

This column contains the reference to the appropriate component view. The reference contains the location within the subsection and the section. Refer to *How to Use Component Location Views*.

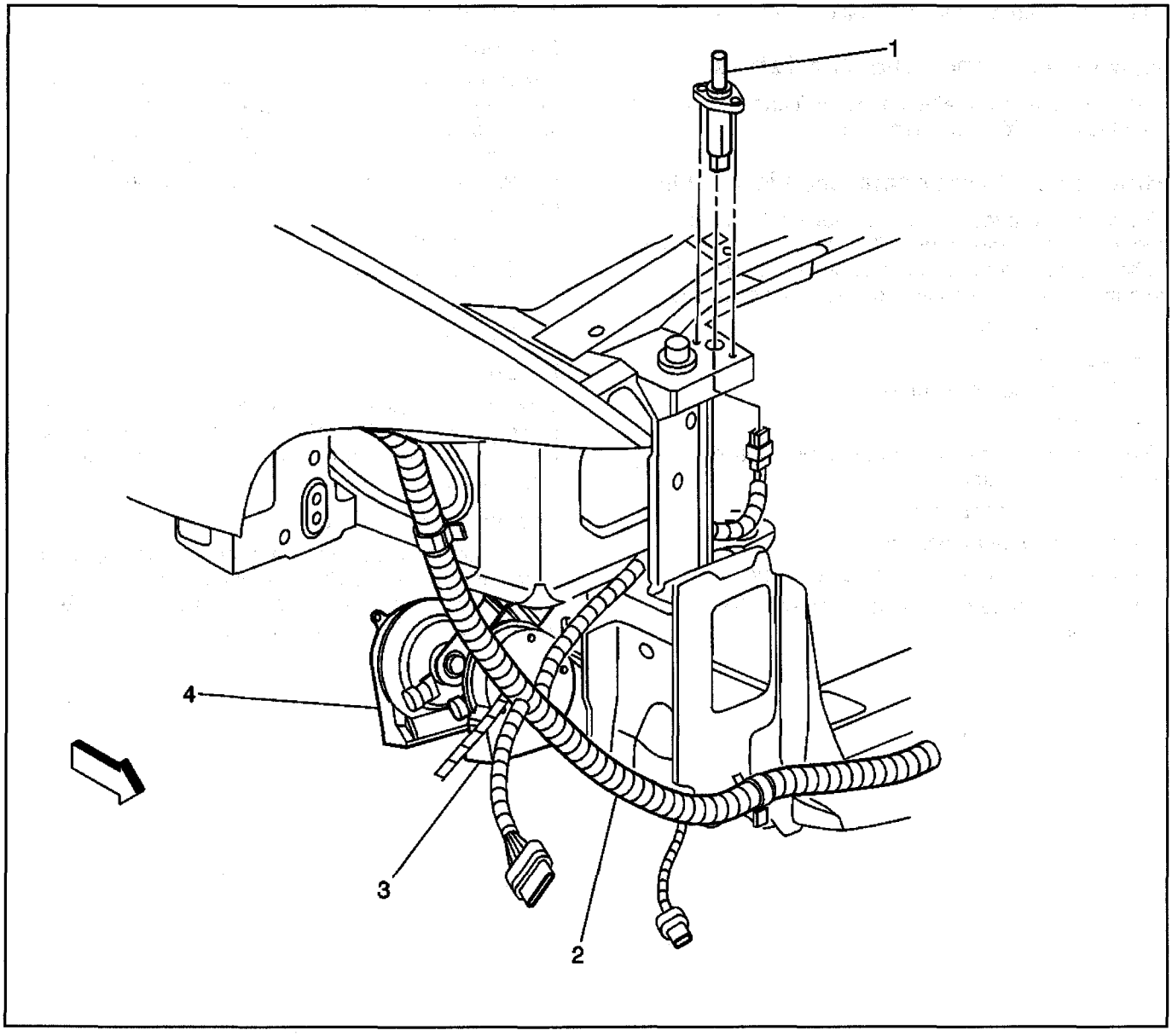
Connector End View

This column contains the reference to the appropriate connector end view. The reference contains the location within the subsection and the section. Refer to *How to Use Connector End Views*.

How to Use Component Location Views

Component location views are line illustrations that indicate all of the vehicle's electrical components within each electrical system.

RH Front Corner of Vehicle



154362

Legend

(1) Hood Ajar Switch (Export)
(2) S114
(3) Right Horn A Note
(4) Right Horn F Note

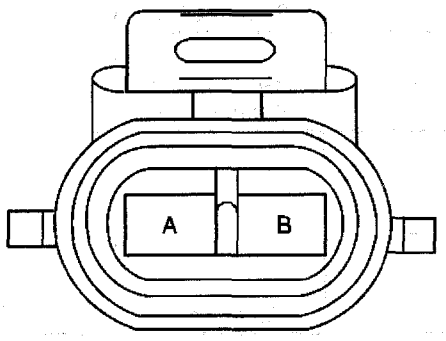
How to Use Connector End Views

Connector end views show the cavity or terminal locations for all the related 2–pin or larger connectors shown in the system schematic(s). The drawings show the connector's face as seen after the harness connector has been disconnected from a component or mating connector. Unused cavities are left blank in the table.

In addition, the color and part number of the connector body is provided along with the family/series name.

Below is an example of a typical connector end view.

RH Horn A Note



35437

Connector Part Information		• 12052644 • 2 Way F Metri-Pack 150 Series Sealed (GRY)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	250	Ground
B	DK GRN	29	Horn Feed

How to Use Diagnostic System Checks

Important: Misdiagnosis could occur if the diagnostic system check is not performed before using the diagnostic tables.

The diagnostic system check determines the diagnostic trouble codes (DTCs) present, verifies proper communication, and navigates to the appropriate diagnostic table.

How to Use Diagnostic Tables

Diagnostic tables provide a procedure that will help you locate the condition in a circuit that is causing a malfunction. All diagnostic procedures are symptom based, to assist you in locating the condition as fast as possible. Diagnostic tables should exist for all possible (realistic) symptoms and diagnostic trouble codes (DTCs).

Horns Inoperative

Step	Action	Value(s)	Yes	No
DEFINITION: Horns will not sound when horn button is pressed.				
1	Was the Diagnostic System Check performed?	—	Go to *Step 2*	Go to *Horns System Check*
2	1. Turn ignition switch to OFF. 2. Remove the horn relay. 3. Connect a fused jumper across the horn relay terminals 30 and 87. Do the horns sound?	—	Go to *Step 3*	Go to *Step 6*
3	Connect a test lamp between the horn relay terminals 85 and ground. Does the test lamp light?	—	Go to *Step 4*	Go to *Power Distribution*
4	1. Connect a test lamp between the horn relay terminal 86 and battery (B+). 2. Press and hold the horn switch. Does the test lamp light?	—	Go to *Step 5*	Go to *Step 11*

Horns Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
5	Replace the horn relay. Is the repair completed?	—	Go to *Horns System Check*	—
6	Connect a test lamp between the underhood junction block terminal A12 or B12 (CKT 29) and ground. Does the test lamp light?	—	Go to *Step 8*	Go to *Step 7*
7	Replace the underhood junction block, refer to underhood junction block replacement. Is repair completed?	—	Go to *Horns System Check*	—
8	Connect a test lamp between the Ground Splice Pack G104 (CKT 250) and battery (B+). Does the test lamp light?	—	Go to *Step 9*	Go to *Step 10*
9	Replace horns. Is repair completed?	—	Go to *Horns System Check*	—
10	Inspect G104 ground, if OK replace Ground Splice Pack G104. Is repair completed?	—	Go to *Horns System Check*	—
11	1. Disconnect the underhood junction block connector C2. 2. Connect a test lamp between the underhood junction block terminal D1 and battery (B+). 3. Press and hold the horn switch. Does the test lamp light?	—	Go to *Step 7*	Go to *Step 12*
12	1. Disconnect the Dash Integration Module (DIM). 2. Connect a test lamp between the underhood junction block terminal D1 and battery (B+). 3. Press and hold the horn switch. Does the test lamp light?	—	Go to *Step 13*	Go to *Step 14*
13	Replace the Dash Integration Module (DIM), refer to DIM replacement. Is the repair completed?	—	Go to *Horns System Check*	—
14	1. Disconnect C202. 2. Connect a test lamp between connector C202 terminal B12 of the steering column side and battery (B+). 3. Press and hold the horn switch. Does the test lamp light?	—	Go to *Step 15*	Go to *Step 16*
15	Repair short to ground in CKT 28 (BLK). Is repair completed?	—	Go to *Horns System Check*	—
16	Repair open in CKT 28 in the steering column. Is the repair completed?	—	Go to *Horns System Check*	—

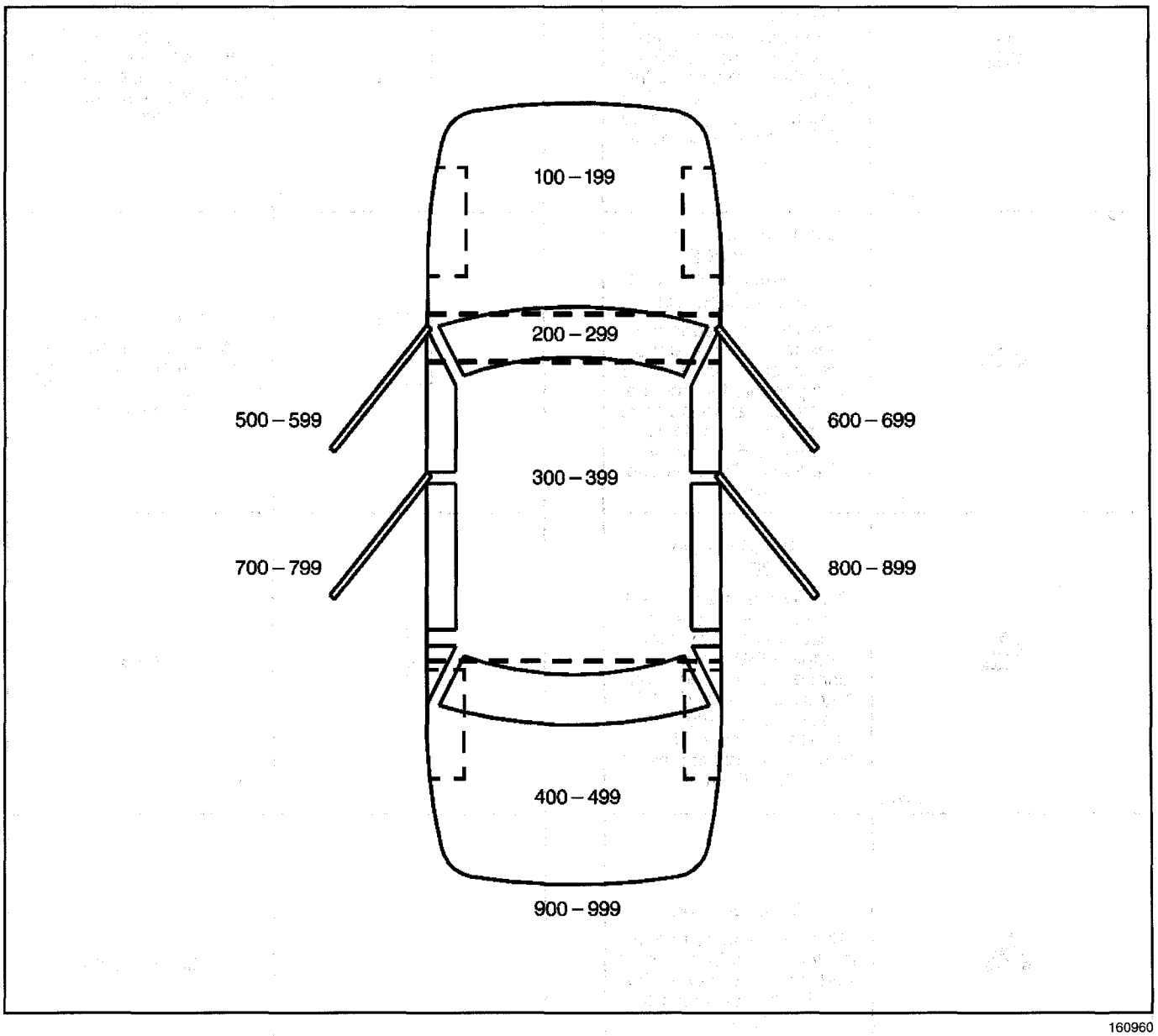
How to Use Circuit Descriptions

The circuit description describes how the system works electrically. It details how power, ground, inputs, and outputs are supplied to the system's related components. The circuit description also explains the communication and interaction of all components that affect the operation of the system.

Battery positive voltage is applied at all times to the horn relay terminals 85 and 30. Pressing the horn switch grounds the horn relay coil on CKT 28 (BLK). The relay coil can also be grounded on CKT 28 (BLK) by the Dash Integration Module (DIM). The horn relay applies battery positive voltage to the horns on CKT 29 (DK GRN) when energized. The horns sound until the horn switch is released or the DIM signal is gone.

Passenger Car Zoning

All grounds, in-line connectors, pass-through grommets, and splices have identifying numbers that correspond to where they are located in the vehicle. The following table explains the numbering system.



160960

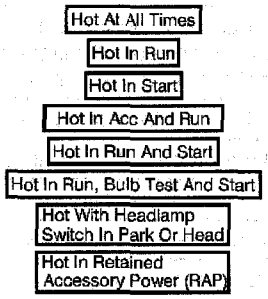
Vehicle Zoning Table

Callout Numbers	Zone Description
100-199	Engine compartment (All forward of the dash panel) Note: 001-099 are additional for the engine compartment (ONLY to be used if all 100-199 items are used)
200-299	Within the instrument panel area
300-399	Passenger compartment (From the instrument panel to the rear wheelhouse)

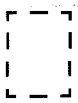
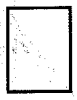
Vehicle Zoning Table (cont'd)

Callout Numbers	Zone Description
400-499	Luggage compartment (From the rear wheelhouse to the rear of the vehicle
500-599	Within the left front door
600-699	Within the right front door
700-799	Within the left rear door
800-899	Within the right rear door
900-999	Wtihin the luggage compartment lid or hatch

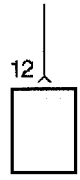
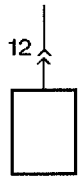
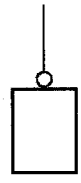
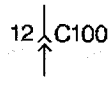
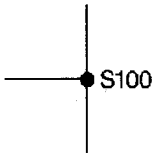
Electrical Symbols

Symbol	Description
 106629	Electrostatic Sensitive Discharge (ESD) Icon. This icon is used to alert the technician that the system contains ESD sensitive components that require certain precautions before servicing. Refer to *ESD Notice* in Cautions and Notices.
 106630	Supplemental Inflatable Restraint (SIR) or Supplemental Restraint System (SRS) Icon. This icon is used to alert the technician that the system contains SIR/SRS components that require certain precautions before servicing. Refer to *SIR Service Precautions Caution* in Cautions and Notices
 106632	On-Board Diagnostic (OBD II) Icon. This icon is used to alert the technician that the circuit is essential for proper OBD II emission controls circuit operation. Any circuit which, if it fails, causes the malfunction indicator lamp (MIL) to turn on, is identified as an OBD II circuit.
 106633	Important Icon This icon is used to alert the technician that there is additional information that will aid in servicing a system.
 106635	Voltage Indicator Boxes. These boxes are used on schematics to indicate when voltage is present at a fuse.

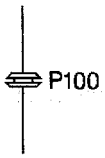
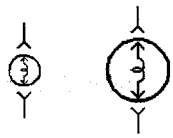
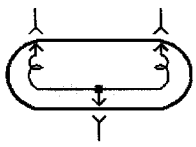
Electrical Symbols (cont'd)

Symbol	Description
 106637	Partial Component. When a component is represented in a dashed box, the component or it's wiring is not shown in it's entirety.
 106641	Entire Component. When a component is represented in a solid box the component or it's wiring is shown in it's entirety.
 106643	Fuse
 106642	Circuit Breaker
 106644	Fusible Link

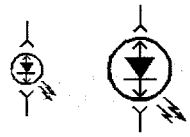
Electrical Symbols (cont'd)

Symbol	Description
 106645	Connector Attached to Component
 106646	Pigtail Connector
 106647	Bolt On or Screw On Eyelet Terminal
 106648	Inline Harness Connector
 106649	Splice

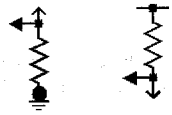
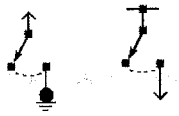
Electrical Symbols (cont'd)

Symbol	Description
 106650	Pass Through The Grommet
 106651	Chassis Ground
 106652	Case Ground
 106653	Single Filament Light Bulbs
 106654	Double Filament Light Bulb

Electrical Symbols (cont'd)

Symbol	Description
 106655	Light Emitting Diodes
 106656	Capacitor
 106657	Battery
 106660	Variable Battery
 106658	Resistor

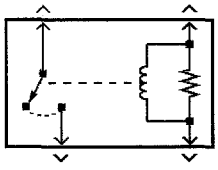
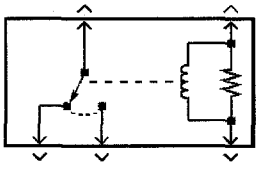
Electrical Symbols (cont'd)

Symbol	Description
 106659	Variable Resistor
 106661	Position Sensor
 106662	I/O Resistors
 106663	I/O Switches
 106664	Diode

Electrical Symbols (cont'd)

Symbol	Description
 106665	Crystal
 106666	Heating Elements
 106667	Motor
 106668	Solenoid
106669	Coil

Electrical Symbols (cont'd)

Symbol	Description
 106670	Antenna
 106671	Shield
 106672	Switches
 106673	Single Pole Single Throw Relay
 106674	Single Pole Double Throw Relay

General Electrical Diagnosis Procedures

Basic Knowledge Required

Without a basic knowledge of electricity, it will be difficult to use the diagnostic procedures contained in this section. You should understand the basic theory of electricity and know the meaning of voltage (volts), current (amps) and resistance (ohms). You should understand what happens in a circuit with an open or a shorted wire. You should be able to read and understand a wiring diagram.

Refer to *Strategy Based Diagnosis* in General Information in order to properly diagnose and repair the customer concern.

Symptom Diagnostic Example

The following is an example of a symptom and the correct course of action taken by the technician.

Important: Research for possible bulletins, DTCs and the vehicle's service history. Also, thoroughly screen the customer regarding the problem in order to complete the repair of the vehicle and completely satisfy the customer when a DTC or a symptom diagnosis is not available.

Verify the Customer Concern, Check the Problem

Customer complaint is the headlamps are inoperative. Verify the normal operating procedure of the circuit and the components that share that circuit. Refer to *Strategy Based Diagnosis.*

Review the Headlamps Electrical Schematic (Preliminary Checks)

Review the schematic, it is essential to understand how a circuit should work before trying to figure out why it doesn't. After understanding how a circuit should operate, read the schematic again, this time keeping in mind what has been learned by operating the circuit. Since both the low beam headlamps are inoperative, ensure that the following components are operating properly.

- The headlamp Switch.
- The YEL wire.
- Low contacts of the Headlamp Dimmer Switch.
- C100 terminal 1E.
- The TAN wires.
- Grounds G105 and G109.

Refer to *Strategy Based Diagnosis.*

Perform the System Check

The system check indicates that the low beam headlamps operate when the high beam switch is in high. Also, the high beam indicator illuminates but neither high beam headlamp operates. Refer to *Strategy Based Diagnosis.*

Check for Bulletins

Utilizing a combination of Techline tools and the information accumulated from the Preliminary Checks, check for bulletins.

Isolate the Root Cause

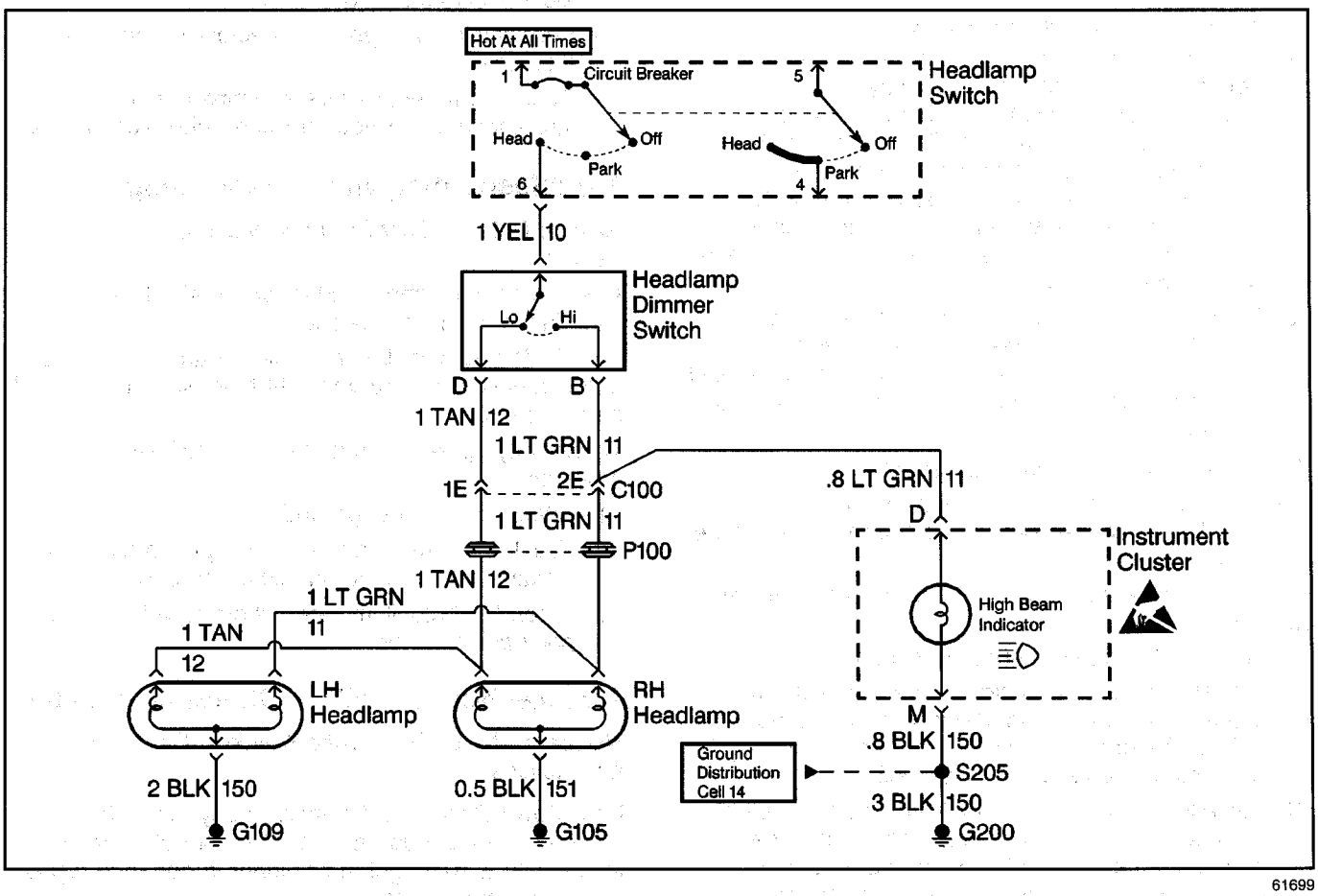
At this point analyze and (diagnose the problem), and develop text. Since the high beam indicator illuminated when the headlamp dimmer switch was in the high position, the high contacts of the headlamp dimmer switch and the LT GRN wire between the headlamp dimmer switch and C100 are good.

At this point, it is extremely unlikely that the high beam filaments in the RH and LH headlamps are both open or that both headlamp connections are bad. The cause must be a bad connection at C100 or an open in the LT GRN wire between C100 and the RH headlamp.

Repair and Verify Fix

From isolating the root cause, basically the problem has been diagnosed. Using the Component Location Table and the corresponding figure, quickly find C100 and the LT GRN wire, locate the exact trouble point and make the repair.

Check the thoroughness of the repair by performing a final system check on the headlamp circuit. This of course means making sure that both high beams, both low beams, and the high beam indicator are working.



61699

Intermittents and Poor Connections Diagnosis

Most intermittents are caused by faulty electrical connections or wiring. Inspect for the following items:

- Wiring broken inside the insulation.
- Poor connection between the male and female terminal at a connector. Refer to Testing for Proper Terminal Contact below for the specific procedure.
- Poor terminal to wire connection. Some conditions which fall under this description are poor crimps, poor solder joints, crimping over wire the insulation rather than the wire itself and corrosion in the wire to terminal contact area, etc.
- Wire insulation which is rubbed through. This causes an intermittent short as the bare area touches other wiring or parts of the vehicle.
- Refer to *Testing for Electrical Intermittents* for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any in-line connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the make and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself, or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter, improperly joining the connector halves, or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Round Wire Connectors

Follow the procedure below to test terminal contact of Metri-Pack or 56 series terminals. Refer to *J 38125-B* Terminal Repair Kit or the J 38125-4 Instruction Manual for terminal identification.

Follow the procedure below in order to test terminal contact.

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact, or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals, and connector body.
3. Using an equivalent male terminal from the *J 38125-B*, test that the retention force is significantly different between a good terminal and a suspect terminal. Replace the female terminal in question.

Flat Wire (Dock and Lock) Connectors

There are no serviceable parts for flat wire (dock and lock) connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact.

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks, or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter from the J 42675 Flat Wire Probe Adapter Kit on the flat wire harness connector in order to test the circuit in question.

Checking Aftermarket Accessories

Do not connect aftermarket accessories into the following circuits:

Caution: Refer to SIR Service Precautions Caution in Cautions and Notices.

- SIR circuits, all such circuits are indicated on circuit diagrams with the SIR symbol.

Notice: Refer to *OBD II Symbol Description Notice* in Cautions and Notices.

- OBDII circuits, all such circuits are indicated on circuit diagrams with the OBDII symbol.

Always check for aftermarket accessories (non-OEM) as the first step in diagnosing electrical problems. If the vehicle is so equipped, disconnect the system to verify that these add-on accessories are not the cause of the problems.

Possible causes of vehicle problems related to aftermarket accessories include:

- Power feeds connected to points other than the battery.
- Antenna location.
- Transceiver wiring located too close to vehicle electronic modules or wiring.
- Poor shielding or poor connectors on antenna feed line.
- Check for recent service bulletins detailing installation guidelines for aftermarket accessories.

Troubleshooting with a Test Lamp

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

A test lamp can simply and quickly test a low impedance circuit for voltage.

The *J 34142-B* Test Lamp is Micro-Pack compatible and comprised of a 12 volt light bulb with an attached pair of leads.

To properly operate this tool use the following procedure.

1. Attach one lead to ground.
2. Touch the other lead to various points along the circuit where voltage should be present.
3. When the bulb illuminates, there is voltage at the point being tested.

Troubleshooting with a Digital Multimeter

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

Important: Circuits which include any solid state control modules, such as the PCM, should only be tested with a 10 megohm or higher impedance digital multimeter such as the *J 39200.*

The J 39200 Instruction Manual is a good source of information and should be read thoroughly upon receipt of the DMM as well as kept on hand for future reference.

A DMM should be used instead of a test lamp in order to test for voltage in high impedance circuits. While a test lamp shows whether voltage is present, a DMM indicates how much voltage is present.

The ohmmeter function on a DMM shows how much resistance exists between two points along a circuit. Low resistance in a circuit means good continuity.

Important: Disconnect the power feed from the suspect circuit when measuring resistance with a DMM. This prevents incorrect readings. DMMs apply such a small voltage to measure resistance that the presence of voltages can upset a resistance reading.

Diodes and solid state components in a circuit can cause a DMM to display a false reading. To find out if a component is affecting a measurement take a reading once, then reverse the leads and take a second reading. If the readings differ the solid state component is affecting the measurement.

Following are examples of the various methods of connecting the DMM to the circuit to be tested:

- Backprobe both ends of the connector and either hold the leads in place while manipulating the connector or tape the leads to the harness for continuous monitoring while you perform other operations or test driving. Refer to *Probing Electrical Connectors*.
- Disconnect the harness at both ends of the suspected circuit where it connects either to a component or to other harnesses.
- If the system that is being diagnosed has a specified pinout or breakout box, it may be used in order to simplify connecting the DMM to the circuit or for testing multiple circuits quickly.

Troubleshooting with a Short Finder

The J 8681-A can locate hidden shorts to ground. The short finder creates a pulsing magnetic field in the shorted circuit and shows the location of the short through the body trim or sheet metal.

Probing Electrical Connectors

Important: Always be sure to reinstall the Connector Position Assurance (CPA) and Terminal Position Assurance (TPA) when reconnecting connectors or replacing terminals.

Frontprobe

Disconnect the connector and probe the terminals from the mating side (front) of the connector.

Notice: Do not insert test equipment probes into any connector or fuse block terminal. The diameter of the test probes will deform most terminals. A deformed terminal can cause a poor connection, which can result in system failures. Always use the J 35616-A Connector Test Adapter Kit or the J 42675 Flat Wire Probe Adapter Kit in order to frontprobe terminals. Do not use paper clips or other substitutes as they can damage terminals and cause incorrect measurements.

Backprobe

Do not disconnect the connector and probe the terminals from the harness side (back) of the connector.

Important:

- Backprobe connector terminals only when specifically required in diagnostic procedures.
- Do not backprobe a sealed (Weather Pack®) connector, less than a 280 series Metri-Pack connector, a Micro-Pack connector, or a flat wire (dock and lock) connector.
- Backprobing can be a source of damage to connector terminals. Use care in order to avoid deforming the terminal, either by forcing the test probe too far into the cavity or by using too large of a test probe.
- After backprobing any connector, inspect for terminal damage. If terminal damage is suspected, test for proper terminal contact.

Using Connector Test Adapters

Notice: Do not insert test equipment probes into any connector or fuse block terminal. The diameter of the test probes will deform most terminals. A deformed terminal can cause a poor connection, which can result in system failures. Always use the J 35616-A Connector Test Adapter Kit or the J 42675 Flat Wire Probe Adapter Kit in order to frontprobe terminals. Do not use paper clips or other substitutes as they can damage terminals and cause incorrect measurements.

Using Fused Jumper Wires

Important: A fused jumper may not protect solid state components from being damaged.

The *J 36169-A* fused jumper includes small clamp connectors that provide adaptation to most connectors without damage. This fused jumper wire is supplied with a 20 A fuse which may not be suitable for some circuits. Do not use a fuse with a higher rating than the fuse that protects the circuit being tested.

Measuring Voltage

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

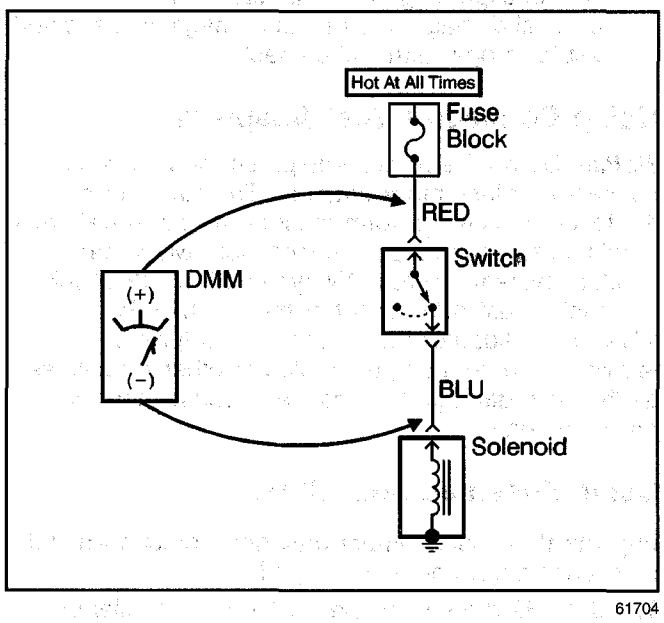
The following procedure measures the voltage at a selected point in a circuit.

1. Apply power to the circuit.
2. Set the rotary dial of the DMM into the V (AC) or V (DC) position.
3. Connect the positive lead of the DMM to the point of the circuit to be tested.
4. Connect the negative lead of the DMM to a good ground.
5. Operate the circuit.
6. The DMM displays the voltage measured at that point.

Measuring Voltage Drop

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

The following procedure determines the difference in voltage potential between two points.



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1. Set the rotary dial of the DMM to the V (DC) position.
2. Connect the positive lead of the DMM to one point of the circuit to be tested.
3. Connect the negative lead of the DMM to the other point of the circuit.
4. Operate the circuit.
5. The DMM displays the difference in voltage between the two points.

Testing for Continuity

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

The following procedures verify good continuity in a circuit.

With a DMM

1. Set the rotary dial of the DMM to the Ω position.
2. Disconnect the power feed (i.e. fuse, control module) from the suspect circuit.
3. Disconnect the load.
4. Press the MIN MAX button on the DMM.
5. Connect one lead of the DMM to one end of the circuit to be tested.
6. Connect the other lead of the DMM to the other end of the circuit.
7. If the DMM displays low or no resistance and a tone is heard, the circuit has good continuity.

With a Test Lamp

Important: Only use the test lamp procedure on low impedance power and ground circuits.

1. Remove the power feed (i.e. fuse, control module) from the suspect circuit.
2. Disconnect the load.
3. Connect one lead of the test lamp to one end of the circuit to be tested.
4. Connect the other lead of the test lamp to battery positive voltage.
5. Connect the other end of the circuit to ground.
6. If the test lamp illuminates (full intensity), then the circuit has good continuity.

Testing for Short to Ground

Notice: Refer to *Test Probe Notice* in Cautions and Notices.

The following procedures test for a short to ground in a circuit.

With a DMM

1. Remove the power feed (i.e. fuse, control module) from the suspect circuit.
2. Disconnect the load.
3. Set the rotary dial of the DMM to the Ω position.
4. Connect one lead of the DMM to one end of the circuit to be tested.
5. Connect the other lead of the DMM to a good ground.
6. If the DMM does NOT display infinite resistance (OL), there is a short to ground in the circuit.

With a Test Lamp

1. Remove the power feed (i.e. fuse, control module) from the suspect circuit.
2. Disconnect the load.
3. Connect one lead of the test lamp to battery positive voltage.
4. Connect the other lead of the test lamp to one end of the circuit to be tested.
5. If the test lamp illuminates, there is a short to ground in the circuit.

Fuse Powering Several Loads

1. Review the system schematic and locate the fuse that is open.
2. Open the first connector or switch leading from the fuse to each load.
3. Connect a DMM across the fuse terminals (be sure that the fuse is powered).
   - When the DMM displays voltage the short is in the wiring leading to the first connector or switch.
   - If the DMM does not display voltage refer to the next step.
4. Close each connector or switch until the DMM displays voltage in order to find which circuit is shorted.

Testing for Electrical Intermittents

Perform the following procedures while wiggling the harness from side to side. Continue this at convenient points (about 6 inches apart) while watching the test equipment.

- *Testing for Short to Ground*
- *Testing for Continuity*

If the fault is not identified, perform the procedure below using the MIN MAX feature on the *J 39200* DMM. This feature allows you to manipulate the circuit without having to watch the *J 39200*. The *J 39200* will generate an audible tone when a change is detected.

Important: The *J 39200* must be used in order to perform the following procedure since the *J 39200* can monitor current, resistance or voltage while recording the minimum (MIN), and maximum (MAX) values measured.

1. Connect the *J 39200* to both sides of a suspected connector (still connected), or from one end of a suspected circuit to the other. Refer to *Troubleshooting with a Digital Multimeter* for information on connecting the *J 39200* to the circuit.
2. Set the rotary dial of the *J 39200* to the V (AC) or V (DC) position.
3. Press the range button of the *J 39200* in order to select the desired voltage range.
4. Press the MIN MAX button of the *J 39200*. The *J 39200* displays 100 ms RECORD and emits an audible tone (beep).

Important: The 100 ms RECORD mode is the length of time an input must stay at a new value in order to record the full change.

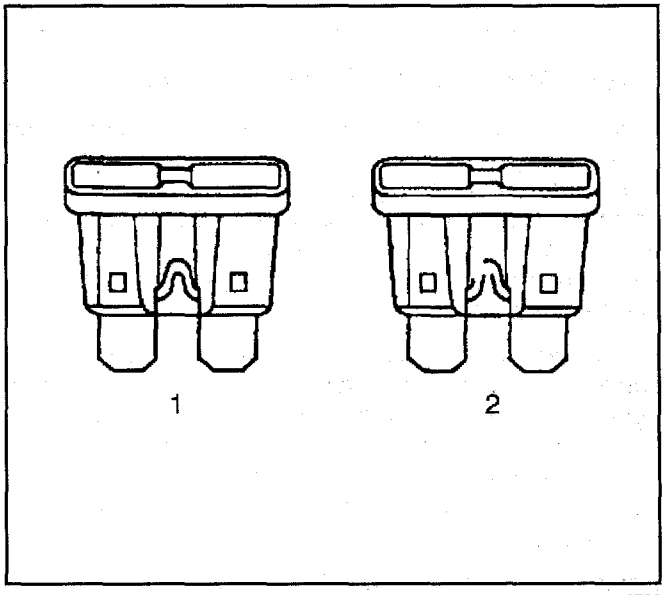
5. Simulate the condition that is potentially causing the intermittent connection, either by wiggling the connections or the wiring, test driving, or performing other operations.
6. Listen for the audible Min Max Alert which indicates that a new minimum or maximum value has been recorded.
7. Press the MIN MAX button once in order to display the MAX value and note the value.
8. Press the MIN MAX button again in order to display the MIN value and note the value.
9. Determine the difference between the MIN and MAX values.
   - If the variation between the recorded MIN and MAX voltage values is 1 volt or greater an intermittent open or high resistance condition exists. Repair the condition as necessary.
   - If the variation between the recorded MIN and MAX voltage values is less than 1 volt an intermittent open or high resistance condition does not exist.

Wiring Repairs

The Wiring Repairs section contains the following types of wiring repair information. Using these elements together will make wiring repair faster and easier:

- *Circuit Protection - Fuses*
- *Circuit Protection - Circuit Breakers*
- *Circuit Protection - Fusible Links*
- *Repairing Damaged Wire Insulation*
- *Splicing Copper Wire Using Splice Clips*
- *Splicing Copper Wire Using Splice Sleeves*
- *Splicing Twisted or Shielded Cable*
- *Splicing Inline Harness Diodes*
- *HO2S Wiring Repairs*
- *SIR Wiring Repairs*
- *Flat Wire Repairs*

Circuit Protection - Fuses



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The fuse is the most common method of an automotive wiring circuit protection. Whenever there is an excessive amount of current flowing through a circuit the fusible element will melt and create an open or incomplete circuit. Fuses are an one time protection device and must be replaced each time the circuit is overloaded. To determine if a fuse is open, remove the suspected fuse and examine the element in the fuse for an open (break). If not broken, also check for continuity using a *J 39200* DMM or a continuity tester. If the element is open or continuity is suspect, replace the fuse with one of equal current rating.

Fuse Types

Current Rating Amperes	Color
Auto Fuses, Mini Fuses	
2	Gray
3	Violet
5	Tan
7.5	Brown
10	Red
15	Blue
20	Yellow
25	White or Natural
30	Green
Maxi Fuses	
20	Yellow
30	Light Green
40	Orange or Amber
60	Blue
50	Red

Circuit Protection - Circuit Breakers

A circuit breaker is a protective device that is designed to open the circuit when a current load is in excess of the rated breaker capacity. If there is a short or other type of overload condition in the circuit, the excessive current will open the circuit between the circuit breaker terminals. Two types of circuit breakers are used.

Circuit Breaker: This type opens when excessive current passes through it for a period of time. It closes again after a few seconds, and if the cause of the high current is still present, it will open again. The circuit breaker will continue to cycle open and closed until the condition causing the high current is removed.

Positive Temperature Coefficient (PTC) Circuit Breaker: This type greatly increases its resistance when excessive current passes through it. The excessive current heats the PTC device, as the device heats its resistance increases. Eventually the resistance gets so high that the circuit is effectively open. Unlike the ordinary circuit breaker the PTC unit will not reset until the circuit is opened, by removing the voltage from its terminals. Once the voltage is removed the circuit breaker will re-close within a second or two.

Circuit Protection - Fusible Links

Fusible link is wire designed to melt and break continuity when excessive current is applied. It is often located between or near the battery and starter or electrical center. Use a continuity tester or a *J 39200* DMM at each end of the wire containing the fusible link in order to determine if it is broken. If broken, it must be replaced with fusible link of the same gage size.

Repairing a Fusible Link

Important: Fusible links cut longer than 225 mm (approx. 9 inches) will not provide sufficient overload protection.

Refer to *Splicing Copper Wire Using Splice Clips.*

Repairing Damaged Wire Insulation

If the conductive portion of the wire is not damaged, locate the problem and apply tape around the wire. If the damage is more extensive, replace the faulty segment of the wire. Refer to *Splicing Copper Wire Using Splice Clips* and follow the instruction to repair the wire.

Wire Size Conversion Table

Metric Wire Sizes (mm 2)	AWG Sizes
0.22	24
0.35	22
0.5	20
0.8	18
1.0	16
2.0	14
3.0	12
5.0	10
8.0	8
13.0	6
19.0	4
32.0	2
50.0	1/0

Splicing Copper Wire Using Splice Clips

Tools Required

J 38125-B Terminal Repair Kit

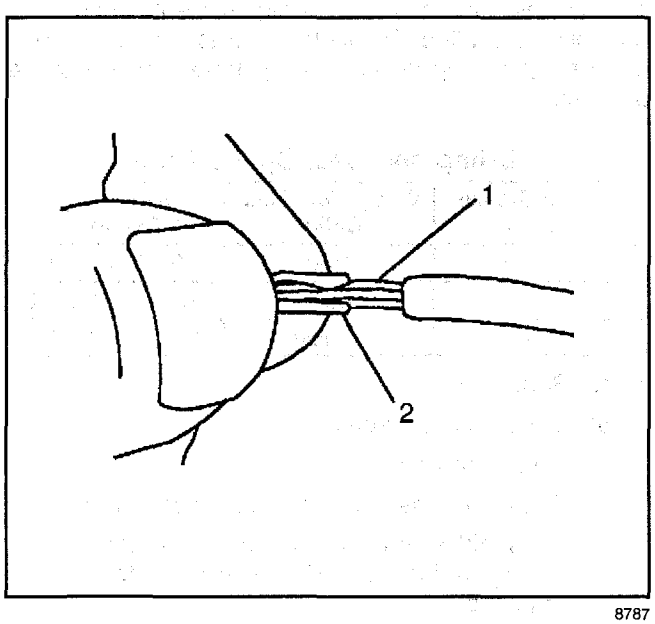
1. Open the harness.
   - If the harness is taped, remove the tape.
   - To avoid wiring insulation damage, use a sewing ripper in order to cut open the harness.
   - If the harness has a black plastic conduit, pull out the desired wire.
2. Cut the wire.
   - Cut as little wire off the harness as possible.
   - Ensure that each splice is at least 40 mm (1.5 in) away from other splices, harness branches and connectors. This helps prevent moisture from bridging adjacent splices and causing damage.

3. Select the proper size and type of wire.
   - The wire must be of equal or greater size than the original (except fusible link).
   - The wire's insulation must have the same or higher temperature rating.
     - Use general purpose insulation for areas that are not subject to high temperatures.
     - Use a cross-linked polyethylene insulated wire for areas where high temperatures are expected.

Important: Use Cross-linked polyethylene wire to replace PVC, but do not replace cross-linked polyethylene with PVC.

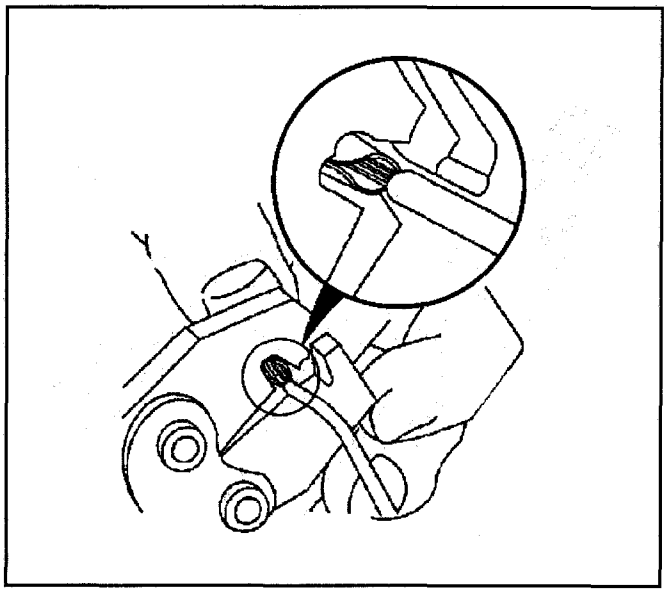
Cross-linked polyethylene wire is not fuel resistant. Do not use to replace wire where there is the possibility of fuel contact.

4. Strip the insulation.
   - Select the correct size opening in the wire stripper or work down from the largest size.
   - Strip approximately 7.5 mm (5/16 inches) of insulation from each wire to be spliced.
5. Select the proper clip to secure the splice. Follow the instructions in the *J 38125-B* Terminal Repair Kit in order to determine the proper clip size crimp tool and anvil.
6. Overlap the two stripped wire ends and hold them between thumb and forefinger.



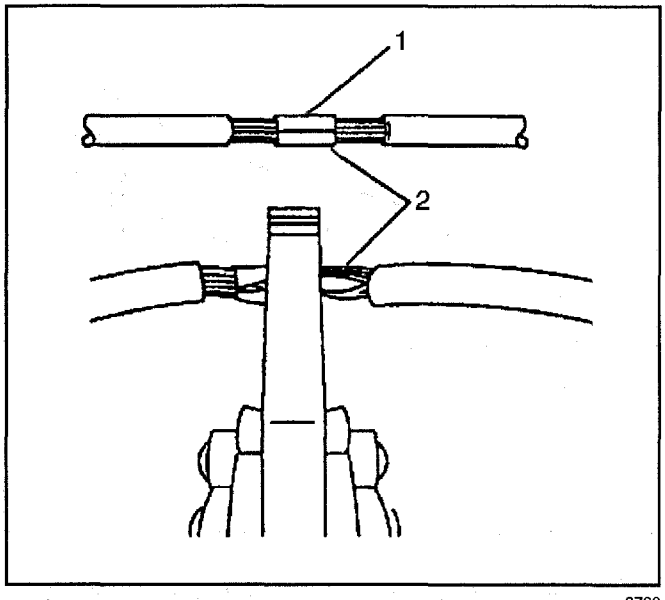
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7. Center the splice clip (2) over the stripped wires (1) and hold the clip in place.
   - Ensure that the wires extend beyond the clip in each direction.
   - Ensure that no insulation is caught under the clip.



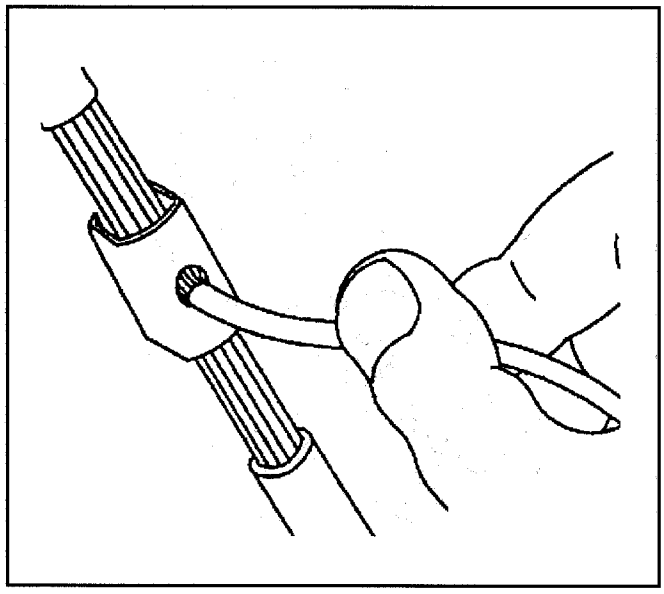
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8. Center the crimp tool over the splice clip and wires.
9. Apply steady pressure until the crimp tool closes. Ensure that no strands of wire are cut.



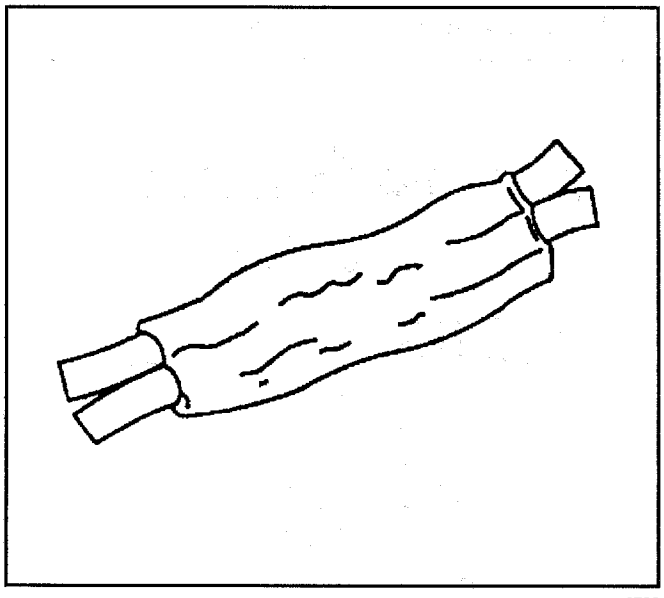
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10. Crimp the splice on each end (2).



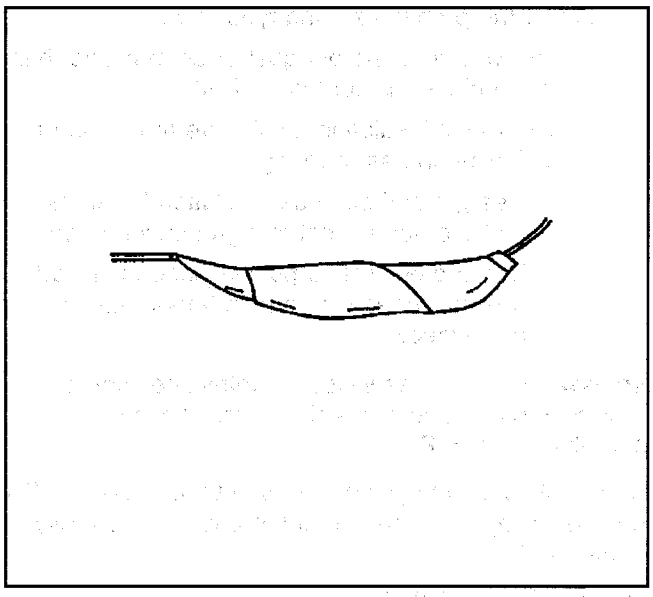
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11. Apply 60/40 rosin core solder to the opening in the back of the clip. Follow the manufacturer's instructions for the solder equipment.



8792

12. Tape the splice. Roll on enough tape in order to duplicate the thickness of the insulation on the existing wires.



8795

13. Additional tape can be applied to the wire if the wire does not belong in a conduit or another harness covering. Use a winding motion in order to cover the first piece of tape.

Splicing Copper Wire Using Splice Sleeves

Use crimp and seal splice sleeves to form a one-to-one splice on all types of insulation except tefzel and coaxial to form a one-to-one splice. Use tefzel and coaxial where there is special requirements such as moisture sealing. Follow the instructions below in order to splice copper wire using crimp and seal splice sleeves.

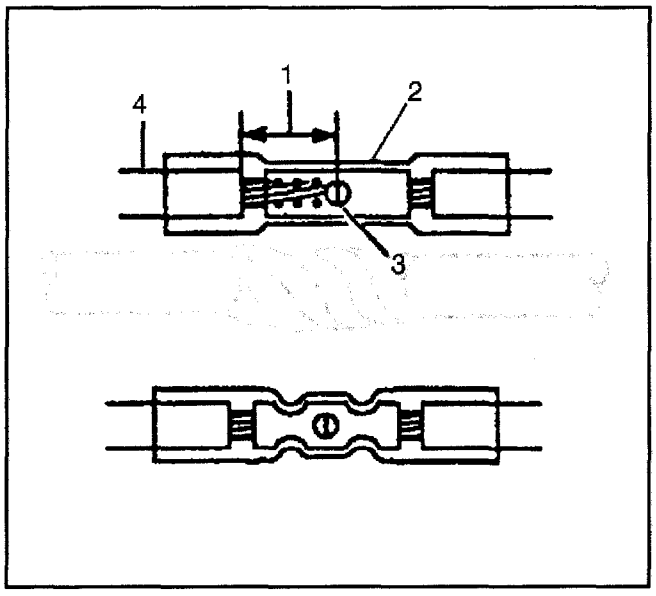
Crimp and Seal Splice Table

Splice Sleeve Color	Crimp Tool Nest Collor	Wire Gauge AWG/(Metric)
Salmon	Red	20,18 / (0.5, 0.8)
Blue	Blue	16, 14 / (1.0, 2.0)
Yellow	Yellow	12, 10 / (3.0, 5.0)

Tools Required

J 38125-B Terminal Repair Kit

1. Open the harness.
   - If the harness is taped, remove the tape.
   - To avoid wiring insulation damage, use a sewing ripper in order to cut open the harness.
   - If the harness has a black plastic conduit, pull out the desired wire.
2. Cut the wire.
   - Cut as little wire off the harness as possible.
   - Ensure that each splice is at least 40 mm (1.5 in) away from other splices, harness branches and connectors. This helps prevent moisture from bridging adjacent splices and causing damage.



8796

3. Select the proper size and type of wire.
   - The wire must be of equal or greater size than the original.
   - The wire's insulation must have the same or higher temperature rating (4).
     - Use general purpose insulation for areas that are not subject to high temperatures.
     - Use a cross-linked polyethylene insulated wire for areas where high temperatures are expected.

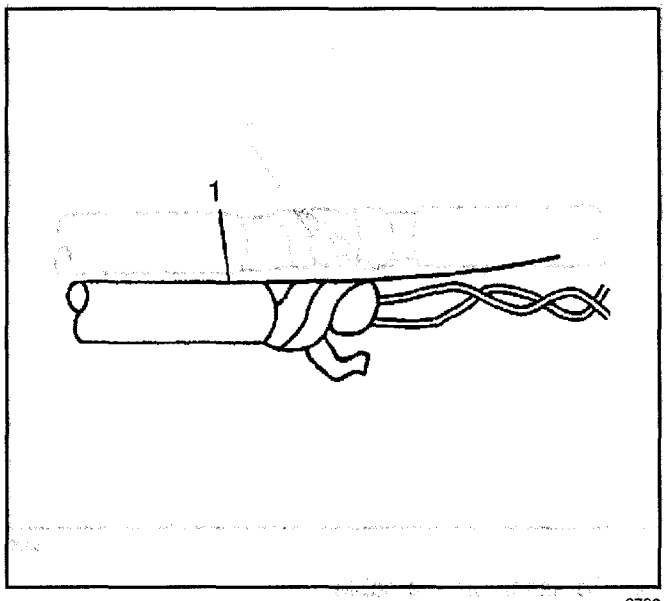
Important: Use Cross-linked polyethylene wire to replace PVC, but do not replace cross-linked polyethylene with PVC.

Cross-linked polyethylene wire is not fuel resistant. Do not use to replace wire where there is the possibility of fuel contact.

4. Strip the insulation.
   - Select the correct size opening in the wire stripper or work down from the largest size.
   - Strip approximately 7.5 mm (5/16 inches) of insulation from each wire to be spliced (1).
5. Select the proper splice sleeve (2) and the required crimp nest tool, refer to the Crimp and Seal Splice Table.
6. Place the nest tool in the J 38125 crimp tool.
7. Place the splice sleeve in the crimp tool nest so that the crimp falls at point 1 on the splice.
8. Close the hand crimper handles slightly in order to hold the splice sleeve firmly in the proper crimp tool nest.
9. Insert the wires into the splice sleeve until the wire hits the barrel stop. The splice sleeve has a stop in the middle of the barrel in order to prevent the wire from passing through the splice (3).
10. Close the handles of the J 38125 until the crimper handles open when released. The crimper handles will not open until the proper amount of pressure is applied to the splice sleeve.
11. Shrink the insulation around the splice.
    - Using the heat torch apply heat to the crimped area of the barrel.
    - Gradually move the heat barrel to the open end of the tubing.
      - The tubing will shrink completely as the heat is moved along the insulation.
      - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

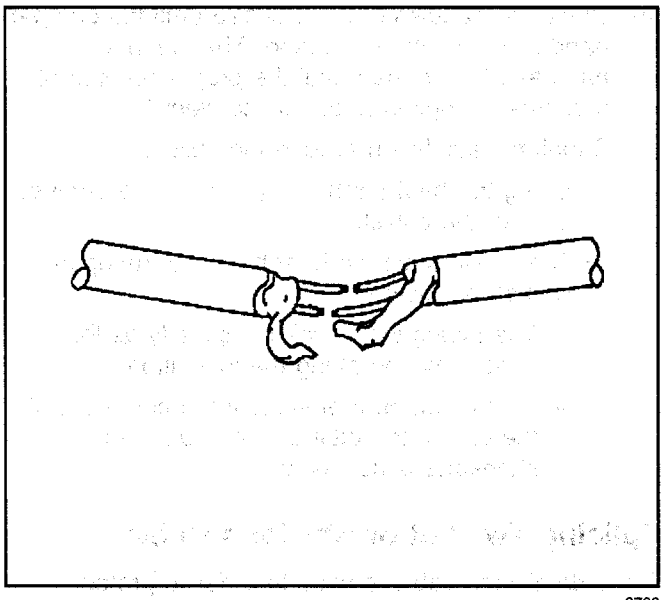
Splicing Twisted or Shielded Cable

Twisted/shielded cable is used in order to protect wiring from electrical noise. Two-conductor cable of this construction is used between the radio and the Delco-Bose® speaker/amplifier units and other applications where low level, sensitive signals must be carried. Follow the instructions below in order to repair the twisted/shielded cable.



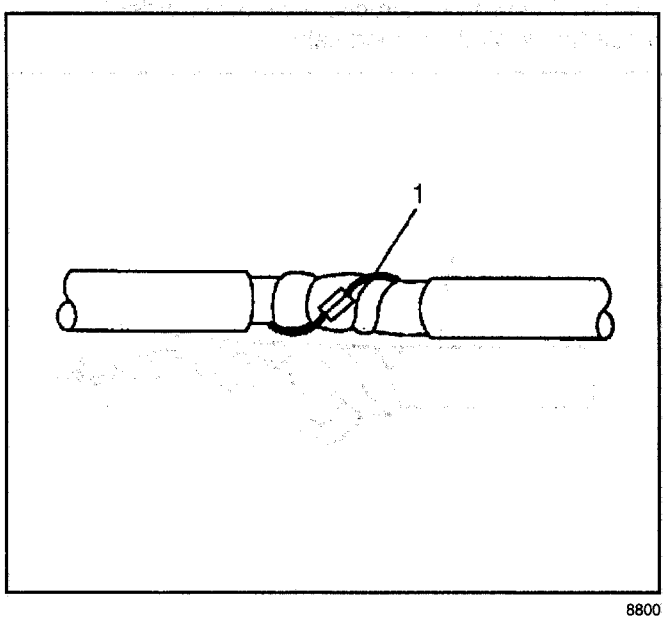
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1. Remove the outer jacket (1). Use care not to cut into the drain wire of the mylar tape.
2. Unwrap the tape. Do not remove the tape. Use the tape in order to rewrap the twisted conductors after the splice is made.



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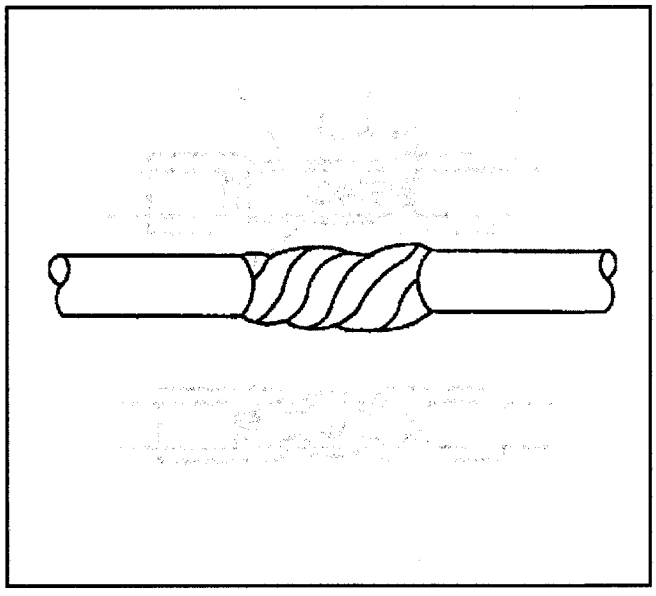
3. Prepare the splice. Untwist the conductors and follow the splicing instructions for copper wire. Staggering the splices by 65 mm is recommended.



8800

4. Re-assemble the cable.
   - Rewrap the conductors with the mylar tape.
   - Use caution not to wrap the drain wire in the tape (1).
   - Follow the splicing instructions for copper wire and splice the drain wire.
   - Wrap the drain wire around the conductors and tape with mylar tape.

Important: Apply the mylar tape with the aluminum side inward. This ensures good electrical contact with the drain wire.



8801

5. Tape over the entire cable. Use a winding motion when you apply the tape.

Splicing Inline Harness Diodes

Many vehicle electrical systems use a diode to isolate circuits and protect the components from voltage spikes. When installing a new diode use the following procedure.

1. Open the harness.
   - If the harness is taped, remove the tape.
   - To avoid wiring insulation damage, use a sewing ripper in order to cut open the harness.
   - If the harness has a black plastic conduit, pull out the diode.
2. If the diode is taped to the harness, remove all of the tape.
3. Check and record the current flow direction and orientation of diode.
4. Remove the inoperative diode from the harness with a suitable soldering tool.

Important: If the diode is located next to a connector terminal remove the terminal(s) from the connector to prevent damage from the soldering tool.

5. Carefully strip away a section of insulation next to the old soldered portion of the wire(s). Do not remove any more than is needed to attach the new diode.
6. Check current flow direction of the new diode, being sure to install the diode with correct bias. Reference the appropriate service manual wiring schematic to obtain the correct diode installation position.
7. Attach the new diode to the wire(s) using 60/40 rosin core solder. Before soldering attach some heat sinks (aluminum alligator clips) across the diode wire ends to protect the diode from excessive heat. Follow the manufacturer's instruction for the soldering equipment.

8. Reinstall terminal(s) into the connector body if previously removed
9. Tape the diode to the harness or connector using electrical tape.

Important: To prevent shorts to ground and water intrusion, completely cover all exposed wire and diode attachment points with tape.

HO2S Wiring Repairs

Notice: Do not solder repairs under any circumstances as this could result in the air reference being obstructed.

If the heated oxygen sensor pigtail wiring, connector, or terminal is damaged the entire oxygen sensor assembly must be replaced. Do not attempt to repair the wiring, connector, or terminals. In order for the sensor to function properly it must have a clean air reference. This clean air reference is obtained by way of the oxygen sensor signal and heater wires. Any attempt to repair the wires, connectors or terminals could result in the obstruction of the air reference and degrade oxygen sensor performance.

The following guidelines should be used when servicing the heated oxygen sensor:

- Do not apply contact cleaner or other materials to the sensor or vehicle harness connectors. These materials may get into the sensor, causing poor performance. Also, the sensor pigtail and harness wires must not be damaged in such a way that the wires inside are exposed. This could provide a path for foreign materials to enter the sensor and cause performance problems.
- Neither the sensor nor vehicle lead wires should be bent sharply or kinked. Sharp bends, kinks, etc., could block the reference air path through the lead wire.
- Do not remove or defeat the oxygen sensor ground wire (where applicable). Vehicles that utilize the ground wire sensor may rely on this ground as the only ground contact to the sensor. Removal of the ground wire will also cause poor engine performance.
- To prevent damage due to water intrusion, be sure that the peripheral seal remains intact on the vehicle harness connector.

The engine harness may be repaired using the *J 38125-B*.

SIR Wiring Repairs

The supplemental inflatable restraint (SIR) system requires special wiring repair procedures due to the sensitive nature of the circuitry. Follow the specific procedures and instructions when working with the SIR system wiring, and the wiring components (such as connectors and terminals).

Important: Do not use the terminals in the kit in order to replace damaged SIR system terminals unless specifically indicated by the terminal package.

Tools Required

J 38125-B Terminal Repair Kit

The tool kit *J 38125-B* contains the following items:

- Special sealed splices - in order to repair the SIR system wiring
- A wire stripping tool
- A special crimping tool
- A heat torch
- An instruction manual

The sealed splices have the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides necessary contact integrity for the sensitive, low energy circuits.

The *J 38125-B* also serves as a generic terminal repair kit. The kit contains the following items:

- A large sampling of common GM electrical terminals
- The correct tools in order to attach the terminals to the wires
- The correct tools in order to remove the terminals from the connectors

SIR Connector (Plastic Body and Terminal Metal Pin) Repair

Use the connector repair assembly packs in order to repair the damaged SIR wire harness connectors and the terminals. Do not use the connector repair assembly pack in order to repair the pigtails. These kits include an instruction sheet and the sealed splices. Use the sealed splices in order to splice the new wires, connectors, and terminals to the harness. The splice crimping tool is color keyed in order to match the splices from the *J 38125-B*. You must use the splice crimping tool in order to apply these splices.

The terminals in the SIR system are made of a special metal. This metal provides the necessary contact integrity for the sensitive, low energy circuits. These terminals are only available in the connector repair assembly packs. Do not substitute any other terminals for those in the assembly packs.

If the individual terminals are damaged on the sensing and diagnostic module (SDM) harness connector, use 1 of the following 2 components in order to replace the SDM harness connector:

- The SDM harness connector pigtail assembly
- The SDM harness connector replacement kit

If the individual terminals are damaged on any other SIR connection, use the appropriate connector repair assembly pack in order to replace the entire connection. Replace the entire SIR wiring harness, if needed, in order to maintain SIR circuit integrity.

SIR Wire Pigtail Repair

Important: Do not make wire, connector, or terminal repairs on components with wire pigtails.

A wire pigtail is a wire or wires attached directly to the device (not by a connector). If a wiring pigtail is damaged, you must replace the entire component (with pigtail). The inflatable restraint steering wheel module coil is an example of a pigtail component.

SIR Wire Repair

Tools Required

J 38125-B Terminal Repair Kit

Important: Refer to *Wiring Repairs* in Wiring Systems in order to determine the correct wire size for the circuit you are repairing. You must obtain this information in order to ensure circuit integrity.

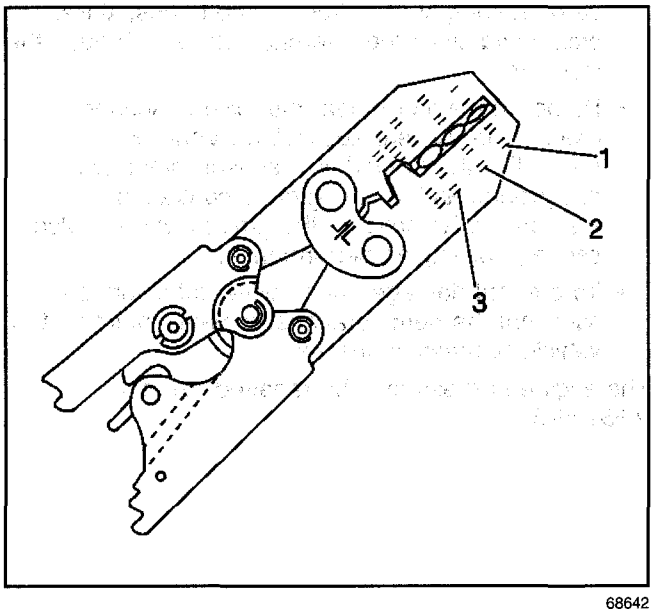
If any wire except the pigtail is damaged, repair the wire by splicing in a new section of wire of the same gauge size (0.5 mm, 0.8 mm, 1.0 mm etc.). Use the sealed splices and splice crimping tool from the *J 38125-B*. Use the following wiring repair procedures in order to ensure the integrity of the sealed splice.

Important: You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

Splice Sleeve Color	Crimp Tool Nest Color	Wire Gauge mm^2 / (AWG)
Salmon (yellow-pink)	Red (1)	0.035–0.8 / (18–20)
Blue	Blue (2)	1.0–2.0 / (14–16)
Yellow	Yellow (3)	3.0–5.0 / (10–12)

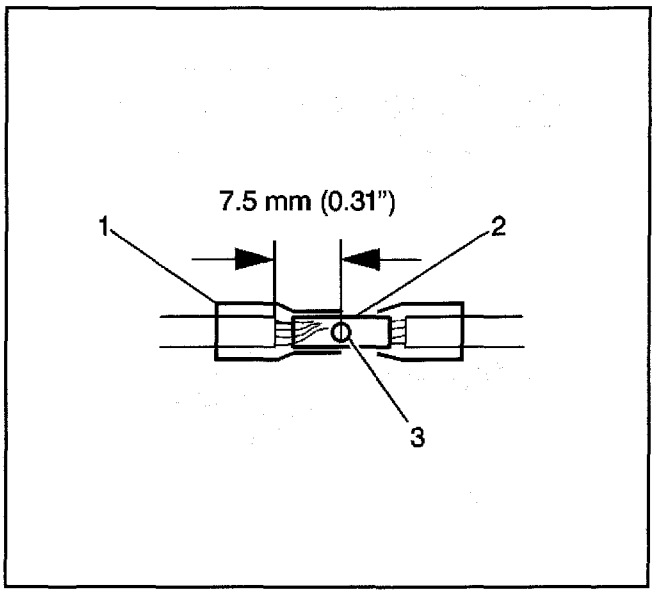
1. Open the harness by removing any tape:
   - Use a sewing seam ripper (available from sewing supply stores) in order to cut open the harness in order to avoid wire insulation damage.
   - Use the crimp and sealed splice sleeves on all types of insulation except tefzel and coaxial.
   - Do not use the crimp and sealed splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

   Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches, or connectors.
3. Strip the insulation:
   - When adding a length of wire to the existing harness, use the same size wire as the original wire.
   - Perform one of the following items in order to find the correct wire size:
     - Find the wire on the schematic and convert the metric size to the equivalent AWG size.
     - Use an AWG wire gauge.
     - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
   - Strip approximately 7.5 mm (0.313 in) of insulation from each wire to be spliced.
   - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
   - If the wire is damaged, repeat this procedure after removing the damaged section.
4. Select the proper sealed splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the splice sleeves and the crimp tool nests.



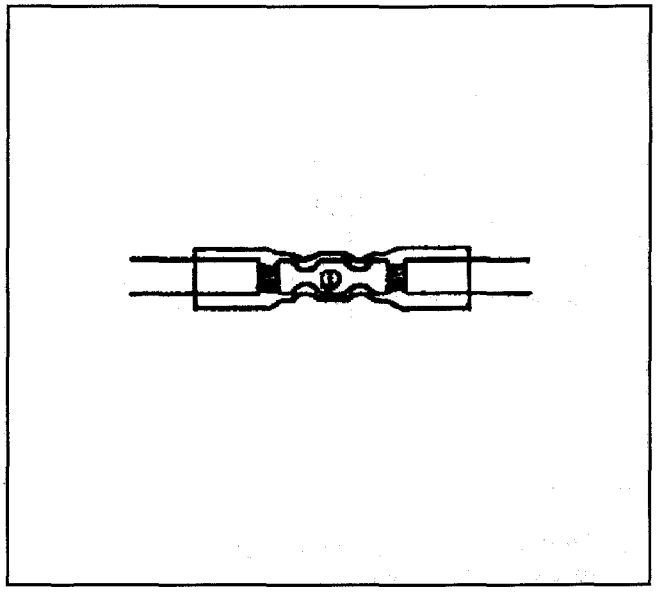
68642

5. Use the Splice Crimp Tool from the *J 38125-B* in order to position the splice sleeve in the proper color nest of the Splice Crimp Tool.



68639

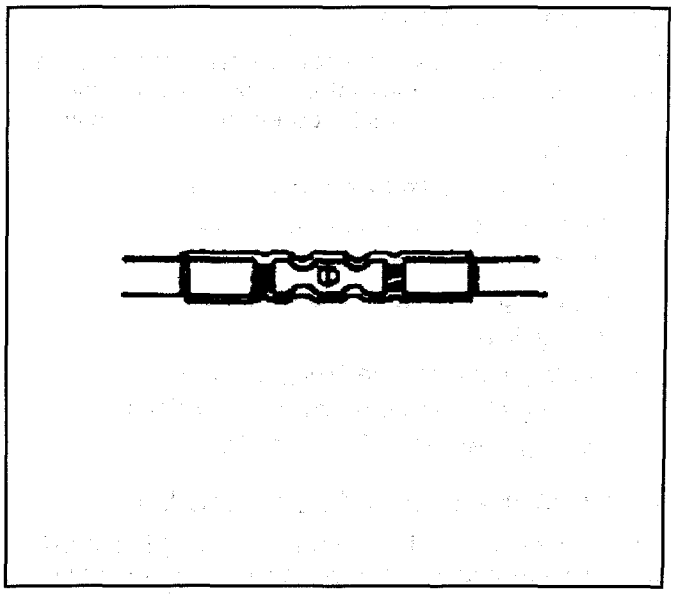
6. Place the splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the splice sleeve in the proper nest.



9502

7. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop.
8. Tightly close the handles of the crimp tool until the crimper handles open when released.

   The crimper handles will not open until you apply the proper amount of pressure to the splice sleeve. Repeat steps 4 and 5 for the opposite end of the splice.



9503

9. Using the heat torch, apply heat to the crimped area of the barrel.
10. Gradually move the heat barrel to the open end of the tubing:
    - The tubing will shrink completely as the heat is moved along the insulation.
    - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

SIR System Wire Splice Repair

Apply a new splice (not sealed) from the *J 38125-B* if damage occurs to any of the original equipment splices (3 wires or more) in the SIR wiring harness. Carefully follow the instructions included in the kit for proper splice clip application.

Connector Position Assurance (CPA)

The connector position assurance (CPA) is a small plastic insert that fits through the locking tabs of all the SIR system electrical connectors. The CPA ensures that the connector halves cannot vibrate apart. You must have the CPA in place in order to ensure good contact between the SIR mating terminals.

Terminal Position Assurance (TPA)

The terminal position assurance (TPA) insert resembles the plastic combs used in the control module connectors. The TPA keeps the terminal securely seated in the connector body. Do not remove the TPA from the connector body unless you remove a terminal for replacement.

Flat Wire Repairs

Notice: The flat wire within the flex wiring harness is not serviceable. If an open or short exists within the flex wiring harness the complete harness must be replaced.

Connector Repairs

The Connector Repairs section contains the following types of connector repair information. Using these elements together will make connector repair faster and easier:

- *Connector Position Assurance Locks.*
- *Terminal Position Assurance Locks.*
- *Push to Seat Connectors.*
- *Repairing Damaged Wire Insulation.*
- *Wiring Repairs.*
- *Splicing Copper Wire Using Splice Clips.*
- *Splicing Copper Wire Using Splice Clips.*
- *Splicing Twisted or Shielded Cable.*

Connector Position Assurance Locks

The Connector Position Assurance (CPA) is a small plastic insert that fits through the locking tabs of all the SIR system electrical connectors. The CPA ensures that the connector halves cannot vibrate apart. You must have the CPA in place in order to ensure good contact between the SIR mating terminals.

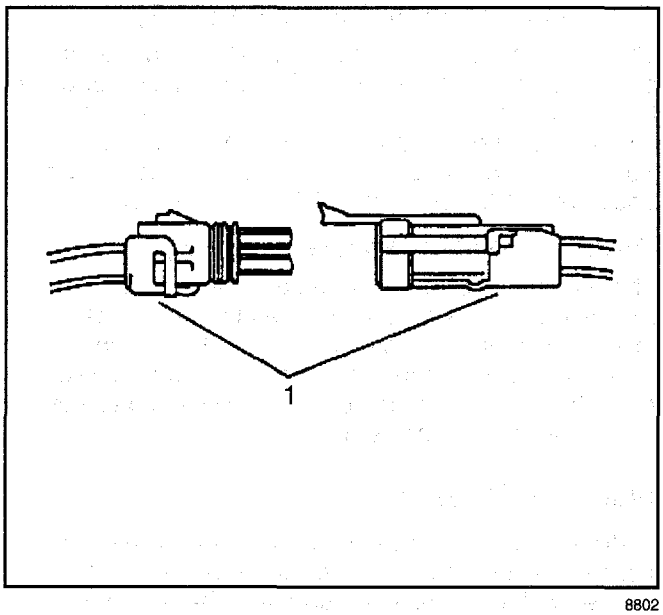
Terminal Position Assurance Locks

The Terminal Position Assurance (TPA) insert resembles the plastic combs used in the control module connectors. The TPA keeps the terminal securely seated in the connector body. Do not remove the TPA from the connector body unless you remove a terminal for replacement.

Push to Seat Connectors

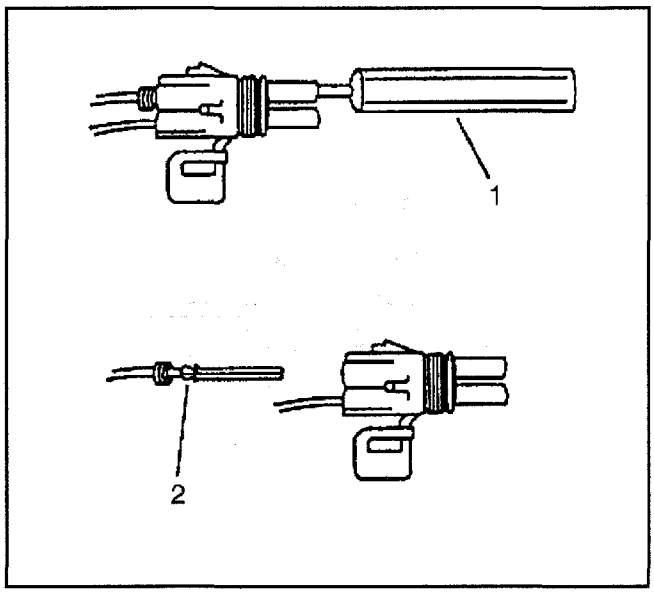
Terminal Removal

Follow the steps below in order to repair push to seat connectors.



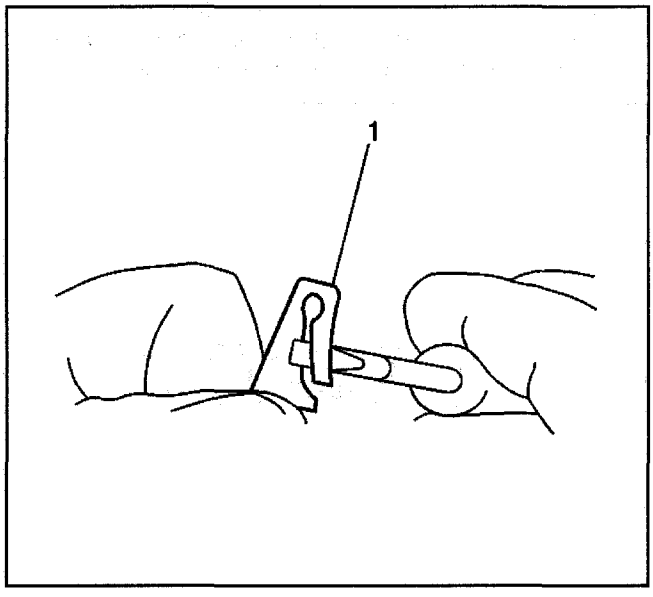
8802

1. Remove the terminal position assurance (TPA) device, the connector position assurance (CPA) device, and/or the secondary lock.
2. Separate the connector halves (1).



8803

3. Use the proper pick or removal tool (1) in order to release the terminal.
4. Gently pull the cable and the terminal (2) out of the back of the connector.



8804

5. Re-form the locking device if you are going to reuse the terminal (1).
6. To repair the terminal, refer to Terminal Repair.

Terminal Repair

1. Slip the cable seal away from the terminal.
2. Cut the wire as close to the terminal as possible.
3. Slip a new cable seal onto the wire.
4. Strip 5 mm (3/16 in) of insulation from the wire
5. Crimp a new terminal to the wire.
6. Solder the crimp with rosin core solder.
7. Slide the cable seal toward the terminal.
8. Crimp the cable seal and the insulation.
9. If the connector is outside of the passenger compartment, apply grease to the connector.

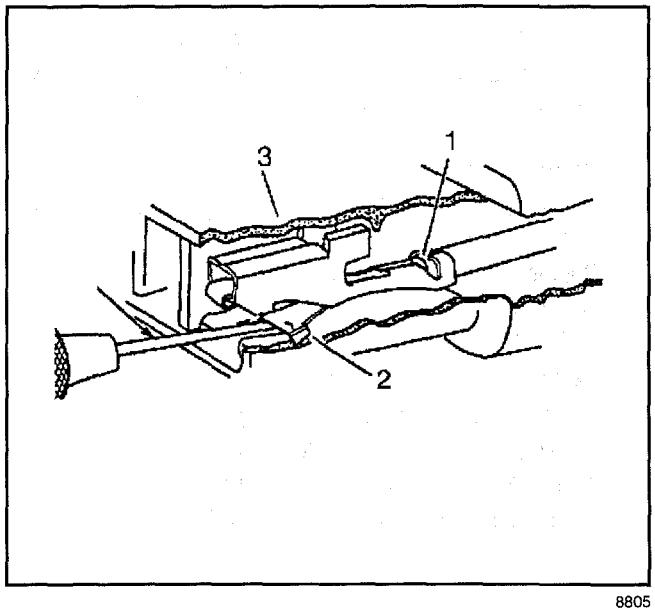
Reinstalling Terminal

1. In order to reuse a terminal or lead assembly. Refer to *Wiring Repairs.*
2. Ensure that the cable seal is kept on the terminal side of the splice.
3. Insert the lead from the back until it catches.
4. Install the TPA, CPA and/or the secondary locks.

Pull to Seat Connectors

Terminal Removal

Follow the steps below in order to repair pull-to-seat connectors.



8805

1. Remove the terminal position assurance (TPA) device, the connector position assurance (CPA) device, and/or the secondary lock.
2. Separate the connector halves.
3. Using the proper pick or removal tool (4) insert into the front of the connector body.
4. Grasp the wire at the back of the connector body and gently pull the terminal (1) from the connector body (3).
5. Inspect the terminal for damage, if damaged refer to Terminal Repair.
6. Reform the locking tang (2) if the terminal is being reused.

Terminal Repair

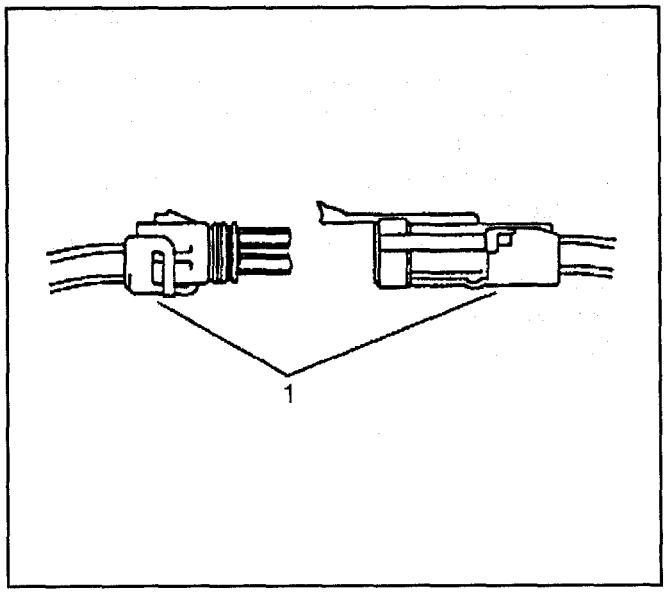
1. Slip the cable seal away from the terminal.
2. Cut the wire as close to the terminal as possible.
3. Slip a new cable seal onto the wire.
4. Strip 5 mm (3/16 in) of insulation from the wire.
5. Crimp a new terminal to the wire.
6. Solder the crimp with rosin core solder.
7. Slide the cable seal toward the terminal.
8. Crimp the cable seal and the insulation.
9. If the connector is outside of the passenger compartment, apply grease to the connector.

Terminal Installation

1. Inspect the terminal for damage. If damaged refer to Terminal Repair.
2. Reform the locking tang (2) if the terminal is being reused.
3. Ensure that the cable seal is kept on the terminal side of the splice.
4. Insert the wire into the back of the connector body. Push until the terminal locking tang locks into the connector body.
5. Install the TPA, CPA and/or the secondary locks.

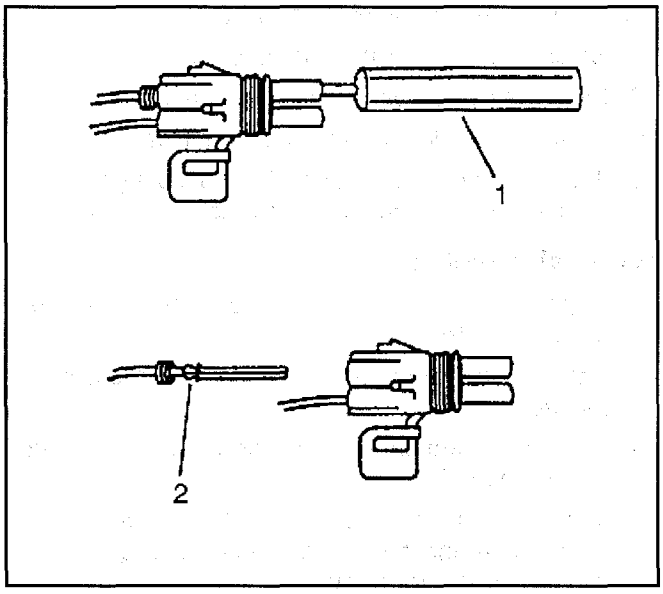
Weather Pack Connectors

The following is the proper procedure for the repair of Weather Pack® Connectors.



8802

- Separate the connector halves (1).
- Open the secondary lock. A secondary lock aids in terminal retention and is usually molded to the connector (1).
- Grasp the wire and push the terminal to the forward most position. Hold the wire in this position.



8803

- Insert the Weather Pack® terminal removal tool into the front (mating end) of the connector cavity until it rests on the cavity shoulder (1).
- Gently pull on the wire to remove the terminal through the back of the connector (2).

Important: Never use force to remove a terminal from a connector.

- Inspect the terminal and connector for damage. Repair as necessary. Refer to *Repairing Connector Terminals.*
- Reform the lock tang (2) and reset terminal in connector body.
- Close secondary locks and join connector halves.
- Verify that circuit is complete and working satisfactorily.
- Perform system check.

Repairing Connector Terminals

Use the following repair procedures in order to repair the following:

- Push to Seat terminals
- Pull to Seat terminals
- Weather Pack® terminals

Some terminals do not require all of the steps shown. Skip the steps that do not apply for your immediate terminal repair. The *J 38125-B* Terminal Repair Kit contains further information.

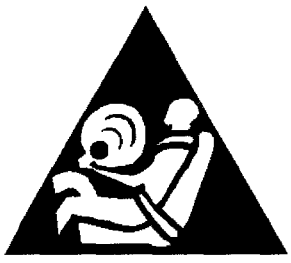
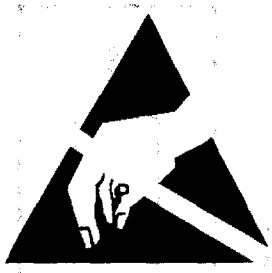
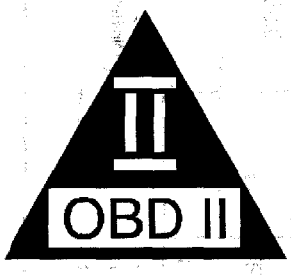
1. Cut off the terminal between the core and the insulation crimp. Minimize any wire loss.
   For Weather Pack® terminals, remove the seal.
2. Apply the correct seal per gauge size of the wire.
   For Weather Pack® terminals, slide the seal back along the wire in order to enable insulation removal.
3. Remove the insulation.
4. For Weather Pack® terminals only, align the seal with the end of the cable insulation.
5. Position the strip in the terminal.
   For Weather Pack® terminals, position the strip and seal in the terminal.
6. Hand crimp the core wings.
7. Hand crimp the insulation wings.
   For Weather Pack® terminals, hand crimp the insulation wings around the seal and the cable.
8. Solder all of the hand crimp terminals.

Schematic and Routing Diagrams

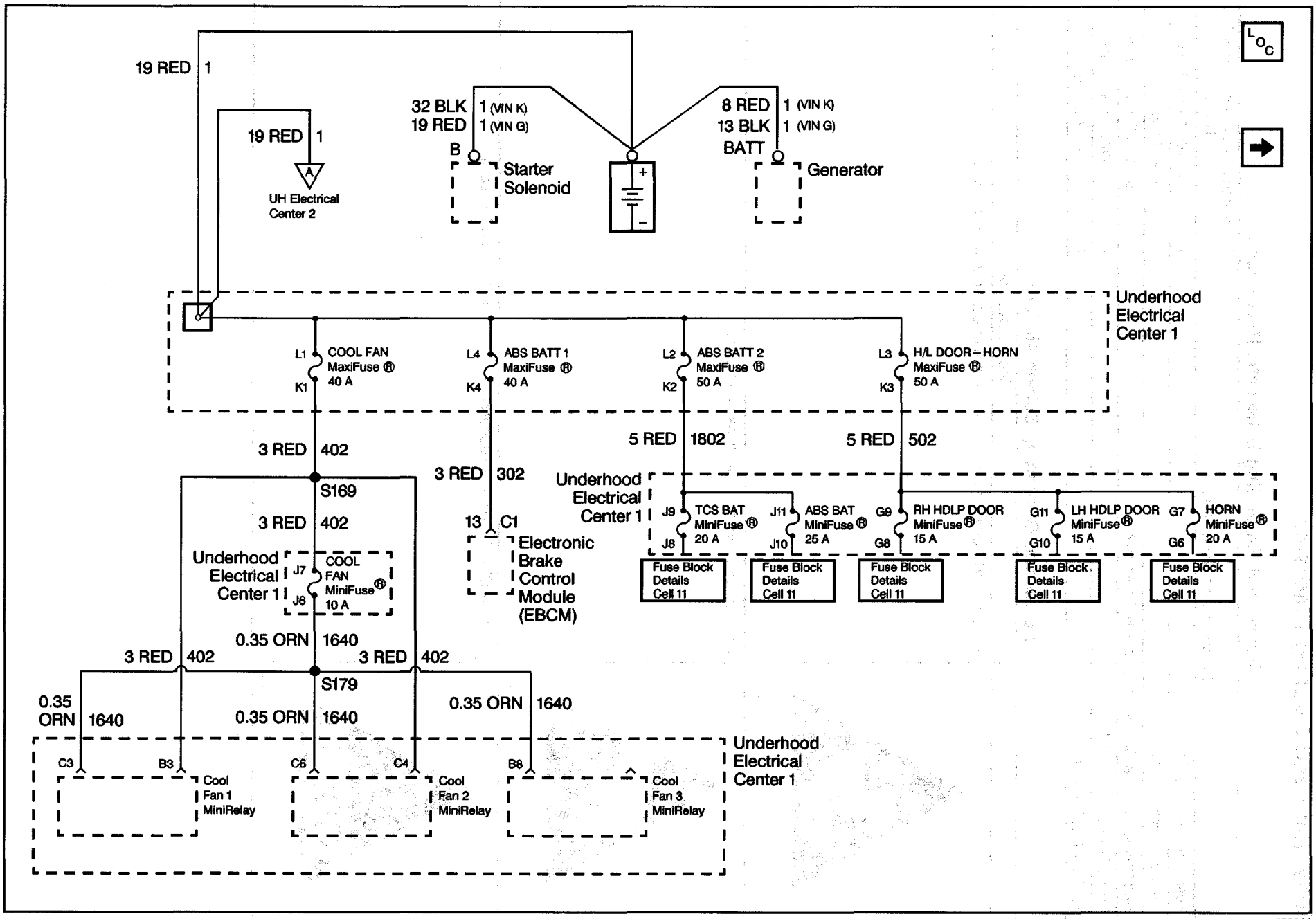
Power and Grounding Schematic References

Reference on Schematic	Section Number Subsection Name
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Headlights: Daytime Running Lights (DRL) Cell 102	8—Lighting Systems
Power Distribution Cell 10	8—Wiring Systems
Engine Electrical Cell 30	6—Engine

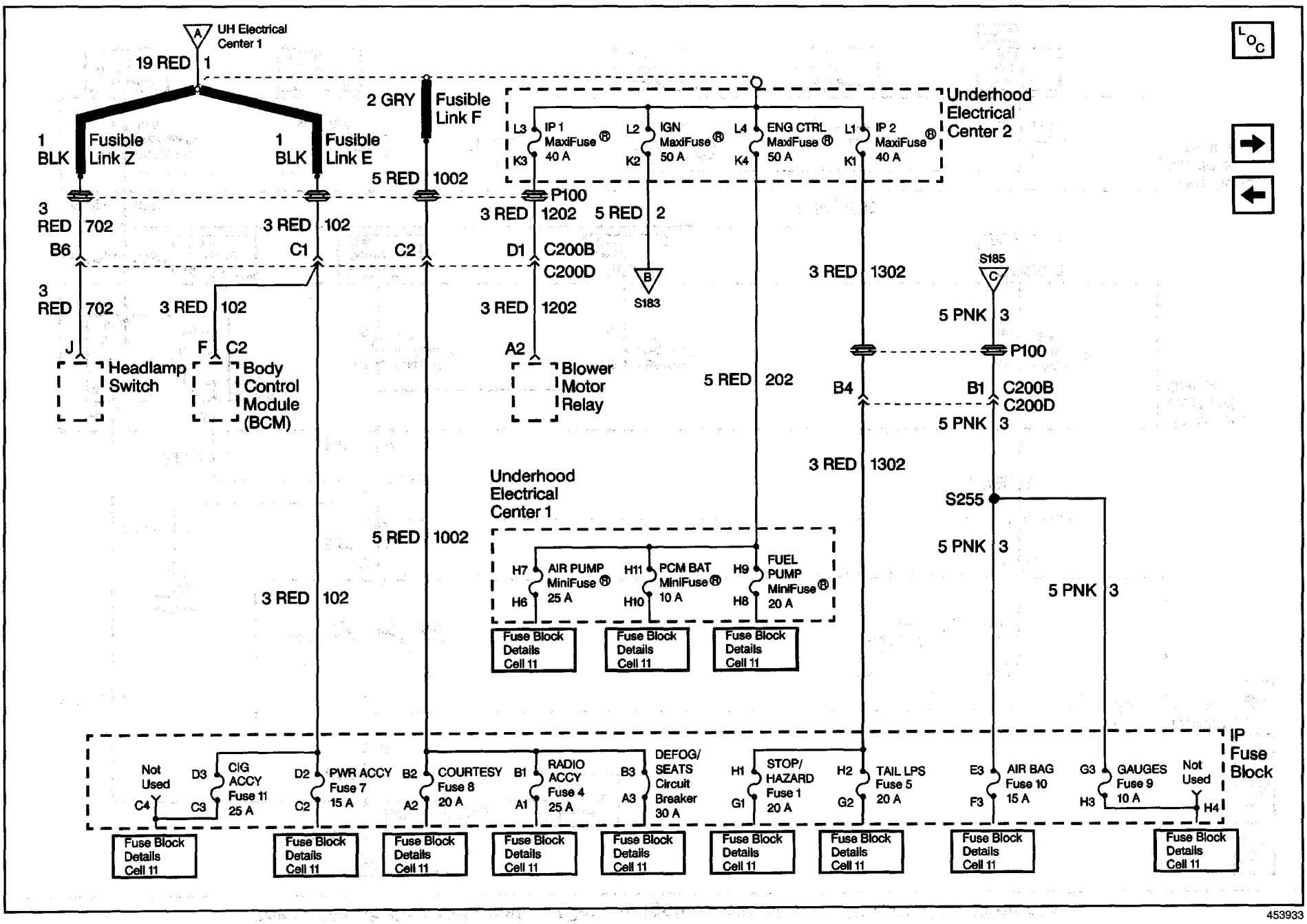
Power and Grounding Schematic Icons

Icon	Icon Definition
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19385	Refer to *OBD II Symbol Description Notice* in Cautions and Notices.

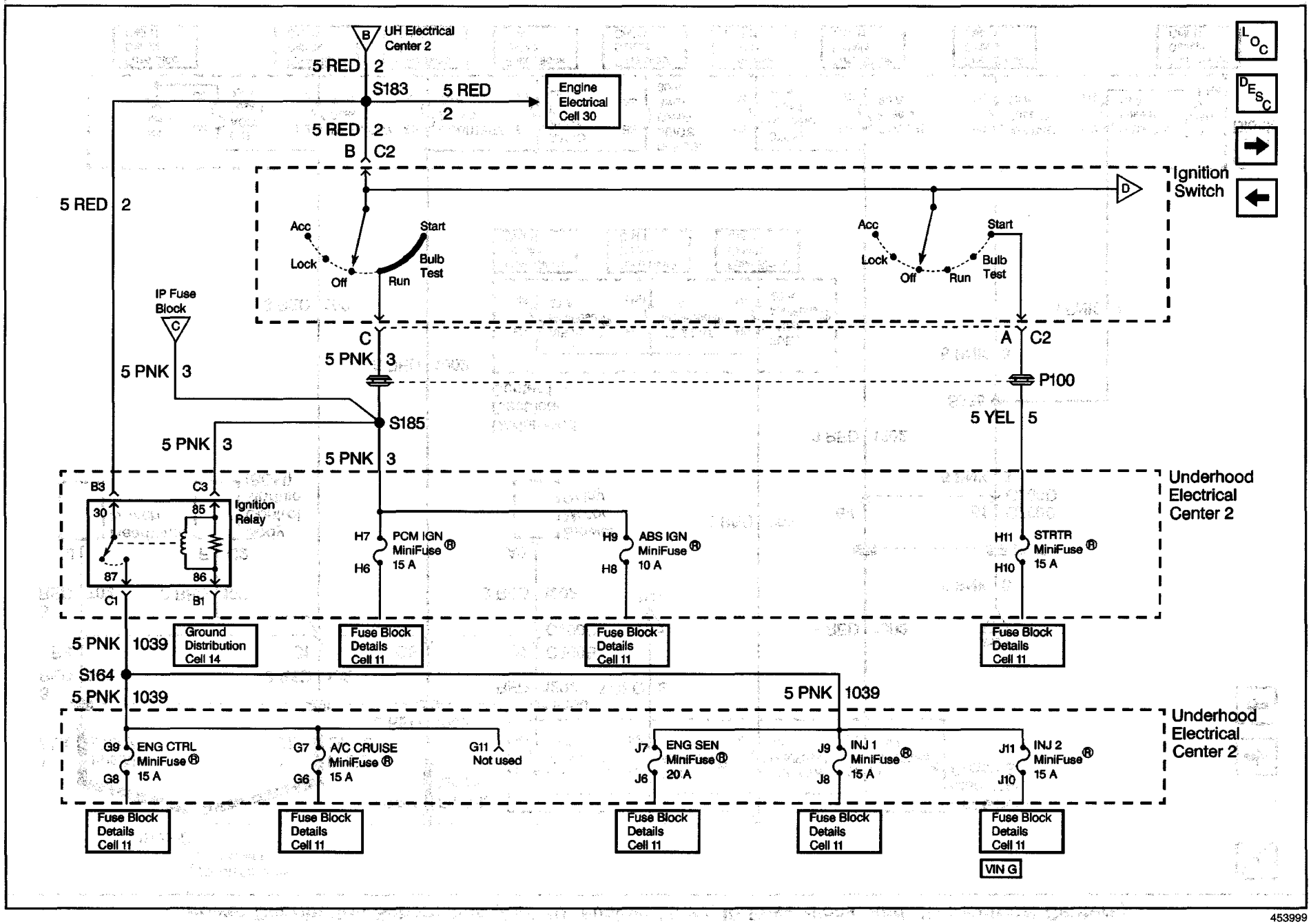
Power Distribution Schematics (Cell 10: Battery and UH Electrical Center 1)



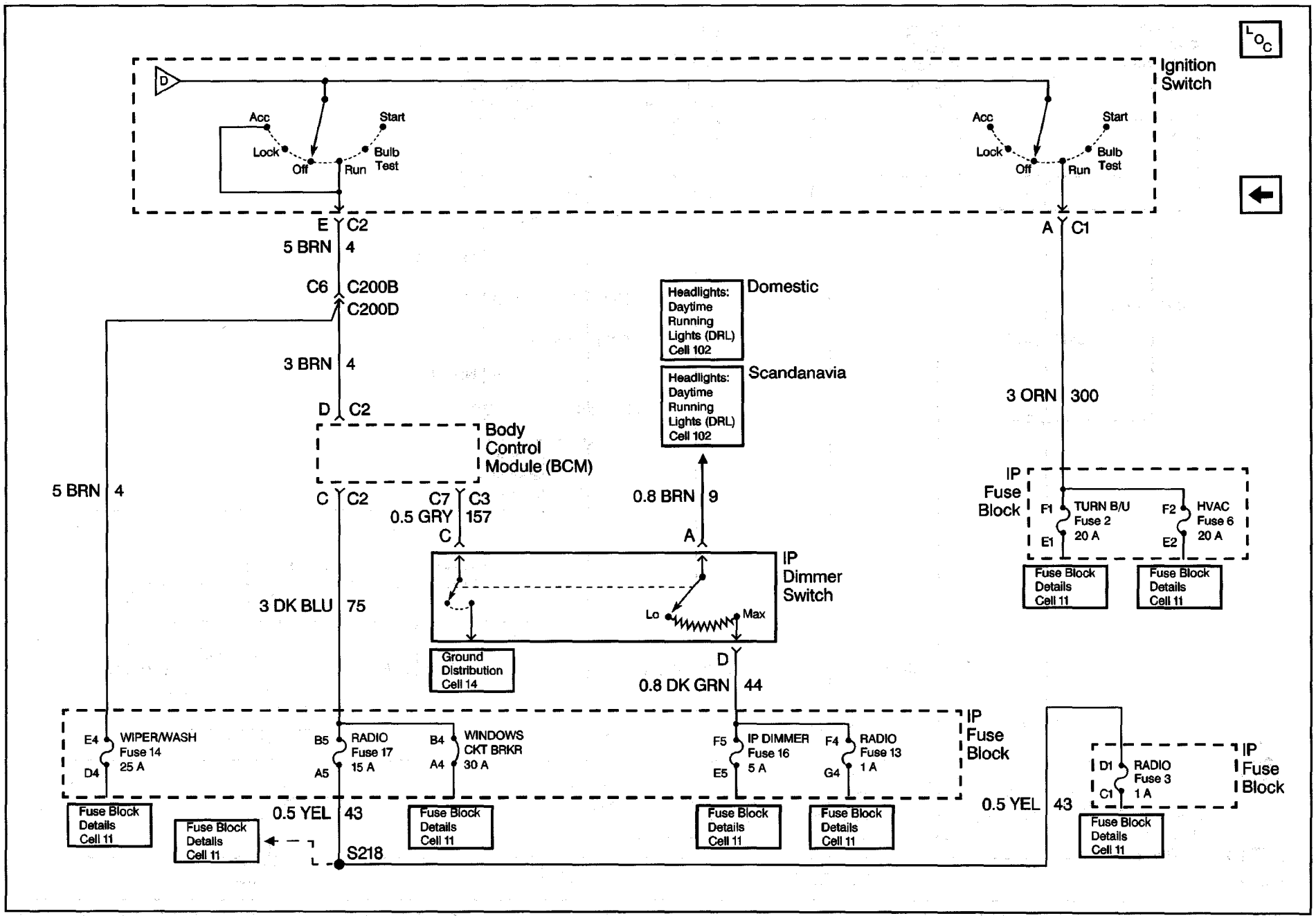
Power Distribution Schematics (Cell 10: Fusible Links, IP Fuse Block, and UH Electrical Centers)



Power Distribution Schematics (Cell 10: Ignition Switch and UH Electrical Center 2)

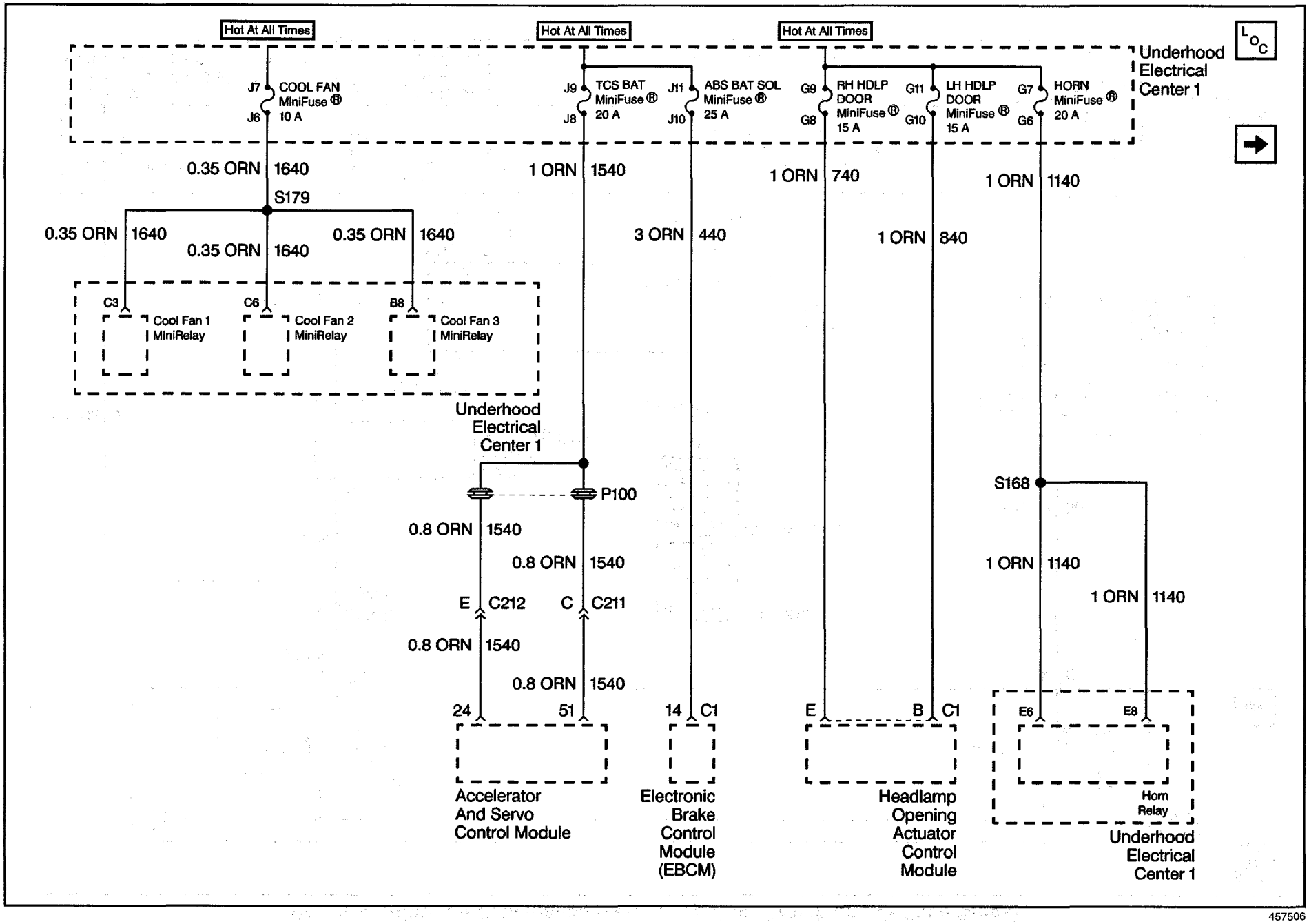


Power Distribution Schematics (Cell 10: Ignition Switch and IP Fuse Block)

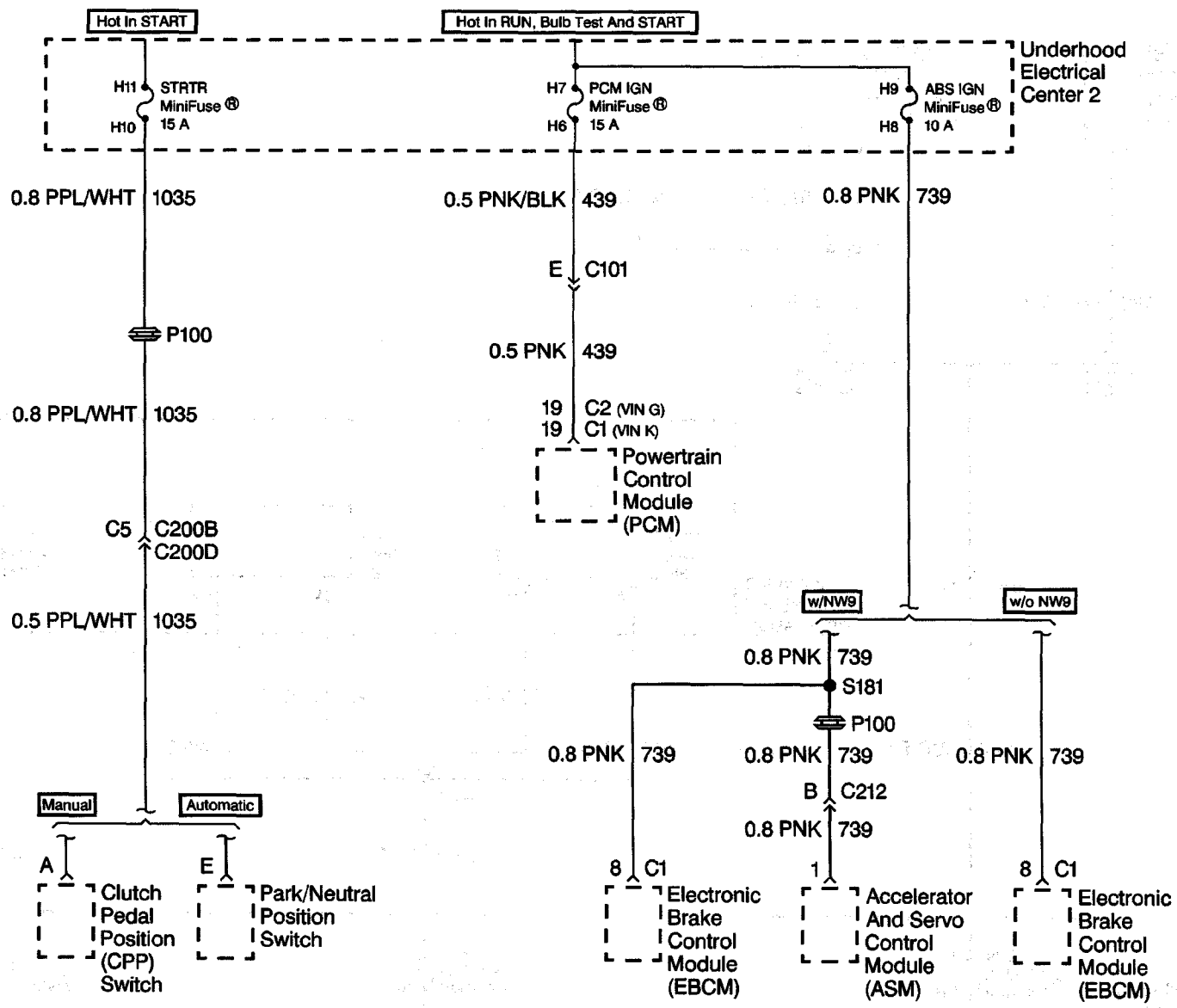


454006

Fuse Block Details Schematics (Cell 11: COOL FAN, TCS BAT, ACS BAT SOL, RH HDLP DOOR, LH HDLP DOOR, and HORN Fuses)

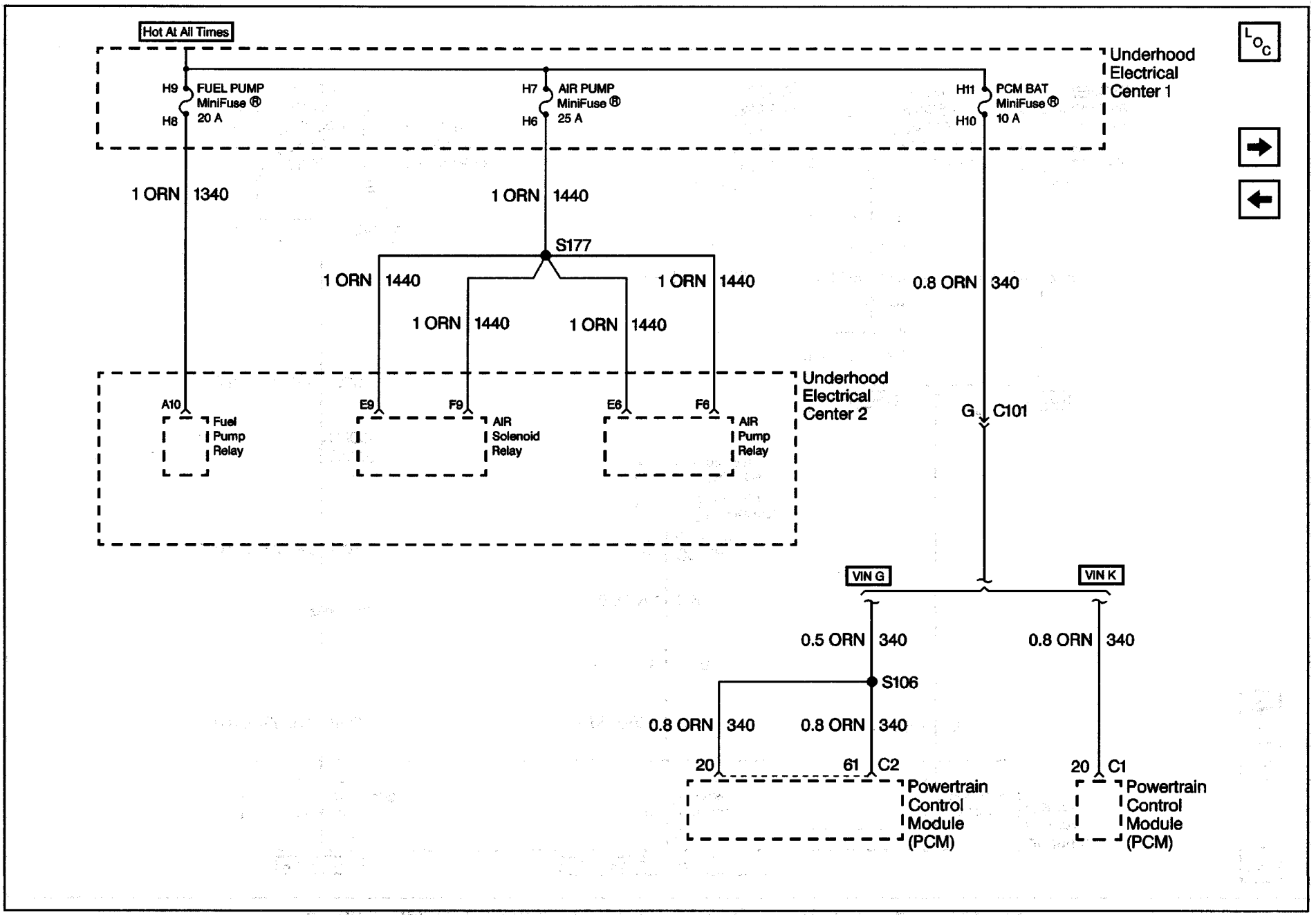


Fuse Block Details Schematics (Cell 11: STRTR, PCM IGN, and ABS IGN Fuse)

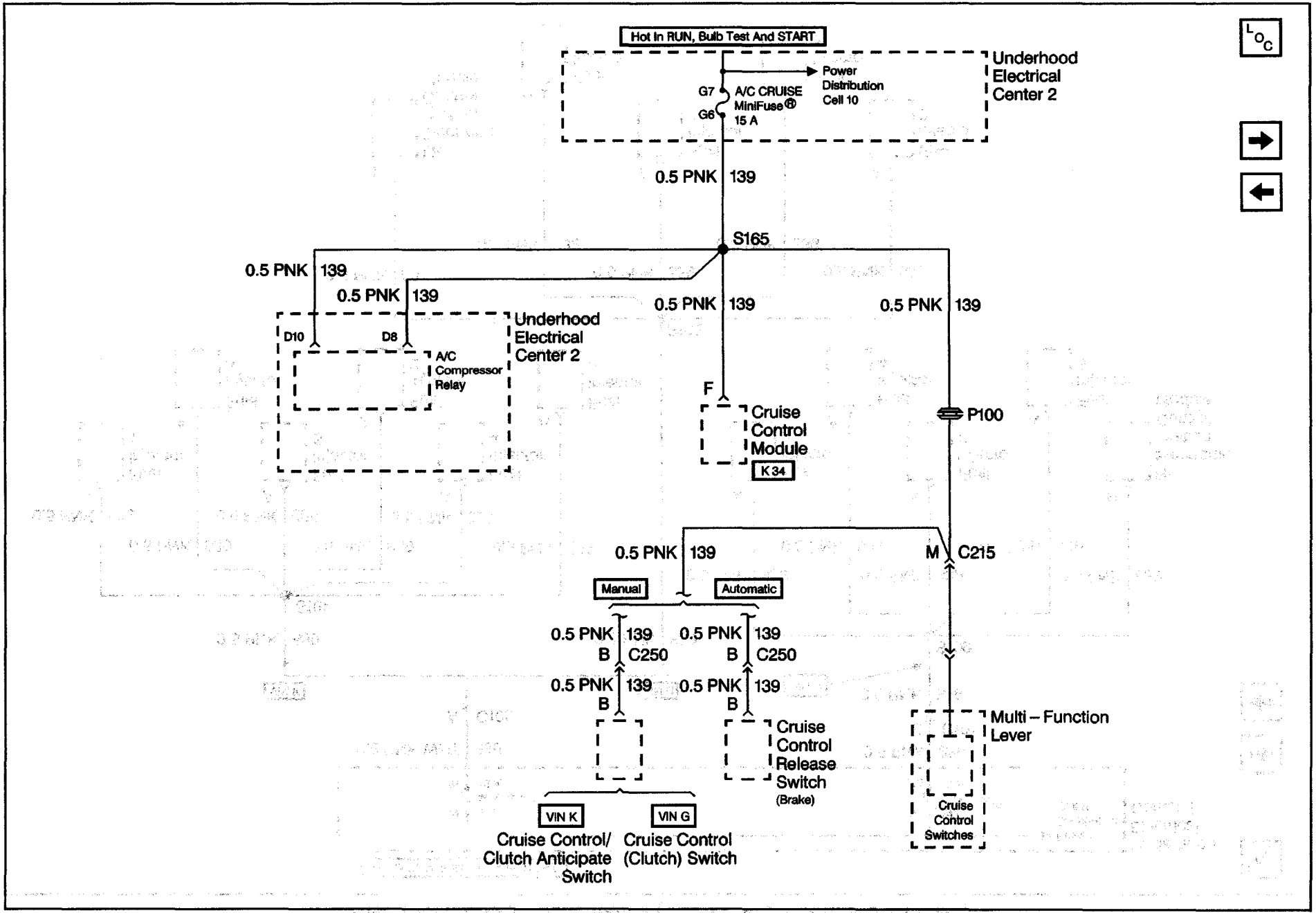


454047

Fuse Block Details Schematics (Cell 11: Fuel Pump, Air Pump, and PCM BAT Fuses)

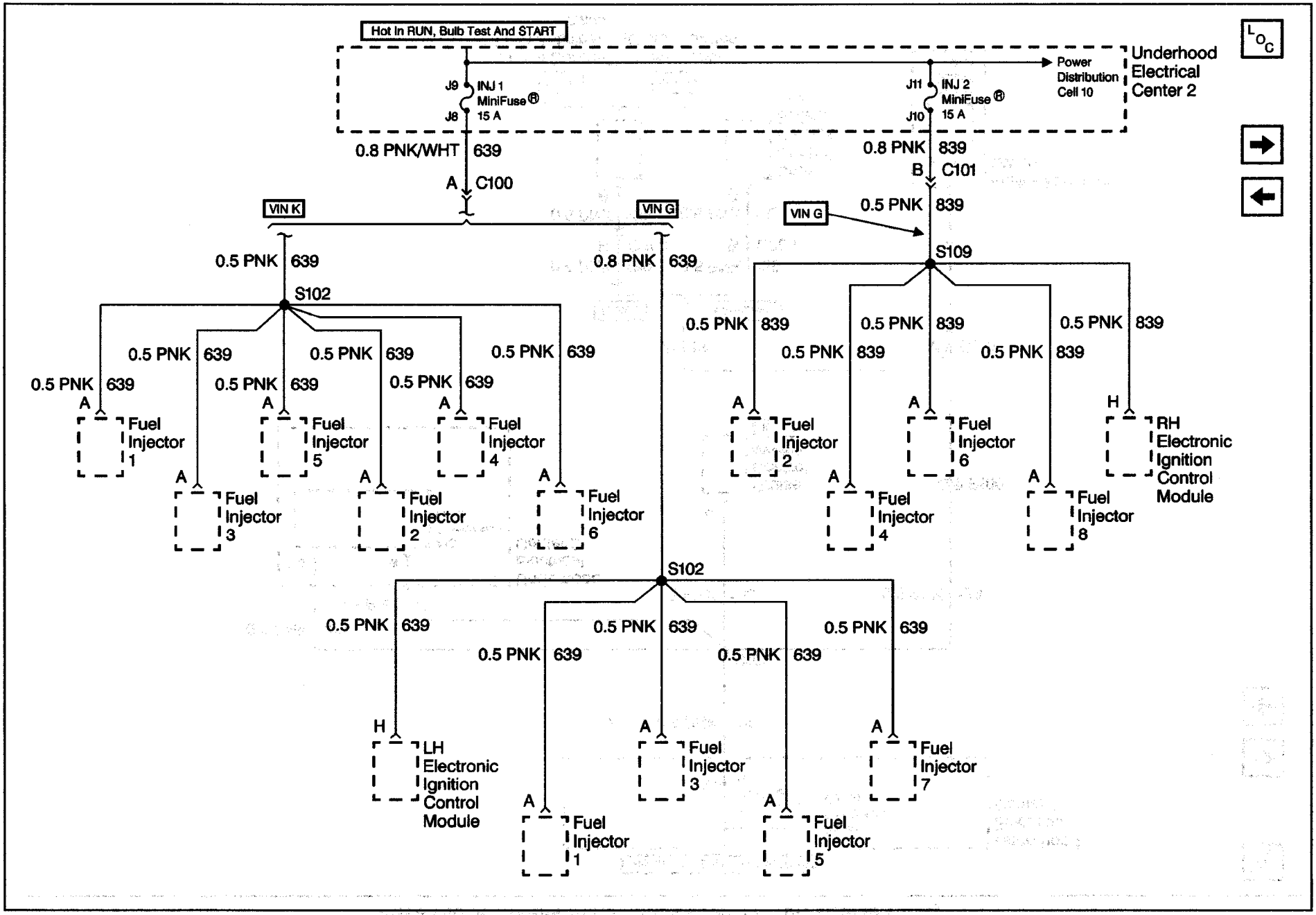


Fuse Block Details Schematics (Cell 11: A/C Cruise Fuse)

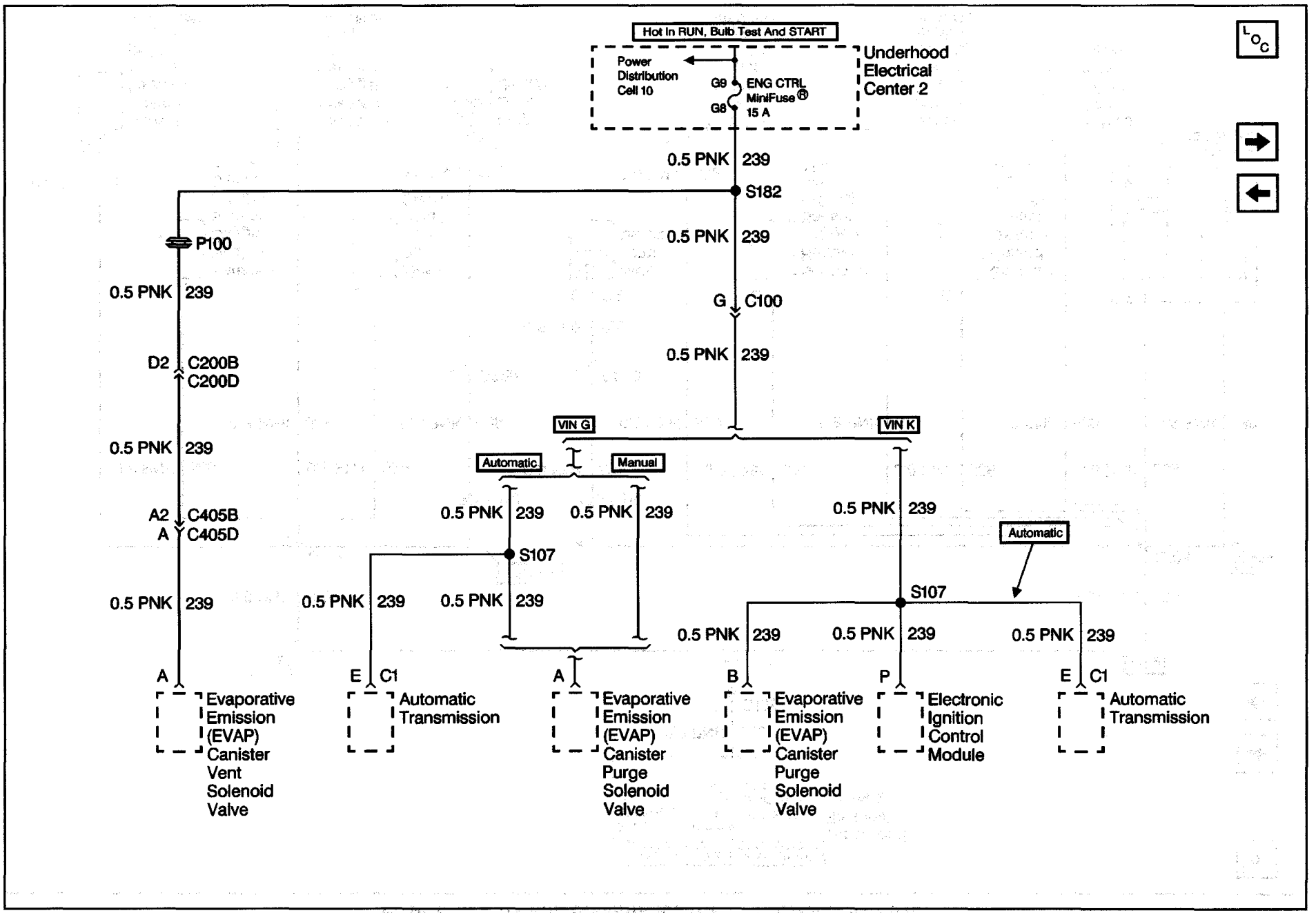


454056

Fuse Block Details Schematics (Cell 11: INJ 1, and INJ 2 Fuses)

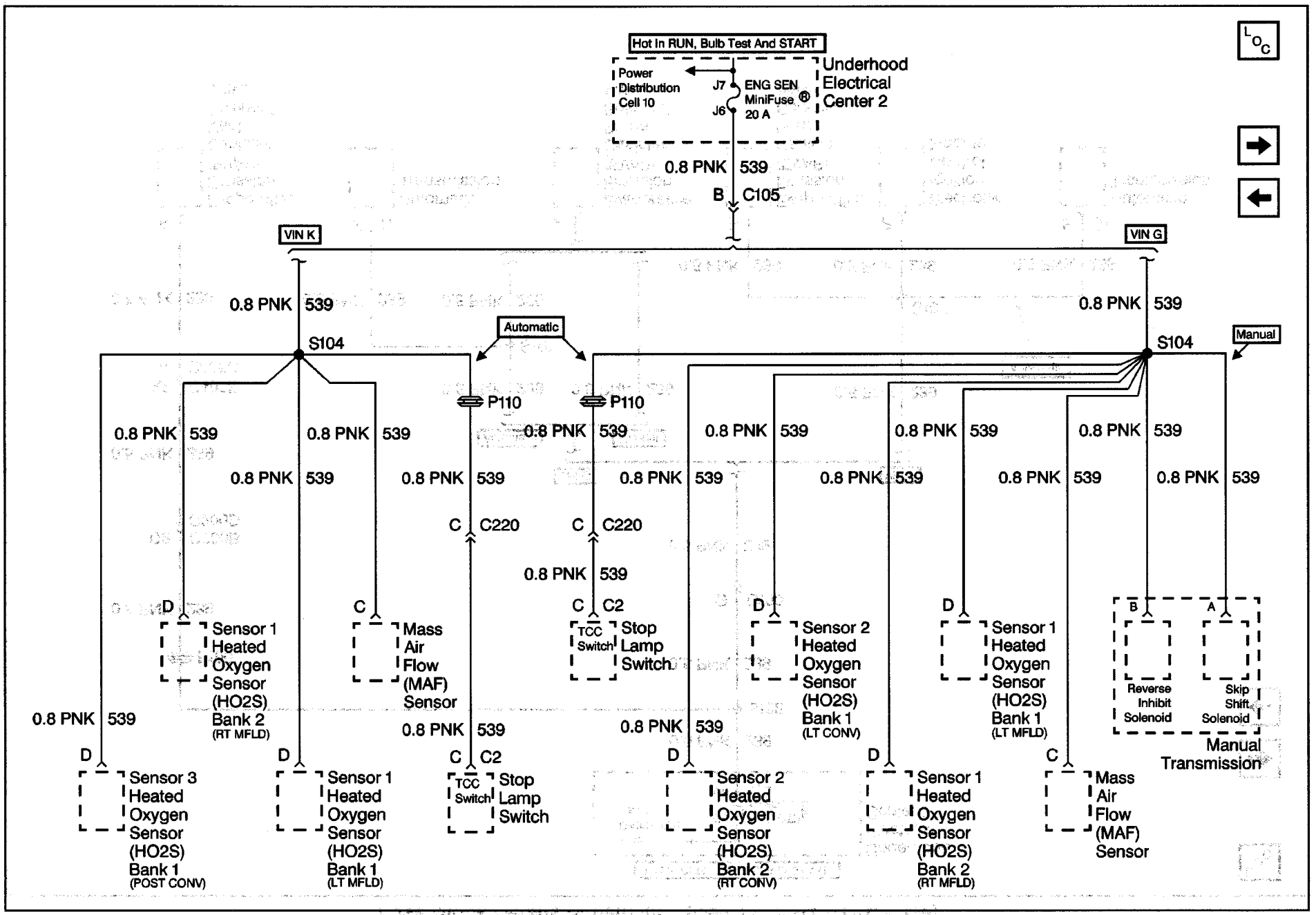


Fuse Block Details Schematics (Cell 11: ENG CTRL Fuse)

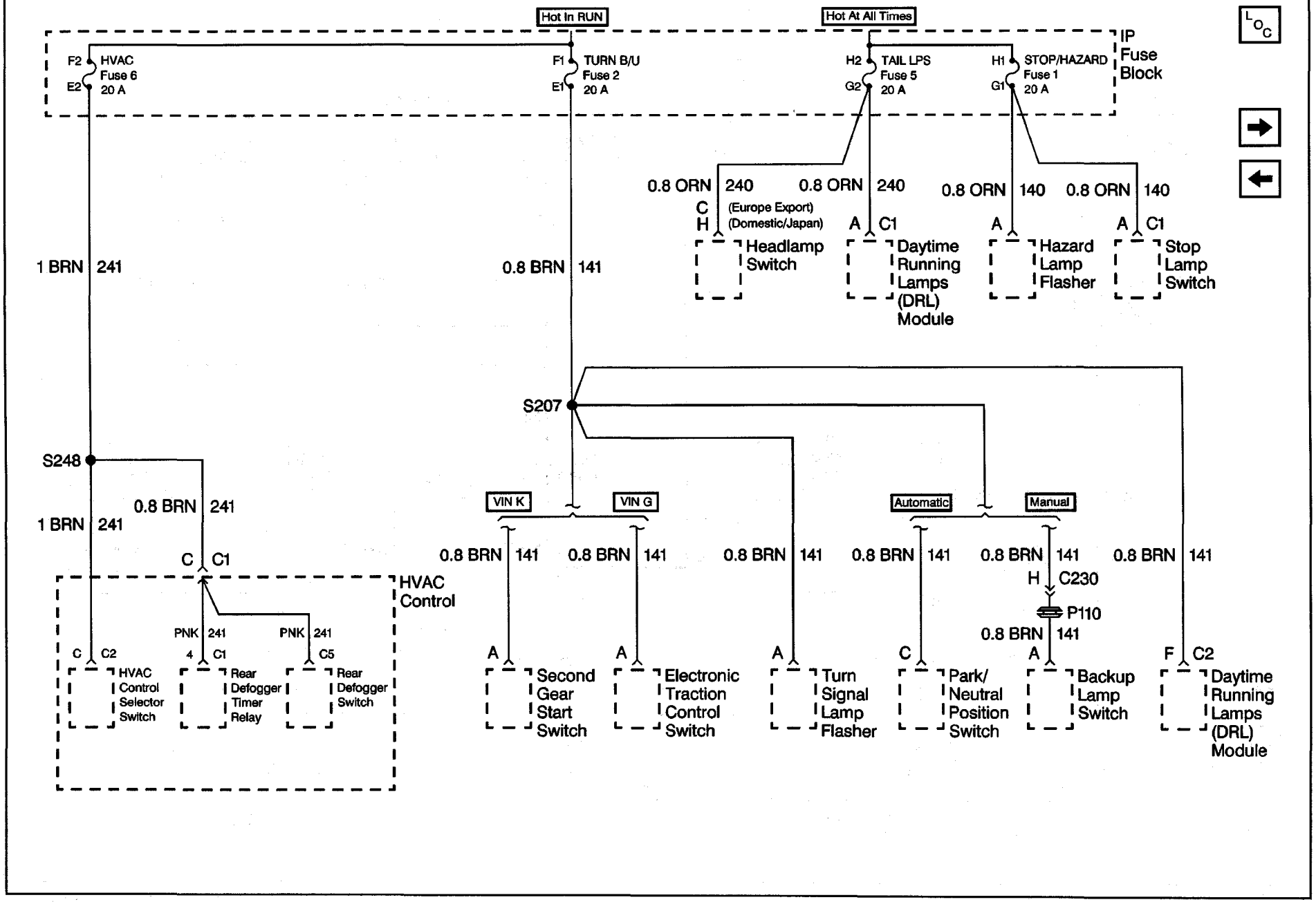


454067

Fuse Block Details Schematics (Cell 11: ENG SEN Fuse)

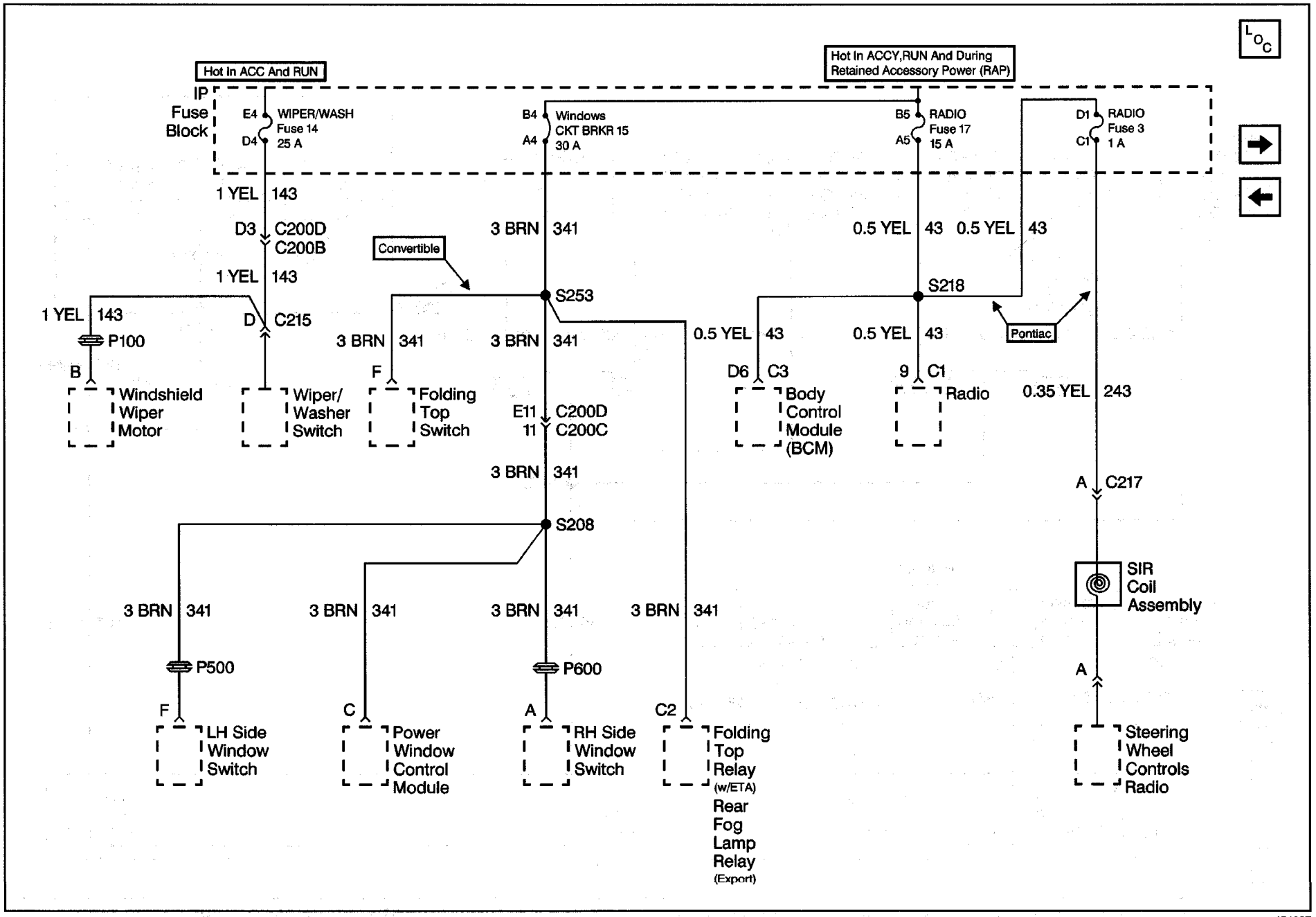


Fuse Block Details Schematics (Cell 11: HVAC Fuse 6, TURN B/U Fuse 2, TAIL LPS Fuse 5, and STOP HAZARD Fuse 1)

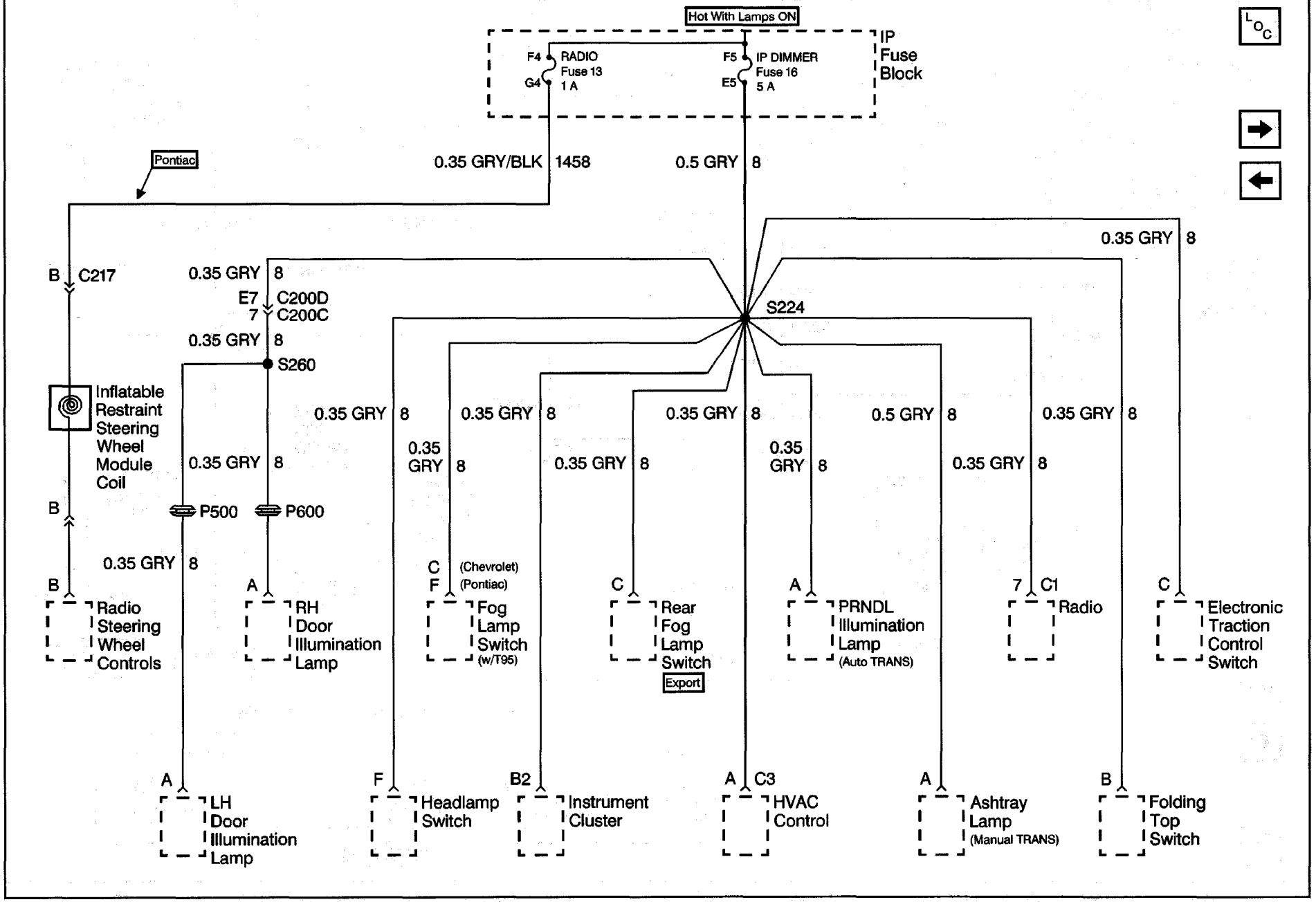


454082

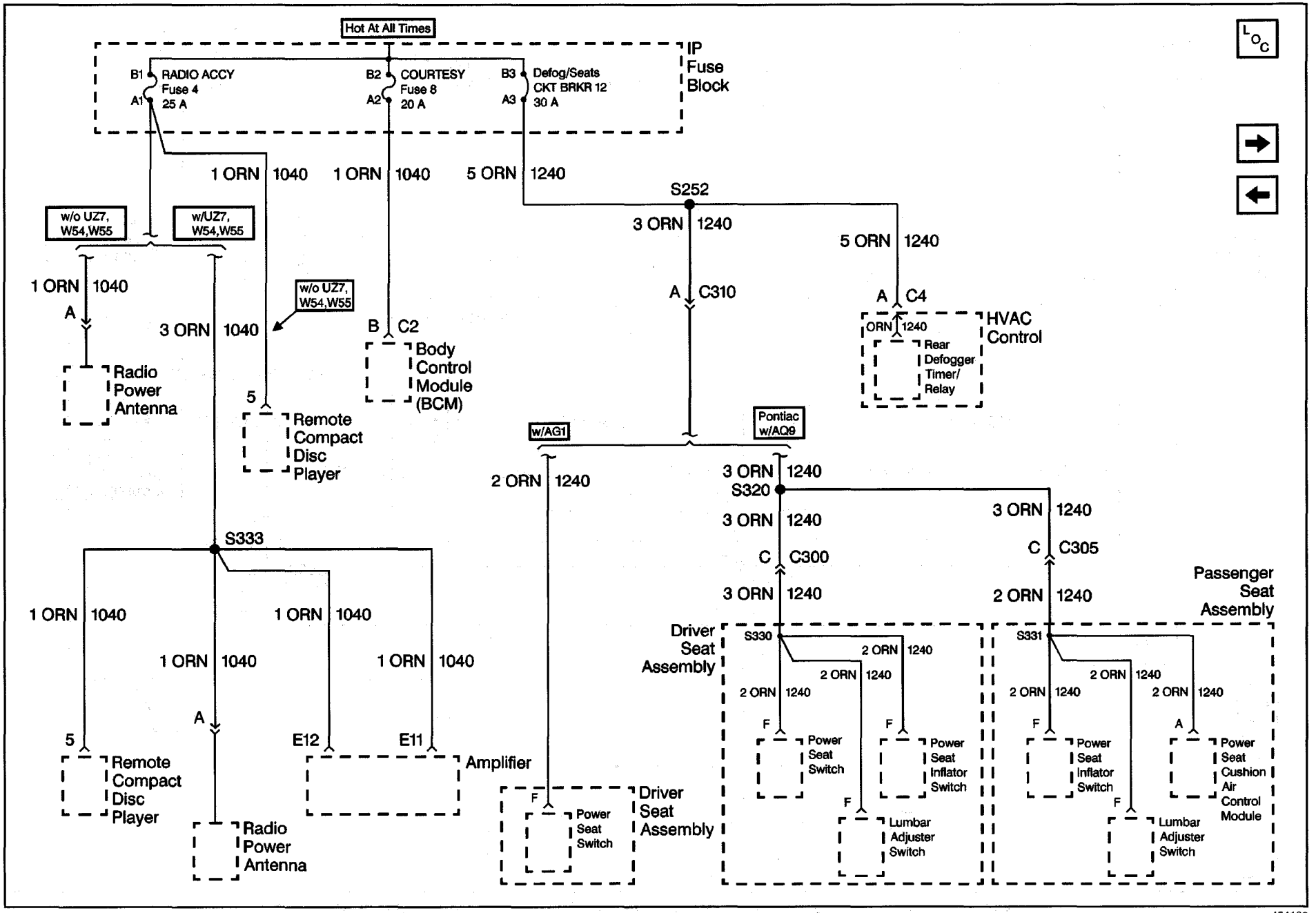
Fuse Block Details Schematics (Cell 11: WIPER/WASH Fuse 14, Windows CKT BRKR 15, RADIO Fuse 17, and RADIO Fuse 3)



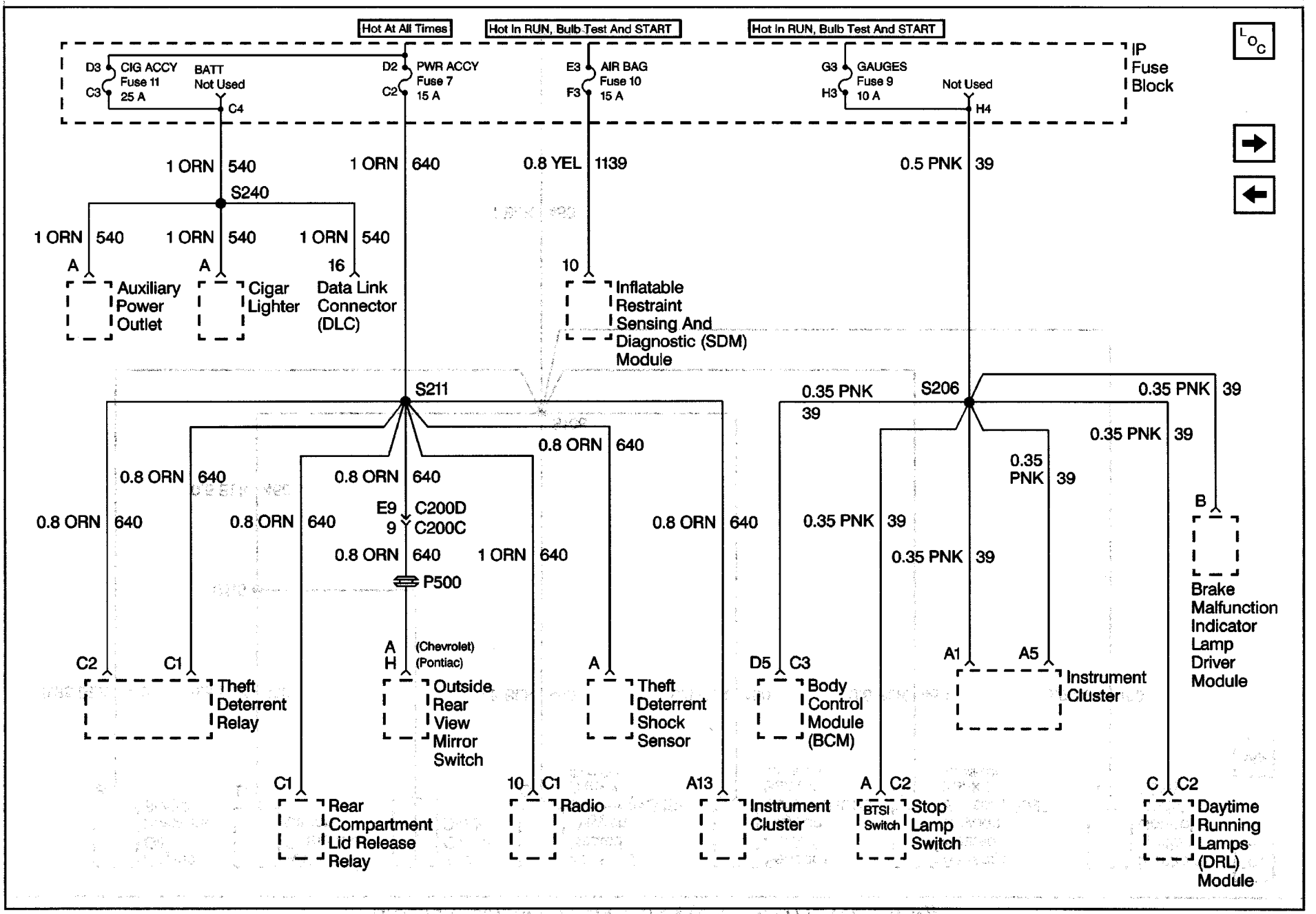
Fuse Block Details Schematics (Cell 11: RADIO Fuse 13 and IP DIMMER Fuse 16)



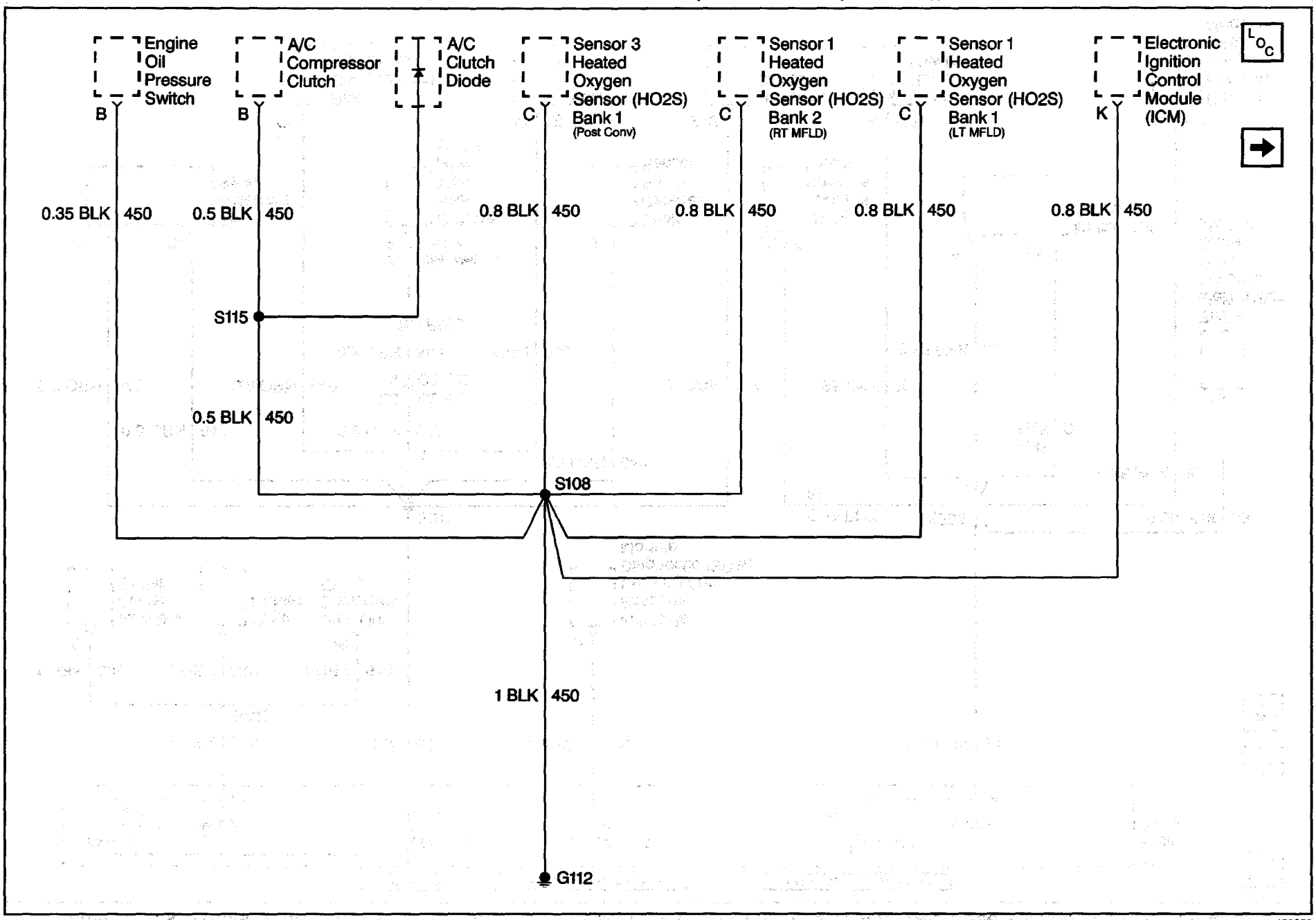
Fuse Block Details Schematics (Cell 11: RADIO ACCY Fuse 4, COURTESY Fuse 8, and Defog/Seats CKT BRKR 12)



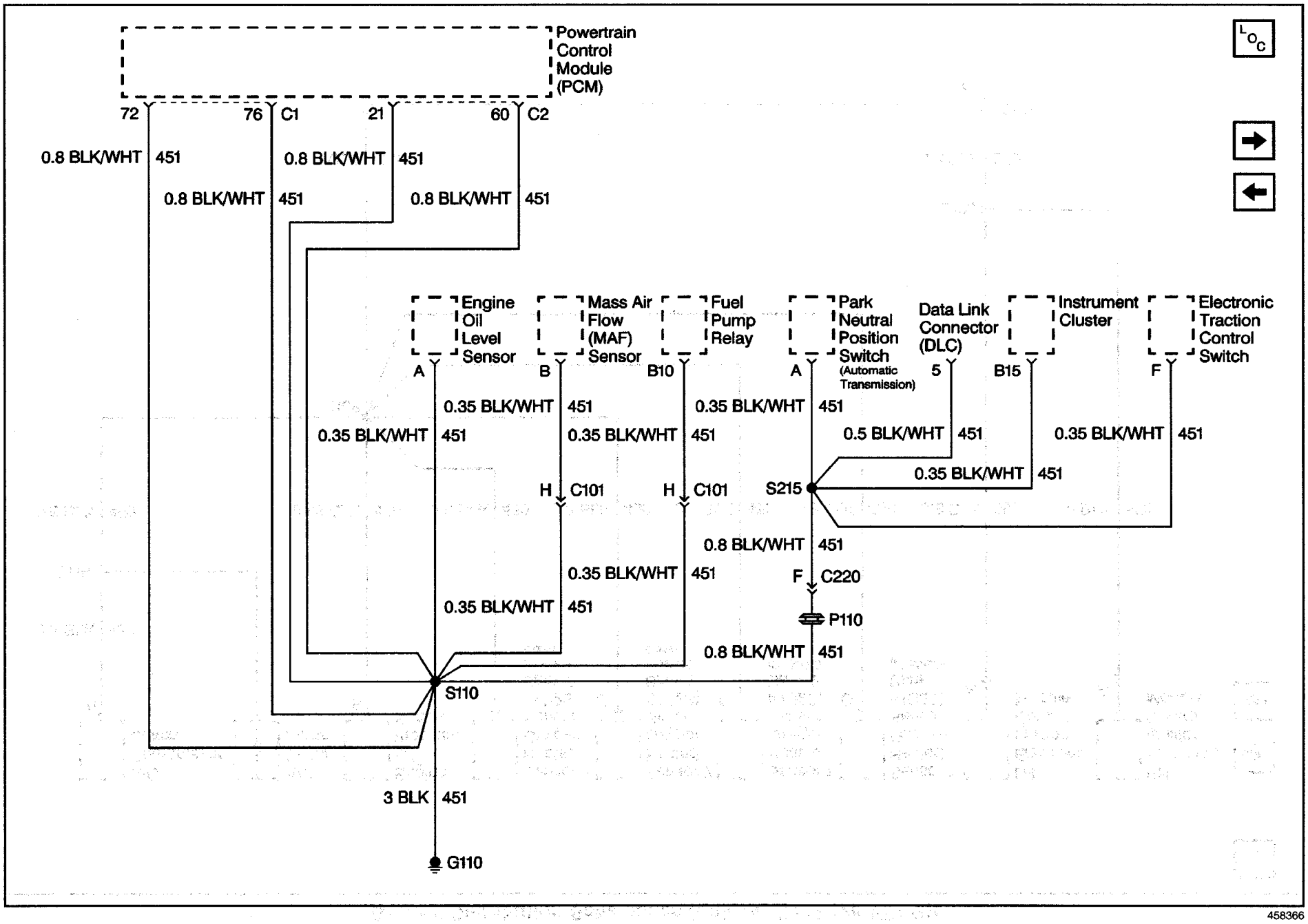
Fuse Block Details Schematics (Cell 11: CIG ACCY Fuse 11, PWR ACCY Fuse 7, AIR BAG Fuse 10, and GAUGES Fuse 9)



Ground Distribution Schematics (Cell 14: G112 (V6 VIN K))

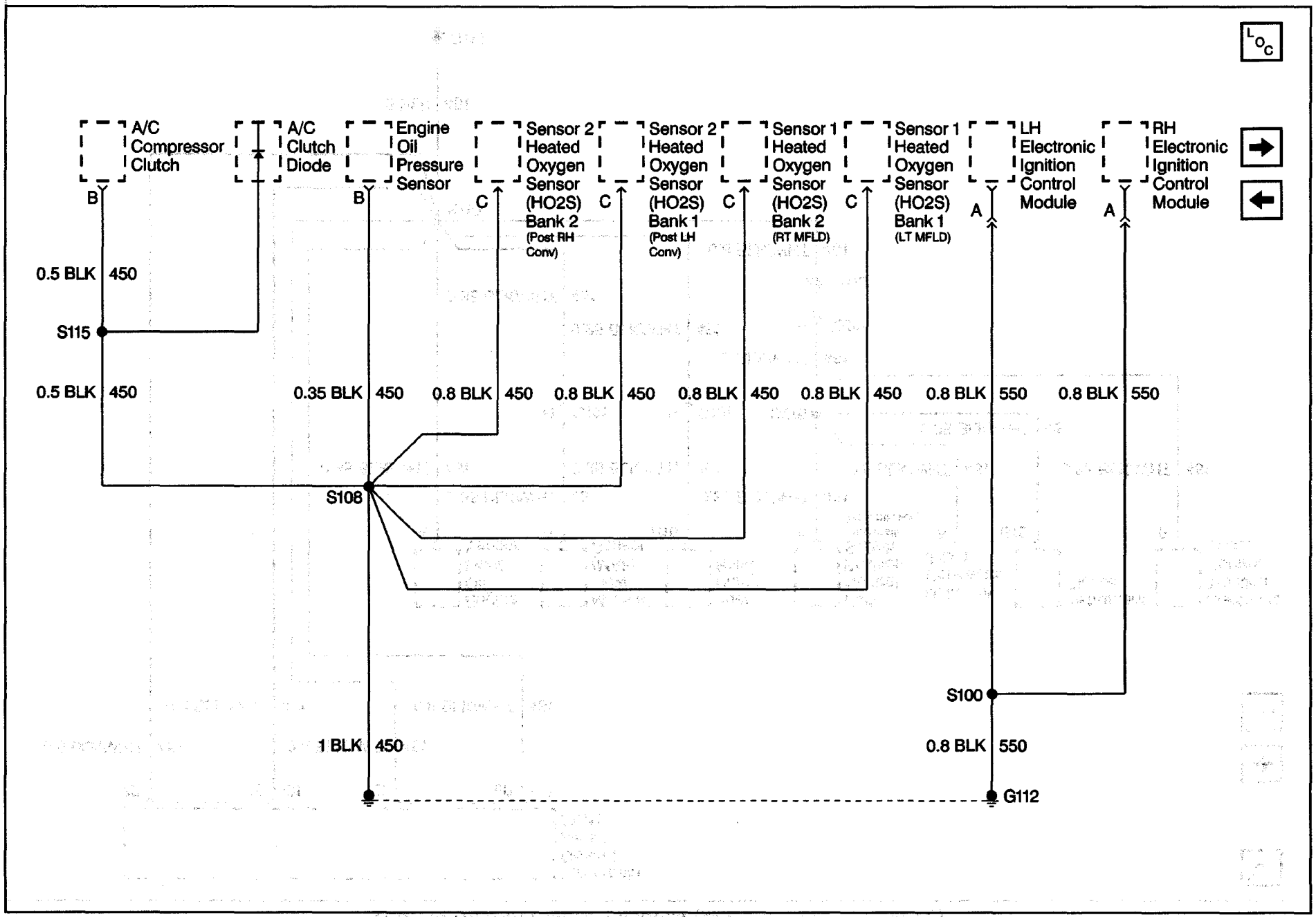


Ground Distribution Schematics (Cell 14: G110 (V6 VIN K))

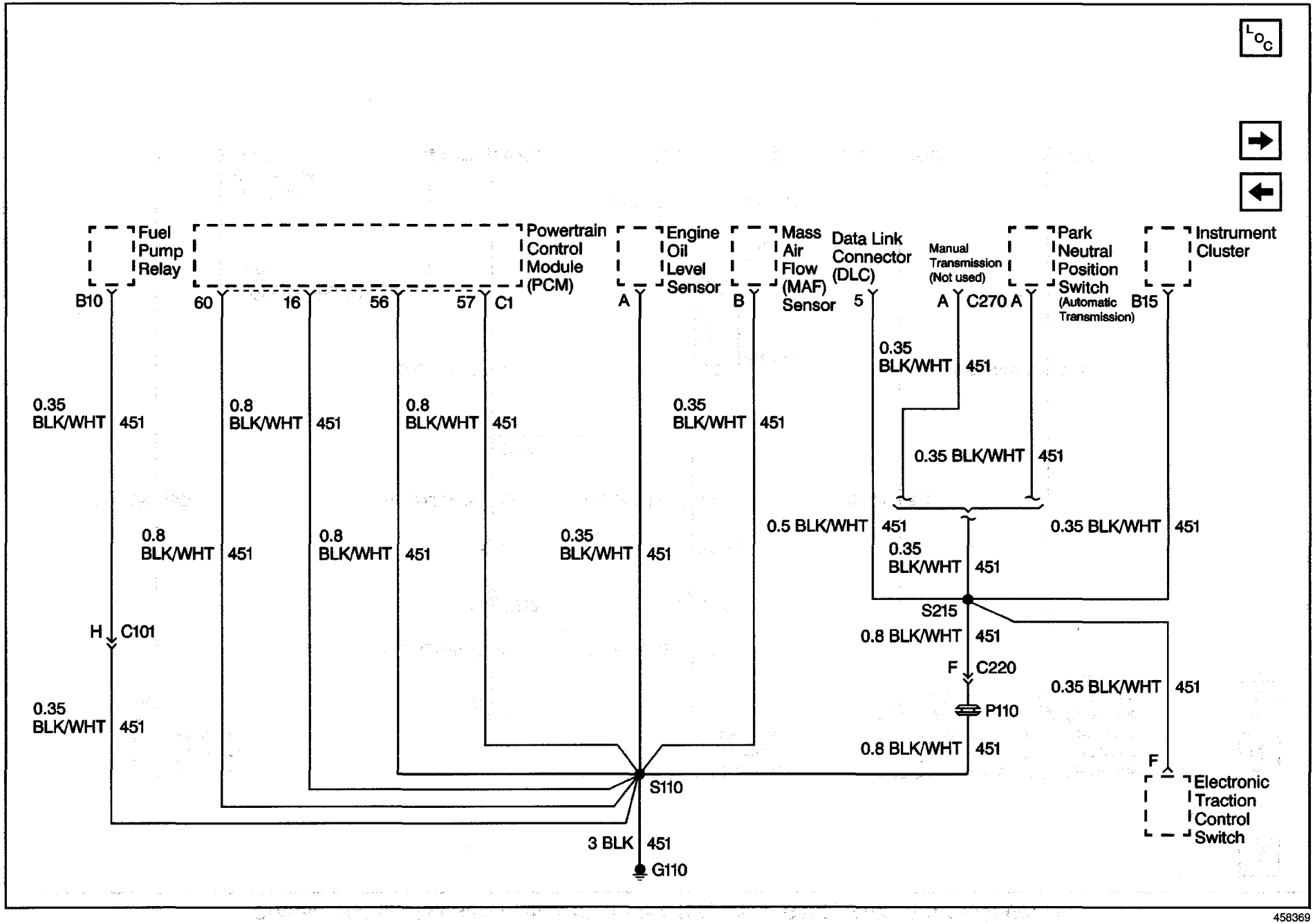


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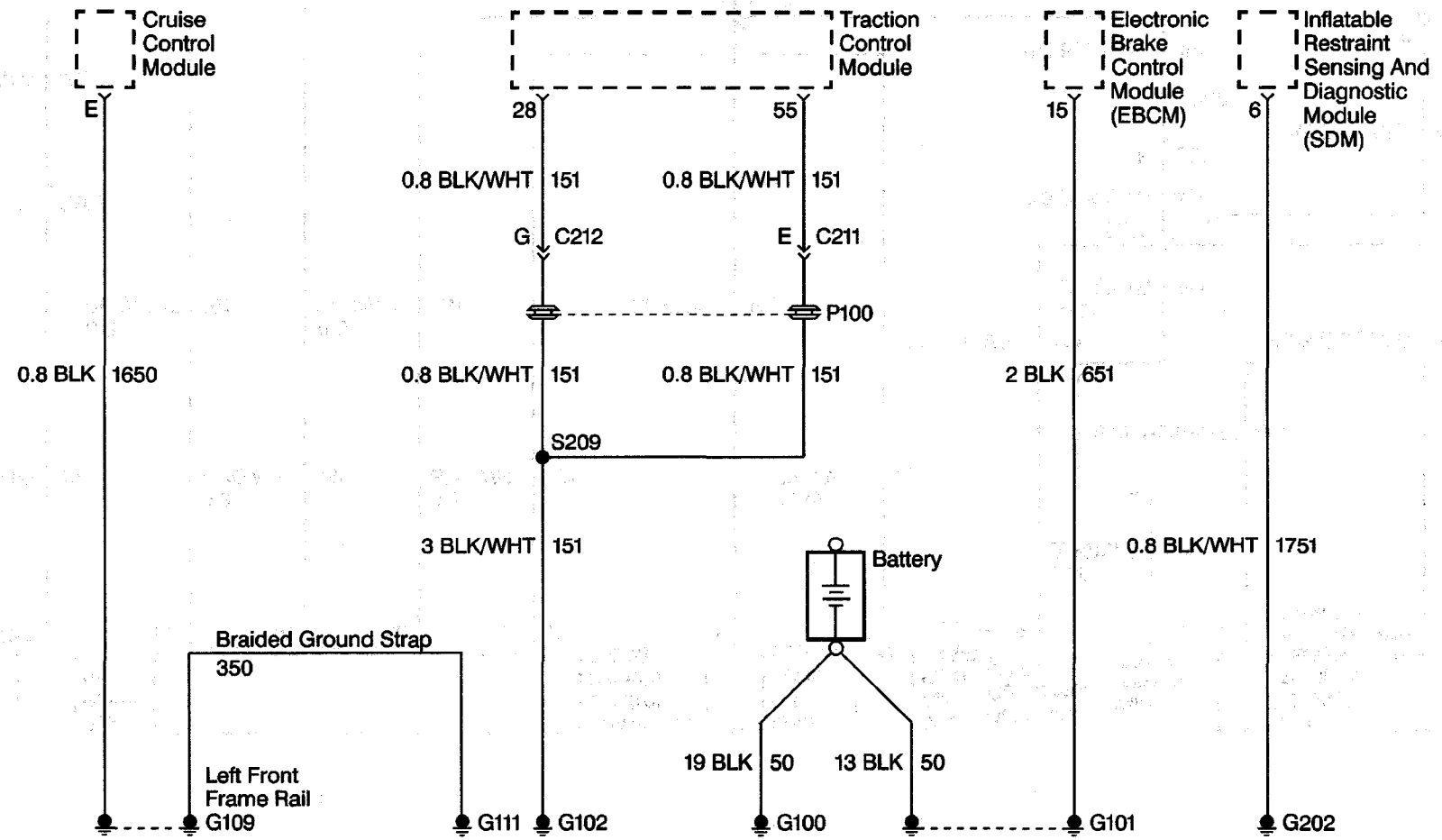
Ground Distribution Schematics (Cell 14: G112 (V8 VIN G))



Ground Distribution Schematics (Cell 14: G110 (V8 VIN G))

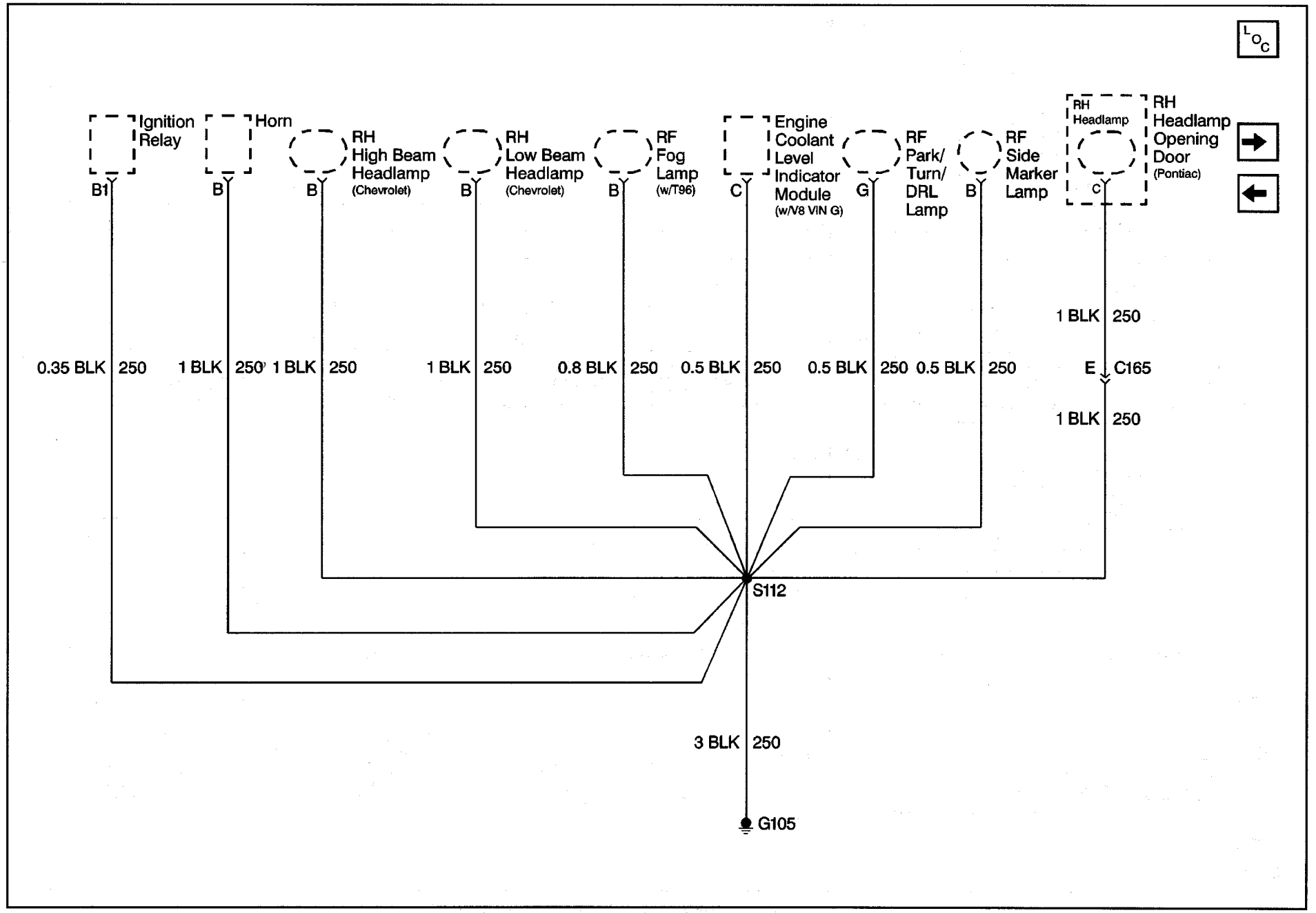


Ground Distribution Schematics (Cell 14: G109, G111, G102, G100, G101 and G202)



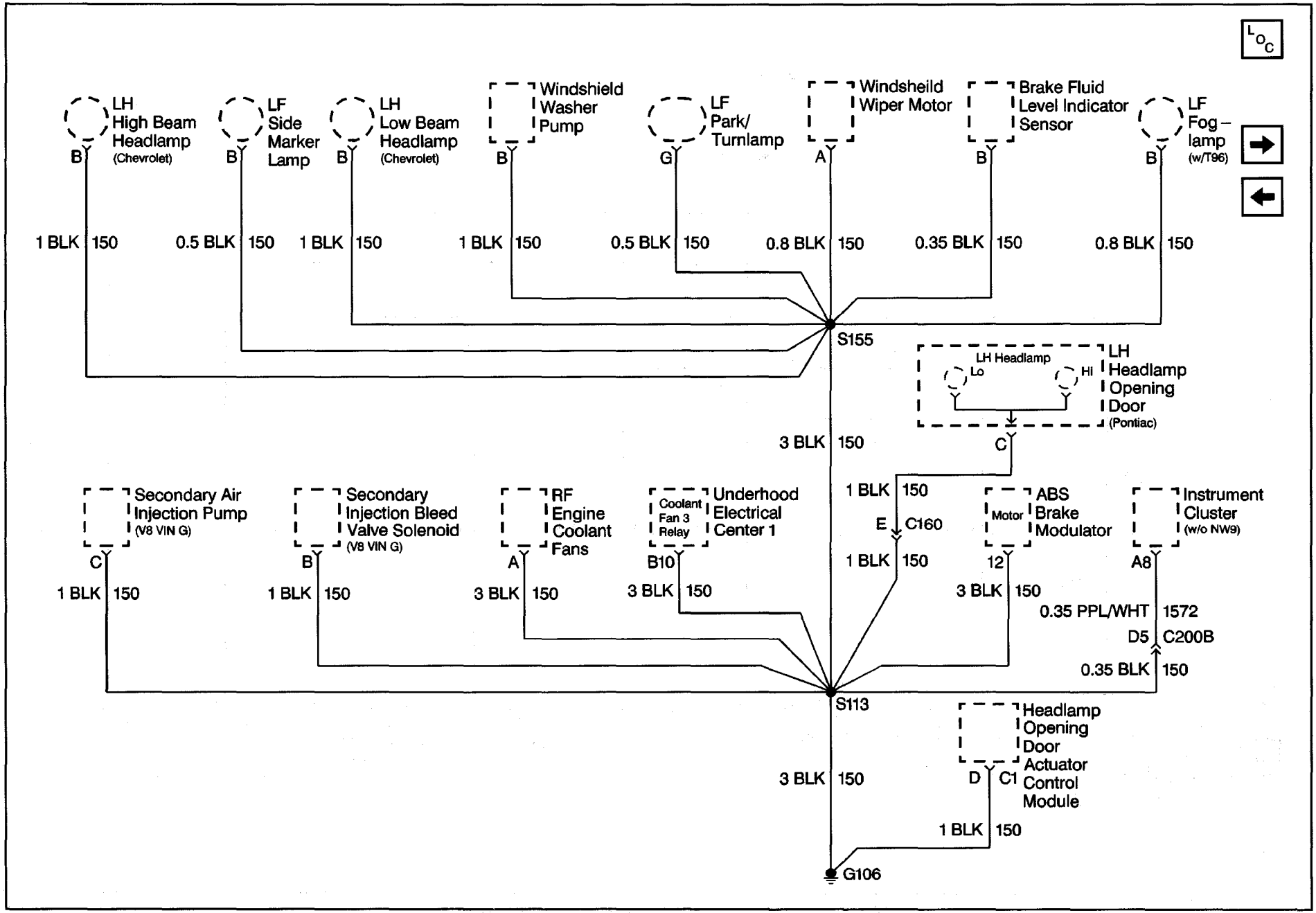
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Ground Distribution Schematics (Cell 14: G105)

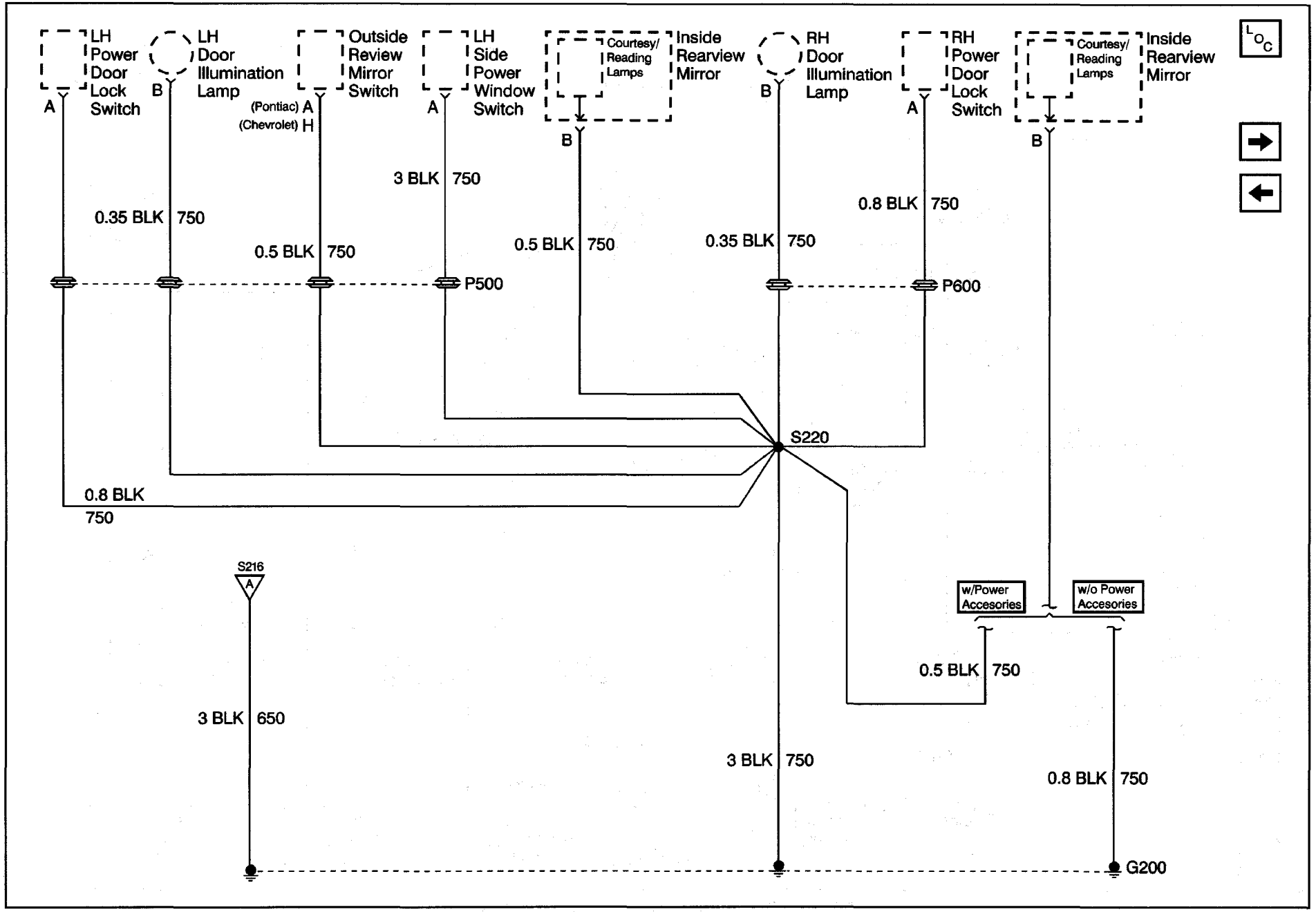


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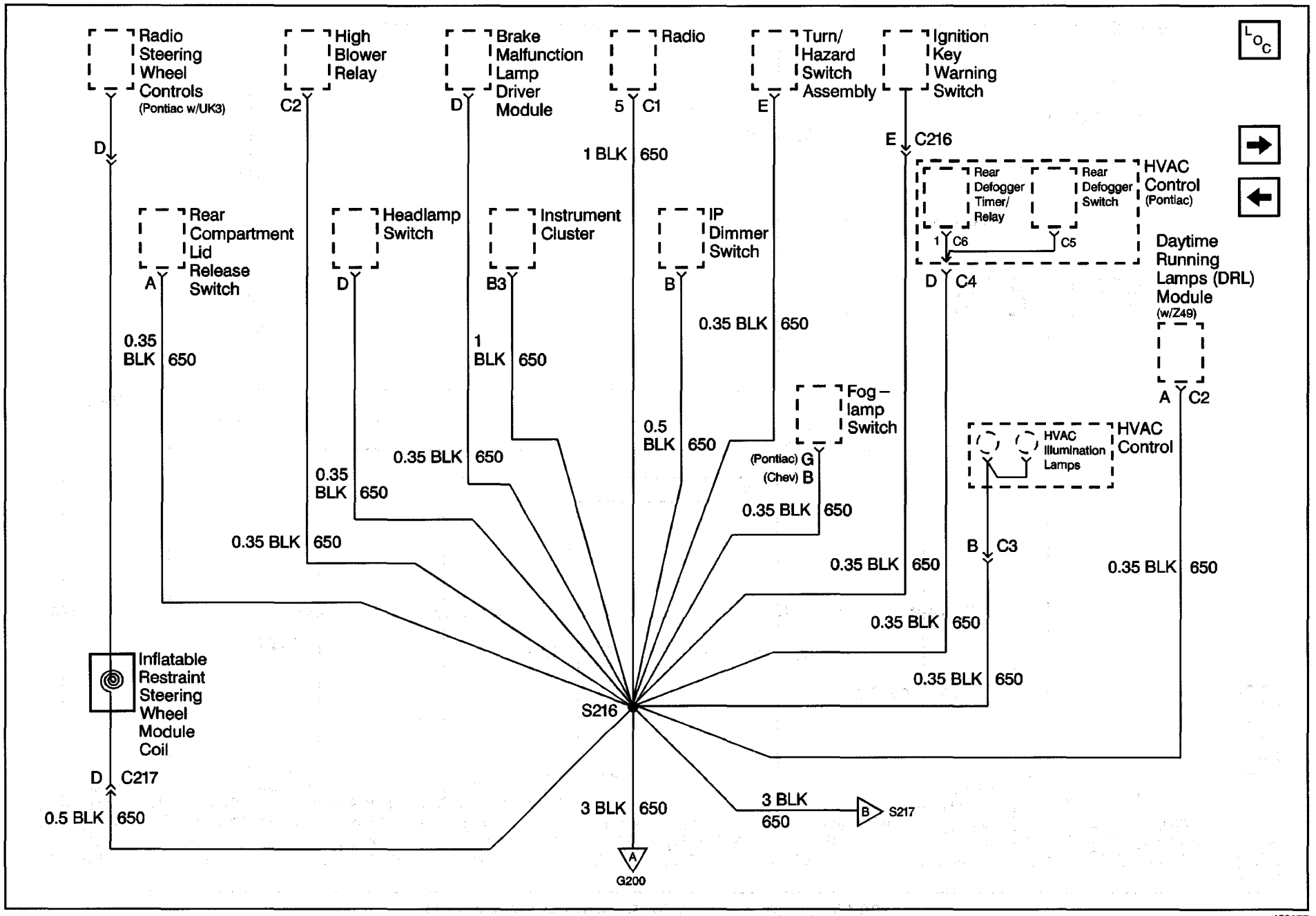
Ground Distribution Schematics (Cell 14: G106)



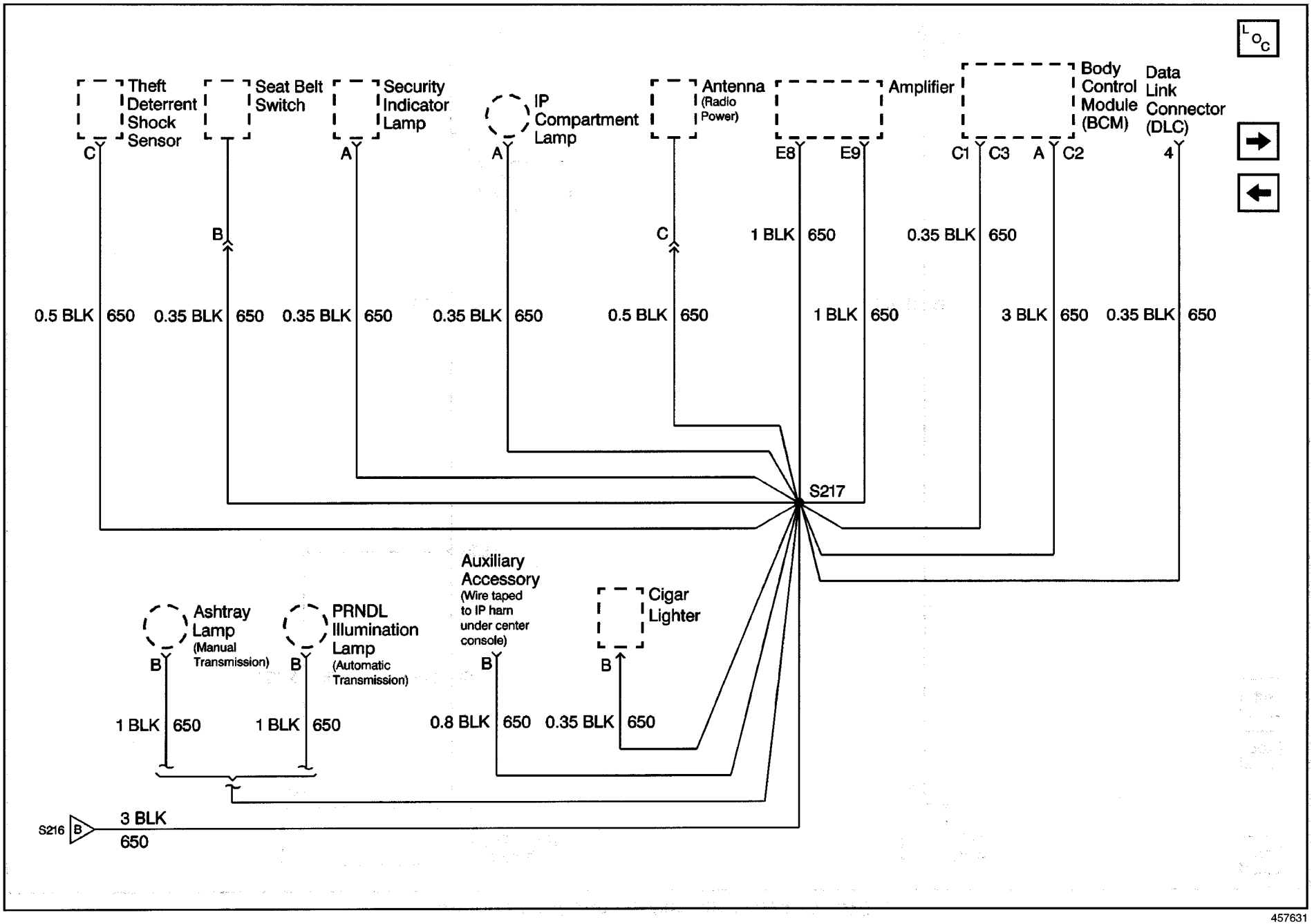
Ground Distribution Schematics (Cell 14: G200)



Ground Distribution Schematics (Cell 14: G200)

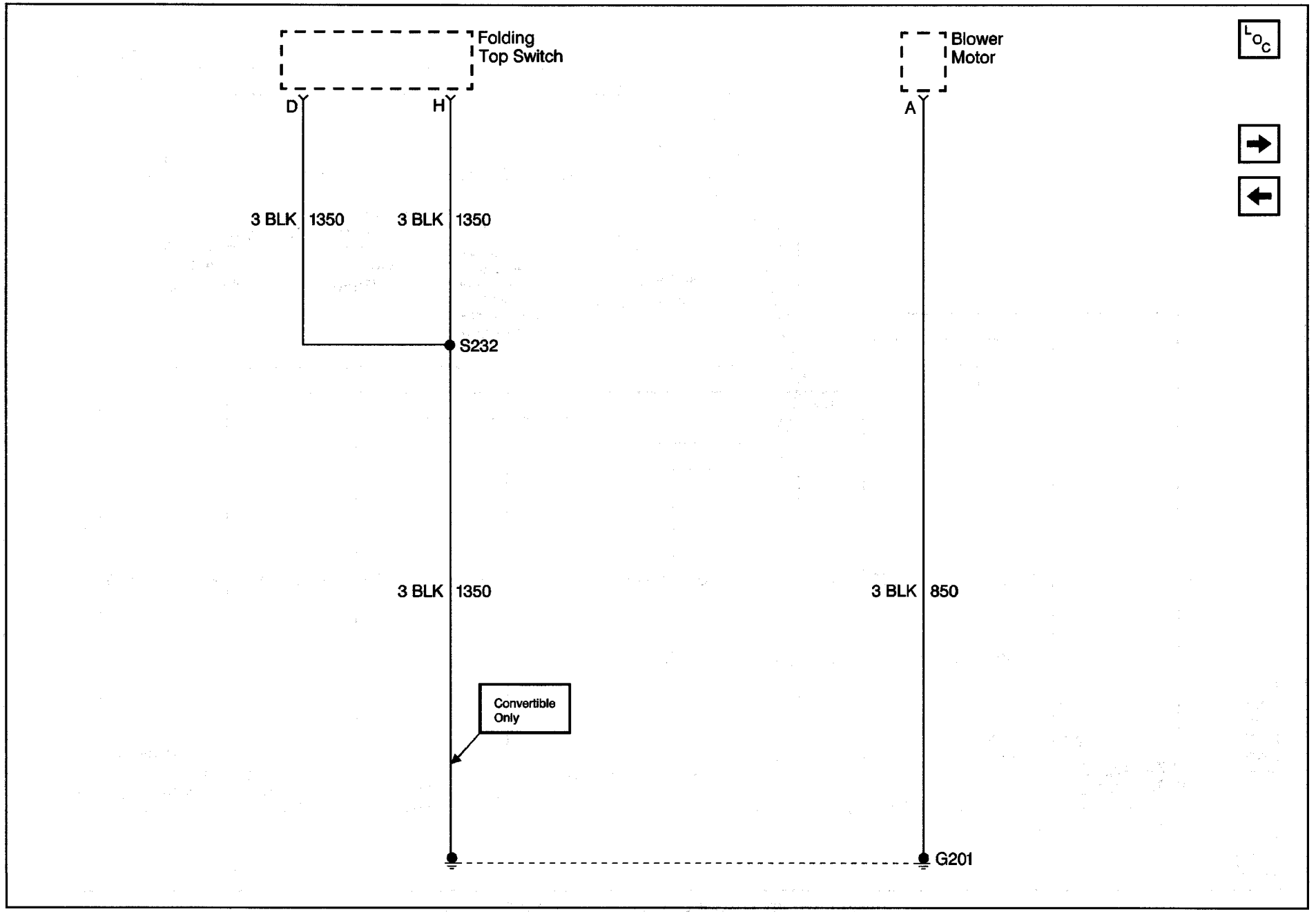


Ground Distribution Schematics (Cell 14: G200)

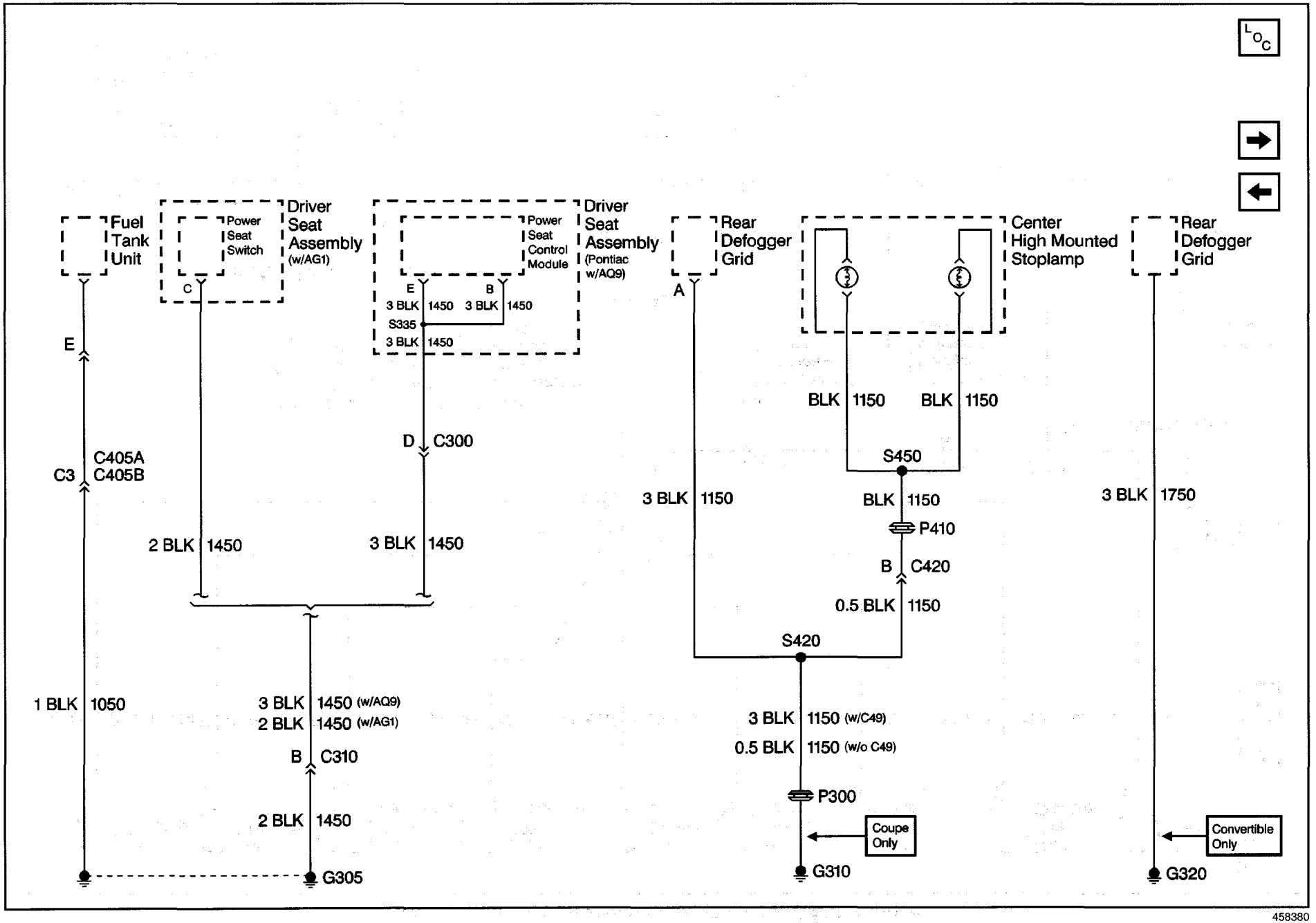


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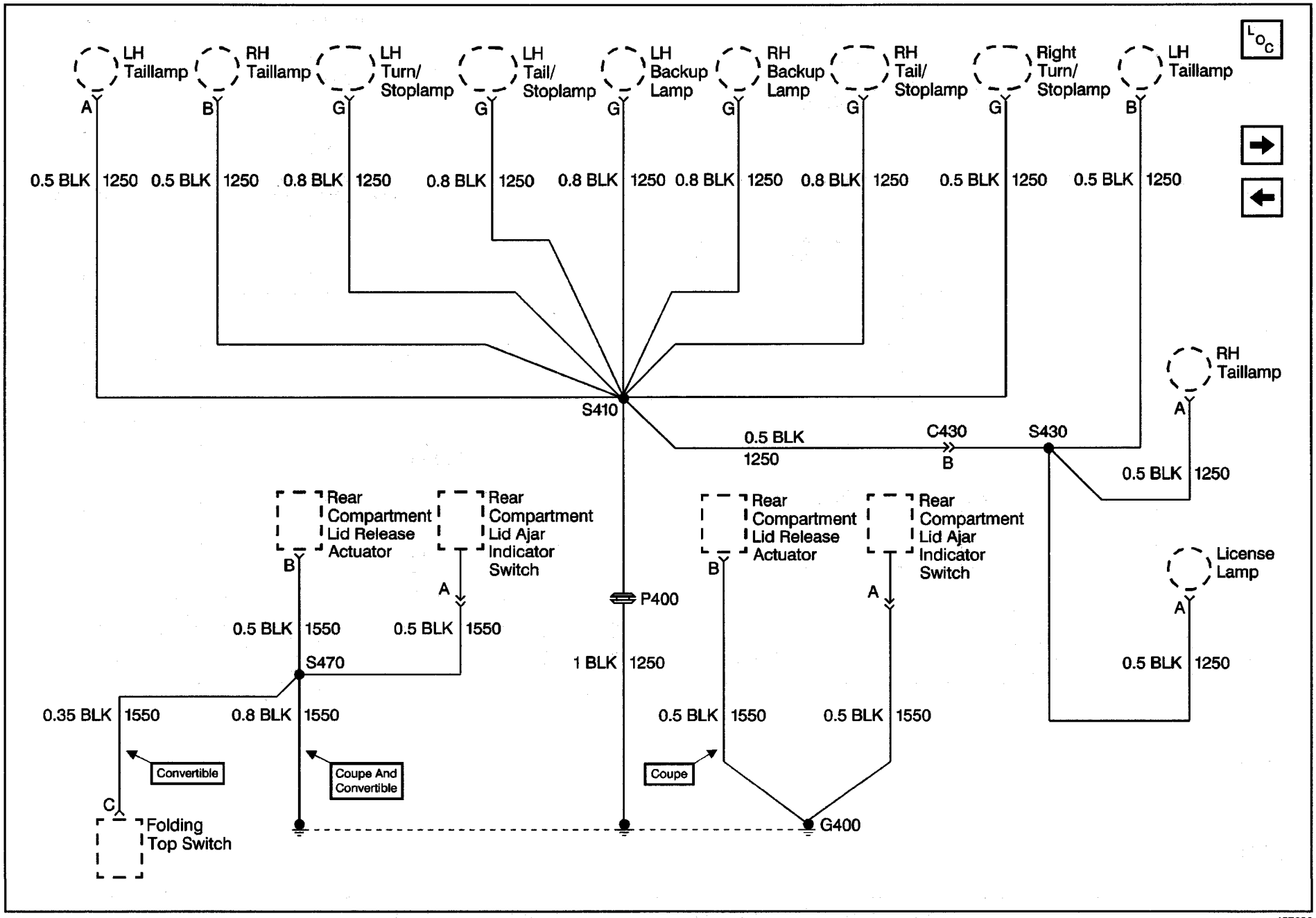
Ground Distribution Schematics (Cell 14: G201)



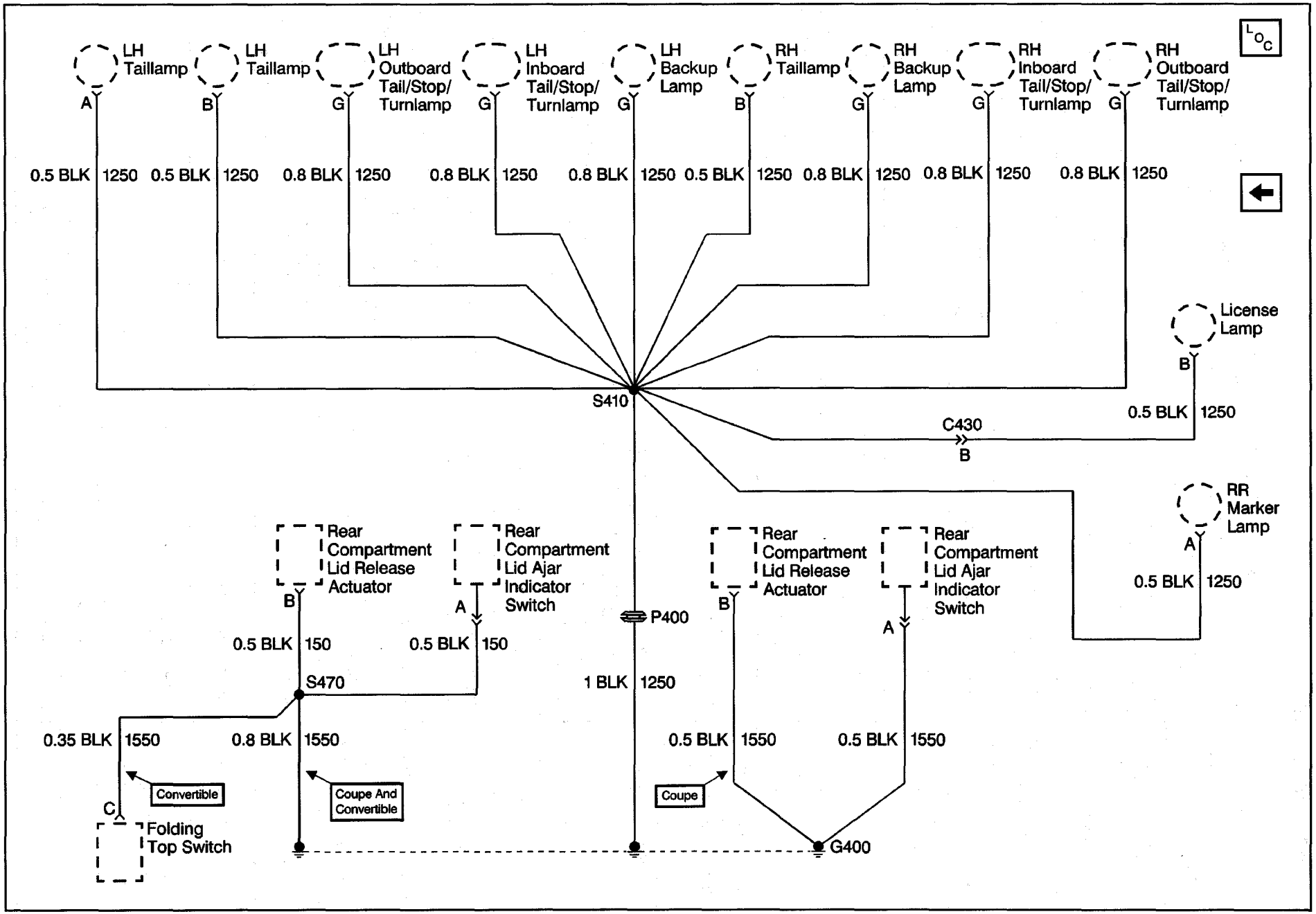
Ground Distribution Schematics (Cell 14: G305, G310 and G320)



Ground Distribution Schematics (Cell 14: G400 Pontiac)



Ground Distribution Schematics (Cell 14: G400 Chevrolet)



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Component Locator

Power and Grounding Components

Name	Location	Locator View	Connector End View
A/C Clutch Diode (V6 VIN K)	Sealed in harness, approximately 3 cm (1 in) from the injector 2 breakout	—	—
A/C Clutch Diode (V8 VIN G)	Sealed in harness, approximately 17 cm (7 in) back from the A/C compressor clutch	—	—
A/C Compressor Clutch (V6 VIN K)	In the front of the engine, on the lower right side	*HVAC Component Views* in HVAC	*Engine Controls Connector End Views* in Engine Controls
A/C Compressor Clutch (V8 VIN G)	In the front of the engine, on the lower right side	—	*Engine Controls Connector End Views* in Engine Controls
A/C Compressor Relay	In the underhood electrical center 2	*HVAC Component Views* in HVAC	—
A/C Refrigerant Pressure Sensor (V6 VIN K)	Above right front wheelhouse, attached to the refrigerant line	—	*Engine Controls Connector End Views* in Engine Controls
A/C Refrigerant Pressure Sensor (V8 VIN G)	Above right front wheelhouse, attached to the refrigerant line	—	*Engine Controls Connector End Views* in Engine Controls
Accelerator Control and Adjuster	In engine compartment, forward of the right front wheelhouse	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Accelerator Control and Cruse Control Servo Cable Adjuster Module (Traction Control Module)	Under the left side of dash, near the kick panel	—	—
Air Pump Relay	In the underhood electrical center 2	—	—
Air Solenoid Relay	In the underhood electrical center 2	—	—
Amplifier	Mounted behind the right rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	*Entertainment Connector End Views* in Entertainment
Ashtray Lamp (Auto Trans)	In the lighting tube from the PRNDL lamp	—	—
Ashtray Lamp (Manual Trans)	Rearward of the shifter, in the ashtray	*Harness Routing Views*	—
Automatic Transmission	Behind the engine	*Automatic Transmission Electronic Component Views (Internal)* in Automatic Transmission	*AT Inline Harness Connector End View* in Automatic Transmission
Auxiliary Power Socket	On the lower right side of the front of the console	*Harness Routing Views*	—
Backup Lamp, LH	Mounted in the taillamp assembly	*Lighting Systems Component Views* in Lighting Systems	*Lighting Systems Component Views* in Lighting Systems
Backup Lamp, RH	Mounted in the taillamp assembly	*Lighting Systems Component Views* in Lighting Systems	—
Backup Lamp Switch (M49) (V6 VIN K)	In the middle of the manual transmission, on the left side	*Lighting Systems Component Views* in Lighting Systems	—
Backup Lamp Switch (MM6) (V8 VIN G)	In the middle of the manual transmission, on the right side	*Lighting Systems Component Views* in Lighting Systems	—
Battery	In the right front of the engine compartment	*Power and Grounding Component Views*	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Blower Motor	Under the lower right side of the instrument panel, mounted in the HVAC module	*Body Control Module Component Views* in Body Control System	—
Blower Motor Relay	Under the instrument panel, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Blower Resistor	In HVAC module, forward and left of temperature control cable attachment	—	—
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Brake Fluid Level Indicator Sensor	Part of the master cylinder	—	—
Brake Malfunction Indicator Lamp Driver Module	Behind the center of the instrument panel near the HVAC control	*HVAC Component Views* in HVAC	*Antilock Brakes System Connector End Views* in Antilock Brake System
Brake Pressure Modulator Valve (BPMV)	Mounted to the left front frame rail	*Harness Routing Views*	—
Brake Transmission Shift Interlock (BTSI) Diode	In instrument panel harness, main branch, approximately 6 cm from body control module (BCM) breakout	—	—
Brake Transmission Shift Interlock (BTSI) Solenoid	In console, forward of shift control lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column-Tilt	*Tilt Wheel/Column Connector End Views* in Steering Wheel and Column-Tilt
Camshaft Position (CMP) Sensor (V6 VIN K)	Mounted in engine front cover	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Camshaft Position (CMP) Sensor (V8 VIN G)	Mounted in engine front cover	—	*Engine Controls Connector End Views* in Engine Controls
Center High Mounted Stop Lamp (CHMSL)	In the rear center of the spoiler	—	—
Cigar Lighter	Mounted on the front of the console	*Harness Routing Views*	—
Clutch Pedal Position (CPP) Switch	Mounted to the clutch pedal bracket	—	*Engine Electrical Connector End Views* in Engine Electrical
Courtesy Lamp, Left Rear (Convertible)	Mounted in the left sail panel	—	—
Courtesy Lamp, Rear Compartment (Convertible)	In the center of the rear compartment, near the rear compartment lid release actuator	*Power Roof Systems Component Views* in Roof	—
Courtesy Lamp, Right Rear (Convertible)	Mounted in the right sail panel	—	—
Crankshaft Position Sensor (V6 VIN K)	Lower front of engine	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Crankshaft Position Sensor (V8 VIN G)	Lower front of engine	—	*Engine Controls Connector End Views* in Engine Controls
Cruise Control/Clutch Anticipate (V6 VIN K Manual with K34)	Mounted in the clutch pedal bracket	*Cruise Control Component Views* in Cruise Control	—
Cruise Control (Clutch) Switch (V8 VIN G Manual with K34)	Mounted in the clutch pedal bracket	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Cruise Control Module	Mounted to the left frame rail, forward of the wheelhouse	*Cruise Control Component Views* in Cruise Control	*Cruise Control Connector End Views* in Cruise Control
Cruise Control Release Switch (Brake) (all with K34)	Mounted in the upper hole of the brake pedal bracket	*Cruise Control Component Views* in Cruise Control	—
Data Link Connector (DLC)	Under the instrument panel, right of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Power and Grounding Connector End Views*
Daytime Running Lamps (DRL) Ambient Light Sensor	Mounted in top of instrument panel, near defrost grill	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Daytime Running Lamps (DRL) Module (Headlamp Auto Control Module)	Mounted behind the radio and the HVAC control, left of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems
Dome Lamp (Coupe)	On the roof, near the hatch	*Harness Routing Views*	—
Door Illumination Lamp	Mounted in left and right door trim panel, above armrest switches	—	—
Door Jamb Switch, LH	Near base of left A-pillar	*Harness Routing Views*	—
Door Jamb Switch, RH	Near base of right A-pillar	*Harness Routing Views*	—
Door Lock Switch	Mounted in the door armrest	*Power Door Systems Component Views* in Doors	—
Driver Power Seat Actuator Assembly (AG1 Power Seat)	Under driver seat	—	—
Drivers Seat Adjuster Actuator-Forward/Back (AG1 Power Seat)	Under driver seat	*Power Seat Systems Component Views* in Seats	—
Drivers Seat Adjuster Actuator Motor-Front Height Motor (AG1 Power Seat)	Under driver seat	*Power Seat Systems Component Views* in Seats	—
Drivers Seat Adjuster Actuator-Rear Height Motor (AG1)	Under driver seat	*Power Seat Systems Component Views* in Seats	—
Electronic Brake Control Module (EBCM)	Mounted with brake pressure modulator valve on the top of the left front frame rail	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Electronic Ignition Control Module (ICM) (V6 VIN K)	On the top front left side of the engine	—	—
Electronic Ignition Control Module (ICM) Left (V8 VIN G)	On the top front left side of the engine	—	—
Electronic Ignition Control Module (ICM) Right (V8 VIN G)	On the top front right side of the engine	—	—
Electronic Traction Control Module	Under the left side of the instrument panel, near the kick panel	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Electronic Traction Control Switch (Chevrolet)	In the center of the instrument panel, above the HVAC control	—	—
Electronic Traction Control Switch (Pontiac)	On the left side of the upper console	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Electronic Turn Signal Lamp Flasher (Export)	Below the center of the A/C duct, mounted to the SIR bracket	—	—
Engine Coolant Fans	Behind the radiator	—	*Cooling System Connector End Views* in Engine Cooling
Engine Coolant Fan Relays	In the underhood electrical center 1	—	—
Engine Coolant Level Indicator Module (V8 VIN G)	Mounted on the upper right side of the radiator	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Engine Coolant Temperature (ECT) Sensor (V6 VIN K)	Under throttle body, front side of engine	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Coolant Temperature (ECT) Sensor (V8 VIN G)	Lower left side of engine, above generator	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Level Switch (V6 VIN K)	On the lower left side of the engine, in the oil pan	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Level Switch (V8 VIN G)	On the lower right side of the engine, in the oil pan	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Pressure Sensor (V6 VIN K)	On the top right side of the engine	—	—
Engine Oil Pressure Sensor (V8 VIN G)	On the top rear of the engine, near the left cylinder head	*Harness Routing Views*	—
Evaporative Emission (EVAP) Canister Purge Solenoid Valve (V6 VIN K)	On the right side of the engine next to injector 2	*Engine Controls Component Views* in Engine Controls	—
Evaporative Emission (EVAP) Canister Purge Solenoid Valve (V8 VIN G)	On the right center of the engine, mounted to the manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Evaporative Emission (EVAP) Canister Vent Solenoid Valve (V6 VIN K)	On the top right side of the engine, part of the EVAP canister	—	*Engine Controls Connector End Views* in Engine Controls
Evaporative Emission (EVAP) Canister Vent Solenoid Valve (V8 VIN G)	On the top right side of the engine, part of the EVAP canister	—	*Engine Controls Connector End Views* in Engine Controls
Exhaust Gas Recirculation (EGR) Valve (V6 VIN K)	Front left side of engine, in front of ignition control module	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Exhaust Gas Recirculation (EGR) Valve (V8 VIN G)	Left rear of engine, mounted to intake manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Fog Lamp, Left Front	On the lower left side of the front fascia	—	—
Fog Lamp, Right Front	Lower right side of front fascia	—	—
Fog Lamp Relay	In underhood electrical center 1	—	—
Fog Lamp Switch (Chevrolet)	In the center of the instrument panel, above the HVAC control	*Lighting Systems Component Views* in Lighting Systems	*Lighting Systems Connector End Views* in Lighting Systems
Fog Lamp Switch (Pontiac)	On the left steering column, below the headlamp switch	*Lighting Systems Component Views* in Lighting Systems	*Lighting Systems Connector End Views* in Lighting Systems

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Folding Top Pump (with Motor)	Left side of the rear compartment, behind the carpeting	—	—
Folding Top Relay	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Folding Top Switch	On the left side of the upper console	*Power Roof Systems Connector End Views* in Roof	—
Front Side Door Lock	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Front Side Door Lock Actuator	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Front Side Door Window Regulator Motor	Inside front door	*Power Door Systems Component Views* in Doors	—
Fuel Injectors (V6 VIN K)	Mounted on the intake manifold, part of the fuel rail	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Fuel Injectors (V8 VIN G)	Mounted on the intake manifold, part of the fuel rail	—	*Engine Controls Connector End Views* in Engine Controls
Fuel Pump Relay	In the underhood electrical center 2	—	—
Fuel Tank Unit	Under the rear of the vehicle	—	*Engine Controls Connector End Views* in Engine Controls
Fusible Links	Forward of the left front wheelhouse, behind the underhood electrical center 2	—	—
Generator (V6 VIN K)	On the front right side of the engine	*Engine Controls Component Views* in Engine Controls	*Engine Electrical Connector End Views* in Engine Electrical
Generator (V8 VIN G)	On the front left side of the engine	*Engine Controls Component Views* in Engine Controls	*Engine Electrical Connector End Views* in Engine Electrical
Hazard Lamp Flasher	Left of the steering column, mounted to the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Headlamp (Pontiac)	On the front of the vehicle	—	—
Headlamp Dimmer Switch	Part of steering column, activated by multifunction lever	*Harness Routing Views*	—
Headlamp Door Motor	In the front of the vehicle, near each headlamp door	—	—
Headlamp, High Beam (Chevrolet)	On the front of the vehicle	—	—
Headlamp Leveling Switch (Export)	On the left side of the upper console	—	—
Headlamp, Low Beam (Chevrolet)	On the front of the vehicle	*Power and Grounding Component Views* in Power and Grounding	—
Headlamp Opening Door Actuator Control Module	On the front left side of the engine compartment, beside the underhood electrical center 2	*Power and Grounding Component Views* in Power and Grounding	*Lighting Systems Connector End Views* in Lighting Systems
Headlamp Switch	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Headlamp, High Beam (Chevrolet)	On the front of the vehicle	—	—
Heated Oxygen Sensor Bank 1, Sensor 1 (V6 VIN K)	Mounted in the left exhaust manifold	—	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 1, Sensor 1 (V8 VIN G)	Mounted in the left exhaust manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 1, Sensor 2 (V8 VIN G)	At the rear of the left catalytic converter	—	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 1, Sensor 3 (V6 VIN K)	At the rear of the catalytic converter	—	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 2, Sensor 1 (V6 VIN K)	Mounted in the right exhaust manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 2, Sensor 1 (V8 VIN G)	Mounted in the right exhaust manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Heated Oxygen Sensor Bank 2, Sensor 2 (V8 VIN G)	At the rear of the right catalytic converter	—	*Engine Controls Connector End Views* in Engine Controls
Horn	In the front right side of the vehicle, directly below headlamp	*Power and Grounding Component Views* in Power and Grounding	*Horns Connector End Views* in Horns
Horn Relay	In the underhood electrical center 1	—	—
Horn Switch	In steering wheel	—	—
HVAC Control	In the center of the instrument panel, above the radio	*HVAC Component Views* in HVAC	—
HVAC Control Blower Switch	Part of HVAC control	—	—
HVAC Control Lamp	Part of the HVAC control	—	—
HVAC Control Selector Switch	Part of the HVAC control	*HVAC Component Views* in HVAC	*HVAC Connector End Views* in HVAC
Idle Air Control (IAC) Valve (V6 VIN K)	Right front of intake manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Idle Air Control (IAC) Valve (V8 VIN G)	Right front on throttle body	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Ignition Key Lock Cylinder	Part of steering column	*Harness Routing Views*	—
Ignition Key Warning Switch	Part of steering column	—	—
Ignition Switch	Part of the steering column	*Harness Routing Views*	—
Inflatable Restraint IP Module	Mounted behind right side of the instrument panel	*SIR Component Views* in SIR	*SIR Connector End Views* in SIR
Inflatable Restraint Sensing and Diagnostic Module (SDM)	On the floor tunnel, below the rear of the console	*SIR Component Views* in SIR	*SIR Connector End Views* in SIR
Inflatable Restraint Steering Wheel Module	Mounted on the steering wheel	—	—
Inflatable Restraint Steering Wheel Module Coil	On the top of the steering column	*SIR Component Views* in SIR	—
Inside Rearview Mirror	Mounted to inside center of windshield	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Instrument Cluster Connector End Views* in Instrument Panel, Gauges and Console
Intake Air Temperature (IAT) Sensor (V6 VIN K)	Mounted on air duct, in front of intake manifold	—	*Engine Controls Connector End Views* in Engine Controls
Intake Air Temperature (IAT) Sensor (V8 VIN G)	Mounted on air duct, in front of intake manifold	—	*Engine Controls Connector End Views* in Engine Controls
IP Compartment Lamp	Inside the top center of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
IP Dimmer Switch	Left of the steering wheel, part of the headlamp switch	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Knock Sensor, LH (V6 VIN K)	In bottom left side of engine block	—	—
Knock Sensor, LH (V8 VIN G)	In bottom left side of engine block	*Harness Routing Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Knock Sensor, RH (V6 VIN K)	In bottom right side of engine block	—	—
Knock Sensor, RH (V8 VIN G)	In bottom right side of engine block	—	*Engine Controls Connector End Views* in Engine Controls
License Lamp	In the center of the rear fascia, above the license plate	*Lighting Systems Component Views* in Lighting Systems	—
Lumbar Inflator Switch, Driver	On the left side of the driver seat	—	—
Lumbar Inflator Switch, Passenger	On the right side of the passenger seat	—	—
Manifold Absolute Pressure (MAP) Sensor (V6 VIN K)	Mounted to right side of intake manifold	*Engine Controls Component Views* in Engine Controls	—
Manifold Absolute Pressure (MAP) Sensor (V8 VIN G)	Mounted to right side of intake manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Manual Transmission (V6 VIN K)	Behind the engine	—	—
Manual Transmission (V8 VIN G)	Behind the engine	—	—
Mass Air Flow (MAF) Sensor (V6 VIN K)	Mounted on the air duct, in front of the intake manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Mass Air Flow (MAF) Sensor (V8 VIN G)	Mounted on the air duct, in front of the intake manifold	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Multi Function Lever	On the left arm of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Outside Rearview Mirror	Mounted to the left and right front doors	*Power Door Systems Component Views* in Doors	—
Outside Rearview Mirror Switch	Mounted in the door armrest	*Power Door Systems Component Views* in Doors	*Power Door Systems Connector End Views* in Doors
Park Brake Switch	In the console, at the base of the park brake lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park Neutral Position Switch	Under the console, on the base of the shift control lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park/Turn Lamp, Left Front	Exterior, left front	—	—
Park/Turn Lamp, Right Front	Exterior, right front	*Lighting Systems Component Views* in Lighting Systems	—
Power Seat Cushion Air Control Module (AQ9)	Under the passenger seat	—	—
Power Seat Inflator Switch, Driver (AQ9)	On the left side of the driver seat	—	—
Power Seat Inflator Switch, Passenger (AQ9)	On the right side of the passenger seat	—	—
Power Seat Switch (AG1)	On the left side of the driver seat	*Power Seat Systems Component Views* in Seats	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views*	*PCM Connector End Views* in Engine Controls
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views*	*PCM Connector End Views* in Engine Controls
Power Window Control Module	Mounted to the center of the dash mat, above the floor tunnel	*Harness Routing Views*	—
PRNDL Illumination Lamp	Under the console, left of the shift control lever	*Harness Routing Views*	—
Pump Assembly (Seat Inflator Pump)	Under passenger seat	—	—
Radio	In the center of the instrument panel, below the HVAC control	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Entertainment Connector End Views* in Entertainment
Radio Power Antenna	Behind the right rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	—
Rear Compartment Courtesy Lamp Switch	Part of rear compartment lid release actuator	—	—
Rear Compartment Lid Ajar Indication Switch	Part of the rear compartment lid latch	*Body Rear End Component Views* in Body Rear End	—
Rear Compartment Lid Release Actuator	In the center of the end panel, in the cargo compartment	*Body Rear End Component Views* in Body Rear End	*Body Rear End Connector End Views* in Body Rear End
Rear Compartment Lid Release Relay	Under the left side of the instrument panel, near C200	*Body Rear End Component Views* in Body Rear End	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Rear Compartment Lid Release Switch	In the driver knee bolster, left of the steering column	—	*Body Rear End Connector End Views* in Body Rear End
Rear Defogger Grid	Mounted on the rear windshield	*Stationary Windows Component Views* in Stationary Windows	—
Rear Defogger Switch	Part of the HVAC control	*HVAC Component Views* in HVAC	*Stationary Windows Connector End Views* in Stationary Windows
Rear Defogger Timer/Relay	Part of the HVAC control	*HVAC Component Views* in HVAC	—
Rear Fog Lamps (Export)	On the left and right side of the rear fascia	—	—
Rear Fog Lamp Relay (Export)	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Rear Fog Lamp Switch (Export)	In the center of the instrument panel, above the HVAC control	—	—
Rear Turn Lamp	On the left and right rear exterior of the vehicle	—	—
Remote Compact Disc Player	In the left rear cargo compartment	*Entertainment Component Views* in Entertainment	*Entertainment Connector End Views* in Entertainment
Reverse Lockout Solenoid (V8 VIN G Manual)	On the rear left side of the transmission	—	—
Seat Belt Switch	Part of the driver seat buckle assembly	*Harness Routing Views*	*Audible Warnings Connector End Views*
Seat Inflation Valve Solenoid (AQ9)	Under passenger seat	—	—
Second Gear Start Switch (V6 VIN K) (Chevrolet)	In the center of the instrument panel, above the HVAC control	*Lighting Systems Component Views* in Lighting Systems	—
Second Gear Start Switch (V6 VIN K) (Pontiac)	On the left side of the upper console	*Lighting Systems Component Views* in Lighting Systems	—
Secondary Air Injection Bleed Valve Solenoid (V8 VIN G)	Mounted to the right front frame rail	—	*Engine Controls Connector End Views* in Engine Controls
Secondary Air Injection Pump (V8 VIN G)	On the front left frame rail, in the engine compartment	—	*Engine Controls Connector End Views* in Engine Controls
Security Indicator LED	On the top center of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Side Marker Lamp, Left Front	On the exterior, left front	*Lighting Systems Component Views* in Lighting	—
Side Marker Lamp, Left Rear	On the exterior, left rear	*Lighting Systems Component Views* in Lighting	—
Side Marker Lamp, Right Front	On the exterior, right front	*Lighting Systems Component Views* in Lighting	—
Side Marker Lamp, Right Rear	On the exterior, right rear	*Lighting Systems Component Views* in Lighting	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Side Window Switch	Mounted in the door arm rest	*Power Door Systems Component Views* in Doors	—
Side Window Switch Illumination Lamp	Behind the door trim panel	*Power Door Systems Component Views* in Doors	—
Skip Shift Solenoid (V8 VIN G Manual)	On the center left side of the transmission	—	*Engine Controls Connector End Views* in Engine Controls
Speaker Assembly, Front (with UZ7) (Chevrolet)	On the lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front (UL0, UM6, UN0 with UQ0 or U62 (Chevrolet), and W51, W52, and W53 (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Midrange (with W54, W55) (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Midrange (with W59, W73) (Pontiac Convertible)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Tweeter (with W54, W55) (Pontiac)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Front Tweeter (with W59, W73) (Pontiac Convertible)	Lower front door	*Power Door Systems Component Views* in Doors	—
Speaker, Rear (UL0, UM6, UN0 with UQ0 or U62 (Chevrolet), and W51, W52, and W53) (Pontiac)	Mounted in sail panel	*Entertainment Component Views* in Entertainment	—
Speaker, Rear Coaxial (with W59, W73) (Pontiac Convertible)	Mounted in sail panel	*Entertainment Component Views* in Entertainment	—
Speaker, Rear Extended Range (with UZ7) (Chevrolet)	Mounted in rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	—
Speaker, Rear Midrange (with W54, W55) (Pontiac)	Mounted in rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	—
Speaker, Rear Subwoofer (with UZ7) (Chevrolet)	Mounted in sail panel	*Entertainment Component Views* in Entertainment	—
Speaker, Rear Tweeter (with W54, W55) (Pontiac)	Mounted in rear quarter inner trim panel	*Entertainment Component Views* in Entertainment	—
Star Connector	Under the left side of the instrument panel, near the DLC	—	—
Starter Motor	On the bottom right side of the engine	*Engine Controls Component Views* in Engine Controls	—
Starter Motor (V6 VIN K)	On the bottom left side of the engine	*Engine Controls Component Views* in Engine Controls	—
Starter Relay	In the underhood electrical center 2	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Starter Solenoid	On the bottom right side of the engine, above the starter motor	*Engine Controls Component Views* in Engine Controls	—
Steering Wheel	On the left side of the instrument panel	—	—
Steering Wheel Controls	On the steering wheel	*Entertainment Component Views* in Entertainment	—
Stop Lamp Switch	Mounted on the brake pedal bracket	*Cruise Control Component Views* in Cruise Control	*Antilock Brakes System Connector End Views* in Antilock Brake System
Stop Lamp/TCC Switch (Automatic)	Mounted on the brake pedal bracket	—	*Lighting Systems Connector End Views* in Lighting Systems
Taillamp, LH	On the exterior, left rear of the vehicle	—	—
Taillamp, RH	On the exterior, right rear of the vehicle	—	—
Tail/Stop Lamp, LH (Chevrolet)	On the exterior, left rear of the vehicle	—	—
Tail/Stop Lamp, RH (Chevrolet)	On the exterior, right rear of the vehicle	—	—
Tail/Stop/Turn Lamp, LH Inboard (Pontiac)	On the exterior, left rear of the vehicle	—	—
Tail/Stop/Turn Lamp, LH Outboard (Pontiac)	On the exterior, left rear of the vehicle	*Lighting Systems Component Views* in Lighting Systems	—
Tail/Stop/Turn Lamp, RH Inboard (Pontiac)	On the exterior, right rear of the vehicle	—	—
Tail/Stop/Turn Lamp, RH Outboard (Pontiac)	On the exterior, right rear of the vehicle	*Lighting Systems Component Views* in Lighting Systems	—
Theft Deterrent Relay	Under the instrument panel, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Theft Deterrent Shock Sensor	Behind the right quarter inner trim panel, attached to the wheelhouse	*Entertainment Component Views* in Entertainment	*Theft Deterrent System Connector End Views* in Theft Deterrent
Throttle Position (TP) Sensor (V6 VIN K)	Mounted to the front of the throttle body	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Throttle Position (TP) Sensor (V8 VIN G)	Mounted to the front of the throttle body	—	*Engine Controls Connector End Views* in Engine Controls
Traction Control Switch (Chevrolet)	In the center of the instrument panel, above the HVAC control	*Lighting Systems Component Views* in Lighting Systems	*Antilock Brakes System Connector End Views* in Antilock Brakes
Traction Control Switch (Pontiac)	On the left side of the upper console	*Lighting Systems Component Views* in Lighting Systems	*Antilock Brakes System Connector End Views* in Antilock Brakes
Turn/Hazard Switch Assembly	Part of steering column	—	—
Turn Signal Lamp Flasher	Under the instrument panel, right of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Turn Signal Lamp Flasher (Export)	Under the instrument panel, right of the steering column	—	—
Turn/Stop Lamp, LH (Chevrolet)	On the exterior, left rear of the vehicle	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
Turn/Stop Lamp, RH (Chevrolet)	On the exterior, right rear of the vehicle	—	—
Underhood Electrical Center 1	On the Left front corner of the engine compartment	*Power and Grounding Component Views*	—
Underhood Electrical Center 2	On the left front corner of the engine compartment	*Power and Grounding Component Views*	—
Vehicle Speed Sensor (Manual) (V6 VIN K)	Rear left side of transmission	*Power and Grounding Component Views*	*Engine Controls Connector End Views* in Engine Controls
Vehicle Speed Sensor (Manual) (V8 VIN G)	Rear left side of transmission	*Power and Grounding Component Views*	*Engine Controls Connector End Views* in Engine Controls
Vehicle Speed Sensor (Automatic) (V6 VIN K)	Rear right side of transmission	*Power and Grounding Component Views*	*Engine Controls Connector End Views* in Engine Controls
Vehicle Speed Sensor (Automatic) (V8 VIN G)	Rear right side of transmission	*Power and Grounding Component Views*	*Engine Controls Connector End Views* in Engine Controls
Wheel Speed Sensor, Left Front	Middle of left front steering knuckle	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Wheel Speed Sensor, Left Rear	Mounted to rear backing plate of wheel disc	*Harness Routing Views*	*Antilock Brakes System Connector End Views* in Antilock Brake System
Wheel Speed Sensor, Rear (without NW9)	Top of rear differential	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Wheel Speed Sensor, Right Front	Middle of right front steering knuckle	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Wheel Speed Sensor, Right Rear	Mounted to rear backing plate of wheel disc	—	*Antilock Brakes System Connector End Views* in Antilock Brake System
Windshield Washer Pump	On the front of the vehicle, forward of the top radiator support	*Wiper/Washer System Component Views* in Wipers/Washer System	—
Windshield Wiper Motor	On the rear of the left front wheelhouse, mounted to the dash panel below the left wiper mount	*Wiper/Washer System Component Views* in Wipers/Washer System	*Wiper/Washer System Connector End Views* in Wipers/Washer
Wiper Isolation Diode	Approximately 10 cm (4 in) from C215 breakout, in forward lamp harness	—	—
Wipers/Washer Switch	In the left side of the steering column, actuated by the multi-function lever	—	—
C100 (10 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views*	*Inline Harness Connector End Views*
C101 (10 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views*	*Inline Harness Connector End Views*
C102 (1 cavity)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views*	—
C105 (8 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views*	*Inline Harness Connector End Views*
C106 (7 cavities)	Engine to engine jumper harness	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
C107 (7 cavities)	Engine to engine jumper harness	—	—
C108 (3 cavities)	Engine to camshaft position sensor jumper harness	—	*Inline Harness Connector End Views*
C120 (2 cavities)	Forward lamp to wheel speed sensor jumper harness, mounted to left frame rail	—	*Inline Harness Connector End Views*
C130 (2 cavities)	Forward lamp to wheel speed sensor jumper harness, mounted to right frame rail	—	*Inline Harness Connector End Views*
C160 (5 cavities) (Pontiac)	Left headlamp to the forward lamp harness, behind the headlamp door bracket	*Harness Routing Views*	—
C165 (5 cavities) (Pontiac)	Right headlamp to the forward lamp harness, behind the headlamp door bracket	*Harness Routing Views*	—
C170 (6 cavities) Pontiac (Export)	Left leveling headlamp to forward lamp harness, mounted to body, under left headlamp door	—	—
C175 (6 cavities) Pontiac (Export)	Right leveling headlamp to forward lamp harness, mounted to body, under right headlamp door	—	—
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views*	*Inline Harness Connector End Views*
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views*	*Inline Harness Connector End Views*
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views*	*Inline Harness Connector End Views*
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views*	*Inline Harness Connector End Views*
C205 (8 cavities) Pontiac (Export)	Forward lamp to instrument panel harness, between left kick panel and steering column	—	—
C206 (4 cavities) Chevrolet (Export)	Forward lamp to instrument panel harness, between left kick panel and steering column	—	—
C210 (8 cavities)	instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views*	*Inline Harness Connector End Views*
C211 (8 cavities)	Forward lamp to traction control module jumper harness, under the left side of the instrument panel, near the kick panel	*Harness Routing Views*	*Inline Harness Connector End Views*
C212 (10 cavities)	Forward lamp to traction control module jumper harness, under the left side of the instrument panel, near the kick panel	*Harness Routing Views*	*Inline Harness Connector End Views*
C215 (11 cavities)	Forward lamp to the steering column harness, near the base of the steering column	*Harness Routing Views*	—
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views*	—
C217 (4 cavities)	Instrument panel to inflatable restraint steering wheel module coil harness, near the base of the steering column	*Harness Routing Views*	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
C218 (2 cavities)	SIR harness to inflatable restraint steering wheel module coil, at base of steering wheel column	*Harness Routing Views*	—
C219 (2 cavities)	SIR harness to inflatable restraint instrument panel module jumper harness, behind instrument panel compartment	*Harness Routing Views*	—
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views*	*Inline Harness Connector End Views*
C230 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views*	*Inline Harness Connector End Views*
C240 (8 cavities)	Cross car to instrument panel harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views*	*Inline Harness Connector End Views*
C250 (2 cavities)	Forward lamp harness of the cruise control harness, near the brake/clutch pedal bracket	*Harness Routing Views*	—
C270 (2 cavities)	Instrument panel harness to cruise control harness, near the brake/clutch pedal bracket	*Harness Routing Views*	—
C300 (6 cavities) (AQ9)	Seat jumper to driver seat harness, under the driver seat assembly	*Harness Routing Views*	*Inline Harness Connector End Views*
C305 (6 cavities) (AQ9)	Seat jumper to passenger seat harness, under the passenger seat assembly	*Harness Routing Views*	*Inline Harness Connector End Views*
C310 (2 cavities) (w/AG1)	Instrument panel to driver seat harness, rear mounting bolt of the driver seat	*Harness Routing Views*	*Inline Harness Connector End Views*
C310 (2 cavities) (w/AQ9)	Instrument panel to seat jumper harness, between the rear mounting bolts of the driver seat	*Harness Routing Views*	—
C320 (1 cavity) Convertible	Convertible rear defogger jumper to instrument panel harness, under left interior trim molding, above left rear wheelhouse	*Harness Routing Views*	—
C330 (2 cavities) Coupe	Hatch to instrument panel harness, center of roof near dome lamp	*Harness Routing Views*	—
C400 (6 cavities)	Instrument panel to rear body harness, left rear cargo compartment, between rear end panel and carpet	*Harness Routing Views*	*Inline Harness Connector End Views*
C405A (7 cavities)	Fuel tank harness to the instrument panel harness pass through connector, forward of the rear axle	—	*Inline Harness Connector End Views*
C405B (16 cavities)	Instrument panel harness pass through connector, forward of the rear axle	*Harness Routing Views*	*Inline Harness Connector End Views*
C405C (4 cavities)	Rear wheel speed sensor jumper to the instrument panel harness pass through connector, forward of the rear axle to the speed sensor (ABS)	*Harness Routing Views*	*Inline Harness Connector End Views*
C405D (4 cavities)	Fuel tank harness to the instrument panel harness pass through connector, forward of the rear axle	—	*Inline Harness Connector End Views*
C410 (2 cavities) (Export)	Instrument panel to rear body harness in the left side of the rear compartment	—	—
C420 (2 cavities) (Convertible) (Chevrolet)	Instrument panel to CHMSL jumper harness, left underside of the rear compartment lid	*Harness Routing Views*	—
C420 (2 cavities) (Convertible) (Pontiac)	Instrument panel to CHMSL jumper harness, center underside of the rear compartment lid	*Harness Routing Views*	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
C420 (2 cavities) (Coupe)	Hatch to CHMSL jumper harness, left side of the rear compartment lid, between the hatch frame and plastic panel	*Harness Routing Views*	—
C430 (2 cavities)	Rear body to rear fascia harness, between the rear fascia and the rear panel, on the left side	*Harness Routing Views*	—
G100 (V6 VIN K)	On the lower right side of the engine, above the A/C compressor	*Harness Routing Views*	—
G100 (V8 VIN G)	On the lower right side of the engine, above the starter solenoid	*Harness Routing Views*	—
G101	In the engine compartment, attached to the front of the left wheelhouse	*Harness Routing Views*	—
G102	In the engine compartment, attached to the front of the right wheelhouse	*Harness Routing Views*	—
G105	Attached to the top right side of the radiator support	*Harness Routing Views*	—
G106	Attached to the top left side of the radiator support	*Harness Routing Views*	—
G109	Attached to the left front frame rail, forward of the brake pressure modulator valve bracket	*Harness Routing Views*	—
G110 (V6 VIN K)	In the front of the engine, bolted to the pulley above the A/C clutch connector	*Harness Routing Views*	—
G110 (V8 VIN G)	Attached to the rear of the left cylinder head	*Harness Routing Views*	—
G111 (V6 VIN K)	Attached to the left engine mount	*Harness Routing Views*	—
G111 (V8 VIN G)	Attached to the lower left side of the engine, behind the generator	*Harness Routing Views*	—
G112	Attached to the rear of the left cylinder head	*Harness Routing Views*	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views*	—
G201	Near the right A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views*	—
G202	Attached to the floor pan, under the center console, to the rear of the inflatable restraint sensing and diagnostic module (SDM)	*Harness Routing Views*	—
G305	Bolted to the left rocker panel at the floor pan bar 3	*Harness Routing Views*	—
G310	Bolted to the roof, left of the dome lamp	*Harness Routing Views*	—
G320	Bolted to the roof, to the left of the dome lamp	—	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views*	—
P100	Left side in the dash panel, engine to the passenger compartment	*Harness Routing Views*	—
P110	Right side in the dash panel, engine to the passenger compartment	—	—
P300	In the rear center of the roof, near the dome lamp	*Harness Routing Views*	—
P400	In the rear of the cargo compartment, left of the rear compartment lid release actuator	*Harness Routing Views*	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
P410	In the center underside of the rear compartment lid	*Harness Routing Views*	—
P500	Between the driver door and A-pillar	*Harness Routing Views*	—
P600	Between the passenger door and A-pillar	*Harness Routing Views*	—
S100 (V8 VIN G) (Manual Transmission)	Engine harness, approximately 5 cm (2 in) from the vehicle speed sensor breakout	—	—
S100 (V8 VIN G) (Automatic Transmission)	Engine harness, approximately 12 cm (5 in) from the automatic transmission breakout	—	—
S101 (V6 VIN K)	Engine harness, main branch, approximately 11 cm (4 in) from the vehicle speed sensor breakout	—	—
S102 (V6 VIN K)	In the engine harness, approximately 11 cm (4 in) from G211 breakout	—	—
S102 (V8 VIN G)	In the engine harness, main branch, approximately 7 cm (3 in) from the engine oil pressure sensor breakout	—	—
S104 (V6 VIN K)	In the engine harness, approximately 15 cm (6 in) from the powertrain control module (PCM) breakout	—	—
S104 (V8 VIN G)	Engine harness, approximately 14 cm (6 in) from the powertrain control module (PCM) breakout	—	—
S105 (V8 VIN G)	Engine harness at A/C refrigerant pressure sensor breakout	—	—
S106 (V8 VIN G)	In the engine harness, main branch approximately 4 cm (2 in) from the powertrain control module (PCM) breakout	—	—
S107 (V6 VIN K)	In the engine harness, main branch, approximately 21 cm (8 in) from the powertrain control module (PCM) breakout	—	—
S107 (V8 VIN G)	In the engine harness, main branch, approximately 7 cm (3 in) from the powertrain control module (PCM) breakout	—	—
S108 (V6 VIN K)	In the engine harness, main branch, approximately 7 cm (3 in) from the vehicle speed sensor breakout	—	—
S108 (V8 VIN G) (Automatic Transmission)	In the engine harness, main branch, approximately 5 cm (2 in) from the automatic transmission breakout	—	—
S108 (V8 VIN G) (Manual Transmission)	In the engine harness, main branch, approximately 12 cm (5 in) from the vehicle speed sensor breakout	—	—
S109 (V8 VIN G)	In the engine harness, approximately 8 cm (3 in) from the fuel injector 4 breakout	—	—
S110 (V6 VIN K)	In the engine harness, approximately 4 cm (2 in) from the powertrain control module (PCM) breakout	—	—
S110 (V8 VIN G)	In the engine harness, main branch, approximately 19 cm (7 in) from the powertrain control module (PCM) breakout	—	—
S112	In the forward lamp harness, approximately 9 cm (4 in) from the right lamps breakout	—	—
S113	In the forward lamp harness approximately 7 cm (3 in) from the engine coolant fans/cruise control	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S114 (V6 VIN K)	Engine harness, approximately 3 cm (1 in) from generator breakout	—	—
S114 (V8 VIN G)	Engine harness, approximately 17 cm (7 in) back from A/C compressor clutch connector	—	—
S115 (V6 VIN K)	In the engine harness at the generator breakout	—	—
S115 (V8 VIN G)	In the engine harness, approximately 20 cm (8 in) back from the A/C compressor clutch connector	—	—
S116 (V8 VIN G)	Engine harness, approximately 9 cm (4 in) from manifold absolute pressure (MAP) sensor breakout	—	—
S118 (V8 VIN G)	Engine harness, approximately 15 cm (6 in) from manifold absolute pressure (MAP) sensor breakout	—	—
S119 (V8 VIN G) (Automatic Transmission)	Engine harness, main branch, approximately 8 cm (3 in) from automatic transmission breakout	—	—
S119 (V8 VIN G) (Manual Transmission)	Engine harness, main branch, approximately 9 cm (4 in) from vehicle speed sensor breakout	—	—
S120 (V8 VIN G)	Engine harness, main branch, 8 cm (3 in) from powertrain control module (PCM) breakout	—	—
S121 (V6 VIN K)	Engine harness, main branch, 8 cm (3 in) from powertrain control module (PCM) breakout	—	—
S122	Engine jumper harness	—	—
S123	Engine jumper harness	—	—
S124	Engine jumper harness	—	—
S125	Engine jumper harness	—	—
S126	Engine jumper harness	—	—
S127	Engine jumper harness	—	—
S150	Forward lamp harness, approximately 16 cm (6 in) from windshield washer pump breakout	—	—
S151	Forward lamp harness, approximately 28 cm (4 in) from C200	—	—
S152	Forward lamp harness, approximately 7 cm (3 in) from C120 (left front wheel speed sensor) breakout	—	—
S153	Forward lamp harness, approximately 13 cm (5 in) from C120 (left front wheel speed sensor) breakout	—	—
S154	Forward lamp harness, approximately 13 cm (5 in) from C120 (left front wheel speed sensor) breakout	—	—
S155	Forward lamp harness, approximately 27 cm (11 in) from engine coolant fans/cruise control module breakout	—	—
S156 (Export)	Forward lamp harness, approximately 7 cm (3 in) from G106 breakout	—	—
S157 (Export)	Forward lamp harness, approximately 8 cm (3 in) from G105 breakout	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S159	Forward lamp harness, approximately 8 cm (3 in) into secondary air injection bleed valve solenoid breakout	—	—
S160	Forward lamp harness, approximately 4 cm (2 in) from the engine coolant fans/cruise control module breakout	—	—
S161	Forward lamp harness, main branch, approximately 13 cm (5 in) from G106 breakout	—	—
S164	In the forward lamp harness, approximately 13 cm (5 in) from the main branch into the UH electrical center 2 breakout	—	—
S165	In the forward lamp harness, approximately 7 cm (3 in) from the main branch into the UH electrical center 2 breakout	—	—
S166	Forward lamp harness, approximately 14 cm (6 in) from G105 breakout	—	—
S167	Forward lamp harness, approximately 7 cm (3 in) from electronic brake control module (EBCM) breakout	—	—
S168	In the forward lamp harness, approximately 8 cm (3 in) from the main branch into the UH electrical center 1 breakout	—	—
S169	In the forward lamp harness, approximately 6 cm (2 in) from the main branch into the UH electrical center 1 breakout	—	—
S170	In the forward lamp harness, approximately 13 cm (5 in) from G106 breakout	—	—
S171	In the forward lamp harness, approximately 10 cm (4 in) from G102 breakout	—	—
S172 (Export)	Forward lamp harness, approximately 28 cm (11 in) from G105	—	—
S177	In the forward lamp harness, approximately 4 cm (2 in) from the main branch into the UH electrical center 1 breakout	—	—
S179	In the forward lamp harness, approximately 25 cm (10 in) from the UH electrical center 1 breakout	—	—
S181	In the forward lamp harness, approximately 20 cm (8 in) from the UH electrical center 1 breakout	—	—
S182	In the forward lamp harness, approximately 15 cm (6 in) from the UH electrical center 1 breakout	—	—
S183	In the forward lamp harness, approximately 10 cm (4 in) from the UH electrical center 1 breakout	—	—
S184	In the forward lamp harness, approximately 5 cm (2 in) from the UH electrical center 1 breakout	—	—
S185	In the forward lamp harness, at the UH electrical center 1 breakout	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S202	Forward lamp harness, approximately 28 cm (11) from C200	—	—
S203	In the forward lamp harness, main branch, approximately 4 cm from C211/C212 breakout, toward C200	—	—
S204	Forward lamp harness, main branch, at C211/C212 breakout	—	—
S205	Forward lamp harness, main branch, approximately 4 cm (2 in) from C211/C212 breakout, toward P100	—	—
S206	Instrument panel, at rear compartment lid release relay breakout	—	—
S207	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the data link connector (DLC) breakout	—	—
S208	In the cross car harness, main branch, approximately 26 cm (10 in) from the power window control module breakout	—	—
S209	Forward lamp harness, main branch, approximately 11 cm (5 in) from C211/C212 breakout, toward P100	—	—
S210	Forward lamp harness, main branch, approximately 8 cm (3 in) from C211/C212 breakout toward P100	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S214 (Chevrolet)	instrument panel harness, approximately 8 cm (3 in) into instrument cluster breakout	—	—
S215	In the instrument panel harness, main branch, approximately 11 cm (4 in) from the antenna cable breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S218	In the instrument panel harness, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S219	instrument panel harness, main branch, approximately 13 cm (5 in) from rear compartment lid release relay breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S222	instrument panel harness, approximately 6 cm from G202 breakout, in the inflatable restraint sensing and diagnostic module (SDM) branch	—	—
S224	In the instrument panel harness, main branch, approximately 17 cm (7 in) from the instrument cluster breakout	—	—
S225	Instrument panel harness, approximately 6 cm (2 in) from blower motor breakout	—	—
S226	Instrument panel harness, approximately 7 cm (3 in) into headlamp switch breakout	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S227	Instrument panel harness, approximately 14 cm (6 in) into headlamp switch breakout	—	—
S228	Instrument panel harness, main branch, approximately 20 cm (8 in) from rear compartment lid release relay breakout	—	—
S232	In the instrument panel harness, approximately 7 cm (3 in) from the park brake switch breakout	—	—
S234 (Automatic)	Instrument panel harness, main branch, approximately 5 cm (2 in) from body control module (BCM) breakout	—	—
S237 (Automatic)	Instrument panel harness, main branch, approximately 6 cm (2 in) from body control module (BCM) breakout	—	—
S239 (Automatic)	instrument panel harness, main branch, approximately 1 cm (0.5 in) from body control module (BCM) breakout	—	—
S240	In the instrument panel harness, main branch, approximately 17 cm (7 in) from the antenna cable breakout	—	—
S241	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the antenna cable breakout	—	—
S242	In the instrument panel harness, main branch, approximately 4 cm (2 in) from data link connector (DLC) breakout	—	—
S243	Instrument panel harness, approximately 9 cm (4 in) from G200 breakout	—	—
S244 (Convertible)	Instrument panel harness, approximately 46 cm (18 in) from C405	—	—
S244 (Coupe)	Instrument panel harness, approximately 40 cm (16 in) back from C405	—	—
S245	Instrument panel harness, approximately 22 cm (9 in) from G200 breakout	—	—
S246	In the instrument panel harness, approximately 3 cm (1.2 in) from the antenna cable breakout	—	—
S247	Instrument panel harness, approximately 16 cm (6 in) from G200 breakout	—	—
S248	In the instrument panel harness, approximately 2 cm (1 in) from the radio connectors breakout	—	—
S250 (Chevrolet) (Export)	In the instrument panel harness, approximately 29 cm (11 in) from the G200 breakout	—	—
S251 (Chevrolet) (Export)	instrument panel harness, at instrument panel fuse block breakout	—	—
S252 (Convertible)	In the instrument panel harness, main branch, approximately 48 cm (19 in) from G200 breakout	—	—
S252 (Coupe)	In the instrument panel harness, main branch, approximately 33 cm (13 in) from G305 breakout	—	—
S253 (Convertible)	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the instrument cluster breakout	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S254	In the instrument panel harness, approximately 7 cm (3 in) from C200 breakout	—	—
S255	In the instrument panel harness, approximately 7 cm (3 in) into the instrument panel fuse block breakout	—	—
S260	Cross car harness, main branch, approximately 22 cm (9 in) from the C200C breakout	—	—
S261 (Pontiac)	Cross car harness, approximately 6 cm (3 in) from body control module (BCM) breakout	—	—
S263	Cross car harness, approximately 16 cm (6 in) from the C200C breakout	—	—
S267	Cross car harness, main branch, approximately 24 cm (9 in) from inside rearview mirror breakout	—	—
S268	Cross car harness, main branch, approximately 18 cm (7 in) from inside rearview mirror breakout	—	—
S275	Forward lamp harness, approximately 30 cm (12 in) back from ignition switch connector	—	—
S276	Forward lamp harness, approximately 25 cm (10 in) back from ignition switch connector	—	—
S278	Forward lamp harness, approximately 7 cm (3 in) into C215 breakout	—	—
S284	In the instrument panel harness, approximately 11 cm (4.3 in) fromt he G202 breakout	—	—
S285	In the instrument panel harness, approximately 16 cm (6.3 in) from the G202 module	—	—
S300 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 4 cm (2 in) from theft deterrent shock sensor breakout	—	—
S301 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 7 cm (3 in) from theft deterrent shock sensor breakout	—	—
S302 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 13 cm (5 in) from remote compact disc player/left rear speaker breakout	—	—
S303 (Pontiac)	Instrument panel harness, main branch, approximately 18 cm (7 in) from C220 breakout	—	—
S303 (Pontiac Convertible)	Instrument panel harness, main branch, approximately 11 cm (4 in) from body control module (BCM) breakout	—	—
S304 (Pontiac)	Instrument panel harness, main branch, approximately 18 cm (7 in) from body control module (BCM) breakout	—	—
S304 (Pontiac Convertible)	Instrument panel harness, main branch, approximately 18 cm (7 in) from body control module (BCM) breakout	—	—

Power and Grounding Components (cont'd)

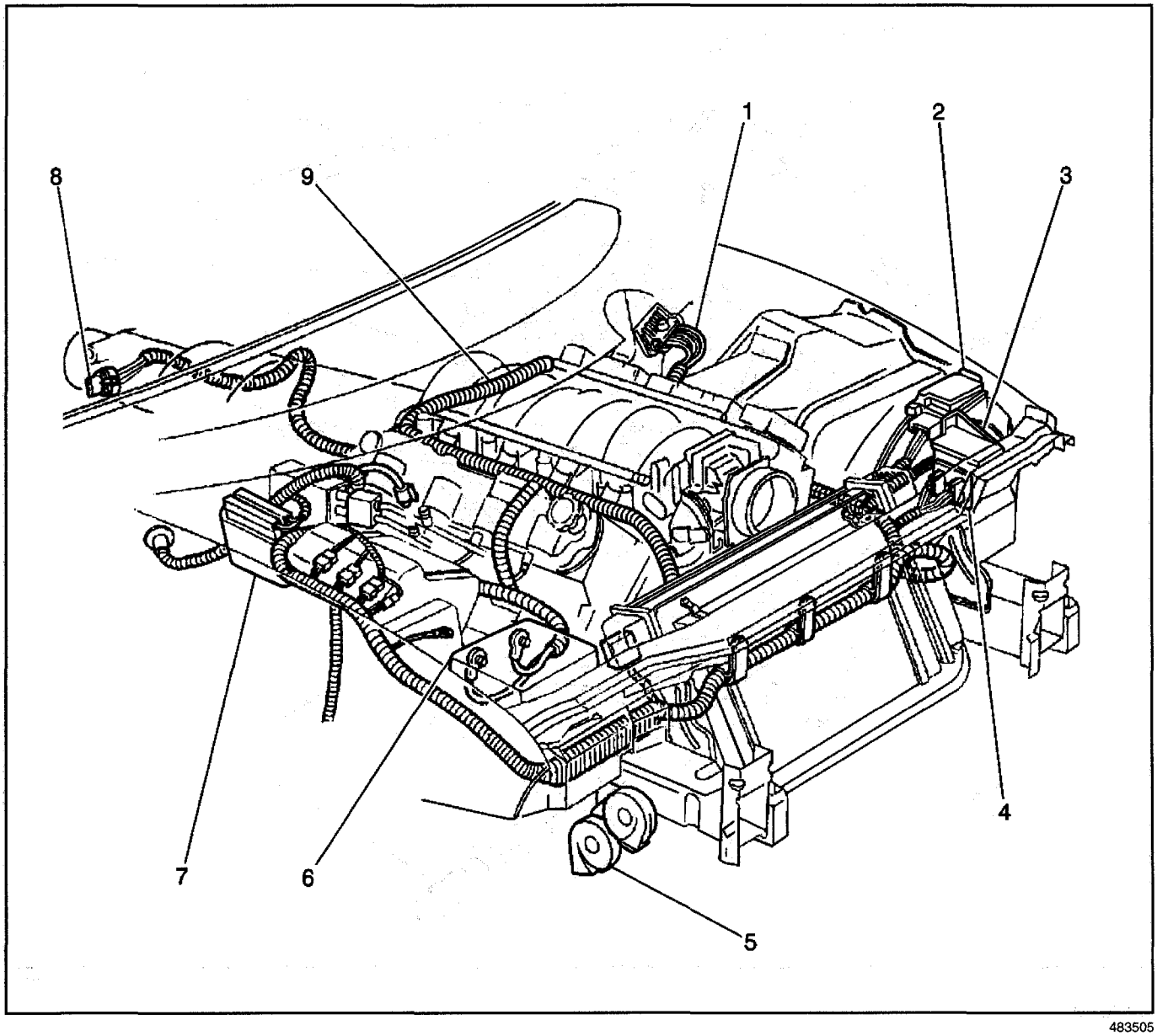
Name	Location	Locator View	Connector End View
S305 (Pontiac Coupe)	Instrument panel harness, main branch, approximately 7 cm (3 in) from remote compact disc player/left rear speaker breakout	—	—
S306 (Pontiac)	Instrument panel harness, main branch, approximately 14 cm (6 in) from G201 breakout	—	—
S307 (Pontiac)	Instrument panel harness, main branch, approximately 7 cm (3 in) from G201 breakout	—	—
S315 (Coupe)	Instrument panel harness, approximately 19 cm (7 in) back from C330	—	—
S317 (Convertible)	Instrument panel harness, main branch, approximately 40 cm (16 in) from left rear courtesy lamp breakout	—	—
S320 (AQ9)	In the seat jumper harness, main branch, approximately 7 cm (3 in) from C310 breakout	—	—
S321 (AQ9)	In the seat jumper harness, main branch, approximately 13 cm (5 in) from C310 breakout	—	—
S330 (AQ9)	In the driver seat harness, main branch, approximately 5 cm (2 in) from the power seat switch breakout	—	—
S331 (AQ9)	In the passenger seat harness, approximately 30 cm (12 in) from C305 breakout	—	—
S333 (Convertible)	In the instrument panel harness, approximately 11 cm (4 in) (4.3 in) from the body control module (BCM) breakout	—	—
S333 (Coupe)	In the instrument panel harness, main branch, approximately 23 cm (9 in) from the remote compact disc player/left rear speaker breakout	—	—
S400 (Chevrolet)	Rear body harness, main branch, approximately 20 cm (8 in) from P400 breakout toward right taillamp	—	—
S400 (Pontiac)	Rear body harness, main branch, approximately 13 cm (5 in) from P400 breakout toward right taillamp	—	—
S401 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 16 cm (6 in) from P400	—	—
S402 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 13 cm (5 in) from P400	—	—
S403 (Chevrolet)	Rear body harness, between P400 and C400 in breakout, 11 cm (4 in) from P400	—	—
S404	Rear body harness, main branch, approximately 20 cm (8 in) from the P400 breakout	—	—
S405 (Chevrolet)	Rear body harness, between P400 and C400 in breakout, approximately 17 cm (7 in) from P400	—	—
S405 (Pontiac)	Rear body harness, between P400 and C400 in breakout, approximately 9 cm (4 in) from P400	—	—

Power and Grounding Components (cont'd)

Name	Location	Locator View	Connector End View
S406	In the rear body harness, approximately 10 cm (4 in) from the rear compartment lid release actuator	—	—
S408 (Chevrolet) (Export)	Rear body harness, main branch, approximately 20 cm (8 in) from P400 breakout	—	—
S410	In the rear body harness, main branch, approximately 27 cm (11 in) from P400 breakout, toward the right taillamp	—	—
S415 (Export)	In the cross car harness, approximately 13 cm (5.1 in) from the license lamp breakout	—	—
S420	In the hatch harness, main branch, approximately 7 cm (3 in) from P300 breakout	—	—
S430	Rear fascia harness, main branch, approximately 12 cm (5 in) from the license lamp breakout	—	—
S430 (Export)	In the rear fascia harness, approximately 8 cm (3 in) from the main branch, in license lamp breakout	—	—
S435 (Pontiac) (Export)	Rear fascia harness, main branch, approximately 20 cm (8 in) from license lamp breakout	—	—
S440	Rear fascia harness, main branch, approximately 5 cm (2 in) from license lamp breakout	—	—
S440 (Export)	Rear fascia harness, main branch, approximately 7 cm (3 in from license lamp breakout	—	—
S450	CHMSL jumper harness, approximately 24 cm (9 in) from the bulbs	—	—
S460	CHMSL jumper harness, approximately 30 cm (12 in) from the bulbs	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—
S501	Cross car harness, approximately 4 cm (2 in) from left outside rearview mirror breakout	—	—
S504	Cross car harness, approximately 11 cm (4 in) from left outside rearview mirror breakout	—	—
S610 (Chevrolet)	Cross car harness, approximately 7 cm (3 in) from left outside rearview mirror breakout	—	—

Power and Grounding Component Views

Engine Compartment

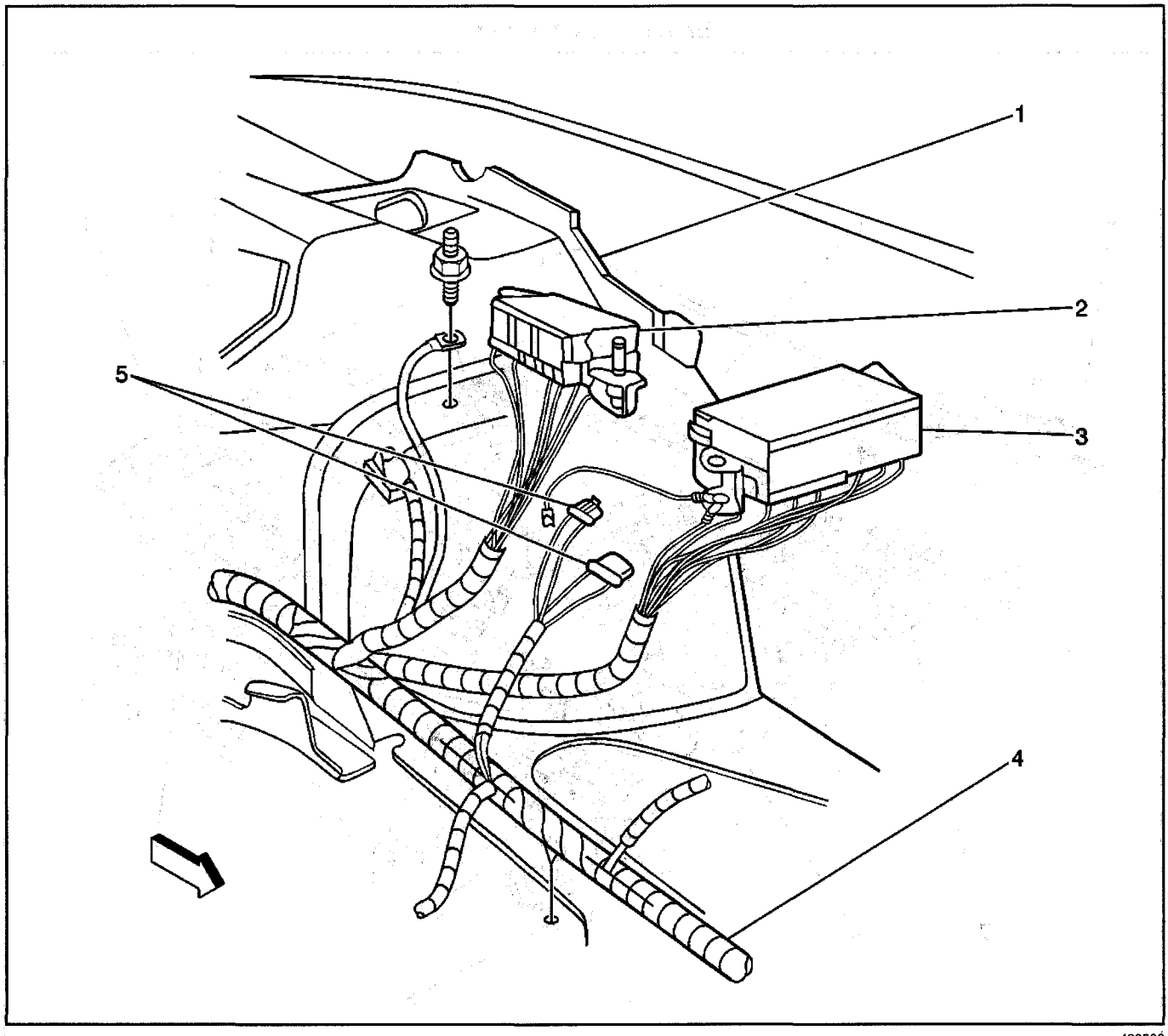


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Legend

(1) Forward Lamp Wiring Harness
(2) Underhood Electrical Center 1
(3) Underhood Electrical Center 2
(4) Headlamp Opening Door Actuator Module
(5) Horns
(6) Battery
(7) Powertrain Control Module (PCM)
(8) Vehicle Speed Sensor
(9) Engine Wiring Harness

Underhood Electrical Centers



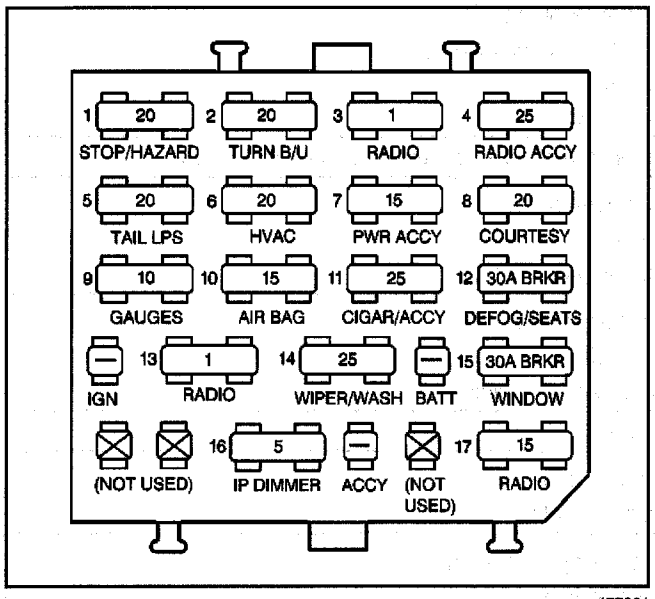
483506

Legend

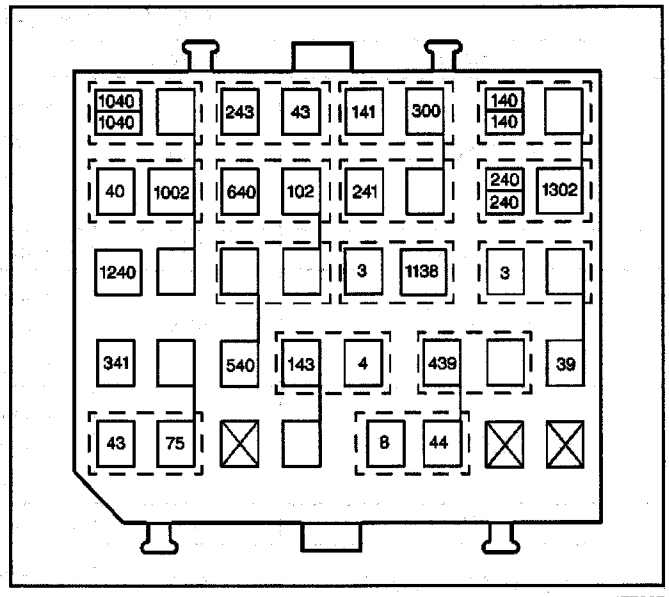
(1) Left Front Wheelhouse
(2) Underhood Electrical Center 2
(3) Underhood Electrical Center 1
(4) Forward Lamp Wiring Harness
(5) Headlamp Connectors (Pontiac)

Electrical Center Identification

IP Fuse Block



477221



477227

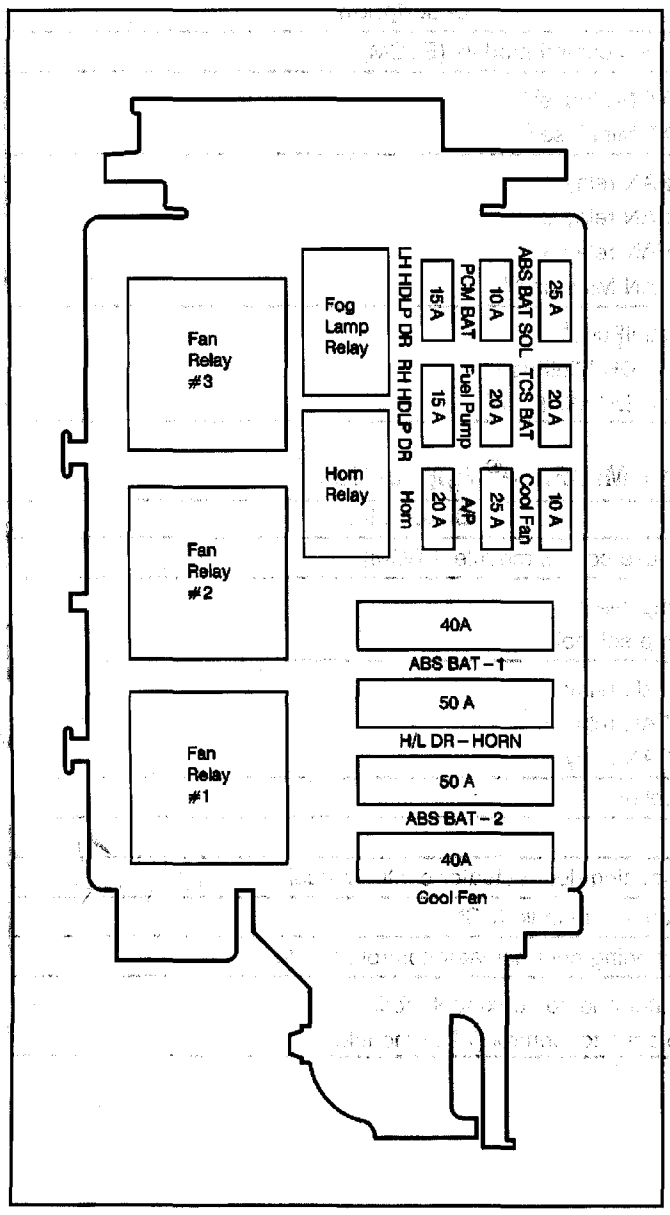
Fuse Block Application Table

Fuse	Rating	Description
1 - STOP HAZARD	20A	• Hazard lamp flasher • Stop lamp switch
2 - TURN B/U	20A	• Backup lamp switch • Daytime running lamps (DRL) module • Park/neutral position switch • Second gear start switch • Traction control switch • Turn signal lamp flasher
3 - RADIO	1A	Steering wheel controls
4 - RADIO ACCY	25A	• Amplifier • Radio power antenna • Remote compact disc player
5 - TAIL LPS	20A	• Daytime running lamps (DRL) module • Headlamp switch
6 - HVAC	20A	HVAC control
7 - PWR ACCY	15A	• Instrument cluster • Outside rearview mirror switch • Radio • Rear compartment lid release relay • Theft deterrent relay • Theft deterrent shock sensor
8 - COURTESY	20A	Body control module (BCM)

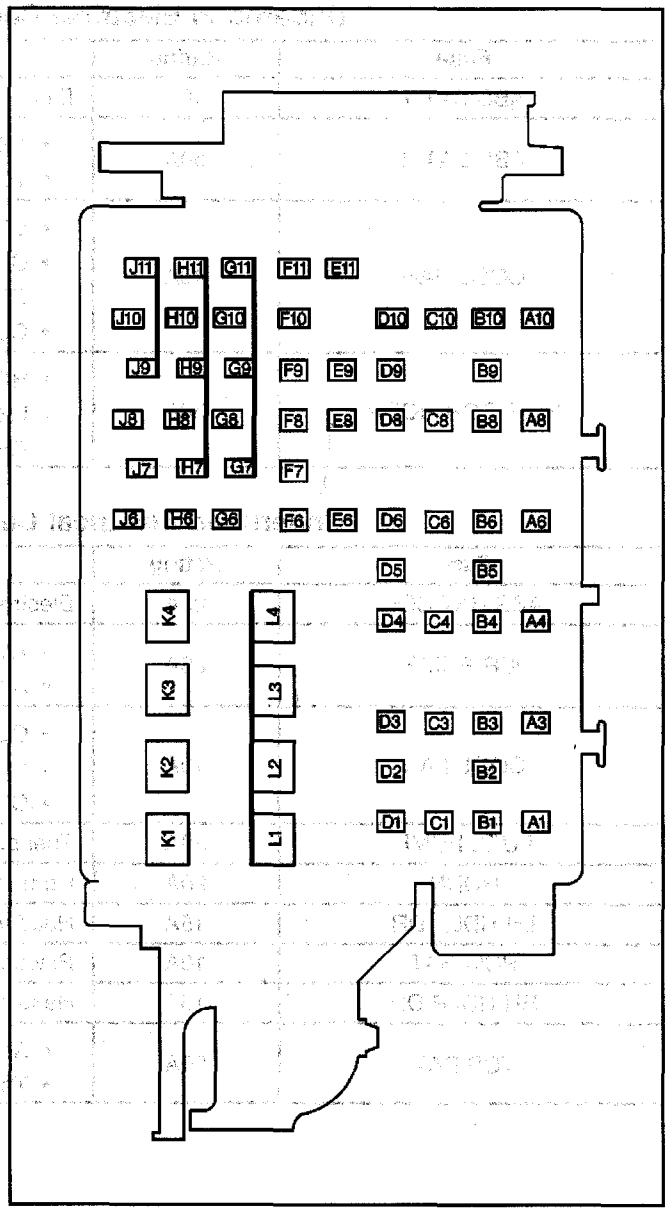
Fuse Block Application Table (cont'd)

Fuse	Rating	Description
9 - GAUGES	10A	• Body control module (BCM), • Daytime running lamps (DRL) module • Instrument cluster • Stop lamp switch
10 - AIR BAG	15A	Inflatable restraint sensing and diagnostic module (SDM)
11 - CIG ACCY	25A	• Auxiliary power outlet • Cigar lighter • Data link connector (DLC)
12 - DEFOG/SEATS	30A	• Driver seat assembly • HVAC control • Passenger seat assembly
13 - RADIO	1A	Steering wheel control
14 - WIPER/WASH	25A	• Windshield wiper motor • Wiper/washer switch
15 - WINDOWS	30A	• Folding top relay (with ETA) • Folding top switch • Power window control module • Rear Fog Lamp Relay (Export) • Side window switches
16 - IP DIMMER	5A	• Ashtray lamp • Door illumination lamps • Electronic traction control switch • Fog lamp switch • Folding top switch • Headlamp switch • HVAC control • Instrument cluster • PRNDL illumination lamp • Radio • Rear fog lamp switch (Export) • Second gear start switch
17 - RADIO	15A	• Body control module (BCM) • Radio • STG WHL CNTRL Fuse 3

Underhood Electrical Center 1



477232



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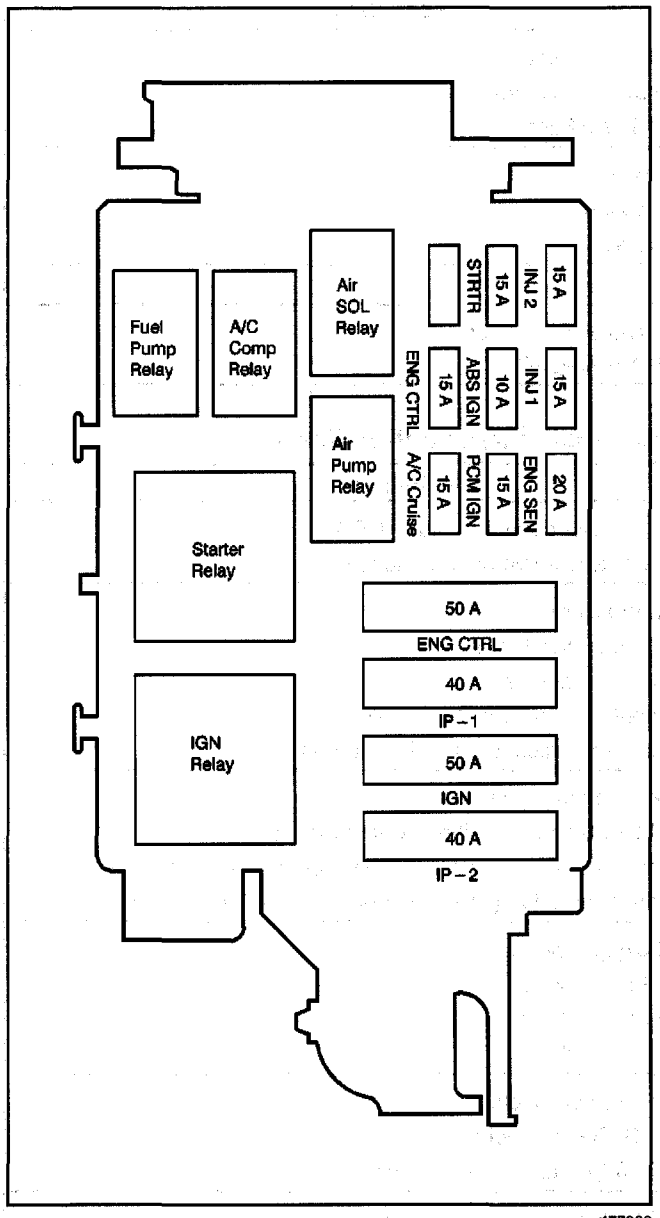
Underhood Electrical Center 1 MaxiFuse® Application

Fuse	Rating	Description
ABS BAT 1	40A	Electronic brake control module (EBCM)
ABS BAT 2	50A	• ABS BAT MiniFuse® • TCS BAT MiniFuse®
COOL FAN	40A	• COOL FAN relay 1 • COOL FAN relay 2 • COOL FAN relay 3 • COOL FAN MiniFuse®
H/L DOOR HORN	50A	• HORN MiniFuse® • LH HDLP DR MiniFuse® • RH HDLP DR MiniFuse®

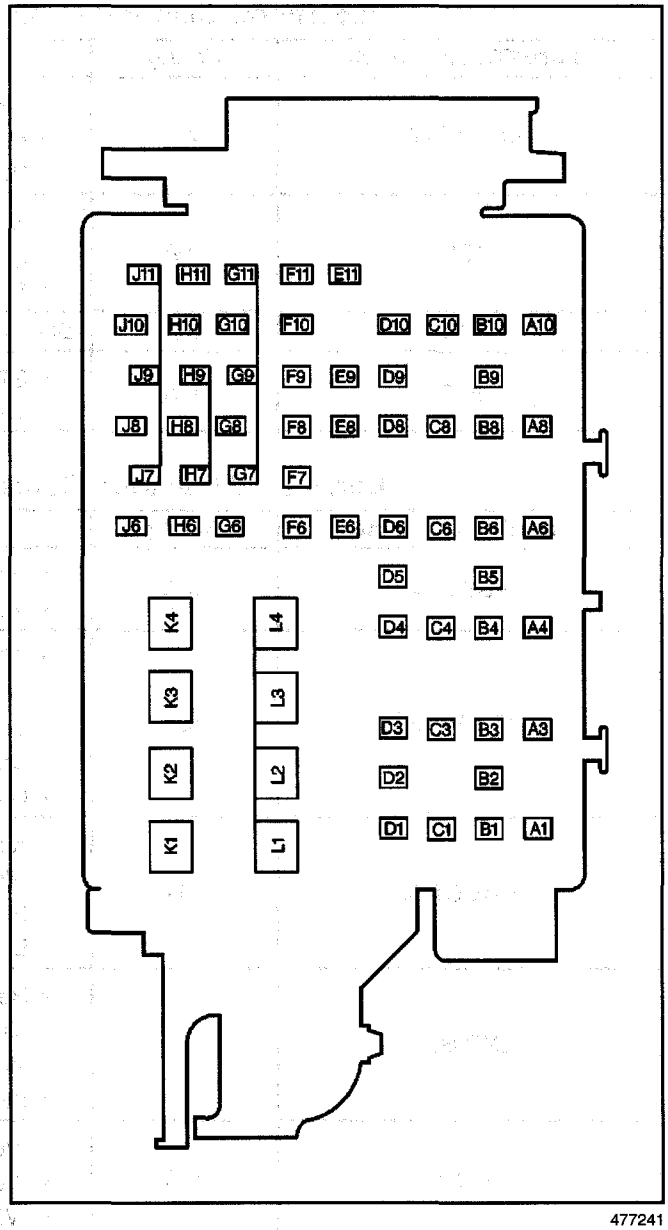
Underhood Electrical Center 1 MiniFuse® Application

Fuse	Rating	Description
ABS BAT SOL	25A	Electronic brake control module (EBCM)
AIR PUMP	25A	• AIR pump relay • AIR pump solenoid
COOL FAN	10A	• COOL FAN relay 1 • COOL FAN relay 2 • COOL FAN relay 3
FUEL PUMP	20A	Fuel pump relay
HORN	20A	Horn relay
LH HDLP DR	15A	Headlamp opening door actuator control module
PCM BAT	10A	Powertrain control module (PCM)
RH HDLP DR	15A	Headlamp opening door actuator control module
TCS BAT	20A	• Accelerator and servo control module • Throttle actuator control (TAC) module

Underhood Electrical Center 2



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Underhood Electrical Center 2 MaxiFuse® Application Table

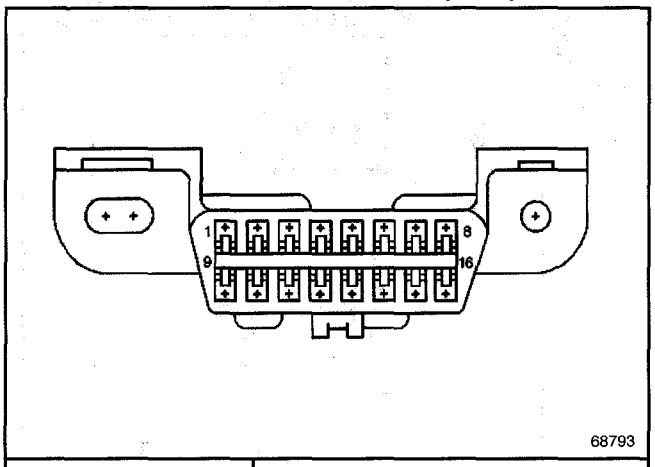
Fuse/Circuit Breaker	Rating	Description
ENG CTRL	50A	• AIR PUMP MiniFuse® • FUEL PUMP MiniFuse® • PCM BAT MiniFuse®
IGN	50A	• Ignition relay • Ignition switch • Starter relay
IP-1	40A	Blower motor relay
IP-2	40A	• STOP/HAZARD MiniFuse® • TAIL LPS MiniFuse®

Underhood Electrical Center 2 MiniFuse® Application Table

Fuse/Circuit Breaker	Rating	Description
ABS IGN	10A	• Electronic brake control module (EBCM) • Accelerator and servo control module
A/C CRUISE	15A	• A/C compressor relay • Cruise control clutch switch • Cruise control module • Cruise control release (brake) switch • Cruise control switches (multi-function lever)
ENG CTRL	15A	• Automatic transmission • (V6 VIN K) Electronic ignition control module • Evaporative emission (EVAP) canister purge solenoid valve • Evaporative emission (EVAP) canister vent solenoid valve
ENG SEN	20A	• Heated oxygen sensors • Manual transmission • Mass air flow (MAF) sensor • Stop lamp switch
INJ 1	15A	• (V6 VIN K) Fuel injectors • (V8 VIN G) Bank 1 fuel injectors • (V8 VIN G) Ignition control module, LH
INJ 2	15A	• (V8 VIN G) Bank 2 Fuel injectors • (V8 VIN G) Ignition control module, RH
PCM IGN	15A	Powertrain control module (PCM)
STRTR	15A	• Clutch pedal position (CPP) switch • Park/neutral position switch • Instrument cluster • Powertrain control module (PCM)

Power and Grounding Connector End Views

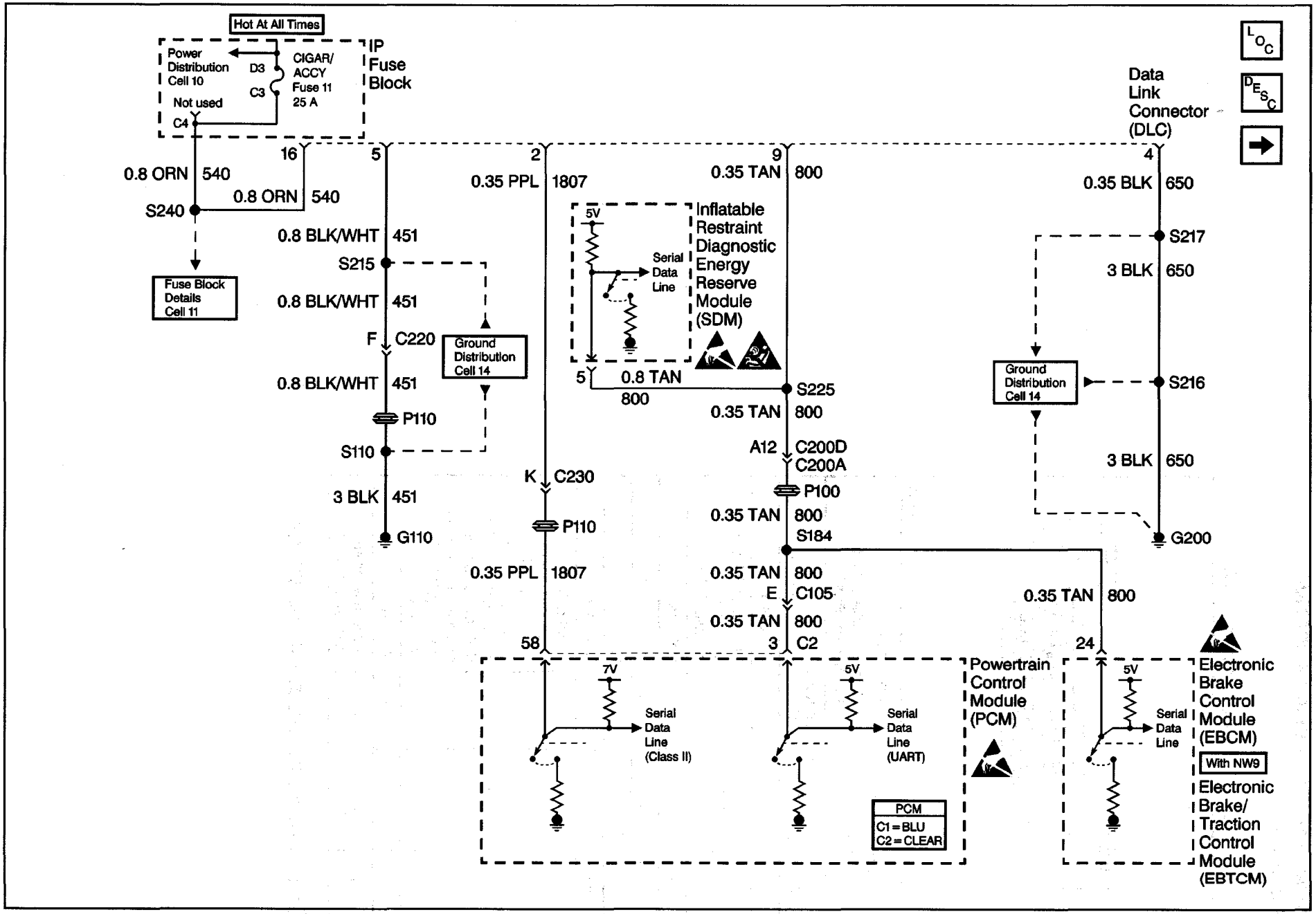
Data Link Connector (DLC)



Connector Part Information		• 12110250 • 16-Way F Metri-Pack 150 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	—	—	Not Used
2	PPL	1807	Class II serial data line, powertrain control module (PCM)
3	—	—	Not Used
4	BLK	650	Ground
5	BLK/WHT	451	Ground
6-8	—	—	Not Used
9	TAN	800	Serial data line, diagnostic energy reserve module (DERM), electronic brake control module (EBCM), electronic brake/traction control module (EBTCM) and PCM
10-15	—	—	Not Used
16	ORN	540	Power feed from cigar/accy fuse 11

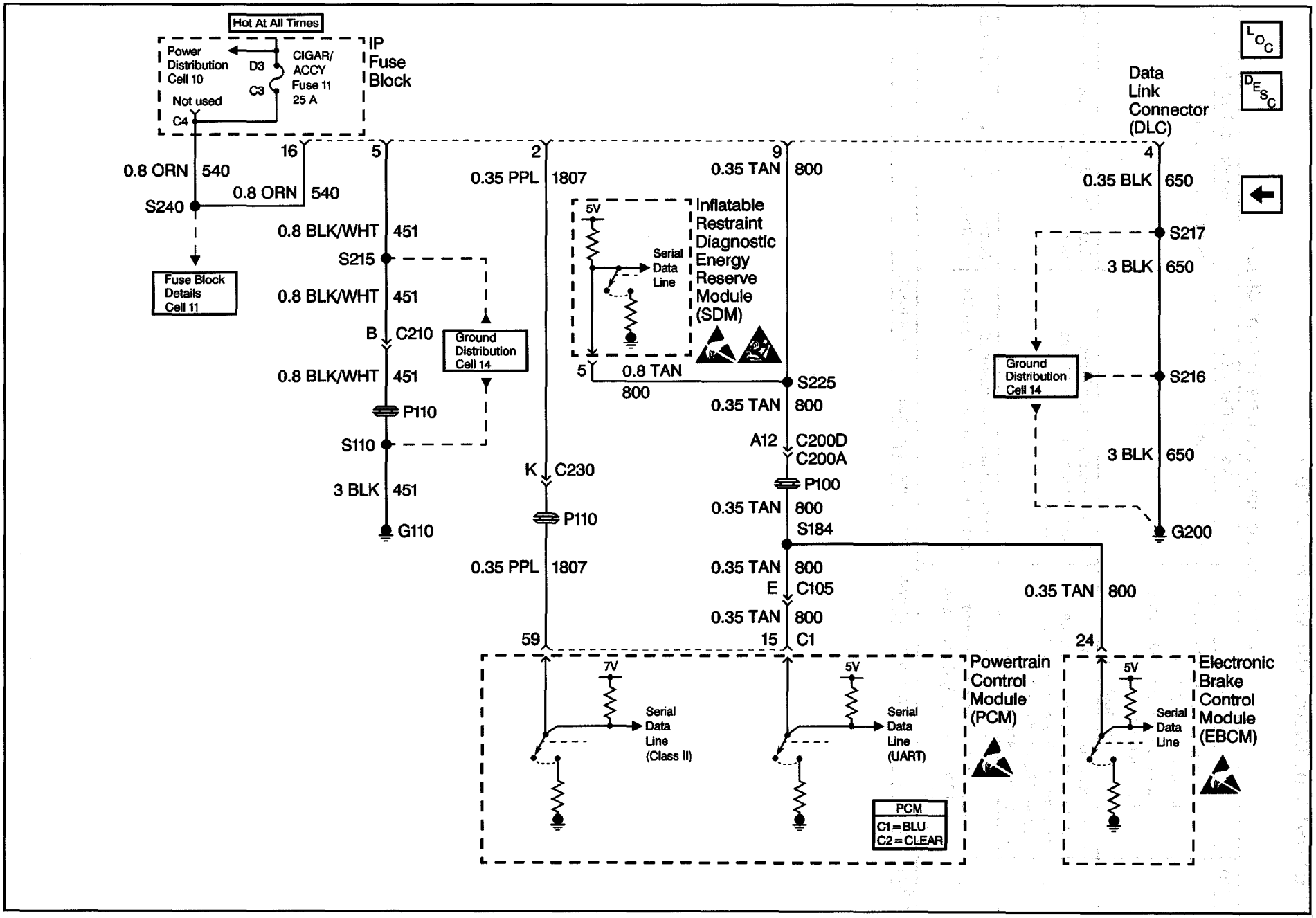
Schematic and Routing Diagrams

Data Link Connector (DLC) Schematics (Cell 50: V8 VIN G)



454800

Data Link Connector (DLC) Schematics (Cell 50: V6 VIN K)



454796

Diagnostic Information and Procedures

Data Link Communications System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Connect a scan tool to the data link connector (DLC). 2. Turn the ignition switch to the RUN position. 3. Turn on the scan tool.	Scan Tool turns on	*Scan Tool Inoperative*
2	Use a scan tool in order to communicate with the inflatable restraint sensing and diagnostic module (SDM), the EBCM (if equipped) and the PCM.	Communication is established between the scan tool and the modules.	*Scan Tool Does Not Communicate with UART Data Line*
3	Use a scan tool in order to communicate with the Powertrain Control Module (PCM) Class II serial data line.	Communication is established between the scan tool and the PCM.	*Scan Tool Does Not Communicate w/Class 2 Data Line*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Scan Tool Inoperative

Circuit Description

The data link connector (DLC) provides operating power for the scan tool at terminal 16 (battery positive voltage) and at terminal 4 (ground). The DLC provides the class 2 serial data signal at terminal 2 and signal ground at terminal 5. The DLC provides the UART serial data signal at terminal 9 and signal ground at terminal 5. The scan tool will power up with the ignition off.

Test Description

1. The CIG ACCY fuse supplies power to the DLC terminal 16.
4. The DLC battery positive voltage and ground circuits are functioning properly. The malfunction must be due to the scan tool.

Scan Tool Inoperative

Step	Action	Yes	No
1	Test the DLC battery positive voltage circuit for an open or a short to ground. Refer to *Wiring Repairs*. Did you find and correct the condition?	Go to the applicable Diagnostic System Check	*Go to Step 2*
2	Test the DLC ground circuit terminal 4 for an open. Refer to *Wiring Repairs*. Did you find and correct the condition?	Go to the applicable Diagnostic System Check	*Go to Step 3*
3	Inspect for poor connections/terminal tension at the DLC terminals 4 and 16. Refer to *Connector Repairs*. Did you find and correct the condition?	Go to the applicable Diagnostic System Check	*Go to Step 4*
4	The scan tool may be malfunctioning. Refer to the scan tool instruction manual. Did you obtain a properly operating scan tool?	Go to the applicable Diagnostic System Check	—

Scan Tool Does Not Communicate with UART Data Line

Step	Action	Value(s)	Yes	No
1	Use a DMM in order to measure the voltage between B+ and DLC terminal 5. Is the voltage within the specified range?	B+ (9–14 V)	Go to *Step 2*	Go to *Step 3*
2	Inspect for proper connection of the scan tool to the DLC. Is the connection OK between the scan tool and the DLC?	—	Go to *Step 6*	Go to *Step 7*
3	Does the instrument cluster display work?	—	Go to *Step 4*	Go to *Step 5*
4	Repair a poor connection or open in circuit 451 between the DLC and S215. Has the repair been made?	—	*Go to Step 19*	—
5	Repair a poor connection or open in circuit 451 between S215 and G110. Has the repair been made?	—	Go to *Step 19*	—
6	Use the scan tool in order to establish communication with the PCM on a different vehicle. Can communication be established with the scan tool?	—	Go to *Step 8*	Go to *Step 9*
7	Repair the poor connection between the DLC and the scan tool. Is the repair complete?	—	Go to *Step 19*	—
8	1. Reconnect the scan tool to the DLC. 2. Turn the ignition switch to the RUN position. 3. Use a scan tool in order to establish communication with the Powertrain Control Module (PCM). Can the scan tool communicate with the PCM?	—	Go to *Step 10*	Go to *Step 11*

Scan Tool Does Not Communicate with UART Data Line (cont'd)

Step	Action	Value(s)	Yes	No
9	Determine if the scan tool is malfunctioning. Refer to the scan tool instruction manual for additional information. Is the action complete?	—	Go to *Step 19*	—
10	Malfunction is not present or intermittent. Inspect the PCM, SDM, and EBCM connectors for a poor connection, short to B+, or short to ground in CKT 800. Repair as necessary. Is the action complete?	—	Go to *Step 19*	—
11	1. Turn the ignition switch to the OFF position. 2. Disconnect the PCM connector C1 (V6 VIN K) or C2 (V8 VIN G). 3. Disconnect the SDM connector. 4. Disconnect the EBCM connector. 5. Use a DMM in order to measure the resistance between the DLC terminal 9 and the DLC terminal 5. Is the resistance the same as the specified value?	Infinite	Go to *Step 12*	Go to *Step 13*
12	1. Turn the ignition switch to the RUN position. 2. Use a DMM in order to measure the voltage between the DLC terminal 9 and the DLC terminal 5. Is the voltage within the specified value?	Less than 1 V	Go to *Step 14*	Go to *Step 15*
13	Repair the short to ground in CKT 800. Is the repair complete?	—	Go to *Step 19*	—
14	Check continuity between DLC terminal 9 and the PCM connector C1 terminal 15 (V6 VIN K) or connector C2 terminal 3 (V8 VIN G) Is there continuity?	—	Go to *Step 16*	Go to *Step 17*
15	1. Turn the ignition switch to the OFF position. 2. Repair the short to voltage in CKT 800. Is the repair complete?	—	Go to *Step 19*	—
16	1. Reconnect the PCM connector C1 (V6 VIN K) or C2 (V8 VIN G). 2. Check for a short to ground in circuit 800. Is a short to ground present?	—	Refer to PCM	Go to *Step 18*
17	Repair the poor connection or an open in CKT 800. Is the repair complete?	—	Go to *Step 19*	—
18	1. Reconnect the EBCM connector. 2. Check for a short to ground in circuit 800. Is a short to ground present?	—	Refer to EBCM	Refer SIR
19	1. Ensure the ignition switch is in the OFF position. 2. Reinstall connectors/components removed. Is the action complete?	—	Go to *Data Link Communications System Check*	—

Scan Tool Does Not Communicate w/Class 2 Data Line

Step	Action	Value(s)	Yes	No
1	Use a DMM in order to measure the voltage between B+ and DLC terminal 5. Is the voltage within the specified range?	B+ (9–14 V)	*Go to Step 2*	*Go to Step 3*
2	Inspect for a proper connection of the scan tool to the DLC. Is the connection OK between the scan tool and the DLC?	—	*Go to Step 6*	*Go to Step 7*
3	Does the instrument cluster display work?	—	*Go to Step 4*	*Go to Step 5*
4	Repair the poor connection or open in circuit 451 between the DLC and S215. Has the repair been made?	—	*Go to Step 17*	—
5	Repair the poor connection or open in circuit 451 between S215 and G110. Has the repair been made?	—	*Go to Step 17*	—
6	Use the scan tool in order to establish communication with the PCM on a different vehicle. Can communication be established with the scan tool?	—	*Go to Step 8*	*Go to Step 9*
7	Repair the poor connection between the DLC and the scan tool. Is the repair complete?	—	*Go to Step 17*	—
8	1. Reconnect the scan tool to the DLC. 2. Turn the ignition switch to RUN. 3. Use a scan tool in order to establish communication with the Powertrain Control Module (PCM). Can the scan tool communicate with the PCM?	—	*Go to Step 10*	*Go to Step 11*
9	Determine if the scan tool is malfunctioning. Refer to the scan tool instruction manual for additional information. Is the action complete?	—	*Go to Step 17*	—
10	1. If malfunction is not present or intermittent, inspect the PCM connector for a poor connection, short to B+, or short to ground in CKT 1807. 2. Repair as necessary. Is the action complete?	—	*Go to Step 17*	—
11	1. Turn the ignition switch to the OFF position. 2. Disconnect the PCM connector C1 (V6 VIN K) or C2 (V8 VIN G). 3. Use a DMM in order to measure the resistance between the DLC terminal 2 and the DLC terminal 5. Is the resistance the same as the specified value?	Infinite	*Go to Step 12*	*Go to Step 13*
12	1. Turn the ignition switch to RUN. 2. Use a DMM in order to measure the voltage between the DLC terminal 2 and the DLC connector terminal 5. Is the voltage less than the specified value?	1 V	*Go to Step 14*	*Go to Step 15*
13	Repair the short to ground in CKT 1807. Is the repair complete?	—	*Go to Step 17*	—
14	Check continuity in circuit 1807 between the DLC terminal 2 and the PCM connector C1 terminal 59 (V6 VIN K) or connector C2 terminal 58 (V8 VIN G). Is there continuity?	—	Refer to PCM	*Go to Step 16*

Scan Tool Does Not Communicate w/Class 2 Data Line (cont'd)

Step	Action	Value(s)	Yes	No
15	1. Turn the ignition switch to the OFF position. 2. Repair the short to voltage in CKT 1807. Is the repair complete?	—	*Go to Step 17*	—
16	Repair the poor connection or an open in CKT 1807. Is the repair complete?	—	*Go to Step 17*	—
17	1. Ensure that the ignition switch is in the OFF position. 2. Reinstall connectors/components removed. Is the action complete?	—	Go to *Data Link Communications System Check*	—

Description and Operation

Data Link Connector Circuit Description

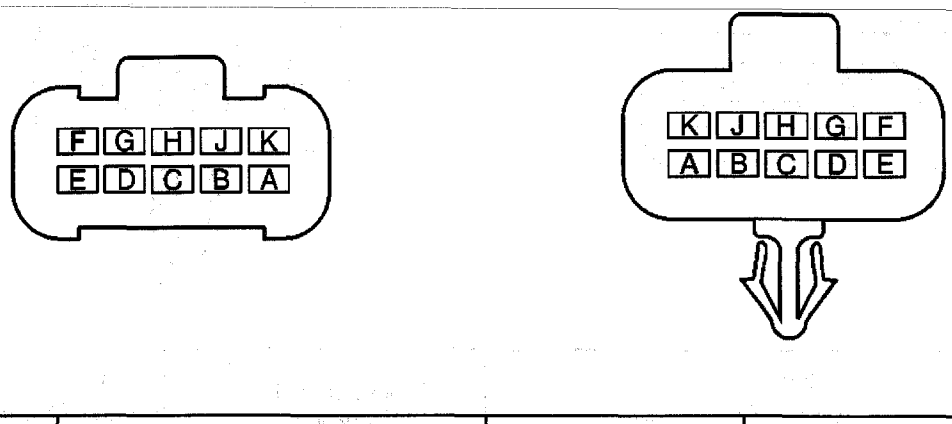
The data link connector (DLC) contains the following components:

- The UART serial data line (CKT 800)
  - The UART serial data line (CKT 800) allows the following components to communicate data with each other:
    - The Powertrain Control Module (PCM)
    - The inflatable restraint diagnostic energy reserve module with sensor(SDM)
    - The Electronic Brake Control Module (EBCM)
  - The UART serial data line allows a scan tool to communicate with these modules for diagnosis and testing.
- The class 2 serial data line (CKT 1807)

  The class 2 serial data line allows a scan tool to communicate with the PCM for diagnosis and testing.
- Unswitched voltage (B+) (CKT 540)
- Ground (CKT 650)

Inline Harness Connector End Views

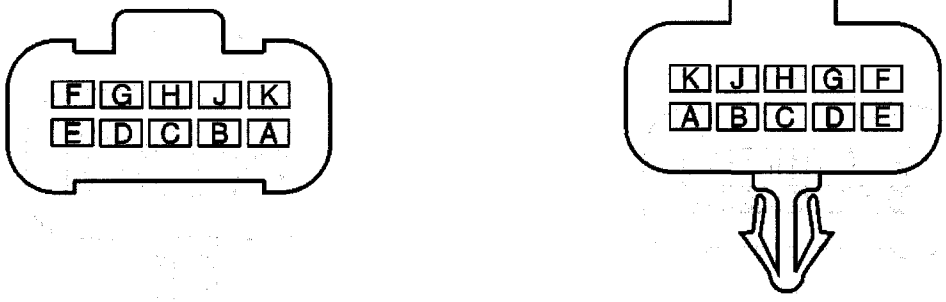
In-Line Connector C100



62472

Connector Part Information		• 12065425 • 10-Way F Metri-Pack 150 Series (BLK)		Connector Part Information		• 12048253 • 10 - Way M Metri-Pack 150 Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	PNK	639	Power feed from injector fuse 9	A	PNK	639	Power feed from injector fuse 9
B	GRN/WHT	459	A/C compressor relay control	B	GRN/WHT	459	A/C compressor relay control
C	DK GRN	59	A/C compressor clutch solenoid feed	C	DK GRN	59	A/C compressor clutch solenoid feed
D	GRY	596	Reference voltage feed - 5 volt reference (V8 VIN G)	D	GRY	596	Reference voltage feed - 5 volt reference (V8 VIN G)
E	DK BLU	417	Throttle position sensor signal (V8 VIN G)	E	DK BLU	417	Throttle position sensor signal (V8 VIN G)
F	—	—	Not Used	F	—	—	Not Used
G	PNK	239	Power feed from ignition fuse (OBD II)	G	PNK	239	Power feed from ignition fuse (OBD II)
H	DK BLU	473	Coolant fan relay control	H	DK BLU	473	Coolant fan relay control
J	DK GRN	335	Coolant fan relay control	J	DK GRN	235	Coolant fan relay control
K	BLK	452	Sensor return (V8 VIN G)	K	BLK	452	Sensor return (V8 VIN G)

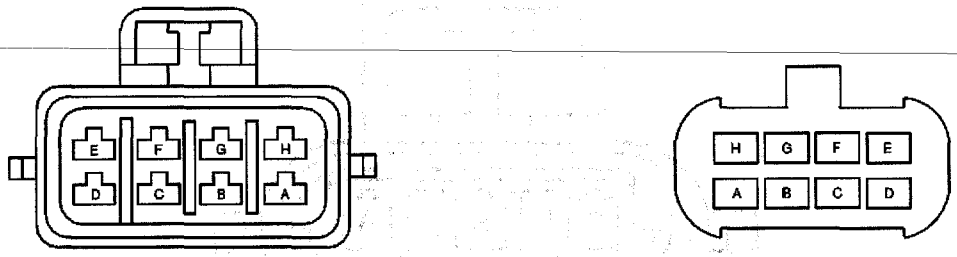
In-Line Connector C101



62472

Connector Part Information		• 12065426 • 10-Way F Metri-Pack 150 Series (GRY)		Connector Part Information		• 12065648 • 10-Way M Metri-Pack 150 Series (GRY)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	YEL/BLK	625	Vehicle anti-theft system starter enable relay output-coil	A	YEL/BLK	625	Vehicle anti-theft system starter enable relay output-coil
B	PNK	839	Fuse output-ignition 1-type III fuse (V8 VIN G)	B	PNK	839	Fuse output-ignition 1-type III fuse (V8 VIN G)
C	BRN	436	Air pump relay control	C	BRN	436	Air pump relay control
D	GRN/WHT	465	Fuel pump relay control	D	GRN/WHT	465	Fuel pump relay control
E	PNK	439	Fuse output-ignition 1-type III fuse	E	PNK/BLK	—	Fuse output-ignition 1-type III fuse
F	—	—	Not Used	F	—	—	Not Used
G	ORN	340	Fuse output-battery-type III fuse	G	ORN	340	Fuse output-battery-type III fuse
H	BLK/WHT	451	Ground	H	BLK/WHT	451	Ground
J	—	—	Not Used	I	—	—	Not Used
K	GRY/BLK	1687	Ignition retard signal (V8 VIN G)	K	GRY/BLK	1687	Ignition retard signal (V8 VIN G)

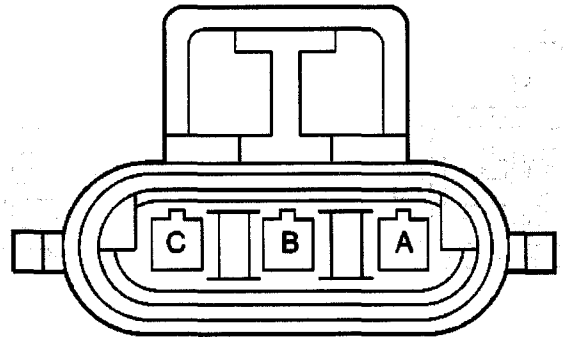
In-Line Connector C105



62442

Connector Part Information		• 12047937 • 8-Way F Metri-Pack 150 Series (BLK)		Connector Part Information		• 12052454 • 8-Way M Metri-Pack 150 Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	PPL/WHT	1572	Traction control system indicator lamp output-failure	A	PPL/WHT	1572	Traction control system indicator lamp output-failure
B	PNK	539	Fuse output-ignition 1—type III fuse	B	PNK	539	Fuse output-ignition — type III fuse1
C	BRN/WHT	1571	Traction control system switch signal	C	BRN/WHT	1571	Traction control system switch signal
D	DK GRN	83	Cruise control signal-disengage (V6 VIN K)	D	DK GRN	83	Cruise control signal-disengage (V6 VIN K)
E	TAN	800	Serial data signal	E	TAN	800	Serial data signal
F	WHT	85	Cruise control indicator lamp output (V6 VIN K)	F	WHT	85	Cruise control indicator lamp output (V6 VIN K)
G	WHT	121	Tachometer signal	G	WHT	121	Tachometer signal
H	PPL	421	Air injection reaction solenoid relay output-coil	H	PPL	421	Air injection reaction solenoid relay output-coil

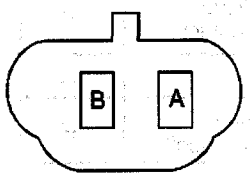
In-Line Connector C108



68730

Connector Part Information		• 12110293 • 3-Way F Metri-Pack 150 Series Sealed (BLK)		Connector Part Information		• 12052844 • 3-Way M Metri-Pack 150 Series Sealed (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN/WHT	633	Camshaft position sensor signal (V8 VIN G)	A	BRN/WHT	633	Camshaft position sensor signal (V8 VIN G)
B	PNK/BLK	632	Camshaft position sensor return (V8 VIN G)	B	PNK/BLK	632	Camshaft position sensor return (V8 VIN G)
C	RED	631	Camshaft sensor feed-12 volt reference (V8 VIN G)	C	RED	631	Camshaft sensor feed-12 volt reference (V8 VIN G)

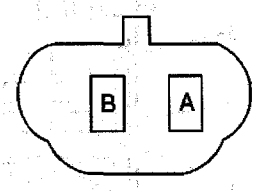
In-Line Connector C120



68803

Connector Part Information		• 12162343 • 2-Way F Metri-Pack 150 Series		Connector Part Information		• 12052644 • 2-Way M Metri-Pack 150 Series	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	YEL	873	Wheel speed sensor return-left front	A	YEL	873	Wheel speed sensor return-left front
B	LT BLU	830	Wheel speed sensor signal-left front	B	LT BLU	830	Wheel speed sensor signal-left front

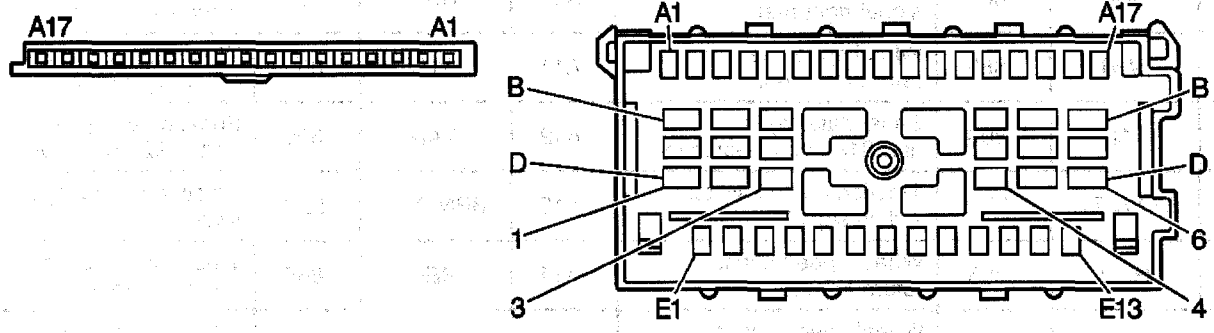
In-Line Connector C130



68803

Connector Part Information		• 12162343 • 2-Way F Metri-Pack 150 Series		Connector Part Information		• 12052644 • 2-Way M Metri-Pack 150 Series	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	TAN	833	Wheel speed sensor return-right front	A	TAN	833	Wheel speed sensor return-right front
B	DK GRN	872	Wheel speed sensor signal-right front	B	DK GRN	872	Wheel speed sensor signal-right front

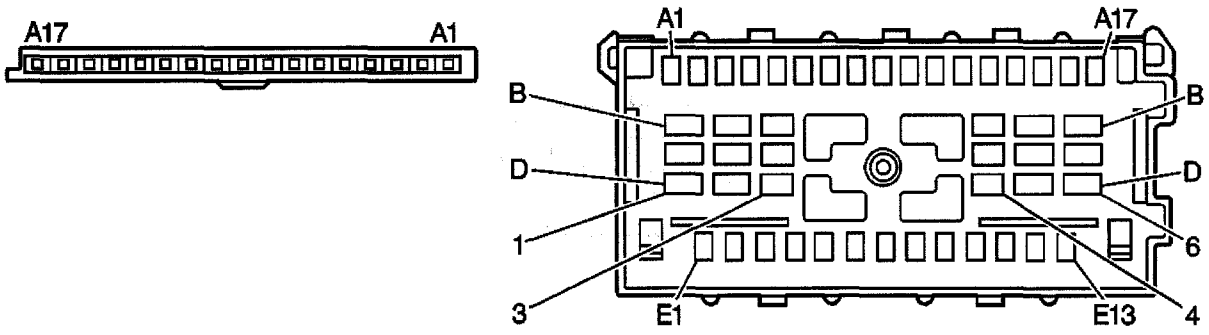
In-Line Connector C200A/C200D



62438

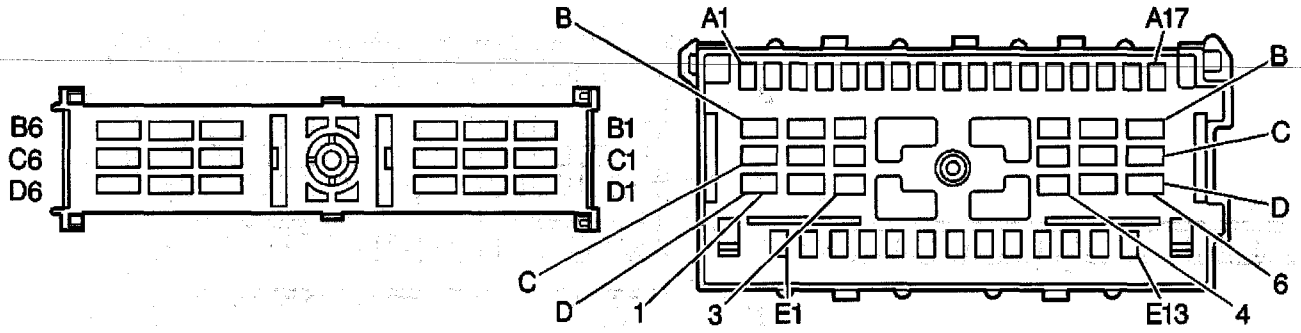
Connector Part Information		• 12047842 • 17-Way F Metri-Pack 150 Series (BLK)		Connector Part Information		• 12077822 • 48-Way M Metri-Pack Mixed Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A1	DK GRN/ WHT	817	Vehicle speed signal-4000 pulses per mile	A1	DK GRN/ WHT	817	Vehicle speed signal-4000 pulses per mile
A2	LT BLU	14	Turn signal lamp-feed-left front	A2	LT BLU	14	Turn signal lamp-feed-left front
A3	LT GRN	867	ABS failure indicator lamp output	A3	LT GRN	867	ABS failure indicator lamp output
A4	LT BLU	20	Stoplamp feed	A4	LT BLU	20	Stoplamp feed
A5	YEL/BLK	1471	Brake warning indicator lamp feed—secondary	A5	YEL/BLK	1471	Brake warning indicator lamp feed—secondary

In-Line Connector C200A/C200D (cont'd)



Connector Part Information		• 12047842 • 17-Way F Metri-Pack 150 Series (BLK)		Connector Part Information		• 12077822 • 48-Way M Metri-Pack Mixed Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A6	DK GRN	1433	Clutch start switch output	A6	DK GRN	1433	Clutch start switch output
A7	BLK	28	Horn relay output-coil	A7	BLK	28	Horn relay output-coil
A8	GRY	120	Fuel pump motor feed	A8	GRY	120	Fuel pump motor feed
A9	DK BLU	1537	ABS indicator lamp output	A9	DK BLU	1537	ABS indicator lamp output
A10	BRN	882	Wheel speed sensor signal-right rear	A10	BRN	882	Wheel speed sensor signal-right rear
A11	WHT	883	Wheel speed sensor return-right rear	A11	WHT	883	Wheel speed sensor return-right rear
A12	TAN	800	Serial data signal-uart 8192 baud—primary	A12	TAN	800	Serial data signal-uart 8192 baud—primary
A13	BRN/WHT	1571	Traction control system switch signal	A13	BRN/WHT	1571	Traction control system switch signal
A14	RED	885	Wheel speed sensor return-left rear	A14	RED	885	Wheel speed sensor return-left rear
A15	BLK	884	Wheel speed sensor signal-left rear	A15	BLK	884	Wheel speed sensor return-left rear
A16	YEL	317	Fog lamp relay feed-coil	A16	YEL	317	Fog lamp relay feed-coil
A17	YEL/BLK	68	Low coolant level indicator lamp output	A17	YEL/BLK	68	Low coolant level indicator lamp output

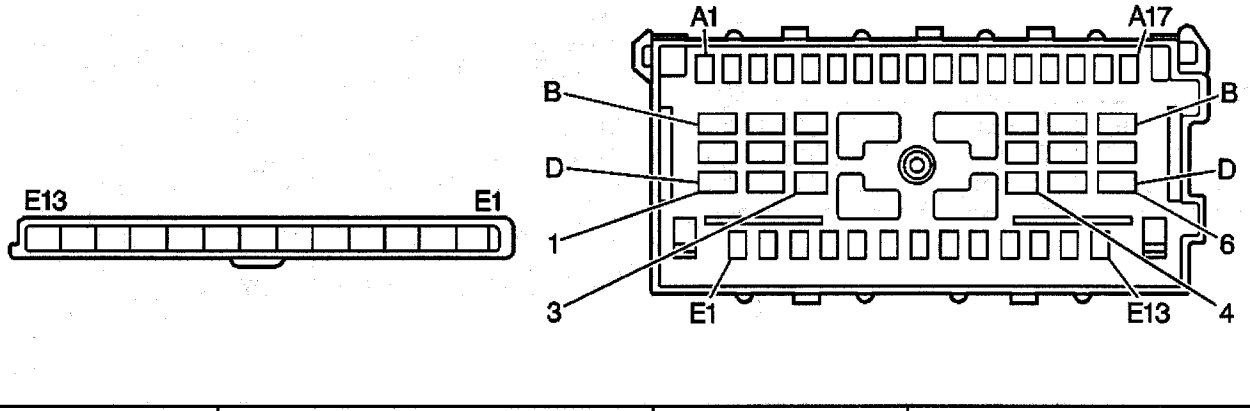
In-Line Connector C200B/C200D



39776

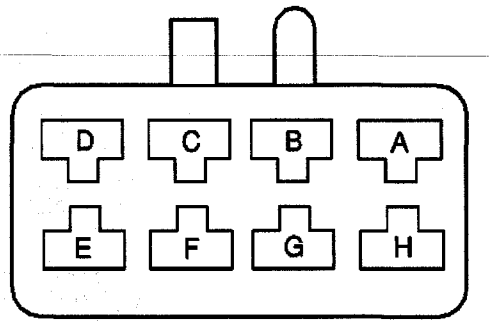
Connector Part Information		• 12162504 • 18-Way F Metri-Pack Mixed Series (BLK)		Connector Part Information		• 12077822 • 48-Way M Metri-Pack Mixed Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
B1	PNK	3	Ignition switch output—ignition 1	B1	PNK	3	Ignition switch output—ignition 1
B2	TAN/WHT	33	Brake warning indicator lamp output	B2	TAN/WHT	33	Brake warning indicator lamp output
B3	PPL	34	Fog lamp feed	B3	PPL	34	Fog lamp feed
B4	RED	1302	Fuse output battery—type 1 fuse	B4	RED	1302	Fuse output battery—type 1 fuse
B5	YEL	10	Headlamp switch output	B5	YEL	10	Headlamp switch output
B6	RED	702	Fuse output-battery—type 1 fuse	B6	RED	702	Fuse output-battery—type 1 fuse
C1	RED	102	Fuse output-battery—type 1 fuse	C1	RED	102	Fuse output-battery—type 1 fuse
C2	RED	1002	Fuse output-battery—type 1 fuse	C2	RED	1002	Fuse output-battery—type 1 fuse
C3	LT GRN	11	High beam headlamp feed	C3	LT GRN	11	High beam headlamp feed
C4	PPL/WHT	1572	Traction control system indicator lamp output-failure	C4	PPL/WHT	1572	Traction control system indicator lamp output-failure
C5	PPL/WHT	1035	Not Used	C5	PPL/WHT	1035	Not Used
C6	BRN	4	Ignition switch output-accessory	C6	BRN	4	Ignition switch output-accessory
D1	RED	1202	Fuse output-battery—type 1 fuse	D1	RED	1202	Fuse output-battery—type 1 fuse
D2	PNK	239	Fuse output-ignition 1—type 111 fuse	D2	PNK	239	Fuse output-ignition 1—type 111 fuse
D3	YEL	143	Fuse output-accessory—type 111 fuse	D3	YEL	143	Fuse output-accessory—type 111 fuse
D4	BRN	9	Park lamp feed	D4	BRN	9	Park lamp feed
D5	PPL/WHT	1572	Traction control system indicator lamp output-failure	D5	PPL/WHT	1572	Traction control system indicator lamp output-failure
D6	DK BLU	15	Turn signal lamp feed-right front	D6	DK BLU	15	Turn signal lamp feed-right front

In-Line Connector C200C/C200D



Connector Part Information		• 12047840 • 13-Way F Metri-Pack 280 Series (GRY)		Connector Part Information		• 12077822 • 48-Way M Metri-Pack Mixed Series (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
E1-E2	—	—	Not used	E1-E2	—	—	Not used
E3	DK BLU/ WHT	149	Courtesy lamp feed	E3	DK BLU/ WHT	149	Courtesy lamp feed
E4	GRY/BLK	745	Door ajar switch signal-left front	E4	GRY/BLK	745	Door ajar switch signal-left front
E5	BLK/WHT	746	Door ajar switch signal-right front	E5	BLK/WHT	746	Door ajar switch signal-right front
E6	—	—	Not used	E6	—	—	Not used
E7	GRY	8	Instrument panel lamp feed	E7	GRY	8	Instrument panel lamp feed
E8	—	—	Not used	E8	—	—	Not used
E9	ORN	640	Fuse output-battery—type 111 fuse	E9	ORN	640	Fuse output-battery—type 111 fuse
E10	WHT	156	Courtesy lamp output	E10	WHT	156	Courtesy lamp output
E11	BRN	341	Fuse output-ignition—type 111 fuse	E11	BRN	341	Fuse output-ignition—type 111 fuse
E12-E13	—	—	Not used	E12-E13	—	—	Not used

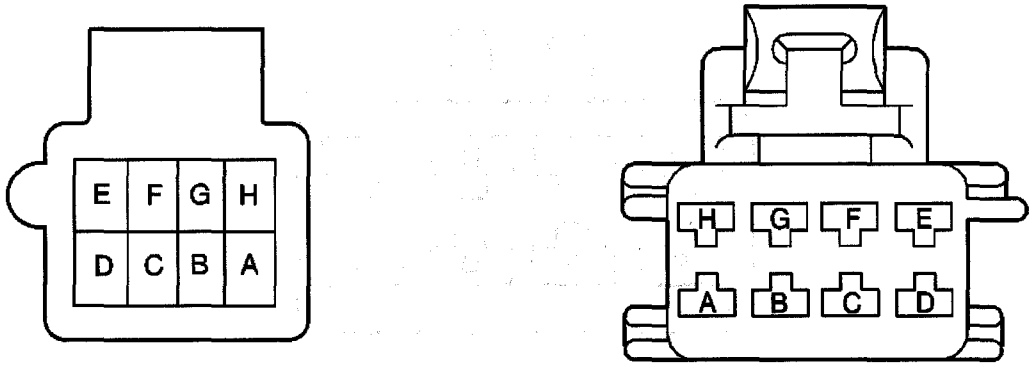
In-Line Connector C210



258248

Connector Part Information	• 1206-5398 • 8-Way F Metri-Pack 150 Series (Neutral)			Connector Part Information	• 1206-5396 • 8-Way M Metri-Pack 150 Series (Neutral)		
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	GRY	598	Reference voltage feed—5 volt reference	A	GRY	598	Reference voltage feed—5 volt reference
B	WHT	1310	Cannister vent valve solenoid output	B	WHT	1310	Cannister vent valve solenoid output
C	GRY	720	Sensor return	C	GRY	720	Sensor return
D	—	—	Not Used	D	—	—	Not Used
E	DK BLU	1936	Fuel gauge sensor signal	E	DK Blue	1936	Fuel gauge sensor signal
F	DK GRN	890	Fuel tank pressure sensor signal	F	DK GRN	890	Fuel tank pressure sensor signal
G	—	—	Not Used	G	—	—	Not Used
H	PPL	30	Fuel Gauge Sensor Signal	H	PPL	30	Fuel Gauge Sensor Signal

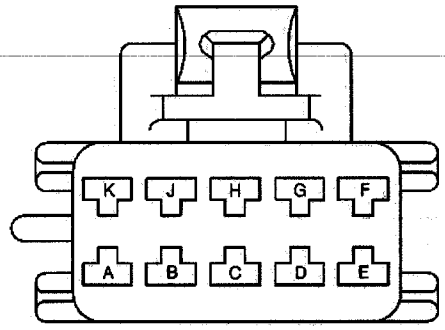
In-Line Connector C211 (Traction Control Module)



62461

Connector Part Information		• 12077777 • 8-Way M Metri-Pack 150 Series (BLU)		Connector Part Information		• 12064766 • 8-Way F Metri-Pack 150 Series (BLU)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	DK BLU	417	Throttle position sensor signal	A	DK BLU	417	Throttle position sensor signal
B	WHT	560	Throttle relaxer motor feed	B	WHT	560	Throttle relaxer motor feed
C	ORN	1540	Fuse output-battery—type III fuse	C	ORN	1540	Fuse output-battery—type III fuse
D	GRY	561	Throttle relaxer motor return	D	GRY	561	Throttle relaxer motor return
E	BLK/WHT	151	Ground	E	BLK/WHT	151	Ground
F-H	—	—	Not used	F-H	—	—	Not used

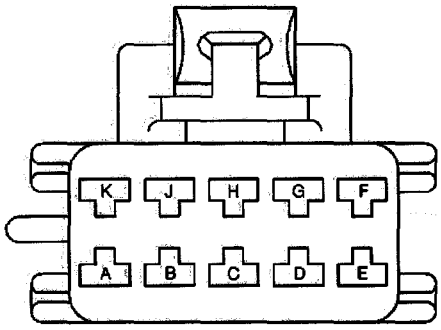
In-Line Connector C212



62464

Connector Part Information		• 12064769 • 10-Way F Metri- Metri-Pack 150 Series (NAT)		Connector Part Information		• 12064769 • 10-Way M Metri-Pack 150 Series (NAT)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	ORN/BLK	463	Traction control system signal-torque desired	A	ORN/BLK	463	Traction control system signal-torque desired
B	PNK	739	Fuse output-ignition—type III fuse	B	PNK	739	Fuse output-ignition—type III fuse
C	TAN/BLK	464	Traction control system signal torque delivered	C	TAN/BLK	464	Traction control system signal torque delivered
D	WHT	560	Throttle relaxer motor feed	D	WHT	560	Throttle relaxer motor feed
E	ORN	1540	Fuse output-battery—type III fuse	E	ORN	1540	Fuse output-battery—type III fuse
F	GRY	561	Throttle relaxer motor return	F	GRY	561	Throttle relaxer motor return
G	BLK/WHT	151	Ground	G	BLK/WHT	151	Ground
H	—	—	Not used	H	—	—	Not used
J	BLK	452	Sensor return	J	BLK	452	Sensor return
K	GRY	596	Reference voltage feed-5 volt reference	K	GRY	596	Reference voltage feed-5 volt reference

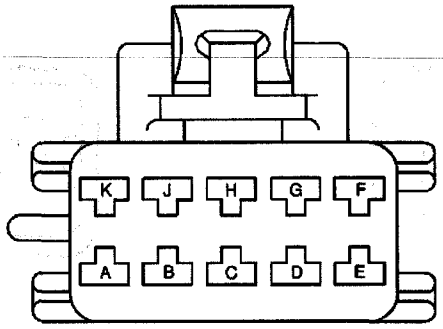
In-Line Connector C220



62464

Connector Part Information		• 12064769 • 10-Way F Metri-Pack 150 Series (NAT)		Connector Part Information		• 12064770 • 10-Way M Metri-Pack 150 Series (NAT)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	RED	225	Generator feed to instrument cluster	A	RED	225	Generator feed to instrument cluster
B	TAN	31	Oil pressure feed to instrument cluster	B	TAN	31	Oil pressure feed to instrument cluster
C	BRN/WHT	1173	Low oil level indicator lamp output	C	BRN/WHT	1173	Low oil level indicator lamp output
D	—	—	Not Used	D	—	—	Not Used
E	—	—	Not Used	E	—	—	Not Used
F	BLK/WHT	451	—	F	451	—	—
G	GRN/WHT	817	Vehicle speed signal	G	GRN/WHT	817	Vehicle speed signal
H	WHT	375	Skip shift indicator control (V8 VIN G Manual transmission)	H	WHT	375	Skip shift indicator control (V8 VIN G Manual transmission)
J	YEL/BLK	625	Vehicle anti-theft system starter enable relay output—coil	J	YEL/BLK	625	Vehicle anti-theft system starter enable relay output—coil
K	DK GRN	135	Coolant temperature feed to instrument cluster	K	DK GRN	135	Coolant temperature feed to instrument cluster

In-Line Connector C230



62464

Connector Part Information		• 12064871 • 10-Way F Metri-Pack 150 Series (BLU)		Connector Part Information		• 12064872 • 10-Way M Metri-Pack 150 Series (BLU)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	GRY	48	Clutch anticipate signal (V6 VIN K Only	A	GRY	48	Clutch anticipate signal (V6 VIN K Only
B	BRN/WHT	419	Service Engine Soon indicator feed	B	BRN/WHT	419	Service Engine Soon indicator feed
C	—	—	Not Used	C	—	—	Not Used
D	WHT	121	Tachometer signal to instrument cluster	D	WHT	121	Tachometer signal to instrument cluster
E	DK BLU	229	Theft deterrent-fuel enable feed	E	DK BLU	229	Theft deterrent-fuel enable feed
F	DK GRN/ WHT	762	A/C request signal	F	DK GRN/ WHT	762	A/C request signal
G	PNK	539	Brake pedal switch output— torque convertor clutch (V6 VIN K Auto Trans)	G	PNK	539	Brake pedal switch output— torque convertor clutch (V6 VIN K Auto Trans)
G	BRN	141	Fuse output-ignition 3-type III fuse (V6 VIN K MAN TRANS)	G	BRN	141	Fuse output-ignition 3-type III fuse (V6 VIN K MAN TRANS)
H	PPL	420	(Automatic) TCC switch power feed	H	PPL	420	(Automatic) TCC switch power feed
J	ORN/BLK	434	(Automatic) Park/Neutral feed from transmission range switch	J	ORN/BLK	434	(Automatic) Park/Neutral feed from transmission range switch
J	LT GRN	24	Back-up lamp feed (V6 VIN K Manual transmission)	J	LT GRN	24	Back-up lamp feed (V6 VIN K Manual transmission)
K	PPL	1807	Output field service enable	K	PPL	1807	Output field service enable

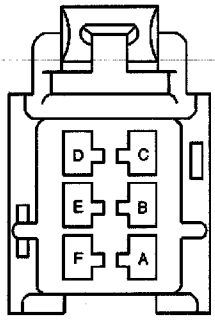
In-Line Connector C240



73135

Connector Part Information		• 12045688 • 6-Way M Metri-Pack Series 280 (BLK)		Connector Part Information		• 12047886 • 6-Way F Metri-Pack Series 280 (BLK)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BLK	1856	Speaker feed-left front-tweeter (UZ7)	A	BLK	1856	Speaker feed-left front-tweeter (UZ7)
A	DK BLU	1857	Speaker feed-left front-midrange (W54 W55)	A	DK BLU	1857	Speaker feed-left front-midrange (W54 W55)
B	DK BLU	1857	Speaker feed-left front-midrange (UZ7)	B	DK BLU	1857	Speaker feed-left front-midrange (UZ7)
B	TAN	201	Speaker feed-left front (W54 W55)	B	TAN	201	Speaker feed-left front (W54 W55)
C	LT BLU	1957	Speaker return-left front-midrange (UZ7)	C	LT BLU	1957	Speaker return-left front-midrange (UZ7)
C	GRY	118	Speaker return-left front (W54 W55)	C	GRY	118	Speaker return-left front (W54 W55)
D	YEL	1956	Speaker return—left front tweeter (UZ7)	D	YEL	1956	Speaker return—left front tweeter (UZ7)
D	LT BLU	1957	Speaker feed-left front-midrange (W54 W55)	D	LT BLU	1957	Speaker feed-left front-midrange (W54 W55)
E	PPL	1952	Speaker return—right front tweeter (UZ7)	E	PPL	1952	Speaker return—right front tweeter (UZ7)
E	ORN	1853	Speaker feed-right front-midrange (W54 W55)	E	ORN	1853	Speaker feed-right front-midrange (W54 W55)
F	DK GRN	1953	Speaker return-right front-midrange (UZ7)	F	DK GRN	1953	Speaker return-right front-midrange (UZ7)
F	DK GRN	117	Speaker return-right front (W54 W55)	F	DK GRN	117	Speaker return-right front (W54 W55)
G	ORN	1853	Speeker feed-right front-tweeter (UZ7)	G	ORN	1853	Speeker feed-right front-tweeter (UZ7)
G	LT GRN	200	Speaker feed-right front (W54 W55)	G	LT GRN	200	Speaker feed-right front (W54 W55)
H	Lt GRN	1852	Speaker feed—right front—tweeter (UZ7)	H	Lt GRN	1852	Speaker feed—right front—tweeter (UZ7)
H	DK GRN	1953	Speaker return-right front midrange (W54 W55)	H	DK GRN	1953	Speaker return-right front midrange (W54 W55)

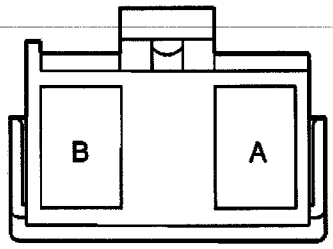
In-Line to Power Seat Switch (LH) C300



62456

Connector Part Information	• 12064752 • 6-Way Metri-Pack 280 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	GRY	764	Pneumatic seat relay feed-coil-drive deflate
B	WHT	766	Pneumatic seat relay feed-coil-drive inflate
C	ORN	1240	Fuse output-battery
D	BLK	1450	Ground
E	BRN	763	Pneumatic seat solenoid feed-lumbar-driver
F	PPL	765	Pneumatic seat solenoid feed-lateral-driver

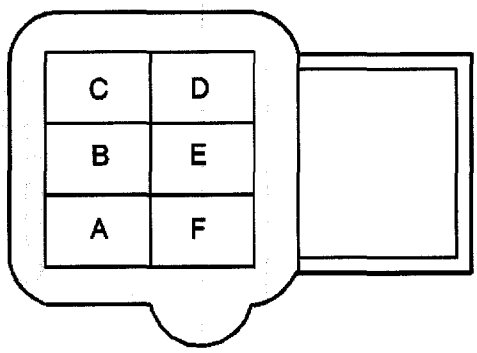
In-Line to I/P C310



38274

Connector Part Information	• 12015199 • 2-Way Metri-Pack 280 Series (NAT)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	ORN	1240	Fuse output-battery
B	BLK	1450	Ground

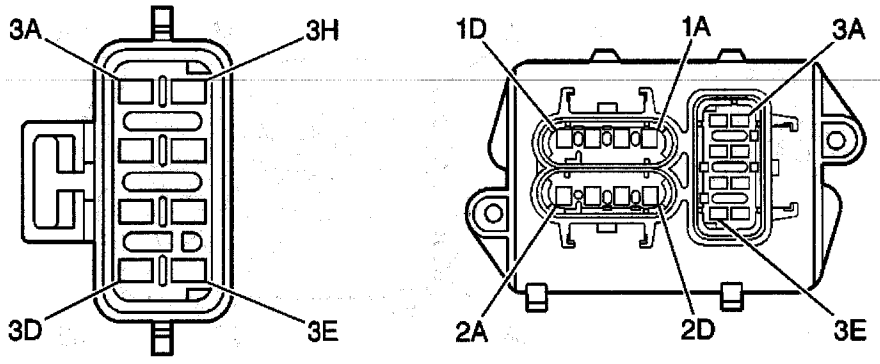
In-Line Connector C400



40425

Connector Part Information		• 12065781 • 6-Way M Metri-Pack 150 Series (GRY)		Connector Part Information		• 12064762 • 6-Way F Metri-Pack 150 Series (GRY)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	LT BLU	20	Stop lamp feed	A	LT BLU	20	Stop lamp feed
B	—	—	Not used	B	—	—	Not used
C	BRN	9	Park lamp feed	C	BRN	9	Park lamp feed
D	YEL	18	Stop/trun lamp feed-left rear	D	YEL	18	Stop/trun lamp feed-left rear
E	DK GRN	19	Stop/turn lamp feed-left rear	E	DK GRN	19	Stop/turn lamp feed-left rear
F	LT GRN	24	Back-up lamp feed	F	LT GRN	24	Back-up lamp feed

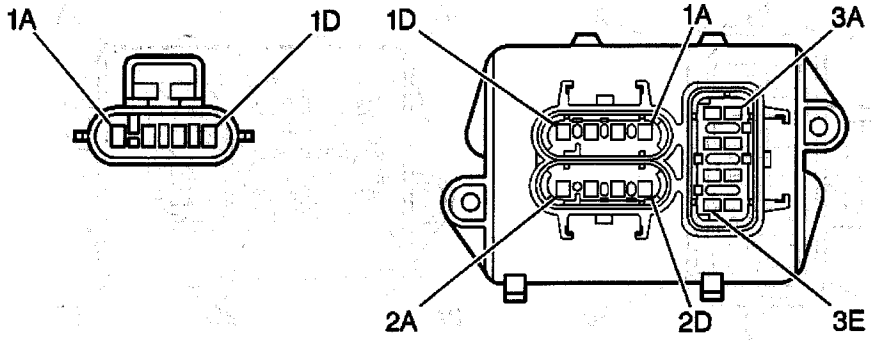
In-Line Connector C405A/C405B



73141

Connector Part Information		• 12146442 • 7-Way F Metri-Pack 280 Series (NAT)		Connector Part Information		• 12160830 • 16-Way M Metri-Pack Mixed Series (GRY)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
3A	PPL	30	Fuel gauge sensor signal	3A	PPL	30	Fuel gauge sensor signal
3B	GRY	120	Fuel pump motor feed	3B	GRY	120	Fuel pump motor feed
3C	BLK	150	Ground	3C	BLK	150	Ground
3D	GRY/BLK	416	Reference voltage feed-5 volt reference	3D	GRY/BLK	598	Reference voltage feed-5 volt reference
3E	—	—	Not used	3E	—	—	Not used
3F	BLK/WHT	651	Fuel gauge sensor ground	3F	BLK/WHT	720	Fuel gauge sensor ground
3G	ORN/BLK	469	Fuel Tank pressure sensor return	3G	ORN/BLK	720	Fuel Tank pressure sensor return
3H	DK GRN	890	Fuel tank pressure sensor signal	3H	DK GRN	890	Fuel tank pressure sensor signal

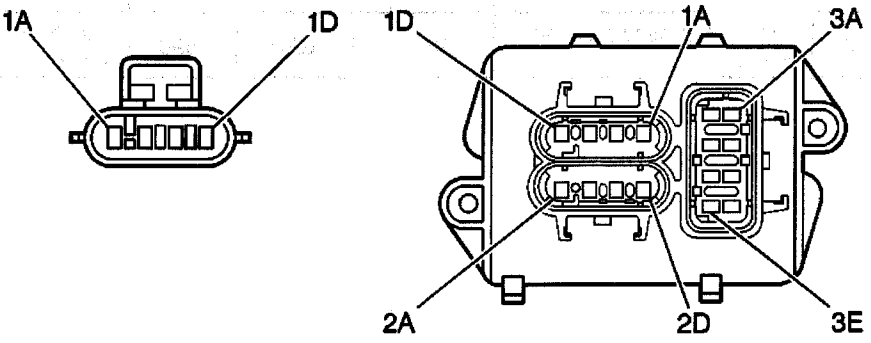
In-Line Connector C405C/C405B



73247

Connectr Part Information		• 12146439 • 4-Way F Metri-Pack 150 Series (GRY)		Connector Part Information		• 12160830 • 16-Way M Metri-Pack Mixed Series (GRY)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN	882	RR wheel speed signal-high	A1	BRN	882	RR wheel speed signal-high
B	WHT	883	RR wheel speed signal-low	B1	WHT	883	RR wheel speed signal-low
C	BLK	884	LR wheel speed signal-high	C1	BLK	884	LR wheel speed signal-high
D	WHT	885	LR wheel speed signal-low	D1	WHT	885	LR wheel speed signal-low

In-Line Connector C405D/C405B

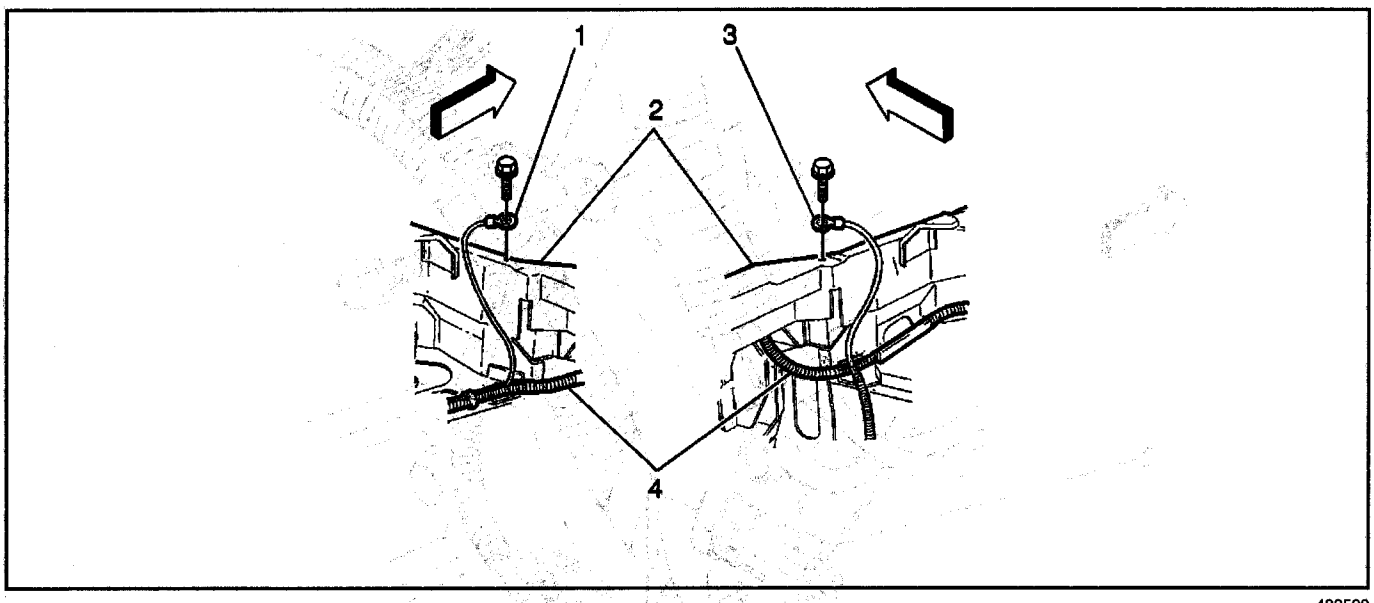


73247

Cnnector Part Information		• 12162144 • 4-Way F Metri-Pack 280 Series (NAT)		Connector Part Information		• 12160830 • 16-Way Metri-Pack Mixed Series (GRY)	
Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	PNK	239	Fuse output-ignition 1—type III fuse	A2	PNK	239	Fuse output-ignition 1—type III fuse
B	WHT	1310	Canister vent valve solenoid output	B2	WHT	1310	Canister vent valve solenoid output
C-D	—	—	Not used	C2-D2	—	—	Not used

Harness Routing Views

Forward Lamp Harness Grounds

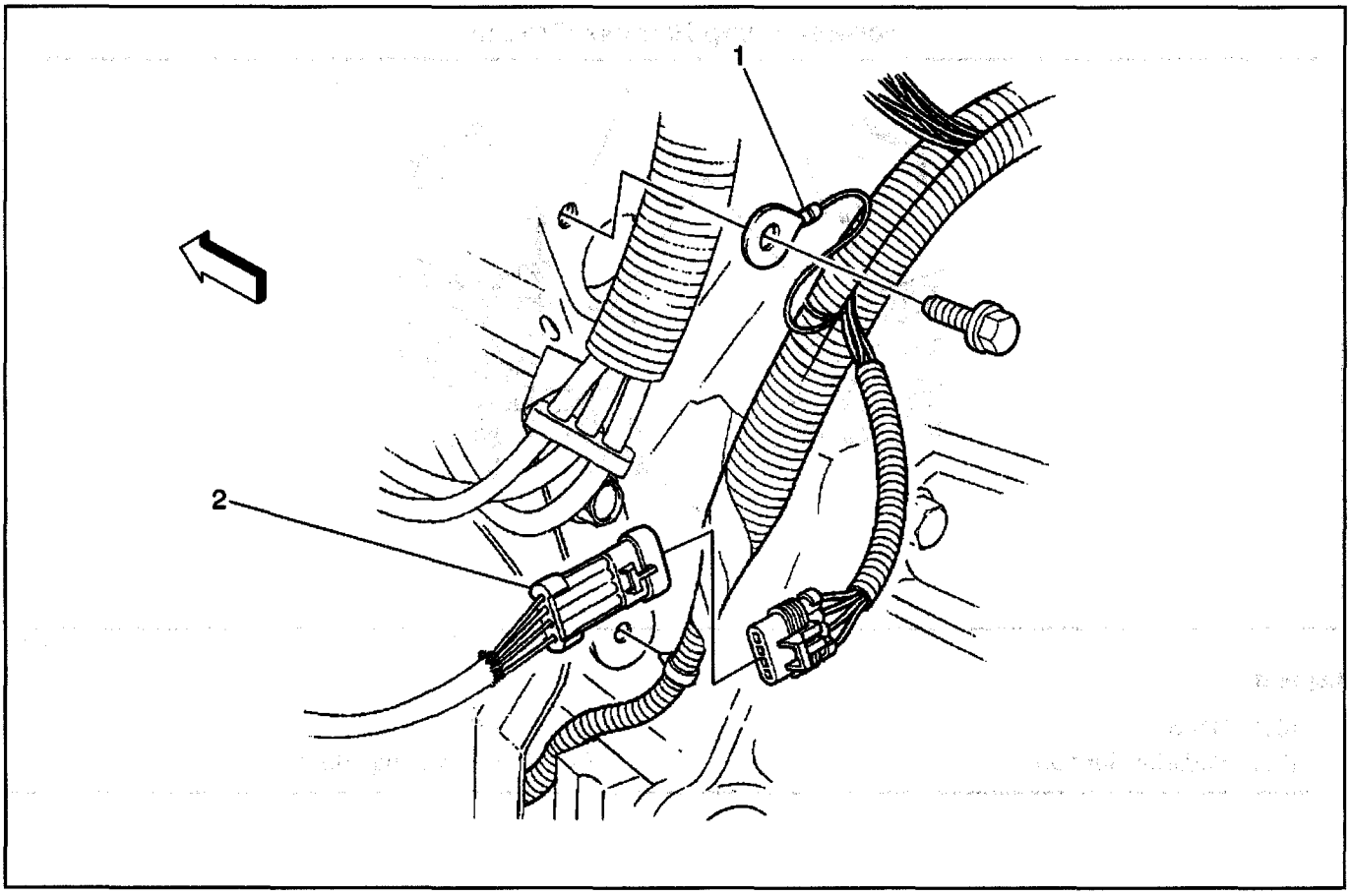


483599

Legend

(01) G106
(02) Radiator Support
(03) G105
(04) Forward Lamp Harness

Rear Left Side of Engine (V6 VIN K)

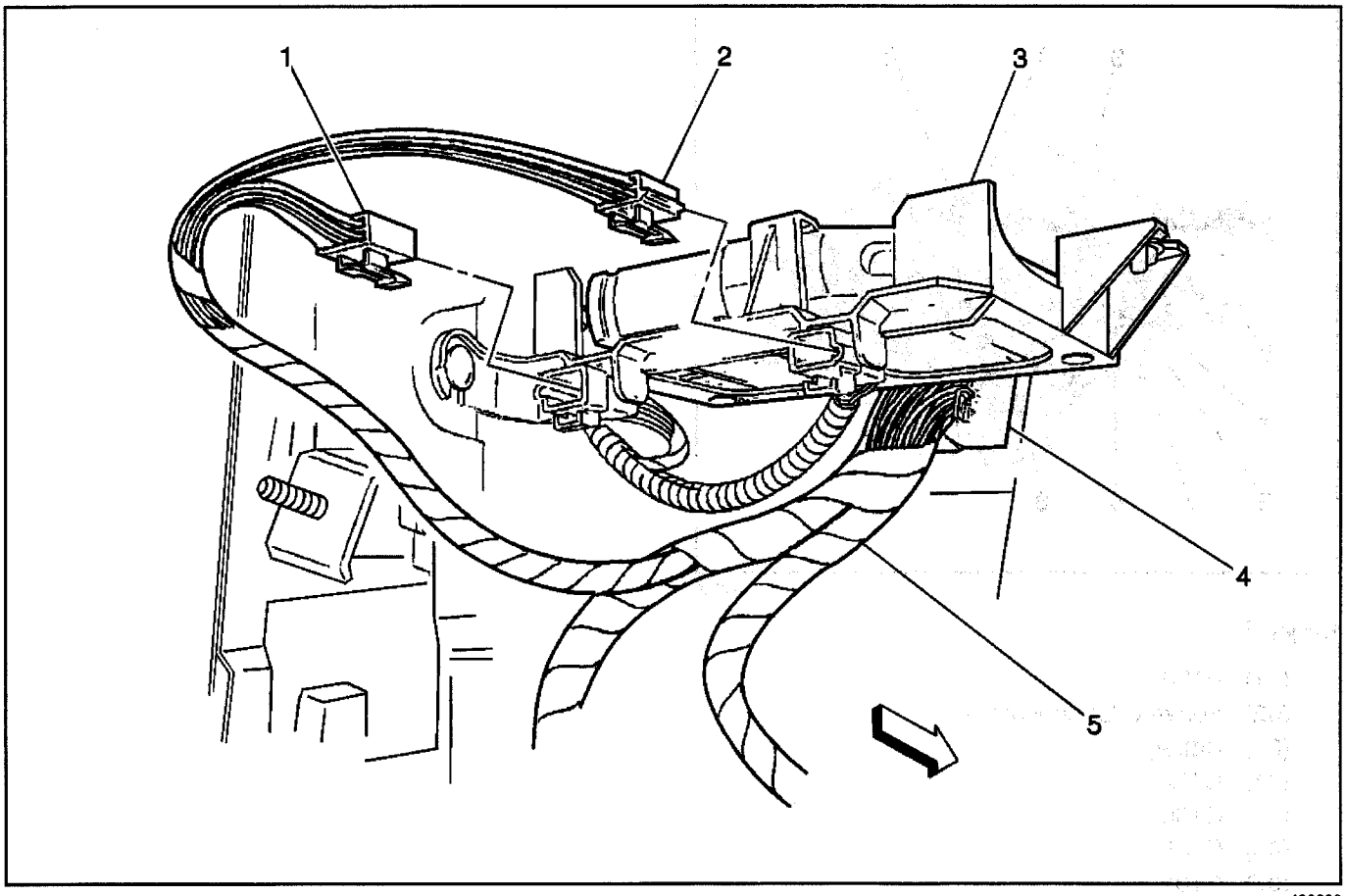


483600

Legend

(1) G112
(2) Left Hand Manifold Heated 02 Sensor Connector

Behind Lower Left Side of I/P

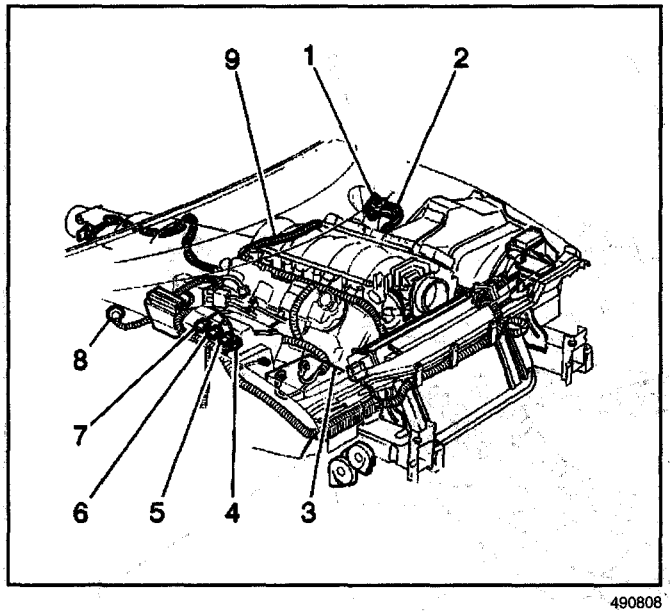


490630

Legend

(1) C212
(2) C211
(3) Traction control module
(4) P100
(5) Forward lamps harness

Engine Compartment

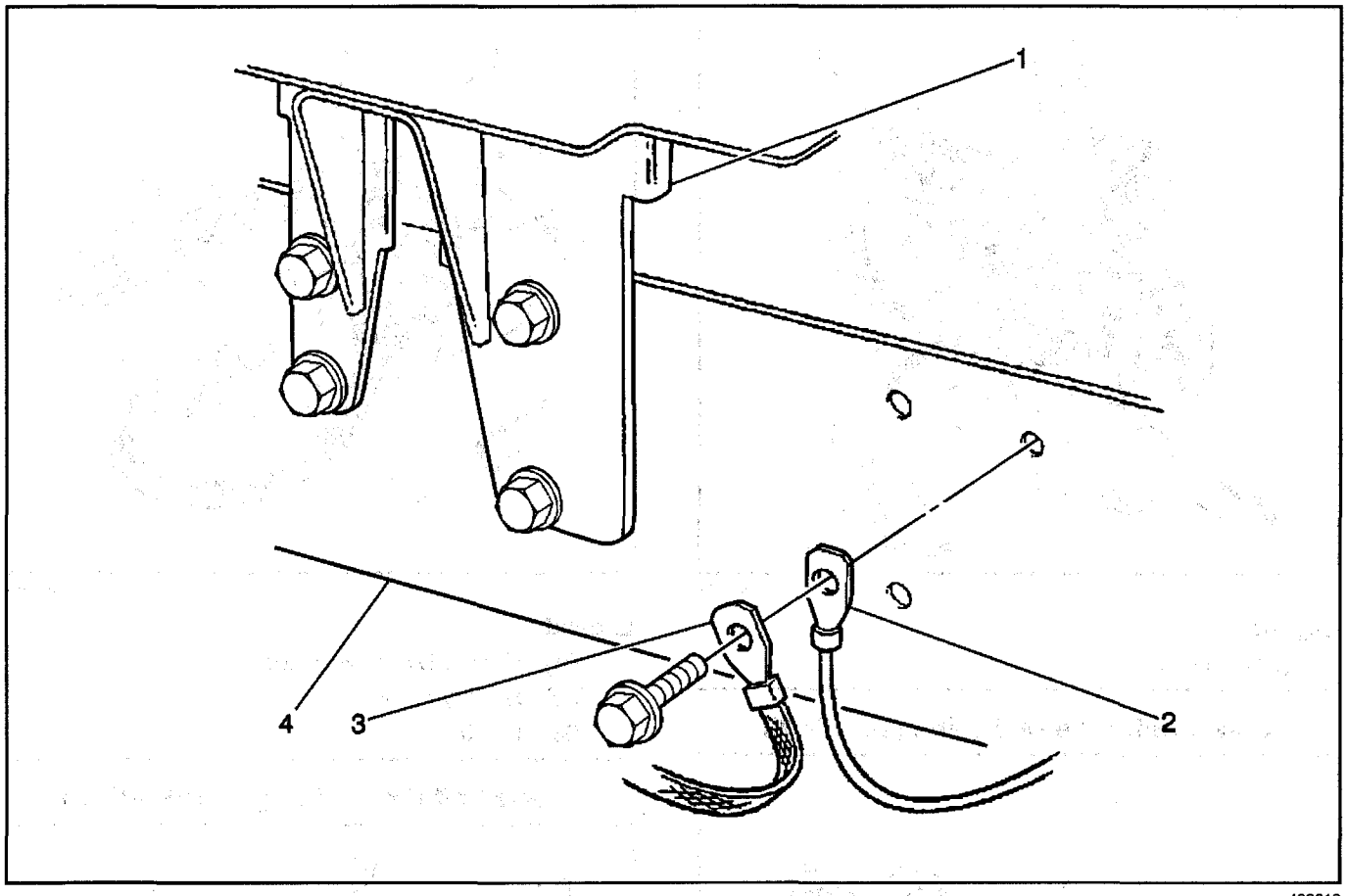


490808

Legend

(01) P100
(02) Forward Lamp Harness
(03) Battery
(04) C102
(05) C100
(06) C105
(07) C101
(08) P110
(09) Engine Harness

Left Frame Rail

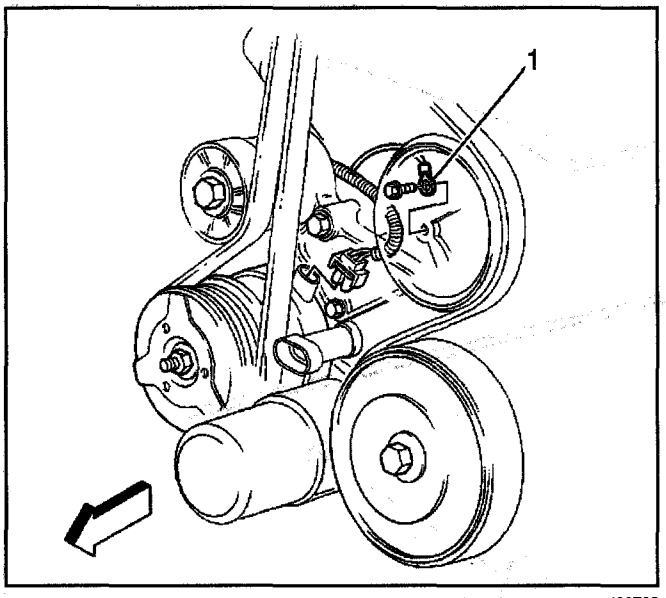


483618

Legend

(1) Brake pressure modulator valve (BPMV) bracket
(2) G109 cruise control ground
(3) G109
(4) Left front frame rail

Lower Right Front Side of Engine (V6 VIN K)

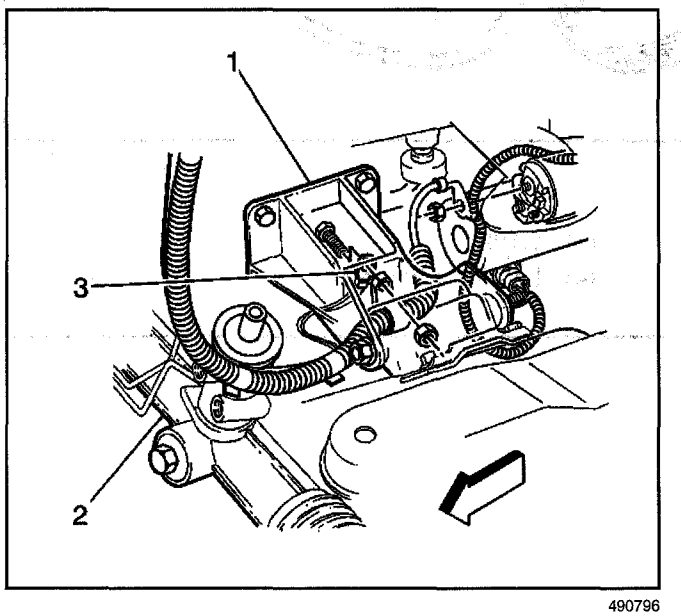


490793

Legend

(01) G110

Lower Left Side of Engine (V6 VIN K)

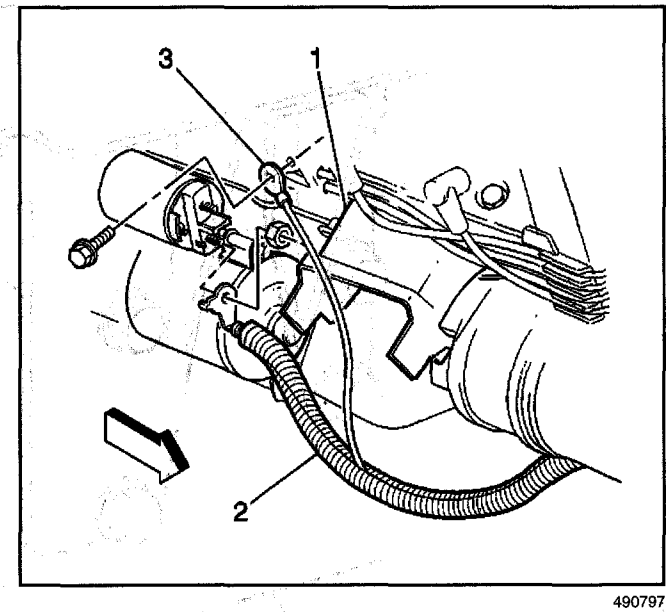


490796

Legend

(01) Left Engine Mount
(02) Steering Geer
(03) G111

Lower Right Side of Engine (V8 VIN G)

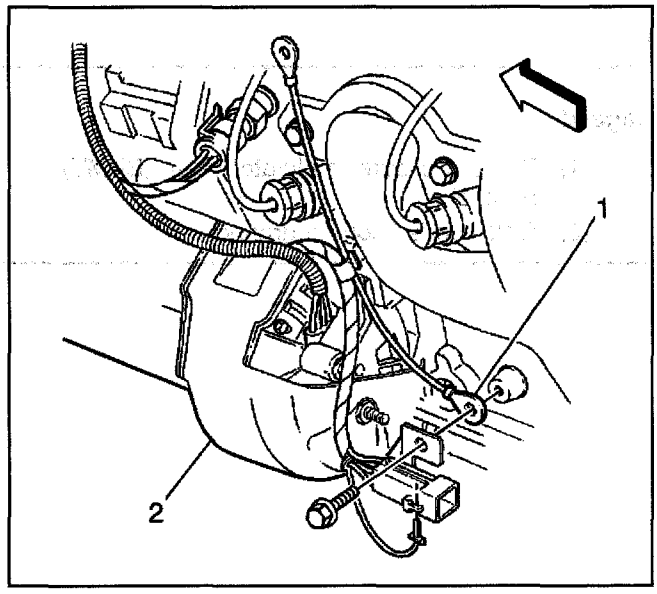


490797

Legend

(01) Engine Mount Bracket
(02) Battery Cable
(03) G100

Lower Left Front of Engine (V8 VIN G)

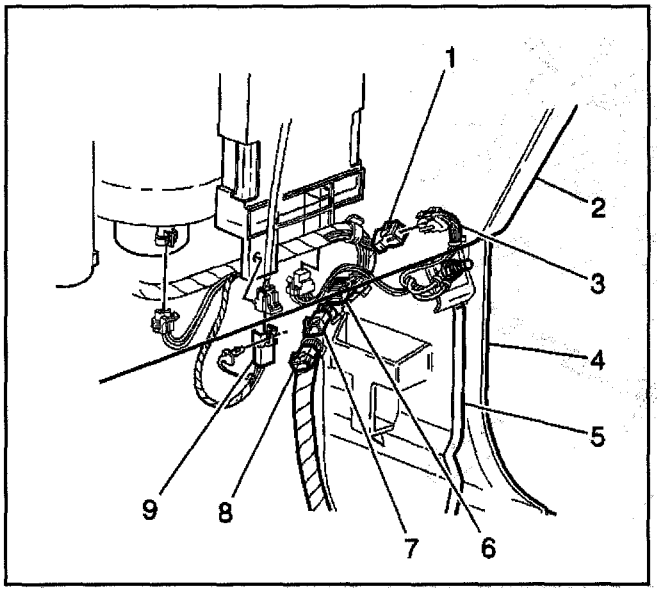


490801

Legend

(01) G111
(02) Generator

Lower Right Side of IP

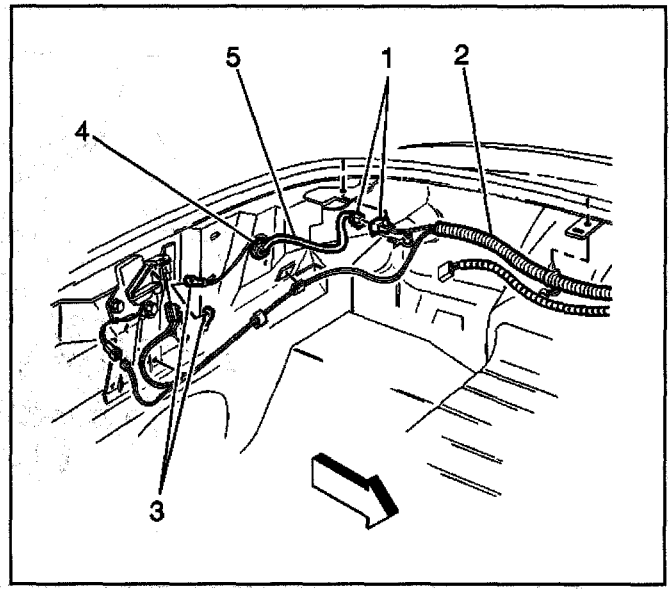


490811

Legend

(01) C240
(02) Instrument Panel
(03) Cross Car Wiring Harness
(04) Right "A" Pillar
(05) Dash Mat
(06) C210
(07) C230
(08) C220
(09) C219

Left Side of Rear Compartment (Coupe)

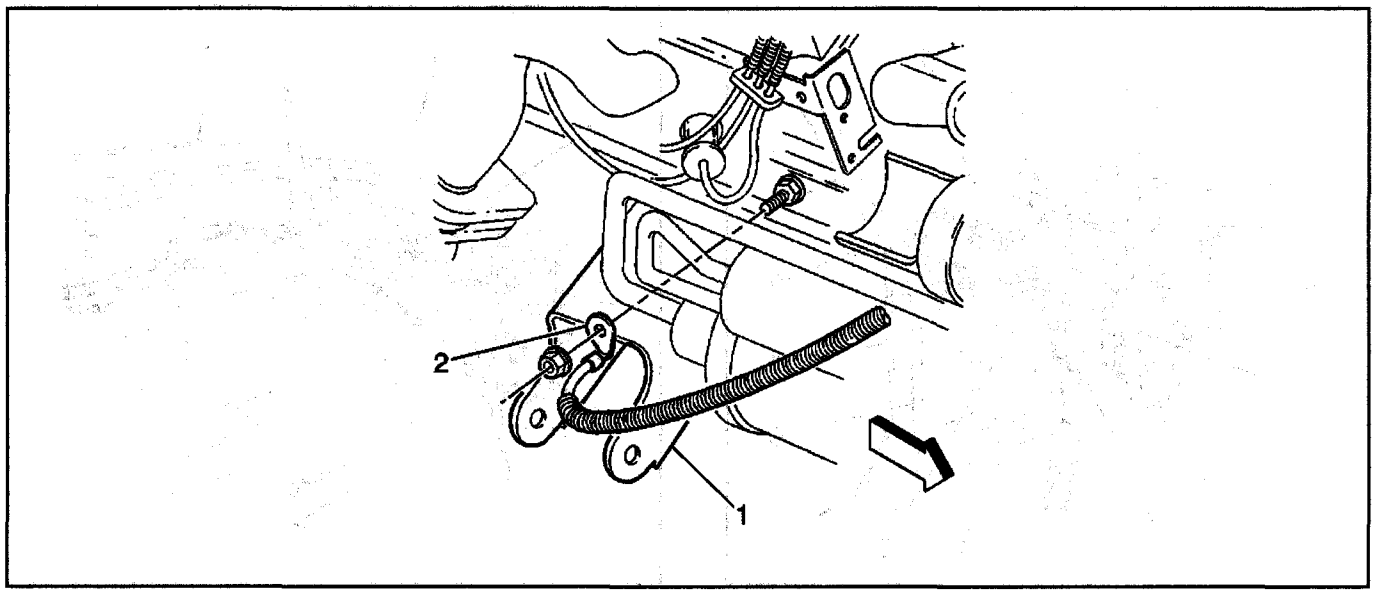


490813

Legend

(01) C400
(02) IP Wiring Harness
(03) G400
(04) P400
(05) RR Body Harness

Lower Right Side of Engine (V6 VIN K)

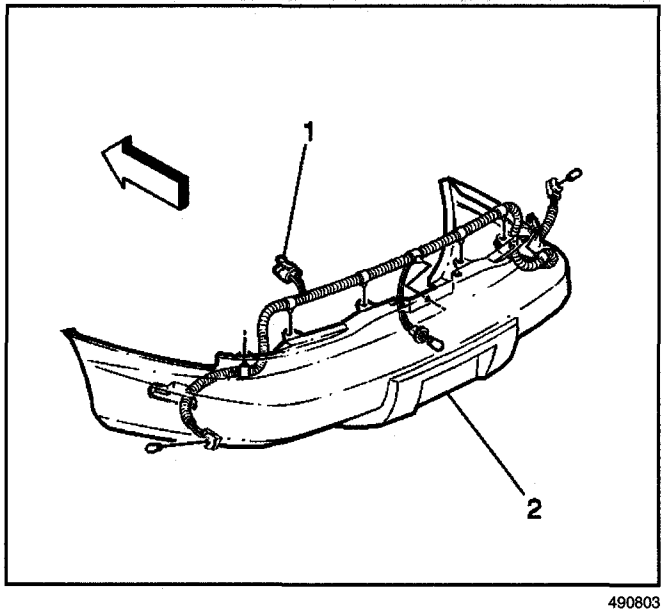


483701

Legend

(01) Right Engine Mount
(02) G100

Rear Fascia

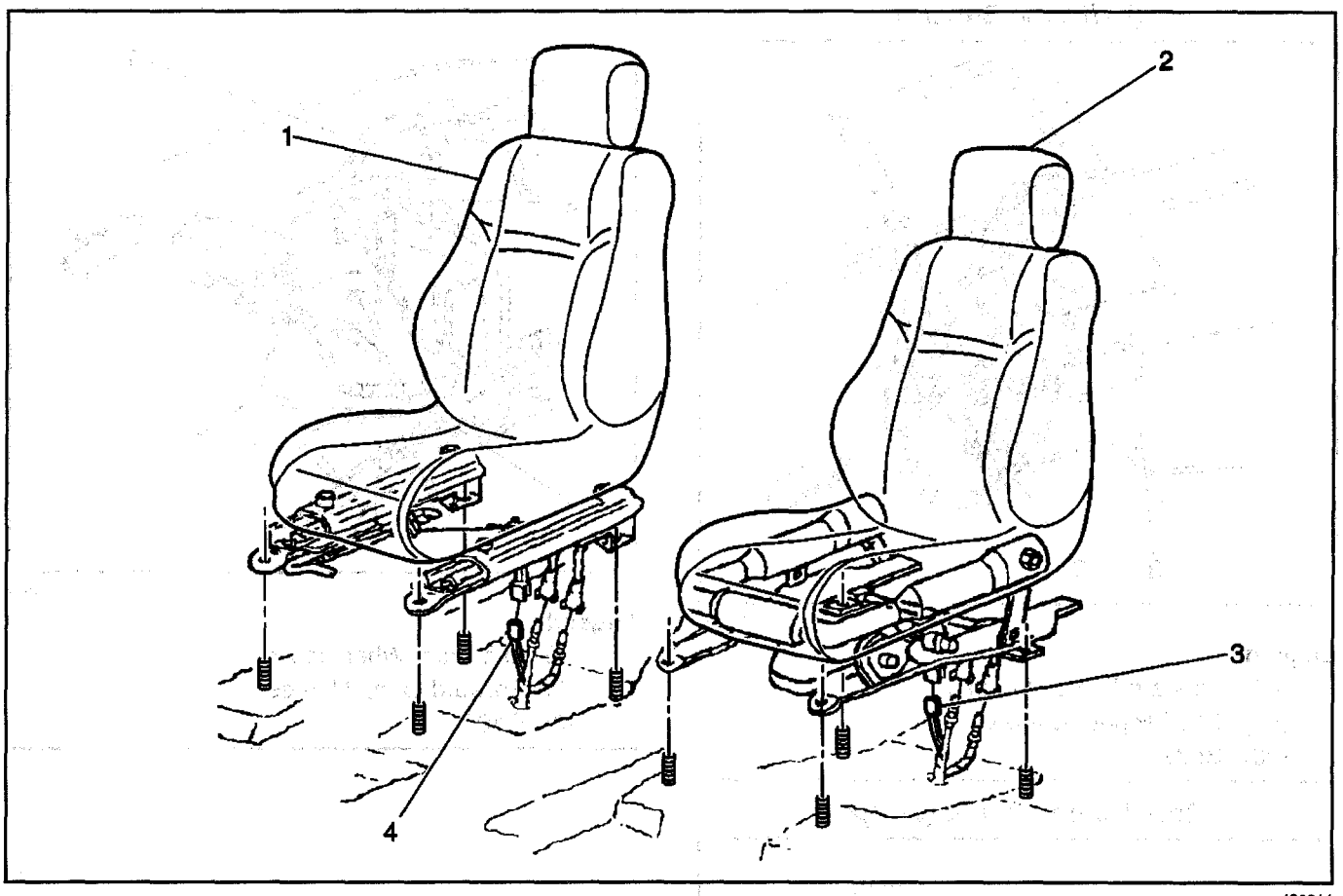


490803

Legend

(01) C430
(02) Rear Fascia

Seats

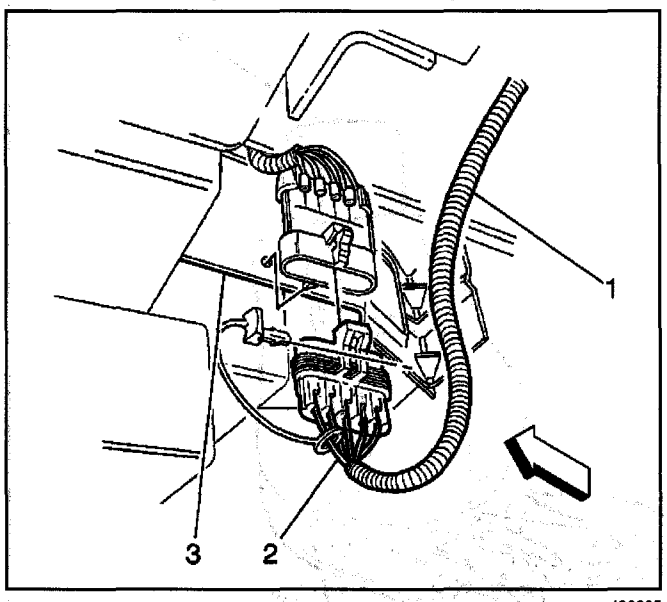


490814

Legend

(1) Passenger seat
(2) Driver seat
(3) C300
(4) C305

Right Front Engine Compartment (Left Side Similar)

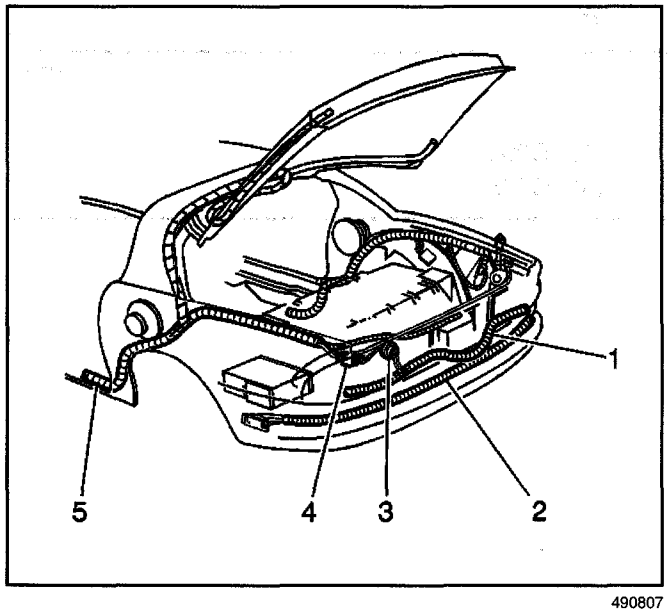


490805

Legend

(01) Forward Lamp Harness
(02) C165 Right / C160 Left
(03) Body

Rear Compartment (Coupe)

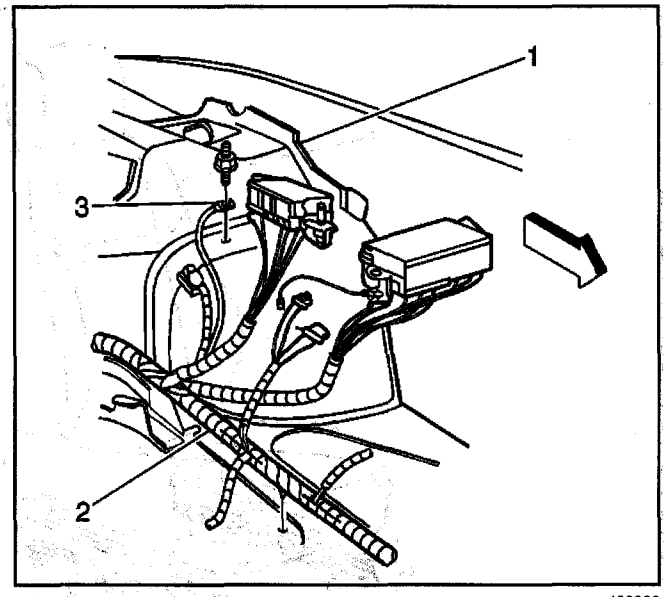


490807

Legend

(01) Rear Body Harness
(02) Rear Fascia Harness
(03) P400
(04) C400
(05) IP Harness

Underhood Electrical Centers

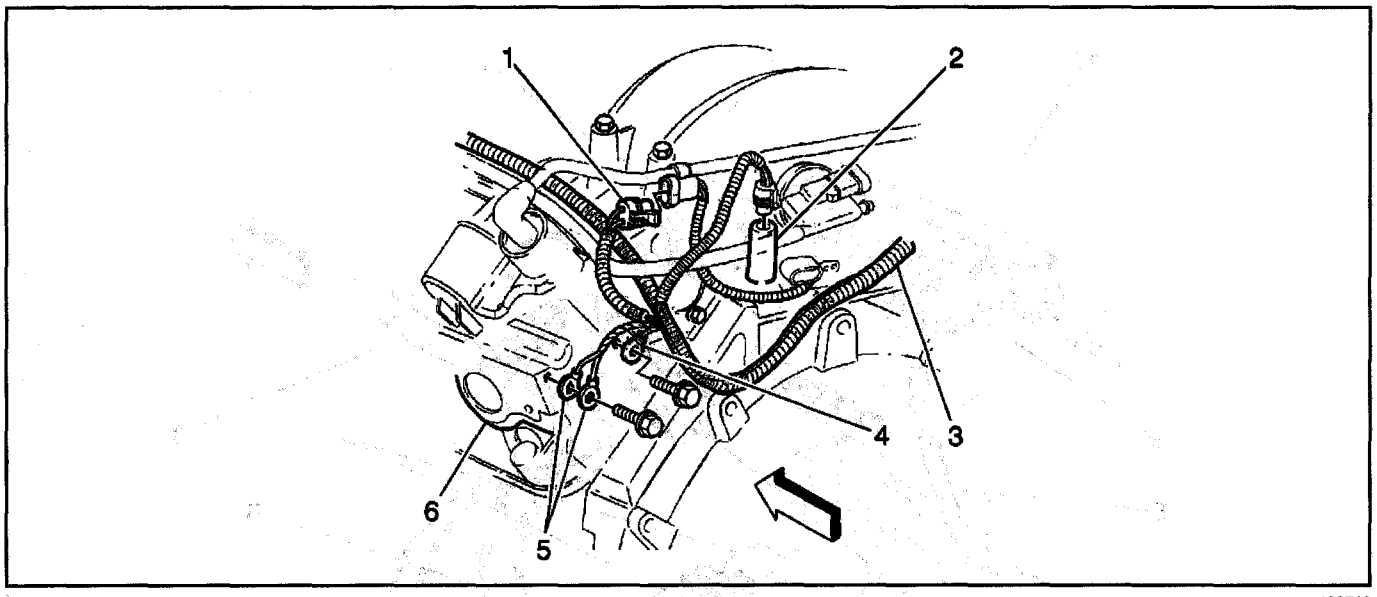


490809

Legend

(1) Left Front Wheelhouse
(2) Forward Lamp Harness
(3) G101

Upper Left Rear Side of Engine (V8 VIN G)

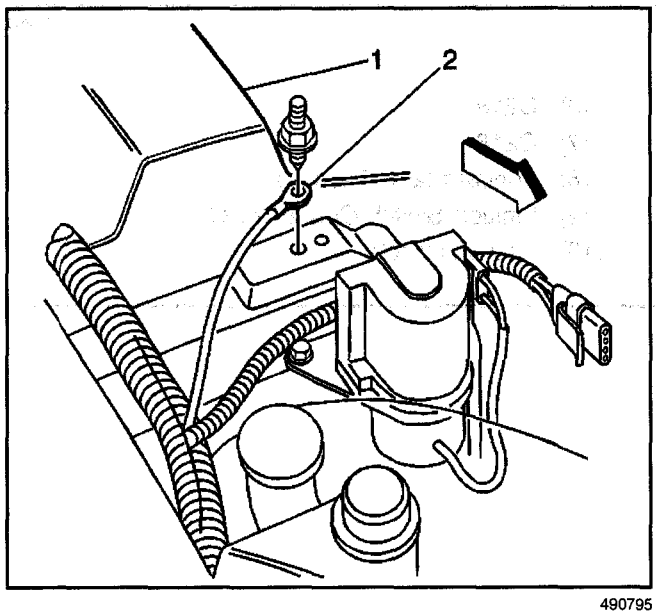


483710

Legend

(01) Knock Sensor Connector
(02) Engine Oil Pressure Sensor
(03) Engine Harness
(04) G110
(05) G112
(06) Left Cylinder Head

Right Front Engine Compartment

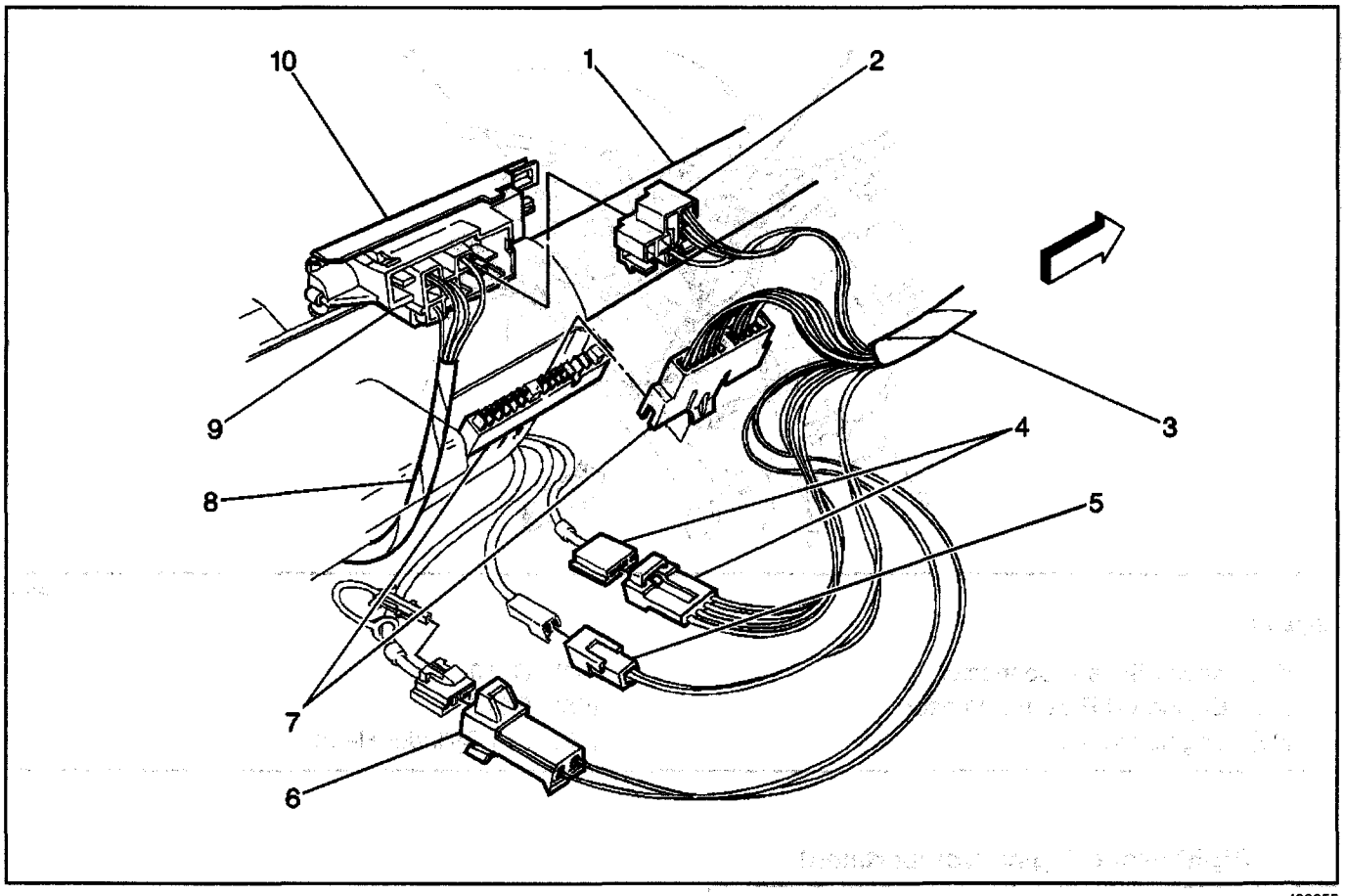


490795

Legend

(1) Right Front Wheelhouse
(2) G102

Steering Column

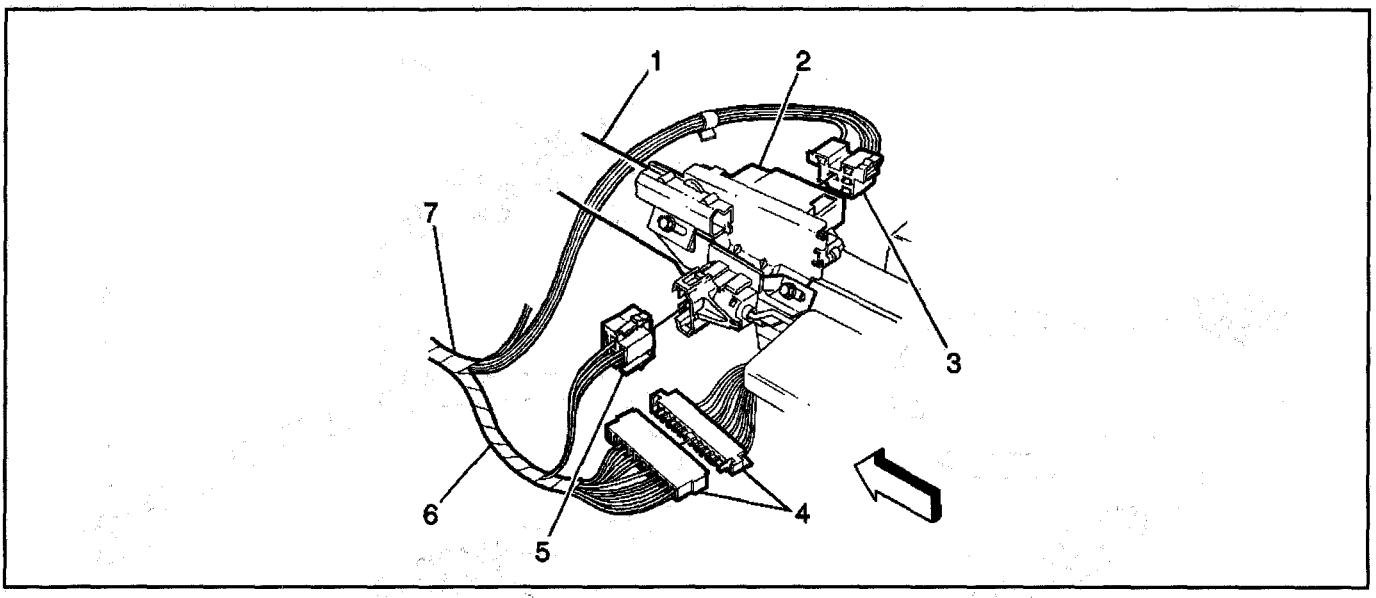


490655

Legend

(1) Steering column
(2) Ignition Switch Connector C1
(3) I/P wiring harness
(4) C217
(5) Ignition key lock cylinder (Resistor Pellet) connector
(6) C218
(7) C216
(8) Forward lamp harness
(9) Ignition Switch Connector C2
(10) Ignition switch

Base of Steering Column

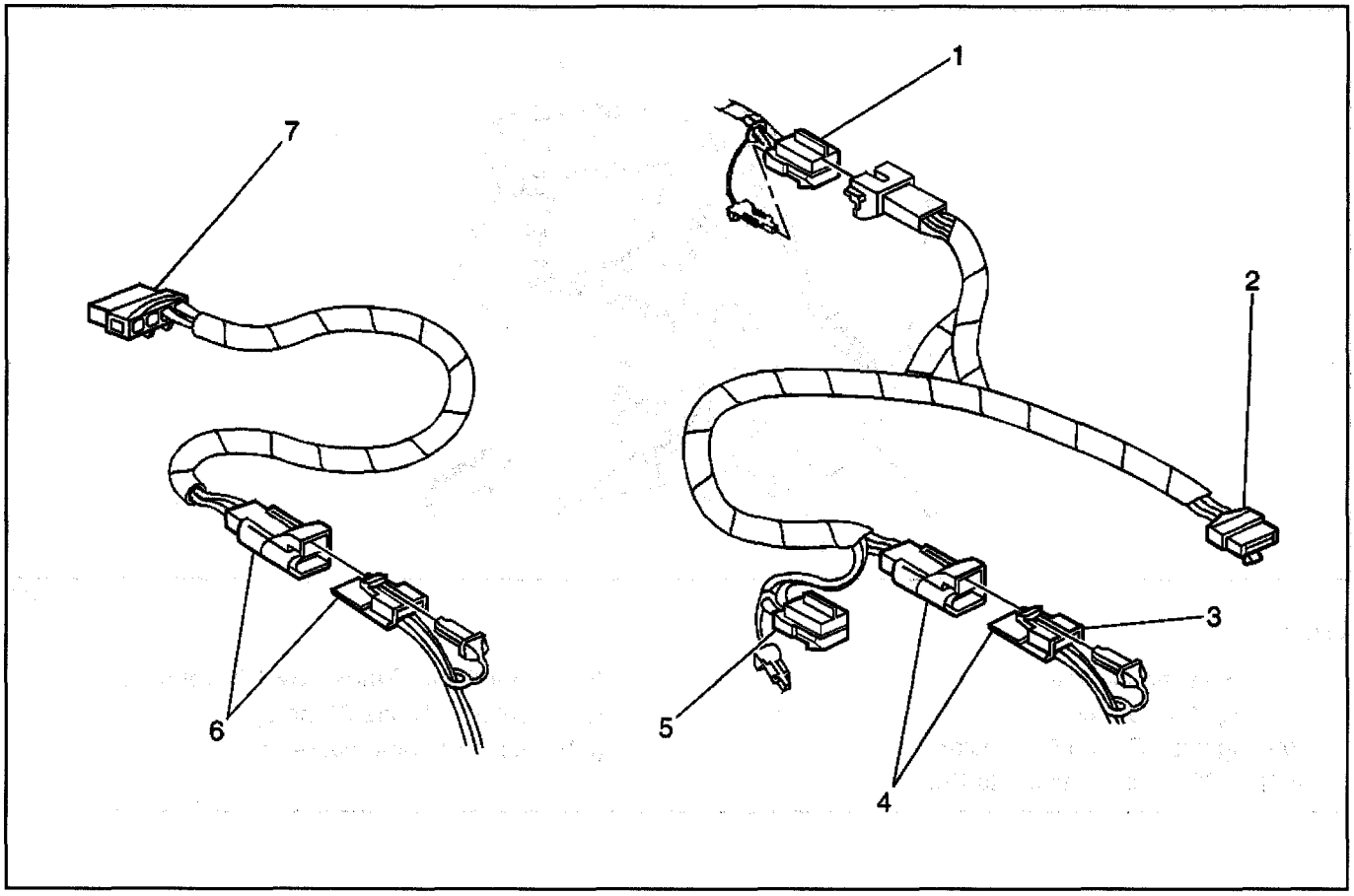


483732

Legend

(01) Steering Column
(02) Ignition Switch
(03) Ignition Switch Connector C2
(04) C215 (Not Attached to Column)
(05) Headlamp Dimmer Switch Connector
(06) Isolation Diode (Wipers)
(07) Forward Lamp Harness

Clutch Jumper Harness Combinations (V6 VIN K) Manual Transmission

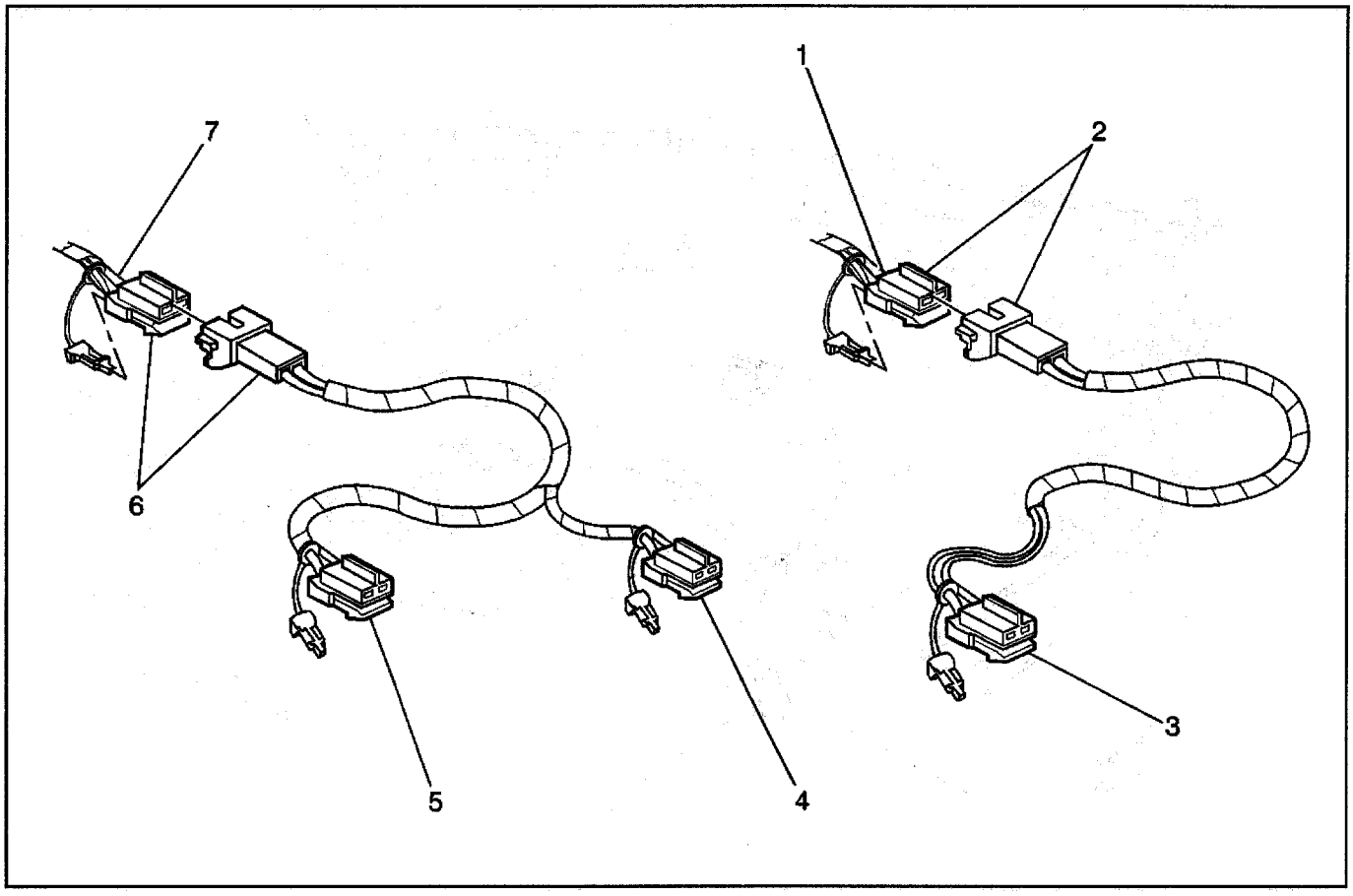


490668

Legend

(1) Forward lamp harness
(2) Cruise control/clutch anticipate switch connector
(3) I/P wiring harness
(4) C270 with manual transmission with cruise control
(5) Cruise control release (Brake) switch connector
(6) C270 with manual transmission, w/o cruise control
(7) Cruise control/clutch anticipate switch connector

Clutch Jumper Harness Combinations (V8 VIN G)

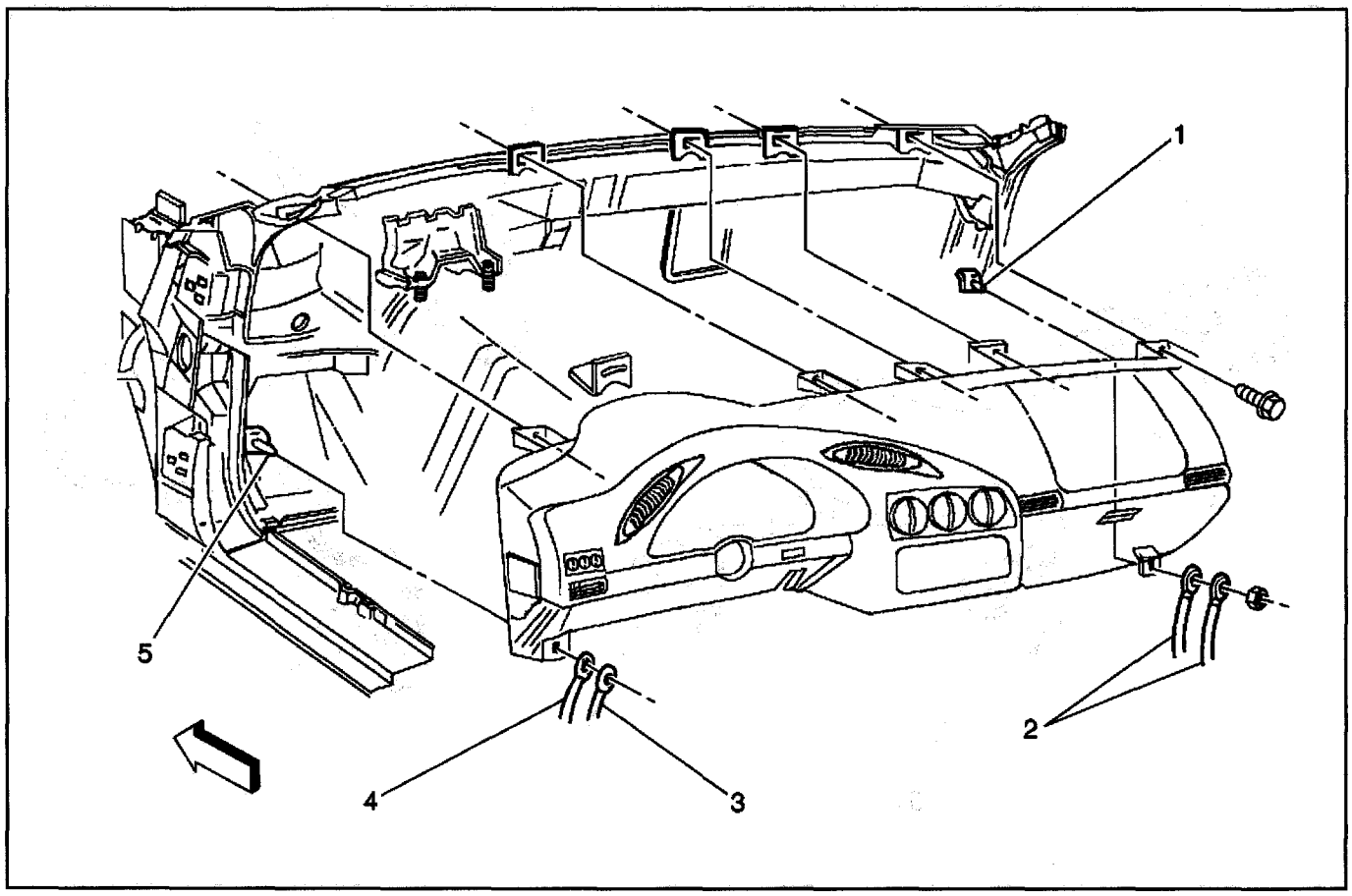


490675

Legend

(1) Foward lamp harness
(2) C250 with automatic transmission and cruise control
(3) Cruise control release (Brake) switch connector
(4) Cruise control (Clutch) switch connector
(5) Cruise control release (Brake) switch connector
(6) C250 With manual transmission and cruise control
(7) Forward lamp harness

Chevrolet I/P Ground (Pontiac Similar)

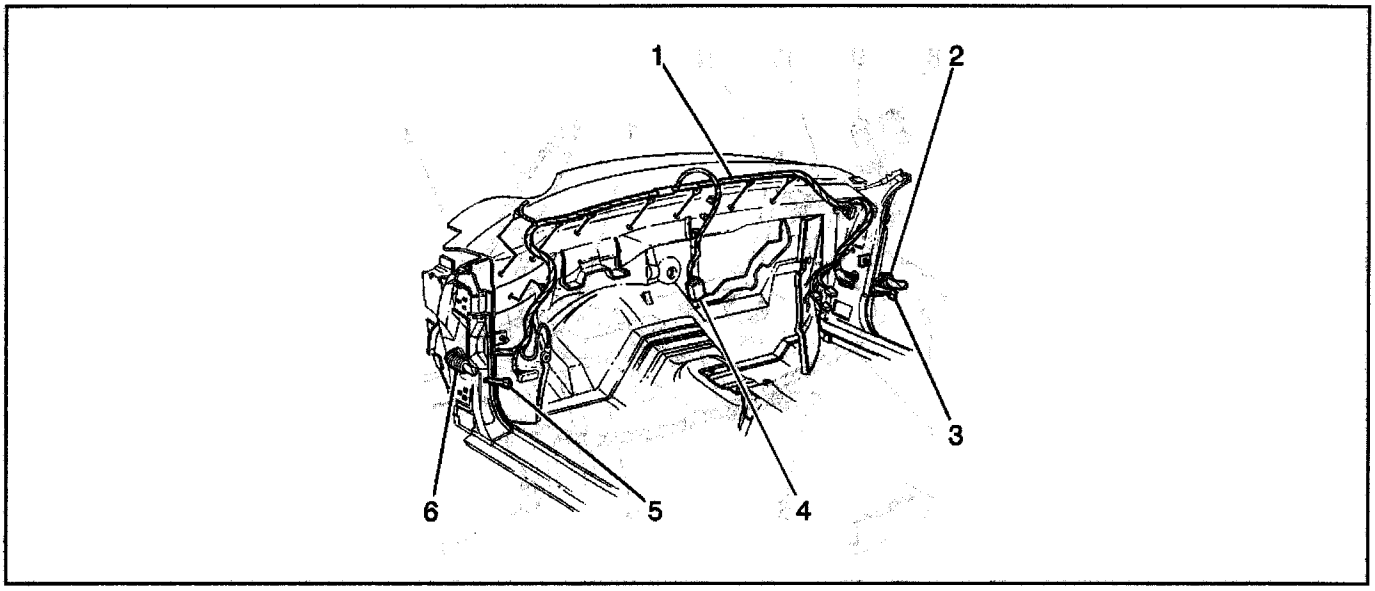


490680

Legend

(1) G201
(2) I/P wiring harness
(3) I/P wiring harness
(4) Cross car wiring harness
(5) G200

Dash Panel

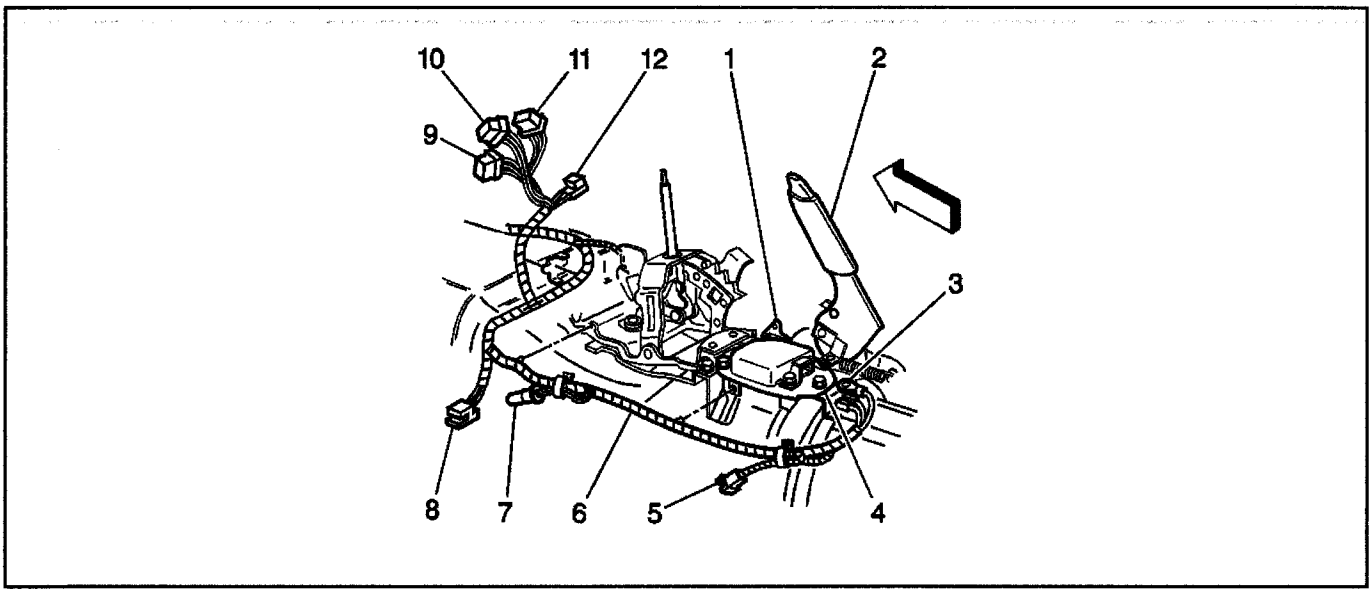


483745

Legend

(01) Cross Car Harness
(02) P600
(03) Door Jamb Switch, RH Connector
(04) Power Window Control Module
(05) Door Jamb Switch, LH Connector
(06) P500

Under Console, Left Side (Automatic Transmission)

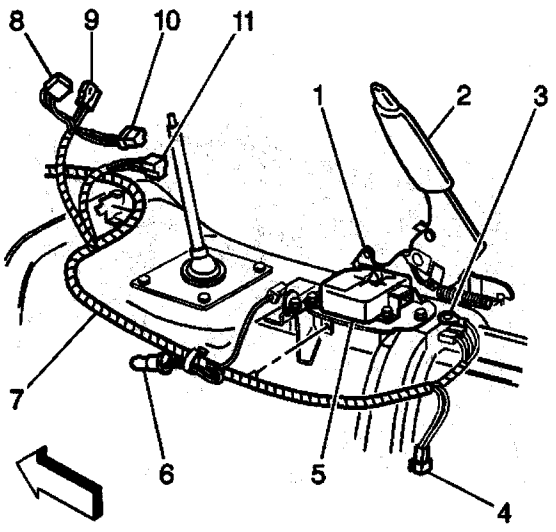


483749

Legend

(01) Park Brake Switch
(02) Park Brake
(03) G202
(04) Inflatable Restraint Sensing and Diagnostic Module (SDM)
(05) Seatbelt Switch Connector
(06) IP Wiring Harness
(07) PRNDL Lamp
(08) BTSI Connector
(09) Traction Control or Second Gear Start Switch Connector
(10) Folding Top Switch Connector
(11) Cigar Lighter Connector
(12) Auxiliary Power Connector

Under Console, Left Side (Manual Transmission)

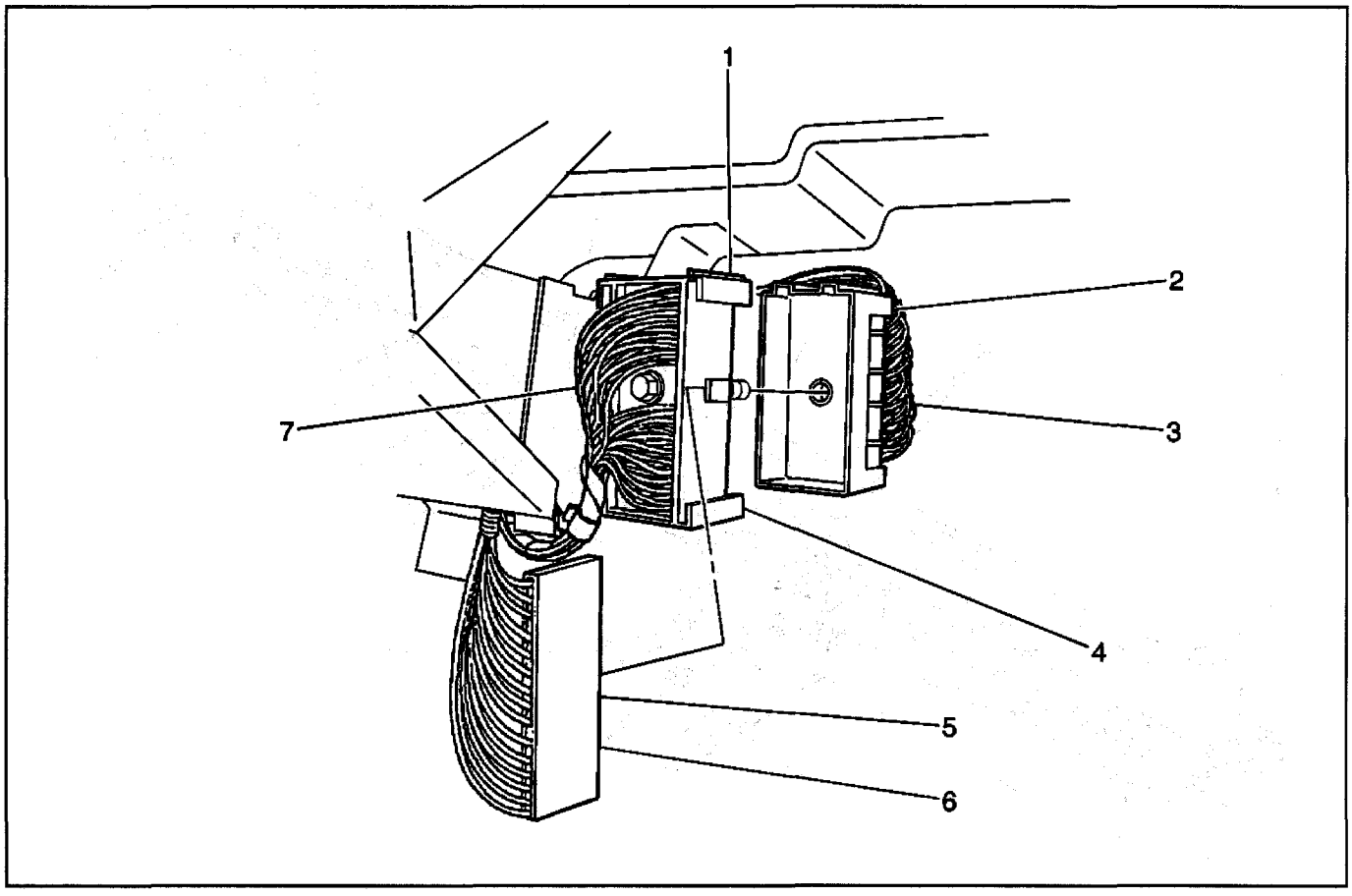


483750

Legend

(1) Park Brake Switch
(2) Park Brake
(3) G202
(4) Seat Belt Switch Connector
(5) Inflatable Restraint Sensing and Diagnostic (SDM) Module
(6) Ash Tray Lamp
(7) IP Wiring Harness
(8) Convertible Top Switch Connector
(9) Cigar Lighter Connector
(10) Traction Control Switch Connector (Pontiac)
(11) Auxiliary Power Connector

Rear Left Side of I/P

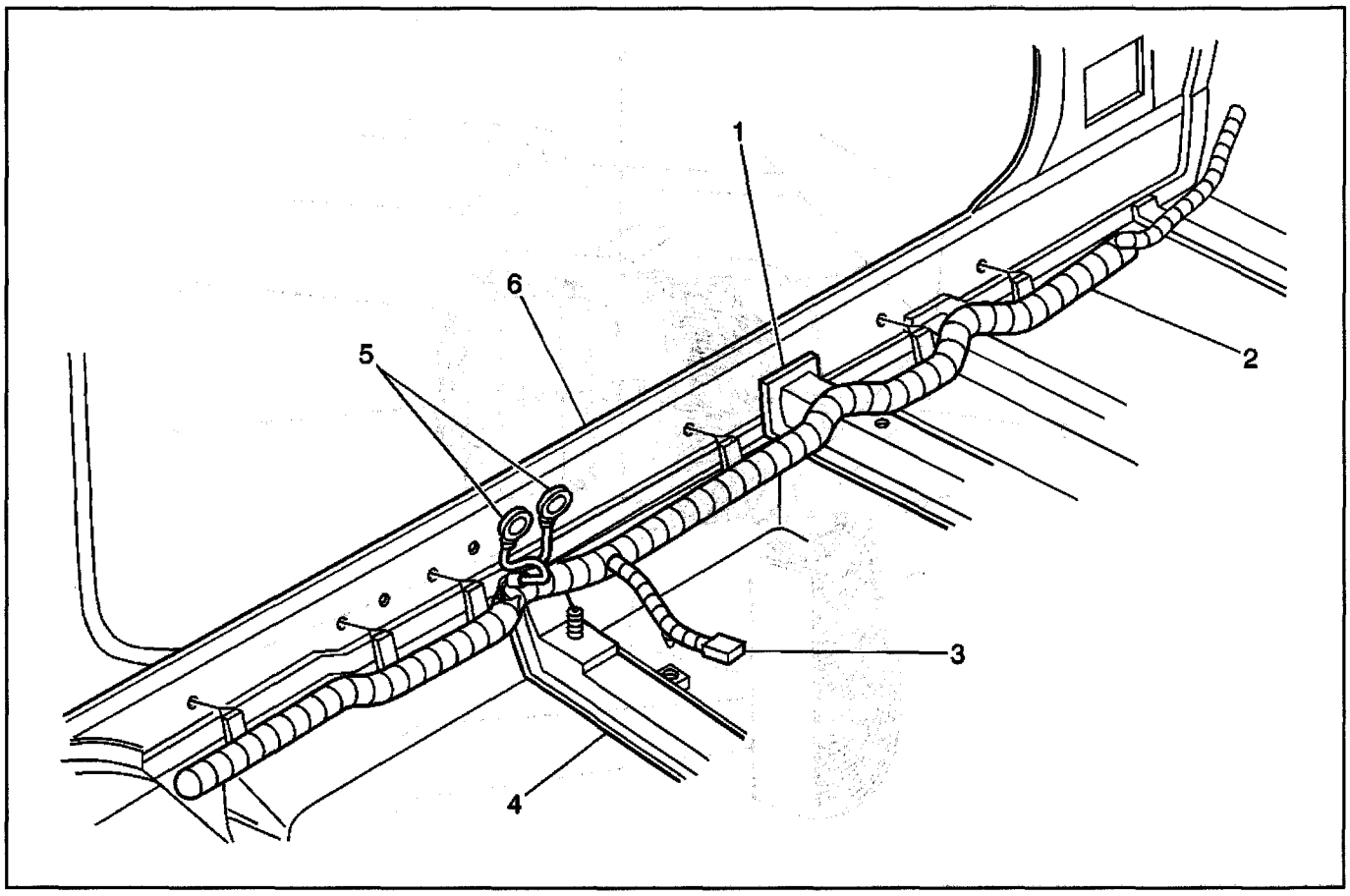


490702

Legend

(1) Forward lamp harness
(2) C200D
(3) I/P wiring harness
(4) C200B
(5) C200C
(6) Cross Car Wiring Harness
(7) C200A

Left Rocker Panel

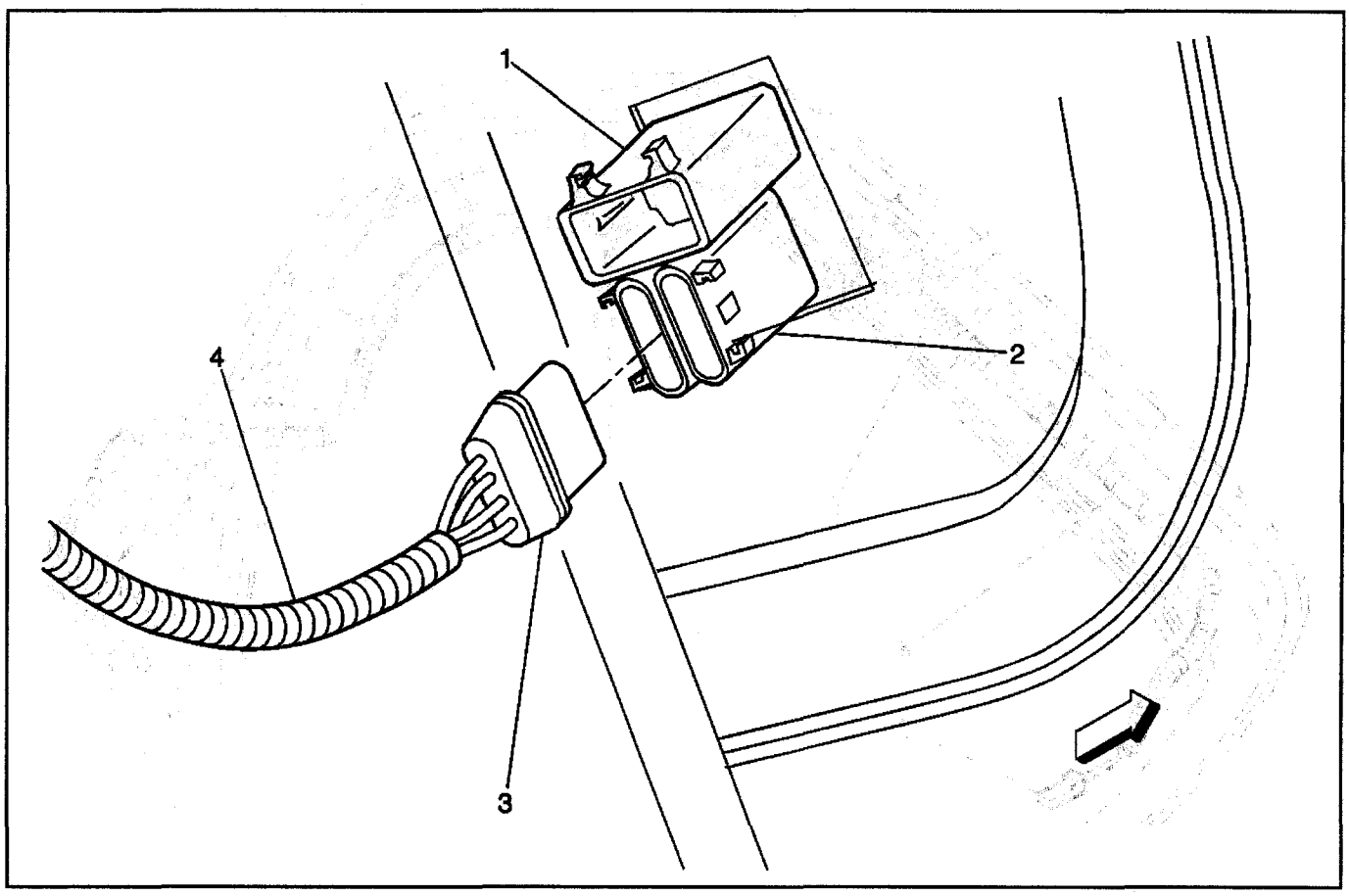


490706

Legend

(1) Number 2 Floor Pan Rail
(2) I/P wiring harness
(3) C310
(4) Number 3 floor pan rail
(5) G305
(6) Rocker panel

Outside Left of Rear Floor Pan, Forward of Rear Axle

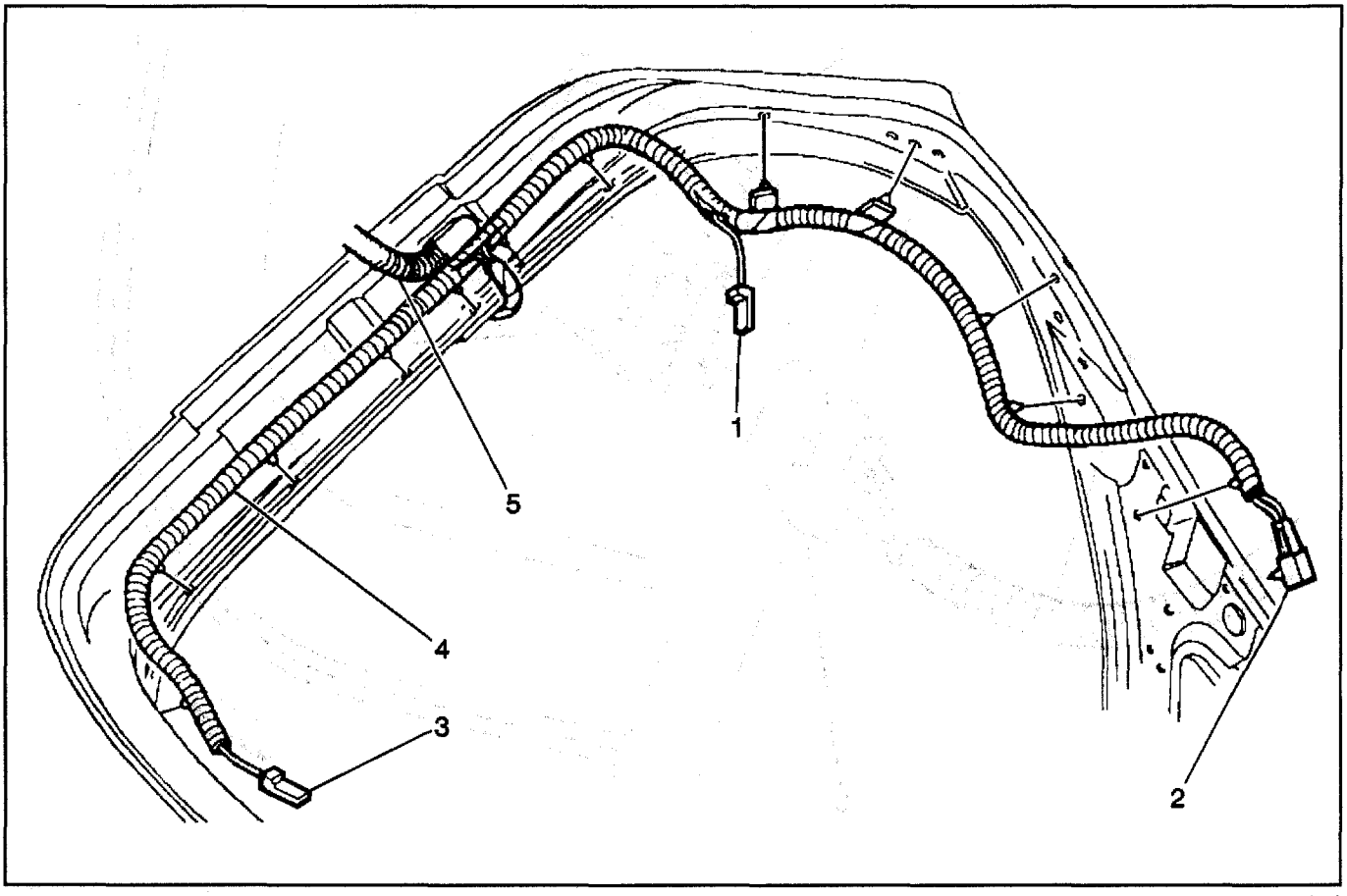


490719

Legend

(1) C405B
(2) I/P wiring harness
(3) C405C
(4) Rear wheel speed sensor harness

Underside of Rear Compartment Lid (Coupe)

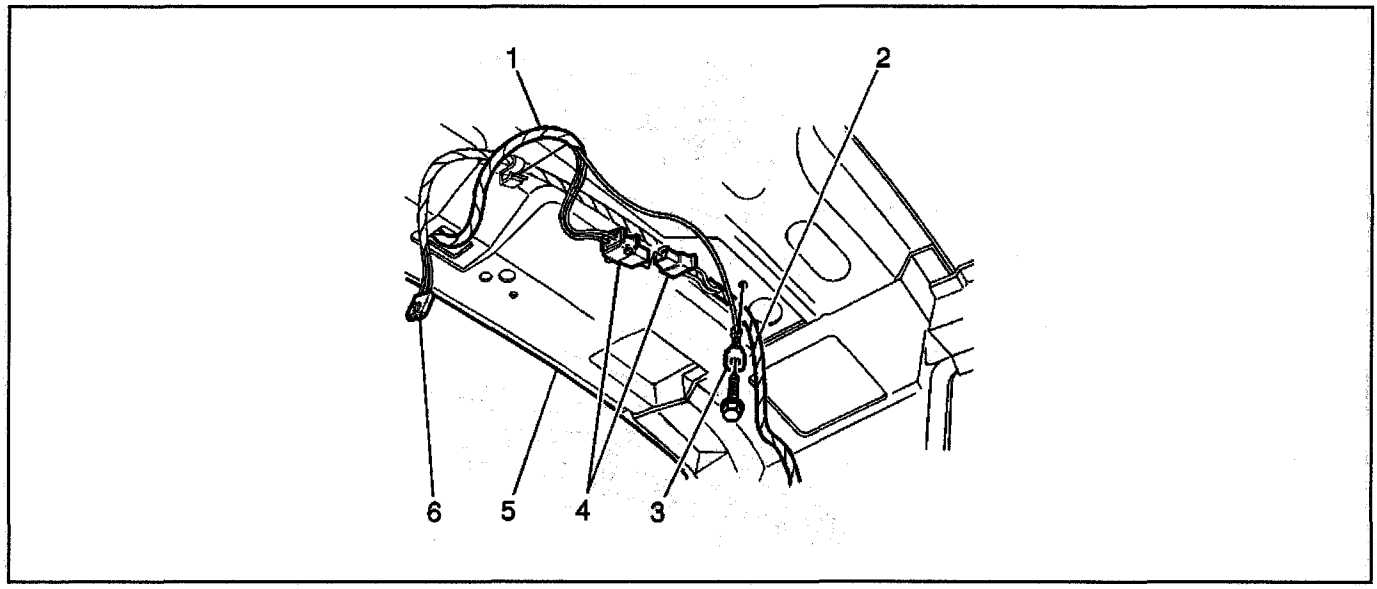


490726

Legend

(1) Rear defogger grid connector (Left Side)
(2) C420
(3) Rear defogger grid connector (Right Side)
(4) Hatch harness
(5) P300

Center Rear of Roof Panel

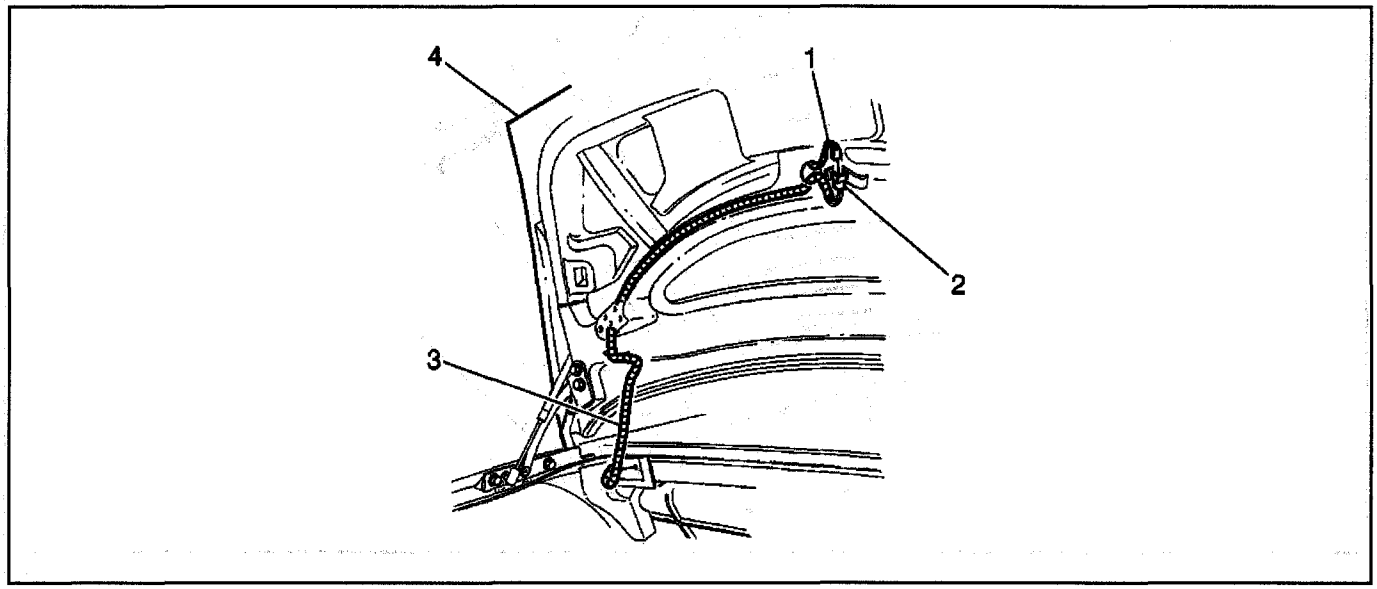


483756

Legend

(01) Hatch Wiring Harness
(02) IP Wiring Harness
(03) G330
(04) C330
(05) Roof Panel
(06) Dome Lamp Connector

Underside of Rear Compartment Lid (Pontiac Convertible)

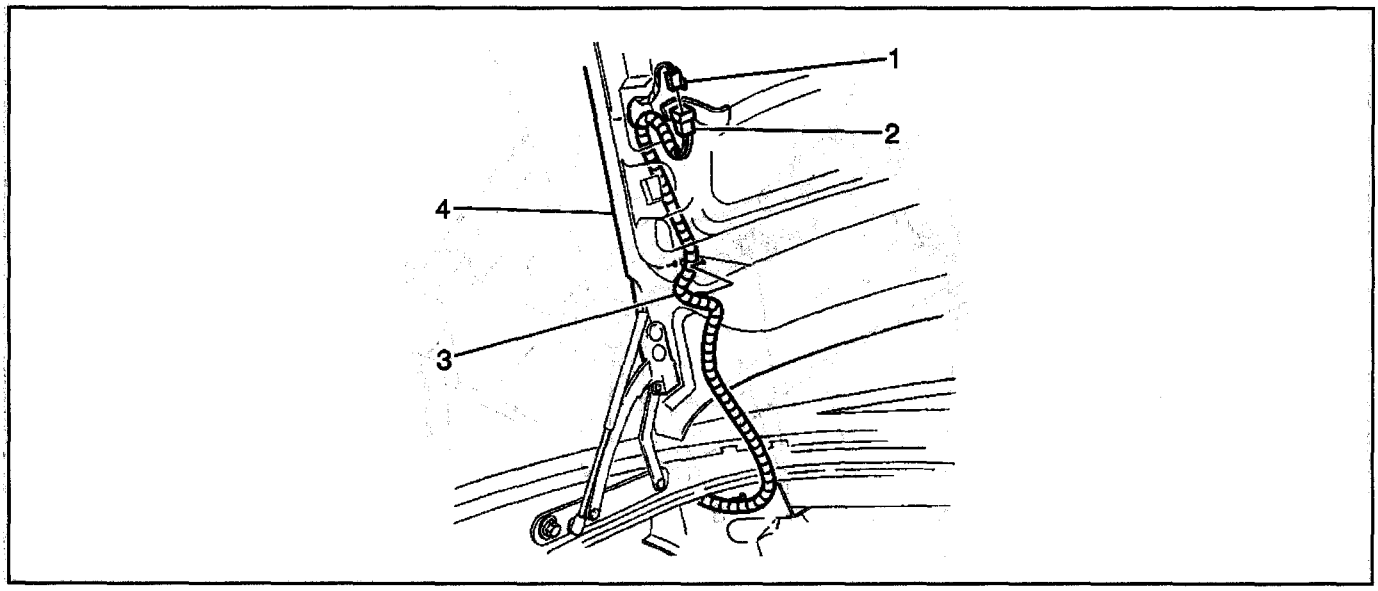


483758

Legend

(01) CHMSL Harness
(02) C420
(03) IP Wiring Harness
(04) Deck Lid

Underside of Rear Compartment Lid (Chevrolet Convertible)

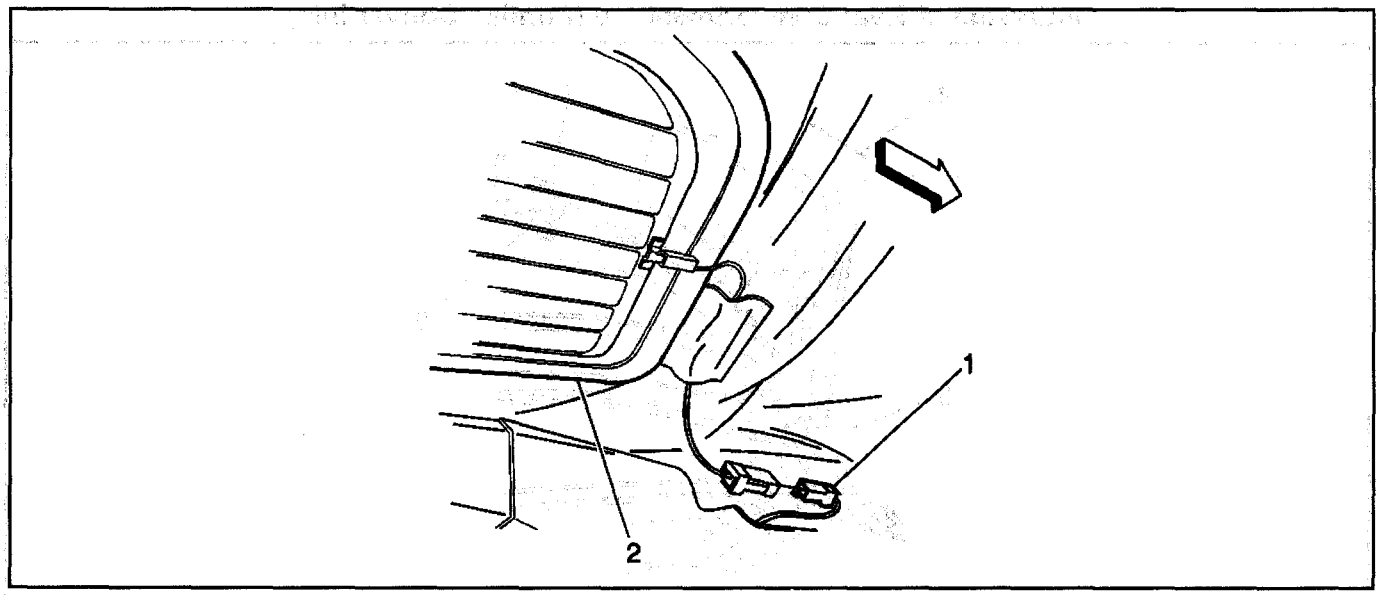


483763

Legend

(01) CHMSL Wiring Harness
(02) C420
(03) IP Wiring Harness
(04) Deck Lid

Inside Rear Convertible Top



478269

Legend

(01) C320
(02) Folding Top Glass

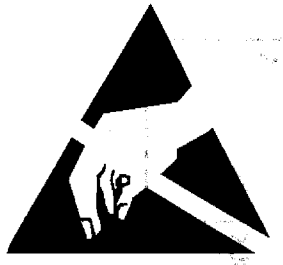
Body Control System

Schematic and Routing Diagrams

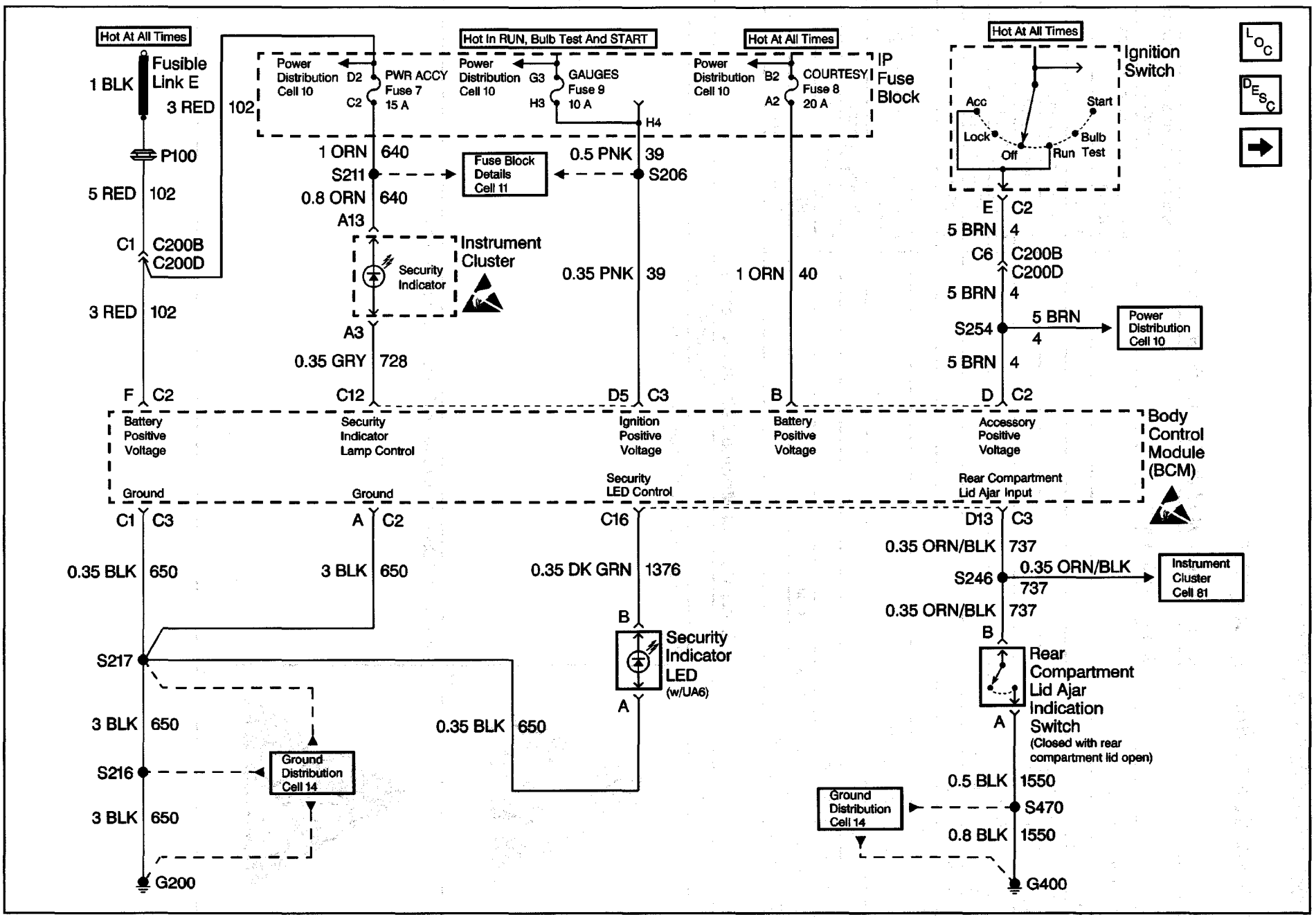
Body Control Module Schematic References

Reference on Schematic	Section Number Subsection Name
Audible Warnings Cell 76	8—Instrument Panel, Gauges and Console
Door Locks Cell 130	8—Doors
Engine Controls Cell 20, 21	6—Engine Controls
Exterior Lights Cell 110	8—Lighting Systems
Fog Lamps Cell 103	8—Lighting Systems
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Horns Cell 40	8—Horns
Instrument Cluster Cell 81	8—Instrument Panel, Gauges and Console
Power Distribution Cell 10	8—Wiring Systems
Release Systems Cell 134	8—Body Rear End
Supplemental Inflatable Restraints (SIR) Cell 47	9—SIR
Theft Deterrent Cell 133	8—Theft Deterrent

Body Control Module Schematic Icons

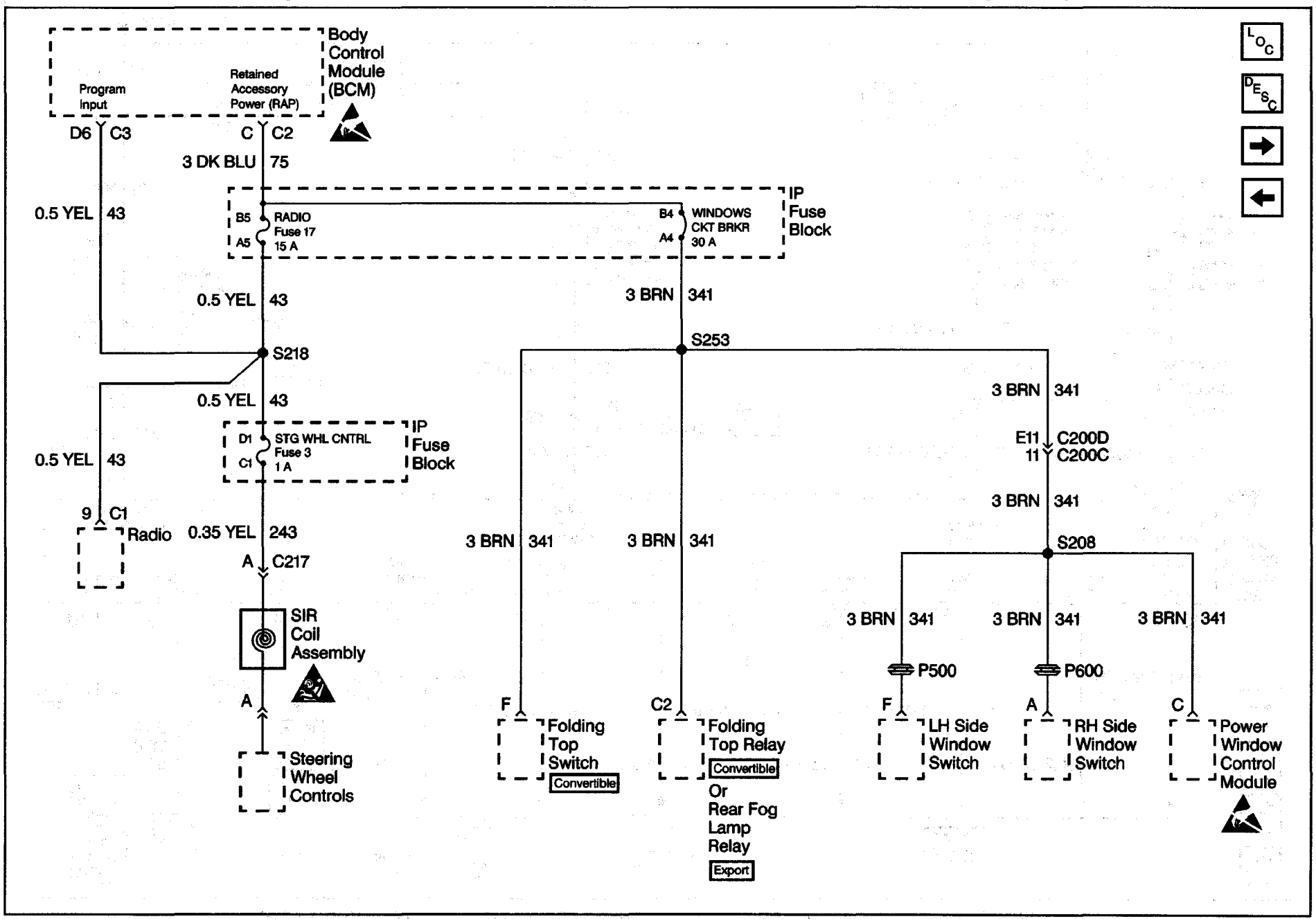
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.

Body Control Module Schematics (Without Door Jamb Switches) (Power and Ground)



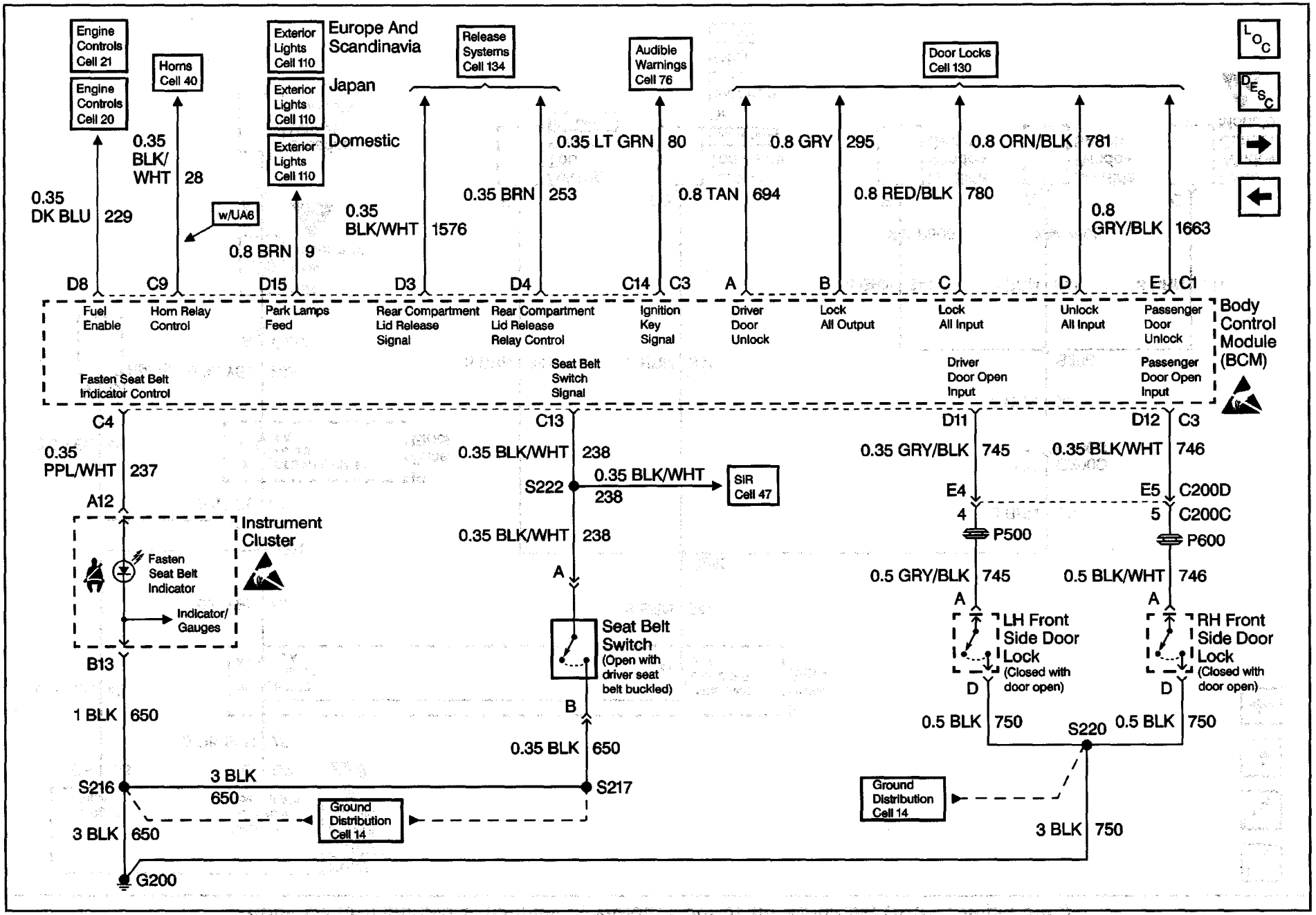
500454

Body Control Module Schematics (Without Door Jamb Switches) (RAP Components)



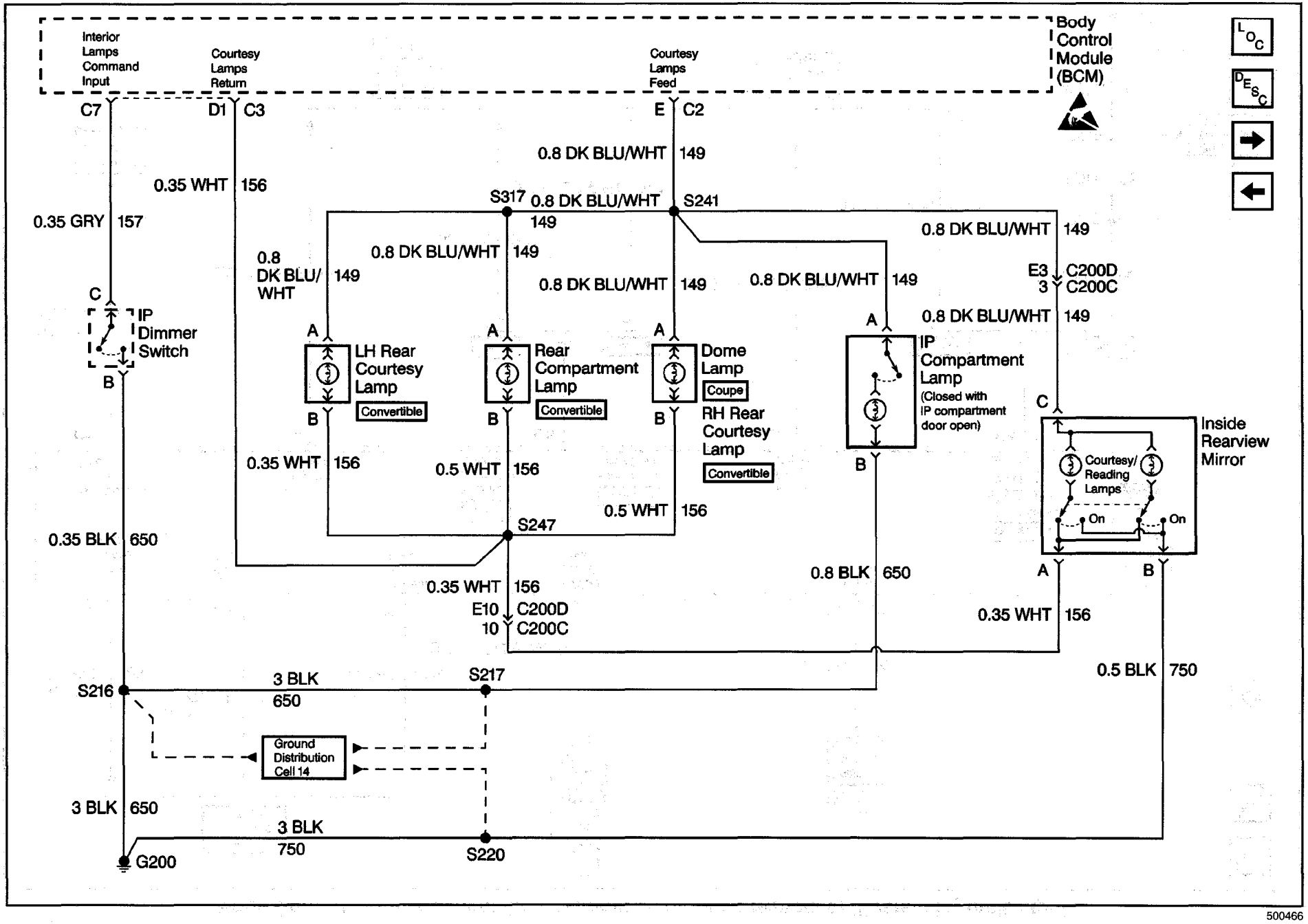
500459

Body Control Module Schematics (Without Door Jamb Switches) (System Outputs)



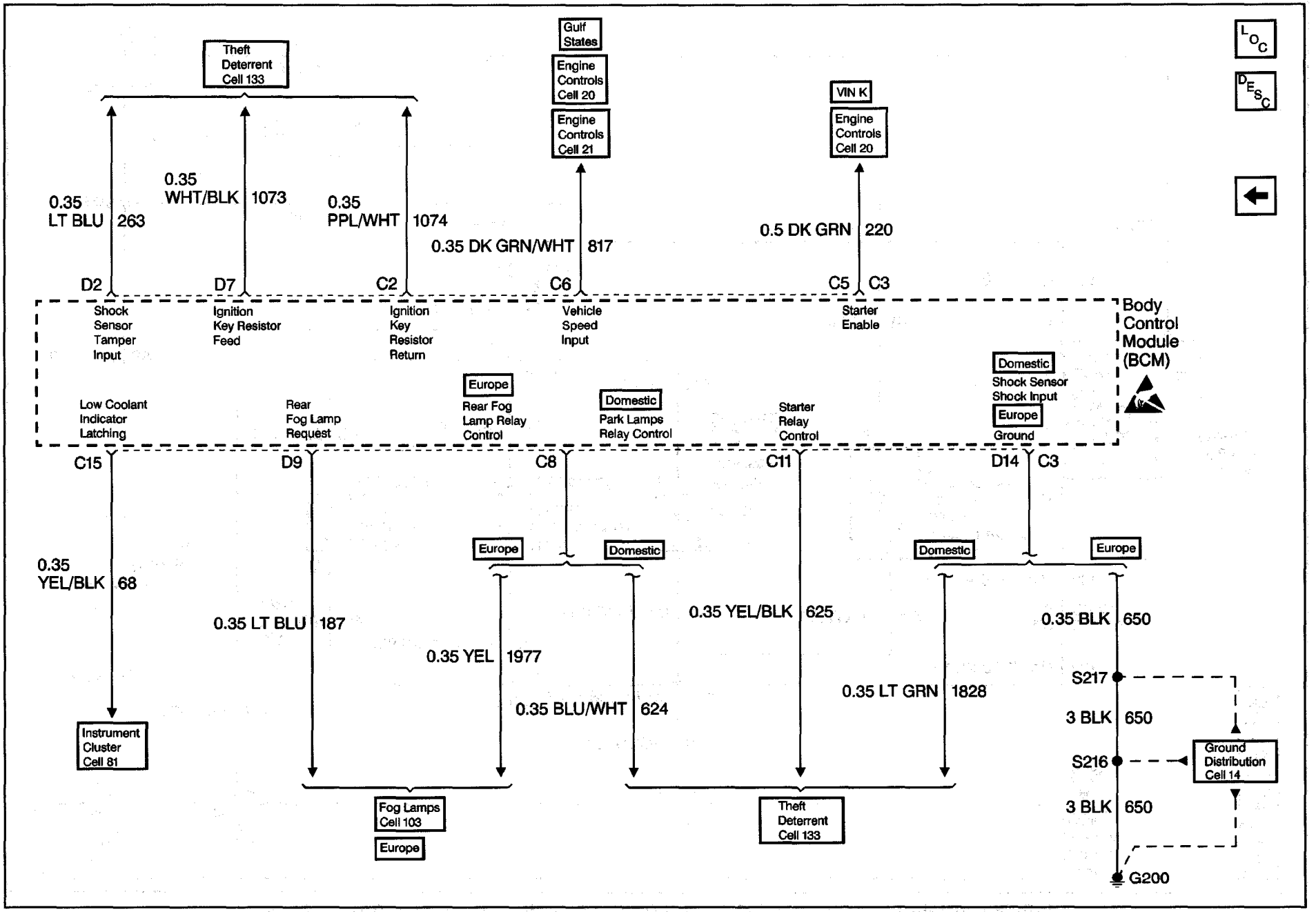
500460

Body Control Module Schematics (Without Door Jamb Switches) (Interior Lamps)



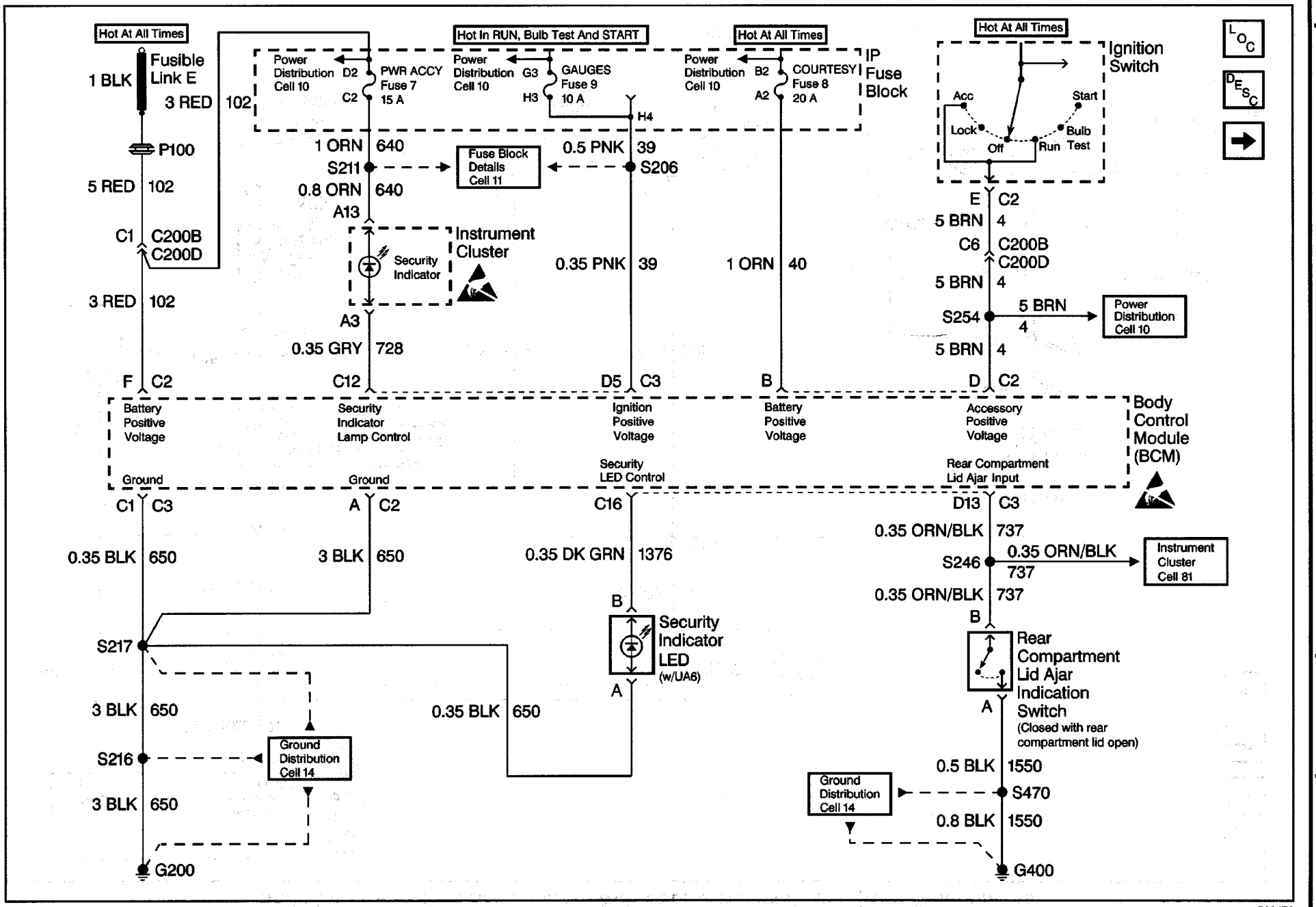
500466

Body Control Module Schematics (Without Door Jamb Switches) (System Inputs/Outputs)



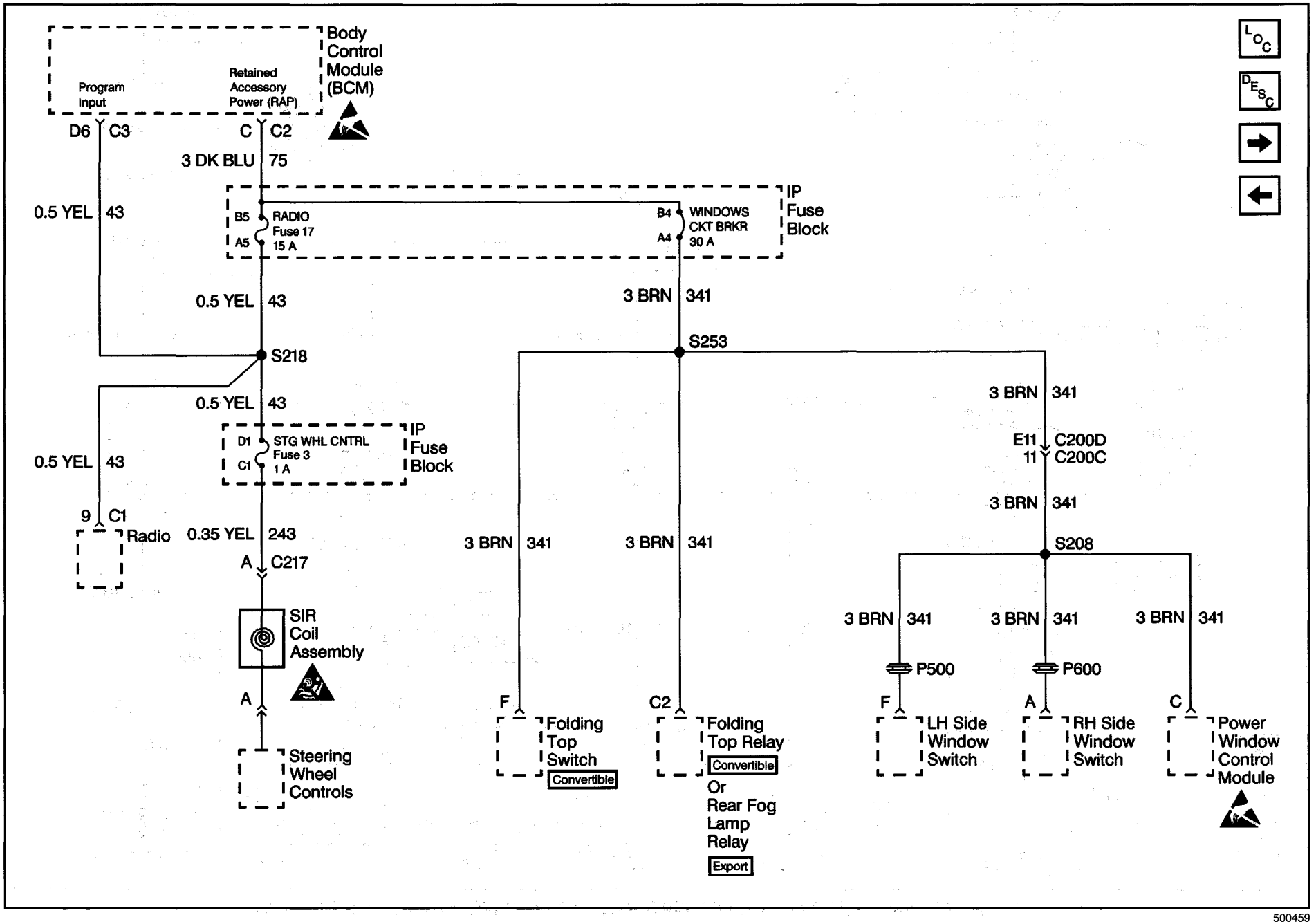
500468

Body Control Module Schematics (With Door Jamb Switches) (Power and Ground)

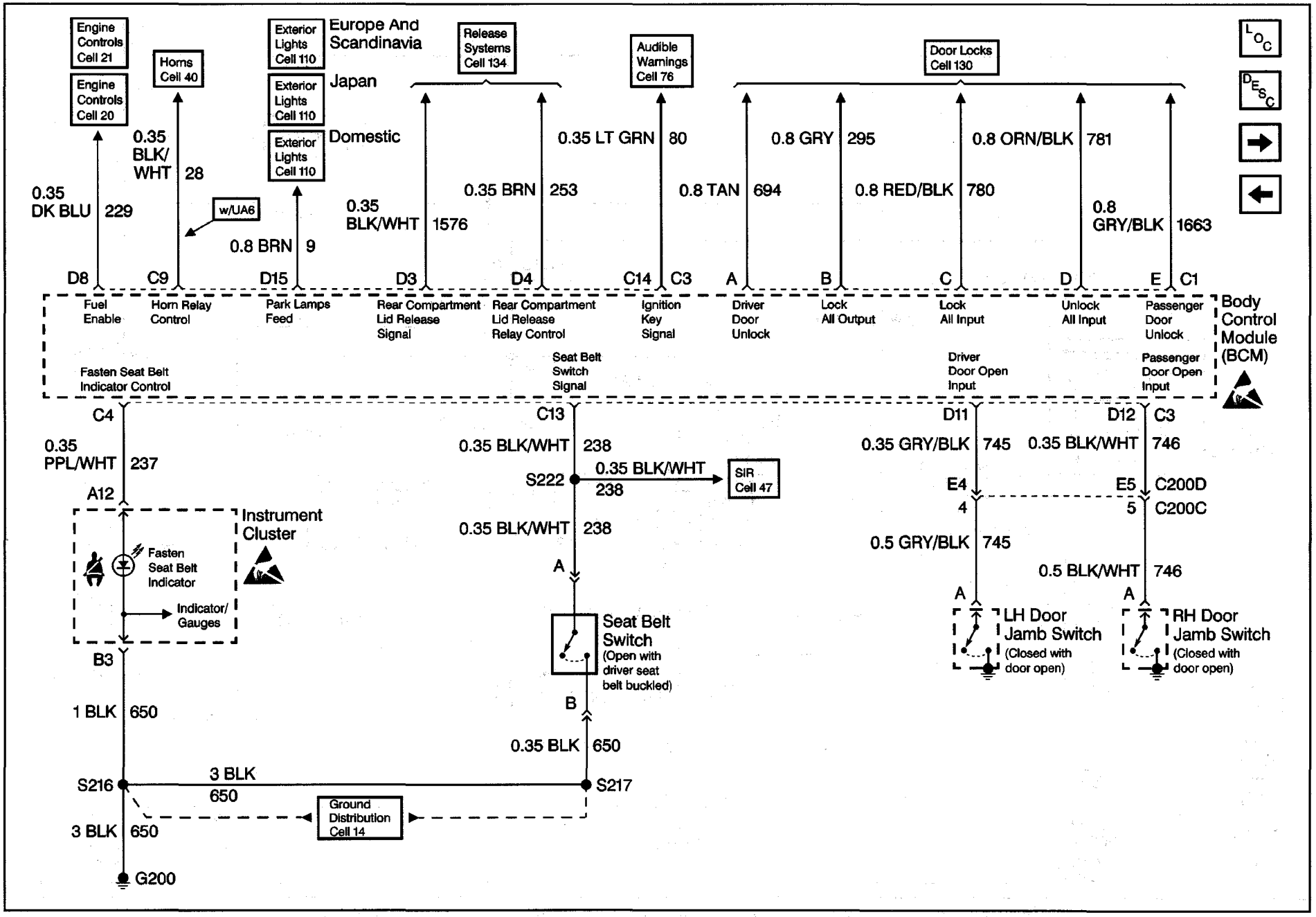


500473

Body Control Module Schematics (With Door Jamb Switches) (RAP Components)

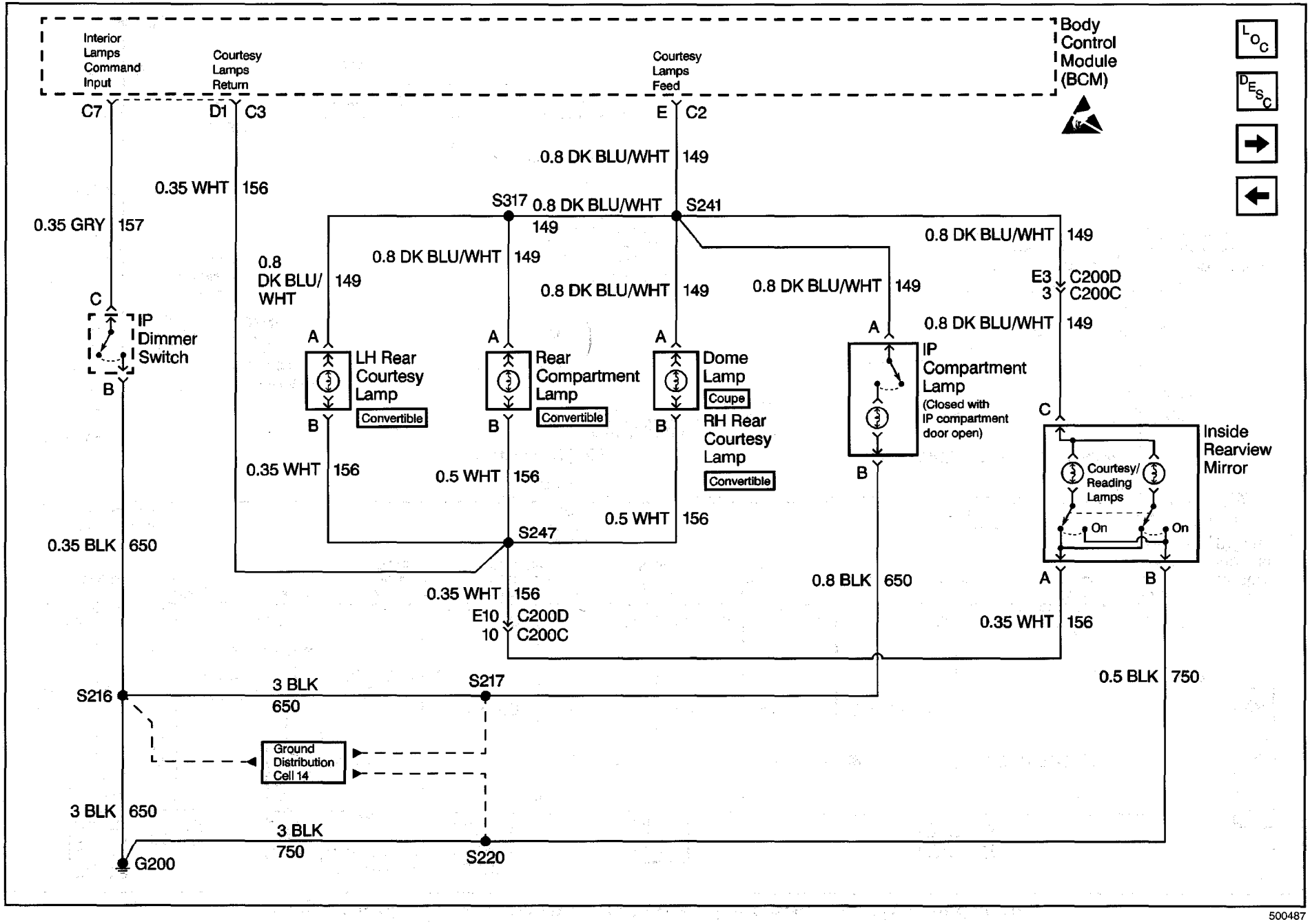


Body Control Module Schematics (With Door Jamb Switches) (System Outputs)



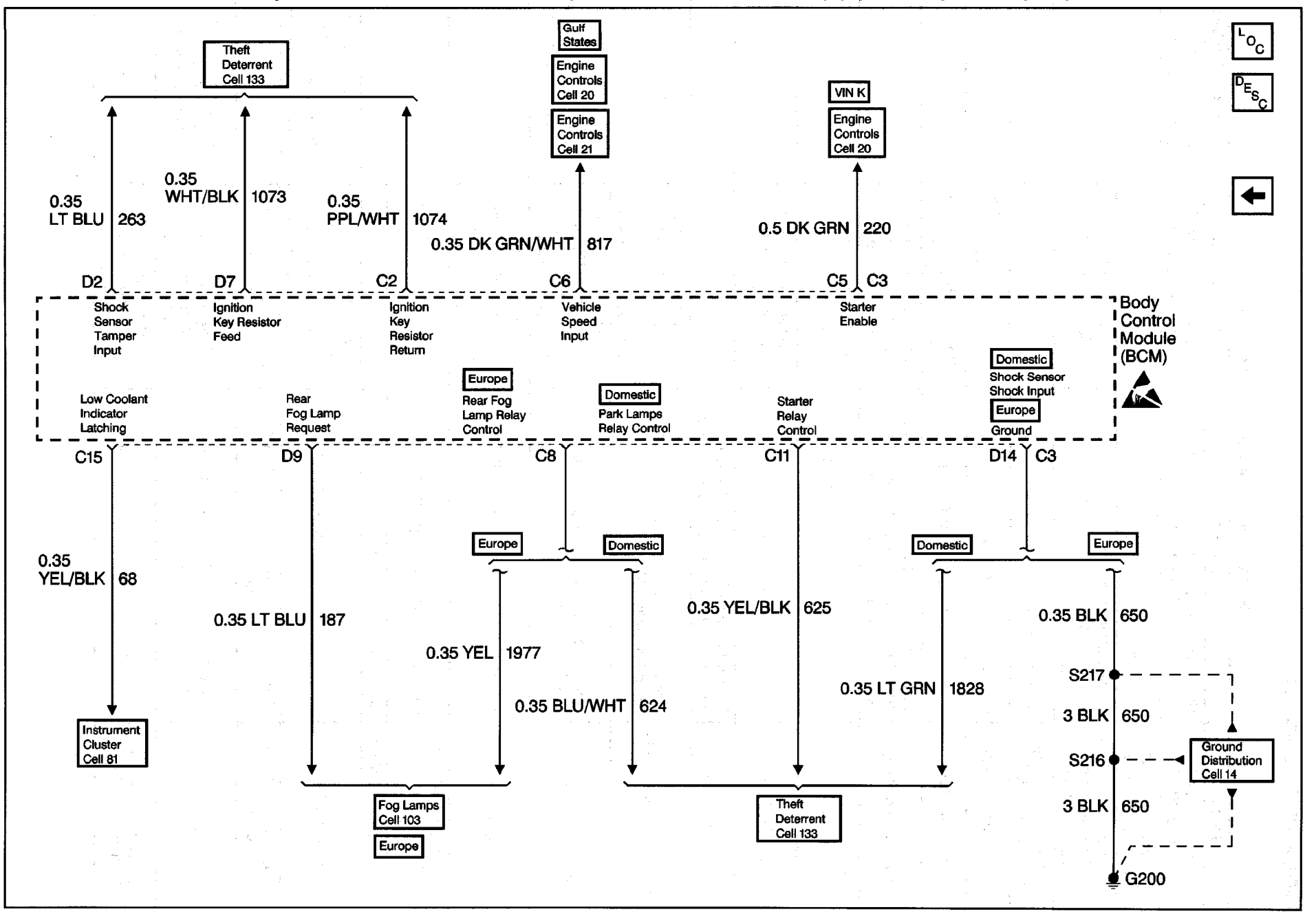
500484

Body Control Module Schematics (With Door Jamb Switches) (Interior Lamps)



500487

Body Control Module Schematics (With Door Jamb Switches) (System Inputs/Outputs)



500491

Component Locator

Body Control Module Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views*	*Body Control Module Connector End Views*
Courtesy Lamp, Left Rear (Convertible)	Mounted in the left sail panel	—	—
Courtesy Lamp, Rear Compartment (Convertible)	In the center of the rear compartment, near the rear compartment lid release actuator	*Power Roof Systems Component Views* in Roof	—
Courtesy Lamp, Right Rear (Convertible)	Mounted in the right sail panel	—	—
Dome Lamp (Coupe)	On the roof, near the hatch	*Harness Routing Views* in WIring Systems	—
Door Jamb Switch	Near base of left and right A-pillar	*Harness Routing Views* in Wiring Systems	—
Folding Top Relay	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Folding Top Switch	On the left side of the upper console	*Power Roof Systems Connector End Views* in Roof	—
Front Side Door Lock	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Fusible Links	Forward of the left front wheelhouse, behind the underhood electrical center 2	—	—
IP Compartment Lamp	Inside the top center of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
IP Dimmer Switch	Left of the steering wheel, part of the headlamp switch	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Inflatable Restraint Steering Wheel Module Coil	On the top of the steering column	*SIR Component Views* in Restraints	—
Inside Rearview Mirror	Mounted to inside center of windsheild	—	—
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Instrument Cluster Connector End Views* in Instrument Panel, Gauges and Console
Power Window Control Module	Mounted to the center of the dash mat, above the floor tunnel	*Harness Routing Views* in Wiring Systems	—
Radio	In the center of the instrument panel, below the HVAC control	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Entertainment Connector End Views* in Entertainment
Rear Compartment Lid Ajar Indication Switch	Part of the rear compartment lid latch	*Body Rear End Component Views* in Body Rear End	—

Body Control Module Components (cont'd)

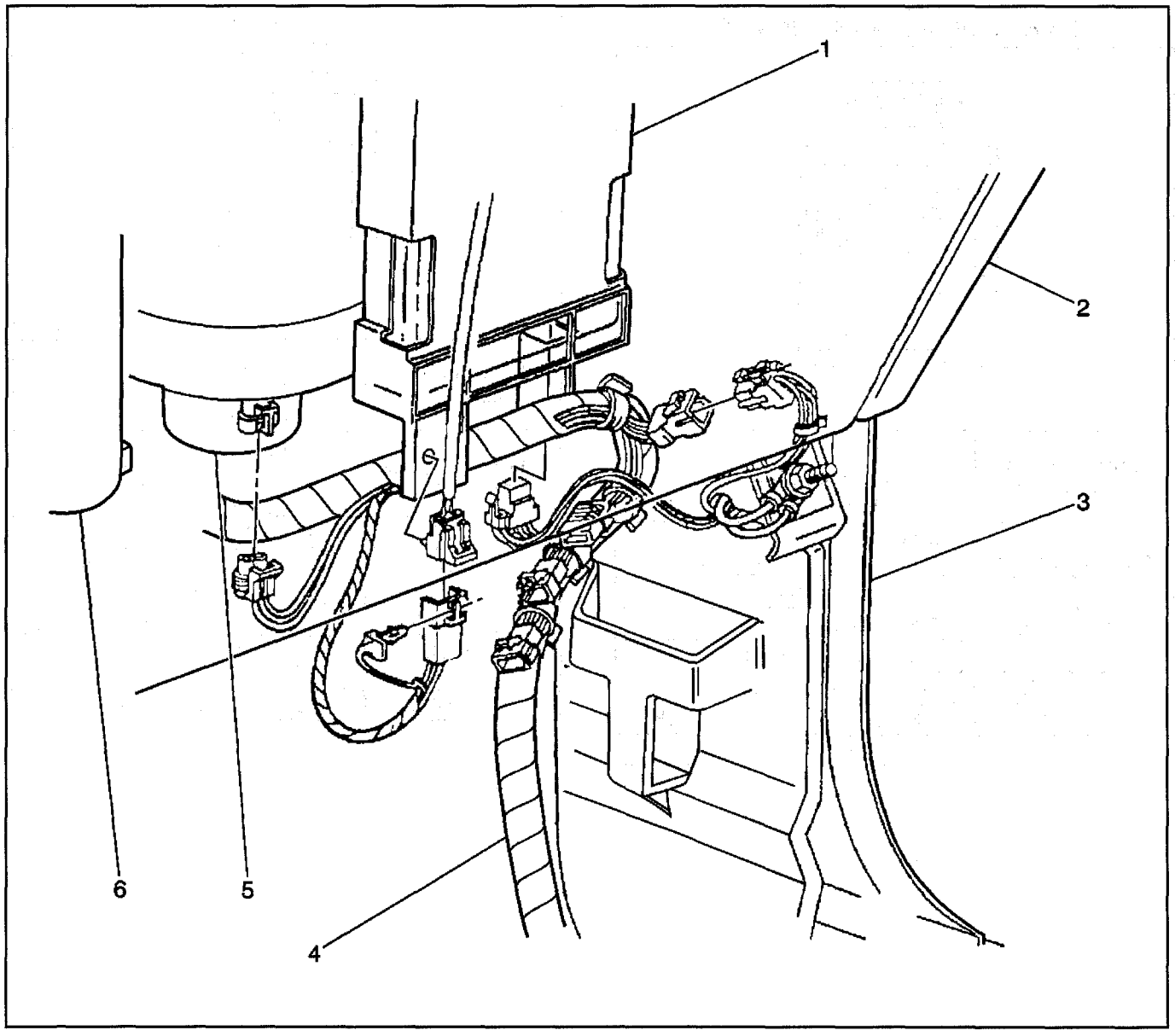
Name	Location	Locator View	Connector End View
Rear Foglamp Relay (Export)	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	—	—
Seat Belt Switch	Part of the driver seat buckle assembly	*Harness Routing Views* in Wiring Systems	*Audible Warnings Connector End Views* in Instrument Panel, Gauges and Console
Security Indicator L.E.D.	On the top center of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Side Window Switch	Mounted in the door arm rest	*Power Door Systems Component Views* in Doors	—
Steering Wheel Controls	On the steering wheel	*Entertainment Component Views* in Entertainment	—
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in WIring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C217 (4 cavities)	Instrument panel to inflatable restraint steering wheel module coil harness, near the base of the steering column	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S206	In the instrument panel harness, at the rear compartment lid release relay breakout	—	—
S208	In the cross car harness, main branch, approximately 26 cm (10 in) from the power window control module breakout	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—

Body Control Module Components (cont'd)

Name	Location	Locator View	Connector End View
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S218	In the instrument panel harness, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S222	instrument panel harness, approximately 6 cm from G202 breakout, in the inflatable restraint sensing and diagnostic module (SDM) branch	—	—
S241	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the antenna cable breakout	—	—
S246	In the instrument panel harness, main branch, approximately 3 cm (1.2 in) from the antenna cable breakout	—	—
S247	Instrument panel harness, approximately 16 cm (6 in) from G200 breakout	—	—
S253 (Convertible)	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S254	In the instrument panel harness, approximately 7 cm (3 in) from C200 breakout	—	—
S317 (Convertible)	Instrument panel harness, main branch, approximately 40 cm (16 in) (from left rear courtesy lamp breakout)	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—

Body Control Module Component Views

Behind Lower Right Side of the Instrument Panel



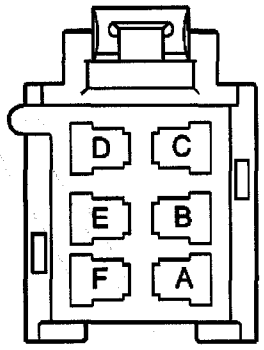
483507

Legend

(1) Body Control Module (BCM)
(2) Instrument Panel (IP)
(3) Right A Pillar
(4) Instrument Panel Wiring Harness
(5) Blower Motor
(6) HVAC Module

Body Control Module Connector End Views

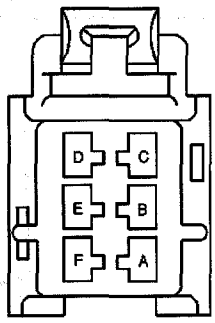
Body Control Module (BCM) C1



62480

Connector Part Information	• 1208-9527 • 6 Way F Metri-Pack 280 Series (GRN)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	TAN	694	Driver door unlock
B	GRY	295	Lock all output
C	RED/BLK	780	Lock all input
D	ORN/BLK	781	Unlock all input
E	GRY/BLK	1663	Passenger door unlock
F	—	—	Not used

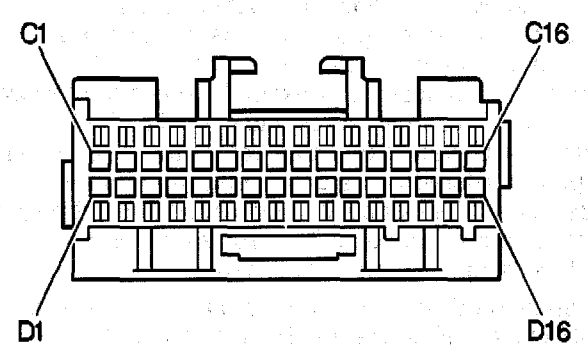
Body Control Module (BCM) C2



62456

Connector Part Information	• 1206-4752 • 6 Way F Metri-Pack 280 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	650	Ground
B	ORN	40	Battery positive voltage
C	DK BLU	75	Retained accessory power (RAP)
D	BRN	4	Accessory positive voltage
E	DK BLU/ WHT	149	Courtesy lamps feed
F	RED	102	Battery positive voltage

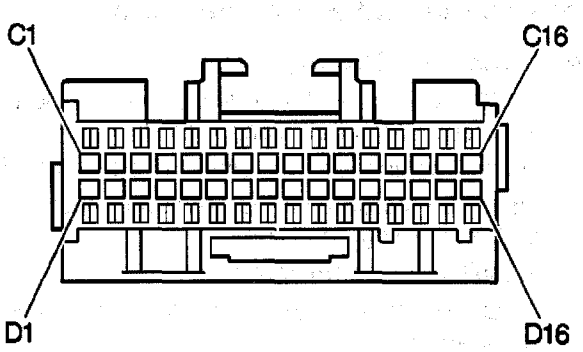
Body Control Module (BCM) C3



73157

Connector Part Information	• 1211-0207 • 32 Way F Metri-Pack 100 Series (BLU)		
Pin	**Wire Color**	**Circuit No.**	**Function**
C1	BLK	650	Ground
C2	PPL/WHT	1074	Ignition key resistor return
C3	—	—	Not used
C4	PPL/WHT	237	Fasten seat belt indicator control
C5	DK GRN	220	Starter enable (V6 VIN K)
C6	DK GRN/ WHT	817	Vehicle speed input (Gulf States)
C7	GRY	157	Interior lamps command input
C8	BLU/WHT	624	Park lamps relay control (Domestic)
C8	YEL	1977	Rear fog lamp relay control (Europe)
C9	BLK	BLK	Horn relay control
C10	—	—	Not used
C11	YEL/BLK	625	Starter relay control
C12	GRY	728	Security indicator lamp control
C13	BLK/WHT	238	Seat belt switch signal
C14	LT GRN	80	Ignition key signal
C15	YEL/BLK	68	Low coolant indicator latching
C16	—	—	Not used

Body Control Module (BCM) C3 (cont'd)



73157

Connector Part Information	• 1211-0207 • 32 Way F Metri-Pack 100 Series (BLU)		
Pin	**Wire Color**	**Circuit No.**	**Function**
D1	WHT	156	Courtesy lamps return
D2	LT BLU	263	Shock sensor tamper input
D3	BLK/WHT	1576	Rear compartment lid release signal
D4	BRN	253	Rear compartment lid release relay control
D5	PNK	39	Ignition positive voltage
D6	YEL	49	Program input
D7	WHT/BLK	1037	Ignition key resistor feed
D8	DK BLU	229	Fuel enable
D9	LT BLU	187	Rear fog lamp request (Europe)
D10	—	—	Not used
D11	GRY/BLK	745	Driver door open input
D12	BLK/WHT	746	Passenger door input
D13	ORN/BLK	737	Rear compartment lid ajar input
D14	LT GRN	1828	Shock sensor shock input (Domestic)
D14	BLK	650	Ground (Europe)
D15	BRN	9	Park lamps feed
D16	—	—	Not used

Diagnostic Information and Procedures

Intermittents and Poor Connections

Intermittent and History DTCs

History DTCs are codes that indicate that the BCM detected a fault which has disappeared.

Any DTC that begins with the digit 3 is a history DTC.

The fault will be stored as a history code under either of the following conditions:

- The fault is an intermittent failure.
- The fault exists in a system which is not currently being operated.

If you cannot determine the cause of the failure through visual inspection, complete the following steps:

1. Connect a DVM to the suspected circuit.
2. Drive the vehicle.
3. Observe the readings. An abnormal voltage or resistance reading when the failure occurs indicates that the condition may be in the suspected circuit.

Diagnostic Trouble Code (DTC) Displaying

Entry Into Diagnostics

If a malfunction occurs in a system monitored by the BCM, the BCM stores a diagnostic trouble code (DTC) in memory. DTCs are stored by the BCM as either current or history codes. A current DTC means that the fault was present when the diagnostic mode was entered. A history DTC means the fault occurred sometime after the DTCs were last cleared from the BCM memory. History codes are displayed even though the fault is not currently present. If a current DTC is stored the corresponding history code will always be stored. In the diagnostic mode the BCM displays any DTCs stored in memory. The DTCs are displayed as flash codes through the security indicator lamp on the instrument cluster (IPC). When working on any system controlled by the BCM the technician should always refer to this section and check for DTCs.

Perform the following steps to enter the BCM diagnostic mode:

- Turn the ignition switch to the RUN position.
- Turn the ignition switch to the OFF position.
- Remove the Radio fuse 17 from the I/P fuse block.
- Turn the ignition switch to the ACCY position (the BCM sounds 1 or 2 audible warning tones).
- Within five seconds, turn the ignition switch to the OFF position and immediately (within 1 second) back to the ACCY position (the BCM sounds three audible warning tones to signal entry into the diagnostic mode).

The BCM will begin flashing trouble codes four seconds after entering the diagnostic mode. Each flash of the security indicator lamp on the IPC represents a number. For example, one flash followed by two quick flashes represents code 12. Each code is displayed three times before the next code is displayed. Stored DTCs are displayed in numerical order. Once the last code is displayed, the list begins again with the first code. The display continues until the diagnostic mode is exited.

When in the diagnostic mode, a change at certain BCM inputs will cause the BCM to respond to the change. For example, if either door lock switch is pressed the BCM will flash the fasten seatbelt indicator on the IPC and sound an audible warning tone. The BCM will also attempt to perform the operation normally performed by the switch operation. In this case, as long as the system is functioning properly, the BCM will lock the doors. This is an easy way for the technician to test the door lock actuators, switches and associated wiring without removing the door trim or components.

The BCM will also respond to a change at either shock sensor input. The tamper input is activated by minor blows to the vehicle. The shock input is activated by heavy blows. In the diagnostic mode either will cause the BCM to activate the horn relay and the horns will sound. The BCM will also flash the fasten seatbelt indicator on the IPC and sound an audible warning tone. An effective method of checking the shock sensor and associated wiring is to tap on the shock sensor while in the diagnostic mode.

Switching the interior lamps switch on and off while in the diagnostic mode will cause the BCM to flash the fasten seatbelt indicator on the IPC, sound an audible warning tone, and flash the courtesy lamps. On vehicles equipped with theft deterrent, each transition of the interior lamps command input will cause the BCM to step to next action in the following list:

1. Courtesy lamps flash
2. Horns sound
3. Exterior lights flash

DTC Display Order

In the diagnostic mode, diagnostic trouble codes (DTCs) are displayed in the following order:

1. DTC 12
2. Any current DTCs (DTC 21-DTC 25) or any history DTCs (DTC 31-DTC 35)
3. The remote control door lock transmitter diagnostic DTCs (DTC 41-DTC 45)

   These DTCs will display if they are evoked while in the diagnostic mode.

4. The begin configuration display (DTC 55). DTC 55 and 2 configuration numbers are always displayed. The first number following DTC 55 is the hardware configuration. The second number is the software configuration.
5. After the configuration numbers are displayed, the entire list is repeated beginning with DTC 12.

DTC 12 is always set and displayed when the body control module (BCM) is in the diagnostic mode. DTC 12 indicates that the diagnostic function is in progress. DTC 55 is also always displayed.

If DTC 12 and DTC 55 are displayed when the BCM is in the diagnostic mode, and no other DTCs are displayed, the BCM is operating properly.

If DTC 12 and DTC 55 are not displayed when the BCM is in the diagnostic mode, refer to *DTC 12 Diagnostic System Check.*

If any other DTCs are displayed, refer to *Diagnostic Trouble Code (DTC) List/Type.*

System faults are stored as current or history DTCs. When working on systems controlled by the body control module, always refer to this section and test for DTCs.

Intermittent and History DTCs

History DTCs are codes that indicate that the BCM detected a fault which has disappeared.

Any DTC that begins with the digit 3 is a history DTC. The fault will be stored as a history code under either of the following conditions:

- The fault is an intermittent failure.
- The fault exists in a system which is not currently being operated.

If you cannot determine the cause of the failure through visual inspection, complete the following steps:

1. Connect a DVM to the suspected circuit.
2. Drive the vehicle.
3. Observe the readings. An abnormal voltage or resistance reading when the failure occurs indicates that the condition may be in the suspected circuit.

Clearing DTCs

Clearing BCM DTCs

Current DTCs (21 to 25) remain stored by the body control module (BCM) and are displayed in the diagnostic mode as long as the BCM detects the fault. Once the fault is corrected, the current DTCs are cleared by the BCM. To clear history DTCs (31 to 35) press and hold the door unlock switch for four seconds while the BCM is in the diagnostic mode. The BCM will sound three audible warning tones to confirm that the DTCs are cleared.

To clear BCM history DTCs on vehicles without power door locks, backprobe with a fused jumper from BCM connector C1 terminal D to ground for four seconds. The BCM will sound three audible warning tones to confirm that the history DTCs have been cleared.

Diagnostic Trouble Code (DTC) List/Type

DTC	Description
12	*DTC 12 Diagnostic System Check*
21/31	*DTC 21/31 Courtesy Lamps Feed Shorted to Ground*
22/32	• *DTC 22/32 Courtesy Lamps Return Shorted to Battery (Coupe)* • *DTC 22/32 Courtesy Lamps Return Shorted to Battery (Convertible)*
23/33	*DTC 23/33 RAP Feed Shorted to Ground or Battery*
24/34	*DTC 24/34 Seatbelt Indicator Shorted to Ground or Battery*
25/35	*DTC 25/35 Security Indicator Status*
41	*DTC 41 Last Message Received Valid*
42	*DTC 42 Last Message Received Invalid*
43	*DTC 43 Last Message Received with Sumcheck Error*
44	*DTC 44 Last Message Received with Encryption Error*
45	*DTC 45 Receiver Processing in 20 Second Lockout*
55	*DTC 55 Begin Configuration Display*

DTC 12 Diagnostic System Check

Circuit Description

Voltage is applied at all times from the POWER ACCY Fuse 7 through circuit 640 to the SECURITY indicator lamp on the instrument cluster.

Ground is applied by the body control module (BCM) through circuit 728 to the SECURITY indicator lamp when the ignition switch is in the RUN or BULB TEST position.

When the ignition switch is turned to the RUN or BULB TEST position, the SECURITY indicator lamp illuminates for approximately 5 seconds in order to verify the circuit operation.

The BCM also uses the SECURITY indicator lamp in order to display the DTC flash codes by grounding CKT 728.

Conditions for Setting the DTC

DTC 12 is always set and displayed when the body control module (BCM) is in the diagnostic mode. DTC 12 indicates that the diagnostic function is in progress. If DTC 12 does not display when the BCM is in the diagnostic mode, refer to the following diagnostic chart.

Test Description

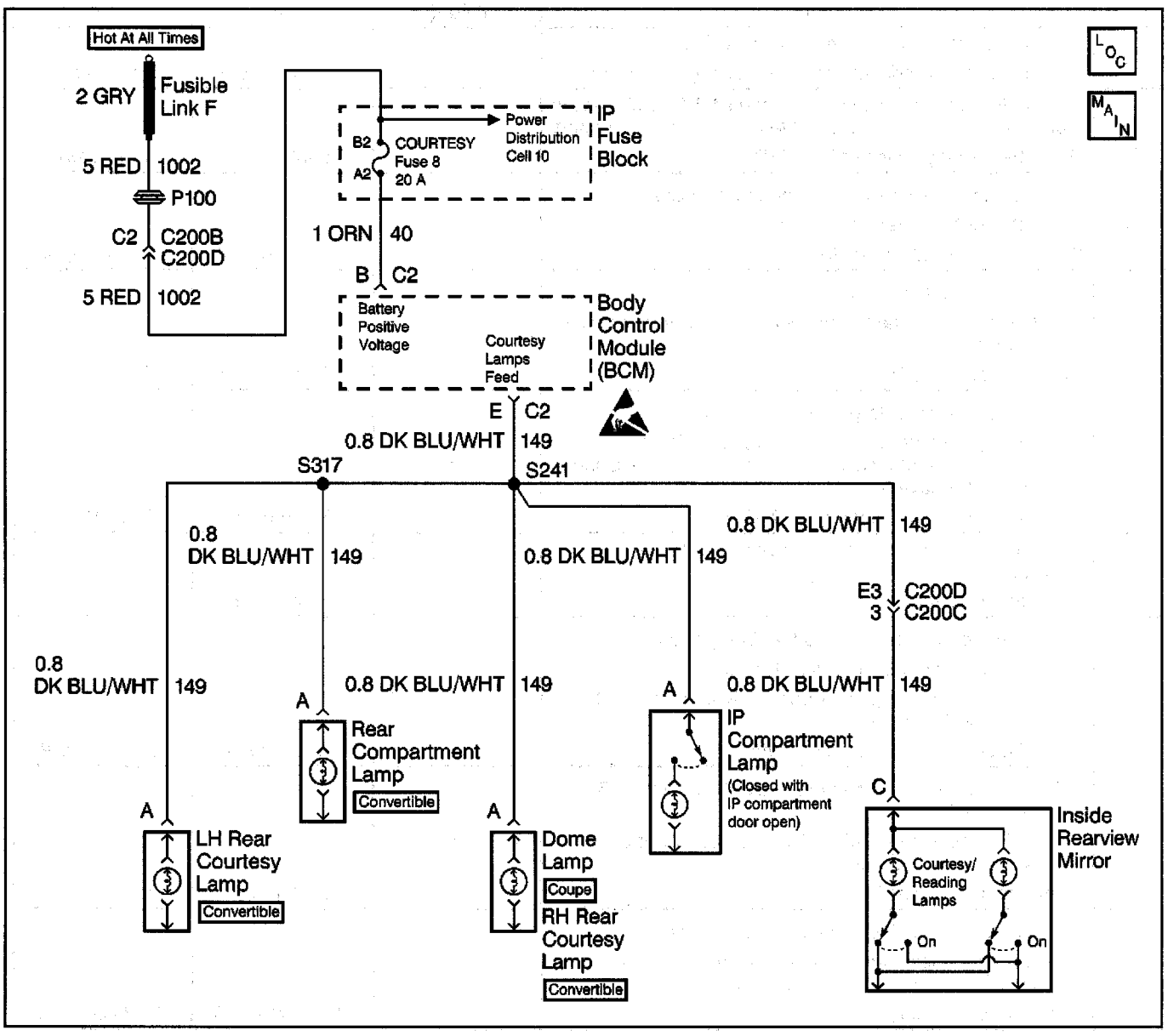
The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the SECURITY indicator lamp operation at the BULB TEST.
2. This step tests the BCM operation in the diagnostic mode.
3. This step tests the BCM output to the retained accessory power (RAP) components.
4. This step tests circuit 75 for a short to ground.
5. This step tests the BCM operation in the diagnostic mode after the repair to circuit 75.
7. If the SECURITY indicator lamp does not illuminate, this step determines if the fault is in the BCM or the SECURITY indicator circuit.
8. This step tests for a poor connection at the BCM.
9. This step tests for an open in circuit 640.
10. This step tests for an open in circuit 728.

DTC 12 Diagnostic System Check

Step	Action	Value(s)	Yes	No
1	Turn the ignition switch to the RUN position. Does the security indicator illuminate during BULB TEST?	—	*Go to Step 2*	*Go to Step 3*
2	Attempt to enter the body control module (BCM) diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying.* Does the security indicator flash DTCs?	—	System OK	*Go to Step 3*
3	1. Turn the ignition switch to the RUN position. 2. Attempt to operate the power windows. Do the power windows work?	—	*Go to Step 7*	*Go to Step 4*
4	1. Disconnect the BCM connector C2. 2. Connect a test lamp from connector C2 terminal C to ground. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 6*
5	1. Repair the short to ground in circuit 75. 2. Attempt to enter the body control module (BCM) diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying.* Does the security indicator flash DTCs?	—	System OK	*Go to Step 6*
6	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
7	1. Turn the ignition switch to the OFF position. 2. Disconnect the BCM connector C3. 3. Connect a fused jumper from BCM connector C3 terminal C12 to ground. Does the security indicator illuminate?	—	*Go to Step 8*	*Go to Step 9*
8	1. Test for a poor connection at BCM connector C3 terminal C12. 2. If OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
9	1. Disconnect the instrument cluster connector. 2. Connect a test lamp from the instrument cluster connector terminal A13 to ground. Does the test lamp light?	—	*Go to Step 10*	*Go to Step 11*
10	1. Test for an open or poor connection in circuit 728, between the BCM and the instrument cluster. 2. If OK, replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—
11	Repair the open in circuit 640, between the instrument cluster and S211. Is the repair complete?	—	System OK	—

DTC 21/31 Courtesy Lamps Feed Shorted to Ground



361763

Circuit Description

The body control module (BCM) provides a 12 volt output to the courtesy lamps on CKT 149 through S241 when the BCM is in the awake state. Ground is applied to the courtesy lamps by the BCM through CKT 156 when commanded by one of the following components:

- The instrument panel (IP) dimmer switch
- The right or left side door lock
- The right or left door jamb switch
- The rear compartment lid ajar indication switch

S241 distributes power to the following lamps on the coupe model:

- The dome lamp
- The courtesy/reading lamp

S241 distributes power to the following lamps on the convertible model:

- S317 (the left rear courtesy lamp and the rear compartment lamp)
- The right rear courtesy lamp
- The IP compartment lamp
- The courtesy/reading lamps

Conditions for Setting the DTC

- CKT 40/1002 is open due to defective Courtesy Fuse 8.
- There is a harness or connector failure.
- CKT 149 (courtesy lamps feed) is shorted to the ground for greater than 50 milliseconds while the BCM is attempting to power the circuit.
- The BCM is defective.

Action Taken When the DTC Sets

- DTC 21 will set.
- There is no courtesy lighting in the vehicle.
- The IP dimmer switch is inoperative.
- The IP compartment lamp is inoperative.
- The BCM will read out a series of flash DTCs upon entering diagnostic mode.

Conditions for Clearing the DTC

The fault is corrected and the DTC memory is cleared.

Diagnostic Aids

If the only DTC that flashes is a history code (DTC 31), the problem may be intermittent. Try performing the test shown while wiggling the wiring and the connectors. This action can often cause the fault to appear. Test for poor connections at the BCM connector. Poor connections may cause an open or an intermittent fault. Refer to *Diagnostic Trouble Code (DTC) Displaying*

Test Description

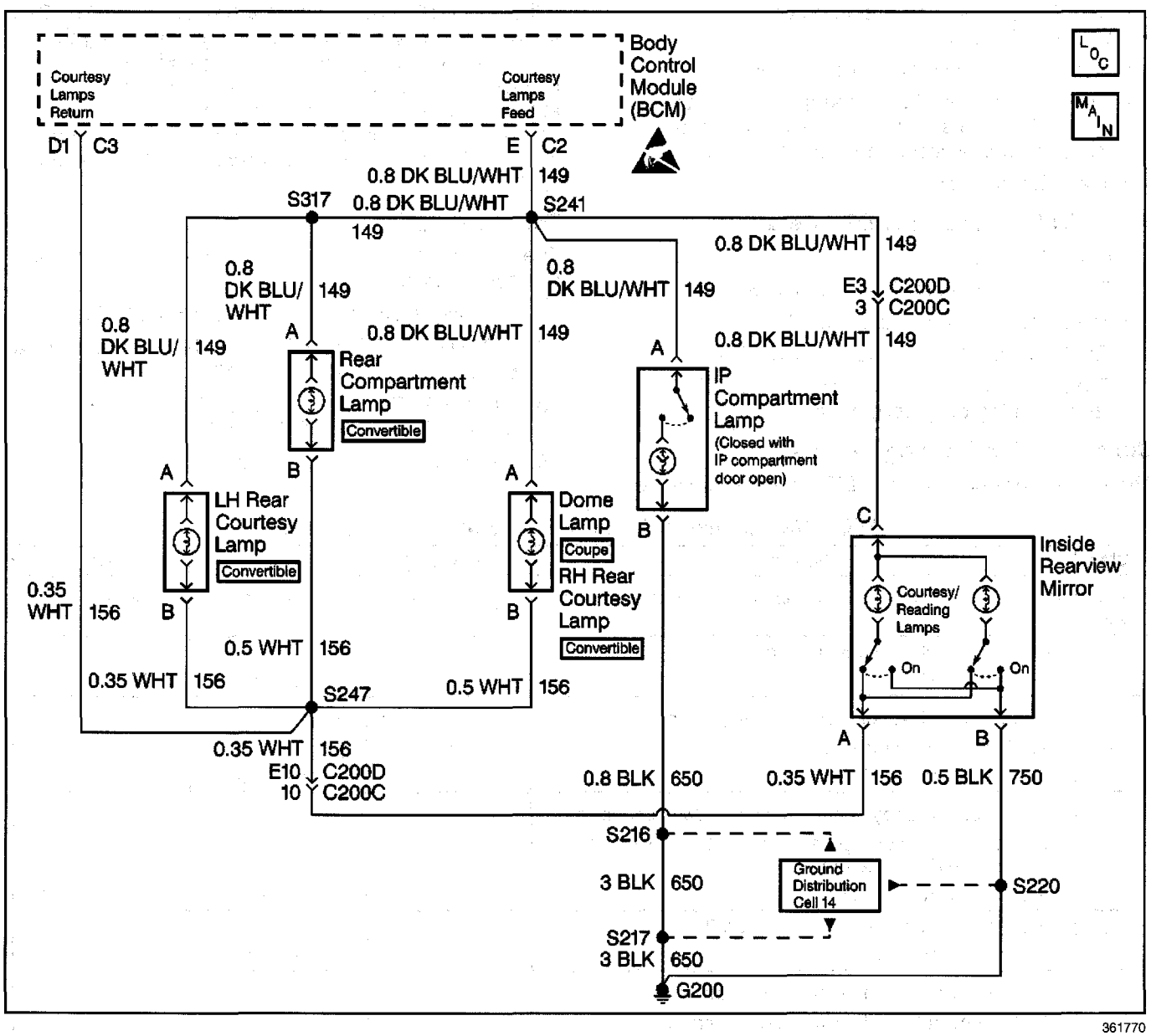
The numbers below refer to the step numbers on the diagnostic table.

1. This step tests for an open COURTESY Fuse 8.
2. If COURTESY Fuse 8 is open, this step tests for a short to the ground on CKT 40.
3. If COURTESY Fuse 8 is OK, this step tests for an open in CKT 40 and CKT 1002.
5. This step tests for a short to the ground in CKT 149.

DTC 21/31 Courtesy Lamps Feed Shorted to Ground

Step	Action	Value(s)	Yes	No
Important: Inspect for the proper installation of aftermarket electronic equipment which may affect the integrity of the system.				
1	Test COURTESY Fuse 8 for an open. Is Fuse 8 open?	—	*Go to Step 2*	*Go to Step 3*
2	1. Check CKT 40 for a short to the ground. 2. If OK, replace Fuse 8. Is the repair complete?	—	System OK	—
3	1. Disconnect body control module (BCM) connector C2. 2. Connect a test lamp between BCM connector C2 terminal B and the ground. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 4*
4	Repair the open in CKT 40 or CKT 1002. Is the repair complete?	—	System OK	—
5	1. Close the instrument panel compartment. 2. Connect a DMM between BCM connector C2 terminal E and ground. Does the meter read the specified value?	0 Ω	*Go to Step 6*	*Go to Step 7*
6	Repair a short to the ground in CKT 149. Is the repair complete?	—	System OK	—
7	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

DTC 22/32 Courtesy Lamps Return Shorted to Battery (Coupe)



Circuit Description

The following inputs command the body control module (BCM) to provide a ground path to the courtesy lamps on CKT 156 to S247:

- The instrument panel (IP) dimmer switch input
- The right or left side door lock input
- The right or left door jamb switch input
- The rear compartment lid ajar indication switch input

S247 distributes the ground to the following components:

- The dome lamp
- The courtesy/reading lamps

Conditions for Setting the DTC

Circuit 156 (courtesy lamps return) is shorted to B+ for greater than 50 milliseconds, while the BCM is attempting to ground the circuit. The BCM grounds circuit 156 if one of the following actions occurs:

- Either door is opened.
- The rear compartment lid is opened.
- The IP dimmer switch is turned on.

Action Taken When the DTC Sets

- DTC 22 will set.
- There is no courtesy lighting in the vehicle.
- The IP dimmer switch is inoperative.
- The IP compartment lamp operates normally.
- The BCM will read out a series of flash codes upon entering the diagnostic mode.

Conditions for Clearing the DTC

The fault is corrected and the DTC memory is cleared.

Diagnostic Aids

If the only DTC that flashes is a HISTORY code (DTC 32), the problem may be intermittent. Perform the test shown while "wiggling" the wiring and connectors. This can often cause the fault to appear. Test for poor connections at the BCM connector, which could cause an open or an intermittent fault. Refer to *Diagnostic Trouble Code (DTC) Displaying*.

Test Description

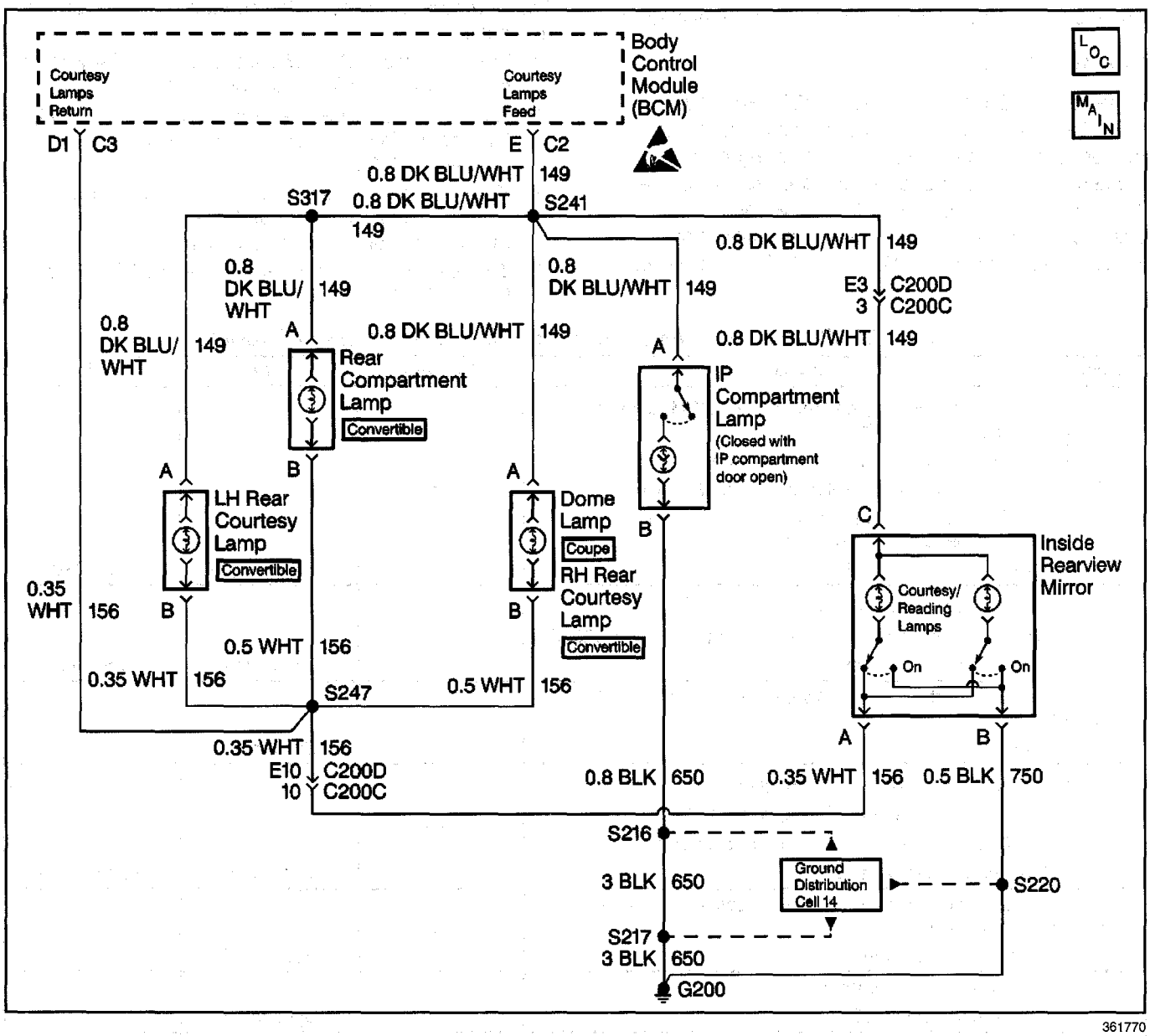
The numbers below refer to the step numbers on the diagnostic table.

1. This step tests CKT 156 for a short to B+ with the body control module disconnected.
2. Knowing that there is a short to B+ in CKT 156, this test isolates the short to one side of connector C200.
4. Knowing that the short is in the C200C side of CKT 156, this test isolates the short to either the harness or the rearview mirror.
7. This step tests for a short between CKT 156 and CKT 149.

DTC 22/32 Courtesy Lamps Return Shorted to Battery (Coupe)

Step	Action	Value(s)	Yes	No
1	1. Disconnect body control module (BCM) connector C2 and connector C3. 2. Close the instrument panel compartment. 3. Turn the ignition switch to the RUN position. 4. Connect a test lamp from BCM connector C3 terminal D1 to the ground. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 7*
2	1. Leave the test lamp connected. 2. Disconnect connector C200C from connector C200D. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 4*
3	Repair a short B+ in CKT 156, between C200D and the BCM. Is the repair complete?	—	System OK	—
4	1. Leave the test lamp connected. 2. Connect connector C200C to C200D. 3. Disconnect the rearview mirror connector. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 6*
5	Repair a short to B+ in CKT 156, between C200C and the rearview mirror. Is the repair complete?	—	System OK	—
6	Replace the rearview mirror. Is the repair complete?	—	System OK	—
7	1. Turn the rearview mirror courtesy/reading lamp switches to the ON position. 2. Remove the bulb from the dome lamp socket. 3. Using a DMM, test the resistance between BCM connector C2 terminal E and connector C3 terminal D1. Does the DMM read infinite resistance?	infinite	*Go to Step 8*	*Go to Step 9*
8	1. Inspect the lamp sockets for conditions which could cause the socket to short with the bulb installed. 2. Inspect exposed filament wires on the base of the bulbs for a shorted condition. 3. If OK, replace the BCM. Is the repair complete?	—	System OK	—
9	Repair a short in the harness, between CKT 156 and CKT 149. Is the repair complete?	—	System OK	—

DTC 22/32 Courtesy Lamps Return Shorted to Battery (Convertible)



Circuit Description

The following inputs command the body control module (BCM) to provide a ground path to the courtesy lamps through CKT 156 to S247:

- The instrument panel (IP) dimmer switch input
- The right or left side door lock input
- The right or left door jamb switch
- The rear compartment lid ajar indication switch

S247 distributes the ground to the following components:

- The right and left rear courtesy lamps
- The rear compartment lamp
- The courtesy/reading lamps

Conditions for Setting the DTC

CKT 156 (courtesy lamps return) is shorted to B+ for greater than 50 milliseconds, while the BCM is attempting to ground the circuit. The BCM grounds CKT 156 if one of the following actions occurs:

- Either door is opened.
- The rear compartment lid is opened.
- The IP dimmer switch is turned on.

Action Taken When the DTC Sets

- DTC 22 will set.
- There is no courtesy lighting in the vehicle.
- The IP dimmer switch is inoperative.
- The console compartment and the IP compartment lamps operate normally.
- The BCM will read out a series of flash codes upon entering the diagnostic mode.

Conditions for Clearing the DTC

The fault is corrected and the DTC memory is cleared.

Diagnostic Aids

If the only DTC that flashes is a HISTORY code (DTC 32), the problem may be intermittent. Perform the test shown while "wiggling" the wiring and connectors. This can often cause the fault to appear. Test for a poor connections at the BCM connector, which could cause an open or an intermittent fault. Refer to *Diagnostic Trouble Code (DTC) Displaying.*

Test Description

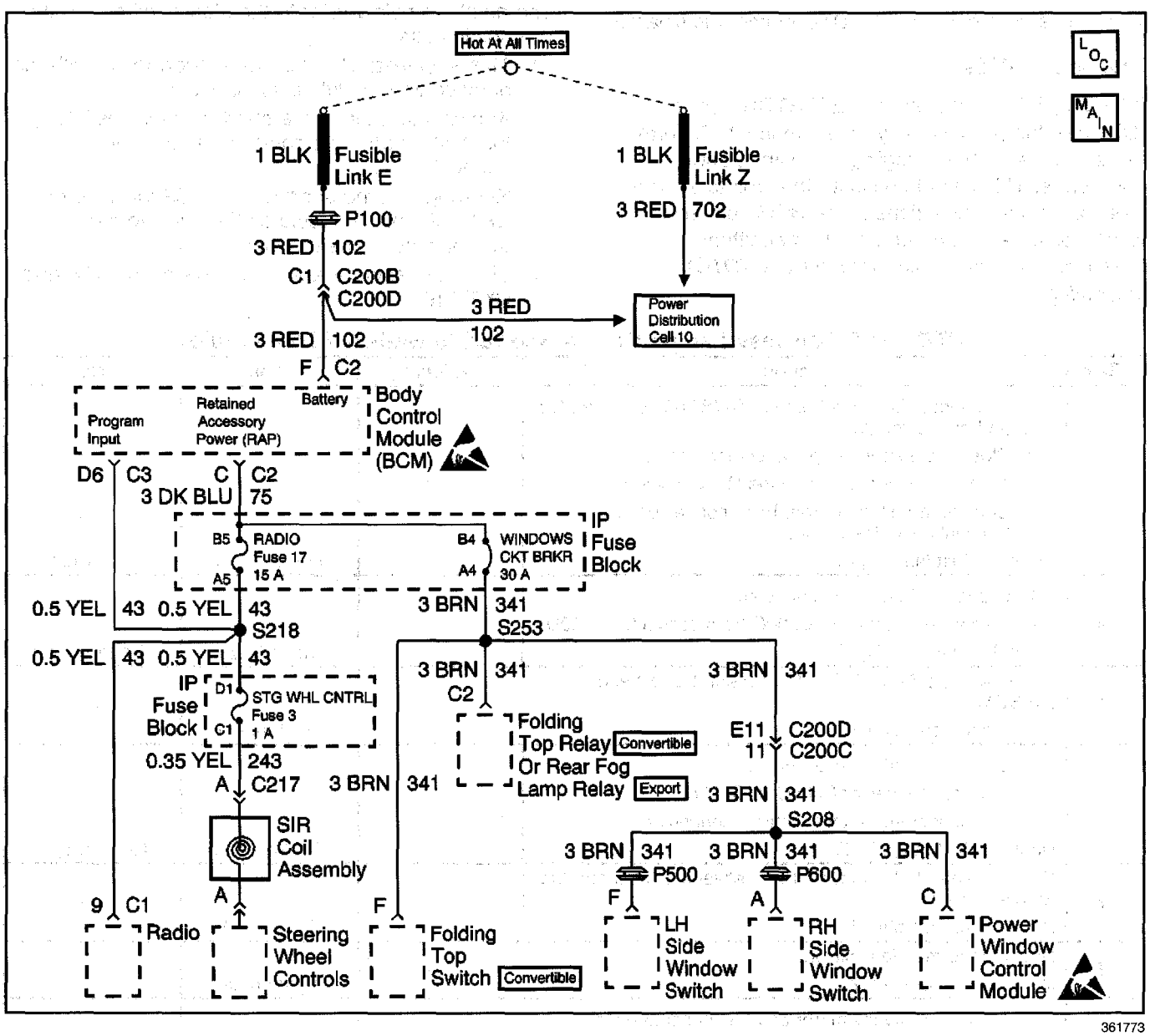
The numbers below refer to the step numbers on the diagnostic table.

1. This step tests CKT 156 for a short to B+ with the body control module disconnected.
2. Knowing that there is a short to B+ in CKT 156, this test isolates the short to one side of connector C200.
4. Knowing that the short is in the C200C side of CKT 156, this test isolates the short to either the harness or the rearview mirror.
7. This step tests for a short between CKT 156 and CKT 149.

DTC 22/32 Courtesy Lamps Return Shorted to Battery (Convertible)

Step	Action	Value(s)	Yes	No
1	1. Disconnect body control module (BCM) connector C2 and connector C3. 2. Close the instrument panel compartment. 3. Turn the ignition switch to the RUN position. 4. Connect a test lamp from BCM connector C3 terminal D1 to the ground. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 7*
2	1. Leave the test lamp connected. 2. Disconnect connector C200C from connector C200D. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 4*
3	Repair a short B+ in CKT 156, between C200D and the BCM. Is the repair complete?	—	System OK	—
4	1. Leave the test lamp connected. 2. Connect connector C200C to C200D. 3. Disconnect the rearview mirror connector. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 6*
5	Repair a short to B+ in CKT 156, between C200C and the rearview mirror. Is the repair complete?	—	System OK	—
6	Replace the rearview mirror. Is the repair complete?	—	System OK	—
7	1. Turn the rearview mirror courtesy/reading lamp switches to the ON position. 2. Remove the bulb from the following areas: • The left rear courtesy lamp socket • The right rear courtesy lamp socket • The rear compartment lamp socket • Using a DMM, test the resistance between BCM connector C2 terminal E and connector C3 terminal D1. Does the DMM read infinite resistance?	infinite	*Go to Step 8*	*Go to Step 9*
8	1. Inspect the lamp sockets for conditions which could cause the socket to short with the bulb installed. 2. Inspect exposed filament wires on the base of the bulbs for a shorted condition. 3. If OK, replace the BCM. Is the repair complete?	—	System OK	—
9	Repair a short in the harness, between CKT 156 and CKT 149. Is the repair complete?	—	System OK	—

DTC 23/33 RAP Feed Shorted to Ground or Battery



361773

Circuit Description

The body control module (BCM) retained accessory power (RAP) function is enabled when the ignition switch is turned to the RUN position. The RAP allows the operation of the following components for up to 10 minutes after the ignition switch is turned to the OFF position:

- The power windows
- The radio and steering wheel controls
- The folding top
- The rear fog lamps (export only)

The RAP is immediately disabled if any door is opened. The BCM provides the RAP function through circuit 75 to the following components:

- The WINDOWS circuit breaker
- RADIO Fuse 17

Conditions for Setting the DTC

- Circuit 75 is shorted to ground for more than 50 milliseconds while the RAP is enabled.
- Circuit 75 is shorted to B+ for more than 50 milliseconds while the RAP is disabled.
- Circuit 102 is open.

Action Taken When the DTC Sets

- The RAP feature will not function if circuit 75 is shorted to ground.
- The RAP feature will not deactivate when the door is opened if circuit 75 is shorted to B+.
- The BCM will read out a series of flash codes upon entering the diagnostic mode.

Conditions for Clearing the DTC

The fault is corrected and the DTC memory clearing procedure is completed.

Diagnostic Aids

If the only DTC that flashes is a HISTORY code (DTC 32), the problem may be intermittent. Perform the test shown while "wiggling" the wiring and connectors. This can often cause the fault to appear. Test for a poor connections at the BCM connector, which could cause an open or an intermittent fault. Refer to *Diagnostic Trouble Code (DTC) Displaying*.

Test Description

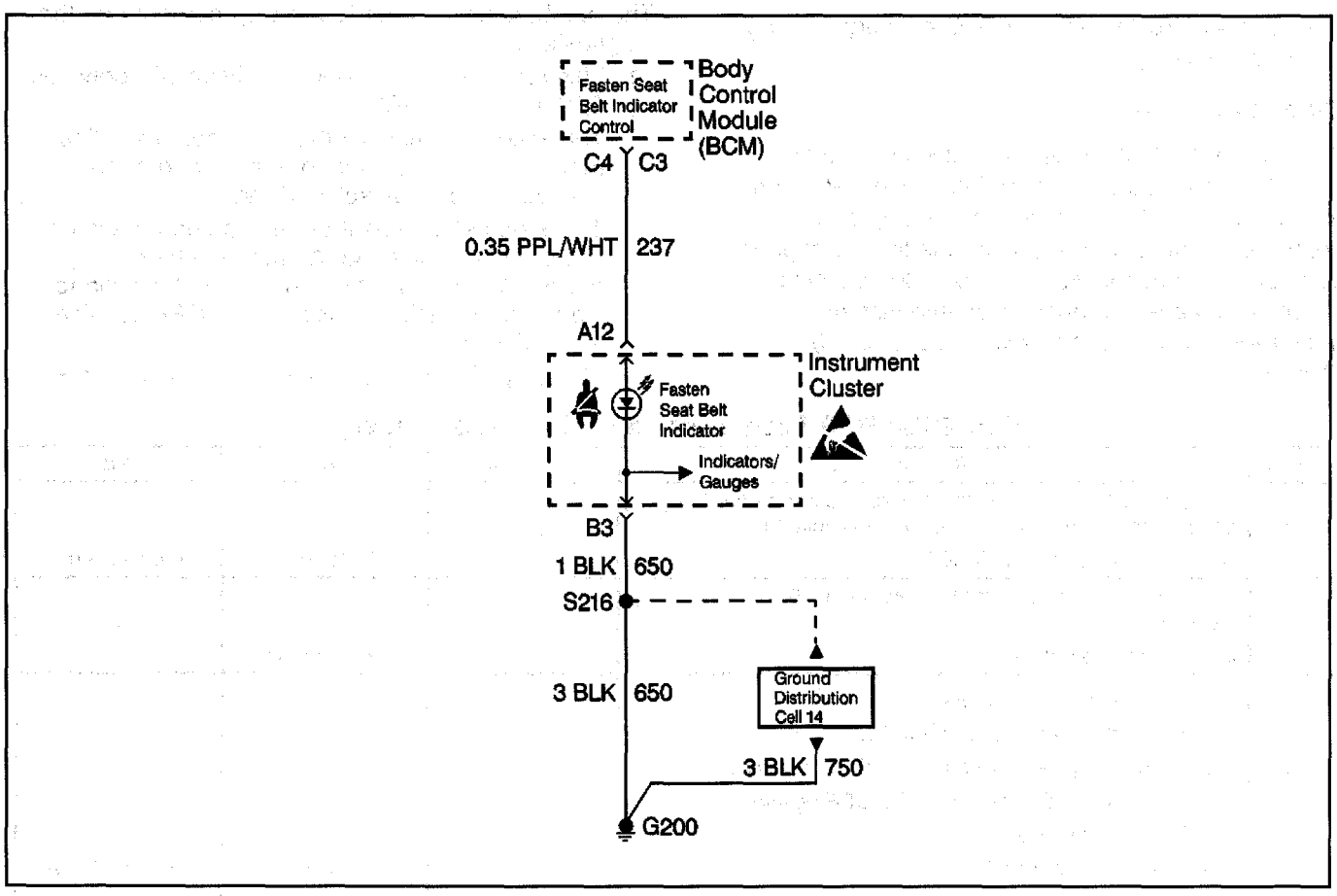
The numbers below refer to the step numbers on the diagnostic table.

1. This step tests for an open in circuit 102 between C200D and the BCM.
3. This step determines if the radio operates. The radio may not work due to a short to ground in circuit 75 or a defective BCM.
4. This step determines if there is a short in either circuit 43 or circuit 243. A short in either circuit 43 or circuit 243 would allow the radio to play with the ignition switch in the OFF position and a door open.
6. This step determines circuit 341 is shorted to B+.

DTC 23/33 RAP Feed Shorted to Ground or Battery

Step	Action	Value(s)	Yes	No
1	Using a DMM connected to ground, backprobe the body control module (BCM) connector C2 terminal F. Does the meter read 12 VDC?	12 VDC	*Go to Step 3*	*Go to Step 2*
2	Repair the open in circuit 102 between C200D and the BCM. Is the repair complete?	—	System OK	—
3	1. Close the vehicle doors. 2. Close the rear compartment lid. 3. Turn the ignition switch to the RUN position. 4. Turn the ignition switch to the OFF position. 5. Turn the radio on. Does the radio operate?	—	*Go to Step 4*	*Go to Step 9*
4	1. Open the driver door. 2. Remove the Radio Fuse 17. Does the radio operate?	—	*Go to Step 5*	*Go to Step 6*
5	Repair the short to B+ in circuit 43/243. Is the repair complete?	—	System OK	—
6	1. Remove the windows circuit breaker. 2. Attempt to operate either power window. Does the power window operate?	—	*Go to Step 7*	*Go to Step 8*
7	Repair the short to B+ in circuit 341. Is the repair complete?	—	System OK	—
8	1. Check for a short to B+ in circuit 75. 2. If circuit 75 is OK, replace the BCM. Refer to *Body Control Module Replacement*. Is the repair complete?	—	System OK	—
9	1. Check for a short to ground in circuit 75. 2. If circuit 75 is OK, replace the BCM. Refer to *Body Control Module Replacement*. Is the repair complete?	—	System OK	—

DTC 24/34 Seatbelt Indicator Shorted to Ground or Battery



488660

Circuit Description

The body control module (BCM) provides a 12 volt output to the FASTEN SEATBELT indicator lamp on the instrument cluster while the driver's seatbelt is unfastened.

Conditions for Setting the DTC

The FASTEN SEATBELT output has been detected by the BCM to be shorted to the ground, or shorted to B+ for greater than 50 milliseconds.

Action Taken When the DTC Sets

The FASTEN SEATBELT indicator lamp does not illuminate when the following conditions exist:

- The ignition is in the ON position.
- The driver side seatbelt is not fastened.

Conditions for Clearing the DTC

The fault is corrected and the DTC memory clearing procedure is completed.

Diagnostic Aids

If the only DTC that flashes is a HISTORY code (DTC 34), the problem may be intermittent. Perform the test shown while "wiggling" the wiring and connectors. This can often cause the fault to appear. Test for a poor connections at the BCM connector, which could cause an open or an intermittent fault. Refer to *Diagnostic Trouble Code (DTC) Displaying*.

Test Description

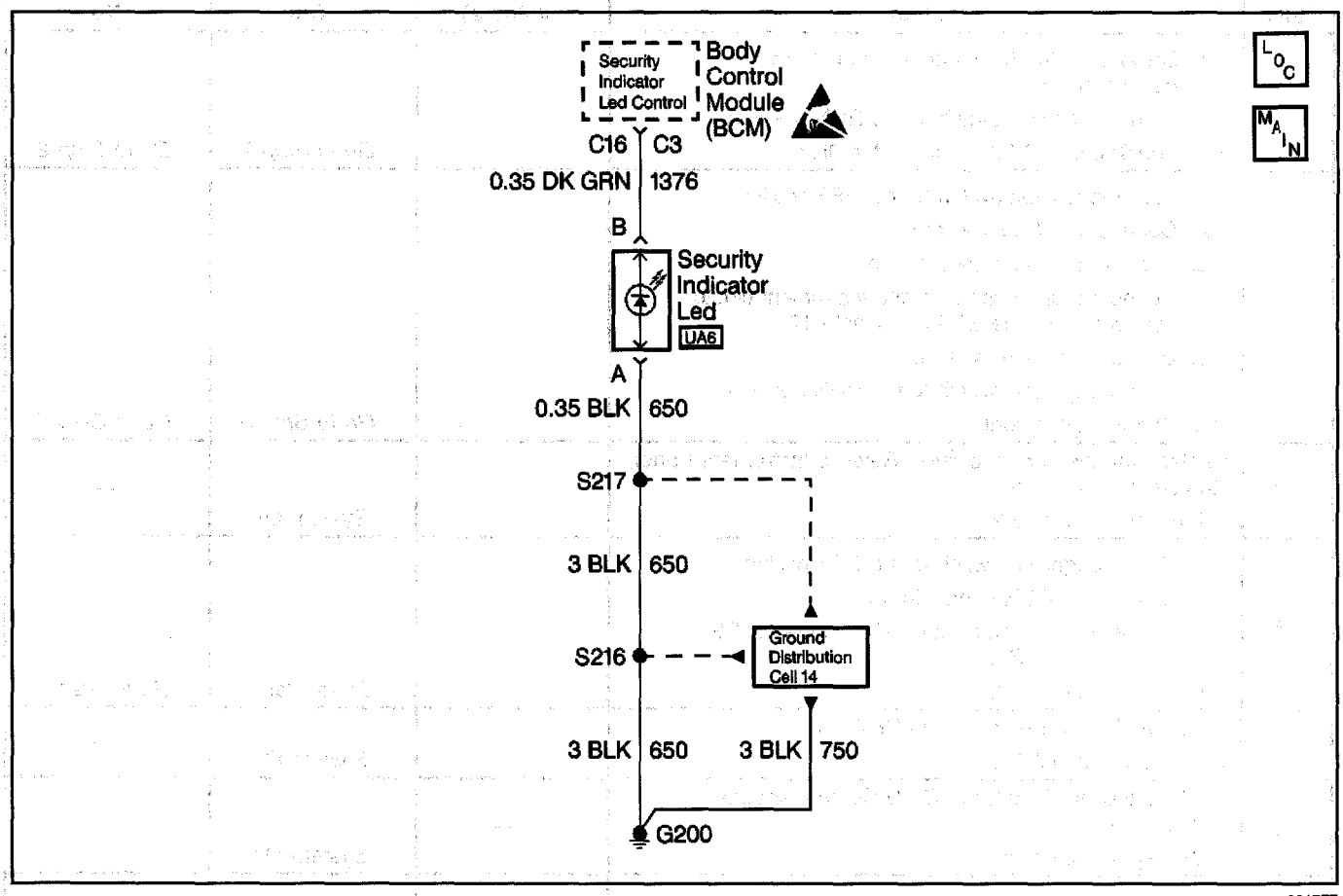
The number(s) below refer to the step number(s) on the diagnostic table.

1. This step tests the FASTEN SEATBELT indicator for operation with the body control module (BCM) disconnected, which would reveal a short to B+ in CKT 237.
2. This step determines if there is a short to the ground in the instrument cluster.
4. If the instrument cluster is OK, this step determines if CKT 237 is shorted to the ground or if the BCM is defective.
7. If there is a short to B+, this step determines if the short is in the instrument cluster or in CKT 237.

DTC 24/34 Seatbelt Indicator Shorted to Ground or Battery

Step	Action	Value(s)	Yes	No
1	1. Disconnect the body control module (BCM) connector C3. 2. Turn the ignition switch to the RUN position. Is the FASTEN SEATBELT indicator ON?	—	*Go to Step 7*	*Go to Step 2*
2	1. Turn the ignition switch to the OFF position. 2. Connect BCM connector C3. 3. Remove the instrument cluster. 4. Connect a test lamp from the instrument cluster connector terminal B3 to terminal A12. 5. Unlatch the driver side seatbelt. 6. Turn the ignition switch to the RUN position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 4*
3	Replace the instrument cluster. Refer to Instrument Panel, Gauges and Console. Is the repair complete?	—	System OK	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect BCM connector C3. 3. Connect a test lamp from BCM connector C3 terminal C4 to B+. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 6*
5	Repair a short to the ground in CKT 237. Is the repair complete?	—	System OK	—
6	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
7	1. Remove the instrument cluster. 2. Connect a test lamp from BCM connector C3 terminal C4 to the ground. Is the test lamp ON?	—	*Go to Step 8*	*Go to Step 9*
8	Repair a short to B+ in CKT 237. Is the repair complete?	—	System OK	—
9	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—

DTC 25/35 Security Indicator Status



361777

Circuit Description

The body control module (BCM) provides an output on circuit 1376 to the security LED lamp on the instrument cluster while the driver's seatbelt is unfastened.

Conditions for Setting the DTC

DTC 25 is set when the BCM detects the security LED at connector C3 terminal C16 when the ignition is turned to the RUN position.

DTC 35 is set when the BCM detects the security LED at any time since the codes were last cleared.

Action Taken When the DTC Sets

DTC 35 is required for content theft deterrent operation. The security LED must be detected for the alarm to function.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the security LED ground CKT 650.
2. This step tests the security LED.
4. This step tests CKT 1376 for an open or poor connection.

DTC 25/35 Security Indicator Status

Step	Action	Value(s)	Yes	No
Important: • Perform this diagnostic when DTC 25/35 is not set or if the LED is not functioning. • Do not use a battery or test light to test the security indicator LED or the LED may be damaged.				
1	1. Disconnect the security indicator LED. 2. Connect a test lamp between the security LED connector terminal A and B+. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	Using a DMM set to the diode scale, connect the red test lead to terminal B of the security LED and the black test lead to terminal A. Does the security LED illuminate?	—	*Go to Step 4*	*Go to Step 5*
3	Repair the open in CKT 650 between S217 and the security LED. Is the repair complete?	—	System OK	—
4	1. Test for a poor connection in CKT 1376 between the body control module (BCM) and the security LED. 2. If the circuit is OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
5	1. Replace the security LED. 2. Disconnect the vehicle battery. 3. Reconnect the vehicle battery. Is the repair complete?	—	System OK	—

DTC 41 Last Message Received Valid

Conditions for Setting the DTC

The signal received by the BCM from the remote control door lock transmitter was valid. No malfunctions are detected by the BCM.

Action Taken When the DTC Sets

The remote control door lock transmitter and BCM functions operate normally.

Conditions for Clearing the DTC

DTC 41 is set when all of the following conditions occur:

- The BCM is in the diagnostic mode
- Any button on the remote control door lock transmitter is pressed
- The BCM and the Remote control door lock transmitter are operating correctly

DTC 41 is automatically cleared after it is displayed. Any button on the remote control door lock transmitter must be pressed again to display DTC 41 again.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the BCM to see if DTC 41 is displayed by the BCM.
2. This step tests the remote control door lock transmitter.

DTC 41 Last Message Received Valid

Step	Action	Value(s)	Yes	No
1	1. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying*. 2. Press any button on the remote control door lock transmitter. Does the BCM display DTC 41?	—	*Go to Step 5*	*Go to Step 2*
2	1. Program a known good remote control door lock transmitter to the BCM. 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying*. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 41?	—	*Go to Step 3*	*Go to Step 4*
3	1. Check the battery of the original transmitter. 2. If the battery is OK, replace the transmitter. Is the repair complete?	—	System OK	—
4	Replace the BCM. Refer to *Body Control Module Replacement*. Is the repair complete?	—	System OK	—
5	Attempt to operate all of the remote functions using the transmitter. Do all of the transmitter functions operate?	—	System OK	Go to: • Theft Deterrent System Check • *Rear Compartment Lid Release System Check* • *Remote Keyless Entry System Check*

DTC 42 Last Message Received Invalid

Conditions for Setting the DTC

The signal received by the BCM from a remote control door lock transmitter that was not assigned to the BCM.

Action Taken When the DTC Sets

All of the remote control door lock transmitter functions do not operate.

Conditions for Clearing the DTC

DTC 42 is set when all of the following conditions occur:

- The BCM is in the diagnostic mode
- Any button on the remote control door lock transmitter is pressed
- The BCM does not recognize the transmitter being used

DTC 42 is automatically cleared after it is displayed. Any button on the remote control door lock transmitter must be pressed again to display DTC 42 again.

Diagnostic Aids

DTC 42 may be set due to the following:

- The remote control door lock transmitter is defective.
- A transmitter was used without programming it to the BCM.
- Another transmitter was used in the immediate area.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the BCM to see if DTC 42 is displayed by the BCM.
2. This step tests the remote control door lock transmitter.

DTC 42 Last Message Received Invalid

Step	Action	Value(s)	Yes	No
1	1. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying.* 2. Press any button on the remote control door lock transmitter. Does the BCM display DTC 42?	—	*Go to Step 2*	System OK
2	1. Reprogram the remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying.* 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 42?	—	*Go to Step 3*	System OK
3	1. Program a known good remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying.* 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 42?	—	*Go to Step 4*	*Go to Step 5*
4	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
5	1. Check the battery of the original transmitter. 2. If the battery is OK, replace the transmitter. Is the repair complete?	—	System OK	—

DTC 43 Last Message Received with Sumcheck Error

Conditions for Setting the DTC

The signal was received by the BCM from a remote control door lock transmitter that is programmed to the BCM. The message did not pass the sumcheck security test.

Action Taken When the DTC Sets

All of the remote control door lock transmitter functions do not operate.

Conditions for Clearing the DTC

DTC 43 is set when all of the following conditions occur:

- The BCM is in the diagnostic mode
- Any button on the remote control door lock transmitter is pressed
- The transmitter signal does not pass the sumcheck security test

DTC 43 is automatically cleared after it is displayed. Any button on the remote control door lock transmitter must be pressed again to display DTC 43 again.

Diagnostic Aids

If DTC 43 is set, the remote control door lock transmitter is out of synchronization with the BCM. This can be caused by any of the following:

- The transmitter buttons were pressed more than 256 times while out of range of the BCM.
- The transmitter buttons were pressed more than 10 time while out of the range of the BCM immediately after the transmitter battery has been replaced.
- The transmitter signal encountered noise from the surrounding environment.
- The transmitter is defective.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the BCM to see if DTC 43 is displayed by the BCM.
2. This step tests the remote control door lock transmitter.

DTC 43 Last Message Received with Sumcheck Error

Step	Action	Value(s)	Yes	No
1	1. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 2. Press any button on the remote control door lock transmitter. Does the BCM display DTC 43?	—	*Go to Step 2*	System OK
2	1. Reprogram the remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 43?	—	*Go to Step 3*	System OK
3	1. Program a known good remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 43?	—	*Go to Step 4*	*Go to Step 5*
4	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
5	1. Check the battery of the original transmitter. 2. If the battery is OK, replace the transmitter. Is the repair complete?	—	System OK	—

DTC 44 Last Message Received with Encryption Error

Conditions for Setting the DTC

The signal was received by the BCM from a remote control door lock transmitter that is programmed to the BCM. The message did not pass the encryption security test.

Action Taken When the DTC Sets

All of the remote control door lock transmitter functions do not operate.

Conditions for Clearing the DTC

DTC 44 is set when all of the following conditions occur:

- The BCM is in the diagnostic mode
- Any button on the remote control door lock transmitter is pressed
- The transmitter signal does not pass the encryption security test

DTC 44 is automatically cleared after it is displayed. Any button on the remote control door lock transmitter must be pressed again to display DTC 44 again.

Diagnostic Aids

If DTC 44 is set, the remote control door lock transmitter is out of synchronization with the BCM. This can be caused by any of the following:

- The transmitter was in the synchronization or program mode while out of the range of the BCM.
- The transmitter signal encountered noise from the surrounding environment.
- The transmitter is defective.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the BCM to see if DTC 44 is displayed by the BCM.
2. This step tests the remote control door lock transmitter.

DTC 44 Last Message Received with Encryption Error

Step	Action	Value(s)	Yes	No
1	1. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 2. Press any button on the remote control door lock transmitter. Does the BCM display DTC 44?	—	*Go to Step 2*	System OK
2	1. Reprogram the remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 44?	—	*Go to Step 3*	System OK
3	1. Program a known good remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 44?	—	*Go to Step 4*	*Go to Step 5*
4	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
5	1. Check the battery of the original transmitter. 2. If the battery is OK, replace the transmitter. Is the repair complete?	—	System OK	—

DTC 45 Receiver Processing in 20 Second Lockout

Conditions for Setting the DTC

At least 50 consecutive signals were received by the BCM from a remote control door lock transmitter that is programmed to the BCM. All of the signals did not pass the encryption security test.

Action Taken When the DTC Sets

The BCM stops processing all transmitter signals for 20 seconds. All of the remote control door lock transmitter functions do not operate.

Conditions for Clearing the DTC

DTC 45 is set when all of the following conditions occur:

- The BCM is in the diagnostic mode
- Any button on the remote control door lock transmitter is pressed

DTC 45 is automatically cleared after it is displayed. Any button on the remote control door lock transmitter must be pressed again to display DTC 45 again.

Diagnostic Aids

If DTC 45 is set, the remote control door lock transmitter is out of synchronization with the BCM. This can be caused by any of the following:

- The transmitter was in the synchronization or program mode while out of the range of the BCM.
- The transmitter is defective.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. This step tests the BCM to see if DTC 45 is displayed by the BCM.
2. This step tests the remote control door lock transmitter.

DTC 45 Receiver Processing in 20 Second Lockout

Step	Action	Value(s)	Yes	No
1	1. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 2. Press any button on the remote control door lock transmitter. Does the BCM display DTC 45?	—	*Go to Step 2*	System OK
2	1. Reprogram the remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 45?	—	*Go to Step 3*	System OK
3	1. Program a known good remote control door lock transmitter to the BCM. Refer to *Transmitter Programming/Synchronization.* 2. Enter the BCM diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* Displaying DTCs. 3. Press any button on the remote control door lock transmitter. Does the BCM display DTC 45?	—	*Go to Step 4*	*Go to Step 5*
4	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
5	1. Check the battery of the original transmitter. 2. If the battery is OK, replace the transmitter. Is the repair complete?	—	System OK	—

DTC 55 Begin Configuration Display

Conditions for Setting the DTC

DTC 55 is always displayed when the BCM is in the diagnostic mode. The following two configuration codes are always displayed immediately after DTC 55:

1. The hardware configuration number
2. The software configuration number

After the configuration codes are displayed, the entire DTC list is repeated starting with DTC 12.

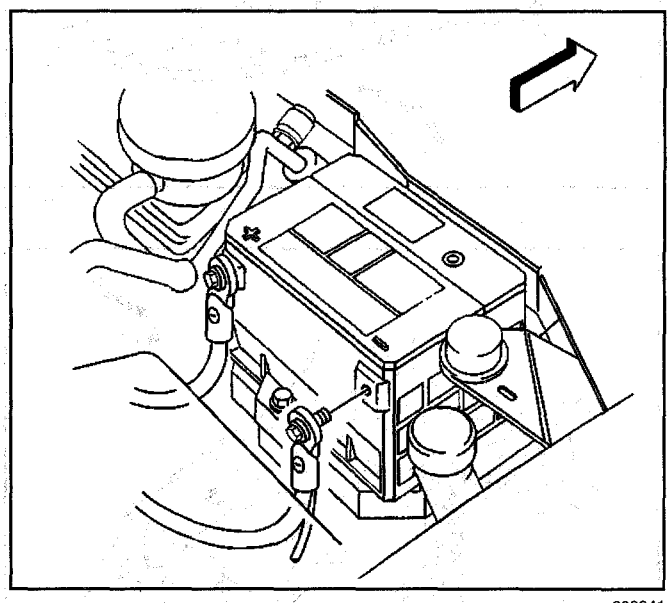
Repair Instructions

Body Control Module Replacement

Removal Procedure

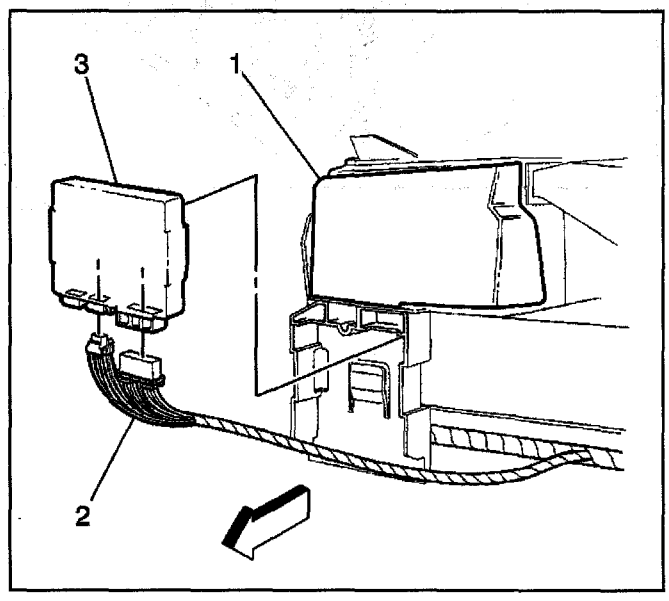
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure*
2. Remove the I/P insulator. Refer to *Insulator Replacement - IP (Right Side)*

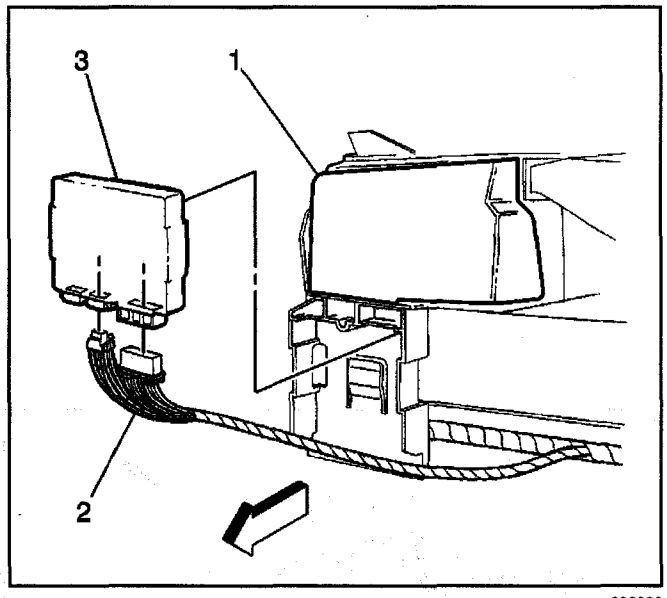


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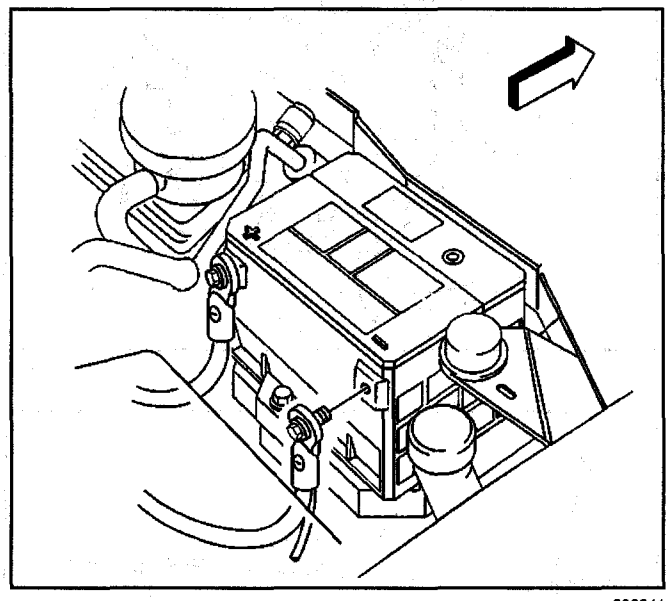
3. Unsnap the BCM (3) from the HVAC duct bracket (1).
4. Disconnect the BCM electrical connectors (2).



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Installation Procedure

1. Connect the BCM electrical connectors (2).
2. Snap the BCM (3) to the HVAC duct bracket (1).
3. Install the I/P insulator. Refer to *Insulator Replacement - IP (Right Side)*
4. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure*

BCM Programming/RPO Configuration

Programming A New Body Control Module (BCM)

Important: Any new body control module (BCM) will automatically program to the resistance of the key (or interrogator setting) being used at the first ignition ON cycle. This can only be done once for the life of the module.

A new BCM is not programmed. Before the system will function properly it must be programmed to the code that matches the customer's keys.

1. Install the new BCM. Refer to *Body Control Module Replacement*
2. Insert one of the customer's keys into the ignition cylinder and turn it to the on position.

   Its good to start the engine at this time to verify system operation.
3. Observe the SECURITY indicator lamp for the following:
   - The indicator lamp lights for approximately 5 seconds and then goes out.

     This indicates that the BCM is programmed properly.
   - The indicator lamp flashes at a rate of one flash per second until the ignition is off.

     This indicates that the BCM did not program and the system components, wiring and contacts should be checked for a fault.

Description and Operation

Body Control System Circuit Description

Circuit Operation

The following functions are controlled by the Body Control Module (BCM):

- Remote Keyless Entry

  Refer to *Remote Keyless Entry System Circuit Description.*
- Universal theft deterrent

  Refer to *Content Theft Deterrent (CTD) Circuit Description.*
- PASS-Key® II

  Refer to *Content Theft Deterrent (CTD) Circuit Description.*
- Audible warnings

  Refer to *Audible Warnings Circuit Description.*
- Fasten seatbelt indicator

  Refer to *Audible Warnings Circuit Description.*
- Low coolant indicator latching

  Refer to *Instrument Cluster Circuit Description.*
- Retained accessory power (RAP)

  Refer to *Retained Accessory Power Circuit Description.*
- Door locks

  Refer to *Power Door Locks Circuit Description.*
- Rear compartment lid release
- Courtesy lamp control

  Refer to *Interior Lights Circuit Description.*
- Illuminated entry
- Delayed interior lamps

This section is intended to provide the technician with an understanding of BCM operation. The systems listed above are not described in detail in this section. For a better understanding of these systems, refer to the circuit description in that section.

Wake-up and Sleep Modes

Wake-up signals are signals which turn on the BCM. Once active, the BCM begins monitoring and controlling the system functions listed above. With the ignition switch in the OFF position the BCM ceases control of the system functions after a 10 minute period. This is the sleep mode. During the sleep mode the BCM monitors several circuits for changes in status. The BCM wakes up when a change is detected in any of the following inputs:

- Courtesy lamps
- Remote keyless entry
- Ignition switch
- Park lamps
- Headlamps
- Front side door locks or door jamb switches
- Rear compartment lid ajar indication switch
- Ignition key lock cylinder
- Shock sensor

Power Requirements

The BCM will operate properly with a system voltage of 9–16 volts.

Operating current measured at the BCM battery terminals in the awake mode should not exceed the following values:

- 75 milliamps with the ignition switch in the OFF position
- 250 milliamps with the ignition switch in the RUN position

Operating current measured at the BCM battery terminals in the sleep mode should not exceed the following values:

- Two milliamps on vehicles without theft deterrent (UA6)
- Three milliamps on vehicles with theft deterrent (UA6)

Operating current measured at the BCM IGN1 and IGN3 terminals should not exceed 15 milliamps.

Abbreviations

The following abbreviations are used throughout this section:

- Body control module (BCM)
- Data link connector (DLC)
- Diagnostic trouble code (DTC)
- Digital Multimeter (DMM)
- Instrument Cluster (IPC)
- Powertrain control module (PCM)
- Personal automotive security system (PASS-Key® II)
- Retained accessory (RAP)
- Universal theft deterrent (UTD)

BCM Replacement

Technicians should not replace the BCM unless directed to do so by the diagnostic procedures in this section. Most system faults are traceable to faulty wiring, connectors or components. The BCM is very reliable and is not likely the cause of the fault. Do not replace the BCM before performing a complete diagnosis. This may result in the replacement of a good BCM and a recurrence of the fault.

Important:

- If the BCM is replaced refer to theft deterrent system to program the new BCM to the current ignition key.
- A new BCM is shipped from the supplier in the factory test mode. This mode allows only limited functionality the BCM controlled systems. When a new BCM is installed it is necessary to exit the factory test mode prior to returning the vehicle to the customer. To restore the BCM to normal operation, turn the ignition switch from the RUN position to the OFF position 10 times or enter the program mode as described in theft deterrent systems.

Instrument Panel, Gauges and Console

Specifications

Fastener Tightening Specifications

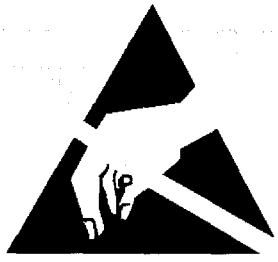
Application	Specification	
	Metric	English
Data Link Connector Bolt	1.9 N·m	17 lb in
Floor Console Bolt	8 N·m	71 lb in
Console Armrest Door Bolt	2.0 N·m	18 lb in
Console Trim Plate Bolt	1.9 N·m	17 lb in
Cup Holder Screw	1.9 N·m	17 lb in
Instrument Cluster Bolt	2.2 N·m	19 lb in
Instrument Panel Upper Mounting Bolt	1.9 N·m	17 lb in
Instrument Panel Cluster Trim Plate Bolt	1.9 N·m	17 lb in
Instrument Panel Compartment Hinge Screw	2.8 N·m	25 lb in
Instrument Panel Compartment Door Latch Bolt	1.9 N·m	17 lb in
Instrument Panel Knee Bolster Deflector Nut	10 N·m	89 lb in
Instrument Panel Knee Bolster Bolt	1.9 N·m	17 lb in
Instrument Panel Fuse Block Bolt	1.5 N·m	13 lb in
Instrument Panel Lower Mounting Nut	25 N·m	18 lb ft
Negative Battery Cable	15 N·m	11 lb ft

Schematic and Routing Diagrams

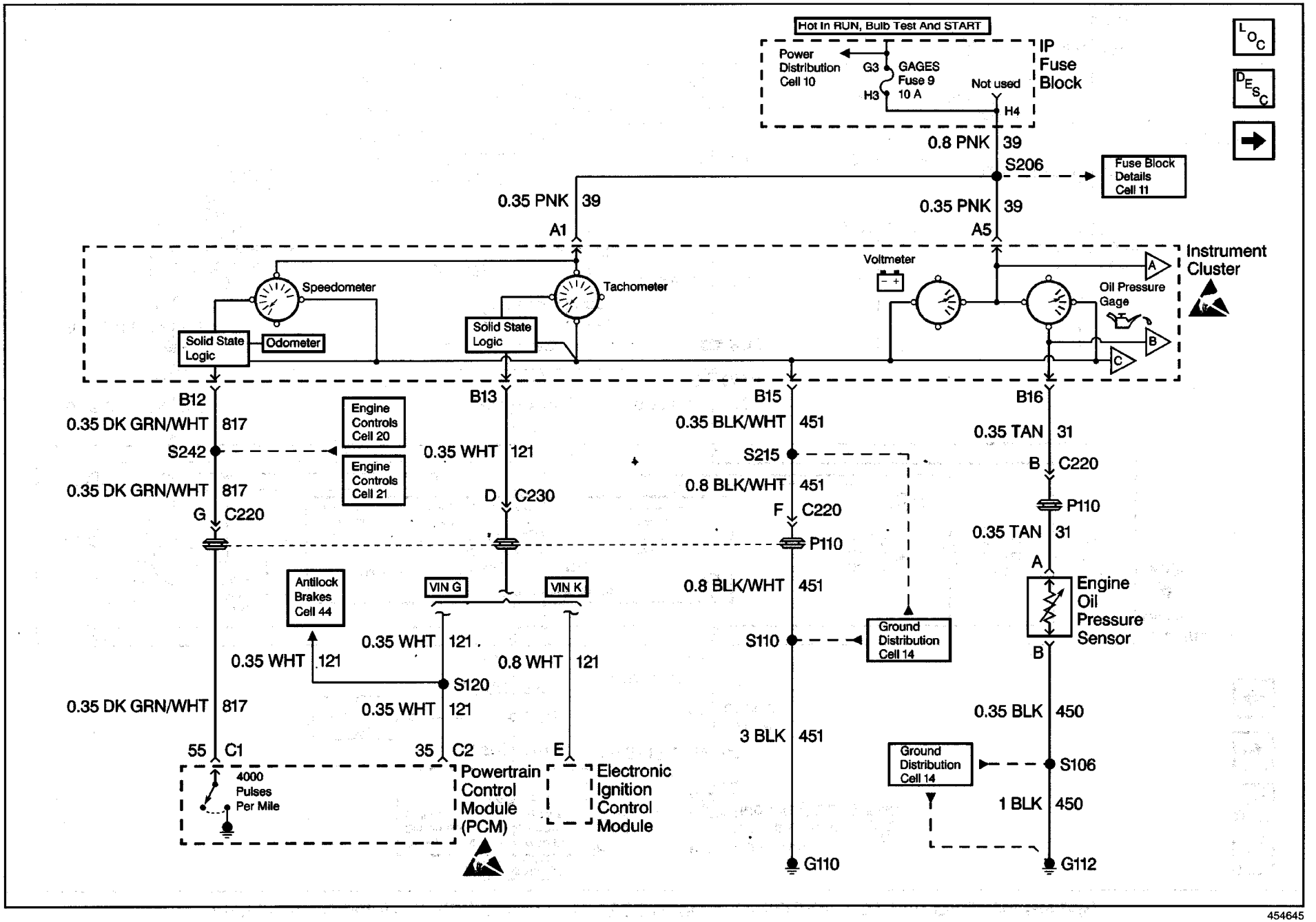
Instrument Cluster Schematic References

Reference on Schematic	Section Number Subsection Name
Antilock Brakes Cell 44	5—ABS Traction Control
Brake Warning Cell 41	5—Hydraulic Brakes
Data Link Connector (DLC) Cell 50	8—Wiring Systems
Engine Controls Cell 20, 21	6—Engine Controls
Exterior Lights Cell 110	8—Lighting Systems
Fog Lights Cell 103	8—Lighting Systems
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Headlights DRL Cell 102	8—Lighting Systems
Interior Lights Dimming Cell 117	8—Lighting Systems
Power Distribution Cell 10	8—Wiring Systems

Instrument Cluster Schematic Icons

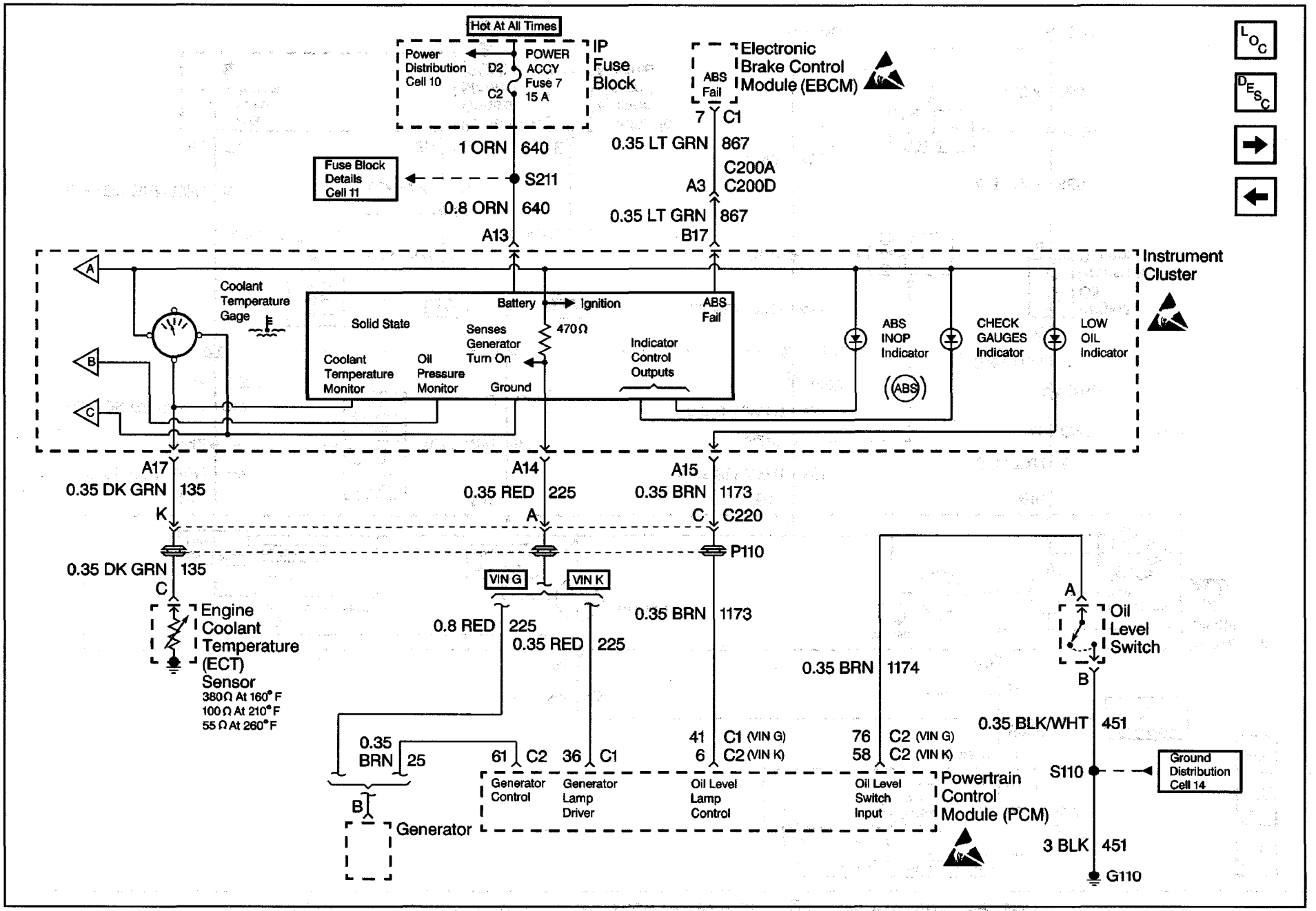
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19386	*SIR Service Precautions Caution* in Cautions and Notices.

Instrument Cluster: Analog Schematics (PCM and Engine Oil Pressure Sensor)



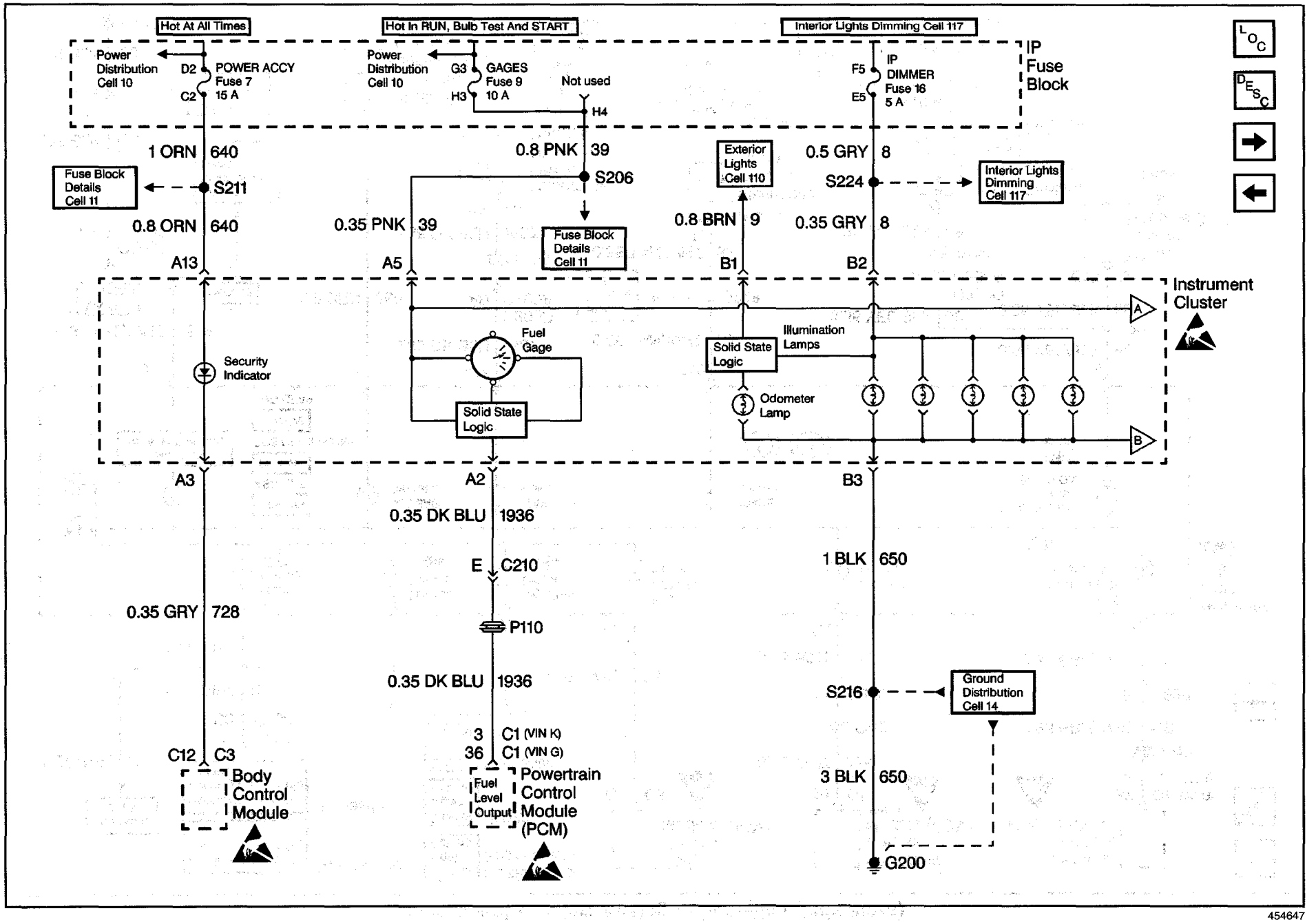
454645

Instrument Cluster: Analog Schematics (EBCM, PCM, Generator, ECT and Oil Level Switch)



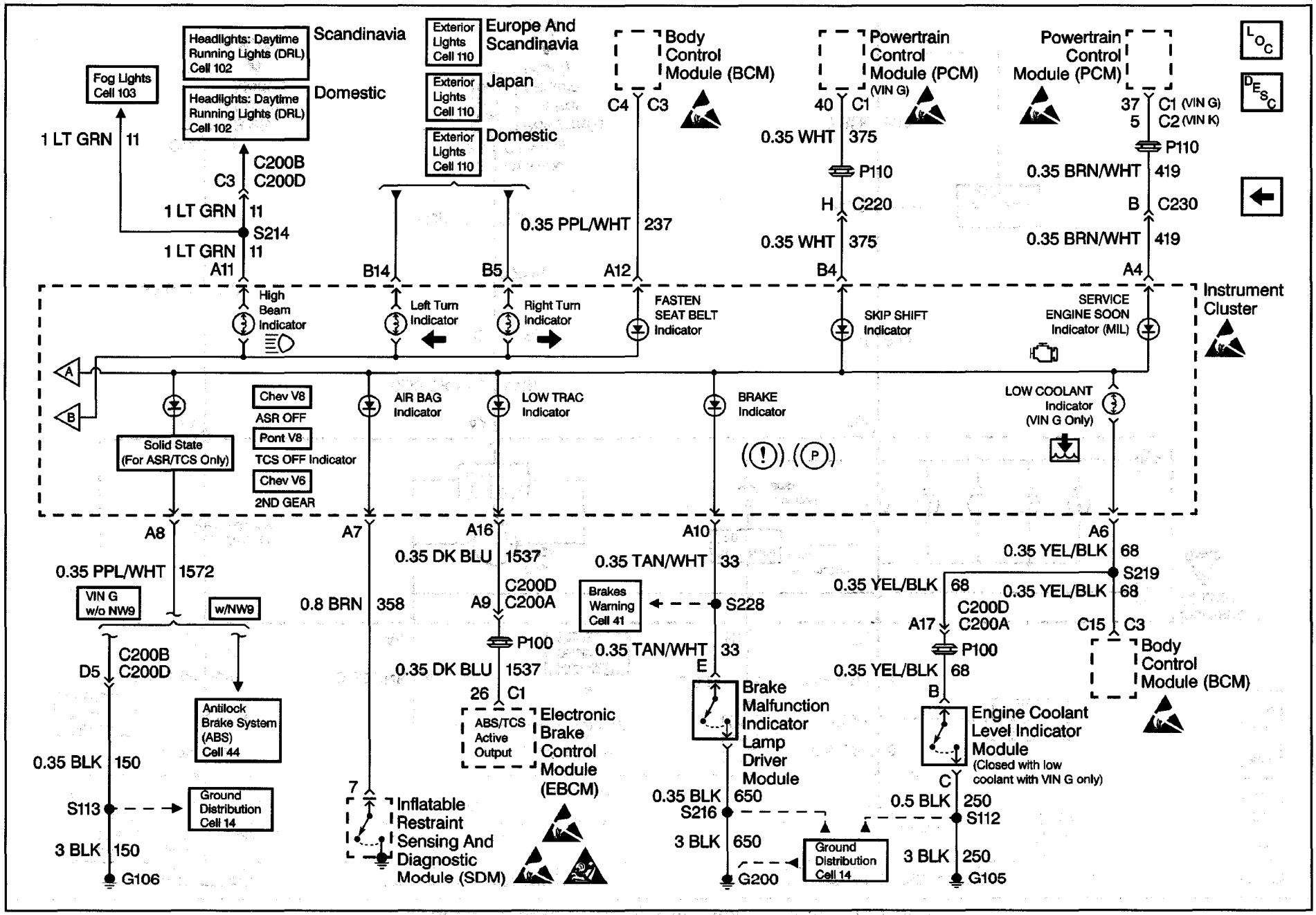
454646

Instrument Cluster: Analog Schematics (BCM and PCM)



454647

Instrument Cluster: Analog Schematics (Indicators)



454648

Component Locator

Instrument Cluster Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control Systems	*Body Control Module Connector End Views* in Body Control Systems
Electronic Brake Control Module (EBCM)	Mounted with brake pressure modulator valve on the top of the left front frame rail	Antilock Brake System Component Views in Brakes	*Antilock Brakes System Connector End Views* in Brakes
Engine Coolant Level Indicator Module (V8 VIN G)	Mounted on the upper right side of the radiator	*Instrument Cluster Component Views*	—
Engine Coolant Temperature (ECT) Sensor (V6 VIN K)	Under the throttle body, on the front side of the engine	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Coolant Temperature (ECT) Sensor (V8 VIN G)	On the lower left side of the engine, above the generator	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Level Switch (V6 VIN K)	On the lower left side of the engine, in the oil pan	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Level Switch (V8 VIN G)	On the lower right side of the engine, in the oil pan	*Engine Controls Component Views* in Engine Controls	*Engine Controls Connector End Views* in Engine Controls
Engine Oil Pressure Sensor (V6 VIN K)	On the top right side of the engine	—	—
Engine Oil Pressure Sensor (V8 VIN G)	On the top rear of the engine, near the left cylinder head	*Harness Routing Views* in Wiring Systems	—
Generator (V6 VIN K)	On the front right side of the engine	*Engine Controls Component Views* in Engine Controls	*Engine Electrical Connector End Views* in Engine Electrical
Generator (V8 VIN G)	On the front left side of the engine	*Engine Controls Component Views* in Engine Controls	*Engine Electrical Connector End Views* in Engine Electrical
Inflatable Restraint Sensing and Diagnostic Module (SDM)	On the floor tunnel, below the rear of the console	*SIR Component Views* in SIR	*SIR Connector End Views* in SIR
Instrument Cluster	On the left end of the instrument panel carrier	*Instrument Cluster Component Views*	*Instrument Cluster Connector End Views*
IP Fuse Block	On the left side of the instrument panel	*Instrument Cluster Component Views*	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C210 (8 cavities)	instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems

Instrument Cluster Components (cont'd)

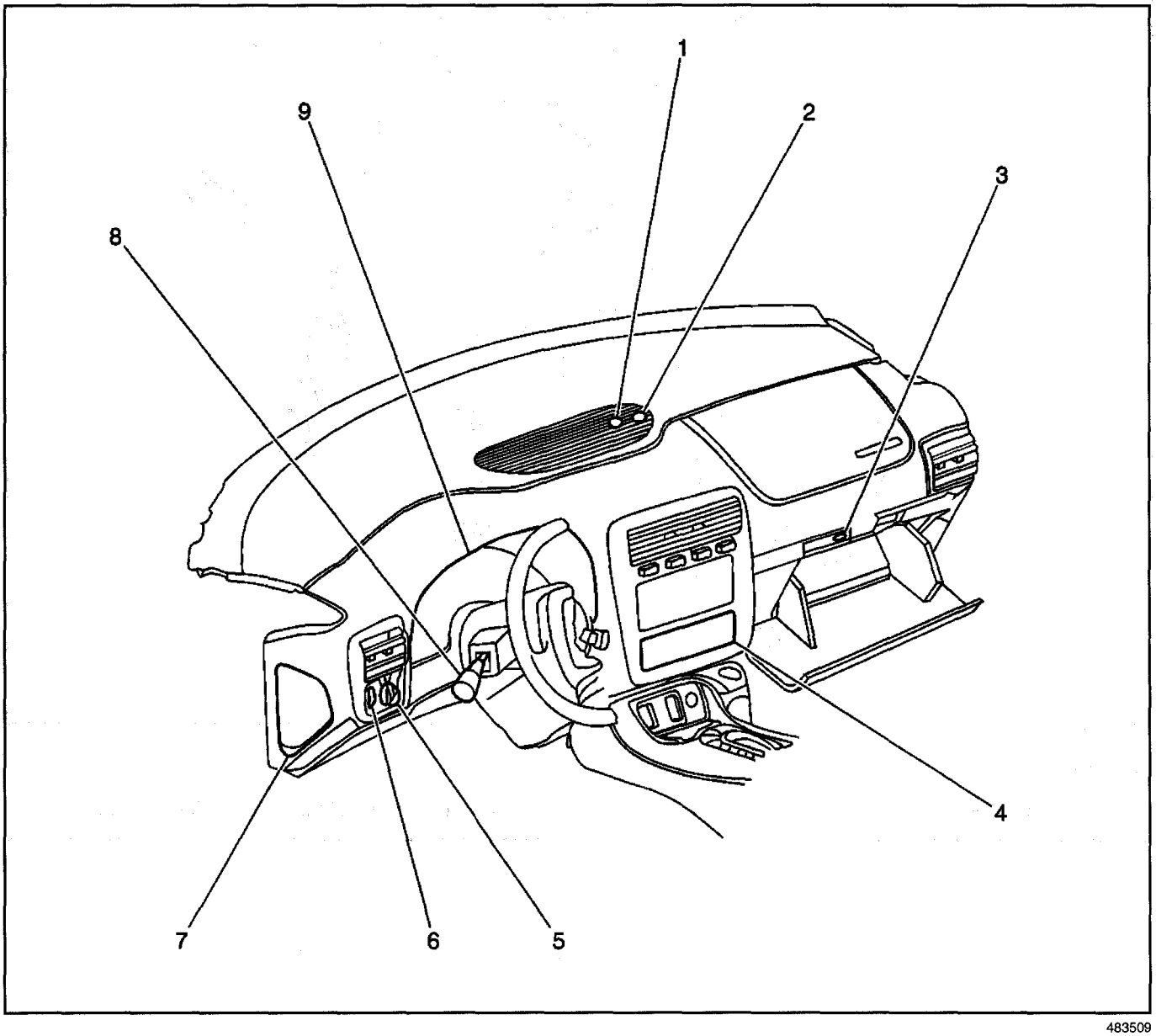
Name	Location	Locator View	Connector End View
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C230 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G105	Attached to the top right side of the radiator support	*Harness Routing Views* in Wiring Systems	—
G106	Attached to the top left side of the radiator support	*Harness Routing Views* in Wiring Systems	—
G110 (V8 VIN G)	Attached to the rear of the left cylinder head	*Harness Routing Views* in Wiring Systems	—
G110 (V6 VIN K)	In the front of the engine, bolted to the pulley above the A/C clutch connector	*Harness Routing Views* in Wiring Systems	—
G112	Attached to the rear of the left cylinder head	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
P110	Right side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
S110 (V8 VIN G)	In the engine harness, main branch, approximately 19 cm (7 in) from the powertrain control module (PCM) breakout	—	—
S110 (V6 VIN K)	In the engine harness, approximately 4 cm (2 in) from the powertrain control module (PCM) breakout	—	—
S112	In the forward lamp harness, approximately 9 cm (4 in) from the right lamps breakout	—	—
S120 (V8 VIN G)	Engine harness, main branch, 8 cm (3 in) from powertrain control module (PCM) breakout	—	—
S206	In the instrument panel harness, main branch, at the rear compartment lid release relay breakout	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S214 (Chevrolet)	instrument panel harness, approximately 8 cm (3 in) into instrument cluster breakout	—	—
S215	In the instrument panel harness, main branch, approximately 11 cm (4 in) from the antenna cable breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S219	instrument panel harness, main branch, approximately 13 cm (5 in) from rear compartment lid release relay breakout	—	—
S224	In the instrument panel harness, main branch, approximately 17 cm (7 in) from the instrument cluster breakout	—	—

Instrument Cluster Components (cont'd)

Name	Location	Locator View	Connector End View
S228	Instrument panel harness, main branch, approximately 20 cm (8 in) from rear compartment lid release relay breakout	—	—
S242	In the instrument panel harness, main branch, approximately 4 cm (2 in) from data link connector (DLCbreakout	—	—

Instrument Cluster Component Views

Instrument Panel

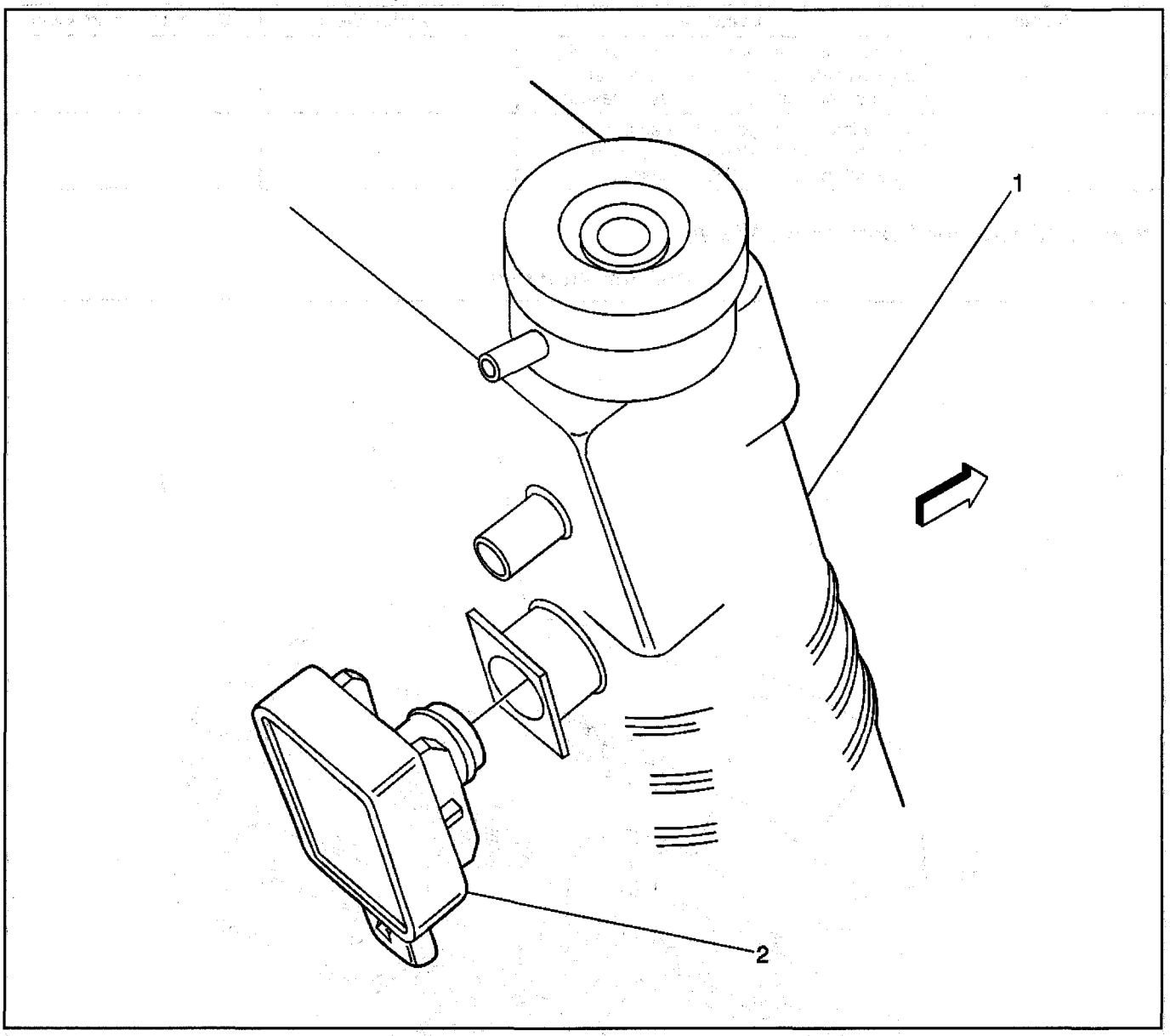


483509

Legend

(1) Security Indicator (LED)
(2) DRL Ambient Light Sensor
(3) IP Compartment Lamp
(4) Radio
(5) Headlamp Switch
(6) IP Dimmer Switch
(7) IP Fuse Block
(8) Multi-Function Lever
(9) Instrument Cluster

Engine Coolant Level Indicator Module



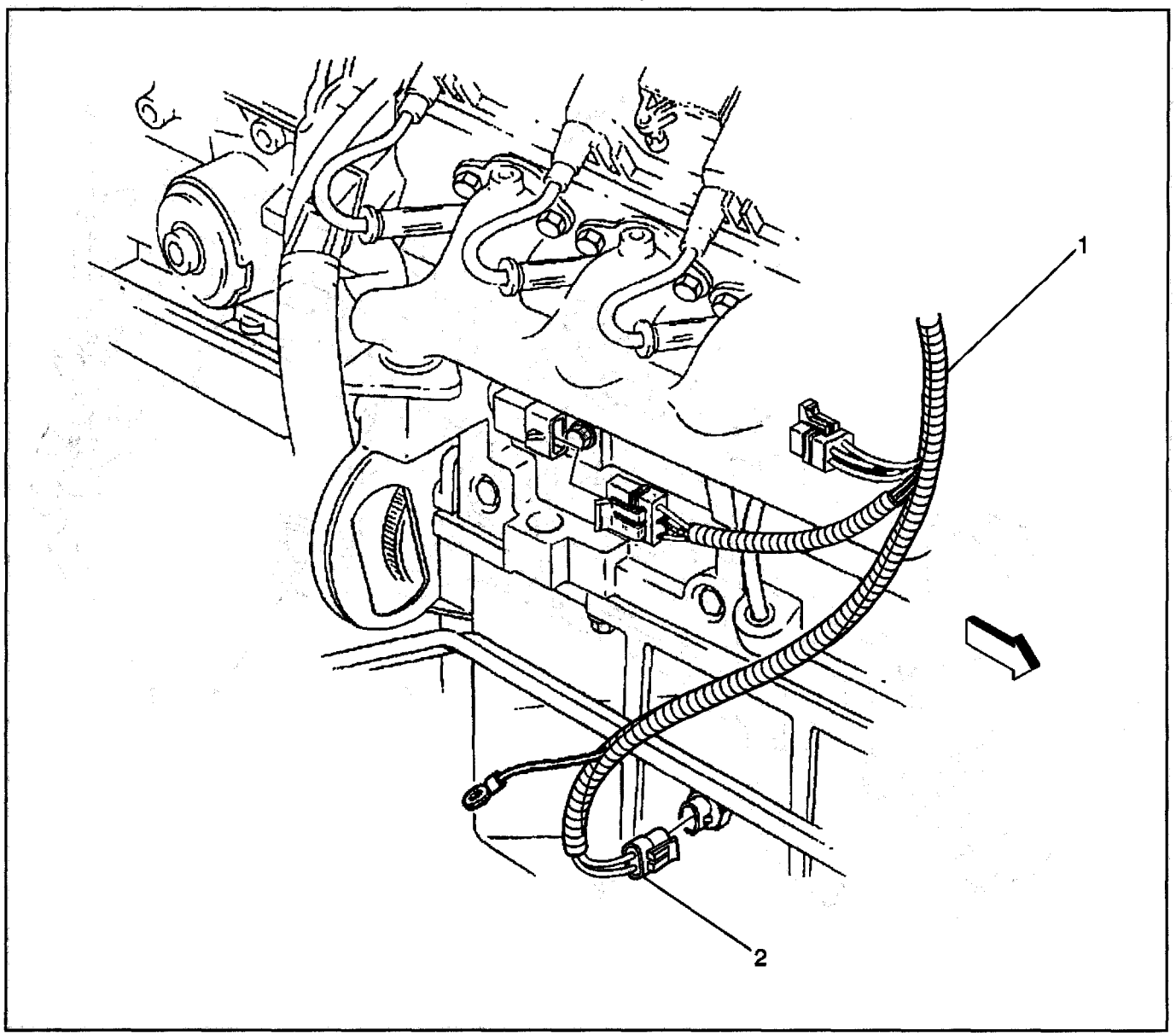
483511

Legend

(1) Radiator

(2) Engine Coolant Level Indicator Module

Lower Right Front of Engine (V8 VIN G)



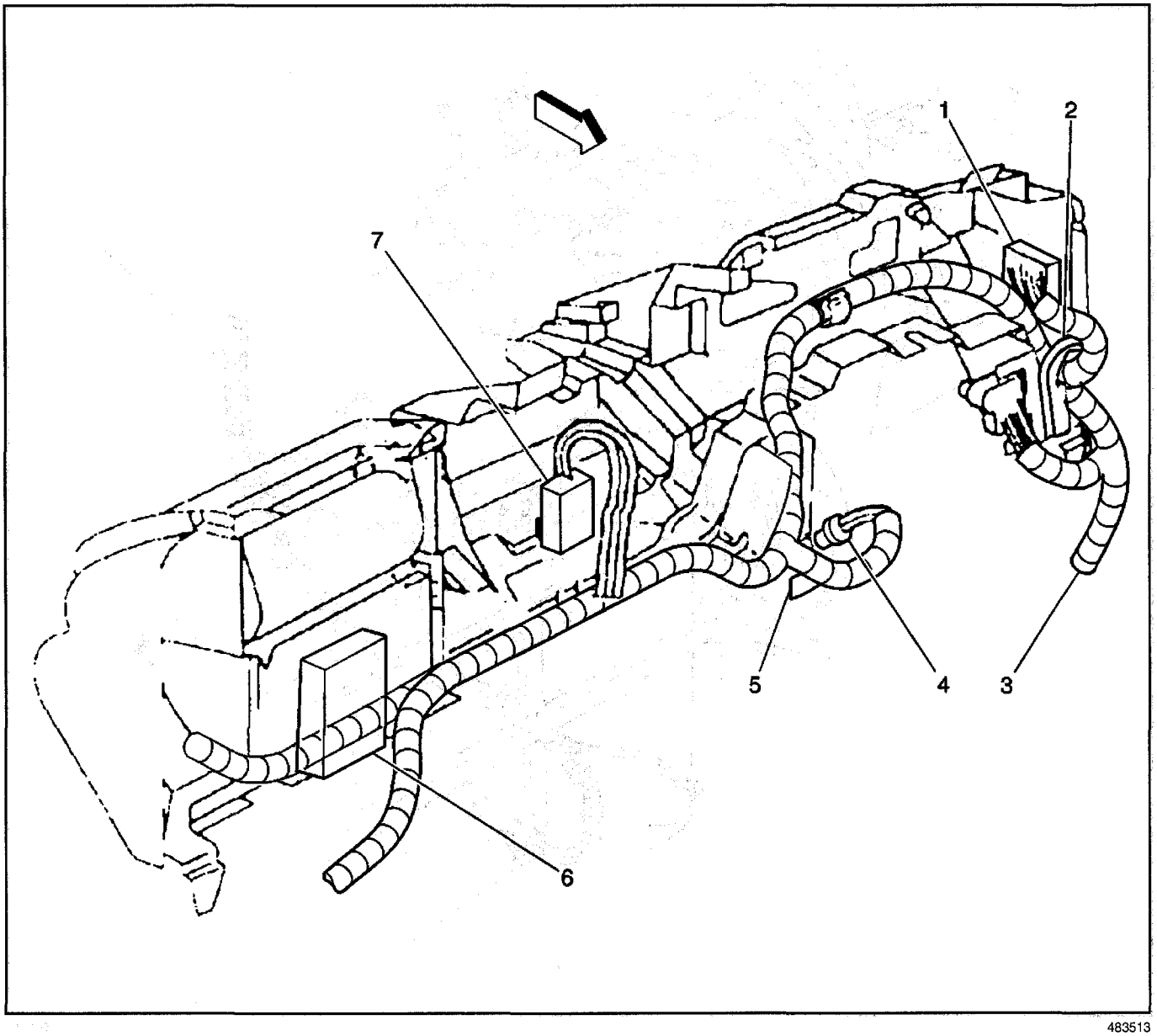
483512

Legend

(1) Engine Wiring Harness

(2) Engine Oil Level Switch

Rear of Instrument Panel



483513

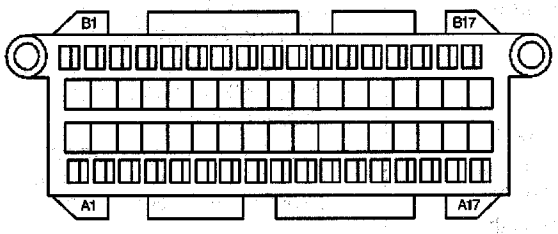
Legend

(1) IP Fuse Block
(2) Hazard Lamp Flasher
(3) IP Wiring Harness
(4) Turn Signal Lamp Flasher
(5) Data Link Connector (DLC)
(6) Body Control Module (BCM)
(7) Daytime Running Lamps(DRL) Module

Visual Identification

Instrument Cluster Connector End Views

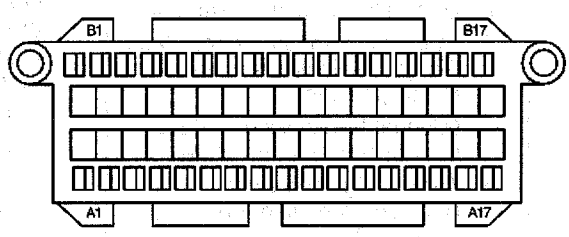
Instrument Cluster



62478

Connector Part Information		• 12065803 • 34-Way F Micro-Pack 100 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A1	PNK	39	Power feed from gages Fuse 9
A2	DK BLU	1936	Fuel gage signal
A3	GRY	728	SECURITY indicator lamp control
A4	BRN/WHT	419	SERVICE ENGINE SOON indicator lamp control
A5	PNK	39	Power feed from gages Fuse 9
A6	YEL/BLK	68	Low coolant level indicator control
A7	BRN	358	AIR BAG indicator control
A8	PPL/WHT	1572	TCS OFF indicator control (with NW9)
A10	TAN/WHT	33	BRAKE warning indicator lamp control
A11	LT GRN	11	High beam headlights on
A12	PPL/WHT	237	FASTEN SEATBELT indicator lamp control
A13	ORN	640	Power feed from PWR ACCY Fuse 7

Instrument Cluster (cont'd)



62478

Connector Part Information		• 12065803 • 34-Way F Micro-Pack 100 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A14	RED	225	Generator output indicator control
A15	BRN/WHT	1173	Oil level lamp signal
A16	DK BLU	1537	LOW TRAC indicator lamp control
A17	DK GRN	135	Coolant temperature sensor signal
B1	BRN	9	Odometer illumination
B2	GRY	8	IP illumination lamps feed
B3	BLK	650	Ground
B4	WHT	375	SKIP SHIFT indicator lamp control (V8 only)
B5	DK BLU/ WHT	1415	Right turn signal switch output
B12	DK GRN/ WHT	817	Vehicle speed signal-4000 pulses per mile
B13	WHT	121	Tachometer signal
B14	LT BLU/ WHT	1414	Left turn signal switch output
B15	BLK/WHT	451	Ground
B16	TAN	31	Oil pressure indicator control
B17	LT GRN	867	ABS fail signal

Diagnostic Information and Procedures

Instrument Cluster System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Close all of the vehicle doors. 2. Unbuckle the driver seat belt. 3. (Automatic transmission) Place the gear selector is in the PARK position. 4. (Manual transmission) Place the transmission in neutral. 5. Turn the ignition switch to the RUN position, with the engine off.	• The vehicle performs a bulb check on the following indicators (the indicators illuminate for approximately 3 seconds): – ASR Off (Chevrolet with traction control) – Brake – Low Trac – Service Engine Soon – Skip Shift (V8 VIN G with manual transmission) – TCS Off (Pontiac with traction control) • The Low Coolant indicator illuminates for approximately ½ to 1½ seconds. • The Fasten Seat Belt indicator illuminates for approximately 4–8 seconds. • The Security indicator illuminates for approximately 5 seconds. • The Air Bag indicator flashes 7 time and turns off. • The check gauges indicator is on continuously. • The low oil indicator is on for approximately 1 second.	• The ASR indicator stays on. Refer to ABS *A Diagnostic System Check.* • The Brake indicator does not illuminate. Refer to *Brake Warning System Check.* • The Brake indicator stays on. Refer to *Brake Warning System Check.* • The Check Gauges indicator does not illuminate. Refer to *CHECK GAGES Indicator Inoperative.* • The Low Oil indicator does not illuminate. Refer to *Low Engine Oil Level Indicator Inoperative.* • The Low Trac indicator does not illuminate. Refer to ABS *A Diagnostic System Check.* • The Low Coolant indicator does not illuminate. Refer to *Low Engine Coolant Indicator Inoperative.* • The Fasten Seat Belt indicator does not illuminate. Refer to *Fasten Safety Belt Indicator Inoperative* • The Security indicator does not illuminate. Refer to *SECURITY Indicator Inoperative.* • The Air bag indicator stays on. Refer to *SIR Diagnostic System Check.*
2	1. Buckle the driver seat belt. 2. Observe the Fasten Seat Belt indicator.	The Fasten Seat Belt indicator is off.	The Fasten Seat Belt indicator stays on. Refer to *Brake Warning System Check.*
3	Apply the park brake.	The Brake indicator illuminates.	The Brake indicator does not illuminate. Refer to *Brake Warning System Check.*
4	Start the engine.	• The engine cranks and starts. • The Security indicator is off. • The speedometer displays zero.	• The Security indicator illuminates. • The engine does not start. Refer to *Vehicle Theft Deterrent (VTD) System Check.*
5	Press the odometer trip reset button.	The trip odometer resets to zero.	Refer to *IP Cluster Replacement.*
6	Observe the fuel gauge.	The fuel gauge indicates the correct fuel level.	• Fuel gauge is inaccurate. Refer to *Fuel Gauge Inaccurate or Inoperative* • Fuel gauge always indicates full. Inspect the PCM for DTCs. If you do not find DTCs, replace the instrument cluster. Refer to *IP Cluster Replacement.*
7	Observe the oil pressure gauge.	The engine oil pressure gauge indicates normal oil pressure.	• *Engine Oil Pressure Gauge Inaccurate or Inoperative* • *Engine Oil Pressure Gauge Always High (V8 Vin G)* • *Engine Oil Pressure Gauge Always Low*

Instrument Cluster System Check (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
8	Observe the tachometer.	The tachometer indicates the correct engine speed.	Refer to *Tachometer Inaccurate or Inoperative (V8 VIN G).*
9	Observe the temperature gauge.	The engine temperature gauge indicates the correct engine temperature.	Refer to: • *Engine Coolant Temperature Gauge Always Cold* • *Engine Coolant Temperature Gauge Always Hot*
10	Observe the voltmeter.	The voltmeter indicates approximately 9–14 volts.	Refer to *IP Cluster Replacement.*
11	Observe the ABS Inop indicator.	The ABS Inop indicator is off.	ABS indicator is illuminated. Refer to ABS *A Diagnostic System Check.*
12	Observe the Air Bag indicator.	The Air Bag indicator is off.	Air Bag indicator is illuminated. Refer to *SIR Diagnostic System Check.*
13	Observe the ASR Off indicator (Chevrolet with traction control).	The ASR Off indicator is off.	The ASR indicator is illuminated. Refer to ABS *A Diagnostic System Check.*
14	Observe the Check Gauges indicator.	The Check Gauges indicator is off.	The Check Gauges indicator is illuminated. Refer to *CHECK GAGES Indicator Always On.*
15	Observe the Low Coolant indicator. (V8 VIN G only)	The Low Coolant indicator is off.	The Low Coolant indicator is illuminated. Refer to *Low Engine Coolant Indicator Always On.*
16	Observe the Low Oil indicator.	The Low Oil indicator is off.	The Low Oil indicator is illuminated. Refer to *Low Engine Oil Level Indicator Always On.*
17	Observe the Low Trac indicator (if equipped).	The Low Trac indicator is off.	The Low Trac indicator is illuminated. Refer to ABS *A Diagnostic System Check.*
18	Observe the Reduced Engine Power indicator. (V6 VIN K only)	The Reduced Engine Power Indicator is off.	The Reduced Engine Power indicator is illuminated. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls (3.8L).
19	Observe the Service Engine Soon indicator.	Service Engine Soon indicator is off.	The Service Engine Soon indicator is illuminated. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls.
20	Observe the Skip Shift indicator. (V8 VIN G only)	The Skip Shift indicator is off.	The Skip Shift indicator is illuminated. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls (5.7L).
21	Observe the TCS Off indicator (Pontiac with traction control)	The TCS Off indicator is off.	The TCS Off indicator is illuminated. Refer to ABS *A Diagnostic System Check.*
22	Drive vehicle at 48 km/h (30 mph).	The speedometer and the odometer operate properly.	• The speedometer or the odometer is inaccurate, refer to *IP Cluster Replacement* • The speedometer and the odometer are inaccurate or inoperative, refer to *Speedometer and/or Odometer Inoperative* *Speedometer Inaccurate (J 38522 Available)*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Engine Coolant Temperature Gauge Always Cold

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition ON and the engine OFF. 2. Disconnect the engine coolant temperature gauge sensor connector. 3. Connect a jumper between terminal A of the connector and ground. Does the coolant temperature gauge move all the way to the right (hot)?	—	Go to *Step 2*	Go to *Step 4*
2	Inspect the engine coolant temperature gauge sensor connector for a poor connection. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 3*
3	Replace the engine coolant temperature gauge sensor connector. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
4	Inspect CKT 135 for a poor connection or an open. Did you repair a poor connection or an open?	—	Go to *Instrument Cluster System Check*	Go to *Step 5*
5	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Engine Coolant Temperature Gauge Always Hot

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition ON and the engine OFF. 2. Disconnect the engine coolant temperature gauge sensor connector. Does the gauge move back to the left (cold)?	—	Go to *Step 2*	Go to *Step 3*
2	Replace the engine coolant temperature gauge sensor connector. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
3	Inspect CKT 135 for a short to ground. Did you repair a short to ground?	—	Go to *Instrument Cluster System Check*	Go to *Step 4*
4	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Engine Coolant Temperature Gauge Inaccurate or Inoperative

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition ON and the engine OFF. 2. Disconnect the engine coolant temperature gauge sensor connector. 3. Using *J 33431-B* J33431 or equivalent, connect one red clip lead from the tester to the sensor connector terminal A. 4. Connect the other red clip lead to ground. 5. Adjust the resistance dials of the tester to 380 Ω and then 55 Ω. Does the coolant temperature gauge register 71°C (160°F) and then 127°C (200°F)?	—	Go to *Step 2*	Go to *Step 3*
2	Replace the engine coolant temperature gauge sensor. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
3	Inspect for a poor connection or high resistance in CKT 135. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 4*
4	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Engine Oil Pressure Gauge Always High (V8 Vin G)

Step	Action	Value(s)	Yes	No
Important: Inspect for proper oil level, then inspect oil pressure with a mechanical gauge before proceeding. Refer to *Engine Mechanical Specifications* in Engine Mechanical.				
1	1. Turn the ignition switch to the RUN position with the engine OFF. 2. Disconnect the oil pressure sensor connector. 3. Connect a jumper between terminal A of the connector and ground. Does the gauge move back to the left (low pressure)?	—	Go to *Step 2*	Go to *Step 4*
2	Inspect the oil pressure sensor connector for a poor connection. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 3*
3	Replace the oil pressure sensor. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
4	Inspect CKT 31 for a poor connection or open. Did you repair a poor connection or open?	—	Go to *Instrument Cluster System Check*	Go to *Step 5*
5	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Engine Oil Pressure Gauge Always Low

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for proper engine oil pressure before performing this diagnosis.				
1	1. Disconnect the engine oil pressure sensor. 2. Turn the ignition switch to the RUN position, with the engine off. Does the engine oil pressure gauge read high pressure?	—	*Go to Step 2*	*Go to Step 3*
2	Replace the engine oil pressure sensor. Is the repair complete?	—	System OK	—
3	1. Test circuit 31 for a short to ground. 2. If circuit 31 is OK, replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—

Engine Oil Pressure Gauge Inaccurate or Inoperative

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for proper engine oil pressure before performing this diagnosis.				
1	Does the oil pressure gauge always read low pressure?	—	Go to *Engine Oil Pressure Gauge Always Low*	*Go to Step 2*
2	1. Disconnect the oil pressure sensor. 2. Using IP tester J33431, connect one red lead to the sensor connector terminal A and connect the other red lead to ground. 3. Turn the ignition switch to the RUN position, with the engine off. 4. While observing the oil pressure gauge, set the resistance dial on the tester to 0Ω, 500Ω, and 1,000Ω. Does the oil pressure gauge move from 0 psi to 30 psi and then to 80 psi?	—	*Go to Step 3*	*Go to Step 4*
3	1. Check for a poor connection at the oil pressure sensor. 2. If the connections are OK, replace the oil pressure sensor. Is the repair complete?	—	System OK	—
4	1. Check for an open or poor connection in circuit 31 between the oil pressure sensor and the instrument cluster. 2. If OK, replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—

Fuel Gauge Inaccurate or Inoperative

Step	Action	Value(s)	Yes	No
1	Using a scan tool, command the powertrain control module (PCM) to deflect the fuel gage to half full. Does the fuel gage read half full?	—	Go to OBD II Diagnostic System Check	Go to *Step 2*
2	1. Inspect CKT 1936 between the instrument cluster and the PCM for an open or poor connection. 2. If CKT 1936 is OK, replace the cluster. Refer to *IP Cluster Replacement.* Did you complete the repair?	—	System OK	—

CHECK GAGES Indicator Always On

Step	Action	Value(s)	Yes	No
1	1. Run the engine at idle speed. 2. Measure the system voltage across the battery. Is the voltage outside of the specified range?	11.2–16.5V	Go to *Starting System Check* or *Charging System Check* in Engine Electrical	Go to *Step 2*
2	1. Inspect for PCM diagnostic trouble codes relative to the charging system, oil pressure or temperature. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* (V6) or *Lubrication Specifications* (V8) in Engine Controls. 2. Verify that the following conditions exist: • The coolant temperature is below approximately 122°C (252°F) for V6 VIN K or below 118°C (244°F) for V8 VIN G. • The oil pressure is above 8.3 psi (minimum for pump). Anything below 3 to 5 psi should cause the check gauges light to turn on. Do these conditions exist?	—	Go to *Step 3*	Go to *Instrument Cluster System Check*
3	Inspect for an open or poor connection in CKT 225. If the circuit is open, the generator will not generate voltage and the vehicle may be running only on battery power. Did you repair an open or a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 4*
4	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

CHECK GAGES Indicator Inoperative

Step	Action	Value(s)	Yes	No
1	Start the engine while monitoring the check gauges indicator. (The check gauges indicator will stay on continuously if engine is not started.) Did the check gauges indictor turn ON for approximately 1 second?	—	Go to *Step 2*	Go to *Step 3*
2	Inspect for the following systems: • Charging system, refer to *Charging System Check* • Coolant temperature, refer to Engine Cooling • Oil pressure, refer to Engine Mechanical Is the check gauges indicator still inoperative?	—	Go to *Step 3*	Go to *Instrument Cluster System Check*
3	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Fasten Safety Belt Indicator Always On

Step	Action	Value(s)	Yes	No
1	1. Latch the driver's seat belt. 2. Disconnect the body control module (BCM) connector C2 and connector C3. 3. Turn the ignition switch to run. Is the fasten seat belt indicator on?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test circuit 237 for a short to B+ 2. If circuit 237 is OK, Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—
3	Connect a test lamp between the BCM connector C2 terminal B and connector C3 terminal C13. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test circuit 238 for a short to ground. 2. If circuit 238 is OK, replace the seat belt switch. Is the repair complete?	—	System OK	—
5	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Fasten Safety Belt Indicator Inoperative

Step	Action	Value(s)	Yes	No
1	1. Disconnect the body control module (BCM) connector C2 and connector C3. 2. Connect a fused jumper from BCM connector C2 terminal B to connector C3 terminal C4. Is the fasten seat belt indicator on?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at the BCM connector C3 terminal C4. 2. If the connection is OK, Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
3	1. Leave the fused jumper connected. 2. Connect a test lamp from instrument cluster connector terminal A12 to ground. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 4*
4	Repair the open in circuit 237 between the BCM and the instrument cluster. Is the repair complete?	—	System OK	—
5	1. Test for an open in circuit 650 between the instrument cluster and S216. 2. Test for a poor connection at the instrument cluster connector. 3. If circuit 650 and the connections are OK, replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—

Low Engine Coolant Indicator Always On

Step	Action	Value(s)	Yes	No
Important: All V8 engines are equipped with a coolant level latching circuit. Refer to Circuit Description and cycle ignition from OFF to RUN before performing this procedure.				
1	1. Disconnect the engine coolant level sensor. 2. Put the igniton in the RUN position and turn the engine OFF. Does the indicator turn ON?	—	Go to *Step 2*	Go to *Step 4*
2	1. Turn the ignition OFF. 2. Disconnect C200A from C200D. 3. Connect a test lamp from terminal A17 on C200A to B+. Does the test lamp light?	—	Go to *Step 3*	Go to *Step 5*
3	Repair a short to ground CKT 68 between C200A and the engine coolant level sensor. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
4	Replace the engine coolant level sensor. Refer to *Coolant Level Sensor Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
5	Connect a test lamp from terminal A17 on C200D to B+. Does the test lamp light?	—	Go to *Step 6*	Go to *Step 9*
6	1. Disconnect connector C3 from the body control module (BCM). 2. Connect a test lamp form terminal C15 on connector C3 to B+. Does the test lamp light?	—	Go to *Step 7*	Go to *Step 10*
7	1. Remove the instrument cluster. 2. Connect a test lamp from instrument cluster harness connector terminal A6 to B+. Does the test lamp light?	—	Go to *Step 8*	Go to *Step 11*
8	Repair a short to ground in CKT 68 between the instrument cluster, C200D and body control module (BCM) connector C3. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
9	Repair the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
10	Repair the body control module. Refer to *Body Control Module Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
11	Repair the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Low Engine Coolant Indicator Inoperative

Step	Action	Value(s)	Yes	No
Important: All V8 engines are equipped with a coolant level latching circuit. Refer to Circuit Description and cycle ignition from OFF to RUN before performing this procedure.				
1	1. Disconnect the engine coolant level sensor. 2. Connect a fused jumper from connector terminal B to ground. 3. Put the ignition in the RUN position and turn the engine OFF. Does the indicator turn ON?	—	Go to *Step 2*	Go to *Step 3*
2	Inspect for an open or a poor connection in ground CKT 250 to terminal C of the engine coolant level sensor connector. Did you repair an open or a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Coolant Level Sensor Replacement*
3	1. Turn the ignition OFF. 2. Backprobe with a fused jumper from C200D terminal A17 to ground. 3. Put the ignition in the RUN position and turn the engine OFF. Does the indicator turn ON?	—	Go to *Step 4*	Go to *Step 5*
4	Repair an open or a poor connection in CKT 68 between C200A and the engine coolant level sensor. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
5	1. Inspect for an open or a poor connection in CKT 68 between C219 and instrument cluster connector terminal A6. 2. Inspect the low coolant indicator bulb. Did you repair an open or a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 6*
6	Service the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Low Engine Oil Level Indicator Always On

Step	Action	Value(s)	Yes	No
1	1. Disconnect connector C220. 2. Turn the ignition switch to the RUN position and the engine OFF. Is the LOW oil indicator on?	—	Go to *Step 2*	Go to *Step 4*
2	Inspect for a short to ground in CKT 1173 between the instrument cluster and connector C220. Did you repair a short?	—	Go to *Instrument Cluster System Check*	Go to *Step 3*
3	Service the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
4	Inspect CKT 1173 for a short to ground between connector C200 and the powertrain control module (PCM). Did you repair a short?	—	Go to *Instrument Cluster System Check*	Go to *A Powertrain On Board Diagnostic (OBD) System Check* (V6) or *A Powertrain On Board Diagnostic (OBD) System Check* (V8) in Engine Controls

Low Engine Oil Level Indicator Inoperative

Step	Action	Value(s)	Yes	No
1	Turn the ignition switch to the RUN position while monitoring the LOW oil indicator. Does the LOW oil indicator turn on for approximately 1 second?	—	Go to *Step 2*	Go to *Step 3*
2	1. Inspect for an open or poor connection in CKT 1173 between the instrument cluster and the powertrain control module (PCM). 2. Inspect for a poor connection at instrument cluster connector terminal A15. Did you repair an open or poor connection?	—	Go to *Instrument Cluster System Check*	Go to *A Powertrain On Board Diagnostic (OBD) System Check* (V6) or *A Powertrain On Board Diagnostic (OBD) System Check* (V8) in Engine Controls
3	Service the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Speedometer Inaccurate (J 38522 Available)

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for powertrain control module (PCM) DTCs before performing this diagnosis. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* (V6 VIN K) or *A Powertrain On Board Diagnostic (OBD) System Check* (V8 VIN G).				
1	1. Disconnect the powertrain control module (PCM) connector C1. 2. Connect a *J 33431-B* signal generator and instrument cluster tester to the PCM connector circuit 817. 3. Set the *J 33431-B* to 54 mph. 4. Turn the ignition switch to the RUN position. Does the speedometer measure approximately 54 mph (87 kph)?	54 mph (87 kph)	*Go to Step 2*	*Go to Step 3*
2	1. Check circuit 817 for a poor connection at the PCM. 2. If OK, replace the PCM. Refer to *PCM Replacement/Programming* (V6 VIN K) or *PCM Replacement/Programming* (V8 VIN G). Is the repair complete?	—	System OK	—
3	1. Disconnect the instrument cluster. 2. Connect a test lamp from the PCM connector circuit 817 to ground. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	Repair the short to B+ in circuit 817. Is the repair complete?	—	System OK	—
5	Connect a test lamp from PCM connector circuit 817 to B+. Does the test lamp light?	—	*Go to Step 6*	*Go to Step 7*
6	Repair the short to ground in circuit 817. Is the repair complete?	—	System OK	—

Speedometer Inaccurate (J 38522 Available) (cont'd)

Step	Action	Value(s)	Yes	No
7	1. Connect a fused jumper from the PCM connector circuit 817 to ground. 2. Connect a test lamp from the instrument cluster connector circuit 817 to B+. 3. Does the test lamp light?	—	*Go to Step 8*	*Go to Step 9*
8	1. Check circuit 817 for a poor connection at the instrument cluster. 2. If the connection is OK, replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	System OK	—
9	Repair the open or poor connection in circuit 817 between the instrument cluster and the PCM. Is the repair complete?	—	System OK	—

Speedometer and/or Odometer Inoperative

Step	Action	Value(s)	Yes	No
1	Did you inspect for Powertrain Control Module DTC's?	—	Go to *Step 2*	Go to *A Powertrain On Board Diagnostic (OBD) System Check* (V6) or *A Powertrain On Board Diagnostic (OBD) System Check* (V8)
2	1. Disconnect the PCM. 2. Disconnect the instrument cluster. 3. Connect a DVM between the instrument cluster connector terminal B12 and the PCM connector C1 terminal 55. Does the meter read less than 1 Ω?	—	Go to *Step 3*	Go to *Step 4*
3	Inspect for a poor connection at instrument cluster terminal B12. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 5*
4	Repair the open in CKT 817 between the instrument cluster and S242. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
5	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Tachometer Inaccurate or Inoperative (V6 VIN K)

Step	Action	Value(s)	Yes	No
1	1. Disconnect the electronic ignition control module connector (14 Way). 2. Connect *J 33431-B* J 33431 to connector E and ground on the electronic ignition control module connector. 3. Set the tester to 54 mph (60 Hz.). 4. Put the ignition in the RUN position and turn the engine OFF. Does the tachometer indicate approximately 1400 rpm?	—	Go to *Step 2*	Go to *Step 4*
2	Inspect for a poor connection at the electronic ignition control module connector. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *Step 3*
3	Replace the electronic ignition control module. Is the repair complete?	—	Go to *Instrument Cluster System Check*	—
4	Inspect for an open, short to ground or B+ in CKT 121. Did you do any repairs?	—	Go to *Instrument Cluster System Check*	Go to *Step 5*
5	Replace the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Tachometer Inaccurate or Inoperative (V8 VIN G)

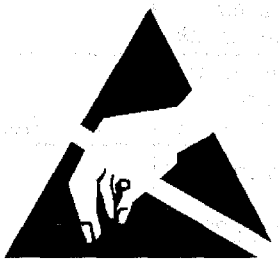
Step	Action	Value(s)	Yes	No
1	1. Disconnect the powertrain control module connector C2. 2. Connect *J 33431-B* J 33431 to connector C2 terminal 35 of the powertrain control module connector and ground. 3. Set the tester to 54 mph (60 Hz.). 4. Put the ignition in th RUN position and turn the engine OFF. Does the tachometer indicate approximately 1900 rpm?	—	Go to *Step 2*	Go to *Step 3*
2	Inspect for a poor connection at powertrain control module connector C2 terminal 35. Did you repair a poor connection?	—	Go to *Instrument Cluster System Check*	Go to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls
3	Inspect for an open, short to ground or B+ in CKT 121. Did you do any repairs?	—	Go to *Instrument Cluster System Check*	Go to *Step 4*
4	Repair the instrument cluster. Refer to *IP Cluster Replacement.* Is the repair complete?	—	Go to *Instrument Cluster System Check*	—

Schematic and Routing Diagrams

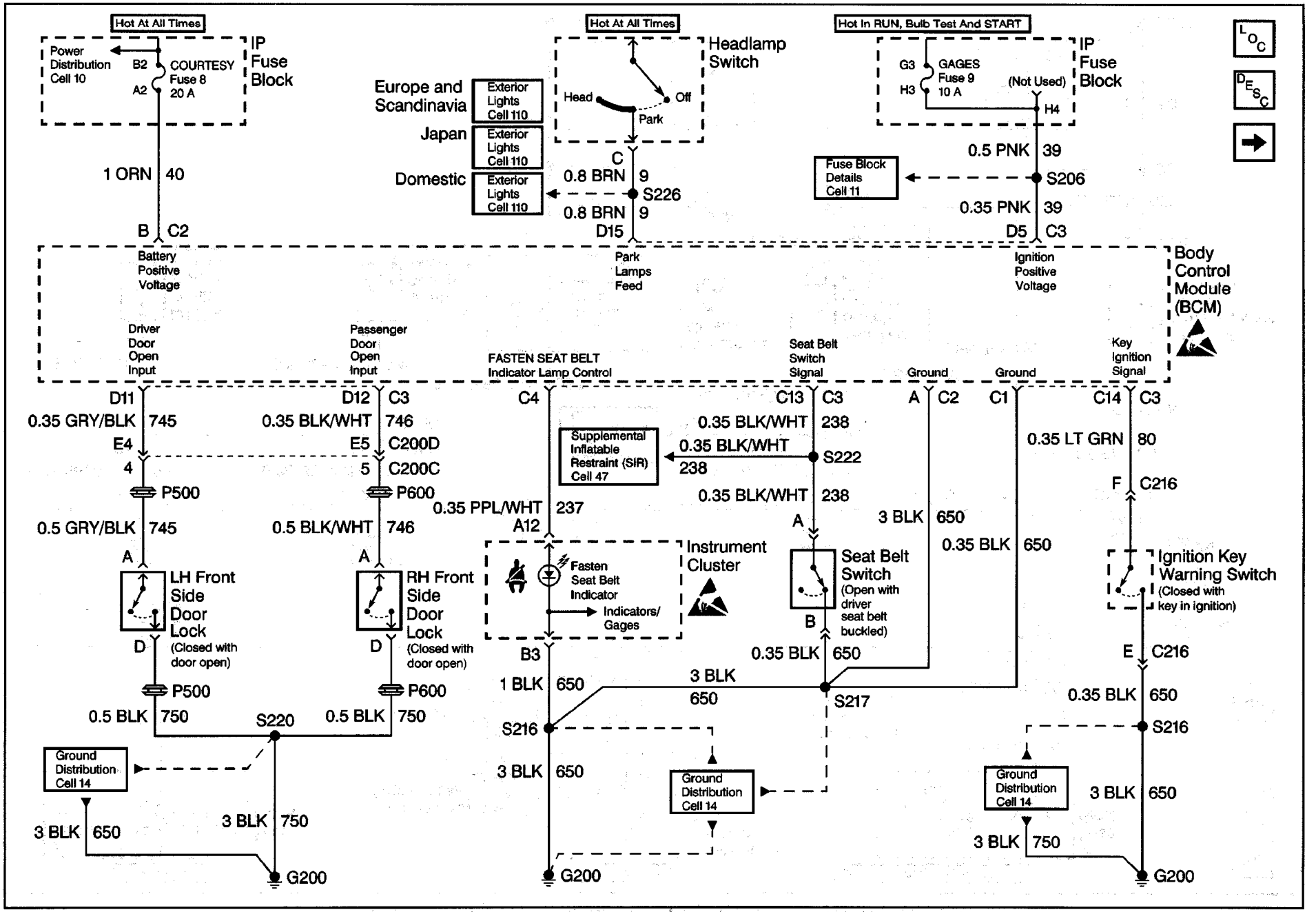
Audible Warnings Schematic References

Reference on Schematic	Section Number Subsection Name
Exterior Lights Cell 110	8—Lighting Systems
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems
Supplemental Inflatable Restraints (SIR) Cell 47	9—SIR

Audible Warnings Schematic Icons

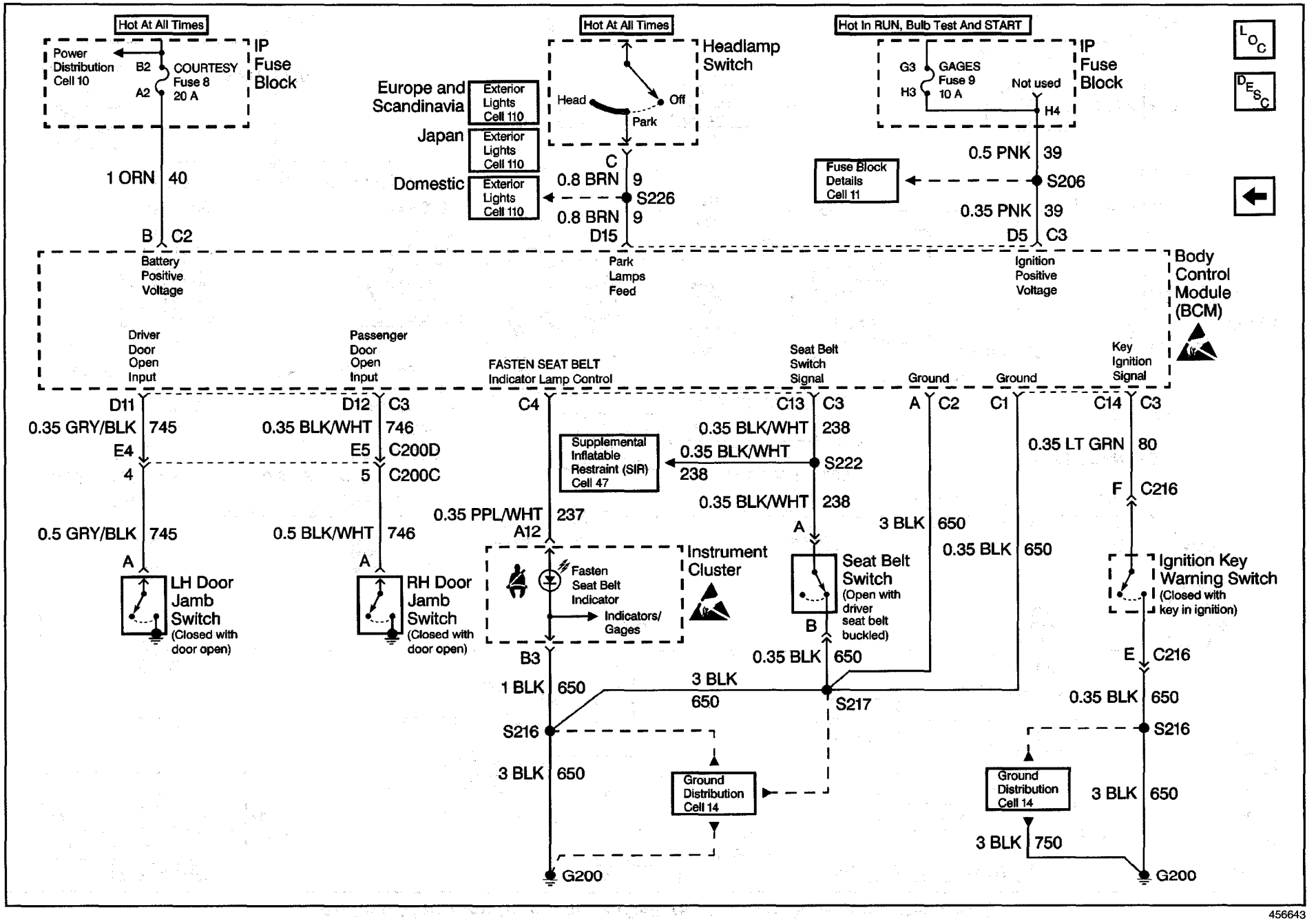
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Caution and Notices.

Audible Warnings Schematics (Cell 76: Without Door Jamb Switches)



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Audible Warnings Schematics (Cell 76: With Door Jamb Switches)



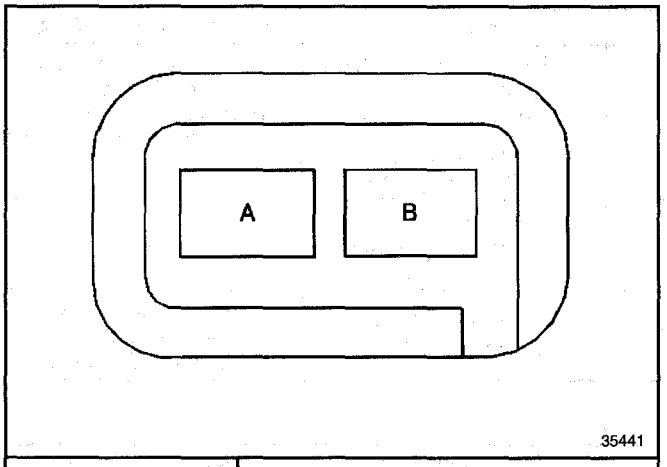
Diagnostic Information and Procedures

Audible Warnings Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Door Jamb Switch	Near base of left and right A-pillar	*Harness Routing Views* in Wiring Systems	—
Front Side Door Lock	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Headlamp Switch	On the left side of the instrument panel	*Instrument Cluster Component Views*	*Lighting Systems Connector End Views* in Lighting Systems
Ignition Key Warning Switch	Part of steering column	—	—
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views*	*Instrument Cluster Connector End Views*
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views*	—
Seat Belt Switch	Part of the driver seat buckle assembly	*Harness Routing Views* in Wiring Systems	*Audible Warnings Connector End Views* in Wiring Systems
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S206	In the instrument panel harness, at the rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S226	Instrument panel harness, approximately 7 cm (3 in) into headlamp switch breakout	—	—

Audible Warnings Connector End Views

Seat Belt Switch



Connector Part Information	• 1204-7663 • 2 Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK/WHT	238	Seat belt switch signal
B	BLK	650	Ground

A Diagnostic System Check - Audible Warnings

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to the RUN position. 2. Turn the headlamp switch to the PARK position or the Head position. 3. Turn the headlamp switch to the OFF position.	No lights ON warning sounds.	*Lights On Chime On with Ignition in Run*
2	1. Remove the ignition key from the ignition switch. 2. Turn the headlamp switch to the PARK position or the Head position. 3. Turn the headlamp switch to the OFF position.	The lights ON warning sounds as long as the headlamp switch is in the PARK or HEAD position.	*Lights On Chime Inoperative*
3	1. Place the ignition key into the ignition switch. 2. Turn the ignition switch to the OFF position. 3. Open the driver door. 4. Close the driver door.	The ignition key warning sounds as long as the driver door is open.	• *Key-in-Ignition Chime Inoperative* • *Key-in-Ignition Chime Always On* • *Key-in-Ign Chime On with LF Door Closed*

A Diagnostic System Check - Audible Warnings (cont'd)

Step	Action	Normal Result(s)	Abnormal Result(s)*
4	1. Turn the ignition switch to the OFF position. 2. Close the driver door. 3. Unlatch the driver's seat belt. 4. Turn the ignition switch to the RUN position.	The fasten seat belt warning sounds for 5–8 seconds.	*Fasten Safety Belt Chime Inoperative*
5	1. Close the driver door 2. Latch the driver's seat belt. 3. Turn the ignition switch to the OFF position. 4. Turn the ignition switch to the RUN position.	The fasten seat belt warning does not sound.	*Fasten Safety Belt Chime Always On*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Fasten Safety Belt Chime Always On

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition switch to the RUN position. 2. Fasten the driver's seat belt. Does the fasten seat belt indicator remain on after 10 seconds?	—	Go to Fasten Safety Belt Indicator Always On	*Go to Step 2*
2	Replace the body control module (BCM). Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—

Fasten Safety Belt Chime Inoperative

Step	Action	Value(s)	Yes	No
1	1. Unbuckle the driver's seat belt. 2. Disconnect the Body Control Module (BCM) connector C2 and connector C3. 3. Connect a test lamp between the BCM connector C2 terminal B and connector C3 terminal C13. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at terminal C13. 2. If OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
3	1. Disconnect the seat belt switch. 2. Connect a test lamp from the BCM connector C2 terminal B to the seat belt switch connector terminal A. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	Repair the open in circuit 238, between the seat belt switch and the BCM. Is the repair complete?	—	System OK	—
5	Connect a test lamp from the BCM connector C2 terminal B to the seat belt switch connector terminal B. Does the test lamp light?	—	*Go to Step 7*	*Go to Step 6*
6	Repair the open in circuit 650 from the seat belt switch to S217. Is the repair complete?	—	System OK	—
7	1. Test the seat belt switch for a poor connection. 2. If OK, replace the seat belt switch. Is the repair complete?	—	System OK	—

Key-in-Ignition Chime Always On

Step	Action	Value(s)	Yes	No
1	1. Remove the ignition key from the ignition key lock cylinder. 2. Disconnect the body control module (BCM) connector C3. 3. Connect a test lamp from B+ to BCM connector C3 terminal C14. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Replace the body control module (BCM). Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
3	1. Test for a short to ground in circuit 80. 2. If circuit 80 is OK, replace the ignition key warning switch. Refer to *Ignition Lock Cylinder Replacement - On Vehicle.* Is the repair complete?	—	System OK	—

Key-in-Ignition Chime Inoperative

Step	Action	Value(s)	Yes	No
1	1. Place the key into the ignition switch. 2. Turn the ignition switch to the OFF position. 3. Close the passenger door and the rear compartment lid. 4. Open the driver door. Are the courtesy lamps ON?	—	*Go to Step 2*	Go to *Courtesy Lamps Inoperative with Doors Open (With Door Jamb Switches)* or *Courtesy Lamps Inoperative with Doors Open (Without Door Jamb Switches).*
2	1. Disconnect the BCM connector C3. 2. Use a DMM to test the continuity between the BCM connector C3 terminal C14 and ground. Is there continuity?	0 Ω	*Go to Step 3*	*Go to Step 4*
3	1. Test for a poor connection at the BCM connector C3. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
4	1. Disconnect connector C216. 2. Use a DMM to test the continuity between connector C216 terminal E and ground. Is there continuity?	—	*Go to Step 6*	*Go to Step 5*
5	Repair the open in circuit 650, between the ignition key warning switch and S216. Is the repair complete?	—	System OK	—
6	1. Test for a poor connection at connector C216 terminal E. 2. Test for an open in circuit 80, between the ignition key warning switch and the BCM. 3. If OK, replace the ignition key warning switch. Refer to *Ignition Lock Cylinder Replacement - On Vehicle.* Is the repair complete?	—	System OK	—

Key-in-Ign Chime On with LF Door Closed

Step	Action	Value(s)	Yes	No
1	Are the interior lights on at all times?	—	Go to Interior Lights	*Go to Step 2*
2	Replace the body control module (BCM). Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Lights On Chime On with Ignition in Run

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition switch to the RUN position. 2. Using a test lamp connected to ground, backprobe body control module (BCM) connector C3 terminal D5. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at BCM connector C3 terminal D5. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
3	Repair the open in circuit 39 between the BCM and S206. Is the repair complete?	—	System OK	—

Lights On Chime Inoperative

Step	Action	Value(s)	Yes	No
1	1. Turn the headlamp switch to the ON position. 2. Using a test lamp connected to ground, backprobe body control module (BCM) connector C3 terminal D15. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at BCM connector C3 terminal D15. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
3	Repair the open in circuit 9 between the BCM and S226. Is the repair complete?	—	System OK	—

Repair Instructions

IP Service Precautions

The SDM can maintain enough voltage to cause a deployment for up to 10 minutes after any of the following situations occur:

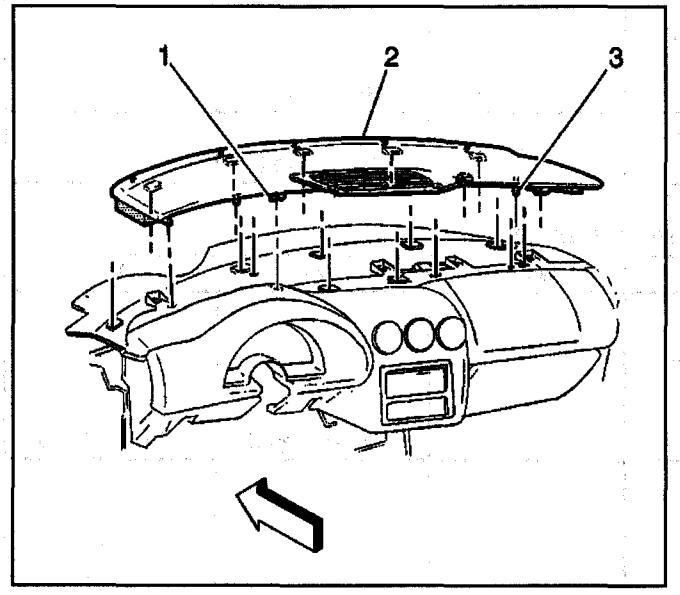
- The ignition switch is turned to the OFF position.
- The battery is disconnected.
- The fuse that is powering the SDM is removed.

Many of the service procedures require removal of the AIR BAG fuse and disconnection of the deployment loops. These actions help avoid an accidental deployment. If the inflator modules are disconnected from the deployment loops, service can begin immediately without waiting for the 10 minute time period to expire.

Trim Pad Replacement - IP Upper

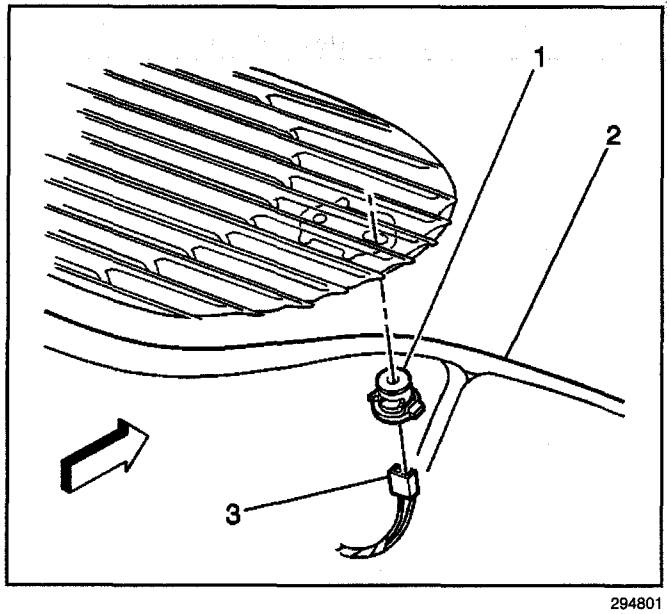
Removal Procedure

1. Remove the windshield side garnish moldings. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* in Stationary Windows.
2. Gently lift the instrument panel (I/P) trim pad (2) to disengage the dual-lock fasteners (1).



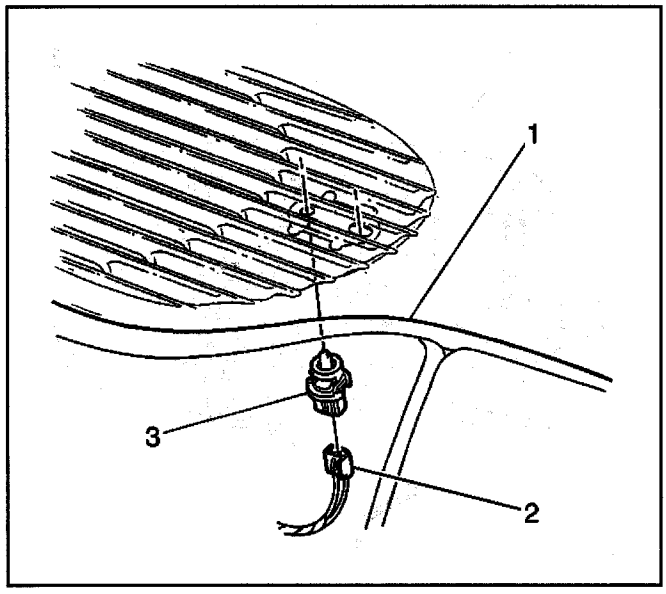
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3. Remove the daytime running lamp ambient light sensor (1).



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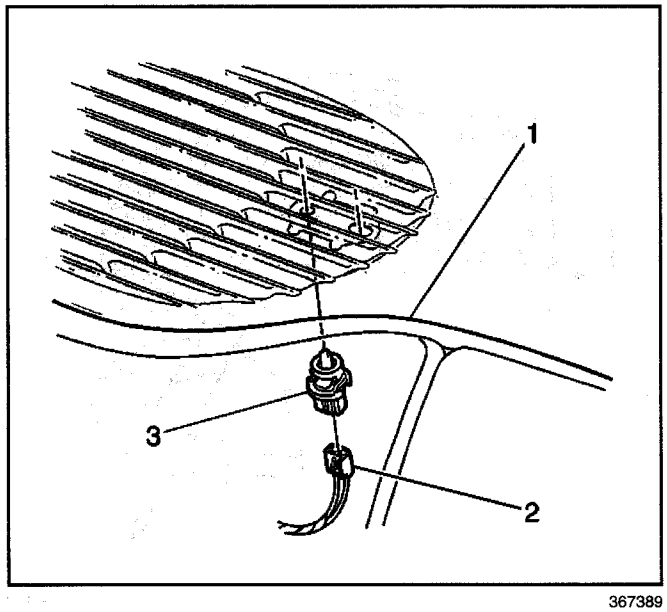
4. Remove the security indicator lamp (3).
5. Remove the I/P upper trim panel (1).



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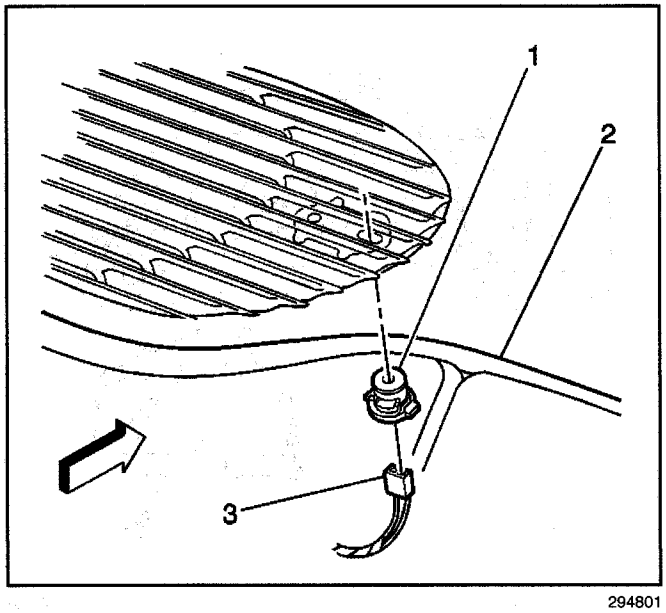
Installation Procedure

1. Set the I/P trim pad (1) into place.
2. Install the security indicator lamp (3).

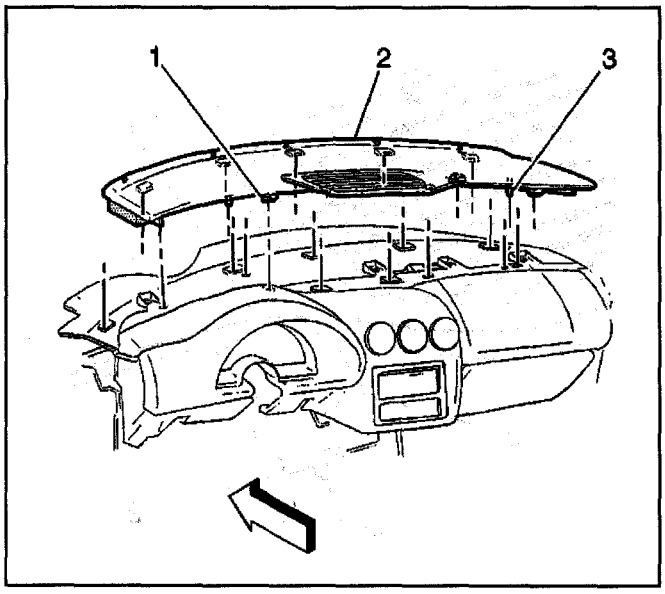


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3. Install the daytime running lamp ambient light sensor (1).

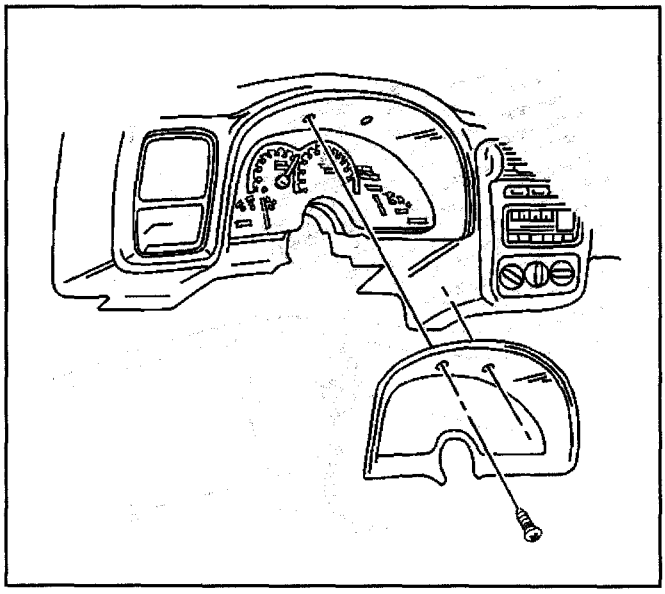


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4. Using the locator pins (3), align the I/P upper trim panel (2).
5. Apply pressure to the rear of the I/P upper trim panel (2), engaging the dual lock fasteners (1).
6. Apply pressure to the front of the I/P upper trim panel (2), engaging the dual lock fasteners (1).
7. Install the windshield side garnish moldings. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* in Stationary Windows.

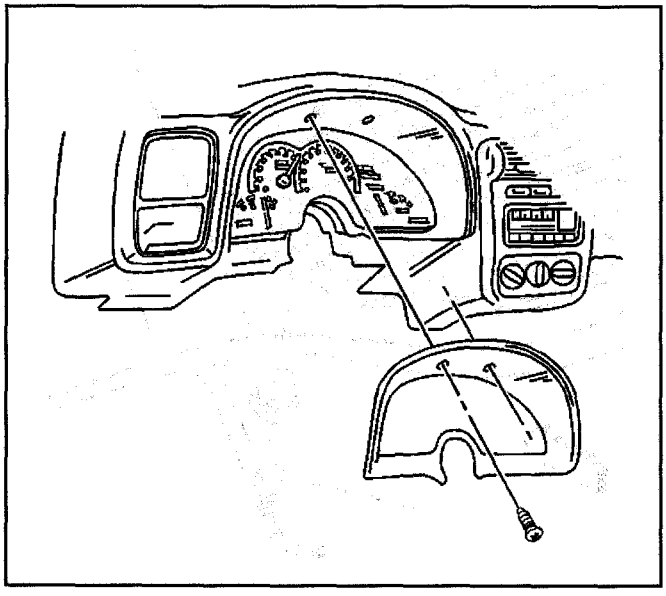


367397

Bezel Replacement - IP Cluster (Chevrolet)

Removal Procedure

1. Disable the SIR system. Refer to *Disabling the SIR System.*
2. Remove the instrument panel insulator. Refer to *Insulator Replacement - IP (Left Side).*
3. Remove the knee bolster bracket. Refer to *Bracket Replacement - Knee Bolster.*
4. Lower the steering column.
5. Remove the instrument panel cluster trim bezel screws.
6. Remove the instrument panel cluster trim bezel.



367397

Installation Procedure

1. Install the instrument panel cluster trim bezel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the instrument panel cluster trim bezel screws.

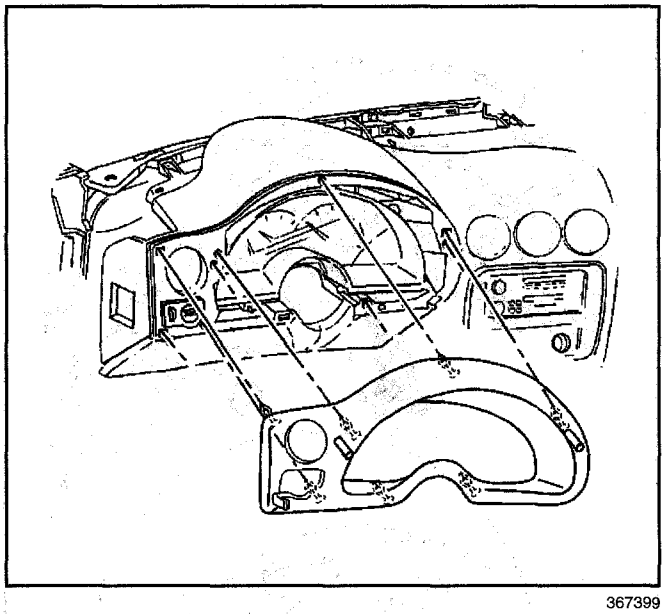
   Tighten

   Tighten the instrument panel cluster trim bezel screws to 1.9 N·m (17 lb in).
3. Raise the steering column.
4. Install the knee bolster bracket. Refer to *Bracket Replacement - Knee Bolster.*
5. Install the instrument panel insulator. Refer to *Insulator Replacement - IP (Left Side).*
6. Enable the SIR system. Refer to *Enabling the SIR System.*

Bezel Replacement - IP Cluster (Pontiac)

Removal Procedure

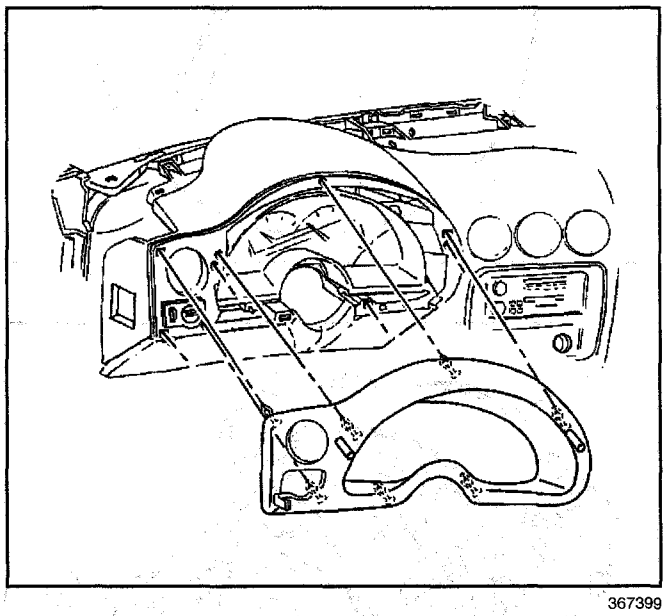
1. Remove the fog lamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front Pontiac)*.
2. Unsnap the instrument panel cluster trim bezel.
3. Remove the instrument panel cluster trim bezel from the vehicle.



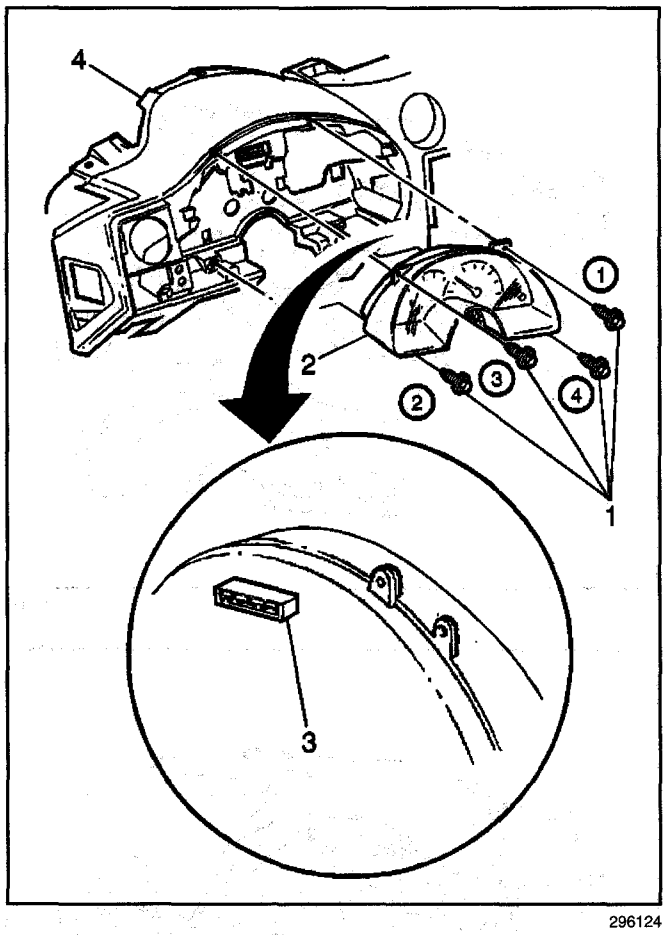
367399

Installation Procedure

1. Install the instrument panel cluster trim bezel to the vehicle.
2. Snap the instrument panel cluster trim bezel to the IP.
3. Install the fog lamp switch. Refer to *Fog Lamp Switch Replacement - Front (Front Pontiac)*.



367399



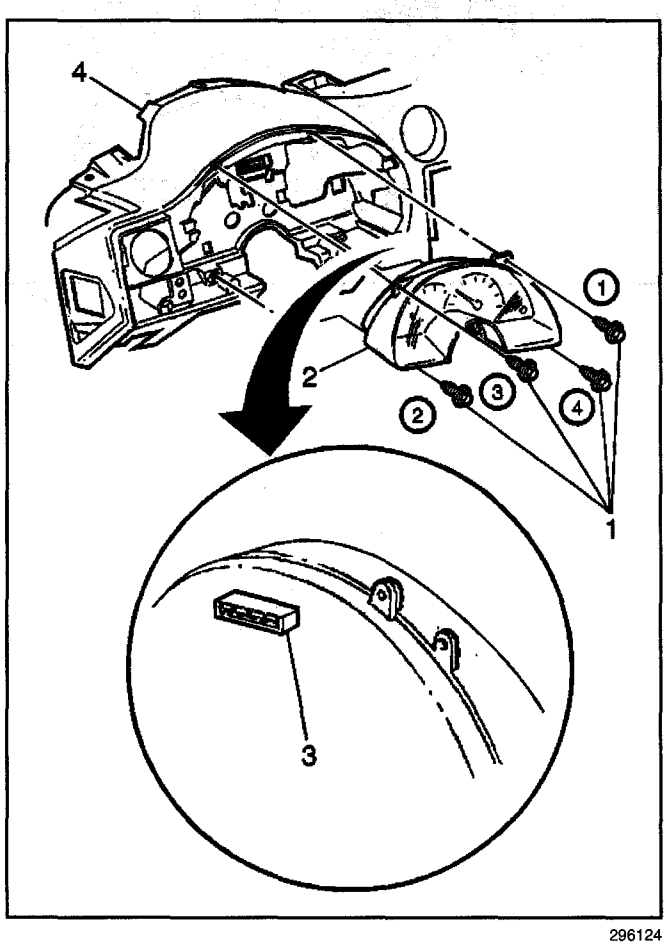
296124

IP Cluster Replacement

Removal Procedure

1. Remove the I/P trim pad. Refer to *Trim Pad Replacement - IP Upper.*
2. Remove the I/P cluster bezel. Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac).*
3. Remove the instrument cluster bolts (1).
4. Remove the instrument cluster (2).

   Gently pull the cluster straight out to disconnect the electrical connector (3).



296124

Installation Procedure

1. Install the instrument cluster (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the instrument cluster bolts (1).

   Tighten

   Tighten the instrument cluster bolts (1) to 2.2 N·m (19 lb in) in sequence as shown.
3. Install the I/P cluster bezel. Refer to *Bezel Replacement - IP Cluster (Chevrolet)* or *Bezel Replacement - IP Cluster (Pontiac).*
4. Install the I/P trim pad. Refer to *Trim Pad Replacement - IP Upper.*
5. Synchronize the instrument panel cluster (IPC).

Instrument Panel Cluster Synchronization

Tools Required

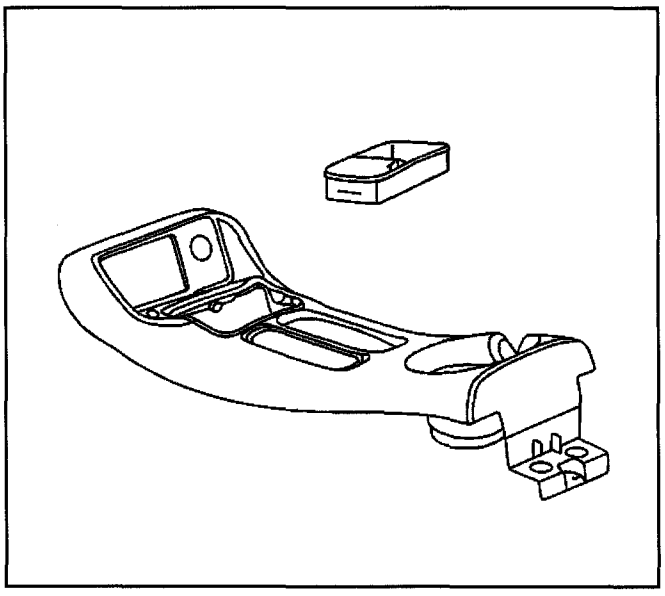
Scan Tool

When installing a new I/P cluster it must be synchronized to the SIR module. To synchronize the new cluster perform the following:

1. Connect the *Scan Tool* to the data link connector (DLC).
2. On the Main Menu select the DIAGNOSTICS key (F0:).
3. From the menu under F0: DIAGNOSTICS select the model year ((X) 1999).
4. From the menu under (X) 1999 press the PASSENGER CAR key.
5. Under the PASSENGER CAR menu select the BODY key (F1:).
6. From the menu under F1: BODY select the F key.
7. From the menu under F select either the (1) CHEVROLET or (2) PONTIAC key.
8. On the menu under the vehicle chosen select either the (K) 3.8L V8 L36 or (G) 5.7L V8 LS1 key.
9. On the menu under the engine chosen select the INSTRUMENT PANEL CLUSTER (F1:) key.
10. From the menu under F1: INSTRUMENT PANEL CLUSTER select the SPECIAL FUNCTIONS (F2:) key.
11. From the menu under F2: SPECIAL FUNCTIONS select the SYNCHRONIZE IPC and SIR (F1:) key.
12. When the F1: SYNCHRONIZE IPC and SIR is selected the following will appear on the screen:

    Do you want to synchronize IPC and SIR modules–Yes or No.
13. Select the Yes key.
14. The screen will display: IPC and SIR modules–Now synchronizing modules.

    This will remain until the procedure is complete.
15. If the procedure is completed successfully the screen will display: Module Synchronization Complete.
16. If communication is lost with the SIR or IPC, the screen will display: Loss of Communications with Vehicle–Check Diagnostics Link Connector–Check Ignition (On/Off).
17. Press the Exit key to return to the previous menu.

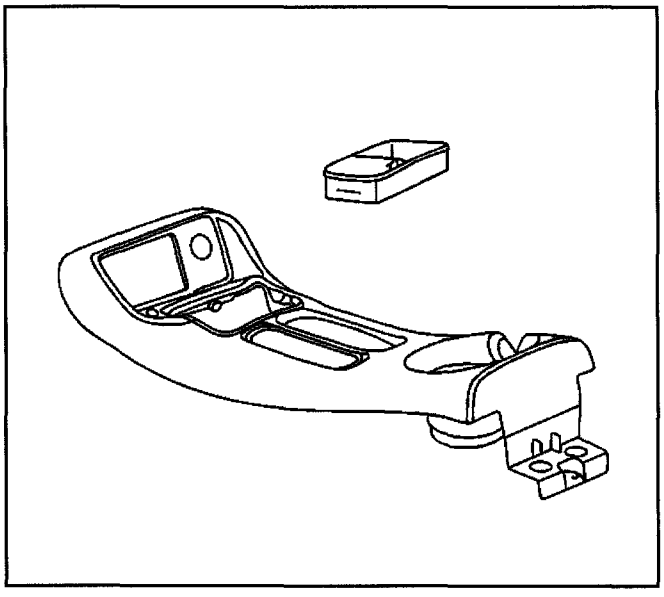


367408

Ashtray Replacement

Removal Procedure

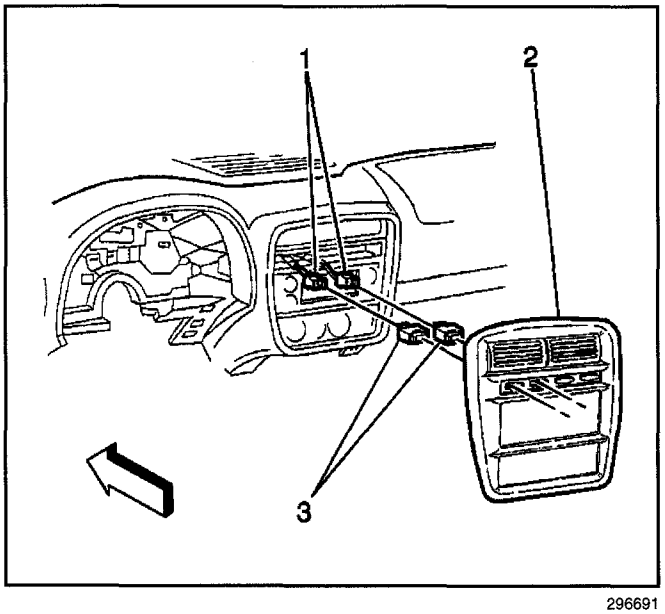
1. Open the ashtray door.
2. Gently pull the ashtray up and out from the console.



367408

Installation Procedure

1. Install the ashtray to the console.
2. Close the ashtray door.



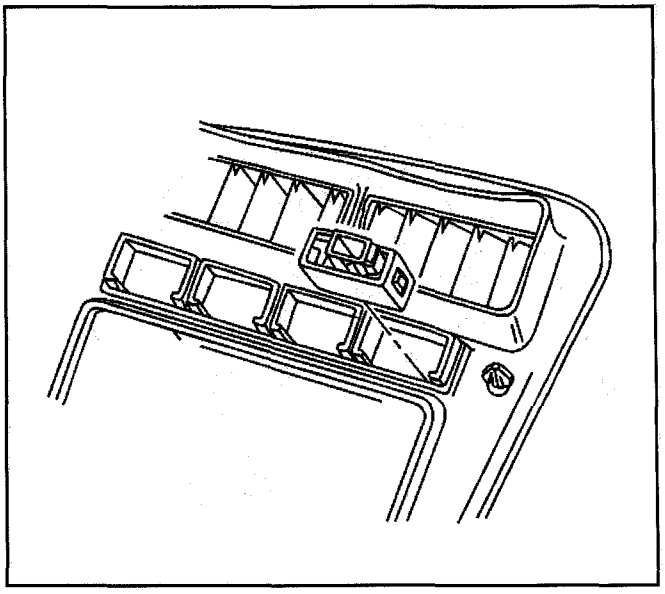
296691

Trim Plate Replacement - IP Accessory (Chevrolet)

Removal Procedure

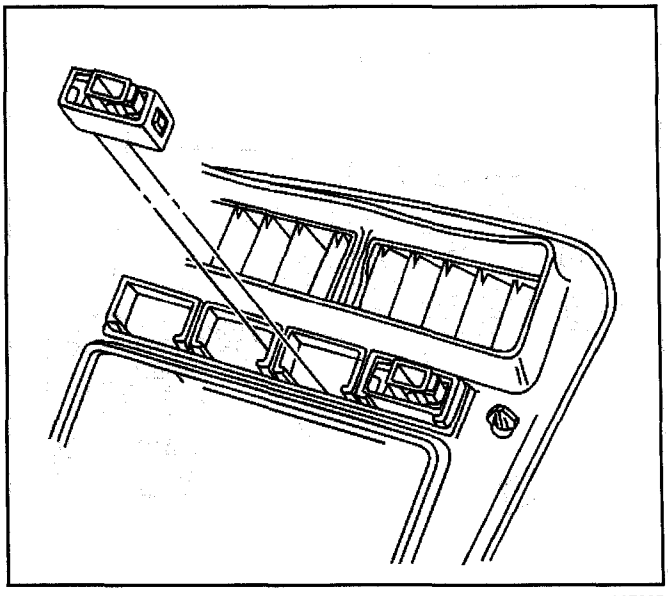
1. Unsnap the instrument panel accessory trim plate (2).
2. Remove the electrical connectors (1) from the switches (3), if equipped.

3. Remove the fog lamp or second gear start switch located in position 1, if equipped.



366717

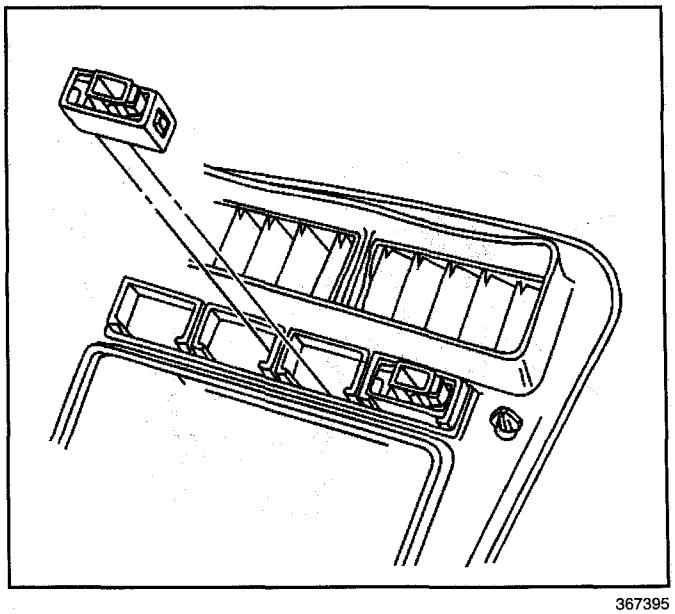
4. Remove the second gear start, rear fog lamp, or traction control switch located in position 2, if equipped.



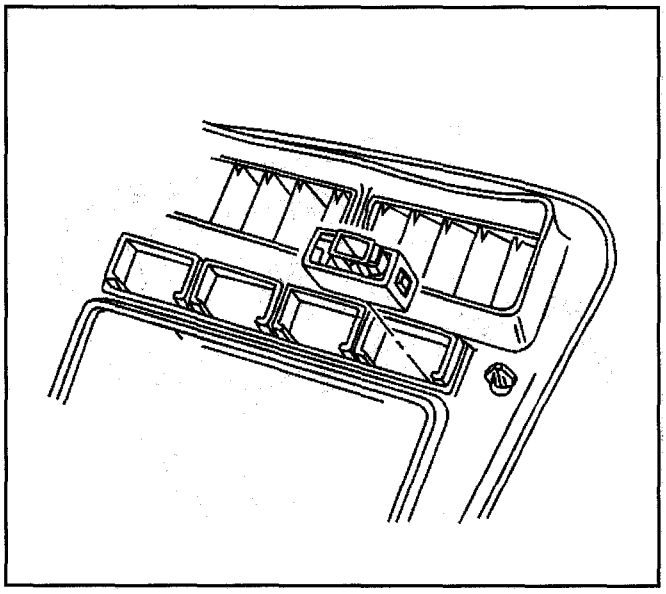
367395

Installation Procedure

1. Install the second gear start, rear fog lamp, or traction control switch located in position 2, if equipped.

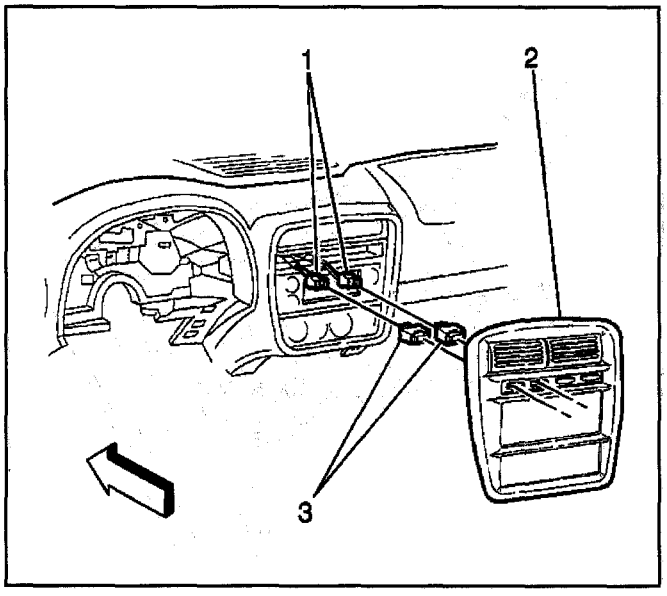


367395



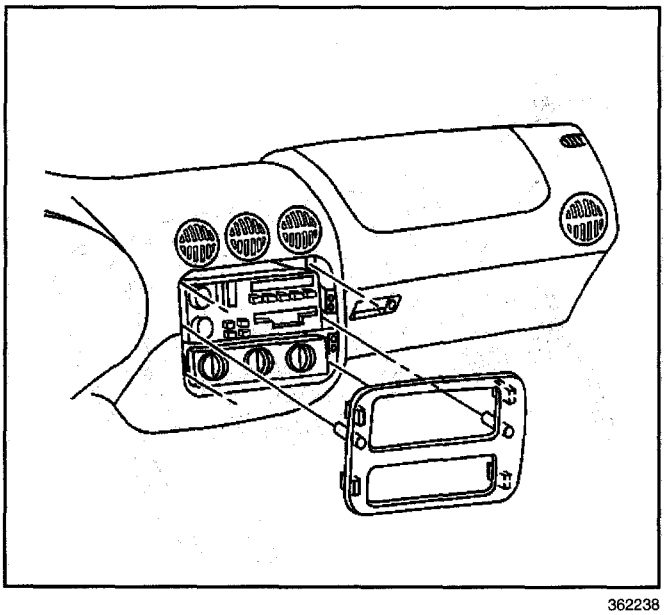
366717

2. Install the fog lamp or second gear start switch located in position 1, if equipped.



296691

3. Install the electrical connectors (1) to the switches (3), if equipped.
4. Snap the instrument panel accessory trim plate (2) to the I/P.



362238

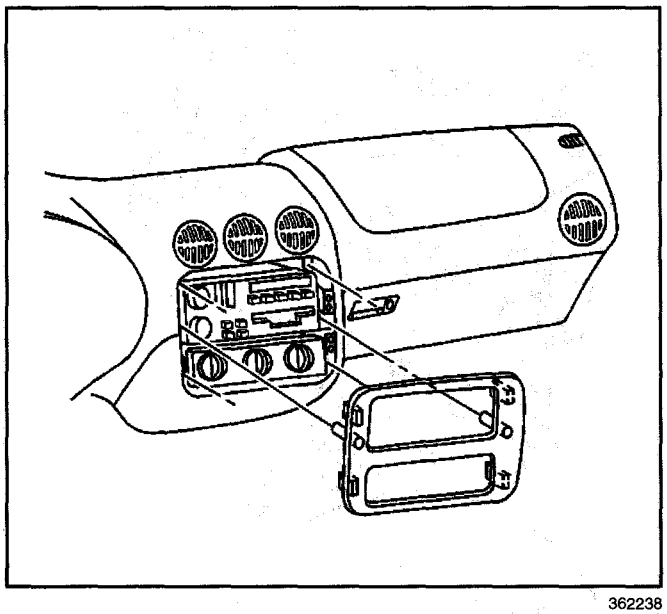
Trim Plate Replacement - IP Accessory (Pontiac)

Removal Procedure

1. Unsnap the instrument panel accessory trim plate.
2. Remove the I/P accessory trim plate from the vehicle.

Installation Procedure

1. Install the I/P accessory trim plate to the vehicle.
2. Snap the instrument panel accessory trim plate to the I/P.

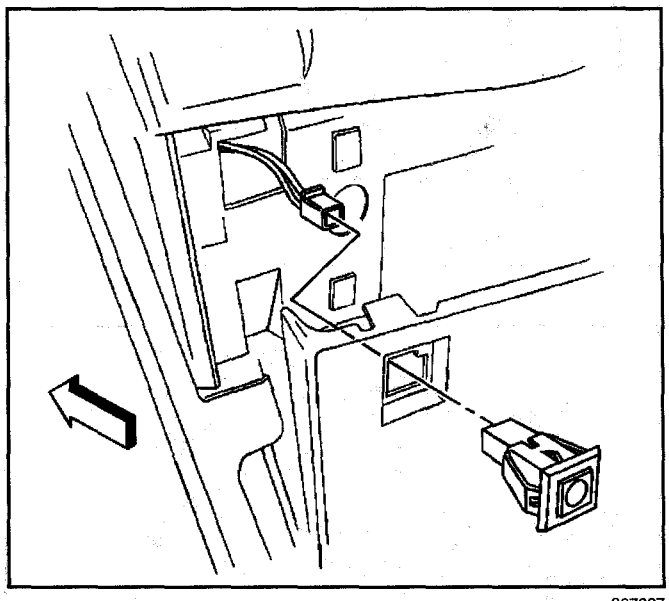


362238

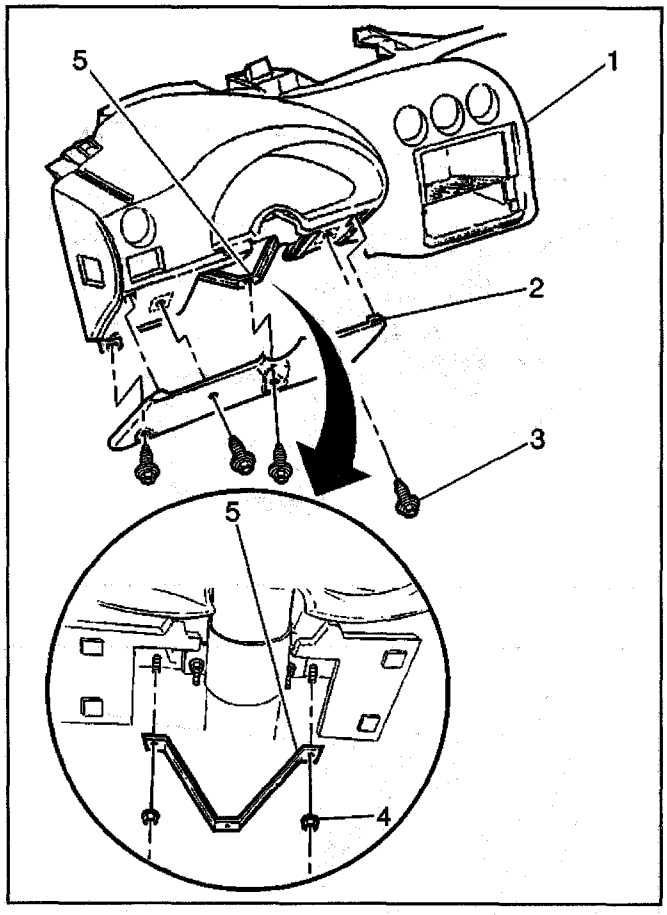
Knee Bolster Replacement

Removal Procedure

1. Remove the rear compartment lid release switch, if equipped. Refer to *Rear Compartment Lid Switch Replacement*.

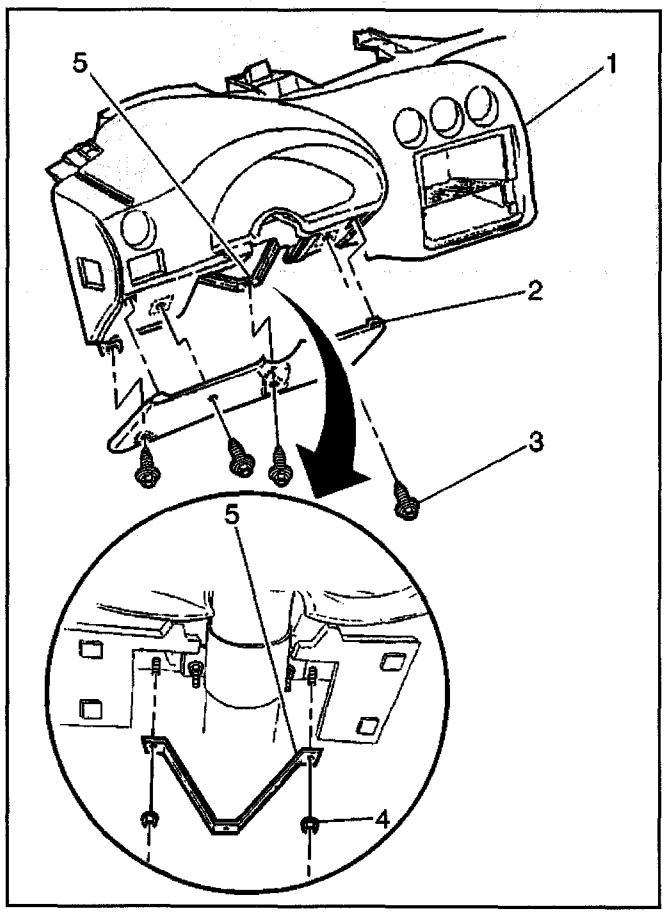


367387



296141

2. Remove the I/P knee bolster bolts (3).
3. Remove the I/P driver knee bolster (2).



296141

Installation Procedure

1. Install the I/P driver knee bolster (2).

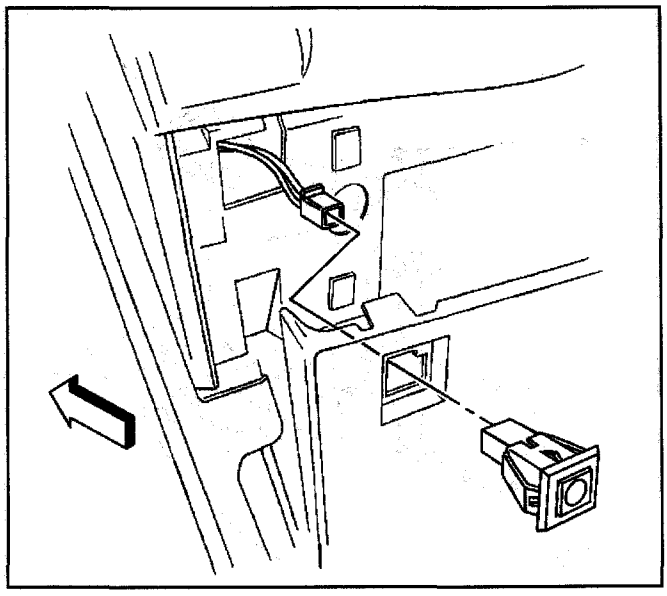
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the I/P knee bolster bolts (3).

   Tighten

   Tighten the I/P knee bolster bolts (3) to 1.9 N·m (17 lb in).

3. Install the rear compartment lid release switch, if equipped. Refer to *Rear Compartment Lid Switch Replacement.*



367387

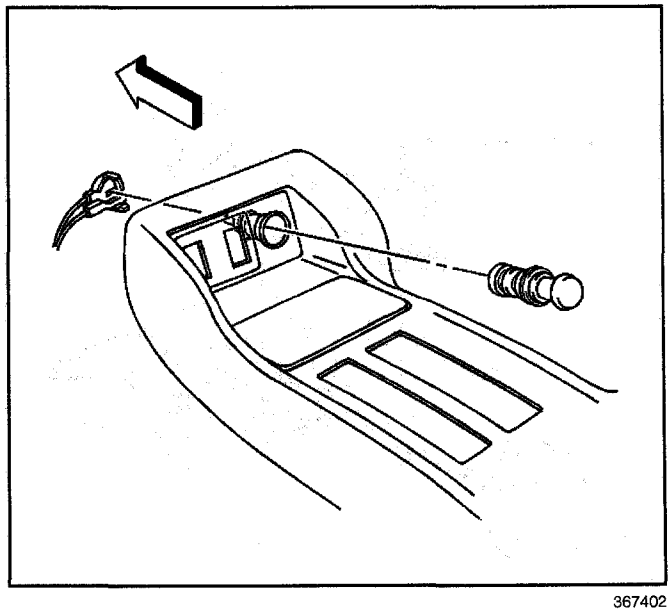
Cigarette Lighter Replacement - IP

Removal Procedure

Tools Required

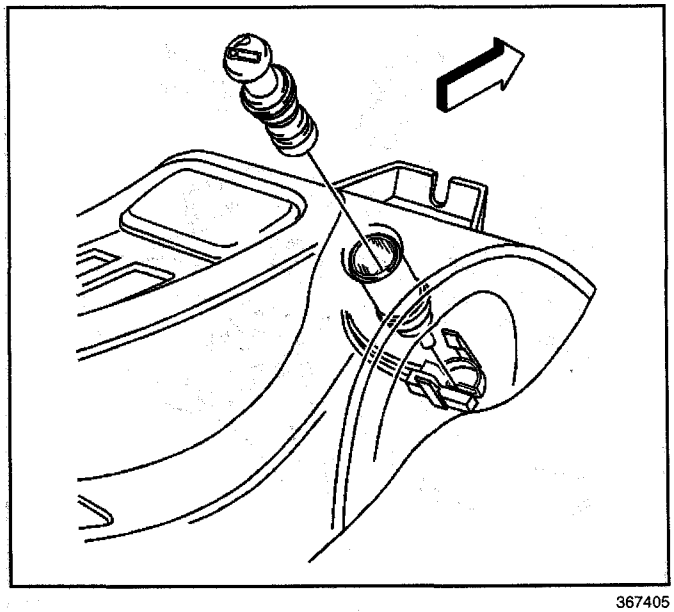
J 42059 Cigarette Lighter Socket Remover

1. Remove the cigarette lighter from the outlet. (Chevrolet automatic shown, Chevrolet and Pontiac manual similar).

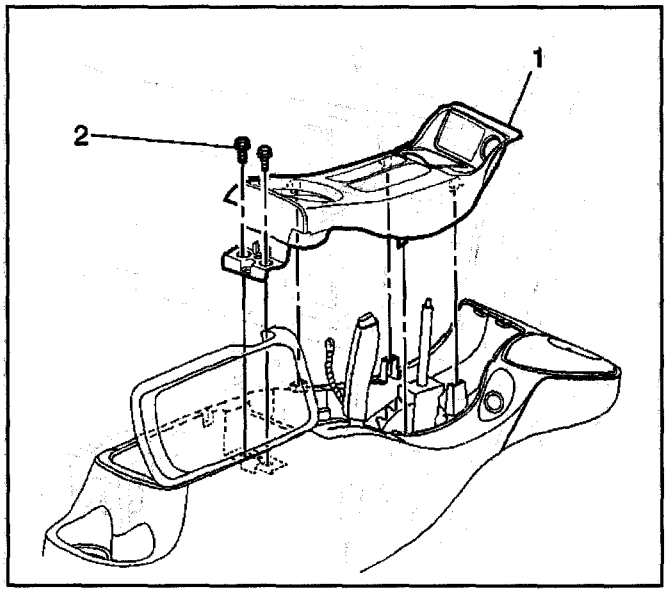


367402

2. Remove the cigarette lighter from the outlet. (Pontiac automatic shown).

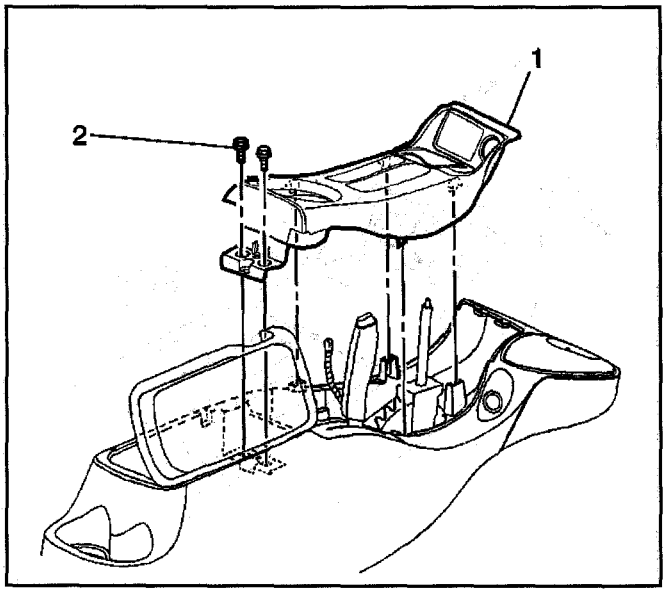


367405



296126

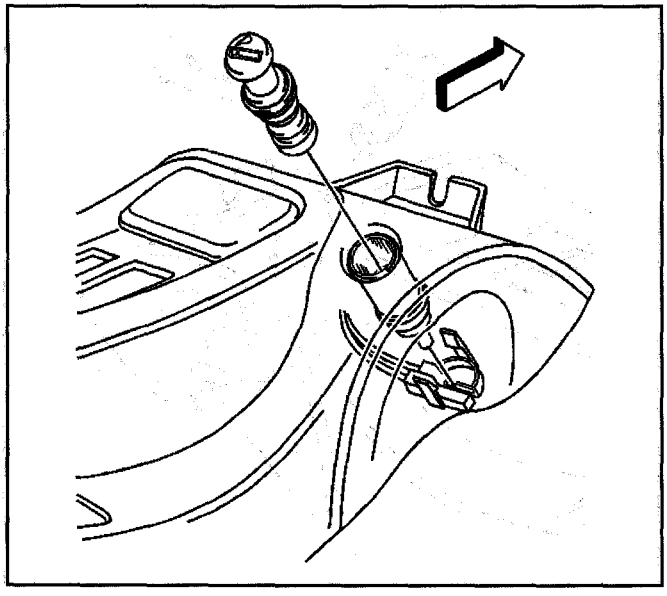
3. Remove the console trim plate (1). Refer to *Trim Plate Replacement - Console (Automatic)* or *Trim Plate Replacement - Console (Manual)*.
4. Disconnect the electrical connector from the cigarette lighter socket.
5. Using the *J 42059* remove the lighter socket, perform the following:
   5.1. Remove the cigarette lighter fuse. Refer to *Electrical Center Identification* in Wiring Systems.
   5.2. Insert one side of the T portion of *J 42059* must be placed in the tab window.
   5.3. The other side should be angled into the opposite window.
   5.4. Pull the lighter socket straight out of its mounting hole.



296126

Installation Procedure

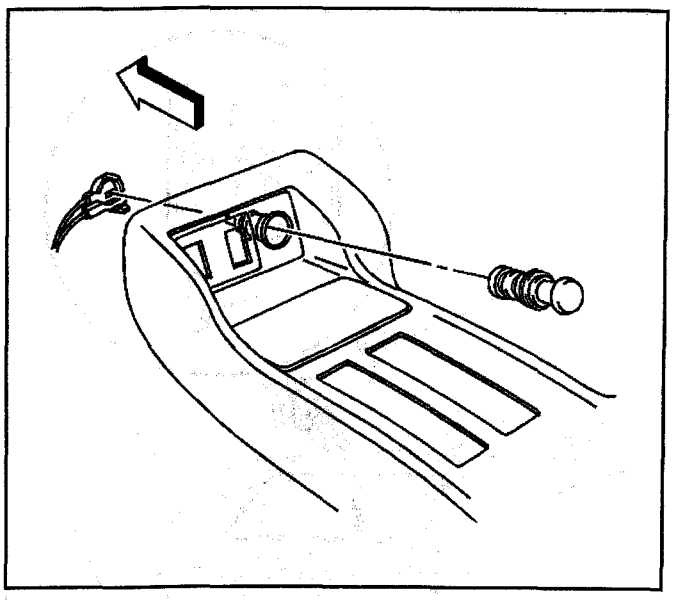
1. Install the cigarette lighter socket, perform the following:
   1.1. Align the socket ribs in the indents in the trim ring.
   1.2. Push the socket straight into the mounting hole.
   1.3. Install the cigarette lighter fuse. Refer to *Electrical Center Identification* in Wiring Systems.
2. Connect the electrical connector to the cigarette lighter socket.
3. Install the console trim plate (1). Refer to *Trim Plate Replacement - Console (Automatic)* or *Trim Plate Replacement - Console (Manual)*.



367405

4. On Pontiac, install the cigarette lighter to the outlet.

5. On Chevrolet, install the cigarette lighter to the outlet.



367402

Door Replacement - IP Storage Compartment Door

Removal Procedure

1. Open the I/P compartment door.
2. Remove the contents of the I/P compartment.
3. Remove the I/P compartment hinge screws.
4. Remove the I/P compartment door from the I/P.

Installation Procedure

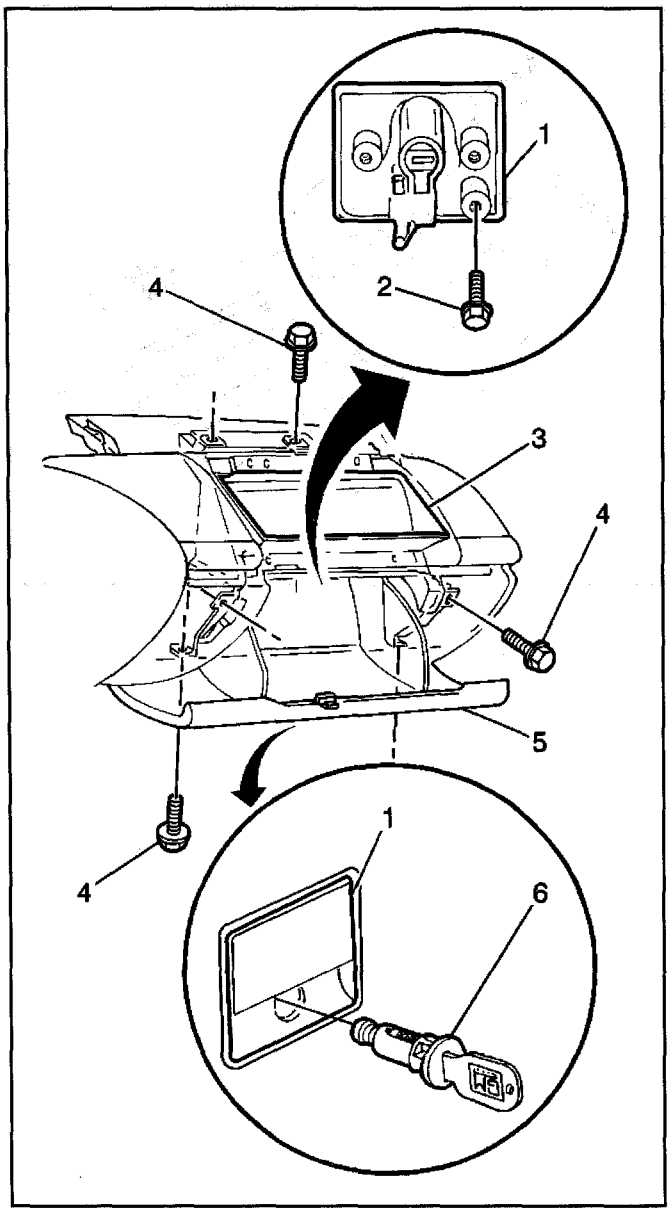
1. Install the I/P compartment door to the I/P.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the I/P compartment hinge screws.

   Tighten

   Tighten the I/P compartment hinge screws to 2.8 N·m (25 lb in).
3. Install the contents of the I/P compartment.
4. Close the I/P compartment door.



296109

Latch Replacement - IP Compartment

Removal Procedure

1. Open the I/P compartment door (5).
2. Remove the I/P compartment door latch bolts (2) and bracket.
3. Remove the I/P compartment door latch (1).

Installation Procedure

1. Install the I/P compartment door latch (1).
2. Align and install the I/P compartment door latch bracket and bolts (2).

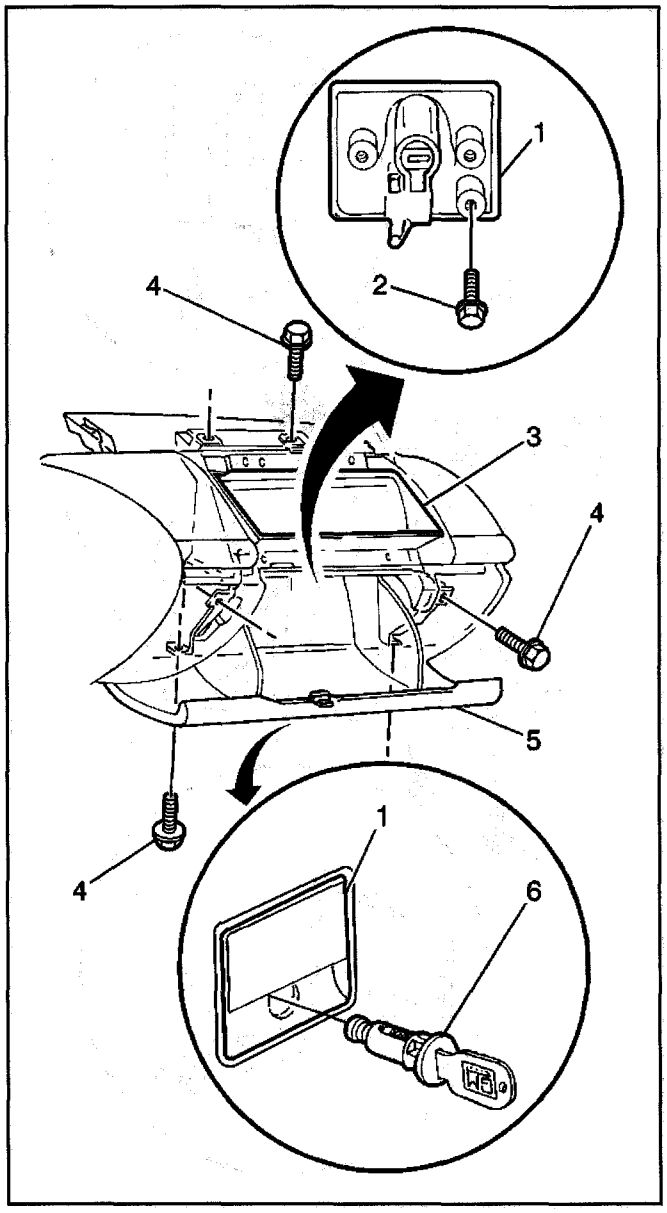
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Tighten the I/P compartment door latch bolts (2).

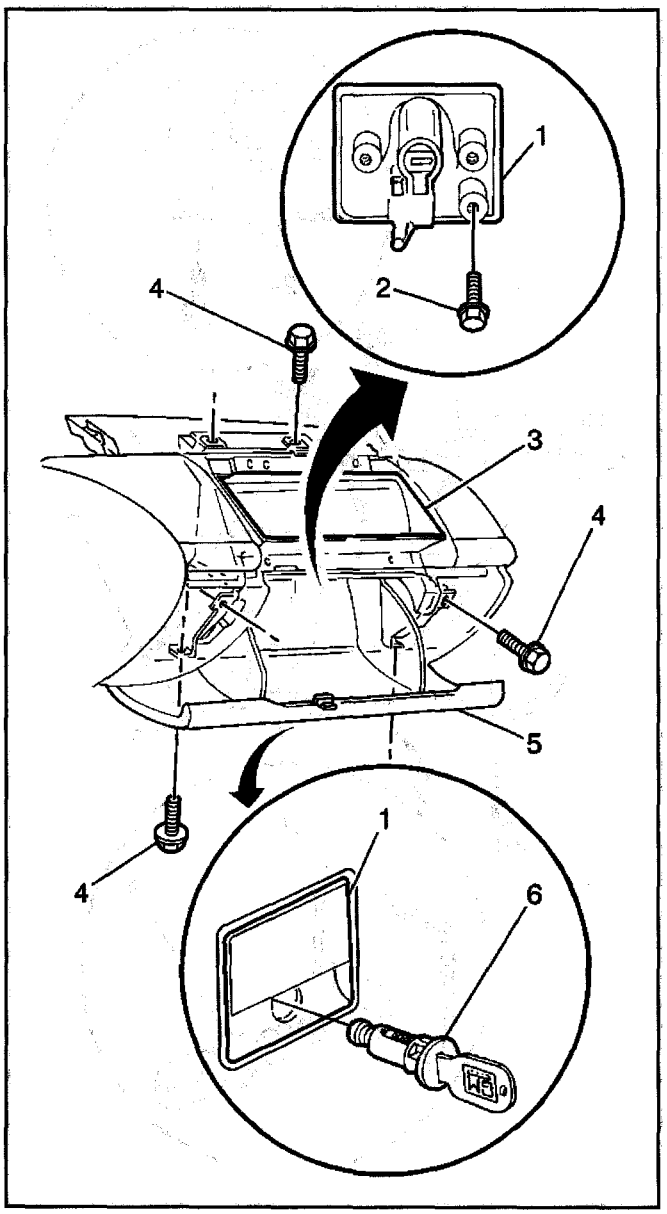
   Tighten

   Tighten the I/P compartment door latch bolts (2) to 1.9 N·m (17 lb in).

4. Close the I/P compartment door (5).



296109



296109

Lock Cylinder Replacement - IP Compartment

Removal Procedure

1. Open the I/P compartment door (5).
2. Remove the I/P compartment door latch bolts (2) and bracket.
3. Remove the I/P compartment door latch (1).

Installation Procedure

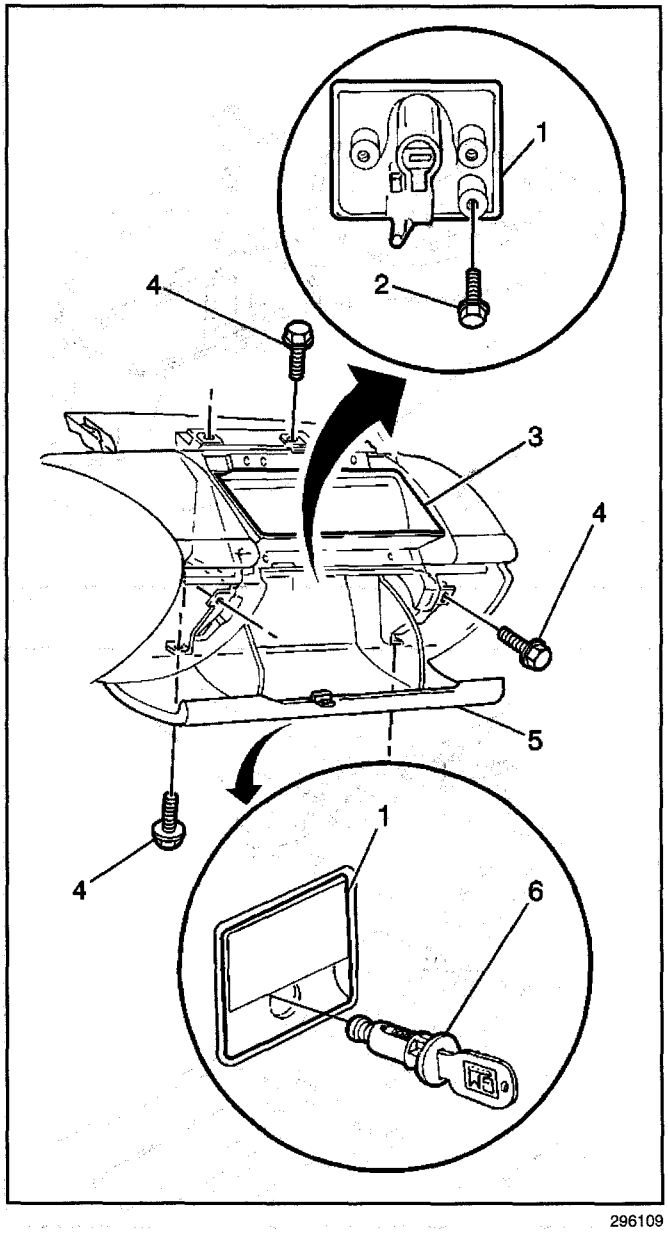
1. Install the I/P compartment door latch (1).
2. Align and install the I/P compartment door latch bracket and bolts (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Tighten the I/P compartment door latch bolts (2).

   Tighten

   Tighten the I/P compartment door latch bolts (2) to 1.9 N·m (17 lb in).
4. Close the I/P compartment door (5).

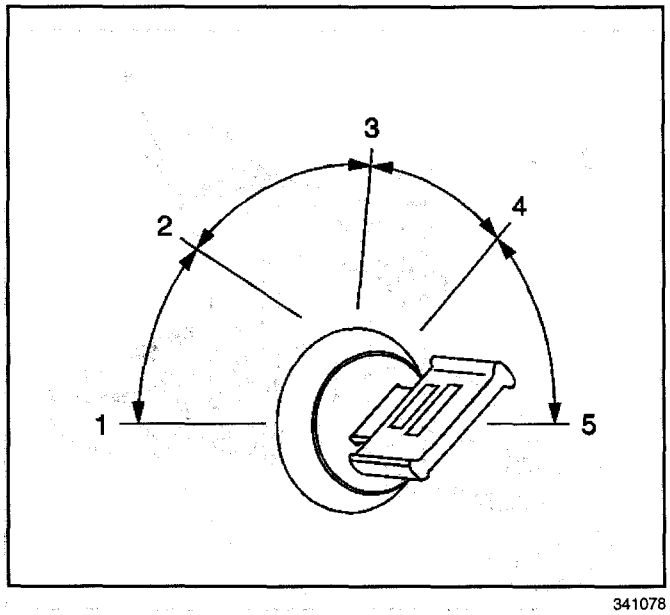


296109

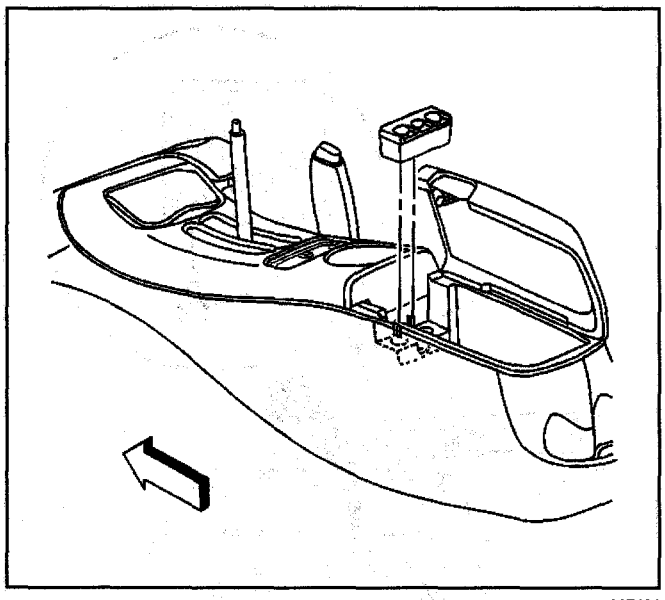
Trim Plate Replacement - Console (Automatic)

Removal Procedure

1. Place the ignition switch in the RUN (4) position.
2. Place the shift lever in the NEUTRAL position.
3. Remove the shift control knob. Refer to *Floor Shift Control Replacement* in Automatic Transmissions.
4. Unsnap the floor console accessory bin, if equipped.
5. Open the console armrest door.

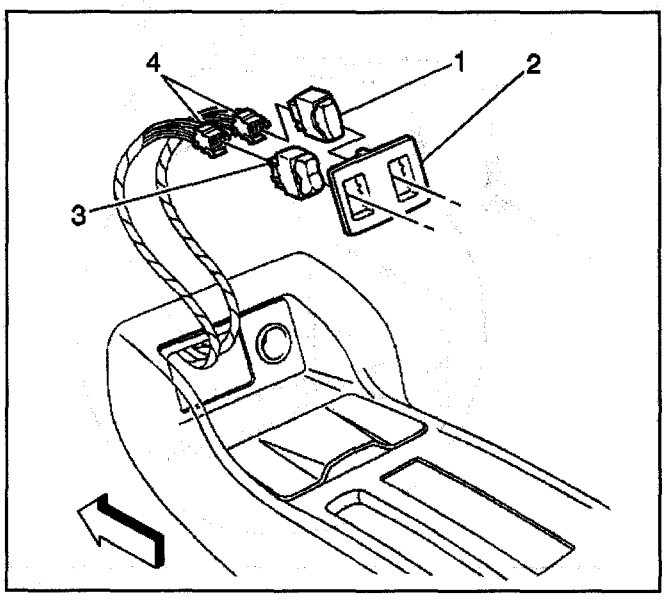


341078



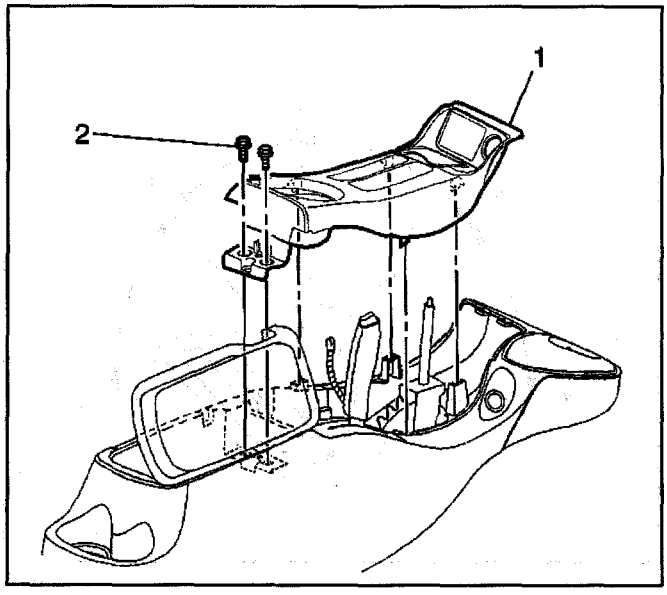
367401

6. Remove the coin holder from inside the console.



380886

7. Unsnap the switch plate (2) from the floor console.
8. Disconnect the electrical connectors (4) from the switches (1, 3), if equipped.



296126

9. Remove the console trim plate bolts (2).
10. Disconnect the PRNDL lamp connector.
11. Disconnect the cigarette lighter electrical connector.
12. Remove the console trim plate (1).

Installation Procedure

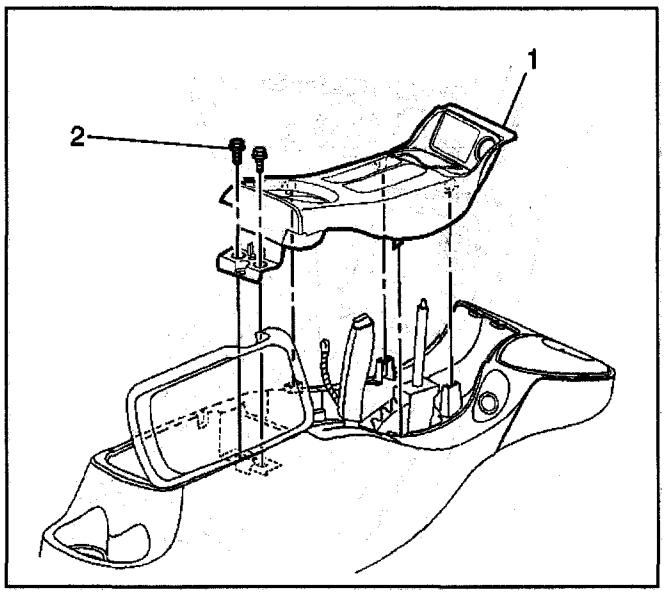
1. Position the console trim plate (1) over the shifter lever.
2. Connect the cigarette lighter electrical connector.
3. Connect the PRNDL lamp connector.
4. Insert the forward end of the trim plate (1) into the console.
5. Apply pressure to the console trim plate (1) and snap the trim plate (1) into place.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

6. Install the console trim plate bolts (2).

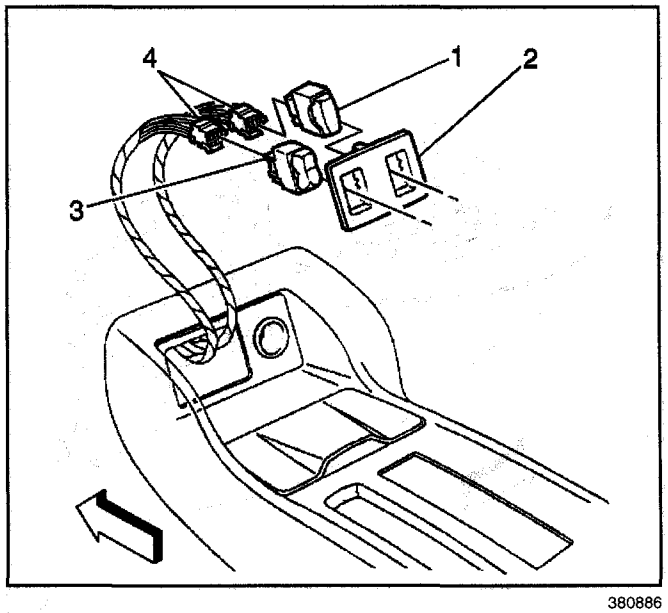
   Tighten

   Tighten the console trim plate bolts (2) to 1.9 N·m (17 lb in).



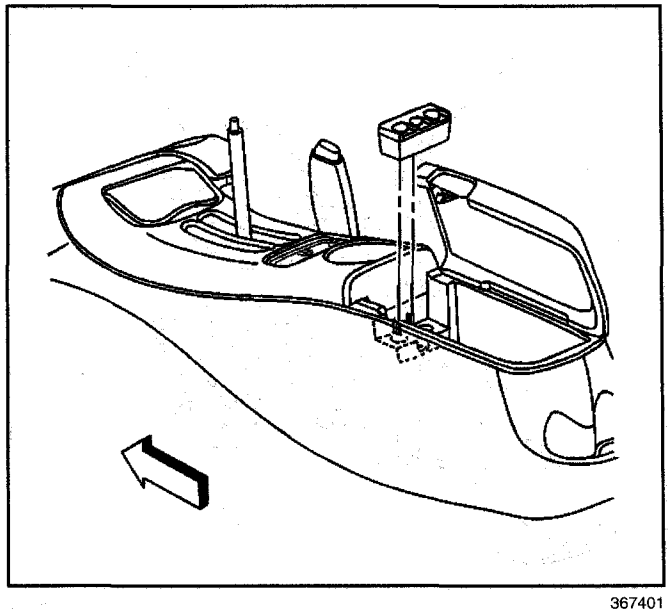
296126

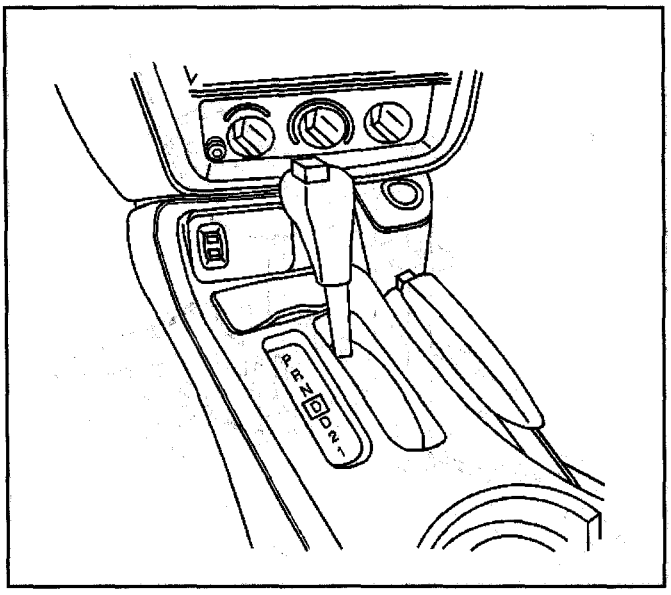
7. Snap the switch plate (2) to the floor console.
8. Connect the electrical connectors (4) to the switches (1, 3), if equipped.



380886

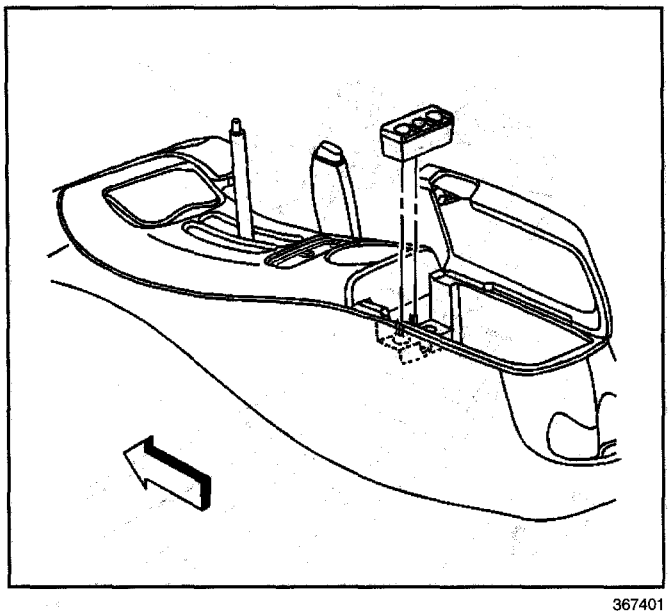
9. Install the coin holder to inside the console.
10. Close the console armrest door.
11. Snap the floor console accessory bin to the console, if equipped.
12. install the shift control knob. Refer to *Floor Shift Control Replacement* in Automatic Transmissions.


367401



341077

13. Place the shift lever in the PARK position.
14. Place the ignition switch in the OFF position.

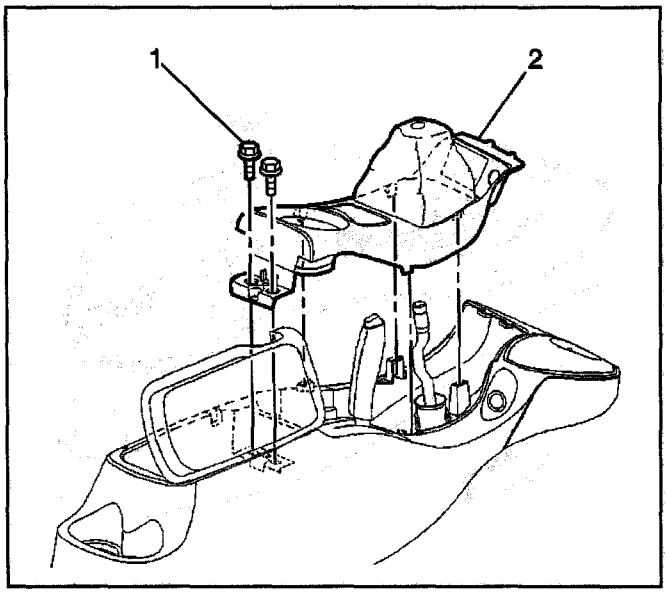


367401

Trim Plate Replacement - Console (Manual)

Removal Procedure

1. Set the park brake.
2. Place the shift lever in the NEUTRAL position.
3. Remove the shift lever knob from the shift lever.
4. Unsnap the floor console accessory bin, if necessary.
5. Open the console armrest door.
6. Remove the coin holder from inside the console.
7. Unsnap the switch plate from the floor console.
8. Disconnect the electrical connectors from the switches, if equipped.



296131

9. Remove the console trim plate bolts (1). Lift the trim plate up.
10. Disconnect the ashtray lamp connector.
11. Disconnect the cigarette lighter electrical connector.
12. Remove the console trim plate (2).

Installation Procedure

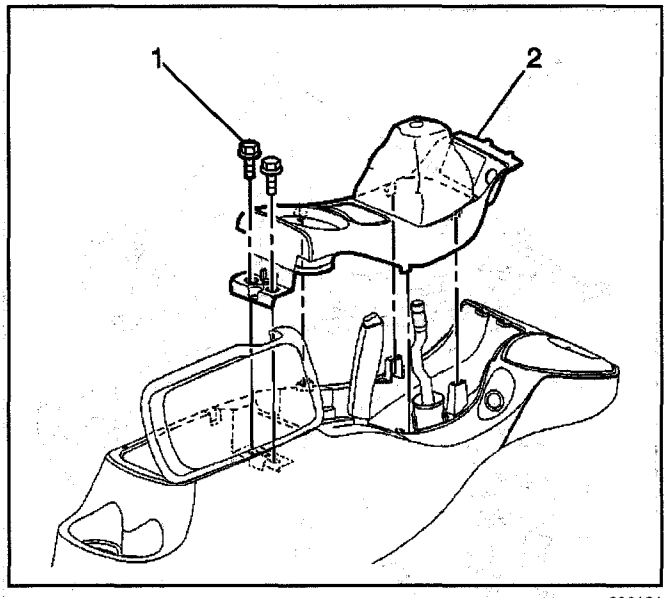
1. Position the trim plate (2) over the shifter lever.
2. Connect the cigarette lighter electrical connector.
3. Connect the ashtray lamp connector.
4. Insert the forward end of the trim plate (2) into the console.
5. Apply pressure to the console trim plate (2) and snap the trim plate (2) into place.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

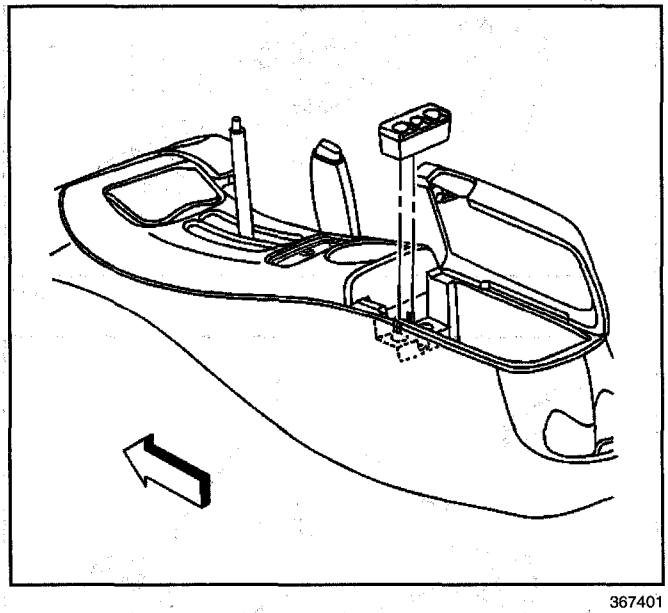
6. Install the console trim plate bolts (1).

   Tighten

   Tighten the console trim plate bolts (1) to 1.9 N·m (17 lb in).
7. Connect the electrical connectors to the switches, if equipped.
8. Snap in the front floor console accessory trim plate.
9. Install the coin holder to the inside of the console.
10. Close the console armrest door.
11. Snap the console accessory bin to the console, if equipped.
12. Install the shift lever knob to the shift lever.



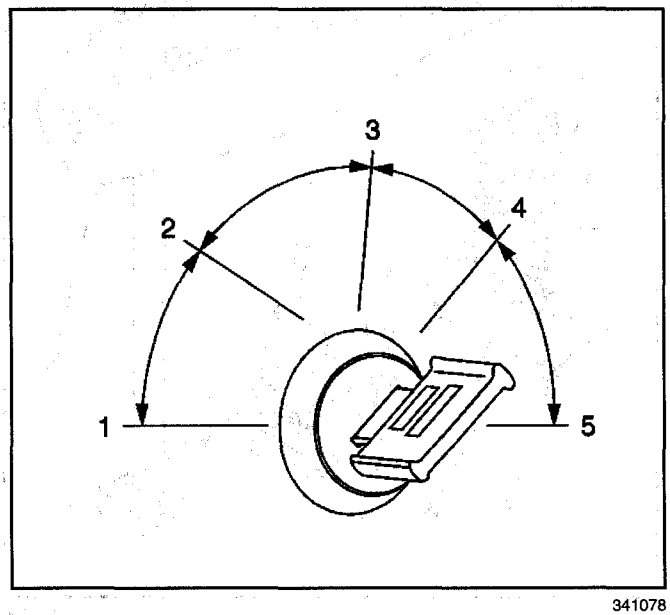
296131


367401

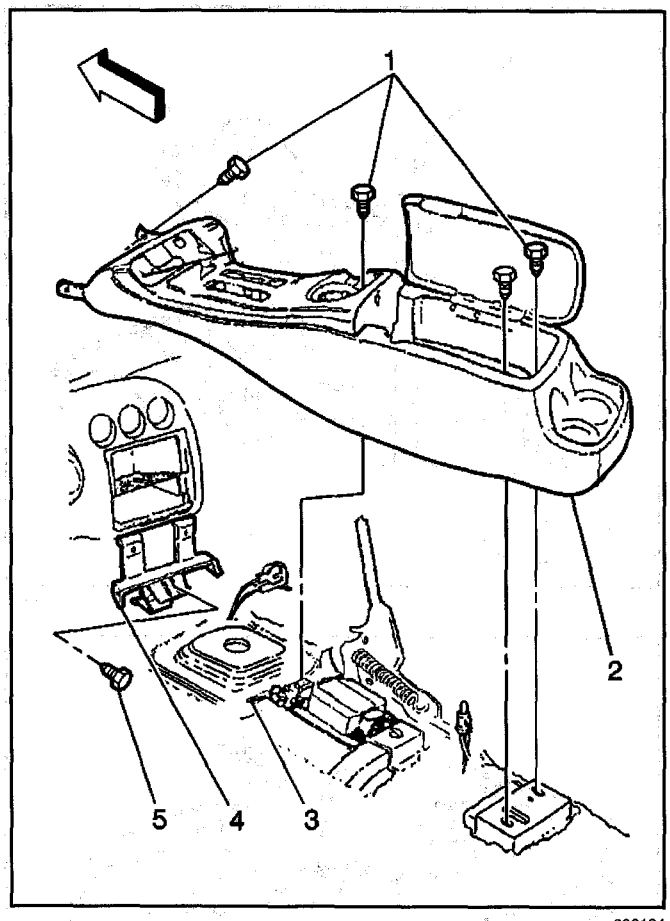
Console Replacement - Front Floor

Removal Procedure

1. Set the park brake, if equipped with a manual transmission
2. Place the ignition switch in the RUN position, if equipped with a automatic transmission.
3. Place the shift lever in the NEUTRAL position.
4. Remove the shift control knob.
5. Remove the shift lever knob from the shift lever.
6. Remove the console trim plate.



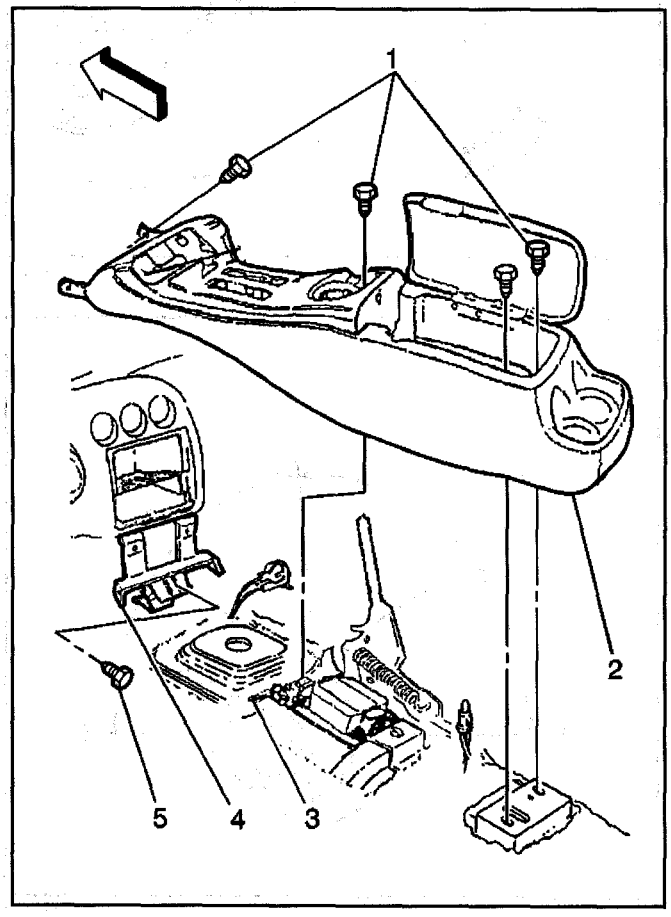
341078



296134

7. Remove the floor console bolts (1).
8. Raise the park brake handle as far as possible.
   If the park brake handle cannot be pulled up far enough to remove the console, perform the following:
   - Release the park brake handle
   - Hold the adjuster pawl disengaged

   Then park brake handle can be pulled up further.
9. Disconnect the power outlet connector.
10. Remove the floor console (2) from the vehicle.



296134

Installation Procedure

1. Install the console (2) to the vehicle.
2. Connect the power outlet connector.
3. Release the park brake handle.

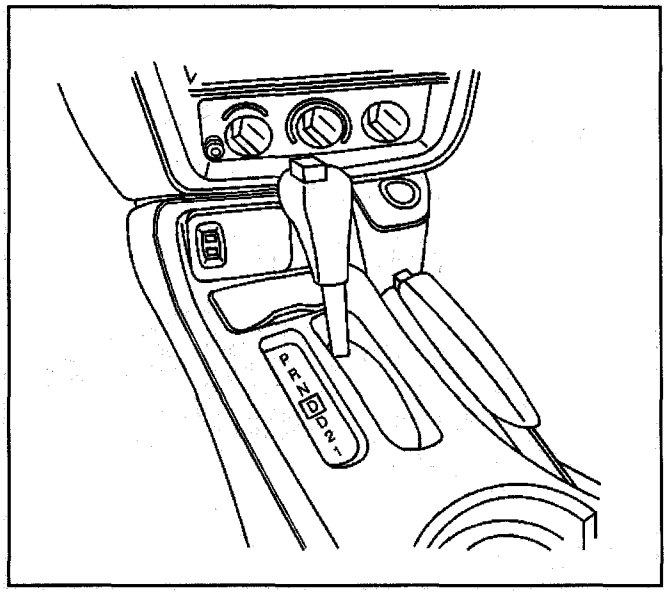
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the floor console bolts (1).

   Tighten

   Tighten the floor console bolts (1) to 8 N·m (71 lb in).
5. Install the console trim plate.
6. Install the shift lever knob to the shift lever.
7. Install the shift control knob.

8. Place the shift lever in the PARK position.
9. Place the ignition switch in the OFF position.

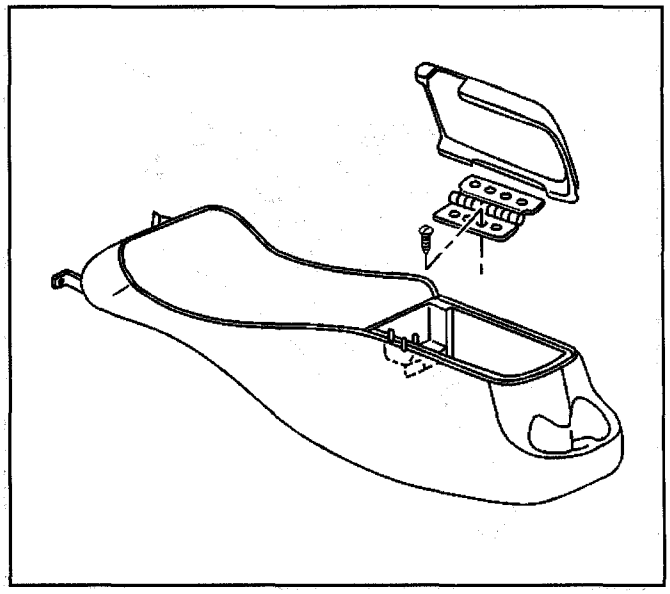


341077

Console Armrest Replacement - Front Floor

Removal Procedure

1. Open the console armrest door.
2. Remove the console armrest door bolts.
3. Remove the console armrest from the vehicle.



367406

Installation Procedure

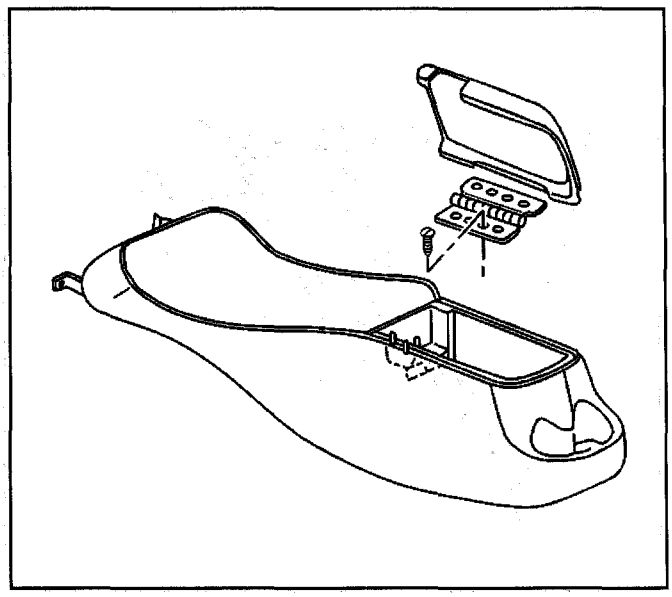
1. Install the console armrest door to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

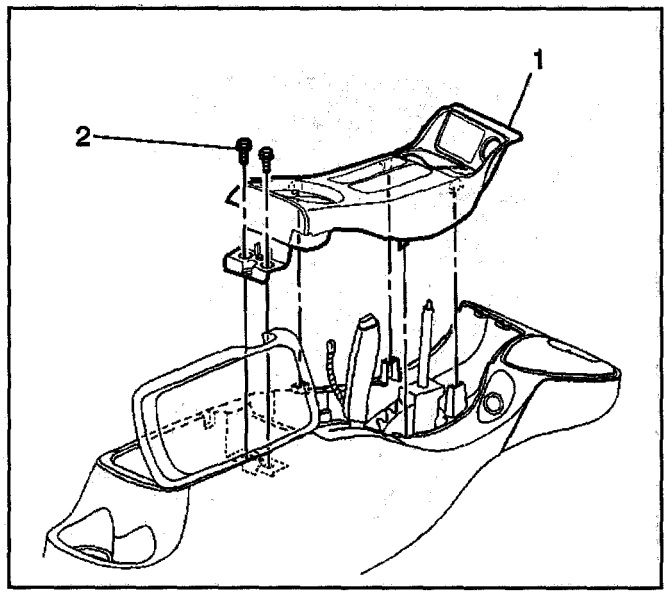
2. Install the console armrest door bolts.

   Tighten

   Tighten the console armrest door bolts to 2.0 N·m (18 lb in).
3. Close the console armrest door.



367406

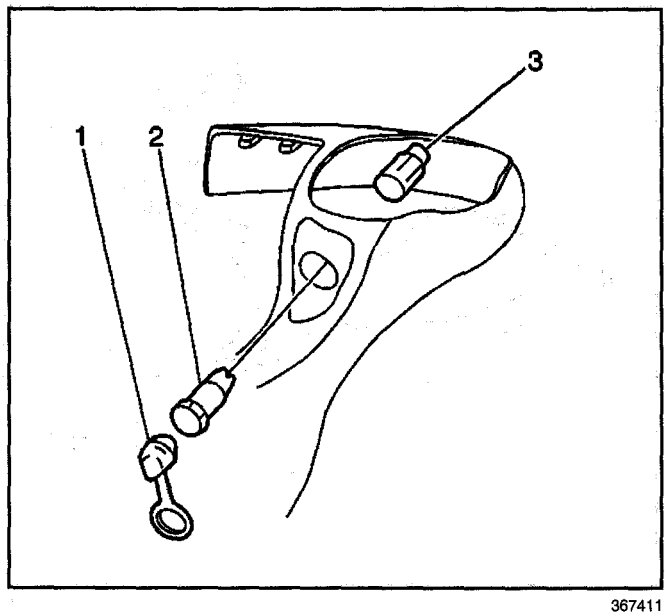


296126

Power Accessory Port Replace - Front Floor Console

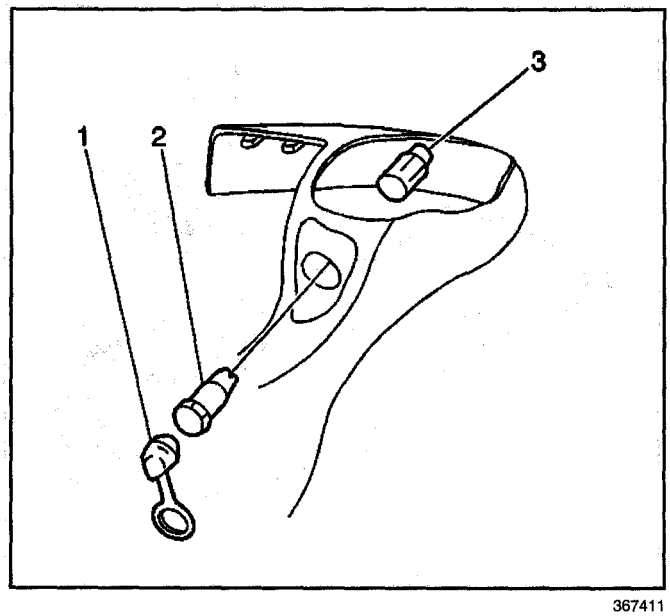
Removal Procedure

1. Remove the console trim plate. Refer to *Trim Plate Replacement - Console (Automatic)* or *Trim Plate Replacement - Console (Manual).*
2. Disconnect the electrical connector from the accessory power receptacle.



367411

3. Unscrew the accessory power receptacle retainer (3).
4. Remove the accessory power receptacle (2) from the console.
5. Remove the accessory power receptacle opening plug (1) from the receptacle (2), if necessary.

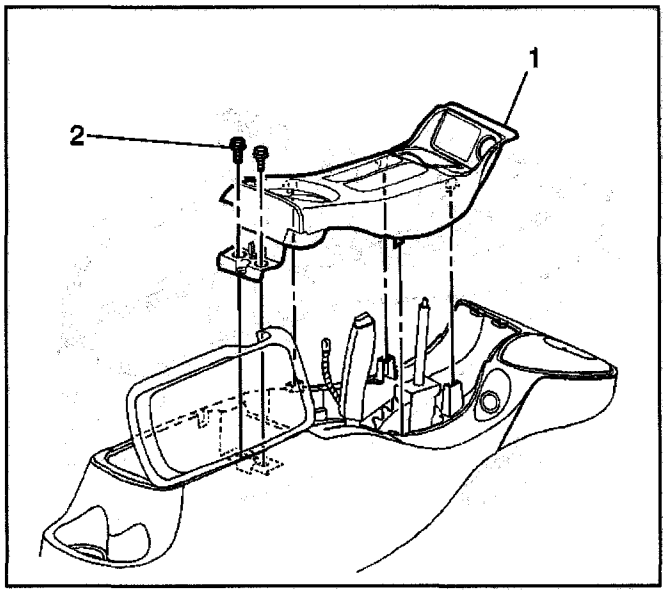


367411

Installation Procedure

1. Install the accessory power receptacle opening plug (1) to the receptacle (2), if removed.
2. Install the accessory power receptacle (2) to the console.
3. Screw the accessory power receptacle retainer (3) to the receptacle (2).
4. Connect the electrical connector to the power receptacle (2).

5. Install the console trim plate. Refer to *Trim Plate Replacement - Console (Automatic)* or *Trim Plate Replacement - Console (Manual)*.

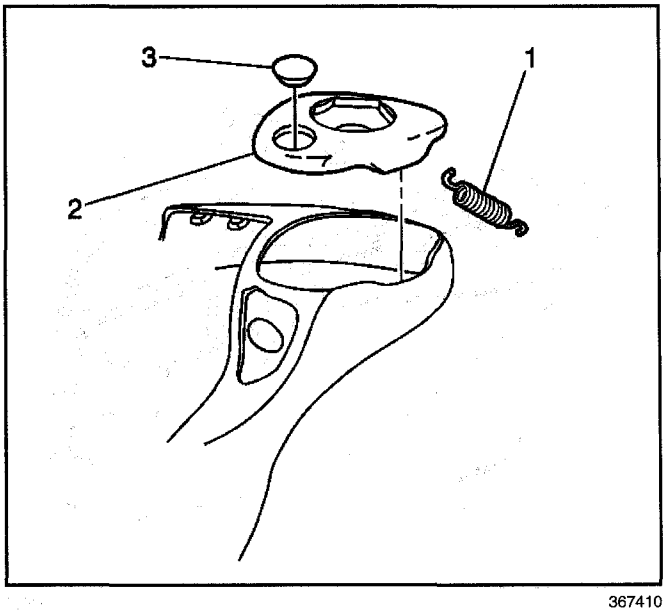


296126

Cupholder Replacement - Front Floor Console

Removal Procedure

1. Remove the front floor console. Refer to *Console Replacement - Front Floor*.
2. Lay the console upside-down on a work surface.
3. Remove the cup holder screw.
4. Remove the cup holder (2).
5. Remove the cup holder spring (1), if necessary.



367410

Installation Procedure

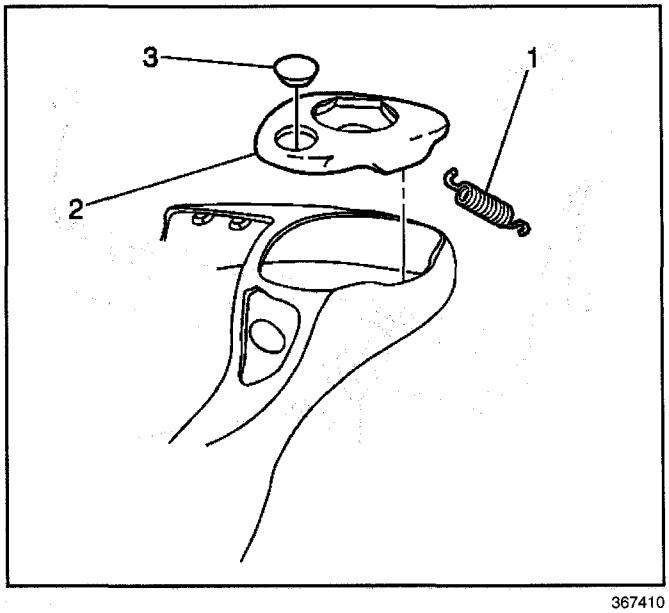
1. Install the cup holder spring (1), if necessary.
2. Install the cup holder (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

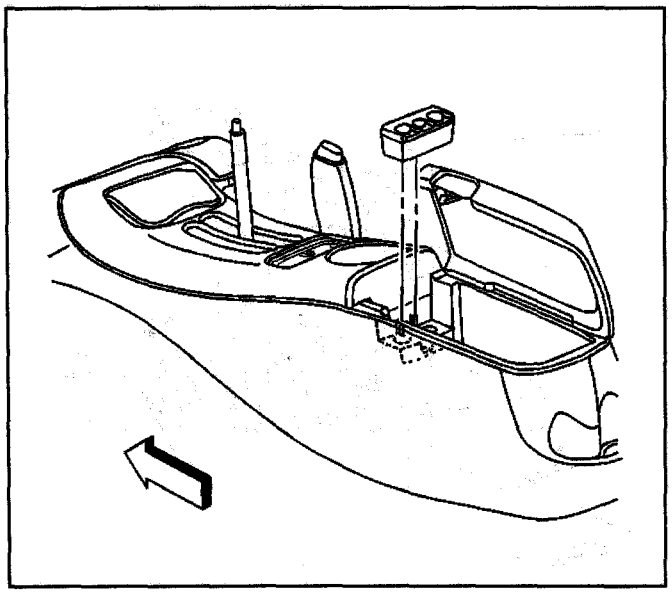
3. Install the cup holder screw.

   Tighten

   Tighten the cup holder screw to 1.9 N·m (17 lb in).
4. Install the front floor console. Refer to *Console Replacement - Front Floor*.



367410

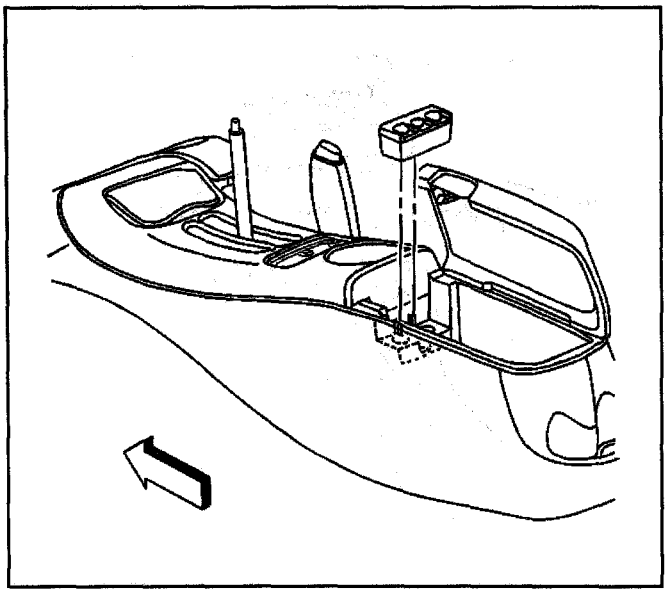


367401

Coin Holder Replacement - Front Floor Console

Removal Procedure

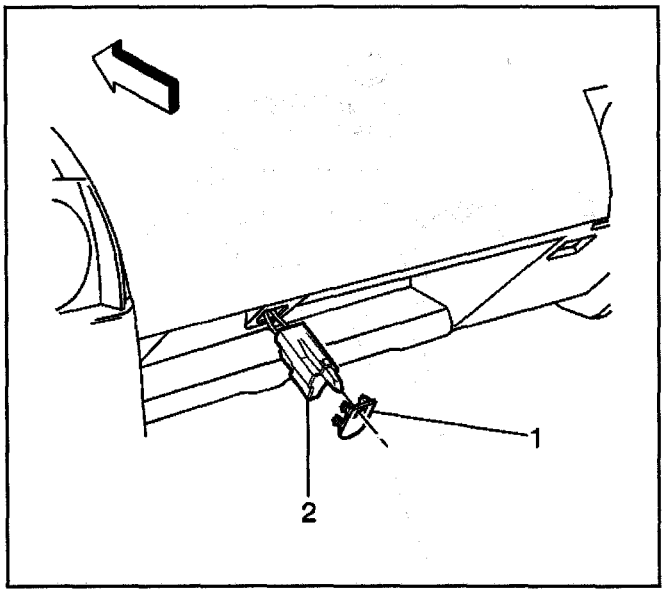
1. Open the console door.
2. Remove any coins from the holder.
3. Remove the coin holder from the console.



367401

Installation Procedure

1. Install the coin holder to the console.
2. Press the coin holder down until it snaps into place.
3. Install the coins to the coin holder.
4. Close the console door.



366722

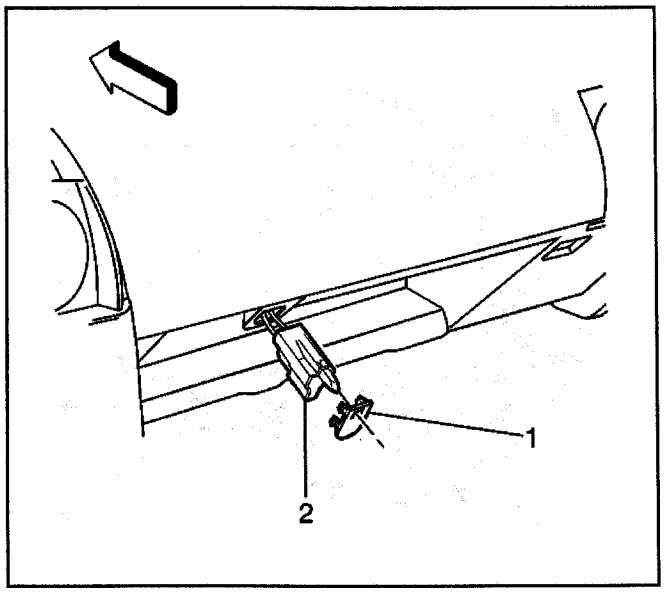
IP Compartment Lamp Switch Replacement

Removal Procedure

1. Unsnap the switch (2) and the retainer (1) from the instrument panel (I/P) carrier.
2. Remove the retainer (1) from the switch (2).

Installation Procedure

1. Install the retainer (1) to the switch (2).
2. Install the switch (2) and the retainer (1) through the opening in the I/P carrier.



366722

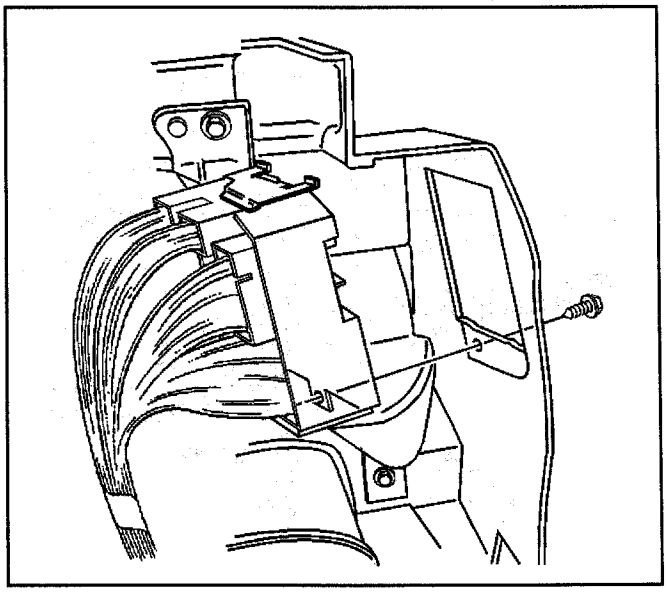
IP Carrier Replacement

Removal Procedure

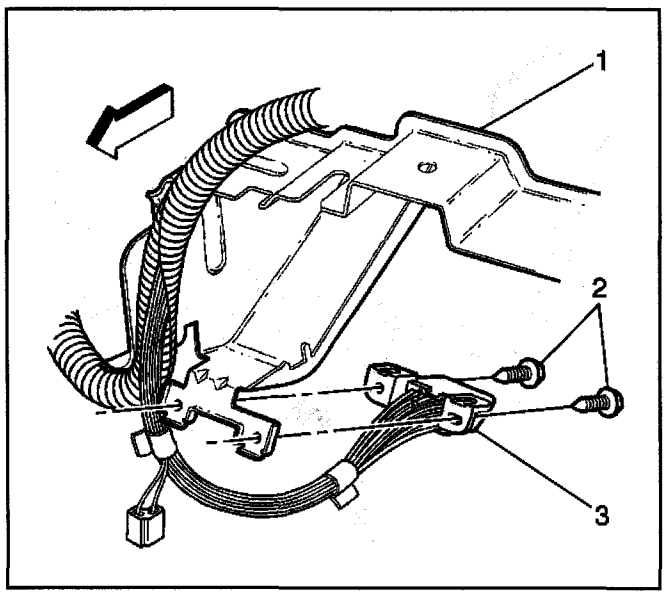
1. Remove the I/P insulators. Refer to *Insulator Replacement - IP (Left Side)* or *Insulator Replacement - IP (Right Side)*.
2. Remove the windshield side garnish moldings. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* in Stationary Windows.
3. Remove the knee bolster deflector. Refer to *Bracket Replacement - Knee Bolster*.

Caution: Refer to SIR Handling Caution in Cautions and Notices.

4. Disable the SIR. Refer to *Disabling the SIR System* in Restraints.
5. Remove the stoplamp switch. Refer to *Stoplamp Switch Replacement* in Hydraulic Brakes.
6. Lower the steering column.
7. Remove the I/P trim pad. Refer to *Trim Pad Replacement - IP Upper*.
8. Remove the IP accessory trim plate. Refer to *Trim Plate Replacement - IP Accessory (Chevrolet)* or *Trim Plate Replacement - IP Accessory (Pontiac)*.
9. Remove the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)* in Entertainment.
10. Remove the instrument cluster. Refer to *IP Cluster Replacement*.
11. Remove the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems with A/C-Manual.
12. Remove the left side air ducts.
13. Remove the front floor console. Refer to *Console Replacement - Front Floor*.
14. Remove the fuse block bolt.
15. Remove the fuse block from the I/P.

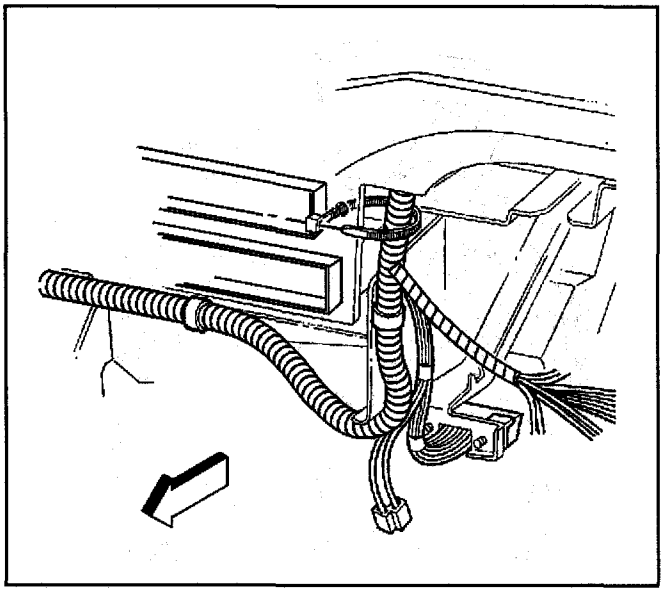


379391



367393

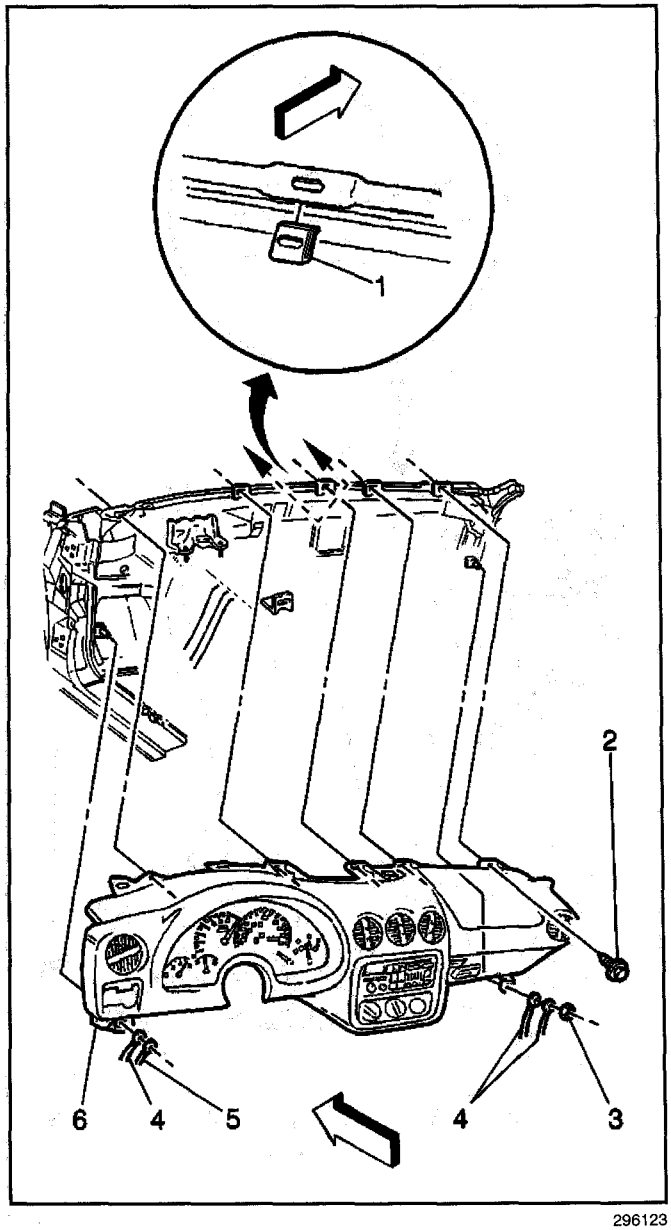
16. Remove the data link connector bolts (2).
17. Remove the data link connector (3) from the tie bar (1).



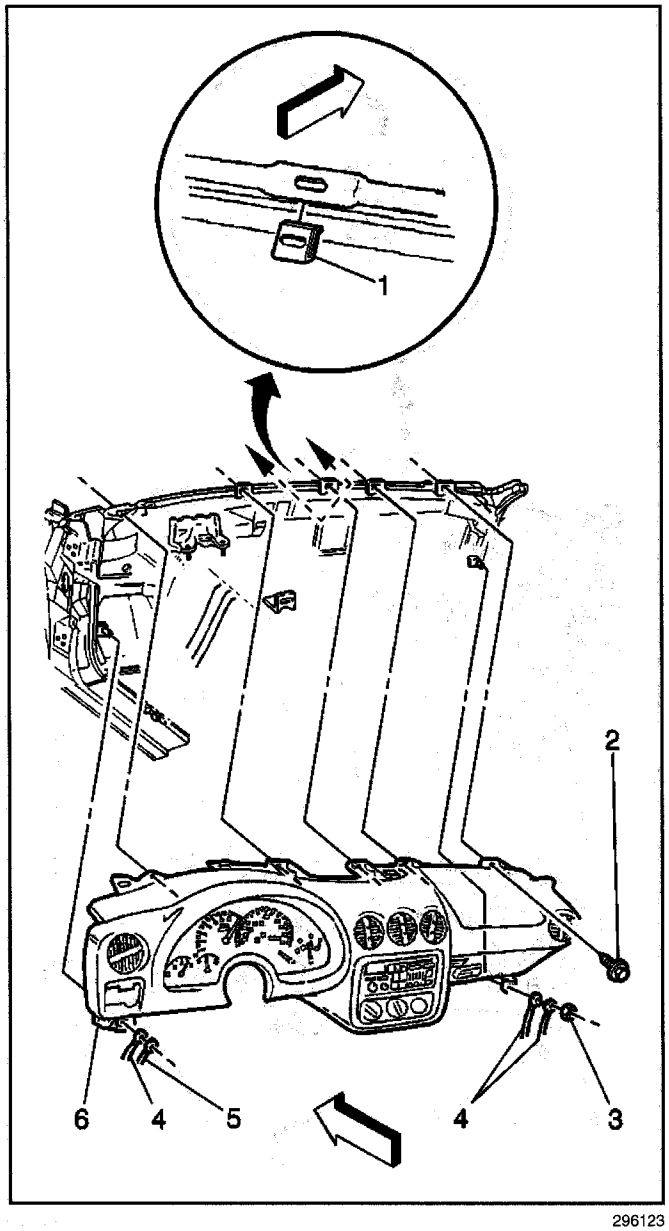
379394

18. Cut the tie strap securing the steering column harness branch to the distributor.

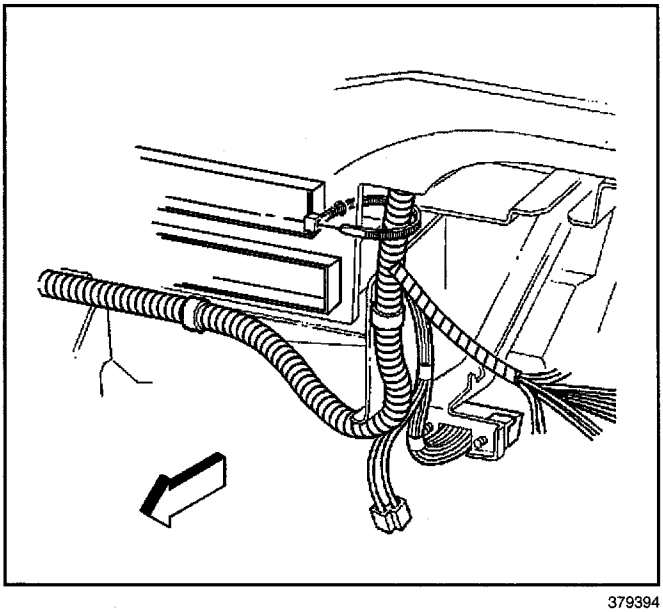
19. Remove the I/P lower mounting nuts (3).
20. Remove the crosscar and I/P harness grounds from the I/P mounting studs.
21. Remove the I/P upper mounting bolts (2).
22. Reposition the I/P (6).
23. Remove the air distributor.
24. Remove the wiring harness from the I/P carrier.
25. Remove the I/P carrier from the vehicle.



296123



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Installation Procedure

1. Install the I/P carrier to the vehicle.
2. Install the wiring harness to the I/P carrier.
3. Install the air distributor.
4. Position the I/P (6).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the I/P upper mounting bolts (2).

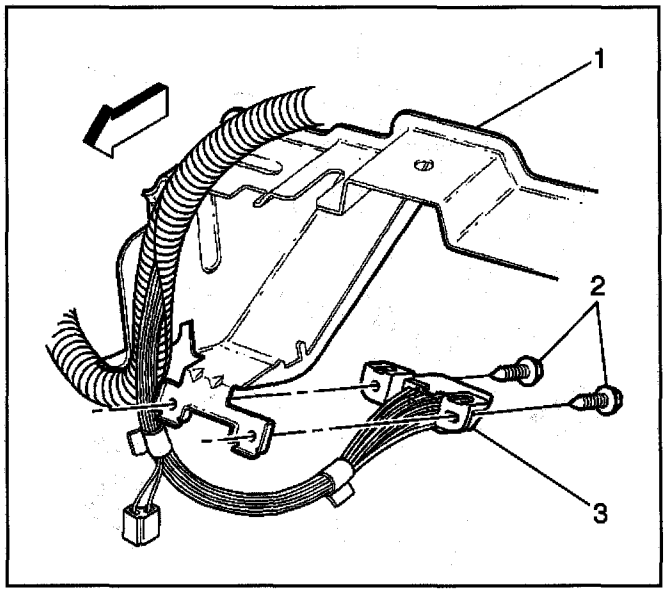
   Tighten

   Tighten the I/P upper mounting bolts (2) to 1.9 N·m (17 lb in).
6. Install the crosscar and I/P harness grounds to the I/P mounting studs.
7. Install the I/P lower mounting nuts (3).

   Tighten

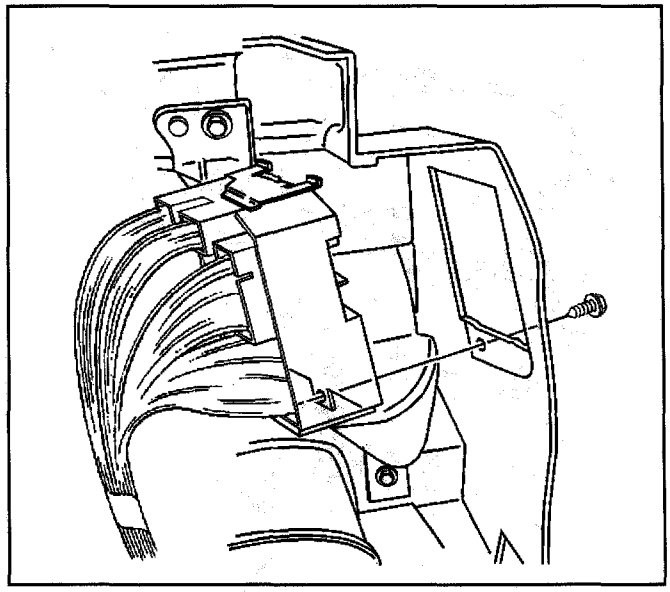
   Tighten the I/P lower mounting nuts (3) to 25 N·m (18 lb ft).
8. Install a new tie strap securing the steering column harness branch to the distributor.

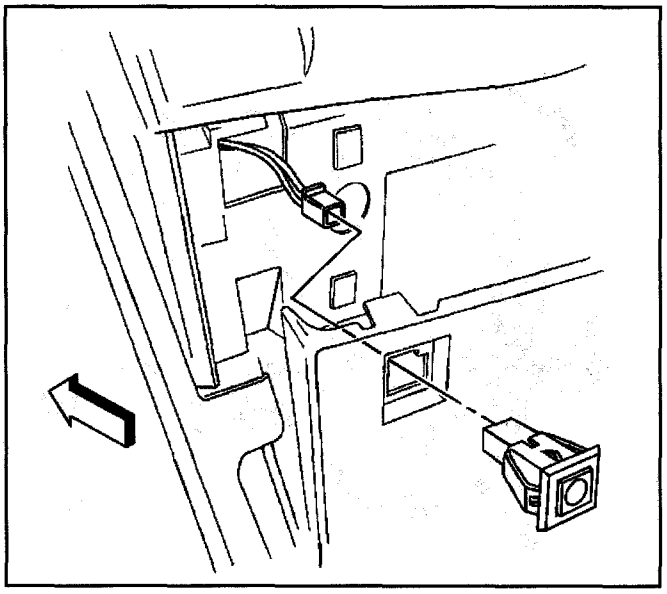
9. Install the data link connector (3) to the tie bar (1).
10. Install the data link connector bolts (2).



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11. Install the fuse block to the I/P.
12. Install the fuse block bolt.
13. Install the front floor console. Refer to *Console Replacement - Front Floor.*
14. Install the left side air ducts.
15. Install the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems with A/C-Manual.
16. Install the instrument cluster. Refer to *IP Cluster Replacement.*
17. Install the radio. Refer to *Radio Replacement (Chevrolet)* or *Radio Replacement (Pontiac)* in Entertainment.
18. Install the I/P accessory trim plate. Refer to *Trim Plate Replacement - IP Accessory (Chevrolet)* or *Trim Plate Replacement - IP Accessory (Pontiac).*
19. Install the I/P trim pad. Refer to *Trim Pad Replacement - IP Upper.*
20. Raise the steering column.
21. Install the stoplamp switch. Refer to *Stoplamp Switch Replacement* in Hydraulic Brakes.
22. Enable the SIR. Refer to *Enabling the SIR System* in Restraints.
23. Install the knee bolster deflector. Refer to *Bracket Replacement - Knee Bolster.*
24. Install the windshield side garnish moldings. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* in Stationary Windows.
25. Install the I/P insulators. Refer to *Insulator Replacement - IP (Left Side)* or *Insulator Replacement - IP (Right Side).*


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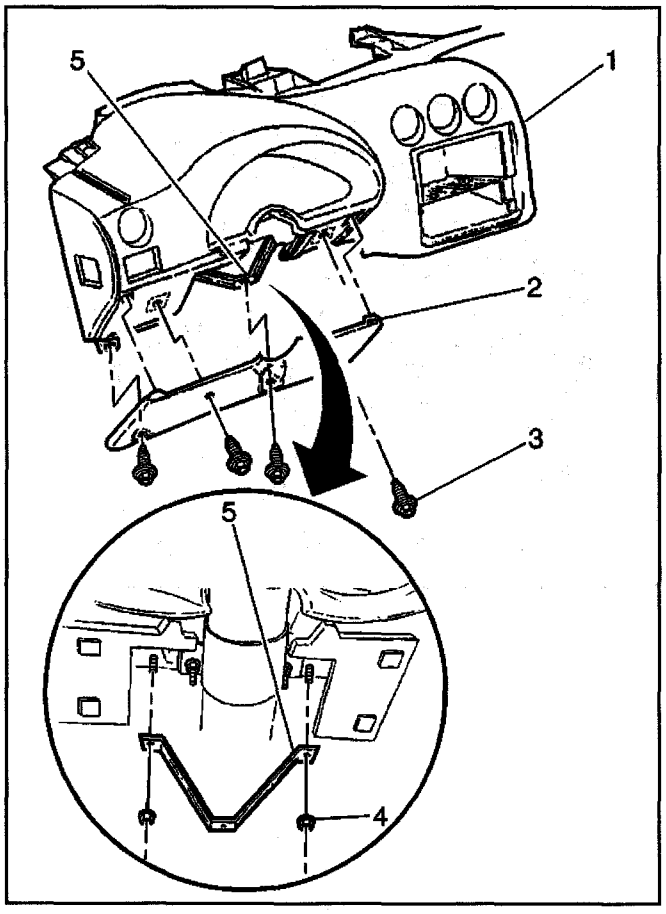


367387

Bracket Replacement - Knee Bolster

Removal Procedure

1. Remove the rear compartment lid release switch, if equipped. Refer to *Rear Compartment Lid Switch Replacement* in Body Rear End.



296141

2. Remove the I/P knee bolster bolts (3).
3. Remove the I/P knee bolster (2).
4. Remove the I/P knee bolster bracket nuts (4).
5. Remove the I/P knee bolster bracket (5).

Installation Procedure

1. Install the I/P knee bolster bracket (5).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the I/P knee bolster bracket nuts (4).

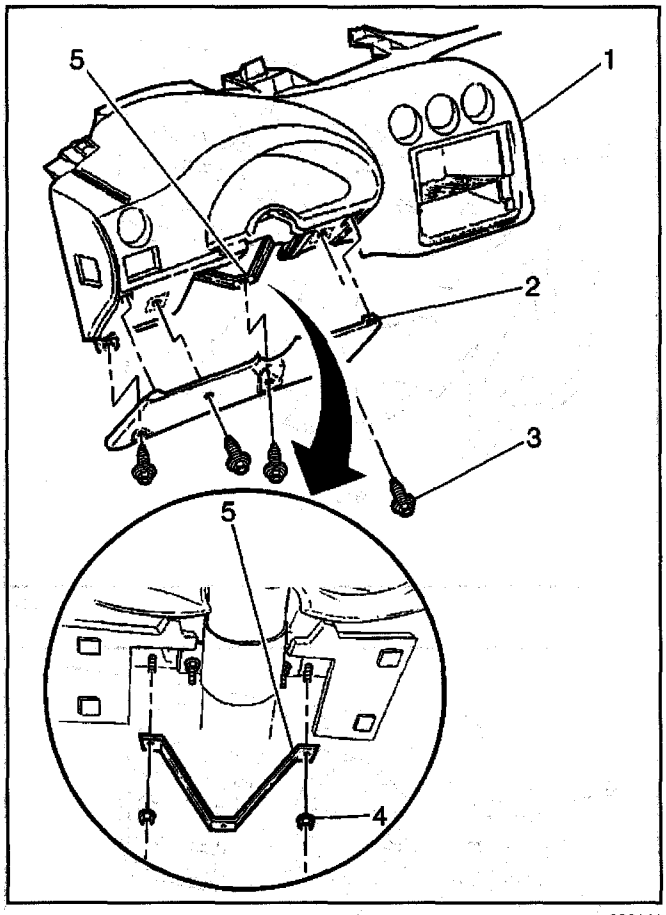
   Tighten

   Tighten the I/P knee bolster bracket nuts (4) to 10 N·m (89 lb in).

3. Install the I/P knee bolster (2).
4. Install the I/P knee bolster bolts (3).

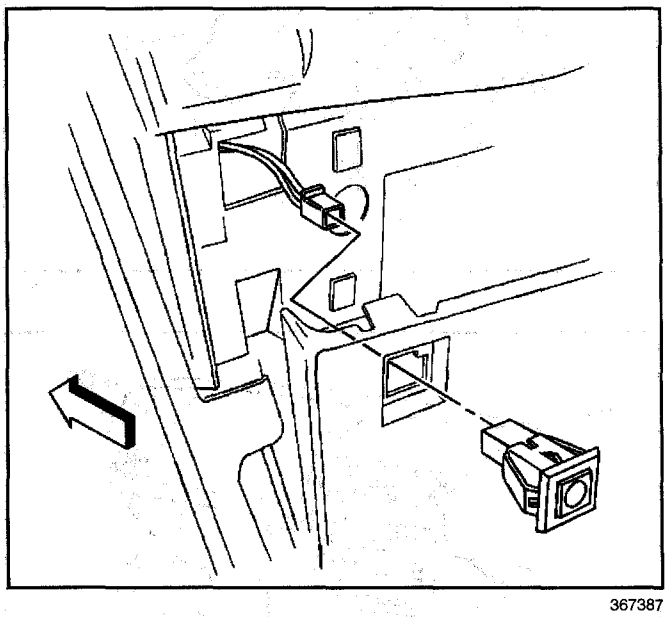
   Tighten

   Tighten the I/P knee bolster bolts (3) to 1.9 N·m (17 lb in).

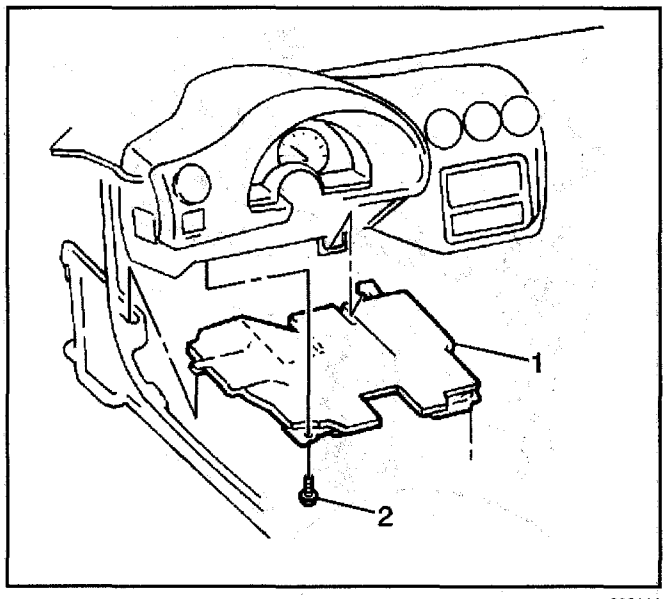


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5. Install the rear compartment lid release switch, if equipped. Refer to *Rear Compartment Lid Switch Replacement* in Body Rear End.



367387

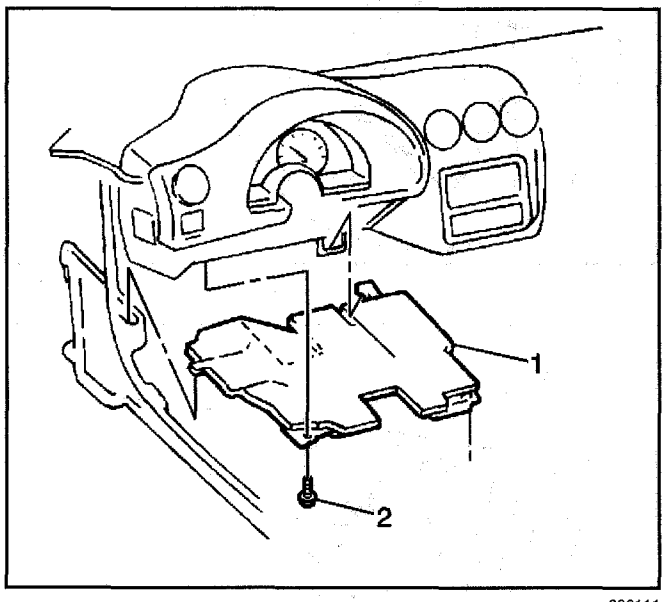


296111

Insulator Replacement - IP (Left Side)

Removal Procedure

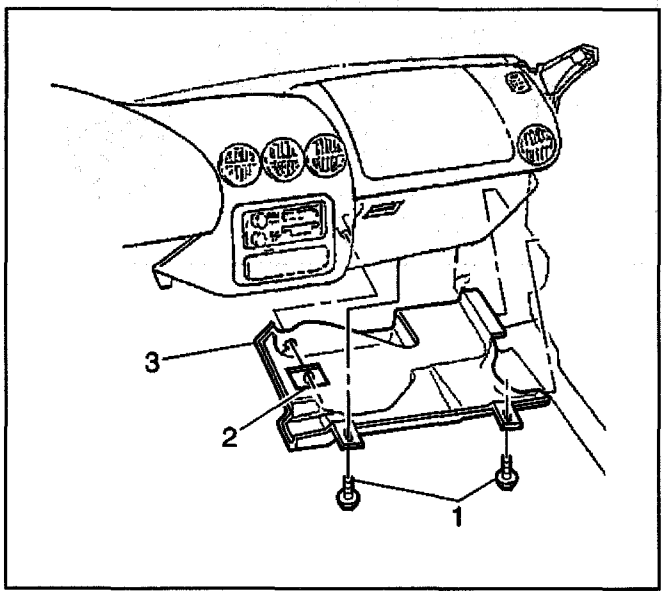
1. Remove the I/P retainers (2).
2. Unhook the flange on the I/P insulator (1) from the side kick panel.
3. Detach the tab on the I/P insulator (1) from the retainer on the I/P.
4. Remove the I/P insulator (1) from the I/P.



296111

Installation Procedure

1. Attach the tab on the insulator (1) to the I/P.
2. Hook the flange on the insulator (1) to the side kick panel.
3. Install the I/P insulator (1) to the I/P.
4. Install the I/P insulator retainer (2).



296114

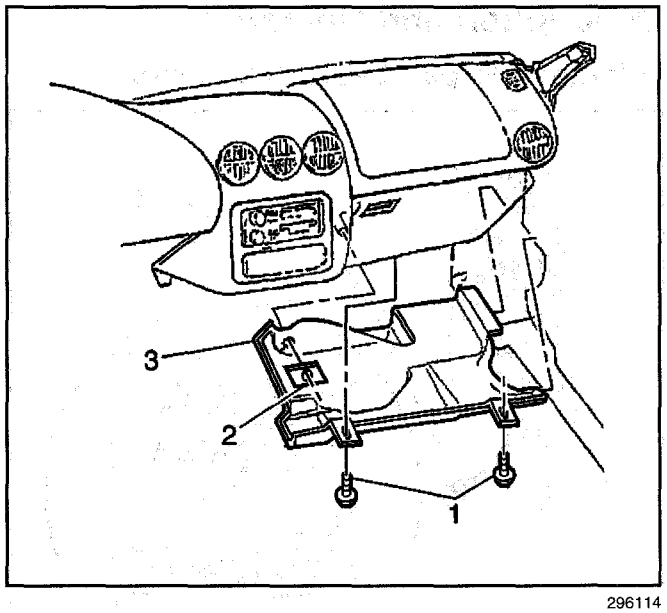
Insulator Replacement - IP (Right Side)

Removal Procedure

1. Remove the I/P retainer (2) from the boss on the heater and air conditioning module.
2. Remove the retainers (1) from the insulator (3).
3. Detach the forward flange on the insulator (3) from the boss on the HVAC module.
4. Unhook the flange on the insulator (3) from under the side kick panel.
5. Remove the insulator (3) from the I/P carrier.

Installation Procedure

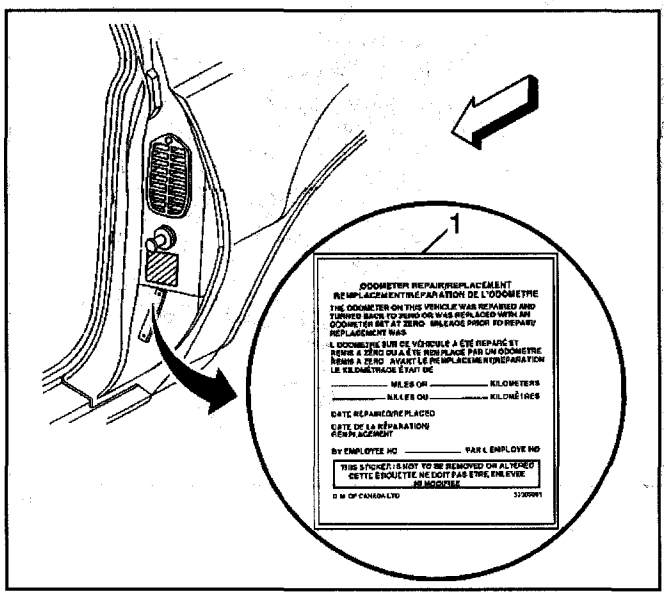
1. Hook the flange on the instrument panel I/P insulator (3) over the side kick panel.
2. Attach the forward flange on the insulator (3) to the boss on the HVAC module.
3. Install the insulator (3) to the I/P carrier.
4. Install the retainer (1) to the insulator (3).
5. Install the retainer (2) to the boss on the HVAC module.



296114

Description and Operation

Odometer Repair Label Description



296119

Important: When you repair an instrument cluster, the law requires that you perform the following steps:

- Set the odometer reading of the replacement unit to register the same mileage that the previous odometer registered.
- If the same mileage cannot be set, set the replacement odometer to zero and install a label on the driver's door frame.

  The label should include the previous reading of the odometer and the date of replacement.
- Retain a copy of the label in compliance with the retention requirements specified in the Guidelines for General Motors Odometer Policy.

Instrument Cluster Description

The instrument cluster is centered above the steering column in the instrument panel (I/P). The instrument cluster contains gages and indicator lamps that provide the driver with vehicle performance information. Warning lights come on when there may be or is a problem with one of the vehicle's functions. Some warning lights come on briefly when the vehicle is started to let you know they are working. Gages can indicated when there may be or is a problem with one of the vehicle's functions. Often gages and warning lights work together to let you know when there is a problem with the vehicle.

The instrument cluster includes the following gages:

- Fuel gage
- Engine coolant temperature gauge
- Voltmeter
- Speedometer
- Odometer
- Trip odometer
- Tachometer

The instrument cluster contains the following indicator lamps:

- Headlamp high beam symbol
- Fasten seatbelt reminder
- Turn signal directional arrows
- Skip shift
- Oil change
- Hatch ajar

The instrument cluster also contains the following warning indicator lamps:

- ABS INOP
- AIR BAG
- ASR OFF (acceleration slip regulation, Chevrolet V8 only)
- BRAKE
- CHECK GAGES
- LOW COOLANT symbol (V8 engines only)
- LOW OIL
- LOW TRAC (on vehicles with ASR or TCS systems only)
- REDUCED ENG PWR (V6 engines only)
- SECURITY
- SERVICE ENGINE SOON
- SERVICE VEHICLE
- TCS OFF (traction control system, on Pontiac vehicles with V8 engines only)

Electric power is directed to the appropriate lamps and gauges of the instrument cluster by a flexible printed circuit. This circuit is attached to the back of the instrument cluster case. Two multiple connectors and the snap-in bulb sockets help to hold the printed circuit to the back of the instrument cluster.

The instrument cluster is non-serviceable, except as noted in this section. The instrument cluster must be replaced as a unit.

When an instrument cluster is replaced, the law requires that the odometer reading of the replacement unit be set to register the same mileage as the prior odometer. If the same mileage cannot be set the law requires that the following actions be performed:

1. Set the replacement odometer to zero.
2. Install a label on the driver's door frame, providing the following information:
   - The previous odometer reading
   - The date of the replacement

Refer to *Odometer Repair Label Description*.

Instrument Cluster Gauge Operation

Engine Coolant Temperature Gauge

The coolant temperature sending unit is mounted to the engine. The unit is mounted at a point where the unit is exposed to the coolant being circulated through the engine coolant passages. The sending unit contains a temperature-sensitive variable resistor that senses and reacts to coolant temperature. Resistance decreases as temperature increases.

When electric power is supplied to the engine coolant temperature gauge, current flows through the gauge. The current flows to the variable resistor and then to a ground at the engine. The position of the gauge pointer is determined by the strength of the current flowing through the gauge. When the engine coolant is cold the following situations exist:

- The resistance is high.
- The current flow is low.
- The pointer indicates a cold reading.

As the coolant temperature increases, the following situations occur:

- The resistance decreases.
- The current flow is high.
- The pointer moves toward the center of the gauge.

Prolonged driving or idling in very hot weather may cause the pointer to move beyond this point. An overheat condition exists if the pointer goes into the red zone at the upper limit of the scale.

Dial calibrations go far above the normal boiling point of water, which is 100°C (212°F). This is because the cooling system is pressurized. The increase in pressure also increases the boiling temperature of the coolant. This action permits the coolant to reach temperatures above those possible with a non-pressurized system without boiling. The higher operating temperature of the cooling system that results gives greater cooling efficiency and other benefits.

Fuel Gauge

The fuel gauge sending unit is mounted on the top surface of the fuel tank. The fuel level sender itself consists of the following two components:

- A float that rides on the surface of the fuel in the tank
- A variable resistor that is controlled by the float arm

When electric power is supplied to the fuel gauge, current flows through the gauge to the variable resistor and then to a ground. The position of the gauge pointer is determined by the strength of the current that is flowing through the gauge.

If the tank is full the following situations occur:

- The resistance of the variable resistor is high (90 Ω).
- The current flow through the gauge is minimum.
- The pointer indicates that the gauge reads full (F) on the gauge dial.

If the fuel level is low the following situations occur:

- The resistance of the variable resistor is low.
- The current flow through the gauge is high.
- The pointer indicates a low fuel level reading.

Intermediate fuel levels cause the pointer to indicate the corresponding position between F and E.

Oil Pressure Gauge

The oil pressure gauge indicates the pressure of the lubricating oil flow provided by the engine oil pump. The oil pressure gauge sending unit is a variable resistor that is mounted to the engine block. The sending unit senses the oil pressure in a main oil passage just downstream from the engine oil pump. When electric power is supplied to the gauge, current flows through the gauge to the resistor in the sending unit and then to the ground at the engine block. The position of the oil pressure gauge pointer is determined by the strength of the current flowing through the gauge.

When oil pressure is low the following situations exist:

- The resistance of the sending unit is low.
- Current flow through the gauge is high.
- The gauge indicator needle shows a low pressure reading.

As oil pressure increases the following situations occur:

- The resistance of the sending unit resistor increases.
- Current flow through the gauge is reduced.

Under normal conditions the oil pressure reading should be measure 138–414 kPa (20–60 psi). Engine oil pressure should never fall below a reading of 28 kPa (4 psi), even at idle.

Speedometer

The electric speedometer does not have a speedometer cable. The source of speed information is a small permanent magnet alternating current generator called a vehicle speed sensor (VSS). The VSS is mounted on the transmission. The shaft of the VSS fits into rotor teeth on the transmission output shaft in the same manner as the speedometer cable of a mechanical speedometer system. The transmission output shaft rotates and turns the rotor teeth near a magnetic pick-up within the VSS. This generates an alternating current in the coil with a frequency that is proportional to the speed of the vehicle.

The alternating current from the VSS is sent to the powertrain control module (PCM).

The PCM modifies the current to a series of direct current pulses at a frequency proportional to the speed of the vehicle. These pulses form a vehicle speed signal that is transmitted to the speedometer.

At the speedometer, a solid state circuit uses the speed signal in order to regulate the distribution of the current from the fuse block to 2 electromagnetic coils. The magnetic coils are at right angles to each other, near the base of the speedometer pointer pivot.

At the base of the speedometer pointer pivot is a magnet that is acted upon by the magnetic fields of the 2 coils. The relative strength of the 2 magnetic fields determines the position of the magnet and accordingly, the position of the speedometer pointer.

Pulses from the solid state circuit also are used in order to drive a small electric stepper motor. The stepper motor turns the numbered wheels of the odometer and the trip odometer. The numbered wheels are geared so that when any one wheel completes a revolution, the next wheel to the left is turned one-tenth of a revolution. Every tenth of a revolution advances the displayed number by one unit. The trip odometer can be reset to zero at any time. This allows the driver to record the distance traveled from any selected starting point.

Tachometer

The tachometer signal comes from the PCM. The tachometer displays the engine speed in thousands of revolutions per minute (rpm).

Voltmeter

The voltmeter is an instrument that shows the voltage of the vehicle electrical system. The voltmeter indicates the ability of the charging system to keep the storage battery charged. The voltmeter is wired in parallel with other circuits in the vehicle.

When the engine is running the voltmeter indicates charging system voltage. If the engine is not running and the ignition switch is in the RUN or START position the voltmeter will show battery voltage. The voltmeter can be used as a first step in diagnosing many electrical problems. Battery voltage drop can be seen while the engine is cranking. After the engine is running, generator output voltage is indicated.

The voltmeter should read between 11–13 volts during extended idle or just after starting. As the electrical load is increased, or in stop-and-go driving, the pointer may rotate temporarily to the bottom of the scale. A voltmeter reading continuously below 11 volts or above 16 volts indicates an electrical system problem.

Instrument Cluster Indicator Operation

Fasten Seat Belts Indicator Lamp

The FASTEN SEATBELTS indicator lamp will go on when one of the following conditions exist:

- The ignition switch is in the RUN position.
- The ignition switch is in the BULB TEST position.
- The ignition switch is in the START position.
- The driver's seatbelt is unbuckled.

The FASTEN SEATBELTS indicator lamp will remain on until the driver's seatbelt is buckled.

For more information, refer to *Audible Warnings Description* Warning/Reminder Chimes.

Turn Signal Indicator Lamps

The left or right turn signal indicator lamp will illuminate when the multi-function lever on the left side of the steering column is moved to signal a turn. The turn/hazard switch in the steering column receives an on-and-off flashing current from the fuse block and the turn signal flasher unit in the convenience center when the ignition switch is in one of the following positions:

- RUN
- START
- BULB TEST

When the multi-function lever is moved the turn/hazard switch routes the current to circuits that feed the following lamps:

- The left front turn signal lamp
- The right front turn signal lamp
- The left rear tail/stop/turn signal lamps
- The right rear tail/stop/turn signal lamps

The circuit to the left or right front turn signal lamp, and the cornering and sidemarker lamps has a branch that feeds the appropriate turn indicator lamp in the instrument cluster. This causes the lamps to flash when the exterior lamps are indicating a turn.

When the hazard warning button on the right side of the steering column is pressed in the following lamps in the instrument cluster flash:

- The left front turn signal lamps
- The right front turn signal lamps
- The cornering lamps
- The sidemarker lamps
- The rear tail/stop/turn lamps
- Both turn signal indicator lamps

Power for the hazard warning system reaches the turn/hazard switch from the fuse block and the hazard flasher in the convenience center. Power is supplied with the ignition switch in any position. When the hazard warning system is flashing, the turn signal circuits are inoperative.

Air Bag Indicator Lamp

The AIR BAG indicator lamp will light in order to warn the driver of a potential supplemental inflatable restraint (SIR) system problem that could prevent the proper deployment of the air bags in an accident. When the ignition switch is first turned on, the lamp will flash seven times. This flashing verifies the proper operation of the lamp circuit and the sensing and discriminating module (SDM). A scan tool can be used in order to read diagnostic trouble codes (DTCs) in the SDM and to clear all DTCs after repair. For additional information, including service precautions, refer to Supplemental Inflatable Restraints (SIR).

Service Engine Soon Indicator Lamp

The SERVICE ENGINE SOON indicator lamp in the instrument cluster will come on when turning the ignition ON or OFF. This serves as a bulb and system check. The light should go off after the engine starts unless a problem has been detected by the system.

For diagnosis, refer to Engine Controls.

Low Coolant Indicator Lamp (V8 Only)

With a low coolant level, the circuit made by the low coolant probe has very high resistance (over 50,000 Ω). The low engine coolant indicator module senses the voltage change at the low coolant level input. The indicator module provides ground to the LOW COOLANT indicator and the indicator lights up. The LOW COOLANT indicator is grounded for 1.5 seconds when the ignition switch is initially turned the ON position, causing the LOW COOLANT indicator to light.

Low Oil Indicator Lamp

The LOW OIL indicator ground is controlled by the engine oil level indicator control module. In order to check for a low oil condition, the low oil module looks for a ground through the oil level switch. This is done after the ignition switch has been turned to the OFF or LOCK position.

The low oil module tests for a low oil condition as follows:

- 32 minutes after the ignition switch is turned to the OFF or LOCK position, if the previous ignition cycle was less than 12 minutes
- 3 minutes after the ignition switch is turned to the OFF or LOCK position, if the previous ignition cycle was longer than 12 minutes.

When the oil level is low, the low oil module loses the ground through the oil level switch. This means that the oil level switch is open, indicating low oil level. This action causes the low oil module to ground the LOW OIL indicator for the duration of the next ignition cycle.

When the low oil module is grounded through the oil level switch, the low oil module ground the LOW OIL indicator. This allows a bulb test when the ignition switch is turned to the RUN position during the next ignition cycle. The bulb test takes 4–5 seconds.

Oil Change Lamp

The OIL CHANGE light comes on for a 3 second bulb check when the vehicle is first started. The light stays on for 60 seconds after the vehicle is started the oil needs to be changed. The light may indicate to change the oil sooner than suggested in the maintenance schedule. The light comes on when the system predicts that the oil's remaining useful life is almost up. To reset the oil life monitor perform the following:

1. Turn the ignition to the RUN position.
2. Push and hold the TRIP/OIL RESET button for 12 seconds.
3. The OIL CHANGE light will start to flash to confirm the system is reset.
4. The reset is complete when the OIL CHANGE light goes out.

Brake Warning Lamp

When the ignition switch is turned to the RUN position the BRAKE warning lamp will come on for approximately 3 seconds. If the parking brake is set, the lamp will remain on. The lamp may also be illuminated by information from the electronic brake control module (EBCM) to the electronic brake/traction control module (EBTCM).

The BRAKE warning lamp may be activated by the brake combo valve when the ignition switch is turned to one of the following positions:

- RUN
- BULB TEST
- START

For more information, refer to Engine Electrical.

ABS INOP Indicator Lamp

The ABS INOP indicator lamp is part of the antilock brake system. When the ignition switch is turned to the RUN position, the ABS INOP lamp will turn on for approximately 3 seconds. The lamp will turn off if no ABS malfunction is detected. If a malfunction is detected, the lamp will remain on.

If the ABS INOP indicator lamp comes on while driving, there is a malfunction in the antilock brake system. For more information, refer to Antilock Brakes.

ASR Indicator Lamp

Chevrolet V8 Only

The accelerated slip regulation (ASR) system limits wheel spin if the ASR senses that one or both of the rear wheels begin to lose traction. When this happens, the ASR system works the rear brakes and reduces engine power in order to limit wheel spin.

The ASR indicator lamp will come on if one of the following conditions exist:

- There is a system failure.
- The driver turns off the system.
- The engine is starting.

When the ignition switch is turned to the crank position the following lamps will come on:

- ABS INOP
- ASR
- TCS OFF

These lights will remain on if the switch is held in the crank position.

Check Gages Indicator Lamp

The CHECK GAGES indicator lamp alerts the driver to inspect the instrument cluster gages when any of the following abnormalities are detected:

- The coolant temperature is too high.
- The generator voltage is too high.
- The generator voltage is too low.
- The oil pressure is too low.

The indicator lamp also comes on for about one second after the ignition is placed into the BULB TEST position.

LOW TRAC Indicator Lamp

ASR and TCS Systems

On vehicles equipped with accelerated slip regulation (ASR) or traction control systems (TCS) the LOW TRAC indicator lamp comes on in order to indicate the following situations:

- The system is active.
- The system is limiting wheel spin.

The LOW TRAC lamp will turn on during the following situations:

- ABS initialization
- An ABS stop
- A TCS event

The LOW TRAC lamp will remain on for approximately 3 seconds and will then turn off.

The LOW TRAC indicator lamp also comes on when the antilock brake system (ABS) is adjusting brake pressure in order to help avoid a skid.

SECURITY Indicator Lamp

The SECURITY indicator lamp is part of the theft deterrent system. This lamp will come on if one of the following conditions exists:

- The body control module (BCM) is preventing the engine from starting.
- The BCM is not properly programmed.
- The ignition has been turned to the BULB TEST position. The lamp will light for approximately 5 seconds.

Skip Shift Indicator Lamp

V8 Manual Only

When the SKIP SHIFT indicator lamp is on the manual transmission can only be shifted from first gear to fourth gear. For more information on skip shift, refer to Engine Controls.

TCS OFF Indicator Lamp

Pontiac V8 Only

The traction control system (TCS), if equipped, limits wheel spin if the TCS senses that one or both of the rear wheels are beginning to lose traction. When this happens, the TCS works the rear brakes and reduces engine power in order to limit wheel spin.

The TCS OFF indicator lamp will come on when one of the following conditions exists:

- There is a system failure.
- The driver turns off the TCS.
- The engine is starting.

When the ignition switch is turned to the crank position the following lamps will come on:

- ABS INOP
- ASR
- TCS OFF

These lamps will remain on if the switch is held in the crank position.

Service Vehicle Lamp

The SERVICE VEHICLE warning light comes on for a 3 second bulb check when the vehicle is first started. This light will stay on steady if there are certian non-emission related vehicle problems. These problems may not be obvious and may affect vehicle performance or durability.

Reduced Engine Power Lamp

The REDUCED ENG PWR warning light comes on for a 3 second bulb check when the vehicle is first started. When this light comes on a noticeable reduction in the vehicle's performance may occur. The vehicle may be driven at a reduced speed while the light is on. Acceleration and speed may be reduced.

Instrument Cluster Circuit Description

Circuit Operation

The instrument cluster contains analog gauges and indicators. Some of the gauges and indicators are controlled by solid-state controls within the cluster. The other gauges and indicators are controlled by direct circuits into the cluster from other components. These operations are described here briefly.

"ABS INOP" Indicator

Refer to Antilock Brake System.

"AIR BAG" Indicator

Refer to Supplemental Inflatable Restraints.

"ASR" Indicator (Chevrolet)

Refer to Antilock Brake System.

"BRAKE" Indicator

Refer to *Brake Warning System Circuit Description.*

"CHECK GAUGES" Indicator

The instrument cluster's internal circuitry monitors three inputs for determining when to illuminate the "CHECK GAUGES" indicator.

A ground is provided inorder to illuminate the "CHECK GAUGES" indicator when the follwing conditions exist:

1. The coolant temperature sensor indicates above-normal temperature (252°F for V6 VIN K or 244°F for V8 VIN G).
2. The instrument cluster senses that the generator turn-on input is at ground potential. The generator pulls CKT 225 low when any of the following conditions exist:
   - System voltage at or below 11.2V.
   - System voltage is at or above 16.5V.
   - The generator is stopped.
3. The oil pressure sensor indicates below-normal pressure. The minimum rating for the pump is 8.3 psi, though the sensor will be approximately 3 to 5 psi at 10Ω. This situation will cause the "CHECK GAUGES" indicator to illuminate (maximum pressure should be about 90Ω at the sensor).
4. The instrument cluster performs a bulb check function for approximately one second after the ignition is turned ON.

Coolant Temperature Gauge

The coolant temperature gauge contains internal coils that create magnetic fields when current flows through the coils. The current through the coils varies depending on the coolant temperature sensor resistance (approximately 55Ω at 260°F (hot) and approximately 1365Ω at 100°F). The varying sensor resistance causes the current through the coils to fluctuate. The magnetic fields of the coils move the pointer.

"FASTEN SEAT BELT" Indicator

Refer to *Audible Warnings Circuit Description.*

Fuel Gauge

The fuel gauge needle deflects from empty to full based on the output the needle receives from a solid state module. This module is also located within the instrument cluster. The module receives a pulse width modulated signal from the Powertrain Control Module (PCM). This signal varies based on the amount of fuel the fuel level sender detects in the vehicle fuel tank. For further information regarding the fuel gauge, refer to Engine Controls.

High Beam Indicator

System voltage is applied to the high beam indicator whenever the following conditions exist:

1. The headlights are ON.
2. The headlight dimmer switch is on HIGH.

The indicator has a constant ground and illuminates whenever system voltage is applied.

"LOW COOLANT" Indicator (V8 VIN G)

The "LOW COOLANT" indicator has system voltage applied in "RUN", "BULB TEST" or "START". The indicator requires a ground for illumination. Following are two ways that the indicator receives a ground:

- During the bulb check through the instrument cluster
- Whenever the engine coolant level sensor detects a low coolant condition

The instrument cluster performs a bulb check by grounding the circuit to the indicator for approximately one second after the ignition is turned ON. When a low coolant condition occurs, a ground path is supplied through the engine coolant level sensor to the indicator. At the same time, ground is suppled through the engine coolant level sensor to the Body Control Module (BCM). The module is designed to provide a continuous ground path to the indicator for the remainder of the ignition cycle in which a momentary low coolant condition occurred. The module provides its own ground to the indicator until the ignition switch is turned OFF.

"LOW OIL" Indicator

The instrument cluster's internal circuitry will only test the oil level sensor at the ignition ON if drainback times are met as follows:

- 35 minutes after ignition OFF if the engine was still cold.
- 4 minutes after ignition OFF if the engine was hot (running for at least 17 minutes).

The drainback timer sets at ignition OFF. The sensor has normally closed contacts that are open under a low oil condition. After determining that a low oil condition exists, the "LOW OIL" indicator is provided a ground for illumination. The indicator also receives a ground for approximately one second during the cluster's bulb check function right after ignition ON. For further information regarding the "LOW OIL" indicator, refer to Engine Controls.

"LOW TRAC" Indicator

Refer to Antilock Brake System.

Odometer

Voltage that pulses from the Powertrain Control Module (PCM) on CKT 817 is interpreted by solid state logic circuits within the cluster. The solid state circuits process the pulses and output a signal to drive the odometer. The odometer is pre-set to display distance traveled in either miles or kilometers and cannot be changed.

Oil Pressure Gauge

The oil pressure gauge contains internal coils that create magnetic fields when current flows through the coils. The current through the coils varies depending on the oil pressure sensor resistance as follows:

- Low pressure resistance is approximately 10Ω.
- High pressure resistance is approximately 90Ω.

The varying sensor resistance causes the current through the coils to fluctuate. The magnetic fields of the coils move the pointer.

"SECURITY" Indicator

Refer to *Vehicle Theft Deterrent (VTD) Operation.*

"SKIP SHIFT" Indicator

Refer to Engine Controls.

(MIL) "SERVICE ENGINE SOON" Indicator

Refer to Engine Controls.

Speedometer

The speedometer displays vehicle speed in miles per hour (MPH) or kilometers per hour (KPH). Voltage pulses from the Powertrain Control Module (PCM) are interpreted by solid state logic circuits within the cluster. The solid state circuits process the pulses and output a signal to drive the speedometer pointer. For further information regarding the speedometer, refer to Engine Controls.

Tachometer

The tachometer displays engine speed in Revolutions Per Minute (RPM). Voltage pulses from the electronic ignition control module (V6 VIN K) or the powertrain control module (V8 VIN G) are interpreted by solid state logic circuits within the cluster. The solid state circuits process the pulses and put out a signal that drives the pointer of the meter. The pointer is moved with magnetic fields created from coils within the tachometer.

"TCS OFF" Indicator (Pontiac)

Refer to Antilock Brake System.

Voltmeter

The voltmeter measures the vehicle's electrical system voltage during run or stopped conditions. The voltmeter has two coils internally that create magnetic fields. These coils are made of a different amount of windings and are in series with a calibrated resistance. Any voltage between 8 to 18 volts will create a magnetic field that will move the pointer to the appropriate voltage indication.

Audible Warnings Description

Warning/Reminder Chimes

The body control module (BCM) sounds a chime in order to bring attention to one or more of the following conditions:

- The lights are on and the ignition switch is not in the RUN, BULB TEST, or START positions.
- The ignition key is in the ignition switch when the driver's door is open.
- The seatbelt is unbuckled when the ignition switch is placed into the RUN, BULB TEST or START position.
- The turn signal has been on for more than a half mile. Voltage is applied at all times through the fuse block in order to power the solid state BCM.

Ignition Key Warning

A ground is provided to the BCM, which sounds the chime, when both of the following conditions exist:

- The key is in the ignition switch.
- The driver's door is open.

Fasten Seatbelt Warning

Voltage is applied through the fuse block to the BCM when the ignition switch is in one of the following positions:

- RUN
- BULB TEST
- START

With the driver's seat belt unbuckled, the module is grounded through the seatbelt switch. This causes the chime to sound. When the driver's seatbelt is buckled, the alarm shuts off. If the driver's seatbelt remains unbuckled, the alarm times out after 4 to 8 seconds.

Lights-On Warning

Voltage is applied to the audio alarm module when the headlamp switch is in the HEAD or PARK position. Voltage is applied through the fuse block to the alarm module when the ignition switch is in one of the following position:

- RUN
- BULB TEST
- START

These 2 voltages are sensed and the alarm is not sounded.

The module loses voltage when the ignition switch is not in one of the following positions:

- RUN
- BULB TEST
- START

The audio alarm module senses change. If voltage is still available, the voltage is applied in order to sound the alarm. The alarm can be turned off by turning the headlamp switch to the OFF position. The alarm module will no longer sense voltage from the headlamp switch, so the alarm will not sound.

Audible Warnings Circuit Description

Circuit Operation

The body control module generates a chime in order to provide the following warnings:

- Lights on
- Ignition key
- Fasten seat belt

Lights On Warning

The body control module (BCM) will sound the lights on warning when the BCM senses all of the following conditions:

- The ignition switch is in the OFF, LOCK or ACCY position. There is no voltage at circuit 39 to the BCM ignition positive voltage input.
- The park lamps or headlamps are on. Voltage is applied through circuit 9 to the BCM park lamps input.
- The driver door is open. On vehicles without door jamb switches: ground is applied from G200 through circuit 750, the left side door lock and circuit 745 to the BCM driver door open input.

  On vehicles with door jamb switches: ground is applied through the door jamb switch and CKT 745 to the BCM driver door open input.

Ignition Key Warning

The Body Control Module (BCM) will sound the ignition key warning when the BCM senses all of the following conditions:

- The ignition switch is in the OFF, LOCK or ACCY position. There is no voltage at circuit 39 to the BCM ignition positive voltage input.
- The ignition key is in the ignition switch. Ground is applied from G200 through circuit 650, the ignition key warning switch and circuit 80 to the BCM key ignition signal input.
- The driver door is open. On vehicles without door jamb switches: ground is applied from G200 through circuit 750, the left side door lock and circuit 745 to the BCM driver door open input.

  On vehicles with door jamb switches: ground is applied through the door jamb switch and CKT 745 to the BCM driver door open input.

Fasten Belts Warning

The body control module (BCM) will sound the fasten belts warning for 5–8 seconds and illuminate the fasten seat belt indicator when the BCM senses both of the following conditions:

- The ignition switch is in the RUN, BULB TEST or START position. Voltage is applied through circuit 39 to the BCM ignition positive voltage input.
- The driver's seat belt is unbuckled. Ground is applied from G200 through circuit 650, the seat belt switch and circuit 238 to the BCM seat belt switch signal input.

If the driver seat belt is buckled before the ignition switch is turned to the RUN, BULB TEST or START positions the following situations will occur:

- The fasten seat belt warning will be disabled.
- The fasten seat belt indicator will not illuminate.

If the driver seat belt is unbuckled, the fasten seat belt indicator will remain ON for approximately 70 seconds. The indicator turns off immediately if the seat belt is buckled.

Console

The front floor console is located between the driver and passenger seats, covering the transmission shift lever and the park brake lever. The console fits over the tunnel in the floor of the vehicle. The console extends from under the center of the instrument panel (I/P) to just before the rear seat. The front floor console is a one piece design.

The console is equipped with the following items:

- A 12V power outlet
- A passenger side cup holder
- 2 rear passenger cup holders

The console storage compartment is located at the rear of the console. The storage compartment also contains a cassette tape/compact disc storage area and a removable coin holder. The padded door of the storage compartment serves as a front seat center armrest. Attached to the center console is the transmission shift opening trim plate. The console trim plate contains the following items:

- A driver's cupholder
- A cigarette lighter
- The PRNDL for the automatic transmission

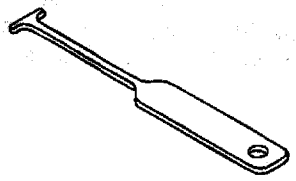
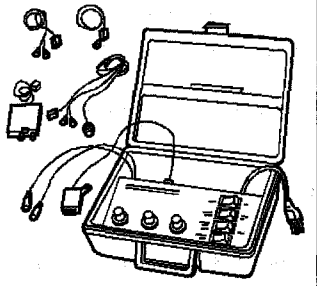
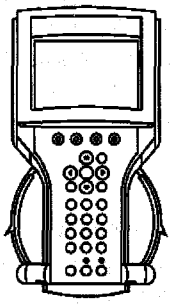
Attached to the console is the console accessory trim plate. On Pontiac vehicles, this trim plate may contain any of the following switches:

- Convertible top
- Traction control

On Chevrolet vehicles, this trim plate will contain only the convertible top switch.

On certain Chevrolet export vehicles there may also be a headlamp leveling switch.

Special Tools and Equipment

Illustration	Tool Number/ Description
 345719	J 42059 Cigarette Lighter Socket Remover
 14424	J 33431-B Signal Generator and Instrument Panel Tester
 59260	Tech 2

Keyless Entry

Schematic and Routing Diagrams

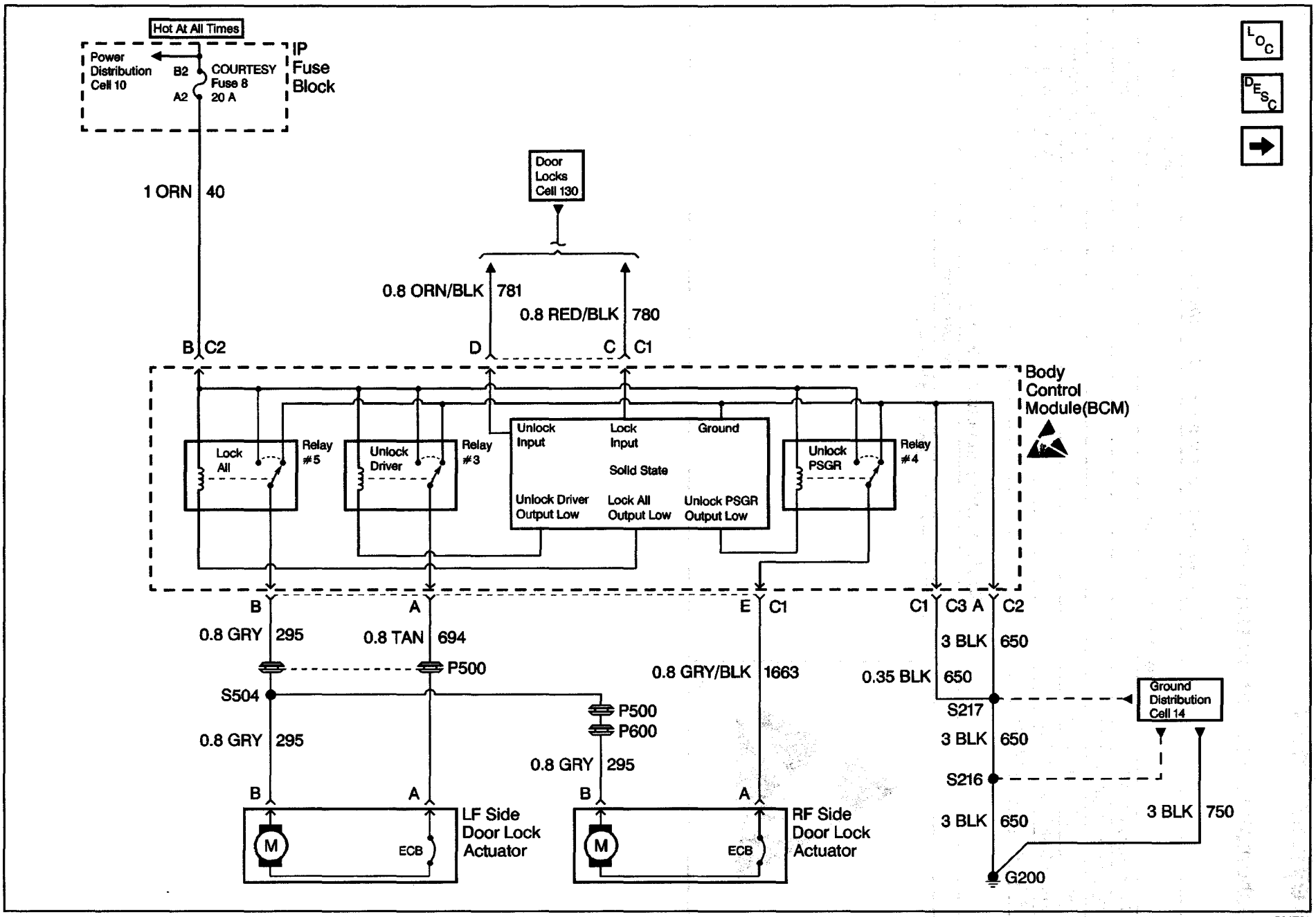
Keyless Entry Schematic References

Reference on Schematic	Section Number Subsection Name
Door Locks Cell 130	8—Doors
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems
Release Systems Cell 134	8—Body Rear End

Keyless Entry Schematic Icons

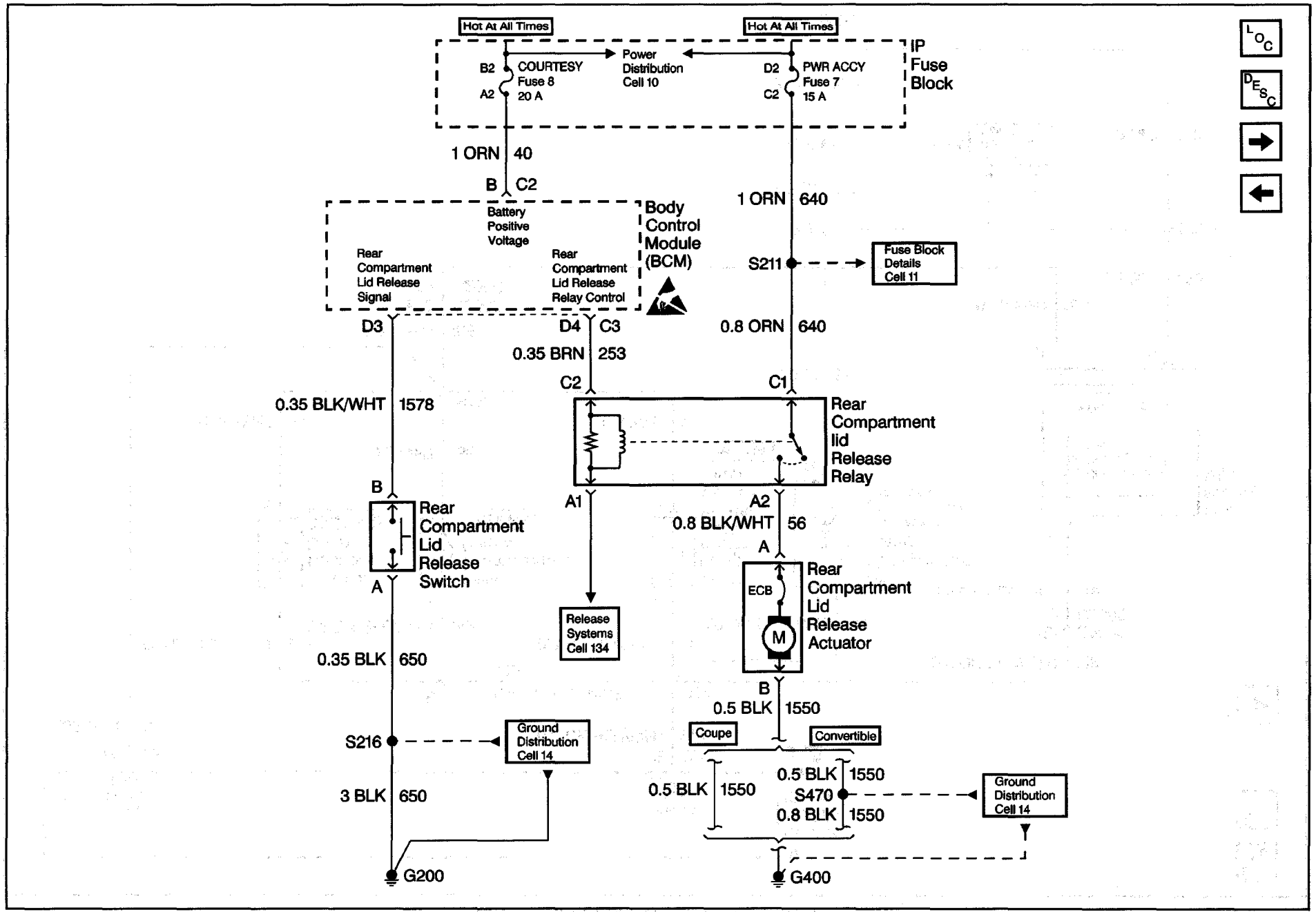
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.

Keyless Entry Schematics (Cell 132: Body Control Module and Side Door Lock Actuators)



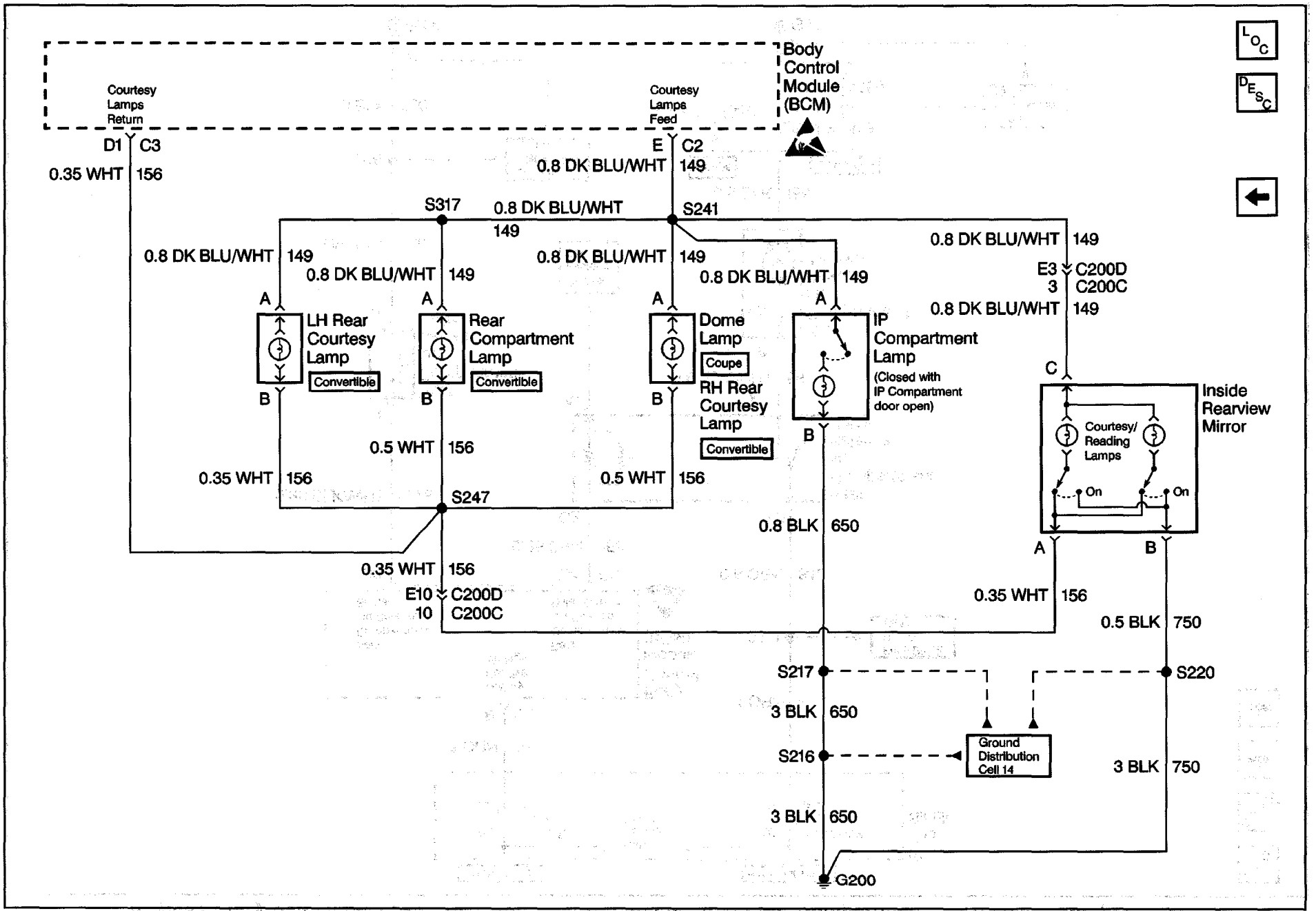
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Keyless Entry Schematics (Cell 132: Body Control Module and Rear Compartment Lid Release Components)



501722

Keyless Entry Schematics (Cell 132: Interior Lights)



Component Locator

Keyless Entry Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Courtesy Lamp, Left Rear (Convertible)	Mounted in the left sail panel	—	—
Courtesy Lamp, Rear Compartment (Convertible)	In the center of the rear compartment, near the rear compartment lid release actuator	*Power Roof Systems Component Views* in Roof	—
Courtesy Lamp, Right Rear (Convertible)	Mounted in the right sail panel	—	—
Dome Lamp (Coupe)	On the roof, near the hatch	*Harness Routing Views* in Wiring Systems	—
Front Side Door Lock Actuator	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Inside Rearview Mirror	Mounted to inside center of windsheild	—	—
IP Compartment Lamp	Inside the top center of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Rear Compartment Lid Release Actuator	In the center of the end panel, in the cargo compartment	*Body Rear End Component Views* in Body Rear End	*Body Rear End Connector End Views* in Body Rear End
Rear Compartment Lid Release Relay	Under the left side of the instrument panel, near C200	*Body Rear End Component Views* in Body Rear End	—
Rear Compartment Lid Release Switch	In the driver knee bolster, left of the steering column	—	*Body Rear End Connector End Views* in Body Rear End
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views* in Wiring Systems	—
P500	Between the driver door and A-pillar	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—

Keyless Entry Components (cont'd)

Name	Location	Locator View	Connector End View
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S241	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the antenna cable breakout	—	—
S247	Instrument panel harness, approximately 16 cm (6 in) from G200 breakout	—	—
S317 (Convertible)	Instrument panel harness, main branch, approximately 40 cm (16 in) (from left rear courtesy lamp breakout	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—
S504	Cross car harness, approximately 11 cm (4 in) from left outside rearview mirror breakout	—	—

Diagnostic Information and Procedures

Remote Keyless Entry System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Exit the vehicle. 2. Close the door and the hatch. 3. Press the door UNLOCK button on the remote control door lock transmitter.	• The driver door unlocks. • The interior lights illuminate.	• *Door Unlock Inoperative with Transmitter - All* • *Remote Keyless Entry System Inoperative* • *Courtesy Lamps Inoperative with Transmitter*
2	Press the door UNLOCK button a second time within 5 seconds of the first press.	• The passenger door unlocks. • The interior lights stay illuminated for one of the following periods of time: • For 40 seconds after the first press of the UNLOCK button • Until the ignition switch is turned to the ON position	• *Door Unlock Inoperative with Transmitter - All* • *Door Lock/Unlock Inoperative - RF* • *Courtesy Lamps Inoperative with Transmitter*
3	1. Wait for the interior lights to go out. 2. Press the door LOCK button on the remote control door lock transmitter.	• The doors lock. • The interior lights illuminate for approximately 2 seconds in order to acknowledge the locking of the doors.	• *Door Lock Inoperative with Transmitter - All* • *Remote Keyless Entry System Inoperative* • *Courtesy Lamps Inoperative with Transmitter*
4	Press the rear compartment lid release button on the remote control door lock transmitter.	• The rear compartment lid releases. • The interior lights illuminate for approximately 40 seconds.	• *Rear Release Inoperative with Transmitter* • *Remote Keyless Entry System Inoperative* • *Courtesy Lamps Inoperative with Transmitter*
5	Enter the BCM feature customization mode. Refer to *Feature Customization*	BCM enters the feature customization mode.	*RKE System Does Not Change Customization Modes*

Remote Keyless Entry System Inoperative

Step	Action	Value(s)	Yes	No
1	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Test the keyless entry system. Did the keyless entry system operate normally?	—	System OK	*Go to Step 2*
2	1. Disconnect the BCM connector C2. 2. Connect a test lamp from connector C2 terminal B to terminal A. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 4*
3	1. Test for poor connections to the BCM. 2. If the connections are OK, replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—
4	Repair the open or a bad connection in circuit 40 between the BCM and fuse 8. Is the repair complete?	—	System OK	—

RKE System Does Not Change Customization Modes

Step	Action	Value(s)	Yes	No
1	Check for body control module (BCM) DTCs. Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. Are any BCM DTCs present?	—	Go to *Diagnostic Trouble Code (DTC) List/Type*	*Go to Step 2*
2	Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Transmitter Test

Important:

1. Inspect that the keyless entry transmitter is the correct model for the vehicle remote system. A wrong model transmitter may pass this test, but will not activate the vehicle remote system.
2. Inspect that the transmitter is synchronized with the vehicle. Refer to *Transmitter Programming/Synchronization.*

Transmitter Test

Step	Action	Value(s)	Yes	No
Tools Required: *J 43241*				
1	Did you perform the Keyless Entry System Check?	—	Go to *Step 2*	Go to *Remote Keyless Entry System Check*
2	1. Turn ON the *J 43241.* 2. Place the transmitter on the *J 43241* test pad. 3. Press each button of the transmitter one at a time. Does a tone sound and the green light illuminate on the *J 43241* after each button is pressed?	—	Transmitter OK	Go to *Step 3*
3	Do any of the buttons on the transmitter sound the tone and illuminate the green light when pressed?	—	Go to *Step 6*	Go to *Step 4*
4	Replace the transmitter battery. Refer to Transmitter Battery Replacement. Did you complete the replacement?	—	Go to *Step 5*	—
5	1. Turn ON the *J 43241.* 2. Place the transmitter on the *J 43241* test pad. 3. Press each button of the transmitter one at a time. Does a tone sound and the green light illuminate on the *J 43241* after each button is pressed?	—	Go to *Step 7*	Go to *Step 6*
6	Replace the transmitter. Refer to Transmitter Replacement. Did you complete the replacement?	—	Go to *Step 8*	—
7	Operate the transmitter within the range of the vehicle. Do the vehicle functions operate normally?	—	Transmitter OK	Go to *Step 8*
8	Perform the Synchronization Procedure. Refer to *Transmitter Programming/Synchronization.* Did you complete the synchronization?	—	Transmitter OK	—

Door Lock Inoperative with Transmitter - All

Step	Action	Value(s)	Yes	No
1	Attempt to lock the right side door and left side door using the left door lock switch. Do the door locks operate?	—	*Go to Step 2*	Go to *Power Door Locks - Lock Inop, Unlock Operates*
2	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Attempt to lock the right side door and left side door using the remote control door lock transmitter. Do the door locks operate?	—	System OK	*Go to Step 3*
3	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Door Unlock Inoperative with Transmitter - All

Step	Action	Value(s)	Yes	No
1	Attempt to unlock the right side door and left side door using the left door lock switch. Do the doors unlock?	—	*Go to Step 2*	Go to *Power Door Locks - Unlock Inop, Lock Operates*
2	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Attempt to unlock the right side door and left side door using the remote control door lock transmitter. Do the doors unlock?	—	System OK	*Go to Step 3*
3	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Rear Release Inoperative with Transmitter

Step	Action	Value(s)	Yes	No
1	Attempt to open the rear compartment using the rear compartment lid release switch located inside the vehicle. Does the rear compartment lid release?	—	*Go to Step 2*	Go to *Rear Compartment Lid Release Inoperative*
2	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Attempt to open the rear compartment lid using the remote control door lock transmitter. Does the rear compartment lid open?	—	System OK	*Go to Step 3*
3	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Courtesy Lamps Inoperative with Transmitter

Step	Action	Value(s)	Yes	No
1	Open the driver door. Do the courtesy lamps illuminate?	—	*Go to Step 2*	Go to *Courtesy Lamps Inoperative*
2	Replace the body control module (BCM). Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Door Lock/Unlock Inoperative - LF

Step	Action	Value(s)	Yes	No
1	Attempt to operate the left side door lock and unlock functions using the left door lock switch. Does the left side door lock and unlock?	—	*Go to Step 2*	Go to *Power Door Locks Inoperative*
2	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Attempt to operate the left side door lock and unlock functions using the remote control door lock transmitter. Does the left side door lock and unlock?	—	System OK	*Go to Step 3*
3	Replace the BCM. Refer to *Body Control Module Replacement.* Is the repair complete?	—	System OK	—

Door Lock/Unlock Inoperative - RF

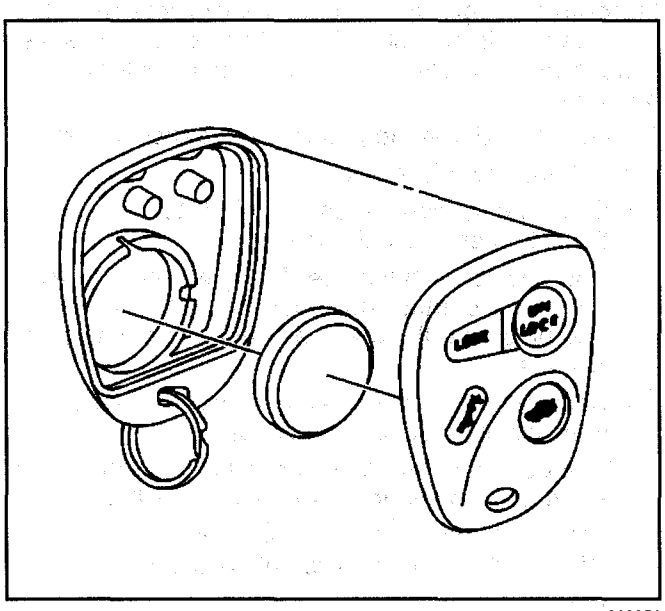
Step	Action	Value(s)	Yes	No
1	Attempt to operate the right side door lock and unlock functions using the right door lock switch. Does the right side door lock and unlock?	—	*Go to Step 2*	Go to *Power Door Locks Inoperative*
2	1. Perform the keyless entry transmitter test. Refer to *Transmitter Test.* 2. Attempt to operate the right side door lock and unlock functions using the remote control door lock transmitter. Does the right side door lock and unlock?	—	System OK	*Go to Step 3*
3	Replace the BCM. Refer to *Body Control Module Replacement* Is the repair complete?	—	System OK	—

Repair Instructions

Transmitter Battery Replacement

Removal Procedure

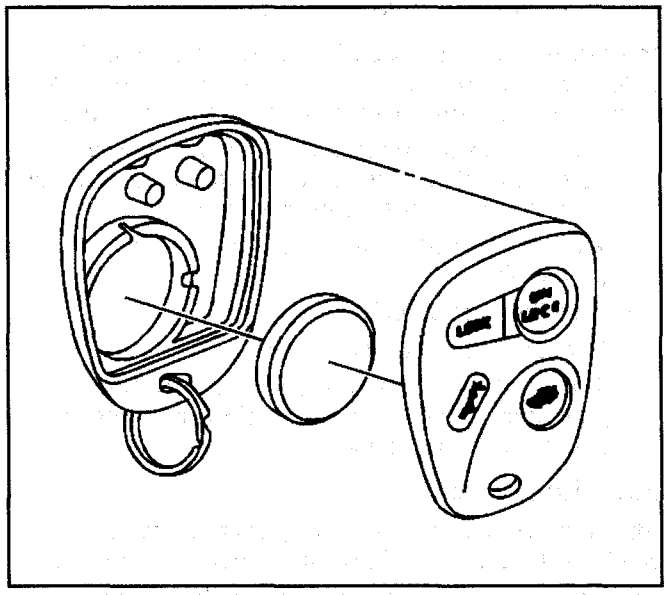
1. Perform the following steps to separate the top cover from the bottom of the transmitter:
   1.1. Insert a coin into the slotted end of the transmitter.
   1.2. Pry the transmitter apart.
2. Remove the old battery.



362251

Installation Procedure

1. Install the new battery.
2. Use battery type CR2032, or the equivalent.
3. Install the top cover by snapping the cover onto the bottom of the transmitter.
4. Stand near the vehicle and hold the transmitter. Push any button on the transmitter in order to resynchronize the transmitter and the body control module (BCM).



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Transmitter Programming/Synchronization

Important: Programming of the transmitters cannot be done simultaneously. The first transmitter must be completely done before the second transmitter is programmed.

Perform the following to program the transmitter(s):

- Pull the radio fuse (#17).
- Cycle the ignition switch from OFF to RUN 3 times within 5 seconds.

  The body control module (BCM) will indicate that it is in a programming sequence by locking, and unlocking the doors and activating the hatch release.
- Depress and hold lock and unlock on the first transmitter for up to 16 seconds.

  The door locks will lock and unlock and the hatch will release again to provide feedback that a transmission has been recognized.

  Wait for the door locks to unlock before proceeding.
- Depress and hold lock and unlock on the second transmitter for up to 16 seconds.

Important: Failing to wait for the doors to unlock before proceeding with the next step will result in one or both of the transmitters not being programmed.

The door locks will lock and unlock and the hatch will release again to provide feedback that a transmission has been recognized.

Wait for the door locks to unlock before proceeding.

- Turn the ignition OFF.
- Replace the radio fuse (#17).
- If at any time it is necessary to restart the procedure, turn the ignition OFF and proceed again with step number 1

Functional Check

After the system has been programmed stand within 20 feet of the vehicle and proceed as follows:

1. Lock all doors by depressing the lock button.
2. Unlock the drivers door and activate the interior lights (unless the interior lights are already on) by depressing the unlock button once.

   The interior lights will stay on for approximately 40 seconds or until the ignition is turned ON. The interior lights cannot be reactivated by depressing the lock or unlock buttons until it has timed out.
3. Unlock the passenger door (interior lights should already be on) by depressing the unlock a second time within 5 seconds of the first activation.
4. Release the rear hatch and activate the interior lights (unless the interior lights are already on) for approximately 40 seconds by depressing the hatch release button twice when the vehicle is in park or the parking brake is applied.
5. On vehicles with the content theft security system, activate the horns and lights by pushing the panic button on the key fob.

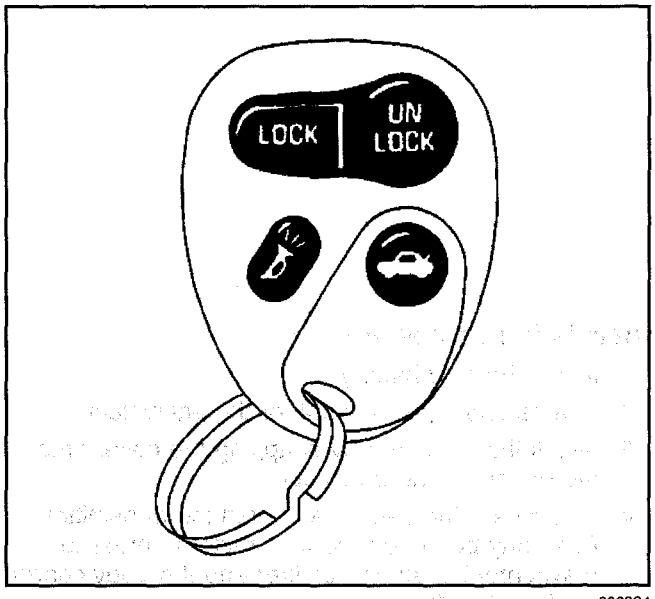
   Push the panic button a second time to deactivate the horns and lights.

Repeat steps 1 through 5 with the second transmitter.

Description and Operation

Remote Keyless Entry System Operation

Unlocking the Doors



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1. Press the UNLOCK button once in order to perform the following operations:
   - Unlock the driver's front side door
   - Turn on the illuminated entry
   - Disarm the universal theft-deterrent system
2. Press the UNLOCK button a second time, within 5 seconds, in order to unlock the passenger door.

Releasing the Rear Compartment Lift Window Panel

1. On vehicles with an automatic transmission, perform one of the following operations:
   - Place the vehicle into the PARK position.
   - Turn the ignition to the OFF position.
2. On vehicles with a manual transmission, perform both of the following operations:
   - Turn the ignition to the ON position.
   - Set the park brake.
3. Press the button marked with the vehicle symbol in order to perform the following operations:
   - Release the rear compartment lift window panel
   - Activate the illuminated entry

Locking the Doors

Press the LOCK button in order to perform the following operations:

- Lock all of the doors
- Deactivate the illuminated entry
- Arm the universal theft-deterrent system

Panic Mode

Press the button that is marked with the horn symbol in order to activate the emergency panic mode. This mode will activate the horn and the parking lights intermittently until the panic mode button is pressed again.

Remote Control Door Lock Transmitter

The remote control door lock transmitter transmits a radio signal to the body control module (BCM). The BCM controls the functions of the transmitter. The transmitter range is approximately 9 m (30 feet).

The transmitter data is encrypted, and changes with each use. If the transmitter buttons are pressed too many times out of range from the vehicle the transmitter and the BCM will get out of synchronization. This will result in the transmitter appearing not to work at all. This situations will occur after the transmitter button is depressed more that 256 time when it is out of range from the vehicle. This may also be necessary if the transmitter battery has been replaced and the buttons were pushed a few times out of range. If the transmitter and the BCM get out of synchronization, re-synchronize the transmitter and the BCM. Refer to Re-synchronizing Transmitter and Body Control Module.

Re-Synchronizing Transmitter and Body Control Module (BCM)

Press both lock and unlock on the transmitter and hold for approximately 8 seconds. This will attempt to match security codes.

Body Control Module (BCM)

The Body Control Module (BCM) is battery fed. The BCM is always monitoring the transmitter signal. When the BCM receives the correct transmitter signal the following actions occur:

1. A transistor driver energizes the correct lock control relay coil.
2. The transistor driver will arm the universal theft-deterrent, if equipped.
3. The doors lock.

The BCM also regulates which lock control relays will be energized in order to perform the following operations:

- Unlock the doors
- Release the rear compartment lift window panel
- Disarm the universal theft-deterrent, if equipped

For replacement of the BCM, refer to *Body Control Module Replacement*

Remote Keyless Entry System Circuit Description

Circuit Operation

The body control module (BCM) is designed with an internal antenna. The BCM picks up transmitted radio frequencies from a hand held remote control door lock transmitter. The transmitter has sufficient power for operating the system from up to 7–10 meters (22–33 ft) from the vehicle.

The side door lock actuators and the rear compartment lid release actuator contain an electronic circuit breaker (ECB). ECB resistance increases if the actuator is overloaded. Resistance returns to normal after the voltage is removed from the actuator terminals.

Remote Control Door Lock Transmitter Functions

Lock

When the lock button on the remote control door lock transmitter is pressed, the body control module (BCM) grounds the coil of relay 5. A voltage pulse is applied from the BCM through circuit 295 to both side door lock actuators. Ground is applied from G200 through circuit 650, the BCM and circuit 694 and circuit 1663 to the actuators. the driver and passenger doors lock. The BCM turns off all of the courtesy lamps as visual confirmation that a lock function was performed.

Unlock

When the unlock button on the remote control door lock transmitter is pressed once, the body control module (BCM) grounds the coil of relay 3. A voltage pulse is applied from the BCM through circuit 694 to the left side door lock actuator. Ground is applied from G200 through circuit 650, the BCM and circuit 295 to the actuator. The driver door unlocks. The BCM also grounds the dome/courtesy lamps through CKT 156 for approximately 40 seconds to provide illuminated entry. The BCM then initiates the theater dimming function until the BCM receives an ignition ON input.

When the unlock button on the transmitter is pressed a second time within 5 seconds, the BCM grounds the coil of relay 3. A voltage pulse is applied from the BCM through circuit 1663 to the right side door lock actuator. Ground is applied from G200 through circuit 650, the BCM and circuit 295 to the actuator. The passenger door unlocks.

Rear Compartment Lid Release

Automatic Transmission

Voltage is applied at all times from the PWR ACCY fuse through circuit 640 to the normally open contacts of the rear compartment lid release relay. When the rear compartment lid release button on the remote control door lock transmitter is pressed twice, voltage is applied from the body control module (BCM) through circuit 253 to the coil of the rear compartment lid release relay. If the transmission is in the PARK or NEUTRAL position, the relay is energized. The relay then applies battery voltage through circuit 56 to the rear compartment lid release actuator. Ground is applied from G400 through circuit 1550 to the actuator. The rear compartment lid opens.

Manual Transmission

Voltage is applied at all times from the PWR ACCY fuse through circuit 640 to the normally open contacts of the rear compartment lid release relay. When the rear compartment lid release button on the remote control door lock transmitter is pressed twice, voltage is applied from the body control module (BCM) through circuit 253 to the coil of the rear compartment lid release relay. If the park brake is set, the park brake switch is closed and the relay is energized. The relay then applies battery voltage through circuit 56 to the rear compartment lid release actuator. Ground is applied from G400 through circuit 1550 to the actuator. The rear compartment lid opens.

Illuminated Entry Operation

The dome lamp (coupe) or the rear courtesy lamps illuminate whenever a remote control door lock transmitter unlock request is received by the body control module (BCM). The BCM provides voltage through circuit 149 to the dome lamp (coupe) or the rear courtesy lamps (convertible). Ground is applied from the BCM through circuit 156 to the lamps. The lamps illuminate whenever a remote control door lock transmitter request is received.

With a LOCK request, the dome lamp (coupe) or the rear courtesy lamps (convertible) are immediately turned off. This action provides visual confirmation that a lock function was performed.

With an unlock or a rear compartment lid release request, the dome lamp (coupe) or the rear courtesy lamps (convertible) are turned on. The lights remain on for 40 seconds in order to provide illuminated entry and hatch area illumination.

Illuminated entry is disabled when the BCM detects ignition ON voltage.

Programming the Body Control Module

The body control module (BCM) is capable of accepting vehicle access code (VAC) programming from any four remote control door lock transmitters. Up to four remote control door lock transmitters can be programmed. When four transmitters are programmed, they must be programmed one after the other, during the same program sequence. Transmitters may not be programmed simultaneously. Each transmitter is manufactured with a permanent VAC combination (one of over 4 billion combinations). The code cannot be changed for the life of the transmitter. The BCM can only be programmed by the transmitters while in the program mode.

Programming Procedure

Important:

- When you replace a lost or damaged transmitter, program all of the remote control door lock transmitters.

  The first transmitter code that you program will always be in all four memories unless additional transmitters are programmed.
- Program the remote keyless entry system for one vehicle at a time.

  If you program two or more vehicles and the vehicles are close to each other, one transmitter could be programmed to more than one vehicle.

1. Turn the ignition switch to the OFF position.
2. Remove the RADIO fuse from the fuse block.
3. Cycle the ignition switch from the OFF position to the RUN position 3 times within 5 seconds.

   The body control module (BCM) will verify entry into the programming mode by performing the following actions:

   3.1. Locking both of the doors
   3.2. Unlocking the driver door
   3.3. Releasing the rear compartment lid
4. Press and hold both the LOCK and UNLOCK buttons on the remote control door lock transmitter for approximately 15 seconds.

   The following actions will occur:

   - The BCM will confirm that the transmitter code is programmed by performing the following actions:

     4.1. Locking both of the doors
     4.2. Unlocking the driver door
     4.3. Releasing the rear compartment lid
   - Any transmitter code that was previously programmed is erased.
   - The BCM is programmed to the transmitter.

5. If you are programming the BCM to match additional remote control door lock transmitters, repeat step 4. You may program up to 4 transmitters. This must be done before the RADIO fuse is reinstalled.
6. Place the ignition switch in the OFF position.

Important: The remote keyless entry system will not be operational if the program input line (RADIO fuse) is open.

7. Reinstall RADIO fuse to the fuse block.

Remote Keyless Entry General Description

The remote keyless entry system (remote control door lock system) performs the following operations:

- Locks the front side doors
- Unlocks the front side doors
- Turns on the interior lamps
- Releases the rear compartment lift window panel
- Arms the universal theft-deterrent system, if equipped
- Disarms the universal theft-deterrent system, if equipped

Vehicles that are equipped with the theft-deterrent system are also equipped with a panic button. Pressing the panic button activates the following components:

- The horn
- The parking lights

The body control module (BCM) receives the panic button signal. The BCM is located above the right instrument panel insulator on the HVAC module.

Important: The remote keyless entry system is intended to be used as a supplementary vehicle entry device. The remote keyless entry system is not intended to replace a door lock key. The remote keyless entry system is intended to be used in conjunction with a door lock key. The remote keyless entry system could be disabled due to one of the following conditions:

- Radio frequency interference
- Low transmitter battery power level

Due to the above conditions, the driver should always maintain access to a door lock key.

The remote keyless entry system operates on a 315 MHz radio frequency at a low energy level. If the system fails to operate from a normal distance, inspect for the following conditions:

- There are weak batteries in the remote transmitter.

  The expected battery life is two years.
- The transmitter and the BCM are not synchronized.
- Trees, bushes or other objects are blocking the signal.
- The system is in close proximity to one of the following radio transmitters:
  - A radio station tower
  - An airport transmitter
  - Mobile radios
  - CB radios

The remote control door lock transmitter is a hand-held item that is attached to a key ring. The transmitter has 3 or 4 buttons that control the functions of the system. The transmitter complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference which the device receives.

   This type of interference includes any interference that may cause undesired operation.

Horns

Specifications

Fastener Tightening Specifications

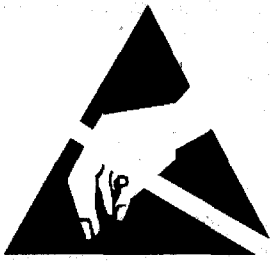
Application	Specification	
	Metric	English
Horn Bolt	27 N·m	20 lb ft

Schematic and Routing Diagrams

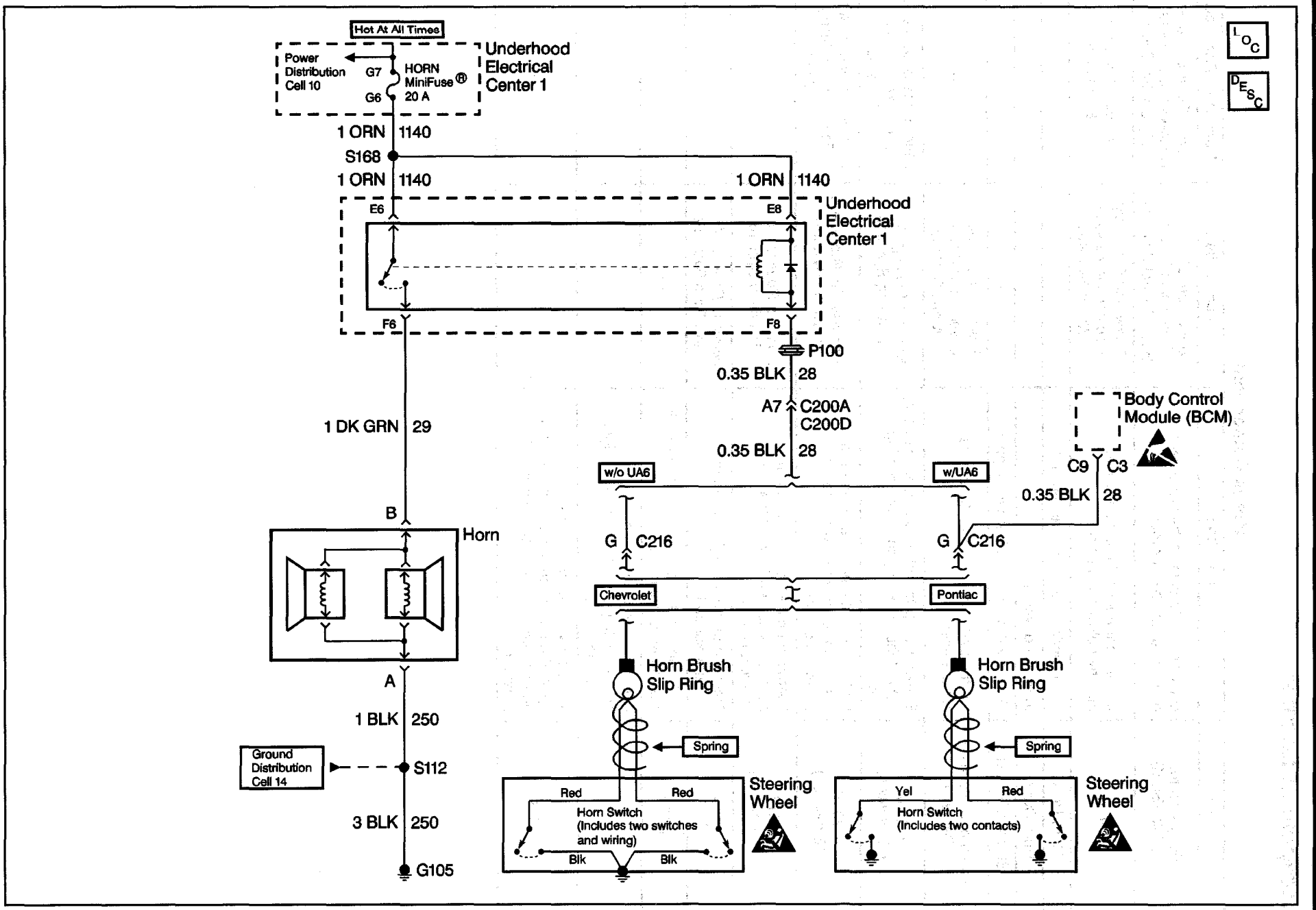
Horns Schematic References

Reference on Schematic	Section Number - Subsection Name
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems

Horns Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.

Horns Schematics (Cell 40)



501320

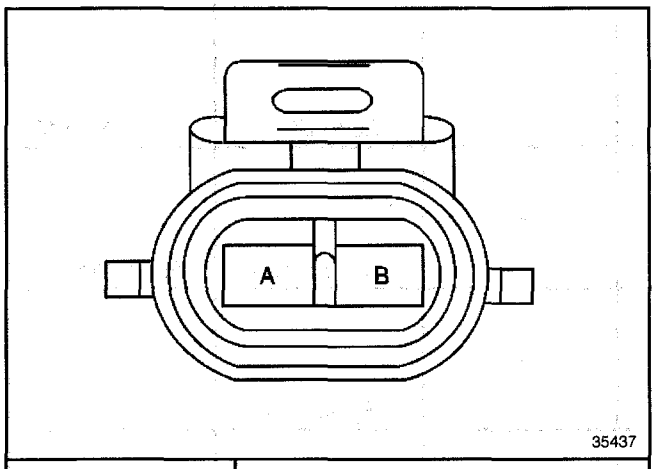
Component Locator

Horns Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control Systems	*Body Control Module Connector End Views* in Body Control Systems
Horn	In the front right side of the vehicle, directly below headlamp	*Power and Grounding Component Views* in Wiring Systems	*Horns Connector End Views*
Horn Relay	In the underhood electrical center 1	—	—
Horn Switch	In steering wheel	—	—
Steering Wheel	On the left side of the instrument panel	—	—
Underhood Electrical Center 1	On the Left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views* in Wiring Systems	—
G105	Attached to the top right side of the radiator support	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
S112	In the forward lamp harness, approximately 9 cm (4 in) from the right lamps breakout	—	—
S168	In the forward lamp harness, approximately 8 cm (3 in) from the main branch into the UH electrical center 1 breakout	—	—

Horns Connector End Views

Horn



Connector Part Information	• 1205-2644 • 2 Way F Metri-Pack 150 Series Sealed (GRY)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	250	Ground
B	DK GRN	29	Horn feed

Diagnostic Information and Procedures

Horns System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Press the horn switch.	The horns sound.	The horns do not sound. Refer to *Horns Inoperative*
2	Release the horn switch.	The horns turn off.	The horns do not turn off. Refer to *Horns Always On*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Horns Inoperative

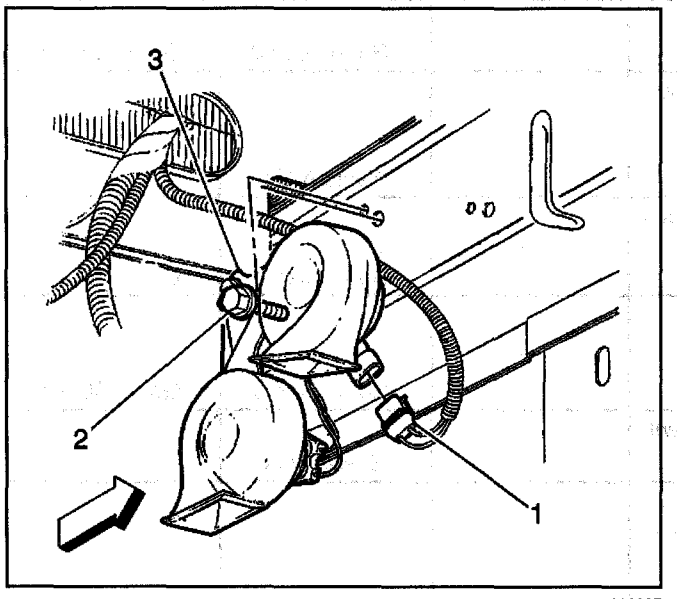
Step	Action	Value(s)	Yes	No
1	1. Disconnect the horn relay. 2. Connect a test lamp from UH electrical center 1 terminal E6 to ground. Does the test lamp light?	—	Go to *Step 2*	Go to *Step 8*
2	Connect a test lamp from UH electrical center 1 terminal E8 to ground. Does the test lamp light?	—	Go to *Step 3*	Go to *Step 9*
3	1. Connect a test lamp between UH electrical center 1 terminals E6 and F8. 2. Press the horn switch. Does the test lamp light?	—	Go to *Step 4*	Go to *Step 10*
4	Connect a fused jumper between UH electrical center 1 terminals E6 and F6. Does the horn sound?	—	Go to *Step 15*	Go to *Step 5*

Horns Inoperative (cont'd)

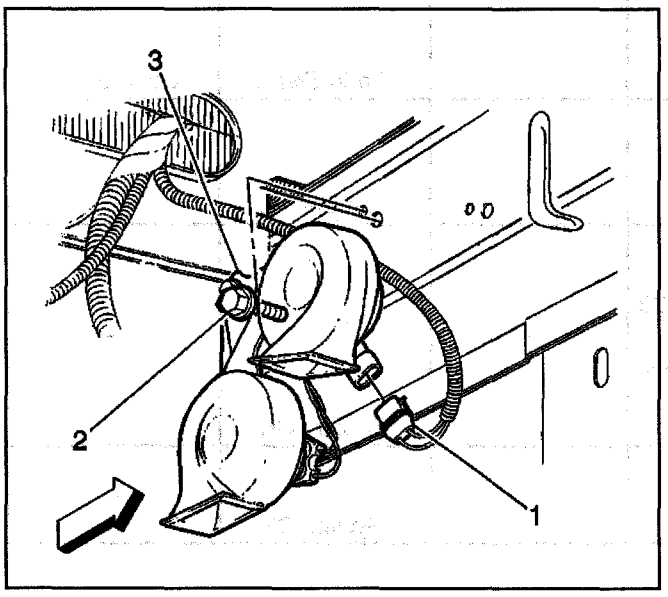
Step	Action	Value(s)	Yes	No
5	1. Reconnect the horn relay. 2. Disconnect the horn. 3. Connect a test lamp from horn connector terminal A to B+. Does the test lamp light?	—	Go to *Step 6*	Go to *Step 13*
6	1. Connect a test lamp from the horn connector terminal B to ground. 2. Press the horn switch. Does the test lamp light?	—	Go to *Step 7*	Go to *Step 14*
7	1. Inspect the horn for a poor connection. 2. If the connection is OK, replace the horn. Refer to *Horn Replacement.* Is the repair complete?	—	System OK	—
8	Repair the open or the poor connection in CKT 1140 between UH electrical center 1 terminal E6 and Horn fuse. Is the repair complete?	—	System OK	—
9	Repair the open or poor connection in CKT 1140 between UH electrical center 1 terminal E8 and S168. Is the repair complete?	—	System OK	—
10	1. Disconnect connector C216. 2. Connect a test lamp from UH electrical connector center 1 terminal E6 to connector C216 terminal G (steering column side). 3. Press the horn switch. Does the test lamp light?	—	Go to *Step 11*	Go to *Step 12*
11	Repair the open or poor connection in CKT 28 between connector C216 and UH electrical center 1. Is the repair complete?	—	System OK	—
12	1. Test for an open in the BLK wires attached to the horn brush slip ring. 2. Test for contact at the horn brush slip ring. 3. For Chevrolet only, inspect for a clean and tight ground at the case of the horn switches. 4. For Pontiac only, inspect for a clean and tight connection at the inflator module. 5. If the above items are OK, replace the horn switches. Refer to *Horn Switch Replacement - On Vehicle (Chevrolet)* or *Horn Switch Replacement - On Vehicle (Pontiac).* Is the repair complete?	—	System OK	—
13	Repair the open in CKT 250 between horn connector terminal A and S112. Is the repair complete?	—	System OK	—
14	Repair the open in CKT 29 between horn connector terminal B and UH electrical center 1 terminal F6. Is the repair complete?	—	System OK	—
15	1. Inspect for a poor connection at the horn relay. 2. If the connection is OK, replace the relay. Refer to *Horn Relay Replacement.* Is the repair complete?	—	System OK	—

Horns Always On

Step	Action	Value(s)	Yes	No
1	Disconnect the horn relay. Are the horns on?	—	Go to *Step 2*	Go to *Step 3*
2	Repair the short to B+ in CKT 29 between the underhood electrical center 1 terminal F6 and the horn connection terminal B. Is the repair complete?	—	System OK	—
3	Connect a test lamp from the underhood electrical center 1 terminal E6 to terminal F8. Does the test lamp light?	—	Go to *Step 4*	Go to *Step 5*
4	1. Ensure that the test lamp is still connected. 2. Disconnect harness connector C216. Is the test lamp still on?	—	Go to *Step 6*	Go to *Step 7*
5	Replace the horn relay. Refer to *Horn Relay Replacement.* Is the repair complete?	—	System OK	—
6	1. For vehicles without UA6, repair the short to ground in CKT 28 between the underhood electrical center 1 terminal F8 and C216 terminal G. 2. For vehicles with UA6, ensure that the test lamp is connected. 3. Disconnect connector C3 from the body control module (BCM). Is the test lamp still on?	—	Go to *Step 8*	Go to *Step 9*
7	Replace the horn switches. Refer to *Horn Switch Replacement - On Vehicle (Chevrolet)* or *Horn Switch Replacement - On Vehicle (Pontiac).* Is the repair complete?	—	System OK	—
8	Repair the short to ground in CKT 28 at one of the following areas: • Between the body control module (BCM) connector C3 terminal C9 and C216 terminal G • Between C216 terminal G and the underhood electrical center 1. Is the repair complete?	—	System OK	—
9	Replace the body control module (BCM). Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—



296227



296227

Repair Instructions

Horn Replacement

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the front bumper fascia air deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
3. Remove the horn bolt (2).
4. Remove the horn (3) from the right engine compartment side outer rail.
5. Disconnect the electrical connector (1) from the horn (3).

Installation Procedure

1. Connect the electrical connector (1) to the horn (3).
2. Install the horn (3) to the right engine compartment side outer rail.

Notice: Refer to in *Fastener Notice* in Cautions and Notices.

3. Install the horn bolt (2).

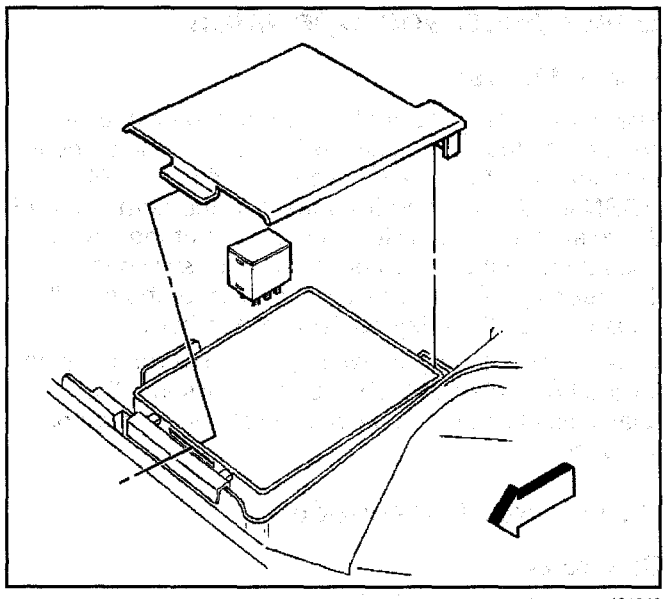
   Tighten

   Tighten the horn bolt to 27 N·m (20 lb ft).
4. Install the front bumper fascia air deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
5. Lower the vehicle.

Horn Relay Replacement

Removal Procedure

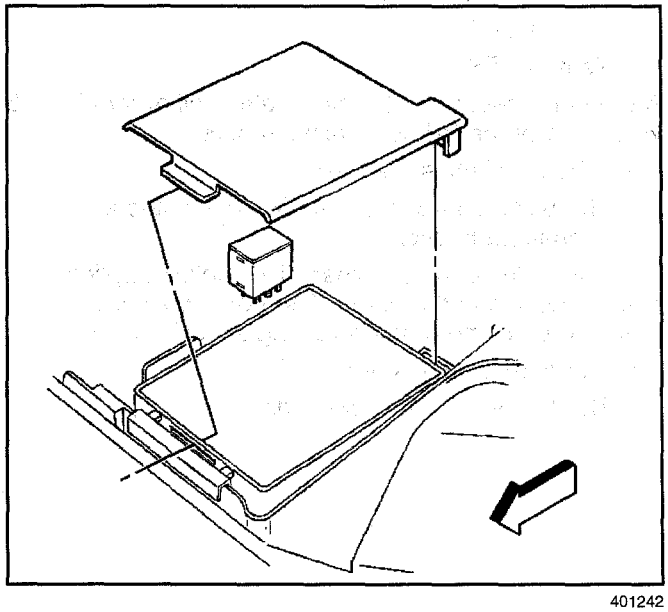
1. Remove the cover from the # 1 underhood electrical center.
2. Remove the horn relay from the electrical center. Refer to *Electrical Center Identification* in Wiring Systems.



401242

Installation Procedure

1. Install the horn relay to the electrical center. Refer to *Electrical Center Identification* in Wiring Systems.
2. Install the cover to the # 1 underhood electrical center.



401242

Description and Operation

Horns Operation

The horn system starts at the underhood electrical center with the horn MiniFuse® fuse. The circuit goes from the horn MiniFuse® fuse to the the H/L DR HORN MaxiFuse® and from there to the horn relay. At the relay the circuit splits. One branch of the circuit goes through the relay coil to the horn switch in the steering column. The other branch of the circuit goes through the relay contacts to the horn.

When closed, the horn switch provides a ground path for the horn relay coil. The current flows into the relay coil, closing the contacts which allows the horn to sound.

Horns Circuit Description

Chevrolet

Battery voltage is applied at all times to the horn relay at the following terminals:

- Terminal E6
- Terminal E8

A ground is placed on the horn relay coil at terminal F8 when one of the following actions occur:

- A horn switch is pressed
- The body control module (BCM) initiates a tamper/alarm cycle

The horn relay contacts close. This action applies battery voltage to the horns. The horns continue to sound until one of the following actions occur:

- The horn switch is released.
- The tamper/alarm cycle ends.

Pontiac

Battery voltage is applied at all times to the horn relay at the following terminals:

- Terminal E6
- Terminal E8

A ground path is provided to the horn relay coil at terminal F8 under the following conditions:

- When the inflator module is pressed against a spring loaded ground plate in the steering wheel.
- When the BCM initiates a tamper/alarm cycle

The horn relay contacts close. This action applies battery voltage to the horns. The horns continue to sound until one of the following actions occur:

- The inflator module is released.
- The tamper/alarm cycle ends.

Theft Deterrent

Specifications

Fastener Tightening Specifications

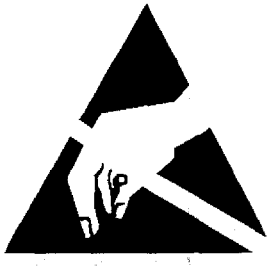
Application	Specification	
	Metric	English
Lock Retaining Screw	2.5 N·m	22 lb in

Schematic and Routing Diagrams

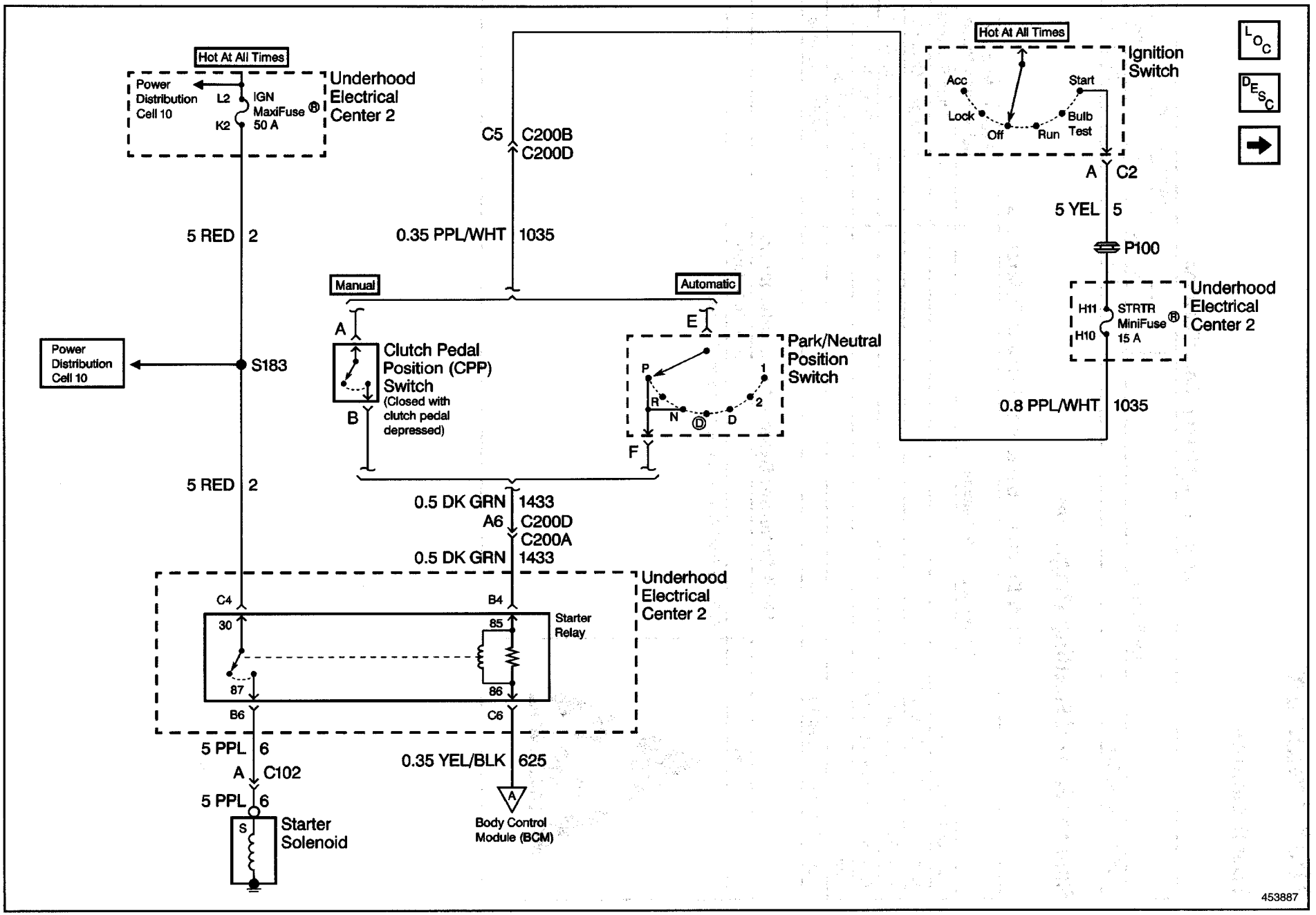
Theft Deterrent System Schematic References

Reference on Schematic	Section Number Subsection Name
Exterior Lights Cell 110	8—Lighting Systems
Engine Controls Cell 20, 21	6—Engine Controls
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Horns Cell 40	8—Horns
Power Distribution Cell 10	8—Wiring Systems

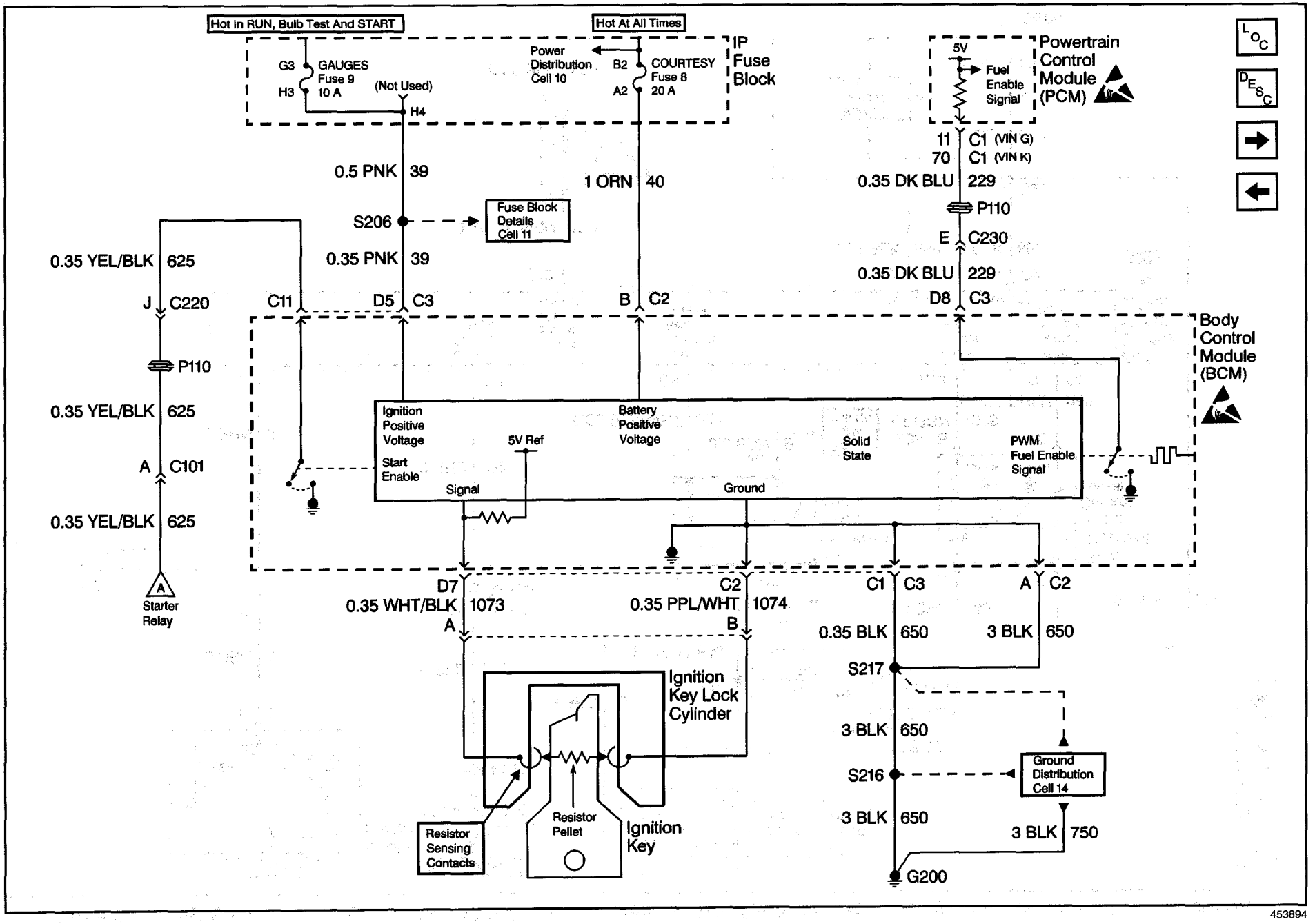
Theft Deterrent System Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.

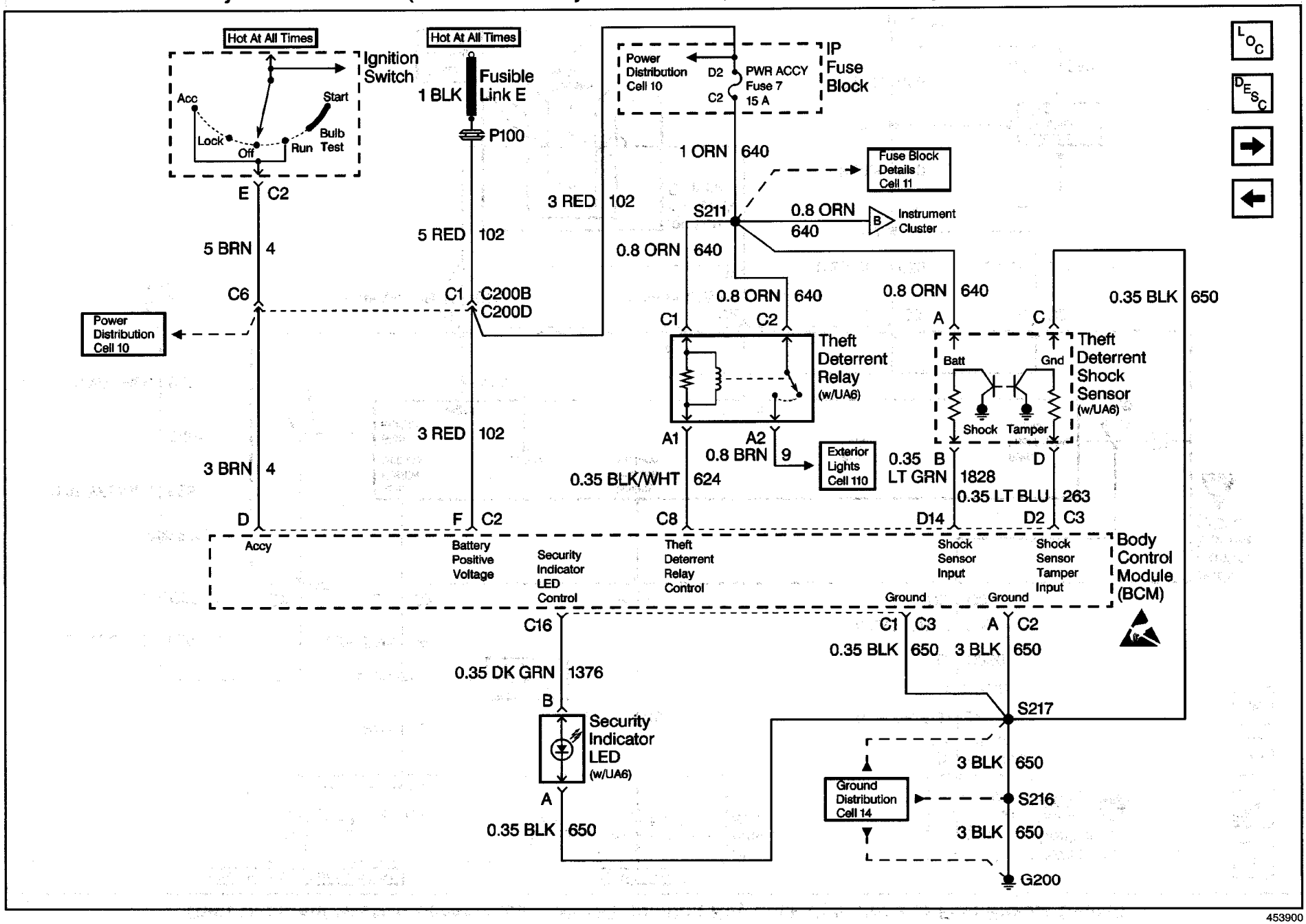
Theft Deterrent System Schematics (Cell 133: Clutch Pedal Position (CPP) Switch, Park/Neutral Position Switch, Ignition Switch, and Starter Solenoid)



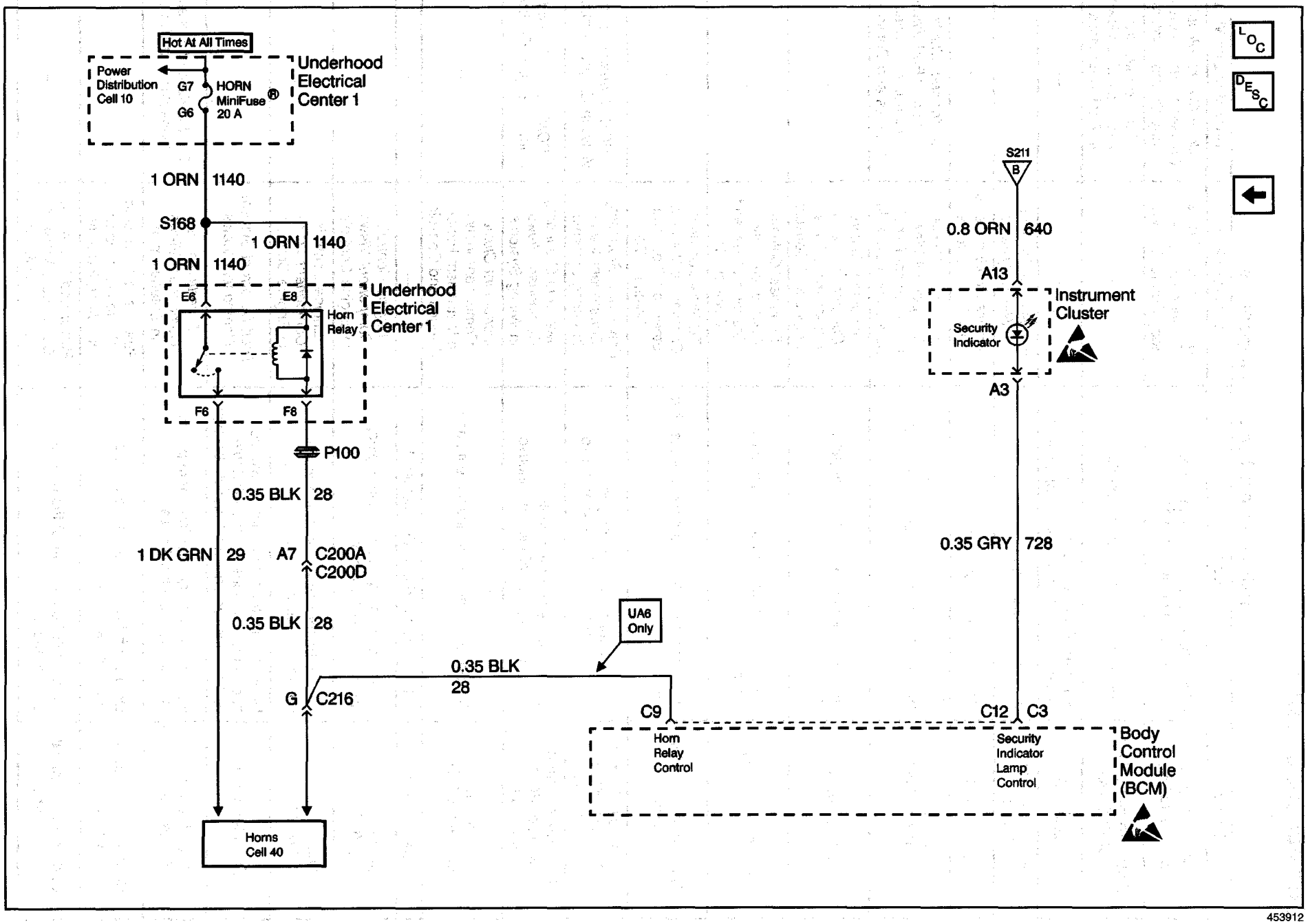
Theft Deterrent System Schematics (Cell 133: Ignition Key Lock Cylinder and Fuel Enable Signal)



Theft Deterrent System Schematics (Cell 133: Security Indicator LED, Theft Deterrent Relay, Theft Deterrent Shock Sensor)



Theft Deterrent System Schematics (Cell 133: Horn Relay and Security Indicator)



453912

Component Locator

Theft Deterrent System Components

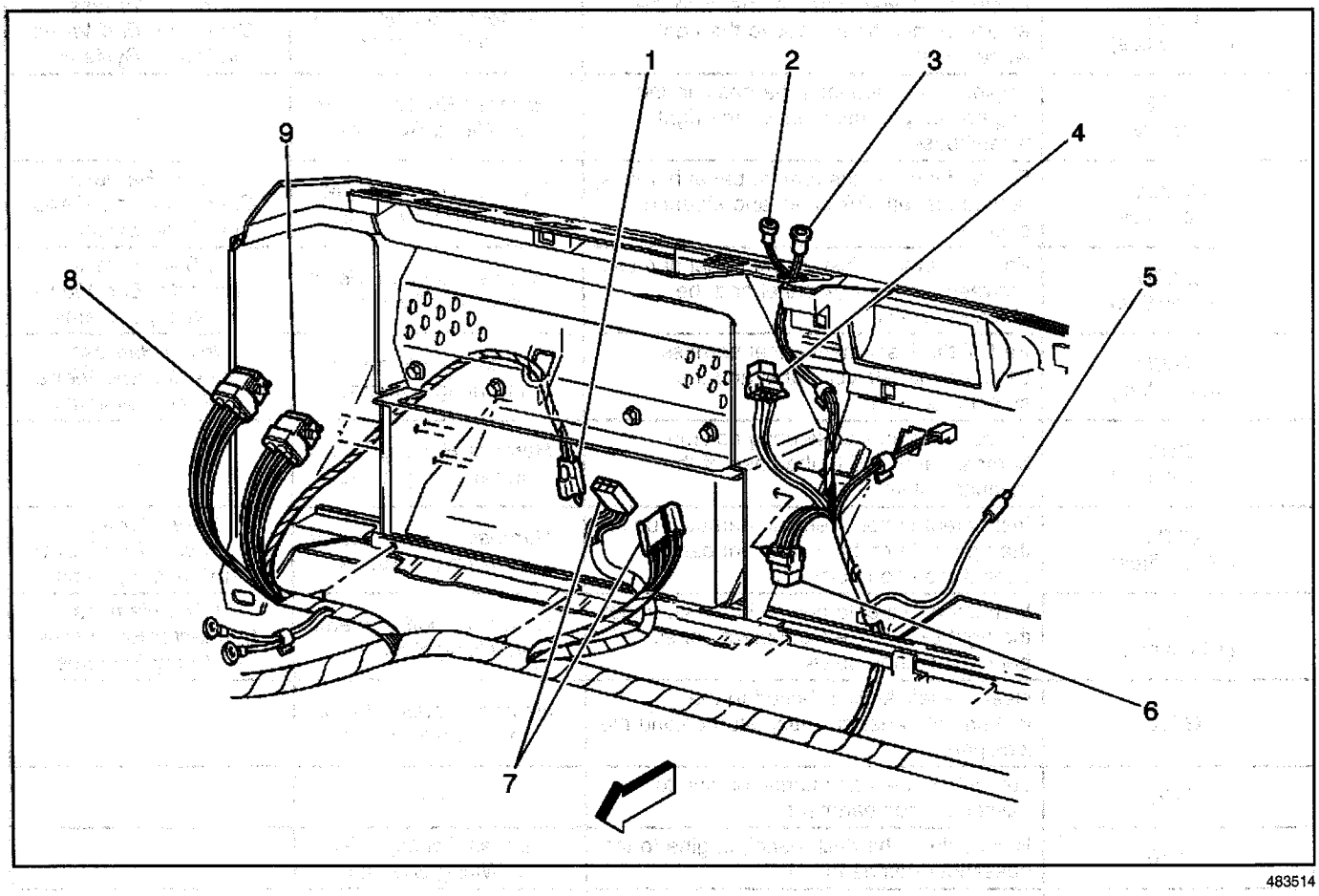
Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Clutch Pedal Position (CPP) Switch	Mounted to the clutch pedal bracket	—	*Engine Electrical Connector End Views* in Engine Electrical
Fusible Links	Forward of the left front wheelhouse, behind the underhood electrical center 2	—	—
Ignition Key Lock Cylinder	Part of steering column	*Harness Routing Views* in Wiring Systems	—
Ignition Switch	Part of the steering column	*Harness Routing Views* in Wiring Systems	—
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Instrument Cluster Connector End Views* in Instrument Panel, Gauges and Console
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Park Brake Switch	In the console, at the base of the park brake lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park Neutral Position Switch	Under the console, on the base of the shift control lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Enigne Controls
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
Security Indicator L.E.D.	On the top center of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Starter Relay	In the underhood electrical center 2	—	—
Starter Solenoid (V6 VIN K)	On the bottom right side of the engine, above the starter motor	*Engine Controls Component Views* in Engine Controls	—
Starter Solenoid (V8 VIN G)	On the bottom right side of the engine, above the starter motor	*Engine Controls Component Views* in Engine Controls	—
Theft Deterrent Relay	Under the instrument panel, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views*	—
Theft Deterrent Shock Sensor	Behind the right quarter inner trim panel, attached to the wheelhouse	*Entertainment Component Views* in Entertainment	*Theft Deterrent System Connector End Views*
Underhood Electrical Center 1	On the left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
Underhood Electrical Center 2	On the left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—

Theft Deterrent System Components (cont'd)

Name	Location	Locator View	Connector End View
C101 (10 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C102 (1 cavity)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views* in Wiring Systems	—
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C216 (11 cavities)	Instrument panel to steering column harness, attached to the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C230 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
P110	Right side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
S168	In the forward lamp harness, approximately 8 cm (3 in) from the main branch into the UH electrical center 1 breakout	—	—
S170	In the forward lamp harness, approximately 13 cm (5 in) from G106 breakout	—	—
S183	In the forward lamp harness, approximately 10 cm (4 in) from the UH electrical center 1 breakout	—	—
S206	In the instrument panel harness, at the rear compartment lid release relay breakout	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S254	In the instrument panel harness, approximately 7 cm (3 in) from C200 breakout	—	—

Theft Deterrent System Component Views

Behind the Rear Right Side of the Instrument Panel



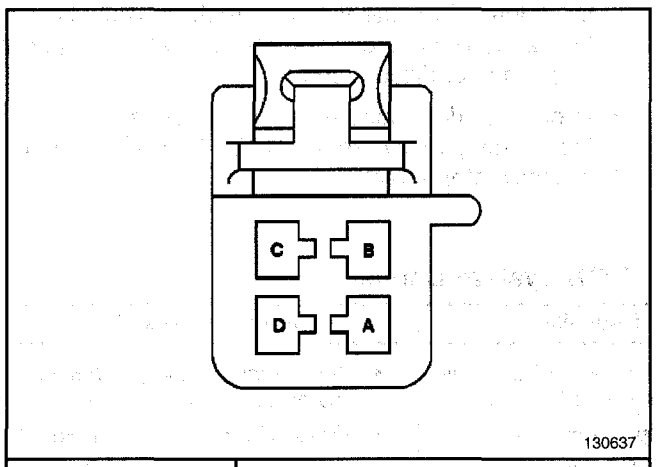
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Legend

(1) IP Compartment Lamp
(2) DRL Ambient Light Sensor
(3) Theft Deterrent Security LED
(4) Theft Deterrent Relay
(5) Antenna Lead
(6) Blower Motor Relay
(7) BCM Connectors
(8) Rear Fog Lamps Relay (Export)
(9) Folding Top Relay

Theft Deterrent System Connector End Views

Theft Deterrent Shock Sensor



130637

Connector Part Information	• 1206-4760 • 4 Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	ORN	640	Fused battery feed
B	LT GRN	1828	Shock sensor shock signal
C	BLK	650	Ground
D	LT BLU	263	Shock sensor tamper signal

Diagnostic Information and Procedures

Intermittents and Poor Connections

Tools Required

J 39200 Digital Multimeter

Important: In order to prevent misdiagnosis, verify that no DTCs are stored in the PCM by performing the On-Board Diagnostic System Check. Look for DTCs that indicate a problem in the PASS-Key® II fuel enable circuit. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls.

The following are the most likely causes of intermittent starting or cranking complaints due to the PASS-Key® II:

- Incorrect resistance measurement of the ignition key resistance
- Intermittent relay

In order to test for incorrect resistance measurements, use the following steps:

- If only one key functions properly, clean or replace the faulty key. If you have tried a key that did not function properly, you must wait 3 minutes for the Tamper Mode timer to expire. After 3 minutes you may try a new key.
- If none of the keys function properly, one of the following conditions is present:
  - The lock cylinder is dirty or defective.
  - The key resistance circuit wiring, connections, or contacts are faulty.

Use the following steps in order to measure the key resistance circuit with an ohmmeter:

1. Use the *J 39200* in order to measure resistance across the key contacts while the key is removed from the vehicle.
2. Disconnect the Body Control Module (BCM).
3. Insert the key into the ignition.
4. Set the *J 39200* to MIN MAX.
5. Measure the resistance across terminals C2 and D7 of the BCM harness connector C3.
6. Rotate the steering wheel from side to side.
7. Listen for an audible tone from the *J 39200*. A tone indicates that the resistance is fluctuating.
   - If the resistance is fluctuating, inspect the wiring and the wiring connections to the lock cylinder for an intermittent condition. An example of an intermittent condition is a poor connection or a broken wire inside the insulation.
   - If the resistance is not within 5 ohms of the resistance measured on the key, inspect for a dirty or defective lock cylinder.
8. In order to test for a resistance change, rotate the key to all possible positions. Monitor the results. A resistance change of over 5 ohms indicates a problem with the lock cylinder or the key contacts.

Use the following steps in order to test for intermittent relay:

1. If the SECURITY indicator illuminates for the 5 second bulb check then goes out, inspect the relay. If the connections to the relay are OK, install a new relay.
2. If the SECURITY indicator remains illuminated longer than the 5 second bulb check when the vehicle will not crank, the relay is not the cause of the condition.
3. If you need to turn the key several times before the engine cranks, the relay is not functioning properly. Inspect the connections to the relay. If the connections to the relay are OK, install a new relay.

If you cannot start the engine immediately after a fault, the relay is not the problem. Complete the following steps:

- Verify that the connector to the Body Control Module (BCM) is tight.
- Verify that the connector terminals to the BCM are clean.
- Inspect the powertrain control module (PCM) for DTCs. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls.
- Manipulate the harness. Inspect the power and the ground to the module.
- During an ignition cycle the SECURITY indicator will illuminate. The indicator will remain illuminated for at least 1 minute when a problem exists in the key resistance circuits. The indicator will go out when the condition stops.
- In order to determine whether the BCM is intermittent, lightly tap the BCM. The BCM is not typically intermittent.

Content Theft Deterrent (CTD) System Check

Step	Action	Normal Results	Abnormal Results
1	1. Set the theft deterrent arming method to the factory mode. Refer to *Feature Customization*. 2. Arm the system (1 of 2): • Turn the ignition switch to the OFF position. • Remove the key from the ignition lock cylinder. • Open the driver's door and press LOCK on either power door lock switch. • Close all of the doors and the rear compartment lid.	• The security indicator LED flashes while the driver door is open. • The park lamps flash once. • The security LED flashes continuously at a slow rate when the content theft deterrent system is armed.	• *Theft Deterrent System Feature Customization Inoperative* • *SECURITY Indicator Inoperative* • *Lights Inoperative in CTD Alarm Mode* • *Content Theft Deterrent Alarm Mode Inoperative*
2	Arm the system (2 of 2) by performing the following procedure: 1. Press unlock on the remote control door lock transmitter. 2. Press the lock on the remote control door lock transmitter.	• The park lamps flash once. • The horns chirp once. • The lamp flashes continuously at a slow rate when the content theft deterrent system is armed. The lamp flashes continuously at a slow rate when the content theft deterrent system is armed.	• *Theft Deterrent System Feature Customization Inoperative* • *SECURITY Indicator Inoperative* • *Lights Inoperative in CTD Alarm Mode* • *Horn Inoperative in CTD Alarm Mode* • *Content Theft Deterrent Alarm Mode Inoperative*
3	Disarm the system (1 of 2): 1. Insert the key into the key lock cylinder of the driver door. Unlock the driver door. 2. Open the driver door. 3. Perform the following actions within 8–seconds of opening the driver door: • Insert the ignition key into the ignition key lock cylinder. • Turn the ginition switch to thew run position.	The system disarms.	*Content Theft Deterrent Alarm Mode Always On*
4	Disarm the system (2 of 2): 1. Close all of the doors. 2. Press LOCK on the remote control door lock transmitter. 3. Wait for 10 seconds. 4. Press unlock on the remote control door lock transmitter.	The system disarms.	*Content Theft Deterrent Alarm Mode Always On*

Content Theft Deterrent (CTD) System Check (cont'd)

Step	Action	Normal Results	Abnormal Results
5	Trigger the alarm (1 of 3): 1. Lower all of the vehicle windows. 2. Remove the key from the ignition key lock cylinder. 3. Close all of the doors. 4. Press the lock on the keyless entry transmitter. 5. Reach through the driver's window opening and unlock the door manually. 6. Open the driver's door. 7. Stop the alarm by pressing any button on the remote control door lock transmitter on the keyless entry transmitter.	• The content theft deterrent system initiates the alarm when opening the driver's door. • During the alarm mode, the content theft deterrent system flashes the park lamps and sounds the horn for 2 minutes. • The security indicator LED turns on steadily.	• *Content Theft Deterrent Alarm Mode Inoperative* • *SECURITY Indicator Inoperative* • *Horn Inoperative in CTD Alarm Mode* • *Lights Inoperative in CTD Alarm Mode*
6	Trigger the alarm (2 of 3): 1. Close all the doors. 2. Press the lock on the remote contrl door lock transmitter. 3. Reach through the passenger window opening. 4. Unlock the passenger door manually. 5. Open the passenger door. 6. Stop the alarm by pressing any button on the remote control door lock transmitter.	• The content theft deterrent system initiates the alarm when you open any vehicle door. • During the alarm mode, the content theft deterrent system flashes the park lamps and sounds the horn for 2 minutes. • The security indicator lamp turns on steadily.	• *Content Theft Deterrent Alarm Mode Inoperative* • *SECURITY Indicator Inoperative* • *Horn Inoperative in CTD Alarm Mode* • *Lights Inoperative in CTD Alarm Mode*
7	Trigger the alarm (3 of 3): 1. Close all of the doors. 2. Press LOCK on the remote control door lock transmitter. 3. Reach through the driver's window opening. 4. Turn the ignition switch to the RUN position. 5. Stop the alarm by pressing UNLOCK on the keyless entry transmitter.	• The content theft deterrent system initiates the alarm when you turn the ignition switch to the RUN position. • During the alarm mode, the content theft deterrent system flashes the park lamps and sounds the horn for 2 minutes. • The security indicator lamp turns on steadily.	• *Content Theft Deterrent Alarm Mode Inoperative* • *SECURITY Indicator Inoperative* • *Horn Inoperative in CTD Alarm Mode* • *Lights Inoperative in CTD Alarm Mode*
8	Trigger the tamper mode: 1. Close all of the doors. 2. Press LOCK on the keyless entry transmitter. 3. Wait for 10 seconds. 4. Simulate a small vehicle impact. Choose an area of the vehicle such as the bumpers in order to avoid body damage.	• The content theft deterrent system flashes the park lamps and sounds the horn twice. This is dependent on the sensitivity level of the shock sensor and the magnitude of the impact to the vehicle. • The security indicator lamp turns on.	• *Shock Sensor Inoperative* • *Content Theft Deterrent Alarm Mode Inoperative* • *SECURITY Indicator Inoperative* • *Horn Inoperative in CTD Alarm Mode* • *Lights Inoperative in CTD Alarm Mode*

Vehicle Theft Deterrent (VTD) System Check

Step	Action	Normal Results	Abnormal Results
1	• Observe the SECURITY indicator. • Turn the ignition switch to the RUN position. • For automatic transmissions, shift the transmission into the PARK position. • For manual transmissions, depress the clutch pedal in order to close the clutch start switch. • Turn the ignition switch to the START position. • Turn the ignition switch to the OFF position.	• The SECURITY indicator illuminates for approximately 5 seconds, then turns OFF. • The engine starts. • The engine stops.	• *SECURITY Indicator Off, Engine Does Not Crank* • *SECURITY Indicator On, Engine Starts*
2	1. Disconnect the key lock cylinder connector at the base of the steering column. 2. Connect the male and the female parts to the mating connectors on the pigtails from the J 35628 interrogator or equivalent. 3. Insert the ignition key into the key code reader on the J 35628 interrogator. 4. Press the On-Off rocker switch to the ON position. 5. A number from 1–15 will appear on the display of the interrogator. This indicates the electrical code of the key. The letter E indicates an error. 6. Set the key code selector on the J 35628 interrogator to a code which is different from the code read on the key code reader display. 7. Turn the ignition switch to the START position.	The vehicle does not crank. The SECURITY indicator is illuminated.	• *SECURITY Indicator Off, Engine Does Not Crank* • *SECURITY Indicator Off, Engine Cranks* • *SECURITY Indicator On, Engine Starts*
3	Complete the following steps within the 3 minute Tamper Mode time out: 1. Turn the ignition switch to the OFF position. 2. Disconnect and remove the J 35628 interrogator. 3. Reconnect the connectors at the base of the steering column. 4. Turn the ignition switch to the START position.	The vehicle does not crank. The SECURITY indicator is illuminated.	• *SECURITY Indicator Off, Engine Does Not Crank* • *SECURITY Indicator Off, Engine Cranks* • *SECURITY Indicator On, Engine Starts*
4	1. Turn the ignition switch to the OFF position. 2. Wait 3–4 minutes. 3. Observe the SECURITY indicator. 4. When the indicator is OFF, use the customer's key in order to turn the ignition switch to the START position.	1. The SECURITY indicator tuns off. 2. The engine starts.	• *SECURITY Indicator Off, Engine Does Not Crank* • *SECURITY Indicator On, Engine Starts*

Ignition Lock Cylinder Test

Step	Action	Value(s)	Yes	No
Important: • Inspect all of the keys for matching codes. • After you repair the lock cylinder harness, the SECURITY indicator will remain ON for approximately 1 minute.				
1	1. Insert the ignition key into the *J 35628-A*. 2. Turn the *J 35628-A* ON. 3. Read the key code on the display of the *J 35628-A*. Is the key code a value of 1–15?	1–15	*Go to Step 2*	*Go to Step 5*
2	1. Write down the key code that the *J 35628-A* displayed. 2. Turn the *J 35628-A* OFF. 3. Connect the *J 35628-A* to the 2-way ignition switch lock cylinder harness connector at the base of the steering column. 4. Insert the ignition key into the ignition switch lock cylinder. 5. Turn the *J 35628-A* ON. 6. Observe the display on the *J 35628-A*. Is the key code the same as the code recorded in step 1?	—	*Go to Step 3*	*Go to Step 6*
3	Using a test lamp, frontprobe the 2-way connector at the base of the steering column, between terminal B (BCM side) and B+. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 7*
4	1. Test for an open in circuit 1073. 2. Test for a short to B+ in circuit 1073. 3. Test for a short to ground in circuit 1073. 4. If circuit 1073 is OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
5	1. Clean the key. 2. Retest the key. If the key code is invalid, replace the key. Refer to *Programming Additional Keys* or *Programming Replacement Keys, Ign Cyl, or PCM.* Did you replace the key?	—	System OK	—
6	Inspect for a poor connection. If the connection is OK, replace the ignition switch lock cylinder. Refer to *Ignition Lock Cylinder Replacement - On Vehicle.* Is the repair complete?	—	System OK	—
7	1. Disconnect the BCM. 2. Connect a test lamp between the BCM connector C3 terminal C1 and B+. Does the test lamp light?	—	*Go to Step 8*	*Go to Step 9*
8	1. Test for poor connections at BCM connector C3 terminal C2 and terminal D7. 2. Test for an open in circuit 1074. 3. If all connections are OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
9	Repair the open in circuit in 650. Is the repair complete?	—	System OK	—

SECURITY Indicator Off, Engine Cranks

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for powertrain control module (PCM) diagnostic trouble codes (DTCs). Refer to Engine Controls.				
1	1. Disconnect the body control module (BCM) connector C3. 2. Attach a fused jumper between the BCM connector C3 terminal C12 and the ground. Does the SECURITY indicator illuminate?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at the BCM connector C3 terminal C12. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	1. Remove the instrument cluster. 2. Connect a test lamp between the instrument cluster connector terminal A13 and terminal A3. 3. Connect a fused jumper between BCM connector C3 terminal C12 and ground. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the instrument cluster connector terminal A3 and terminal A13. 2. If the connections are OK, replace the instrument cluster. Refer to *IP Cluster Replacement* in Instrument Panel, Gauges and Console. Is the repair complete?	—	System OK	—
5	1. Test for an open in circuit 728 between the instrument cluster connector terminal A3 and the BCM connector C3 terminal C12. 2. If the connection is OK, repair the open in circuit 640 between S211 and the instrument cluster connector terminal A10. Is the repair complete?	—	System OK	—

SECURITY Indicator Off, Engine Does Not Crank

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for powertrain control module (PCM) DTCs. Refer to Engine Controls.				
1	1. Disconnect the starter relay. 2. Connect a test lamp between underhood electrical center 2 terminal C6 and B+. 3. While observing the test lamp, turn the ignition switch to the RUN position. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 6*
2	1. Connect a test lamp between underhood electrical center 2 terminal B4 and ground. 2. Depress the clutch pedal (manual transmission). 3. Place the vehicle in park (automatic transmission). 4. While observing the test lamp, turn the ignition switch to the START position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 7*
3	Connect a test lamp between underhood electrical center 2 terminal C4 and ground. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 10*

SECURITY Indicator Off, Engine Does Not Crank (cont'd)

Step	Action	Value(s)	Yes	No
4	1. Disconnect circuit 6 (PPL wire) from the starter solenoid. 2. Connect a fused jumper from circuit 6 (PPL wire) to ground. 3. Connect a test lamp from underhood electrical center terminal C4 to terminal B6. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 11*
5	1. Test circuit 6 for a poor connection at the starter solenoid. 2. If the connection is OK, replace the starter motor. Is the repair complete?	—	System OK	—
6	1. Test for a poor connection in circuit 625 between the body control module (BCM) and the underhood electrical center 2. 2. Test for an open in circuit 625 between the BCM and the underhood electrical center 2. 3. Test circuit 625 for a short to B+. 4. If circuit 625 is OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
7	Is the vehicle equipped with a manual transmission?	—	*Go to Step 8*	*Go to Step 9*
8	1. Test for an open or poor connection in circuit 1443 between the underhood electrical center 2 terminal B4 and the clutch pedal position switch. 2. Test for an open or poor connection in circuit 1035 between the clutch pedal position switch and C200. 3. If the circuits are OK, replace the clutch pedal position switch. Refer to *Clutch Pedal Position Switch Replacement* in Clutch Transmission. Is the repair complete?	—	System OK	—
9	1. Test for an open or poor connection in circuit 1443 between the underhood electrical center 2 terminal B4 and the park neutral position switch. 2. Test for an open or poor connection in circuit 1035 between the park neutral position switch and C200. 3. If the circuits are OK, adjust or replace the park/neutral position switch. Refer to *Park/Neutral Position Switch Replacement* or Park/Neutral Position Switch Adjustment. Is the repair complete?	—	System OK	—
10	Repair the open in circuit 2 between the underhood electrical center terminal C4 and S183. Is the repair complete?	—	System OK	—
11	Repair the open or poor connector in circuit 6 between the starter solenoid and the underhood electrical center 2. Is the repair complete?	—	System OK	—

SECURITY Indicator On, Engine Starts

Step	Action	Value(s)	Yes	No
Important: In order to avoid misdiagnosis, check for powertrain control module (PCM) diagnostic trouble codes (DTCs). Refer to Engine Controls.				
1	1. Disconnect the Body Control Module (BCM) connector C3. 2. Turn the ignition switch to the RUN position. Is the SECURITY indicator illuminated?	—	*Go to Step 2*	*Go to Step 3*
2	1. Inspect for a short to ground on circuit 728 between the BCM connector C3 terminal C12 and the instrument cluster connector terminal A3. 2. If the connection is OK, service the instrument cluster. Refer to *IP Cluster Replacement* in Instrument Panel, Gauges and Console. Is the repair complete?	—	System OK	—
3	1. Perform a lock cylinder and harness test. Refer to *Ignition Lock Cylinder Test.* 2. If the keys, the lock cylinder, and the cylinder harness are OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. The security indicator will remain illuminated for approximately 1 minute after the repair is complete if a failure occurred in the previous ignition cycle. Is the repair complete?	—	System OK	—

SECURITY Indicator Inoperative

Step	Action	Value(s)	Yes	No
Important: Do not use a battery or test light to test the security indicator LED or the LED may be damaged.				
1	1. Using a DMM set to the diode scale, backprobe the body control module (BCM) connector C3 terminal C16 with the red test lead. 2. Backprobe the BCM connector C3 terminal C1 with the black test lead. Does the security LED illuminate?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at the BCM connector C3 terminal C1 and terminal C16. 2. If the connections are OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	1. Disconnect the security LED. 2. Connect a test lamp between B+ and terminal A of the security LED harness Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Check for a poor connection in circuit 1376 between the security LED and the BCM. 2. If the Connection is OK, perform the following: 2.1. Replace the security LED. 2.2. Disconnect the vehicle battery. 2.3. Reconnect the vehicle battery. Is the repair complete?	—	System OK	—
5	Repair the open in circuit 650 between S217 and the security indicator. Is the repair complete?	—	System OK	—

Content Theft Deterrent Alarm Mode Always On

Step	Action	Value(s)	Yes	No
1	Check for body control module (BCM) DTCs. Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. Are any BCM DTCs present?	—	Go to *Diagnostic Trouble Code (DTC) List/Type*	*Go to Step 2*
2	1. Open the driver door. 2. Close the driver door. Do the courtesy lamps turn off?	—	*Go to Step 3*	Go to Interior Lamps System Check in Lighting Systems
3	Disconnect the theft deterrent shock sensor. Is the theft deterrent alarm on?	—	*Go to Step 5*	*Go to Step 4*
4	Replace the theft deterrent shock sensor. Refer to *Shock Sensor Replacement.* Is the repair complete?	—	System OK	—
5	1. Disconnect the BCM connector C3. 2. Connect a test lamp from BCM connector C3 terminal D14 to B+. Does the test lamp light?	—	*Go to Step 6*	*Go to Step 7*
6	Repair the short to ground in circuit 1828 between the BCM connector C3 terminal D14 and the theft deterrent shock sensor terminal B. Is the repair complete?	—	System OK	—
7	Connect a test lamp from BCM connector C3 terminal D2 to B+. Does the test lamp light?	—	*Go to Step 8*	*Go to Step 9*
8	Repair the short to ground in circuit 263 between the BCM connector C3 terminal D2 and the theft deterrent shock sensor terminal D. Is the repair complete?	—	System OK	—
9	Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Content Theft Deterrent Alarm Mode Inoperative

Step	Action	Value(s)	Yes	No
1	Check for body control module (BCM) diagnostic trouble codes (DTCs). Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. Is DTC 25/35 displayed?	—	*Go to Step 2*	*Go to Step 3*
2	Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	1. Check for a poor connection at the BCM connector C3 terminal C16. 2. Check for a poor connection at the security LED. Are the connections OK?	—	Go to *SECURITY Indicator Inoperative*	*Go to Step 4*
4	1. Repair the connections as needed. 2. Disconnect the battery. 3. Re connect the battery. Is the repair complete?	—	System OK	—

Horn Inoperative in CTD Alarm Mode

Step	Action	Value(s)	Yes	No
Important: Horns may be turned off in feature customization. Refer to *Feature Customization.*				
1	1. Disconnect the Body Control Module (BCM) connector C3. 2. Connect a test lamp between B+ and the BCM connector C3 terminal C9. 3. Press the horn switch on the steering wheel. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at BCM connector C3 terminal C9. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	Repair the open in circuit 28 between the BCM C9 terminal C9 and connector C216 terminal G. Is the repair complete?	—	System OK	—

Lights Inoperative in CTD Alarm Mode

Step	Action	Value(s)	Yes	No
Important: Verify that the arming verification feature of the theft deterrent system is enabled prior to performing this diagnostic. Refer to *Feature Customization.*				
1	1. Remove the theft deterrent relay. Refer to *Theft Deterrent Relay Replacement* 2. Connect a test lamp between the theft deterrent relay terminal C1 and ground. Does the test lamp light?	—	*Go to Step 2*	*Go to Step 8*
2	1. Connect a test lamp between the theft deterrent relay terminal C1 and terminal A1 2. While observing the test lamp, press the lock button on the remote control door lock transmitter. Does the lamp light?	—	*Go to Step 3*	*Go to Step 9*
3	Connect a test lamp the theft deterrent relay connector terminal C2 and ground. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 6*
4	1. Connect a test lamp the theft deterrent relay connector terminal A2 and ground. 2. Turn on the park lamps. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 7*
5	1. Test for a poor connection at the theft deterrent relay connector terminal A2. 2. If the connection is OK, replace the theft deterrent relay. Refer to *Theft Deterrent Relay Replacement* Is the repair complete?	—	System OK	—
6	Repair the open in circuit 640 between S211 and the theft deterrent relay connector terminal C2. Is the repair complete?	—	System OK	—
7	Repair the open in circuit 9 between S226 and the theft deterrent relay connector terminal A2. Is the theft deterrent relay?	—	System OK	—

Lights Inoperative in CTD Alarm Mode (cont'd)

Step	Action	Value(s)	Yes	No
8	Repair the open in circuit 640 between S211 and the theft deterrent relay connector terminal C1. Is the repair complete?	—	System OK	—
9	1. Leave the test lamp connected to theft deterrent relay connector terminal C1. 2. Backprobe the body control module (BCM) connector terminal C8. 3. While observing the test lamp, press the lock button on the remote control door lock transmitter. Does the test lamp light?	—	*Go to Step 10*	*Go to Step 11*
10	Repair the open in circuit 624 between the theft deterrent relay terminal A1 and the BCM connector C3 terminal C8. Is the repair complete?	—	System OK	—
11	1. Check for a poor connection at BCM connector C3 terminal C8. 2. If the connection is OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Theft Deterrent System Feature Customization Inoperative

Step	Action	Value(s)	Yes	No
1	Check for body control module (BCM) DTCs. Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. Are any BCM DTCs present?	—	Go to *Diagnostic Trouble Code (DTC) List/Type* in Body Control Systems	*Go to Step 2*
2	Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

PASS-Key Programming

Important: Any new Body Control Module (BCM) will automatically program to the resistance of the key or interrogator setting that is used the first time that the ignition is turned ON. This will occur once for the life of the module.

New BCMs are not programmed. After a you install a new module, you must program the new module so that it matches the code on the customer's keys. Complete the following steps in order to program a new BCM:

1. Install a new BCM.
2. Insert the customer's key into the ignition lock cylinder.
3. Turn the ignition to the ON position.
4. Start the vehicle in order to verify that the system operates.
5. Observe the SECURITY indicator lamp.

   The indicator lamp should illuminate for approximately 5 seconds. If the wiring or contacts to the key resistance pellet or the key is defective or intermittent and a new module is installed, the engine will start but the SECURITY indicator will flash at a rate of 1 flash per second until the ignition switch is turned OFF. This indicates that the module did not program. This also indicates that you should inspect the following areas for a fault:

   - The system components
   - The wiring
   - The contacts
6. Ensure that all of the ignition keys for the vehicle operate with the new BCM.

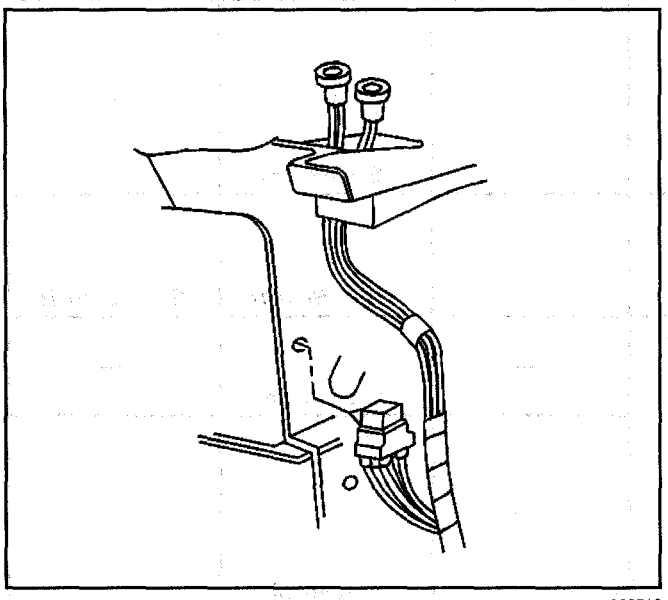
Shock Sensor Inoperative

Step	Action	Value(s)	Yes	No
Important: The factory sets the theft deterrent shock sensor to a middle range of sensitivity. Depending on you area or usage, the factory setting may be too sensitive, or not sensitive enough. Make sure that the tamper label on the knob that adjusts the shock sensor is not broken or altered. If the label is broken or altered, the shock sensor may be misadjusted to a less sensitive setting.				
1	1. Enter the Body Control Module (BCM) diagnostic mode. Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. 2. Access the theft deterrent shock sensor. 3. While in the diagnostic mode, tap the shock sensor with your index finger. Does the BCM chime sound when you tap the shock sensor?	—	*Go to Step 2*	*Go to Step 3*
2	The shock sensor may be misadjusted. In order to adjust the shock sensor, refer to *Shock Sensor Replacement.* Is the adjustment complete?	—	System OK	—
3	1. Disconnect the shock sensor connector. 2. Connect a test lamp between the shock sensor connector terminal A and terminal C. Does the test lamp light?	—	*Go to Step 7*	*Go to Step 4*
4	Connect a test lamp between the shock sensor terminal A and ground. Does the test lamp light?	—	*Go to Step 6*	*Go to Step 5*
5	Repair the open in circuit 640 between S211 and the shock sensor terminal A. Is the repair complete?	—	System OK	—
6	Repair the open in circuit 650 between S217 and the shock sensor terminal C. Is the repair complete?	—	System OK	—
7	Connect a test lamp between the shock sensor harness connector terminal D and ground. Does the BCM chime sound when the test lamp is connected (the horn may also sound)?	—	*Go to Step 8*	*Go to Step 13*
8	Connect a test lamp between the shock sensor harness connector terminal B and ground. Does the BCM chime sound when the test lamp is connected (the horn may also sound)?	—	*Go to Step 9*	*Go to Step 10*
9	1. Check for poor connections at the shock sensor. 2. If the connections are OK, replace the shock sensor. Refer to *Shock Sensor Replacement.* Is the repair complete?	—	System OK	—
10	Backprobe BCM connector C3 terminal D14 with a test lamp connected to ground. Does the BCM chime sound when the test lamp is connected (the horn may also sound)?	—	*Go to Step 11*	*Go to Step 12*
11	Repair the open in circuit 1828 between the BCM and the shock sensor. Is the repair complete?	—	System OK	—

Shock Sensor Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
12	1. Check for a poor connection at the BCM connector C3 terminal D14. 2. If the connection is OK, Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
13	Backprobe BCM connector C3 terminal D2 with a test lamp connected to ground. Does the BCM chime sound when the test lamp is connected (the horn may also sound)?	—	*Go to Step 14*	*Go to Step 15*
14	Repair the open in circuit 263 between the BCM and the shock sensor. Is the repair complete?	—	System OK	—
15	1. Check for a poor connection at the BCM connector C3 terminal D2. 2. If the connection is OK, Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Repair Instructions

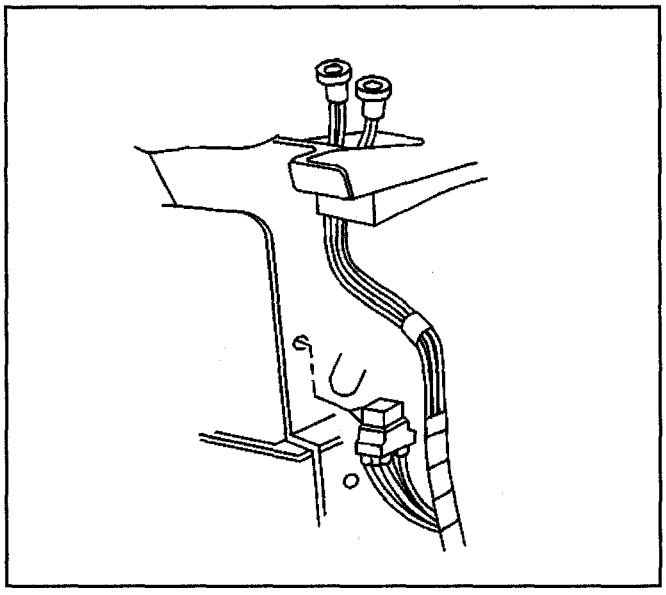


363516

Theft Deterrent Relay Replacement

Removal Procedure

1. Remove the relay from the inflatable restraint bracket.
2. Disconnect the electrical connector from the relay.



363516

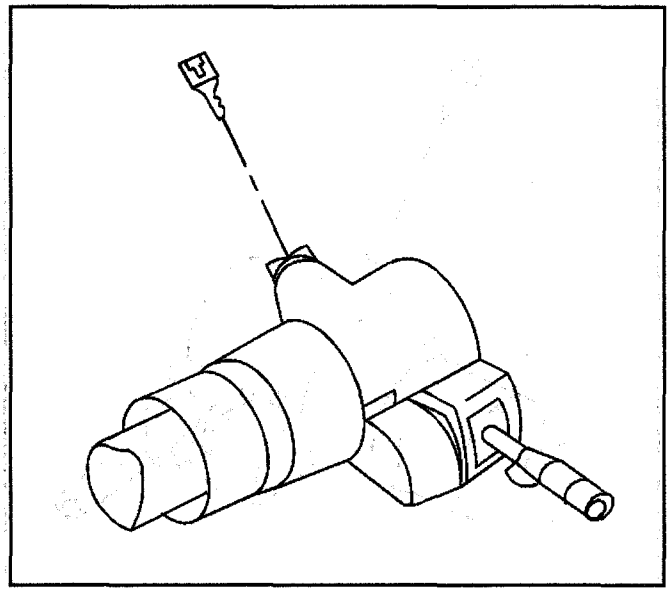
Installation Procedure

1. Connect the electrical connector to the relay.
2. Install the relay to the inflatable restraint bracket.

Ignition Lock Cylinder Replacement - On Vehicle

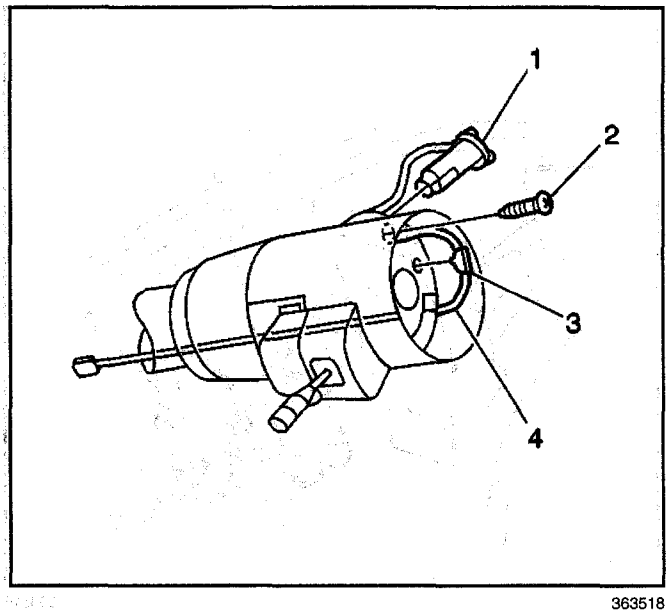
Removal Procedure

1. Remove the inflatable restraint coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement* in Restraints.
2. Insert the ignition key into the lock cylinder.
3. Leave the key in the LOCK position.



363517

4. Remove the lock retaining screw (2).
5. Remove the lock cylinder (1) and harness (4), perform the following:
   - Disconnect the terminal connector from the bulkhead connector.
   - Remove the wiring protector.
   - Disconnect the retaining clip (3) from the lock housing cover sleeve.
   - Gently pull wire harness (4) through the column.
   - Remove the lock cylinder (1) from the vehicle.



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Installation Procedure

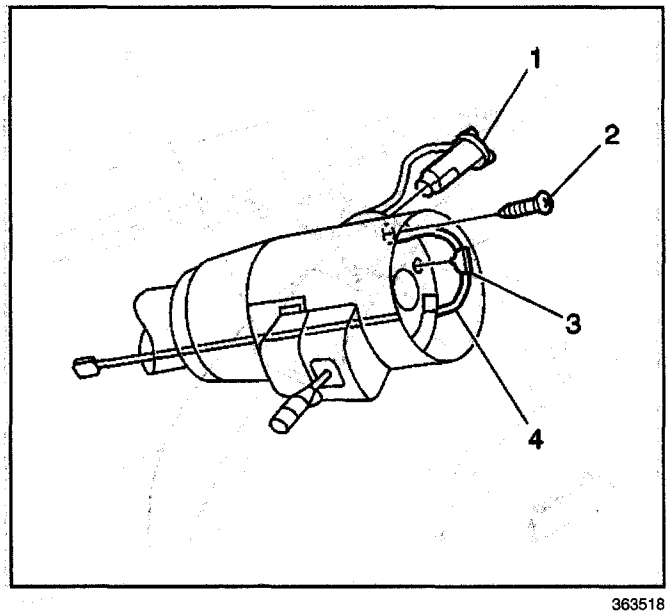
1. Install the lock cylinder (1) and harness (4), perform the following:
   - Install the lock cylinder (1) to the vehicle.
   - Gently pull wire harness (4) through the column.
   - Connect the retaining clip (3) to the lock housing cover sleeve.
   - Install the wiring protector.
   - Connect the terminal connector to the bulkhead connector.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

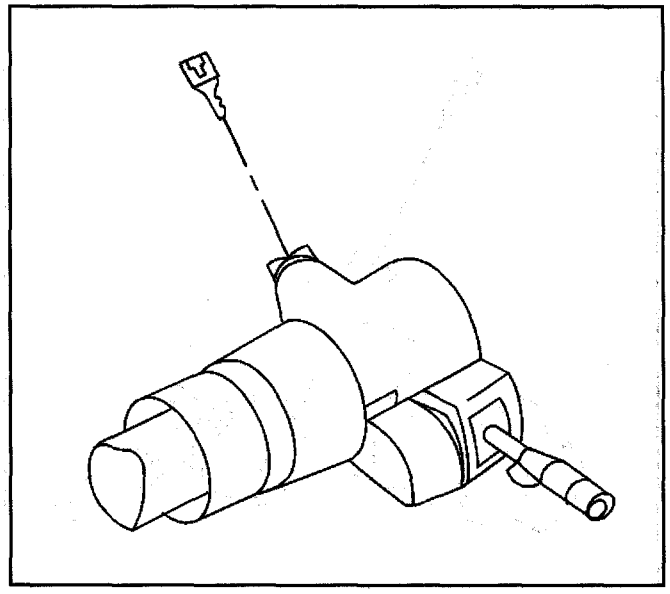
2. Install the lock retaining screw (2).

   Tighten

   Tighten the lock retaining screw to 2.5 N·m (22 lb in).

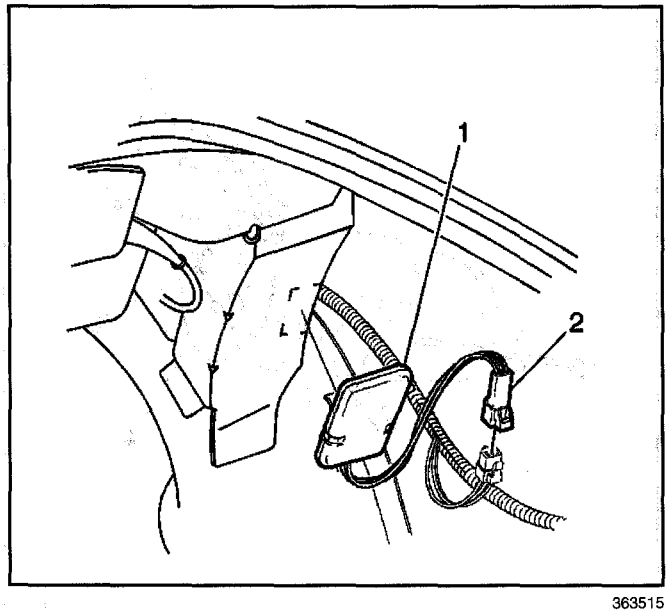


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3. Remove the ignition key from the lock cylinder.
4. Install the inflatable restraint coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement* in Restraints.

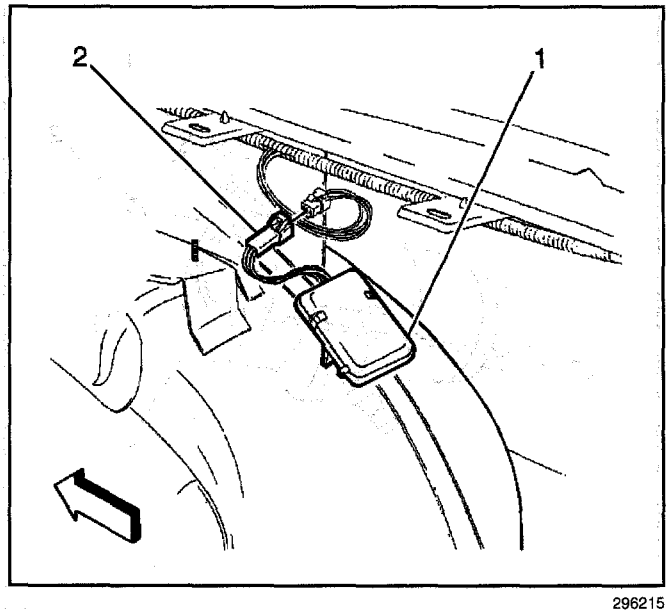


363515

Shock Sensor Replacement

Removal Procedure

1. Remove the right quarter inner rear trim finishing panel.
2. Disconnect the shock sensor electrical connector (2).
3. On the convertible, remove the shock sensor (1) from the wheelhouse bracket.



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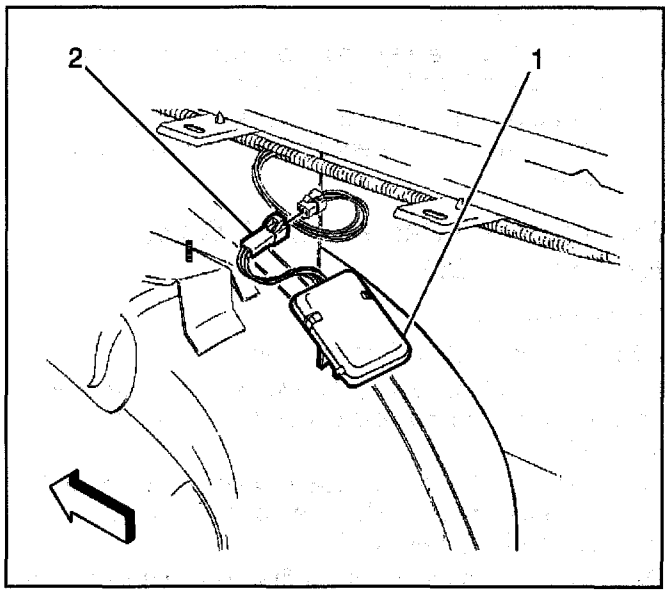
4. Disconnect the shock sensor electrical connector (2).
5. On the coupe, remove the shock sensor (1) from the right rear inner wheelhouse.
6. Remove the shock sensor (2) from the vehicle.
7. Clean the shock sensor mounting surface.

Installation Procedure

Important: The shock sensor sensitivity is preset and should not require adjustment. Remove the label covering and adjust only if more or less sensitivity is requested. Refer to *Theft Deterrent System Components* in Theft Deterrent Systems.

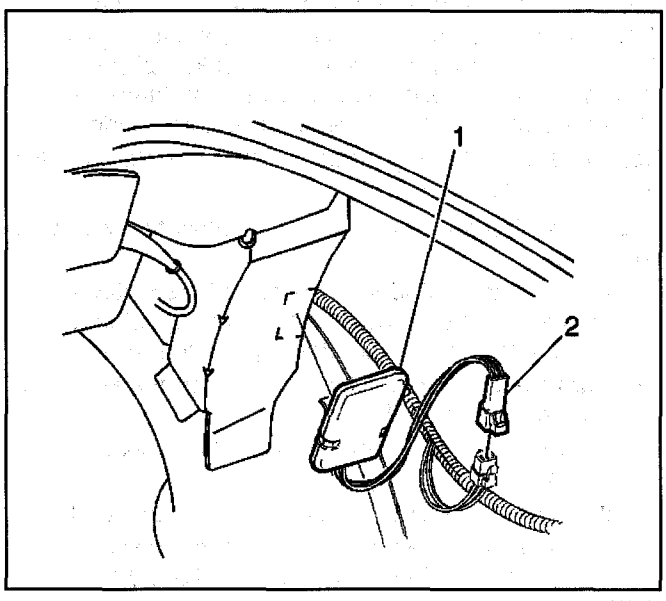
1. Remove the paper backing from the shock sensor (1).

   On the coupe, install the shock sensor (1) to the right rear inner wheelhouse.
2. Connect the shock sensor (2) electrical connector.



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3. Remove the paper backing from the shock sensor (1).
4. On the convertible, install the shock sensor (1) from the wheelhouse bracket.
5. Connect the shock sensor electrical connector (2).
6. Remove the right quarter inner rear trim finishing panel.



363515

Programming Additional Keys

Duplicating Ignition Keys

Tools Required

J 35628-A PASS/VATS Interrogator

In order to copy an ignition key, determine which PASS-Key II® key code or resistance value is needed. Test the key that you will copy in order to determine the code. Use the following steps in order to determine the code:

1. Insert the customer's spare ignition key into the key code reader on the *J 35628-A*.
2. Press the On-Off rocker switch to the ON position.
3. A number from 1 to 15 will appear in the window designating the electrical code of the key.

4. Cut a new key.
   Ensure that the key has the electrical code that was determined by the *J 35628-A*.
5. Start the engine with the new key in order to ensure the key is mechanically and electrically correct.

Programming Replacement Keys, Ign Cyl, or PCM

Tools Required

J 35628-A PASS/VATS Interrogator

In order to replace lost ignition keys it is necessary to determine the mechanical cut and the electrical key code.

The mechanical and electrical key codes are recorded on the vehicle invoice. Use the codes to create a new ignition key, if available.

Determine the mechanical cut first. Use the key code on the ignition cylinder or call Divisional Roadside Assistance in order to determine the mechanical cut.

If the mechanical cut cannot be determined, replace the ignition cylinder. Make an ignition key blank with the correct mechanical cut. Use the blank key while determining the proper electrical key code.

Complete the following steps in order to determine the correct electrical key code:

Important: Do not disconnect the yellow two-way SIR connector.

1. Connect the *J 35628-A* wiring to PASS-Key II® connector at the base of the steering column. Do not connect to the steering column wiring.
2. Turn the *J 35628-A* ON and position the key code switch to number 1.
   Attempt to start the engine with the proper mechanically cut key.
   If the engine starts, the key code is number 1.
3. If the engine does not start, turn the ignition OFF and press the 4–minute timer on *J 35628-A*.
4. When the timer lamp goes out, move the key code switch to number 2 and attempt to start the engine.
   If the engine starts, the key code is number 2.
5. Continue trying different key codes until the correct key code is found.
6. Make a new ignition key with the proper key code and mechanical cut.

Feature Customization

Many features of the universal theft deterrent system, including horn chirps, how the system arms and delay times, may be set to the customer's preference. The alarm system can also be turned off. To customize features, after the system is in programming mode, refer to the appropriate chart below.

Programming Mode

Programming mode is necessary to customize features of the system. To set body control module (BCM) in programming mode, refer to the following procedure.

Entering Programming Mode

To enter the programming mode, perform the following:

1. Turn the ignition ON.
   This will disarm the theft system, if necessary.
2. Turn the ignition OFF.
3. Remove the RADIO fuse (#17).
4. Turn the ignition to the ACC position.
   The chime will sound to verify the system is in programming mode.
   - When the chime sounds once; exit lighting, delayed illumination, last door closed locking and unlocking prevention can be customized.
   - When the chime sounds twice and the vehicle is equipped with universal theft deterrent; remote lock control verification, arming method, arming verification, driver's door delay and shock sensor enable/disable can be customized.

Exiting Programming Mode

To exit the programming mode, perform the following:

1. When the programming is done, turn the ignition switch OFF.
2. Install the RADIO fuse (#17).

Customization Charts

Exit Lighting and Delayed Illumination

Exit lighting illuminates interior lamps when the key is removed from the ignition switch to help in exiting the vehicle. Delayed illumination illuminates interior lamps for 25 seconds after the doors are closed. The 25 seconds is shortened if the ignition is turned on or if the power locks are activated. Both exit lighting and delayed illumination are enabled from the factory, and can be disabled if desired.

1. Enter the programming mode.
2. Turn the courtesy lamp switch ON then OFF (I/P dimmer switch, not parking lamps).
   Listen to the number of chimes to determine current setting.
   The factory setting is in CAPITAL print.
3. Turn the courtesy lamp switch ON and OFF to increment desired setting below.
4. Continue customizing other features or exit the programming mode.

Number of Chimes	Exit Lighting Feature	Delayed Illumination Feature
1	Disabled	Disabled
2	Disabled	Enabled
3	Enabled	Disabled
4	ENABLED	ENABLED

Last Door Closed Locking and Lockout Prevention

Last door closed locking is available on cars with power locks, this feature provides for delayed locking of the door (three seconds after the last door is closed). This allows the driver to exit the vehicle and press the lock button (either on the key fob or the door panel), but the doors will not lock until both doors are closed. When the locked switch is pressed, the chime will sound three times, indicating a last door closed locking is pending. Pressing the lock switch again will lock the doors immediately. Pressing the unlock switch will cancel a pending last door closed locking. Last door closed locking is disabled from the factory, and can be enabled if desired.

Lockout prevention protects the driver from locking the keys in the vehicle, this feature disables the power lock from locking when the keys are in the ignition and a door is open. If the power lock button is pressed when a door is open, the chime will sound 5 time as a reminder to take the keys before locking the door. Lockout prevention is enabled from the factory, and can be disabled if desired.

1. Enter the programming mode.
2. Press the lock switch on the door.

   Listen to the number of chimes to determine current setting.

   The factory setting is in CAPITAL print.
3. Press the lock switch on the door to increment desired setting below.
4. Continue customizing other features or exit the programming mode.

Number of Chimes	Last Door Closed Locking	Lockout Prevention
1	Disabled	Disabled
2	DISABLED	ENABLED
3	Enabled	Disabled
4	Enabled	Enabled

Remote Lock Control Verification (Horn Chirp and Parking Lamps Flash)

Available on vehicles equipped with Universal Theft Deterrent (UTD) system, this feature provides horn chirps and/or parking lamp illumination to indicate that the remote transmitter LOCK or UNLOCK command was received.

1. Enter the programming mode.
2. Press the unlock switch on the remote transmitter.

   Listen to the number of chimes to determine current setting.

   The factory setting is in CAPITAL print.
3. Press the unlock switch on the remote transmitter to increment desired setting below.
4. Continue customizing other features or exit the programming mode.

Number of Chimes	Key Fob Lock 1st Push	Key Fob Lock 2nd Push	Key Fob Unlock
1	Verification Off	Verification Off	Verification Off
2	Horns and Lamps	Horns and Lamps	Lamps
3	Horns and Lamps	Horns and Lamps	Horns and Lamps
4	Lamps	Lamps	Lamps
5	LAMPS	HORNS AND LAMPS	LAMPS

Theft Deterrent Arming Method

Available on vehicles equipped with Universal Theft Deterrent (UTD) system, this feature provides different methods of arming the UTD system.

1. Enter the programming mode.
2. Press the unlock switch on the door.

   Listen to the number of chimes to determine current setting.

   The factory setting is in CAPITAL print.
3. Press the unlock switch on the door to increment desired setting below.
4. Continue customizing other features or exit the programming mode.

Number of Chimes	Theft Deterrent Arming Method
1	Alarm System Off
2	Remote Transmitter Arms
3	REMOTE TRANSMITTER OR DOOR LOCK SWITCH ARMS
4	Passive (Automatic)

Theft Deterrent Arming Verification (Horn Chirp and Parking Lamps Flash)

Available on vehicles equipped with Universal Theft Deterrent (UTD) system, this feature provides horn chirps and/or parking lamp illumination to indicate when the UTD system has been armed. It is programmed separately from the remote lock control verification list above.

1. Enter the programming mode.
2. Press the lock switch on the remote transmitter.

   Listen to the number of chimes to determine current setting.

   The factory setting is in CAPITAL print.
3. Press the lock switch on the remote transmitter to increment desired setting below.
4. Continue customizing other features or exit the programming mode.

Number of Chimes	Arming with Key Fob	Arming With Door Lock Switch	Passive Arming
1	Off	Off	Off
2	Horns and Lamps	Horns and Lamps	Horns and Lamps
3	HORNS AND LAMPS	LAMPS	LAMPS
4	Lamps	Lamps	Lamps

Theft Deterrent Operation (Driver's Door Delay and Shock Sensor Enable)

Available on vehicles equipped with Universal Theft deterrent (UTD) system, this feature provides a driver's door delay that can be set at zero or 8 seconds from the time the driver's door is opened until the alarm sounds. The shock sensor feature, that detects sharp blows to the vehicle, can also be enabled or disabled using this chart. Refer to *Content Theft Deterrent (CTD) Description* for a description of the two sensitivity levels. Refer to *Shock Sensor Replacement* for adjustment procedures.

1. Enter the programming mode.
2. Turn the parking lamps ON and OFF.

   Listen to the number of chimes to determine current setting.

   The factory setting is in CAPITAL print.
3. Turn the parking lamps ON and OFF to increment desired setting below.
4. Continue customizing other features or exit programming mode.

Number of Chimes	Drivers Door Delay	Shock Sensor Enable
1	Zero	Disabled
2	8 seconds	Disabled
3	Zero	Enabled
4	8 SECONDS	ENABLED

Description and Operation

Content Theft Deterrent (CTD) Description

The Universal Theft Deterrent (UDT) option UA6, combined with the remote control door lock option AU0, is available for the vehicle. The universal theft deterrent operates separately from the Personal Automotive Security System (PASS-Key II®), which is standard on the vehicle. The universal theft deterrent system is comprised of the following components:

- The remote transmitters
- The red security indicator lamp on the I/P upper trim panel
- A shock sensor
- A controller with fuel and starter disable
- Horn outputs
- Parking lamp outputs
- Door jamb release switches
- Rear lid release switches

The following actions occur for 2 minutes if a break in is attempted:

- The system sounds the horn.
- The parking lamps flash.

Two levels of alarm are available through the shock sensor:

- Two horn blasts and parking lamps flash for non-threatening blows to the vehicle
- A two-minute alarm for harder blows to the vehicle

The red lamp at the shock sensor illuminate at shock levels that would cause the full 2 minute alarm to sound.

Many of the features of the system, including the following features, can be set to the customer's preference:

- Horn chirps
- The method of arming the system
- The delay times

The alarm system can be turned off. Refer to *Feature Customization*.

Content Theft Deterrent (CTD) Operation

The following steps are the normal arming procedure:

1. Close all of the windows.
2. Place the shift lever in PARK, if equipped with an automatic transmission.
3. Turn the ignition switch to the LOCK position. Remove the ignition key.
4. Open any door.
5. Lock the doors with the power lock switch or with the remote transmitter.
6. Close the doors.

The vehicle alarm is now armed.

Activation of any of the following components will sound the alarm:

- The door switches
- The rear compartment lid release switch
- The shock sensor

The system will also sound if the wrong key resistance is detected. The armed system will briefly flash the red lamp every two seconds.

The system can also be armed with the windows open. The system will be disarmed only when the unlock button on the remote transmitter is pushed or the ignition key is ON.

Important: Locking the doors with the lock control side knob will not arm the system.

When any door is opened during the arming procedure, the system goes into an armed wait mode.

The following actions will occur if the remote transmitter is used in order to arm the system:

- Closing the doors will arm the system.
- The horns chirp twice.
- The parking lamps flash.

If the door switch was used to arm the system, only the parking lamps will flash. If the rear compartment lift window panel is open or ajar during arming procedure, the horn will only chirp once.

Passive Arming

If the ignition is turned off and a door is opened, the system will automatically arm 6 seconds after all doors are closed regardless if the doors are locked or not. In all other cases, the system will wait 30 seconds after all doors are closed before automatically arming. The parking lamps will flash when the system arms. The vehicle is set to active arming mode from the factory. Passive arming can be enabled. Refer to *Feature Customization*.

Locking without Arming

In order to lock the vehicle without arming the system, manually lock the doors with the inside lock knobs or front door lock key and close the doors.

Disarming the System

When the system is disarmed, the red lamp is off. The rear compartment lift window panel button on the remote transmitter will disarm the rear compartment lift window panel and the shock sensor, in order to allow access to the rear compartment. The doors will remained armed. When the window panel is closed, in 5 seconds the rear compartment lift window panel will be armed again. In order to disarm the entire system, use either of the following two steps:

- Press the UNLOCK button on the remote transmitter.
- Turn the ignition ON with the proper key.

Driver's Door Delay

Unlocking the door or the rear compartment lift window panel with the use of a key will not disarm the system. The BCM is factory set with a driver's door delay. The driver's door delay gives the driver 8 seconds to turn the ignition key ON after the driver's door is unlocked with a key. The driver's door delay can be set for no delay time if the customer prefers disarming the alarm with the transmitter. If the driver's door delay is set for no delay time, any entry without the transmitter will activate the alarm. Refer to *Feature Customization*.

Deactivating the Alarm

To deactivate the alarm when activated and functioning, use the following procedure:

- If the alarm is activated by pressing the panic mode button on the remote transmitter, press the panic mode button again. Pressing the panic button a second time will deactivate the alarm.
- If the alarm is activated by the shock sensor, door or rear lid release switch, the alarm is deactivated by any of the following actions:
  - Turn the ignition ON.

    Use the proper key.
  - Press any button on the remote transmitter.
  - Press UNLOCK in order to complete the following actions:
    - Silence the alarm
    - Unlock the driver door
    - Disarm the system
  - Press LOCK in order to complete the following actions:
    - Silence the alarm
    - Keep the doors locked
    - Keep alarm system activated
  - Press the rear compartment lift window panel button in order to complete the following actions:
    - Silence the alarm
    - Unlock the lift window panel
    - Disarm the lift window panel
  - Press the panic button in order to complete the following actions:
    - Silence the alarm
    - Keep the doors locked
    - Keep the alarm system activated
- The alarm will deactivate after 2 minutes.
- If the alarm is activated by an improper ignition key, press any button on the remote transmitter in order to deactivate the alarm.

System Components

Remote Control Door Lock Transmitter

The remote transmitter is the primary device to disarm the theft deterrent system. If the vehicle has universal theft deterrent, the remote transmitter has a panic button. Press this button to sound the car alarm; press it again to turn the alarm off. As with the other functions, operation of this feature is subject to the range of the transmitter.

Shock Sensor

The chock sensor is located near the spare tire in the hatch area. Its sensitivity has been set to comply with various local regulations requiring vehicle contact to set off the alarm. It can be adjusted if more or less sensitivity is desired. If sensitivity is increased too much, it may give false alarms caused by gusts of wind or other natural events that may shake the vehicle. To adjust, remove the label covering the adjustment knob and adjust as desired. Turn clockwise to increase sensitivity. Turn counterclockwise to decrease sensitivity. The red lamp on the shock sensor illuminates at shock levels that would cause the full (2 minute) alarm to sound. Different levels of shock are required on the various body panels and windows to activate the sensor, depending on the material (plastic, steel or glass) and distance from the shock sensor. Two levels of alarms are available through the shock sensor.

- Two horn blasts and lamp flashes for non-threatening blow to the vehicle.
- A full 2 minute alarm for harder blows to the vehicle.

The shock sensor is ignored by the system during ignition ON, when the rear compartment lift window panel is open, when the alarm is disarmed, 5 seconds after the horn sounds, or when customized to be ignored.

Theft Deterrent Relay

The theft deterrent relay controls the park lamps. The BCM provides a ground path for the relay when the theft deterrent is activated.

Content Theft Deterrent (CTD) Circuit Description

Circuit Operation

The universal theft deterrent (UTD) system is contained in the body control module (BCM). The UTD system allows a variable entry time into the vehicle before sounding the alarm. The UTD system is disabled when the ignition key is inserted into the ignition key lock cylinder and turning the ignition switch to the ON position. The UTD system consists of the following components:

- Body control module (BCM)
- Remote control door lock transmitter
- Security indicator LED
- Theft deterrent shock sensor

The use of the transmitter is the primary method of arming the UTD system. The transmitter has four push buttons which perform the following functions:

- Lock the vehicle door and arm the UTD system
- Unlock the vehicle doors and disarm the UTD system
- Open the rear compartment.
- Initiate the Panic mode during which the horns sound and park lamps flash

The side door lock switches can also be used to arm and disarm the UTD system. The security indicator LED flashes to confirm the system is armed. The LED is visible on top of the instrument panel to provide the system status and as a warning to intruders. The status of the UTD system can be determined by the output of the LED as described below:

1. The LED flashes once per second with a door open and the UTD system unarmed.
2. The LED is on steady when the UTD system is waiting for the doors to close before arming.
3. The LED flashes briefly every two seconds when the UTD system is armed.
4. The LED flashes twice every two seconds when the UTD system has sounded the alarm due to an impact to the vehicle.
5. The LED flashes three times every two seconds when the UTD system has sounded the alarm due to the opening of a door or the rear compartment.
6. The LED is off when the UTD system is off, disarmed, or the vehicle doors are open for longer than ten minutes.

The theft deterrent shock sensor detects impacts to the vehicle. The shock sensor determines the level of the impact to the vehicle and signals the BCM to sound one of the following alarm cycles:

- For low level impacts to the vehicle, the BCM sounds the horn and flashes the park lamps twice.
- For high level impacts to the vehicle, the BCM repeatedly sounds the horn and flashes the park lamps.

The shock sensor is ignored by the BCM under any of the following conditions:

- The ignition switch is in the ON position
- The rear compartment lid is open
- Up to five seconds after the UTD system is armed
- When feature customization is used to disable the UTD system

When armed, the UTD system will monitor the following to determine when to sound an alarm:

- Ignition key lock cylinder
- Theft deterrent shock sensor
- Front side door locks
- Rear compartment lid ajar indication switch

The UTD system provides vehicle security along with PASS-Key® II by controlling the following:

- Fuel enable
- Starter enable
- Audible alarm (horns)
- Visual alarm (park lamps)

Vehicle Theft Deterrent (VTD) Description

The Personal Automotive Security System (PASS-Key II®) is standard equipment on the vehicle. The system is designed to prevent vehicle theft by disabling the engine unless an ignition key with a specific electrical resistance is used in the ignition cylinder. The PASS-Key II® system and the universal theft deterrent operate separately. The universal theft deterrent system is optional. The PASS-Key II® system includes the following components:

- The ignition key
- The ignition cylinder
- The body control module (BCM)
- The starter relay
- The powertrain control module (PCM)

Vehicle Theft Deterrent (VTD) Operation

The PASS-Key II® system is designed to prevent the engine from starting if the proper resistance is not sensed from the ignition key. Of the 15 key codes or resistance values available, only one will work with each BCM. Once the key code is programmed into the BCM, the resistance value is stored in a non-volatile memory.

The PASS-Key II® system prevents the engine from starting by controlling the starter relay and the PCM fuel enable input. If the PCM does not sense the proper frequency signal on the fuel enable input, fuel will not be provided to the engine.

If the wrong resistance value is sensed when the ignition switch is in the RUN position, the BCM will not ground the starter enable circuit and will not output the fuel enable signal for approximately three minutes. The engine is prevented from starting and discourages the thief from trying key codes or resistance values at random.

If the correct resistance value is sensed when the ignition switch is in the RUN position, the BCM will ground the starter enable circuit and output the fuel enable signal. The engine will start normally.

If the PASS-Key II® system detects an open or short to ground when the ignition switch is in the RUN position, the BCM will default to fail enable. Fail enable occurs when the proper key resistance is sensed before the open short to ground occurs. This has to occur for 1 minute before the fail enable is engaged. Fail enable will illuminate the security indicator lamp and allow the operator to stop and start the vehicle until the problem is corrected.

System Components

Ignition Key

The ignition key for vehicles with the PASS-Key II® system is a typical square ignition key blank and resistor. The key blank and resistor are not serviceable separately. There are 15 different resistance values. The ignition key also has mechanical cuts similar to non-PASS-Key II® ignition keys. When servicing the PASS-Key II® system, obtain all ignition keys, if possible, and verify proper values using *J 35628-A*.

Ignition Cylinder

The ignition cylinder contains a set of electrical contacts used to measure the resistor in the ignition key. When servicing the cylinder, be certain to maintain proper wire routing. A two pin connector at the base of the steering column connects the contacts to the vehicle wiring. The connector is also used for diagnostic purposes.

Body Control Module (BCM)

The BCM contains the logic of the PASS-Key II® system. The BCM has inputs from the battery, ignition circuits, key resistor, shock sensor, door lock, jamb, and hatch switches. The BCM has outputs to the starter, and fuel enable, security lamp circuits and also the remote hatch release. The BCM also controls power locks, interior lamps, horn chirps and parking lamps flashes for locking and arming functions.

Ignition Input

The ignition input is used to turn the BCM on. When the BCM is on, it will read the resistor and control the outputs accordingly. When the BCM is off the resistor is not read, and the starter relay and fuel enable output will not allow the engine to start. When the ignition switch is in the OFF position, the battery input to the BCM will draw about 75 milli-amps for the first ten minutes and about 2.4 milli-amps after 10 minutes of ignition off.

Key Resistor Inputs

The key resistor inputs are used to determine if the correct ignition key is being used to start the vehicle. The key resistor inputs are read when the ignition is turned on. If the key code (resistance value) of the ignition key matches the value stored in the BCM, the starter relay and fuel enable output will allow the vehicle to start.

Starter Enable Output

The starter enable circuit controls the starter relay. When the BCM sees the proper resistance at the ignition key, it grounds the starter enable circuit which allows the engine to be started. If the BCM does not sense the proper resistance at the ignition key, it will not ground the starter enable circuit.

Fuel Enable Output

The fuel enable circuit is an output from the BCM and an input to the PCM. When the BCM senses the proper resistance at the ignition key, it will output a signal to the PCM. If the BCM does not see the proper resistance at the ignition key, it will not output the signal to the PCM, the engine will start momentarily, then stall.

Security Indicator Lamp Output

The SECURITY lamp circuit is a indicator lamp output. The lamp output will be grounded during a 5 second bulb test at key on, at any time that the BCM is preventing the engine from starting, during an open or short to ground, or in the BCM is not properly programmed.

Starter Relay

The starter relay is used to stop the engine from cranking if the correct resistance is not sensed at the ignition key. It prevents the engine from cranking by opening the circuit to the starter solenoid switch.

Powertrain Control Module (PCM)

The PCM reads the fuel enable circuit to determine if fuel injection should be allowed. If the fuel enable signal is not present, the PCM will not allow fuel injection and normal engine operation.

Vehicle Theft Deterrent (VTD) Circuit Description

Circuit Operation

PASS-Key® II allows the vehicle to start only when the resistance pellet of the ignition key is recognized by the body control module (BCM). If an incorrect resistance value is not recognized by the BCM, the engine is prevented from starting in two ways:

- Battery voltage is disabled through the starter relay to the starter solenoid.
- The fuel injectors are disabled by the powertrain control module (PCM).

On vehicles equipped with content theft deterrent (CTD), the BCM will initiate an audible alarm cycle if an attempt is made to start the vehicle with the incorrect ignition key.

Voltage is applied to the BCM through circuit 39 when the ignition key is inserted into the ignition lock cylinder and turned to the START position. The BCM checks the pellet resistance of the ignition key through circuit 1073 and 1074 and the ignition key lock cylinder. If resistance is correct, the BCM applies ground through circuit 625 to the starter relay coil. The relay contacts close, applying voltage to the starter solenoid. At the same time, the BCM applies a fuel enable signal through circuit 229 to the powertrain control module (PCM). The PCM then allows the vehicle to start and run, then checks circuit 229. If the fuel enable signal is present from the BCM the engine continues to run. If the signal is not present, the PCM disables the fuel injectors and the engine stops.

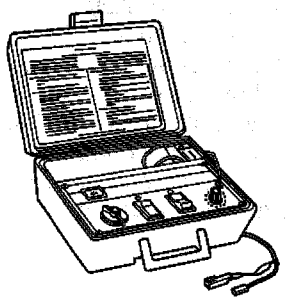
If the resistor pellet is the wrong value, the BCM disables vehicle starting for approximately 3 minutes. The starter relay and the fuel injectors are disabled. After the 3 minute period the vehicle can be started with the correct ignition key.

Security Indicator Operation

The BCM grounds the instrument cluster circuit 728 to illuminate the security indicator. The following describes the conditions and modes of the indicator illumination:

1. When the ignition switch is turned to the RUN or Start position, the indicator illuminates for a 5 second bulb test.
2. When an attempt is made to start the vehicle with an incorrect ignition key, the indicator is illuminated for approximately 3 minutes. The vehicle is disabled and the indicator remains illuminated for the entire 3 minute period, regardless of the position of the ignition switch.
3. Under any of the following conditions the indicator will flash at a rate of once per second and the vehicle will not start:
   - The resistor sensing contacts of the ignition switch are open
   - Circuit 1073 or circuit 1074 are open or shorted
4. If the ignition key resistor pellet reads infinite (open), the vehicle is disabled and the indicator flashes once per second, however the vehicle will start immediately if a good key is used.
5. When an unprogrammed BCM is installed, the vehicle will start but the indicator will flash at a rate of once per second under these conditions:
   - The resistor sensing contacts of the ignition switch are open
   - Circuit 1073 or circuit 1074 are open or shorted
   - If the ignition key resistor pellet reads infinite (open)
6. Circuit 1073 and circuit 1074 are continuously monitored by the BCM. The indicator illuminates If a fault is detected in either circuit 1073 or circuit 1074 for one minute. If the fault goes away for one minute, the indicator turns off and the system functions normally.
7. If any of the above faults occur while the engine is running or when the ignition switch is turned to the off position, the indicator turns on. The PASS-Key® II system is disabled and the BCM allows the vehicle to start in the Fault Enable mode. The indicator will remain on whenever the ignition switch is in the RUN position until the fault is corrected. The indicator remains illuminated for approximately one minute after the fault is corrected.

Special Tools and Equipment

Illustration	Tool Number/ Description
 74161	J 35628-A Pass/Vats Interrogator

Cruise Control

Specifications

Fastener Tightening Specifications

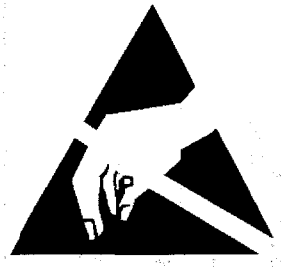
Application	Specification	
	Metric	English
Cruise Control Module Bracket Bolt (Side)	2.0 N·m	17 lb in
Cruise Control Module Bracket Bolt (Top)	10 N·m	89 lb in
Cruise Control Module Shield Bolt	6 N·m	53 lb in
Cruise Control Module Shield Nut	27 N·m	20 lb ft
Cruise Control Module to Bracket Bolt	4.5 N·m	40 lb in

Schematic and Routing Diagrams

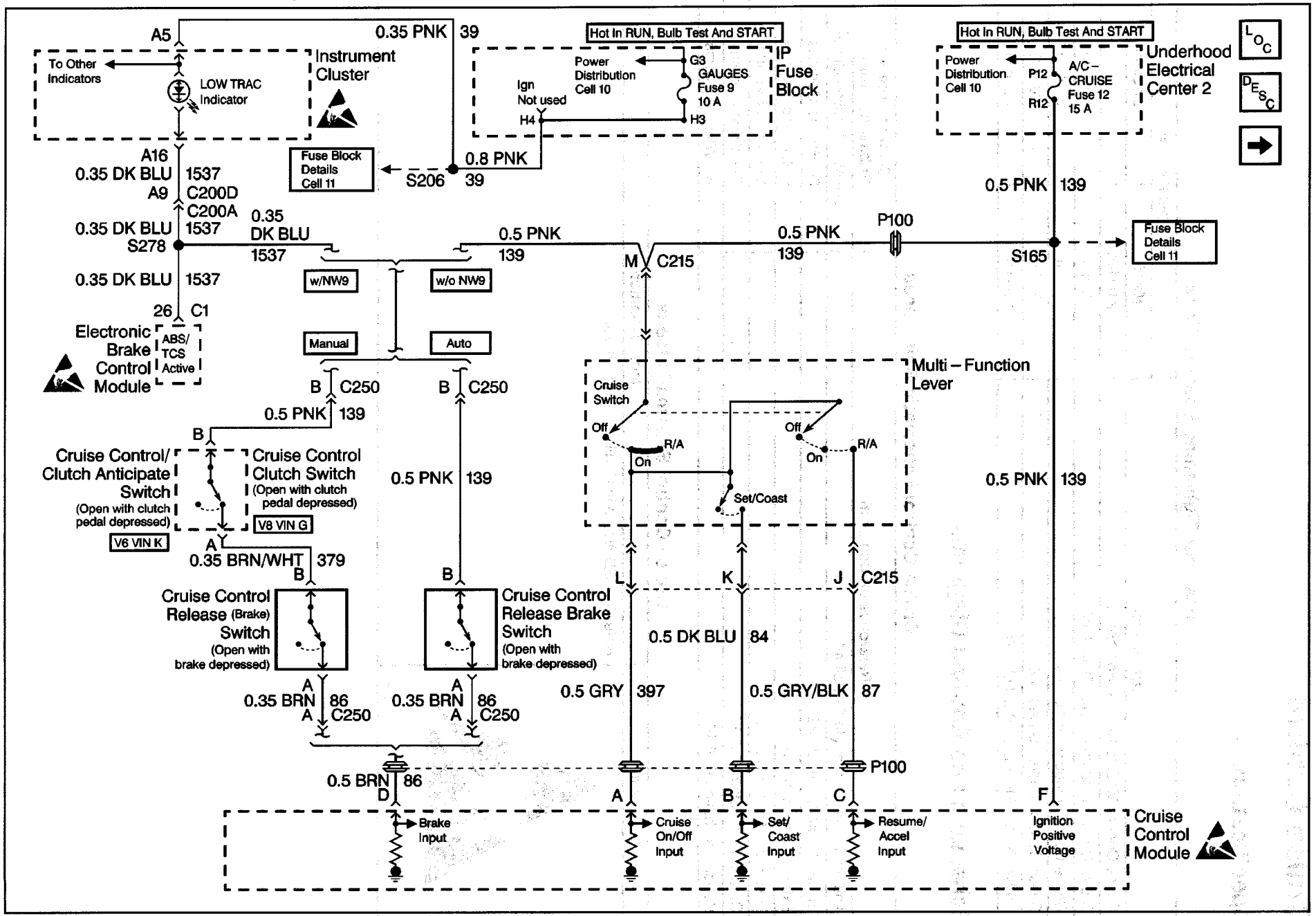
Cruise Control Schematic References

Reference on Schematic	Section Number Subsection Name
Antilock Brake System (ABS) Cell 44	5—ABS/Traction Control
Engine Controls Cell 21/22	6—Engine Controls
Exterior Lights Cell 110	8—Lighting Systems
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems

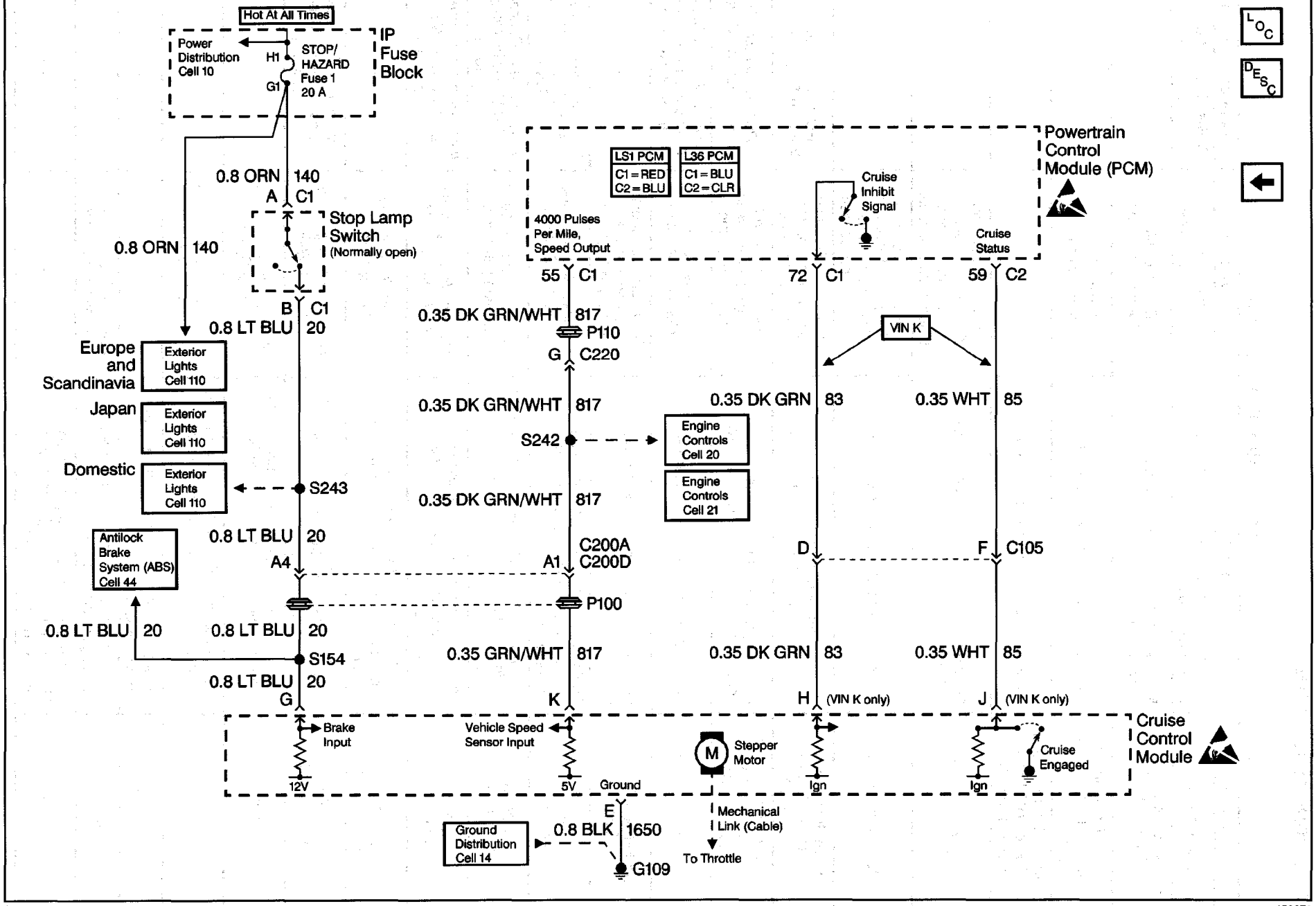
Cruise Control Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.

Cruise Control Schematics (Cell 34: Cruise Control Clutch Switch, Cruise Control Release Brake Switch, and Multi-Function Lever)



Cruise Control Schematics (Cell 34: Stop Lamp Switch and Stepper Motor)



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Component Locator

Cruise Control Components

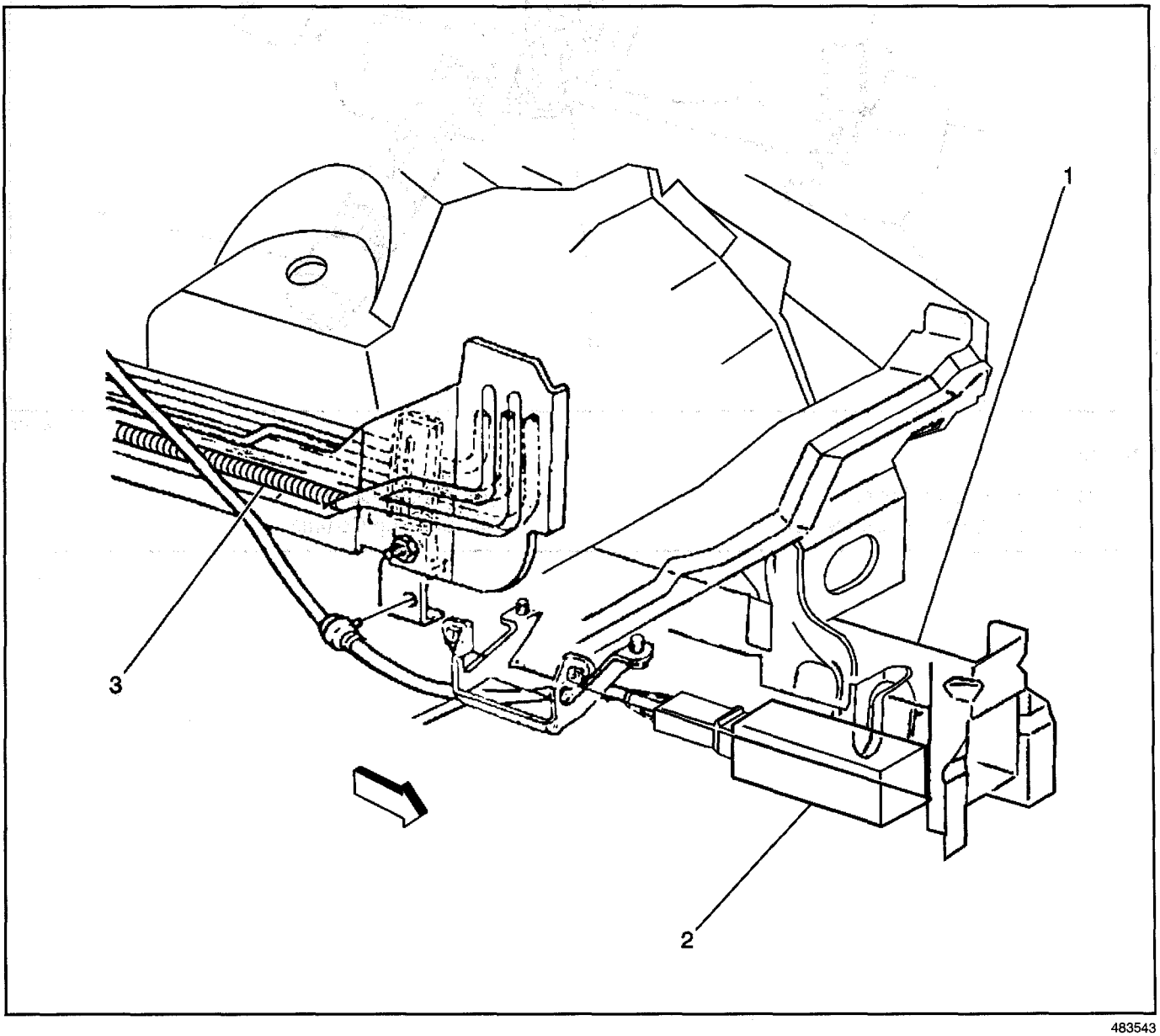
Name	Location	Locator View	Connector End View
Cruise Control Module	Mounted to the left frame rail, forward of the wheelhouse	*Cruise Control Component Views*	*Cruise Control Connector End Views*
Cruise Control Release Switch (Brake) (all with K34)	Mounted in the upper hole of the brake pedal bracket	*Cruise Control Component Views*	—
Cruise Control/Clutch Anticipate (V6 VIN K Manual with K34)	Mounted in the clutch pedal bracket	*Cruise Control Component Views*	—
Cruise Control (Clutch) Switch (V8 VIN G Manual with K34)	Mounted in the clutch pedal bracket	—	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Multi Function Lever	On the left arm of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Enigne Controls
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	*Power and Grounding Component Views* in Wiring Systems	*PCM Connector End Views* in Engine Controls
Stop Lamp Switch	Mounted on the brake pedal bracket	*Cruise Control Component Views*	*Antilock Brakes System Connector End Views* in Antilock Brake System
Underhood Electrical Center 2	On the left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
C105 (8 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200A (17 cavities)	Forward lamp to instrument panel harness, behind the left kick panel and steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C215 (11 cavities)	Forward lamp to the steering column harness, near the base of the steering column	*Harness Routing Views* in Wiring Systems	—
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C250 (2 cavities)	Forward lamp harness of the cruise control harness, near the brake/clutch pedal bracket	*Harness Routing Views* in Wiring Systems	—
G109	Attached to the left front frame rail, forward of the brake pressure modulator valve bracket	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
P110	Right side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
S154	Forward lamp harness, approximately 13 cm (5 in) from C120 (left front wheel speed sensor) breakout	—	—

Cruise Control Components (cont'd)

Name	Location	Locator View	Connector End View
S165	In the forward lamp harness, approximately 7 cm (3 in) from the main branch into the UH electrical center 2 breakout	—	—
S242	In the instrument panel harness, main branch, approximately 4 cm (2 in) from data link connector (DLC breakout)	—	—
S243	Instrument panel harness, approximately 9 cm (4 in) from G200 breakout	—	—

Cruise Control Component Views

Left Frame Rail

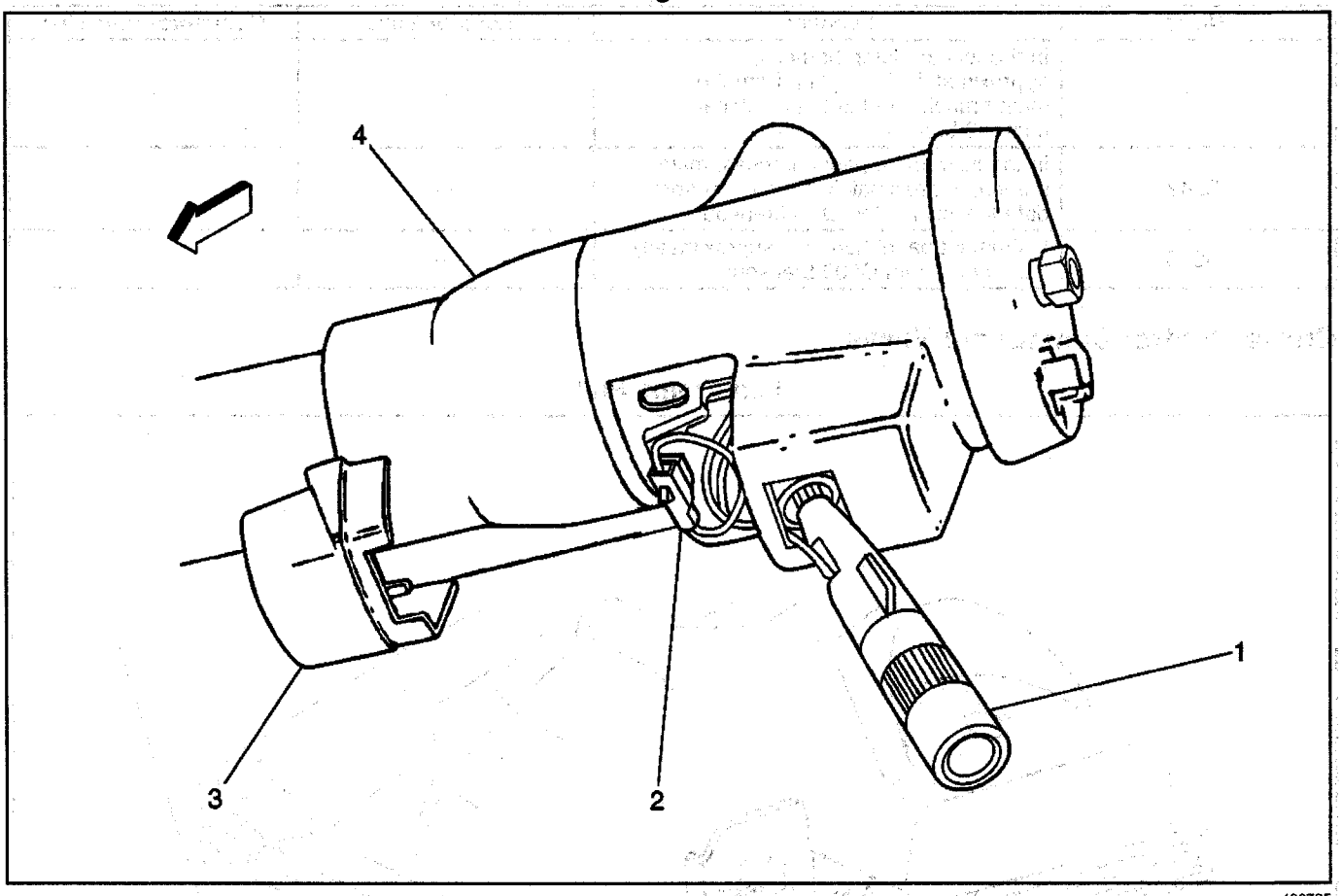


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Legend

(1) Left Frame Rail
(2) Cruise Control Module
(3) Forward Lamp Harness

Steering Column

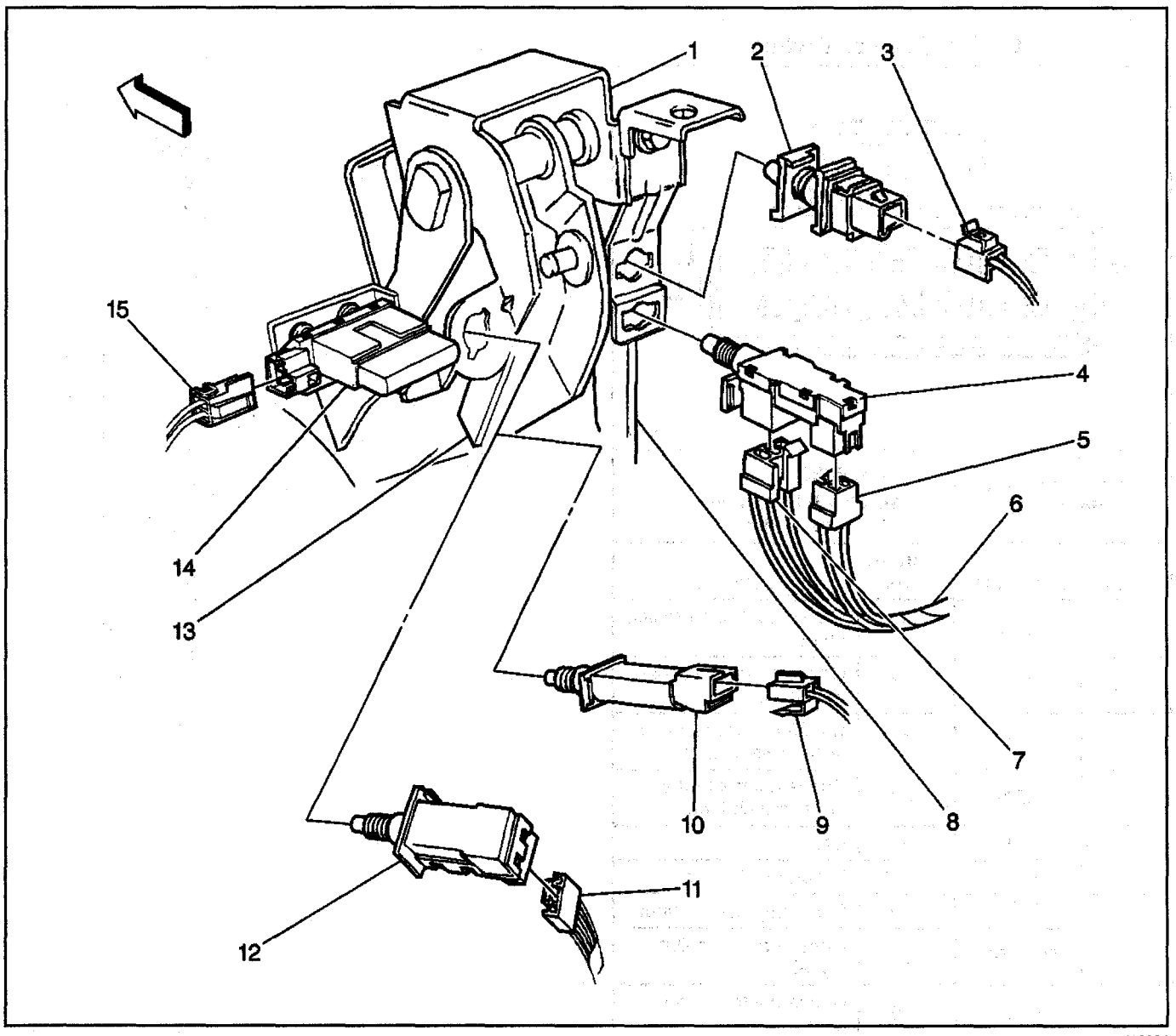


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Legend

(1) Multi-Function Lever
(2) Cruise Switches Connector
(3) Access Cover
(4) Steering Column

Under Left Side of the Instrument Panel



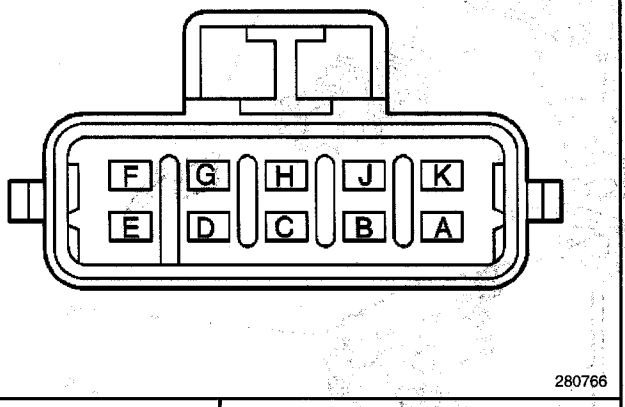
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Legend

(1) Brake/clutch pedal braket
(2) Cruise control release (brake) switch
(3) Cruise control harness
(4) Stoplamp switch
(5) Stoplamp switch connector C2 (Automatic transmission only)
(6) IP wiring harness
(7) Stoplamp switch connector C1
(8) Brake pedal
(9) Cruise control harness
(10) Cruise control (clutch) switch (V8 VIN G)
(11) Cruise control harness
(12) Cruise control/clutch anticipate switch (V6 VIN K)
(13) Clutch pedal
(14) Clutch pedal position switch
(15) IP wiring harness

Cruise Control Connector End Views

Cruise Control Module



280766

Connector Part Information	• 1206-5425 • 10-Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	GRY	397	Cruise control on switch output
B	DK BLU	84	Cruise control set/coast switch signal
C	GRY/BLK	87	Cruise control resume/ accel switch signal
D	BRN	86	Cruise control brake pedal switch input
E	BLK	1650	Ground
F	PNK	139	Fused ignition feed
G	LT BLU	20	Stop lamp switch input
H	DK GRN	83	Cruise control inhibit signal input
J	WHT	85	Cruise control status output
K	DK GRN/ WHT	817	Vehicle speed sensor input

Diagnostic Information and Procedures

Cruise Control System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Drive the vehicle above 25 mph. 2. Turn the cruise switch ON. 3. Depress the set switch once and release. 4. Release the accelerator pedal.	The vehicle maintains the set speed at the time the button is released.	• *Cruise Control Inoperative.* • Cruise control will not engage, speedometer does not operate. Refer to *A Powertrain On Board Diagnostic (OBD) System Check* or *A Powertrain On Board Diagnostic (OBD) System Check.*
2	1. Depress and hold the set switch until vehicle speed decreases by 4-5 mph. 2. Release the set switch.	The vehicle decelerates and maintains a new lower set speed if the speed is above 25 mph.	*Does Not Resume, Accelerate, or Tap Up or Down*
3	1. Depress and hold the R/A switch until the vehicle speed increases by 4–5 mph. 2. Release the R/A switch.	The vehicle accelerates and maintains a new higher set speed.	*Does Not Resume, Accelerate, or Tap Up or Down*
4	Depress the brake pedal slightly.	The cruise control disengages and the memory remains unchanged.	*Cruise Control Inoperative*
5	Depress the R/A switch once (less than 3/4 second) and release.	The vehicle accelerates and maintains the previous set speed.	*Does Not Resume, Accelerate, or Tap Up or Down*
6	Depress the R/A switch once and release (less than 1/2 second.	The vehicle speed increases by 1 mph and maintains a new set speed.	*Does Not Resume, Accelerate, or Tap Up or Down*
7	Depress the set switch once and release (less than 1/2 second).	The vehicle speed decreases by 1 mph and maintains a new set speed.	*Does Not Resume, Accelerate, or Tap Up or Down*
8	Depress the set and R/A switches simultaneously.	The vehicle is put in the noncruise mode with the memory unchanged.	*Does Not Resume, Accelerate, or Tap Up or Down*
9	Depress the R/A switch once (less than 3/4 second) and release.	The vehicle accelerates and maintains previous set speed.	*Does Not Resume, Accelerate, or Tap Up or Down*
10	Turn the cruise switch OFF.	The cruise control disengages and the memory is lost.	*Cruise Control Inoperative*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Cruise Control Inoperative

Important: Perform the following steps in order to avoid misdiagnosis:

- Inspect for proper operation of the following lamps:
  - The brake lamps
  - The CHMSL lamps
- Inspect the throttle linkage for mechanical binding that may cause a system malfunction.
- Test for a stored PCM Diagnostic Trouble Code (DTC). Refer to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls-3.8L or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls-5.7L.

  Refer to Engine Controls.
- Test for a stored Traction Control System (TCS) DTC. Refer to *A Diagnostic System Check* in Antilock Brakes.

The PCM will inhibit the cruise control when any of the following situations exist:

- The vehicle speed is less than 25 mph.
- The Park/Neutral Position Switch is placed into one of the following positions:
  - PARK
  - REVERSE
  - NEUTRAL
  - 1st GEAR
- An over/under battery voltage condition exists.
- There are low engine RPMs.
- There are high engine RPMs (fuel cut-off).

  Refer to Engine Controls for cruise control inhibit criteria diagnosis.

Cruise Control Inoperative

Step	Action	Value(s)	Yes	No
1	Did you perform the Cruise Control System Check?	—	Go to *Step 2*	Go to *Cruise Control System Check*
2	1. Place the cruise control switch to the OFF position. 2. Disconnect the cruise control module. 3. Turn the ignition switch to the RUN position. 4. Connect a test lamp between the cruise control module connector terminal F and ground. Does the test lamp illuminate?	—	Go to *Step 3*	Go to *Step 10*
3	Connect a test lamp between the cruise control module terminal F and terminal E. Does the test lamp illuminate?	—	Go to *Step 4*	Go to *Step 11*
4	1. Place the cruise switch in the ON position. 2. Connect a test lamp between the cruise control module terminal E and terminal A. Does the test lamp illuminate?	—	Go to *Step 5*	Go to *Step 12*
5	1. Connect a test lamp between the cruise control module connector terminal E and terminal B. 2. While observing the test lamp, press and hold the SET/COAST switch. Does the test lamp illuminate?	—	Go to *Step 6*	Go to *Step 13*
6	1. Front probe using a test light connected between the cruise control module connector between terminal E and terminal C. 2. While observing the test lamp, press and hold the SET/COAST switch. Does the test lamp illuminate?	—	Go to *Step 14*	Go to *Step 7*
7	Using a *J 39200* DMM, measure voltage at cruise control module connector between terminal D and E. Does the voltage measured equal the specified value?	B+	Go to *Step 8*	Go to *Step 17*
8	Connect a test light between the cruise control module connector between terminal E and terminal B. Does the test lamp illuminate?	—	Go to *Step 9*	Go to *Step 24*
9	1. Test circuit 84 for a short to B+. 2. If circuit 84 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
10	Repair one of the following conditions in CKT 139, between the cruise control module connector terminal F and splice S165: • A poor connection • An open Is the repair complete?	—	System OK	—
11	Repair the open in circuit 1650, between the cruise control module terminal E connector and G109. Is the repair complete?	—	System OK	—
12	1. Connect a test lamp between the cruise control module connector terminal E and terminal B. 2. While observing the test lamp, press and hold the set/coast switch. Does the test lamp illuminate?	—	Go to *Step 16*	Go to *Step 15*

Cruise Control Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
13	1. Test circuit 84 for one of the following conditions: • A short to ground • A poor connection • An open 2. If circuit 84 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
14	1. Test circuit 87 for a short to circuit 84. 2. If circuit 87 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
15	1. Test for one of the following conditions in circuit 139, between the multi-function lever and splice S165: • A poor connection • An open 2. If circuit 139 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
16	1. Test circuit 397 for one of the following conditions: • A short to ground • A poor connection • An open 2. If circuit 397 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
17	1. Disconnect the cruise control release (brake) switch connector. 2. Using a *J 39200* DMM, measure the voltage between the cruise control release (brake) switch connector terminal B and ground. Does the measured voltage equal the specified value?	B+	Go to *Step 20*	Go to *Step 18*
18	1. Disconnect connector C250. 2. Using a *J 39200* DMM, measure the voltage between the connector C250 terminal B and ground. Does the voltage measured equal the specified value?	B+	Go to *Step 21*	Go to *Step 19*
19	• On vehicles equipped with NW9, repair the open in CKT 1537 between connector C250 terminal B and S 278. • On vehicles not equipped with NW9, repair the open in CKT 139 between connector C250 terminal B and connector C215 terminal M. Is the repair complete?	—	System OK	—
20	1. Test circuit 86 for one of the following conditions: • A poor connection • An open **Important:** Inspect the cruise control release (brake) switch for the proper alignment. 2. If circuit 86 is OK, replace the cruise control release (brake) switch. Is the repair complete?	—	System OK	—

Cruise Control Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
21	Determine if the vehicle is automatic or manual transmission. Does the vehicle have an automatic transmission?	—	Go to *Step 22*	Go to *Step 23*
22	Repair one of the following conditions in circuit 139, between connector C250 terminal B and the cruise control release (brake) switch connector terminal B: • A poor connection • An open Is the repair complete?	—	System OK	—
23	1. Test for one of the following conditions in CKT 139 between connector C250 terminal B and the cruise control (clutch) switch connector terminal B: • A poor connection • An open 2. Test for one of the following conditions in CKT 379, between the cruise control (clutch) switch connector terminal A and the cruise control release (brake) switch terminal B: • A poor connection • An open 3. If the connections and the circuits are OK, replace the cruise control (clutch) switch. Is the repair complete?	—	System OK	—
24	Connect a test lamp between the cruise control module connector between terminal E and terminal C. Does the test lamp Illuminate?	—	Go to *Step 30*	Go to *Step 25*
25	1. Raise the drive wheels. 2. Use the *J 39200* to monitor voltage between cruise control module connector terminal K and ground. 3. While observing the *J 39200* DMM display, rotate the drive wheels by hand. Does the voltage vary within the specified value?	0–5 volts	Go to *Step 26*	Go to *Step 31*
26	1. Place the ignition switch in the OFF position. 2. Test circuit 83 for one of the following conditions between the PCM and the cruise control module: • A poor connection • An open 3. Reconnect the cruise control module connector. 4. Attach a *scan tool* scan tool to the DLC. 5. Start the engine. 6. Clear any DTCs. 7. Monitor the SMCC INHIBITED display on the *scan tool.* 8. Attempt to operate the vehicle in cruise control mode. Is SMCC Inhibited displayed or the scan tool?	—	Go to *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls or *A Powertrain On Board Diagnostic (OBD) System Check* in Engine Controls	Go to *Step 27*
27	1. Clear any DTCs. 2. Select MODE 4 DIAGNOSTICS on the *scan tool* 3. Use the *scan tool* in order to command the SMCC to allow cruise control. 4. Use the *J 39200* DMM in order to probe the cruise control module connector between terminal H and B+. Does the measured value equal the specified value?	B+	Go to *Step 28*	Go to *Step 29*

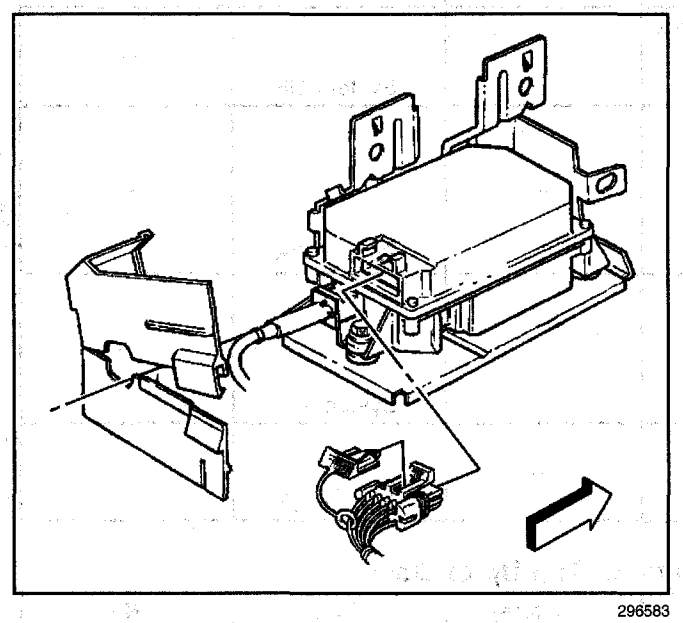
Cruise Control Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
28	Replace the cruise control module. Refer to *Cruise Control Module Replacement.* Is the repair complete?	—	System OK	—
29	1. Test circuit 83 for a short to B+. 2. If circuit 83 is OK, service the PCM. Refer to *A Powertrain On Board Diagnostic (OBD) System Check.* Is the repair complete?	—	System OK	—
30	1. Test circuit 87 for a short to B+. 2. If CKT 87 is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—
31	Repair the open or the poor connection in circuit 817 between the cruise control module and splice S242. Is the repair complete?	—	System OK	—

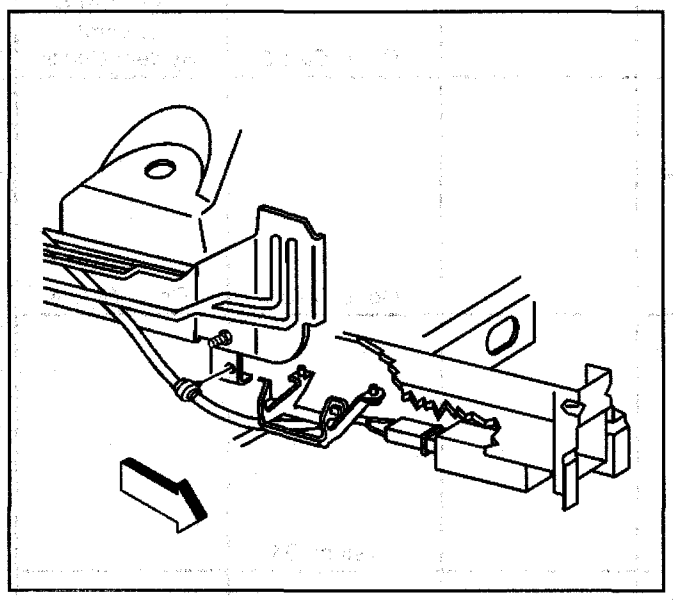
Does Not Resume, Accelerate, or Tap Up or Down

Step	Action	Value(s)	Yes	No
1	Did you perform the Cruise Control System Check?	—	Go to *Step 2*	Go to *Cruise Control System Check*
2	1. Turn the ignition switch to the RUN position. 2. Turn the cruise control switch to the ON position. 3. Using a test light, backprobe connector C215, at the base of the steering column, from terminal J to ground. 4. Press and hold the RESUME/ACCEL switch. Does the test lamp illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	1. Test for an open in CKT 87, between connector C215 and the cruise control module. 2. Test for a poor connection at the cruise control module terminal C. 3. If the connection is OK, replace the cruise control module. Refer to *Cruise Control Module Replacement.* Is the repair complete?	—	System OK	—
4	1. Test for one of the following conditions in CKT 87, in the steering column: • An open • A short to ground 2. Test for a poor connection at connector C215 terminal J. 3. If the connection is OK, replace the multi-function lever. Refer to *Multifunction Lever Replacement.* Is the repair complete?	—	System OK	—

Repair Instructions



296583



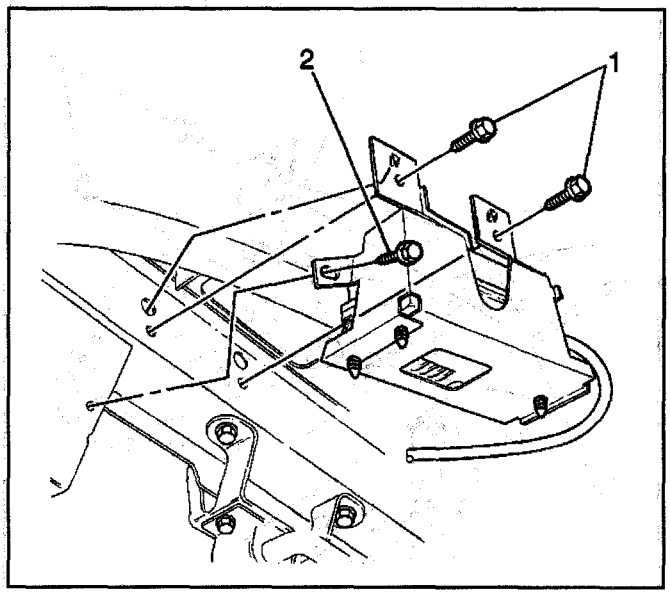
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Cruise Control Module Replacement

Removal Procedure

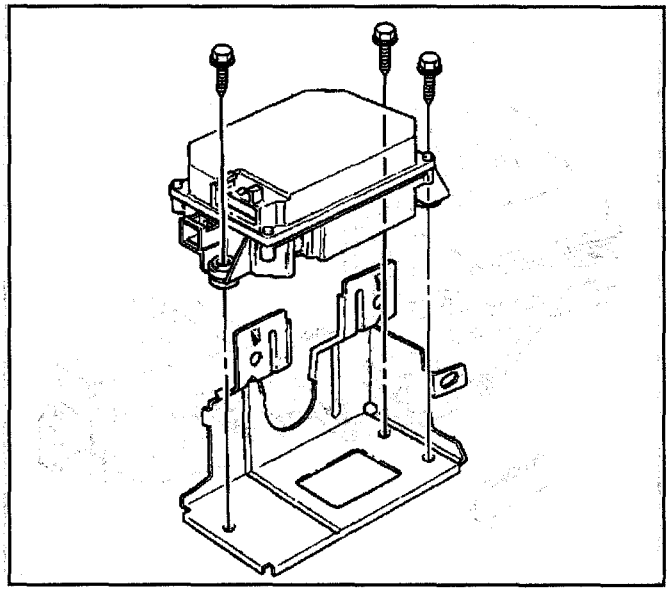
1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the left front bumper fascia lower deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
3. Remove the cruise control module cover.
4. Disconnect the electrical connector from the cruise control module.
5. Disconnect the cruise control cable connector from the brake pipe clip.
6. Disconnect the cruise control cable from the cruise control module. Refer to *Cruise Control Cable Replacement (3.8L)* or *Cruise Control Cable Replacement (5.7L)*.

7. Remove the cruise control module bracket bolts (1 and 2).
8. Remove the cruise control module and bracket from the left side engine compartment inner rail.



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9. Remove the cruise control module to bracket bolts.
10. Remove the cruise control module from the bracket.


296587

Installation Procedure

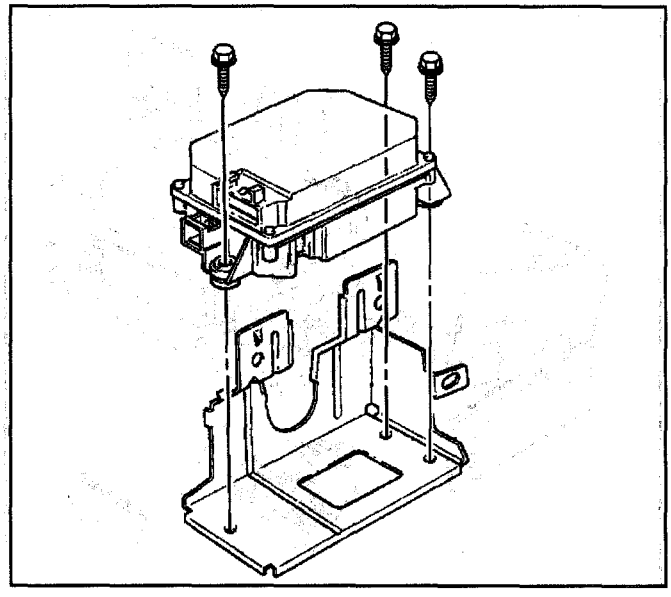
1. Connect the cruise control module to the bracket.

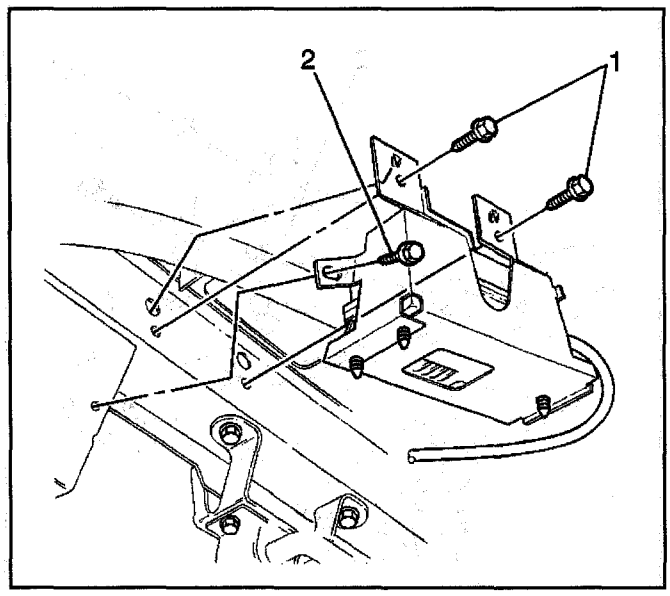
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the cruise control module to bracket bolts.

   Tighten

   Tighten the cruise control module to bracket bolts to 4.5 N·m (40 lb in).


296587

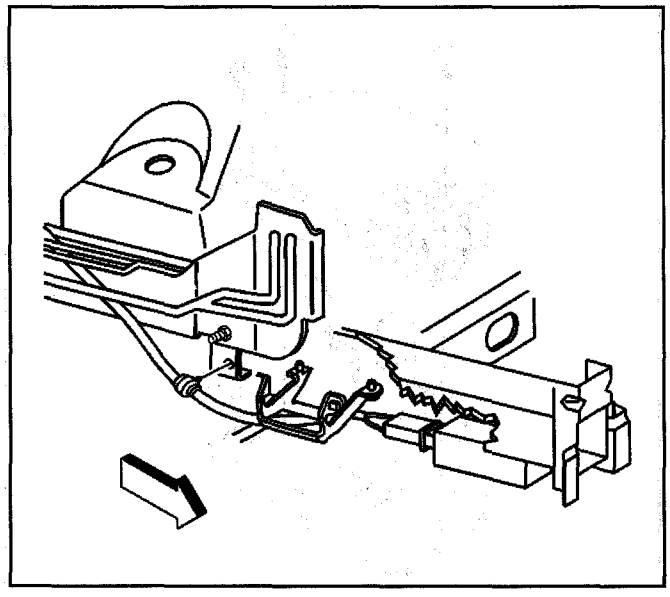


296585

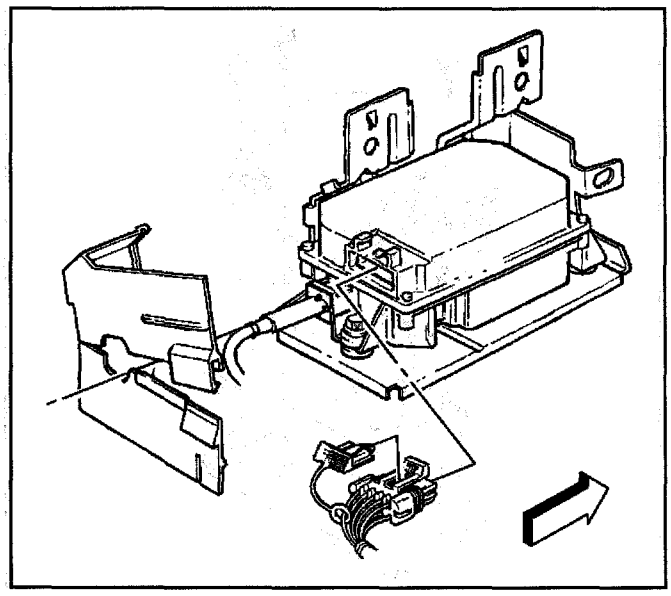
3. Install the cruise control module and bracket to the left engine compartment inner rail.
4. Install the cruise control module bracket bolts (1, 2).

   Tighten

   - Tighten the cruise control module bracket bolts (1) to 10 N·m (89 lb in).
   - Tighten the cruise control module bracket bolt (2) to 2.0 N·m (18 lb in).
5. Connect the cruise control cable to the cruise control module. Refer to *Cruise Control Cable Replacement (3.8L)* or *Cruise Control Cable Replacement (5.7L)*.


296584

6. Connect the cruise control cable clip to the brake pipe clip.
7. Connect the electrical connector to the cruise control module.


296583

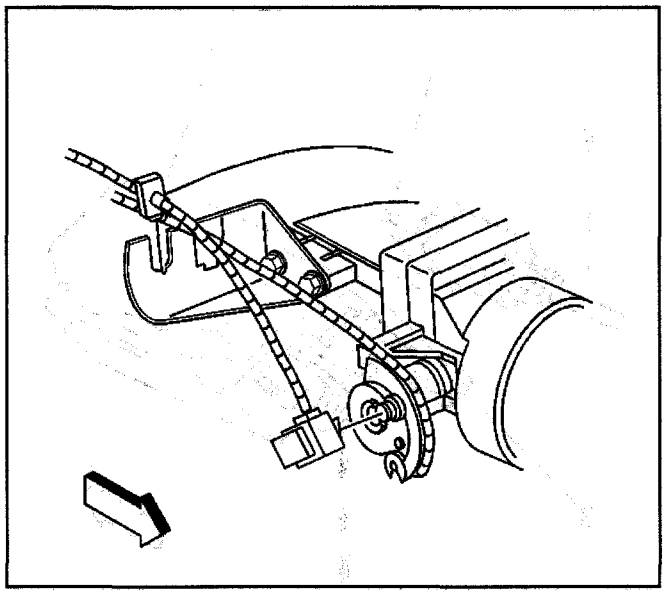
8. Install the cruise control module cover.
9. Instal the left front bumper fascia lower deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
10. Lower the vehicle.
11. Adjust the cruise control cable as needed. Refer to *Cruise Control Cable Adjustment*.

Cruise Control Cable Replacement (3.8L)

Removal Procedure

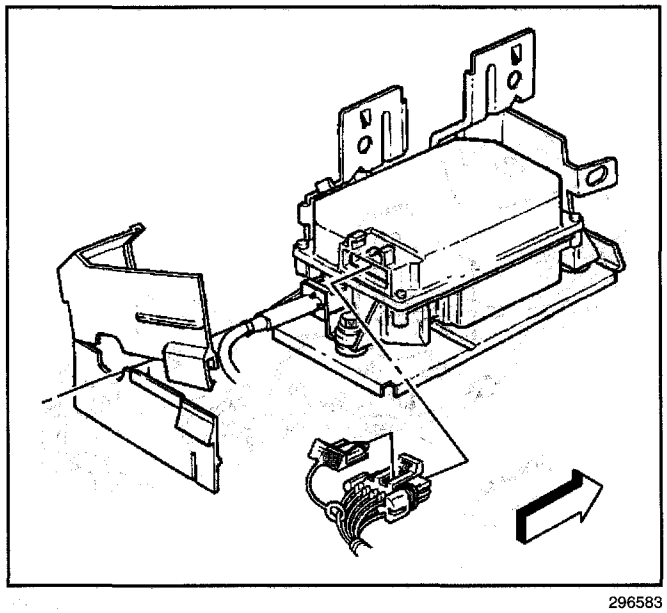
Important: When removing the cable end fitting from the throttle body, push down in order to disengage the cable. Slide the cable off the throttle lever.

1. Disconnect the cruise control cable from the engine bracket.
2. Disconnect the cable end fitting from the throttle body lever stud.
3. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.



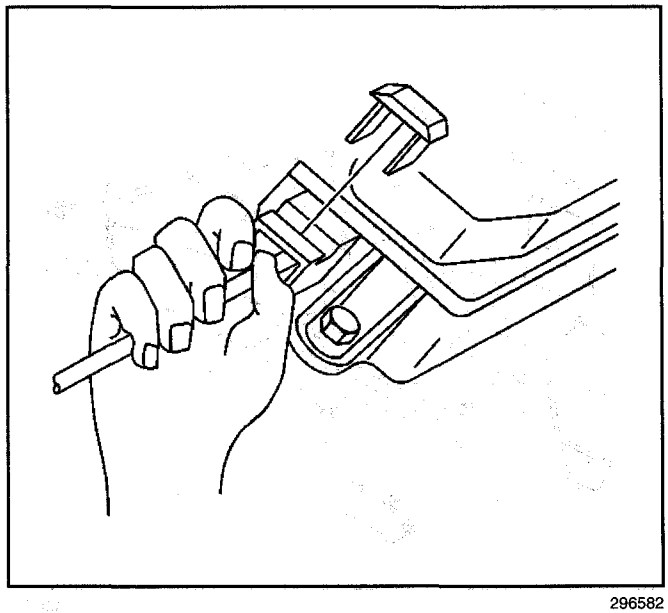
296575

4. Remove the cruise control servo cover.

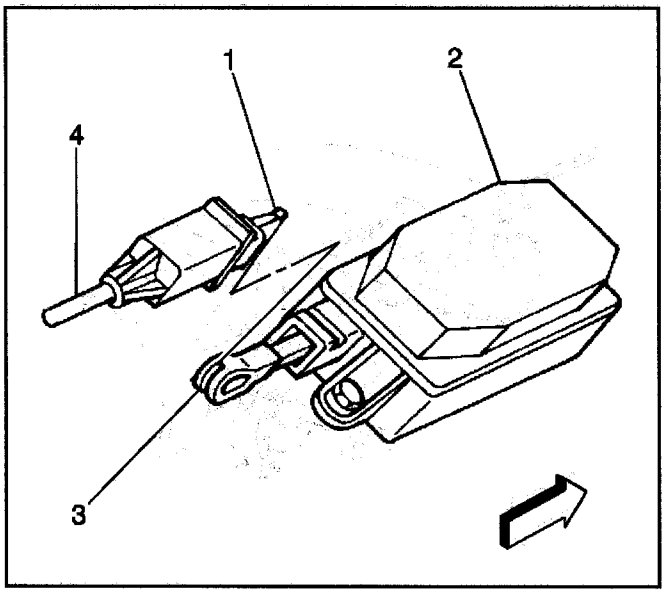


296583

5. Remove the cruise control servo retainer from the cruise control module.
6. Compress the conduit tangs.
   Pull the cable out of the cruise control module.

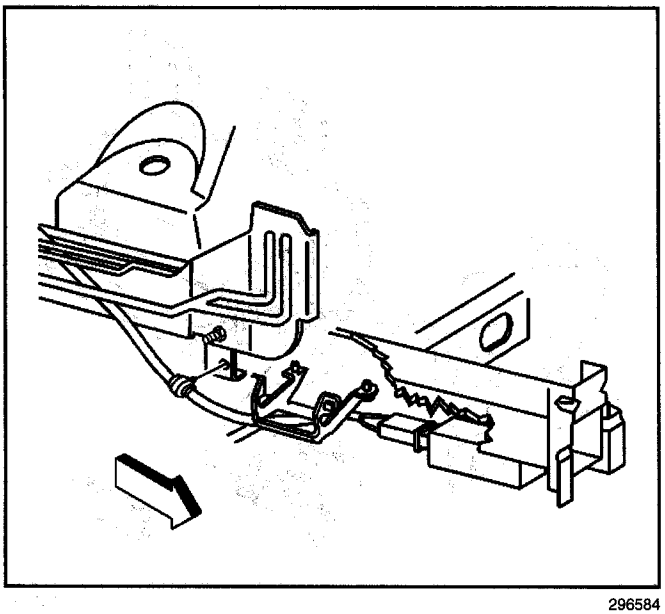


296582



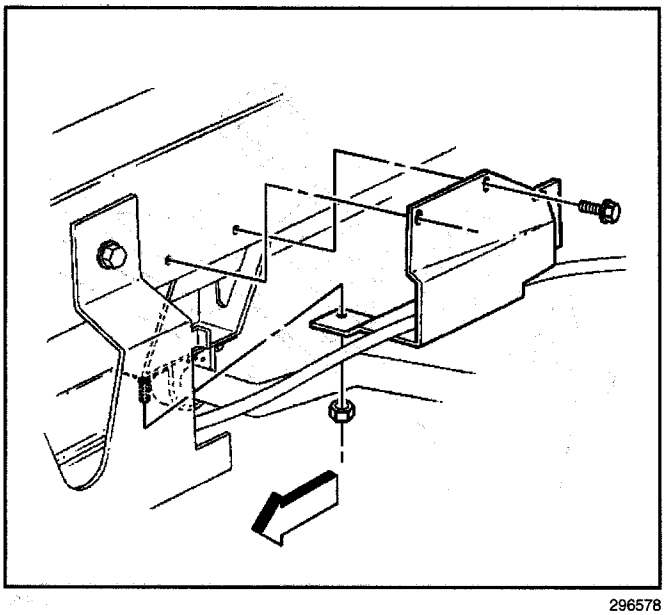
296577

7. Remove the cable bead (1) from the cruise motor band end fitting (3) on the cruise control module (2).



296584

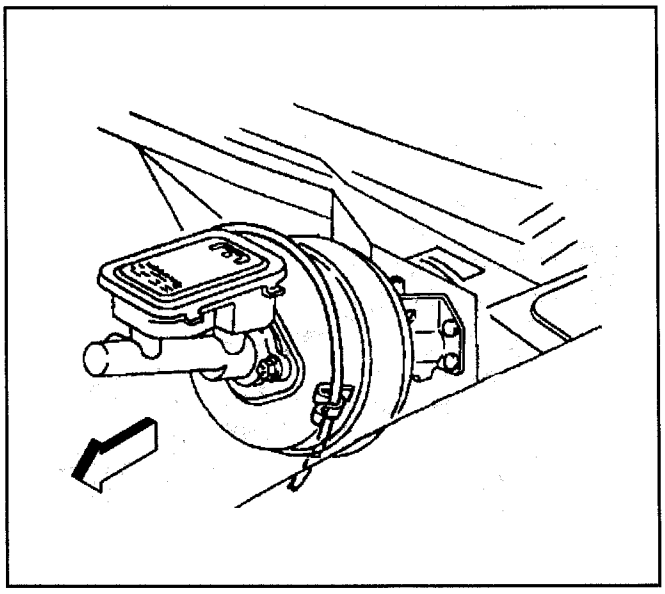
8. Remove the cruise cable from the brake pipe clip.



296578

9. Remove the bolts and nuts attaching the cruise control shield.
10. Remove the cruise control shield.
11. Lower the vehicle.

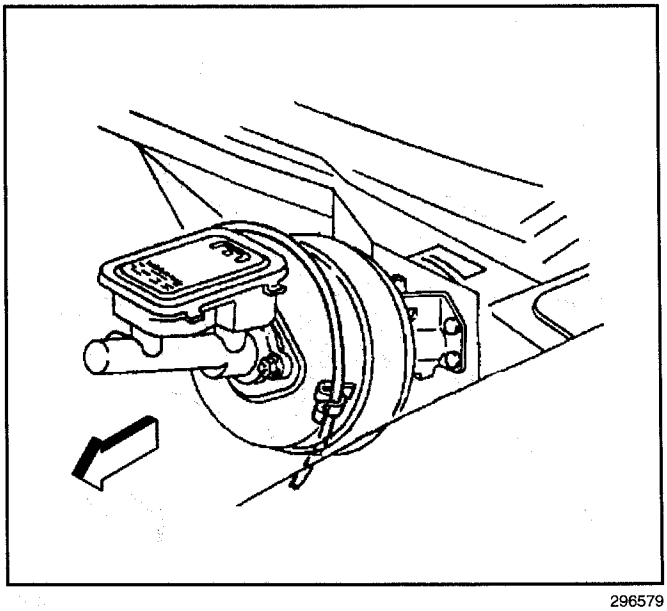
12. Mark the cable position on the brake booster.
13. Unclip the cruise control cable.
14. Observe the routing of the cruise cable in order to insure proper re-installation.



296579

Installation Procedure

1. Position the cruise control cable to the vehicle.
2. Attach the cable to the marked position on the brake booster.
3. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.



296579

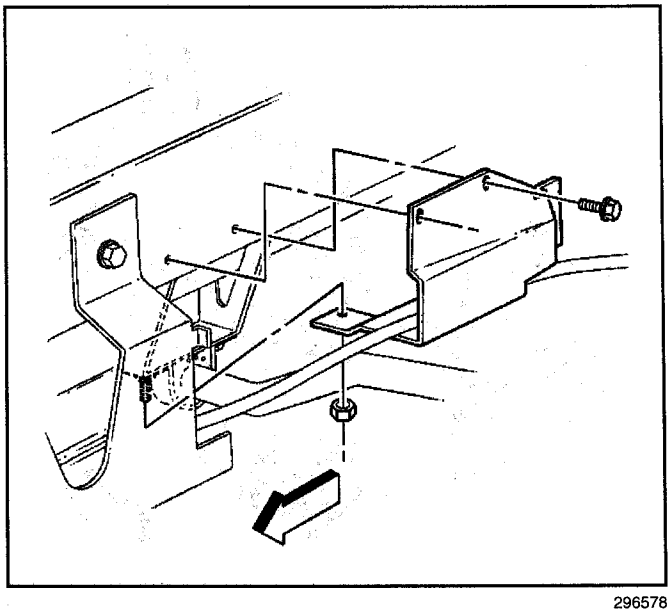
4. Install the cruise control shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

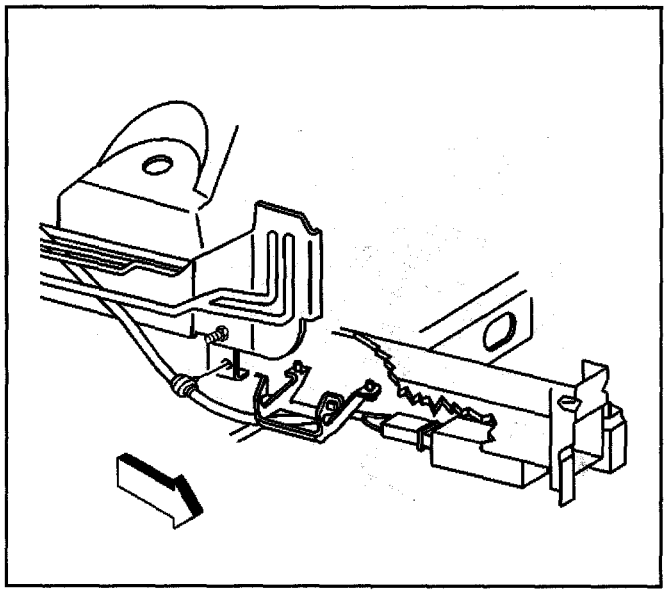
5. Install the bolts and nut attaching the cruise control shield.

   Tighten

   - Tighten the cruise control shield bolts to 6 N·m (53 lb in).
   - Tighten the cruise control shield nut to 27 N·m (20 lb ft).

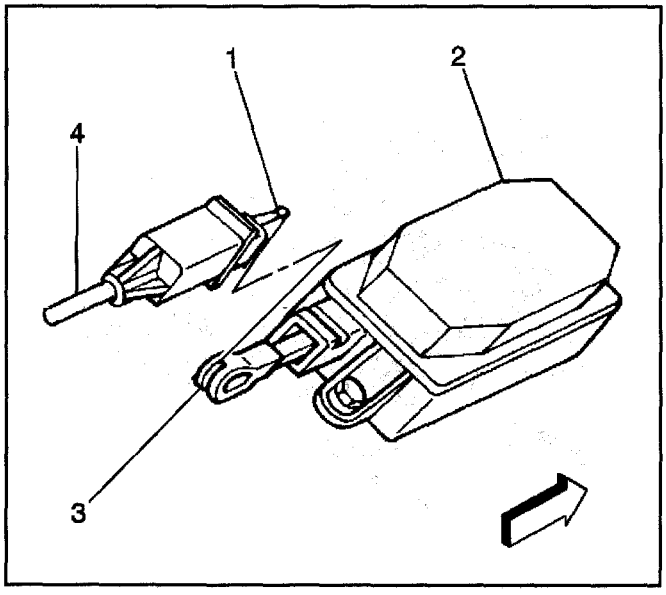


296578



296584

6. Connect the cruise control cable to the brake pipe clip.

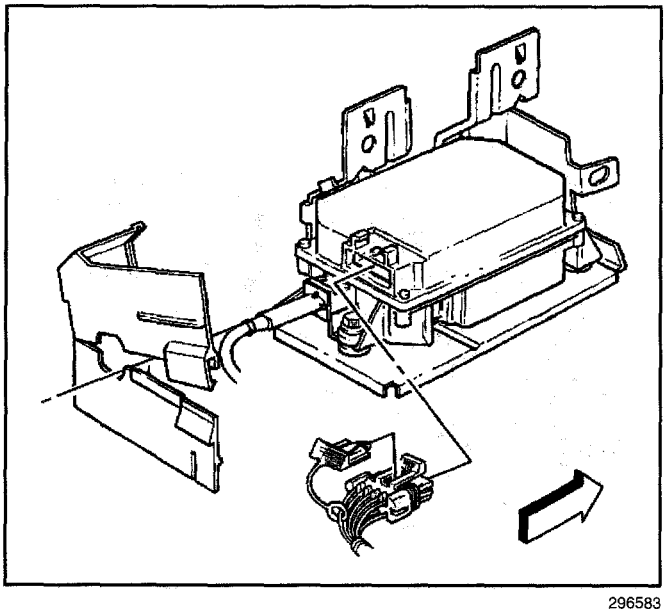


296577

7. Connect the cable (4) to the cruise control module (2).
8. Connect the cable bead (1) to the cruise motor band end fitting (3) on the cruise control module (2).
9. Pull the engine end of the cable until the cable is taut.

Important: The ribbon must not be twisted.

10. Turn the cable ribbon until the ribbon is flat.
11. Slide the cable conduit fitting over the ribbon.
12. Snap the fitting into the module housing.
13. Ensure that both tangs are engaged.
14. Connect the cruise retainer to the cruise control module.

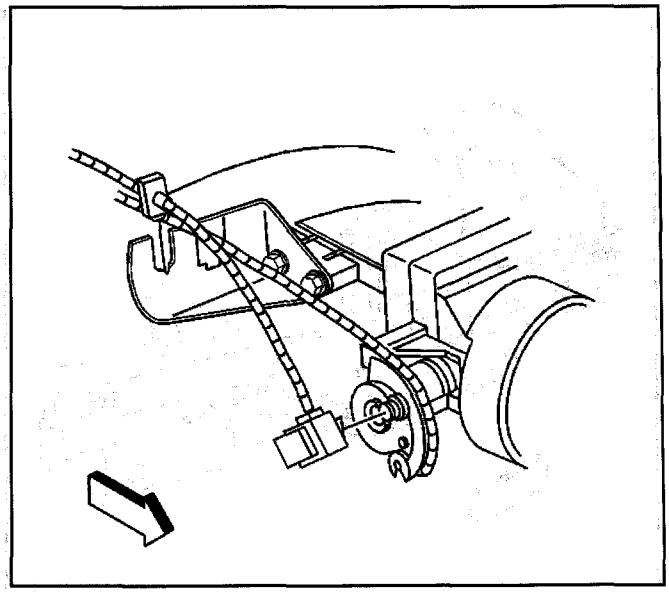


296583

15. Install the cruise control servo cover.
16. Lower the vehicle.

Important: Install the slug of the cruise cable to the cam of the throttle body before installing the cruise cable to the engine bracket. Do not bend the core wire of the cable when installing the slug to the cam.

17. Connect the cable end fitting to the throttle body lever stud.
18. Connect the cruise control cable to the engine bracket.
19. Adjust the cruise control cable. Refer to *Cruise Control Cable Adjustment.*



296575

Cruise Control Cable Replacement (5.7L)

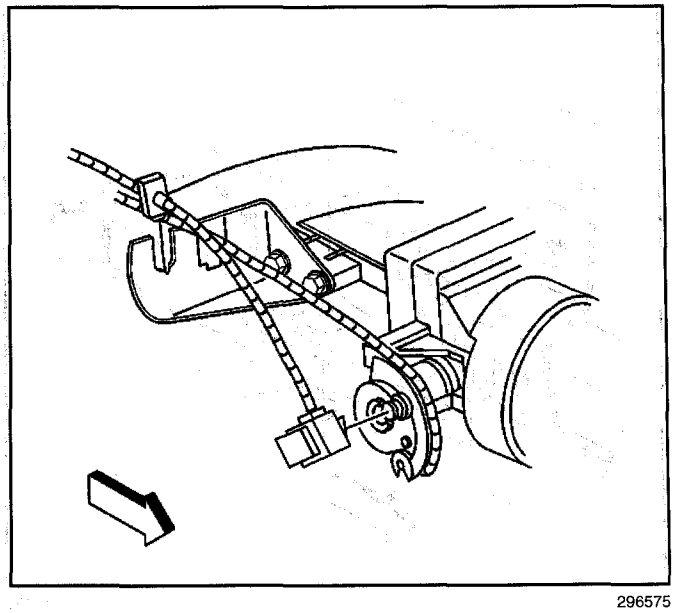
Removal Procedure

Without Traction Control

1. Remove the cruise control cable from the throttle body linkage.

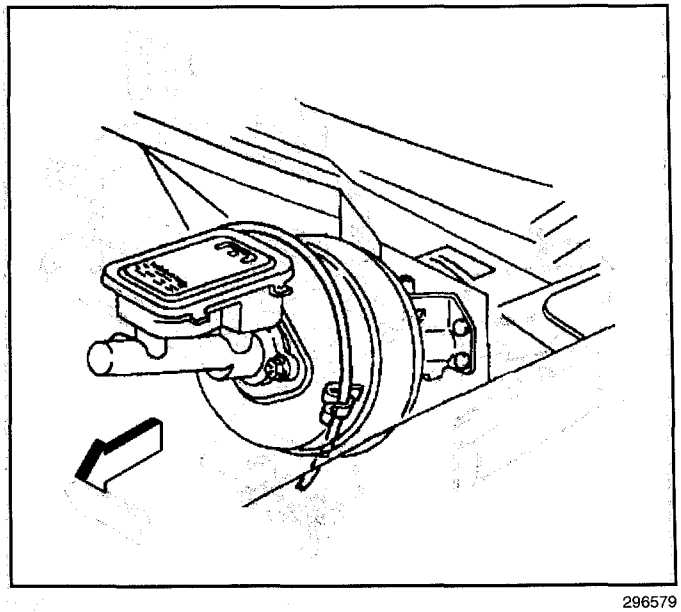
Important: To remove the cable from the throttle body, push down the cable end to disengage the cable. Slide the cable end off the throttle lever.

2. Unsnap and remove the cruise control cable from the throttle body bracket.
3. Remove the cruise control cable from the accelerator/cruise control cable servo bracket.

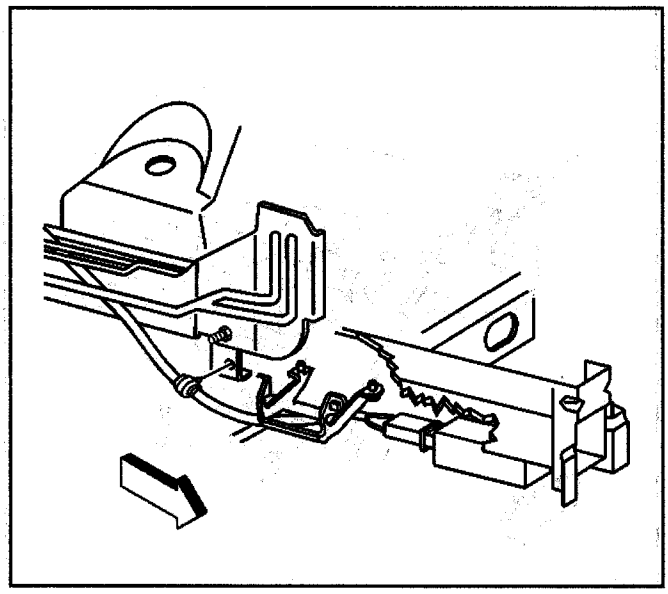


296575

4. Remove the cruise control cable clip from the brake booster.
5. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

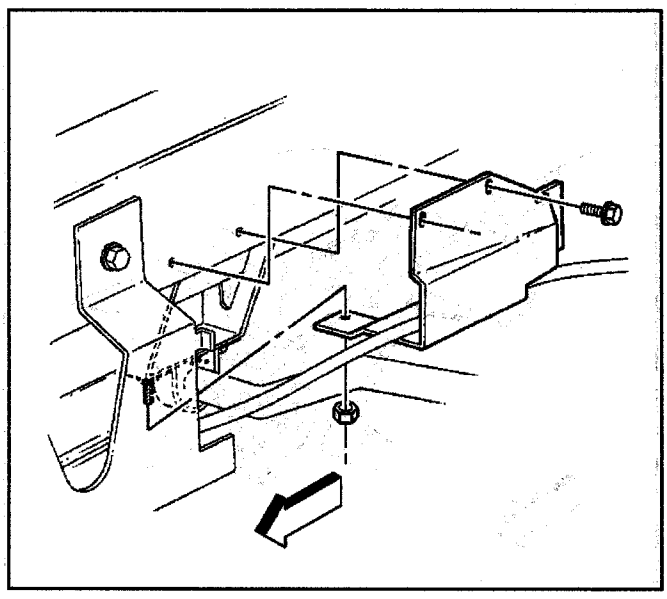


296579



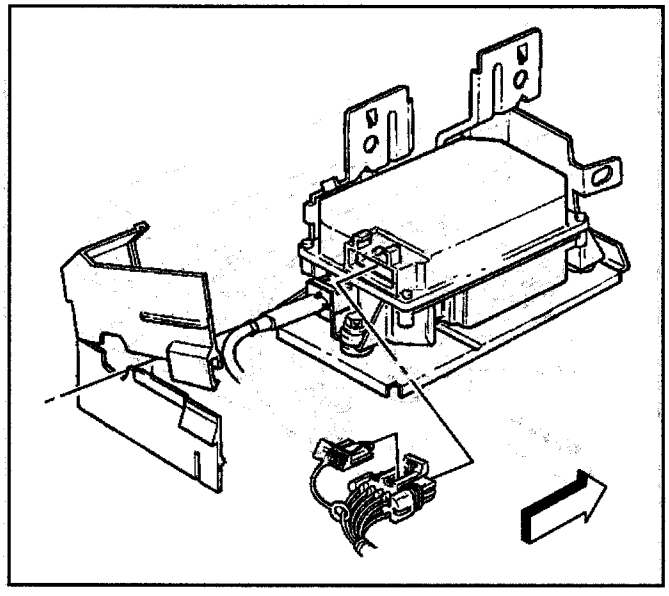
296584

6. Disconnect the cruise control cable rosebud connector from the brake pipe clip.



296578

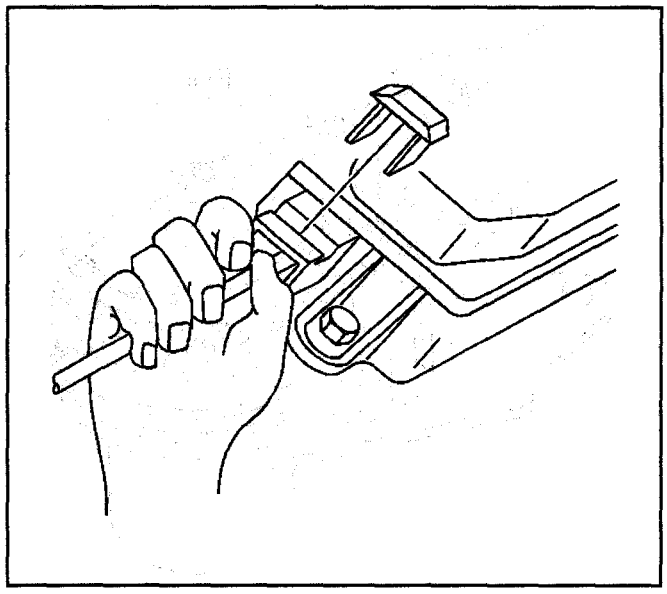
7. Remove the cruise control module shield bolts and nut.
8. Remove the cruise control module shield.



296583

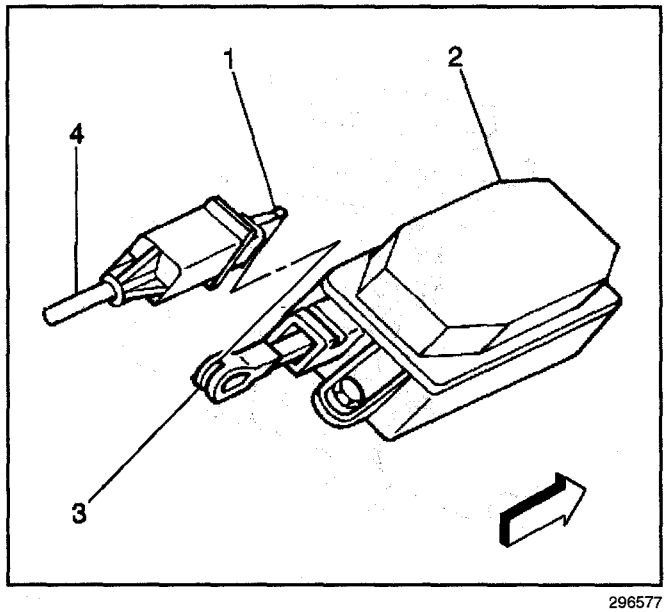
9. Remove the cruise control servo cover.

10. Remove the retainer from the cruise control module.
    Compress the conduit tangs.



296582

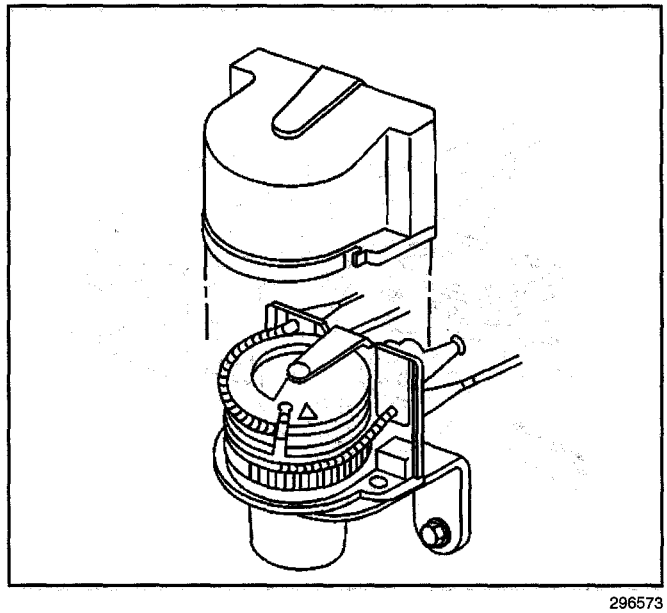
11. Pull the cruise control cable (4) out from the module (2).
12. Disconnect the cable bead (1) from the ribbon (3).
13. Remove the cruise control cable from the vehicle.



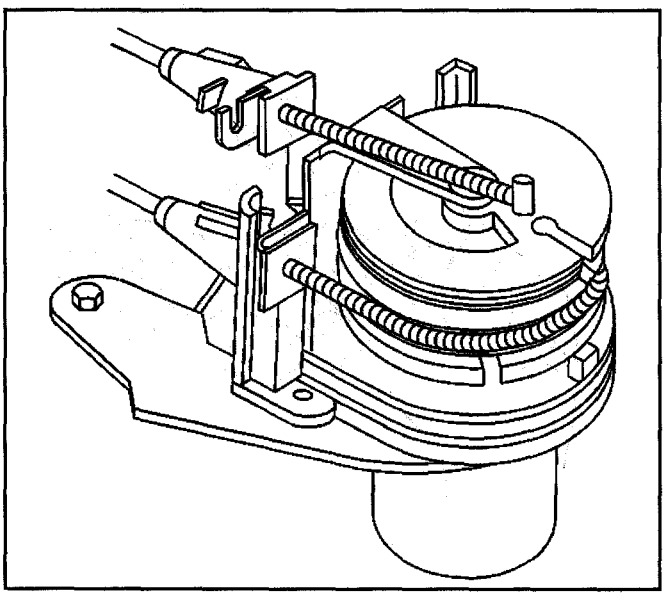
296577

With Traction Control

1. Remove the cruise control servo cable adjuster cover.

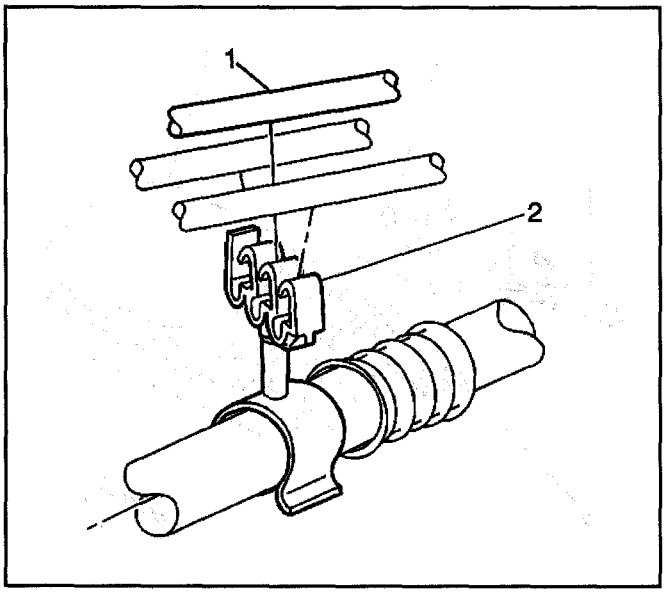


296573



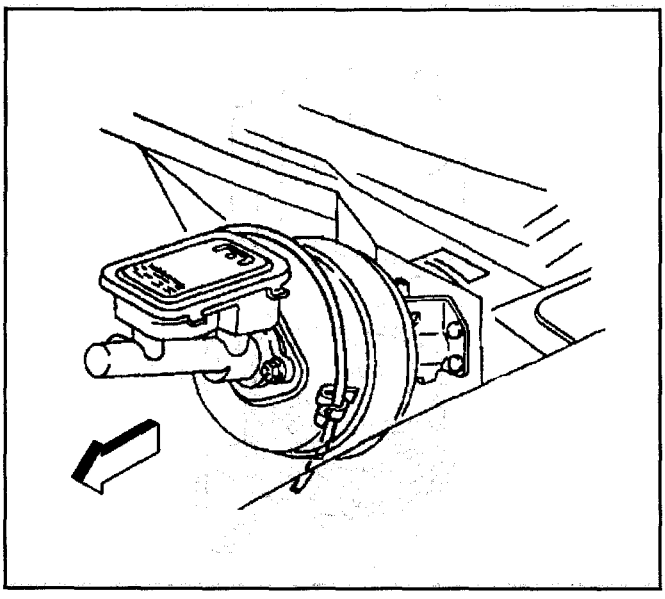
296567

2. Remove the cruise control cable from the servo cable adjuster.



296570

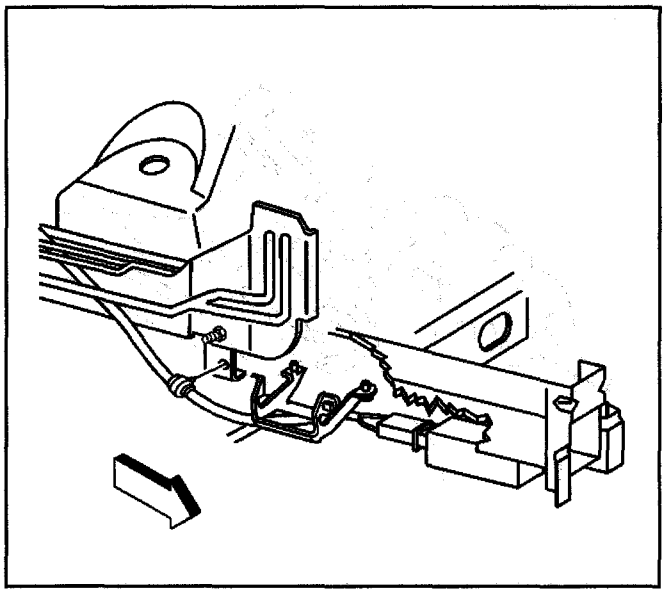
3. Remove the cruise control cable (1) from the accelerator control cable clip (3).
4. Remove the cruise control cable from the accelerator/cruise control cable servo bracket.



296579

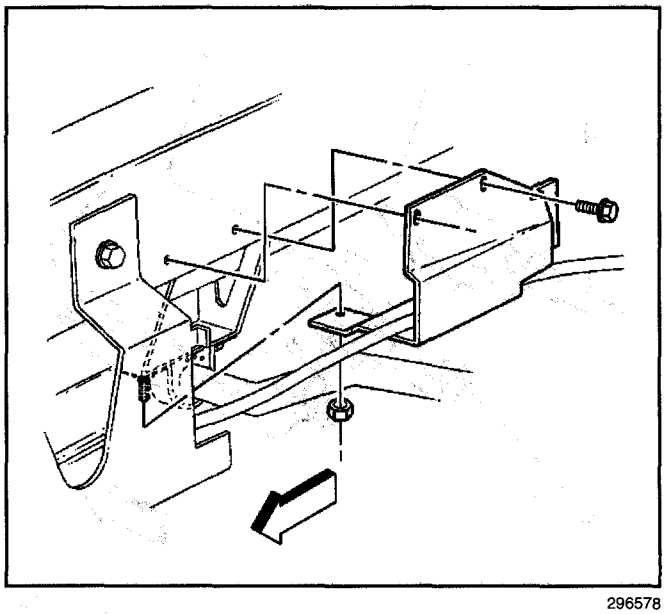
5. Remove the cruise control cable clip from the brake booster.
6. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.

7. Disconnect the cruise control cable rosebud connector from the brake pipe clip.



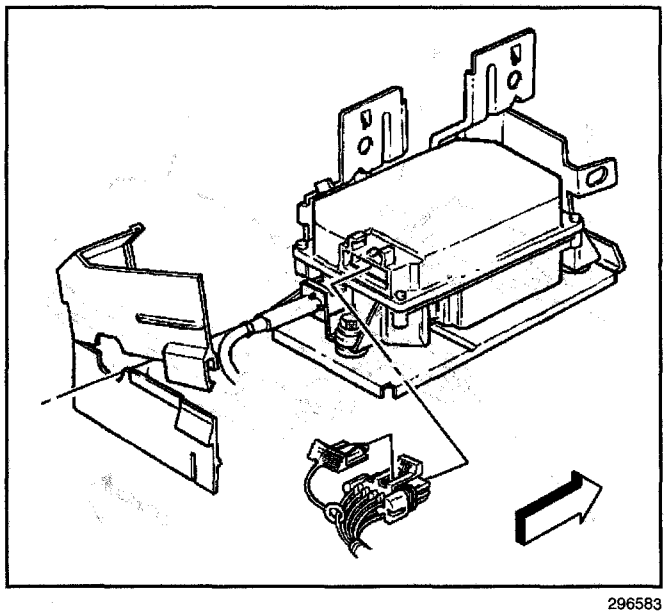
296584

8. Remove the cruise control module shield bolts and nut.
9. Remove the cruise control shield.

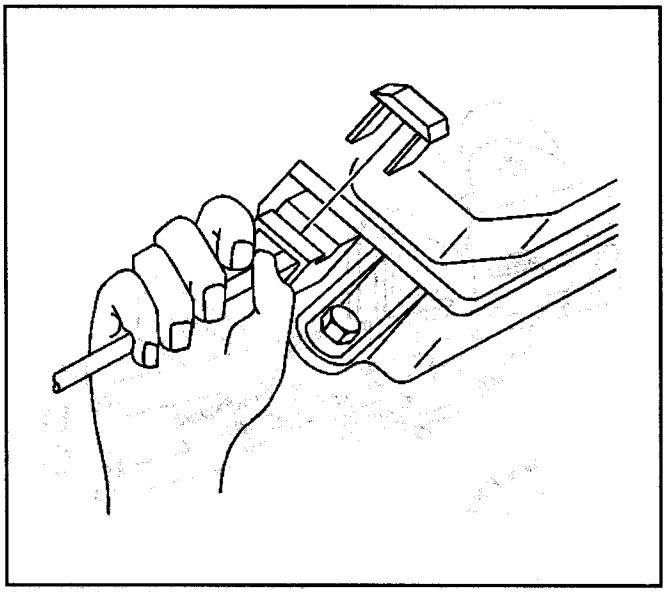


296578

10. Remove the cruise control servo cover.



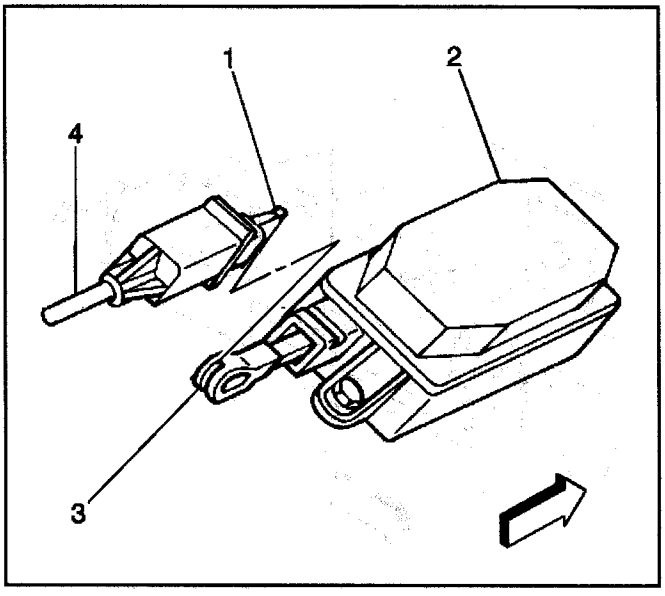
296583



296582

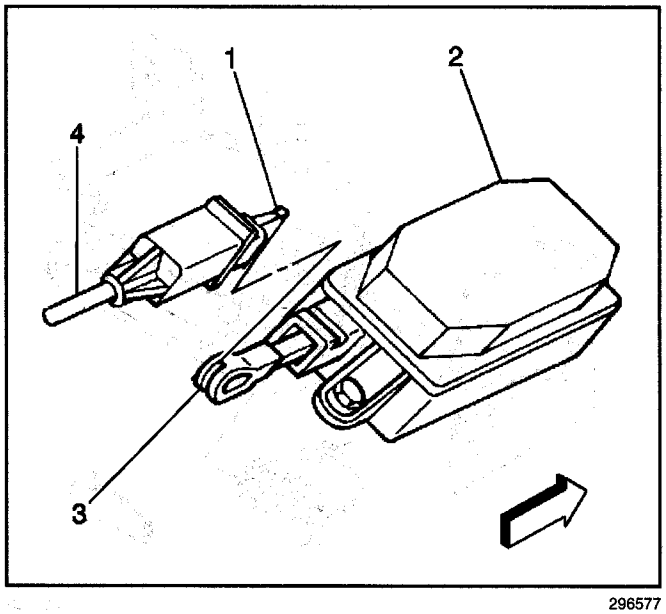
11. Remove the retainer from the cruise control module.

    Compress the conduit tangs.



296577

12. Pull the cruise control cable (4) out from the module (2).
13. Disconnect the cable bead (1) from the ribbon (3)
14. Remove the cruise control cable from the vehicle.



296577

Installation Procedure

Without Traction Control

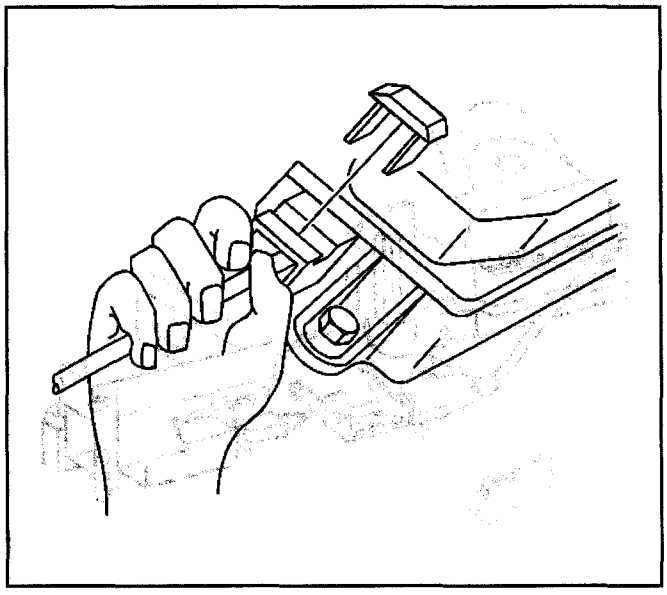
1. Install the cruise control cable to the vehicle.
2. Inspect the cable end to insure the O-ring is in place.
3. Connect the cable bead (1) to the ribbon (3)
4. Remove the shipping retainer.

Important: Cruise control module ribbon must not be twisted.

5. Pull the engine end of the cruise control cable until the cable is taut.
6. Install the conduit fitting over the ribbon and snap cable end into the module.

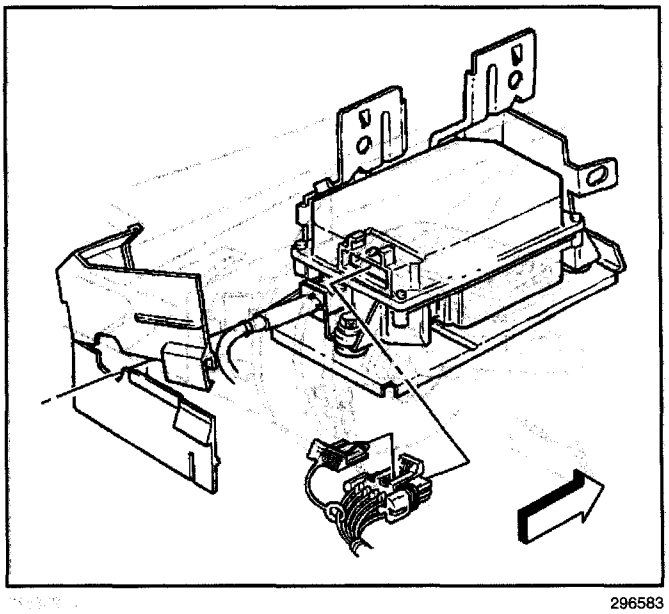
   Ensure that both tangs are engaged.

7. Install the retainer to the cruise control module.



296582

8. Install the cruise control servo cover.



296583

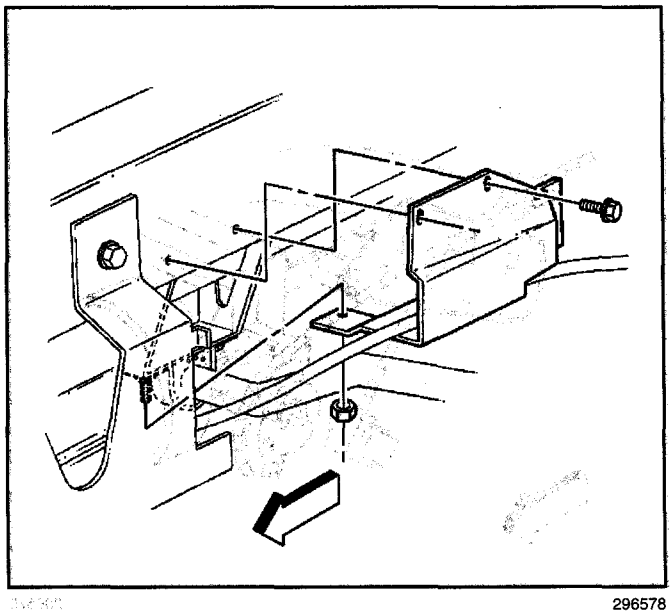
9. Install the cruise control module shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

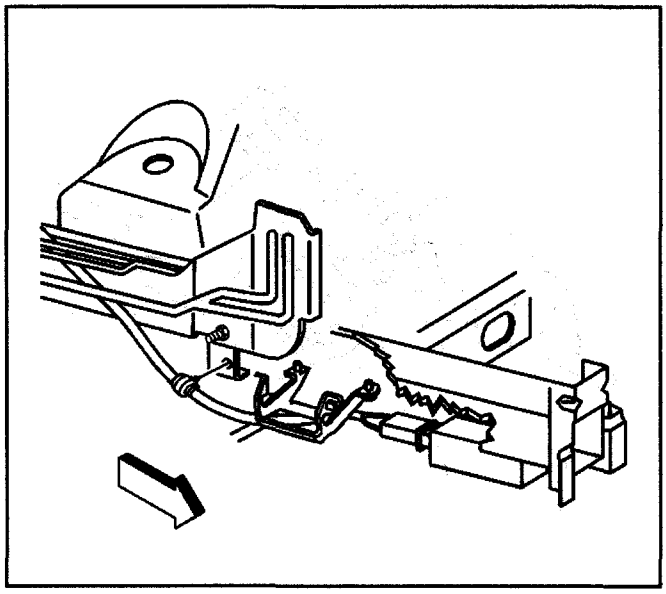
10. Install the cruise control module shield bolts and nut.

Tighten

- Tighten the cruise control module shield bolts to 6 N·m (53 lb in).
- Tighten the cruise control module shield nut to 27 N·m (20 lb ft).

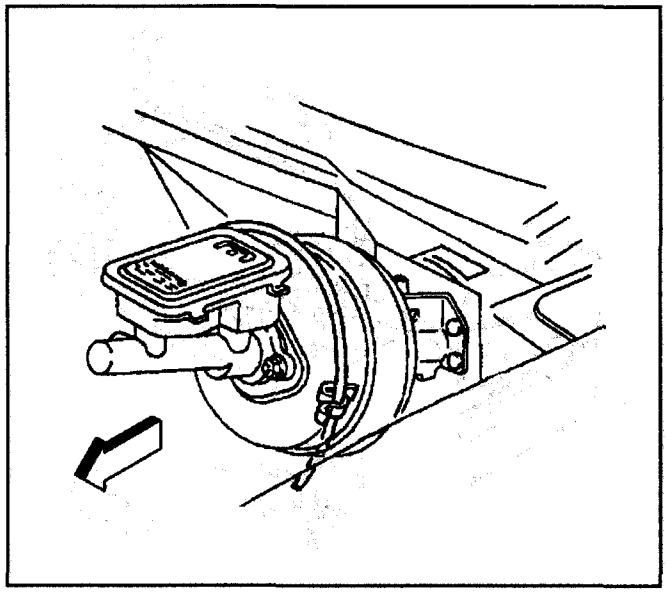


296578



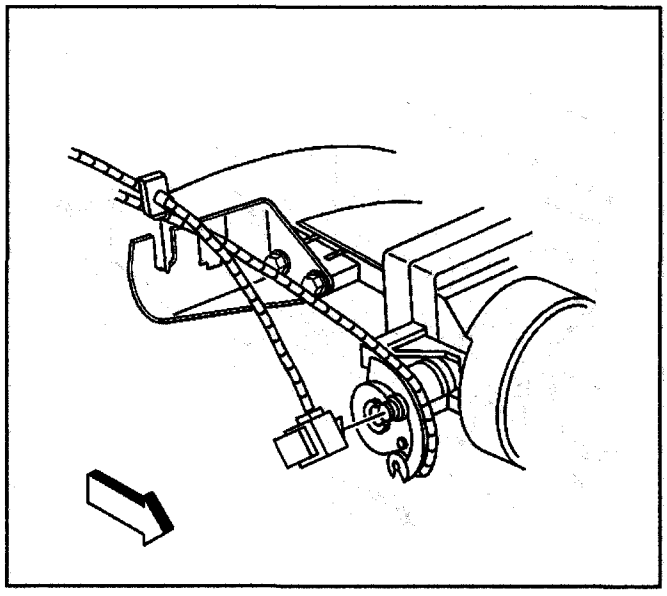
296584

11. Connect the cruise control cable rosebud connector to the brake pipe clip.
12. Lower the vehicle.



296579

13. Install the cruise control cable clip to the brake booster.
14. Install the cruise control cable to the accelerator/cruise control cable servo bracket.



296575

15. Install the cruise control cable to the throttle body linkage.
16. Adjust the cruise control cable as needed. Refer to *Cruise Control Cable Adjustment*.

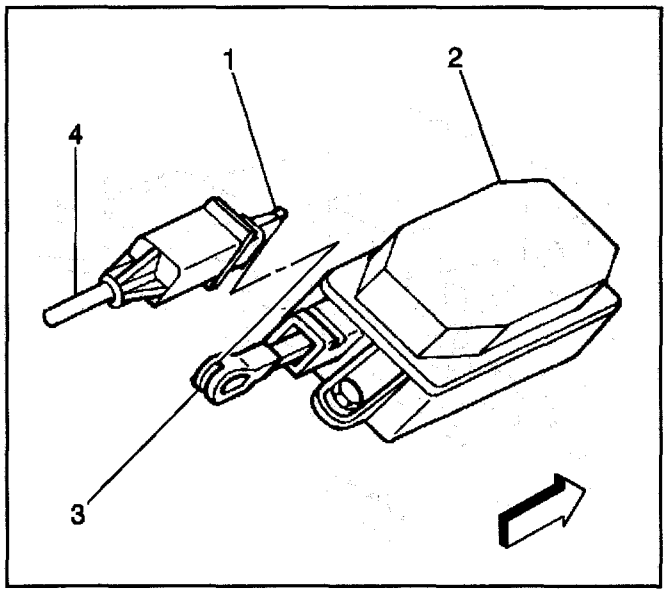
With Traction Control

1. Install the cruise control cable to the vehicle.
2. Inspect the cable end to insure the O-ring is in place.
3. Connect the cable bead (1) to the ribbon (3)
4. Remove the shipping retainer.

Important: Cruise control module ribbon must not be twisted.

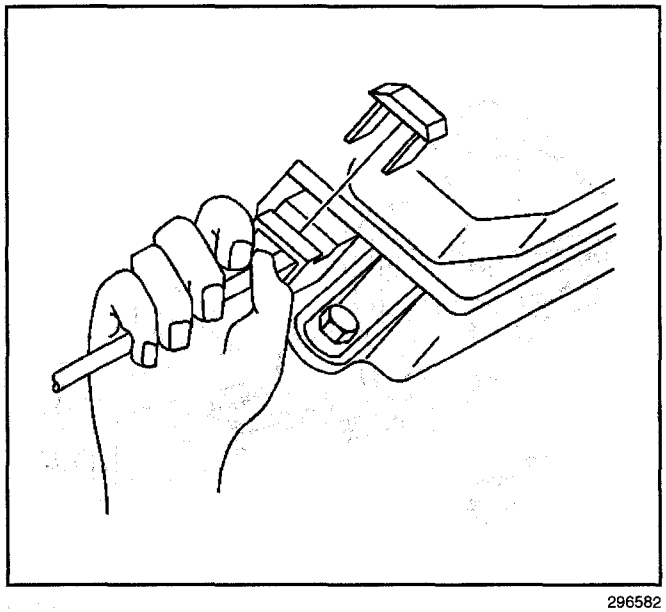
5. Pull the engine end of the cruise control cable until the cable is taut.
6. Install the conduit fitting over the ribbon and snap cable end into the module.

   Ensure that both tangs are engaged.



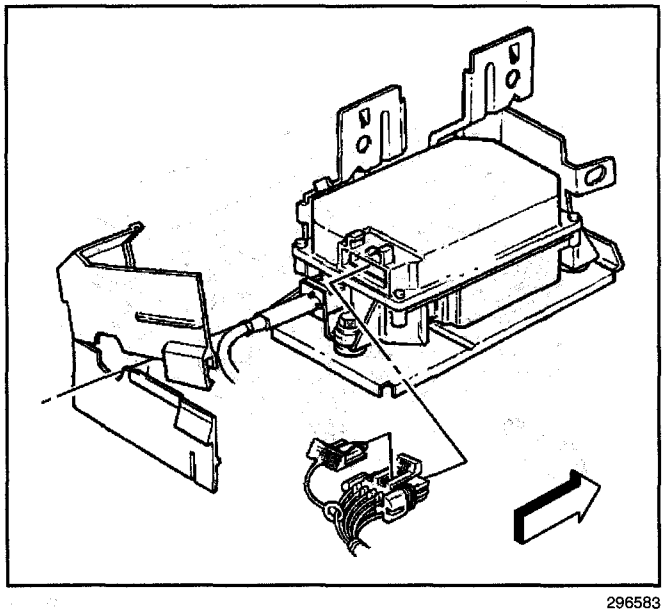
296577

7. Install the retainer to the cruise control module.

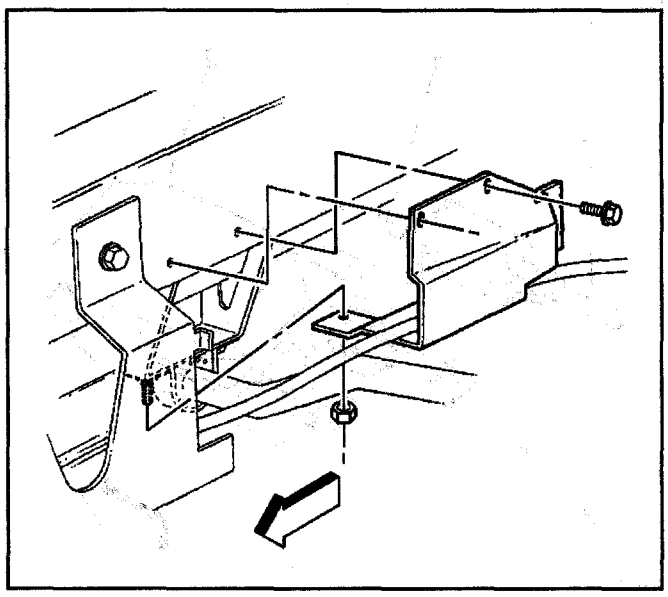


296582

8. Install the cruise control servo cover.



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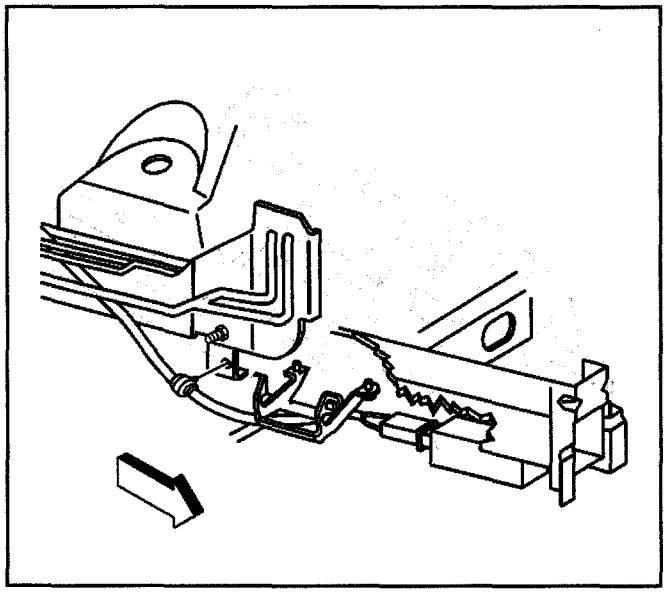
9. Install the cruise control module shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

10. Install the cruise control module shield bolts and nut.

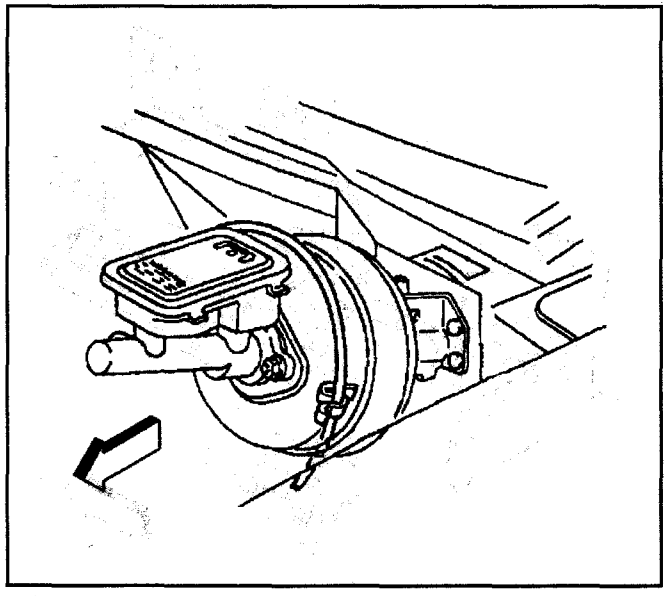
Tighten

- Tighten the cruise control module shield bolts to 6 N·m (53 lb in).
- Tighten the cruise control module shield nut to 27 N·m (20 lb ft).



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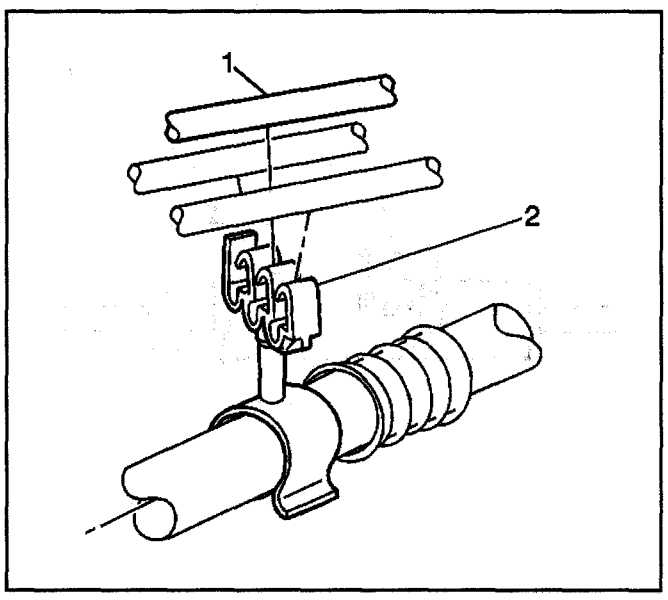
11. Connect the cruise control cable rosebud connector to the brake pipe clip.
12. Lower the vehicle.



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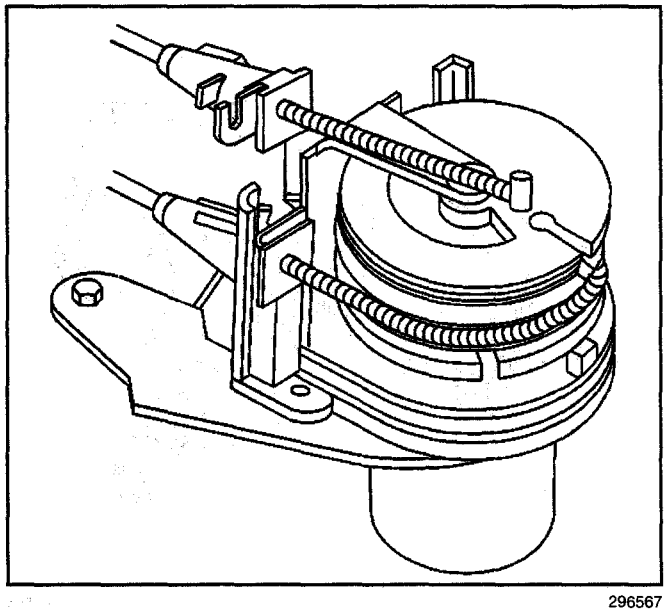
13. Install the cruise control cable clip to the brake booster.
14. Install the cruise control cable to the accelerator/cruise control cable servo bracket.

15. Install the cruise control cable (1) to the accelerator control cable clip (3).

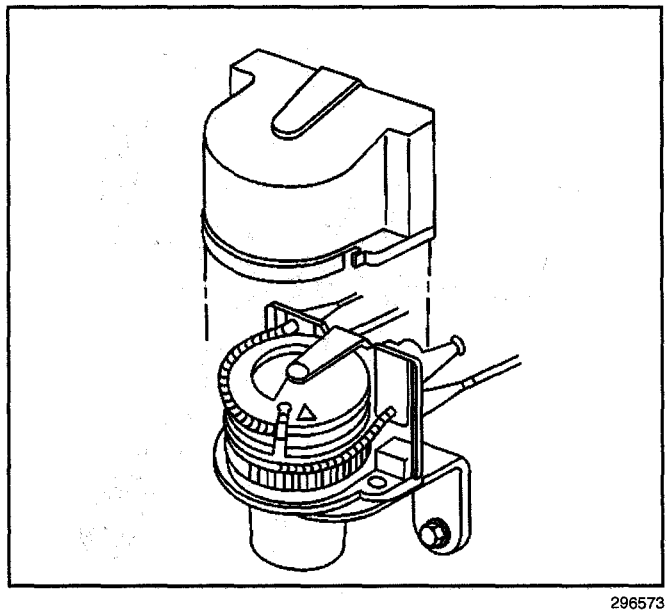


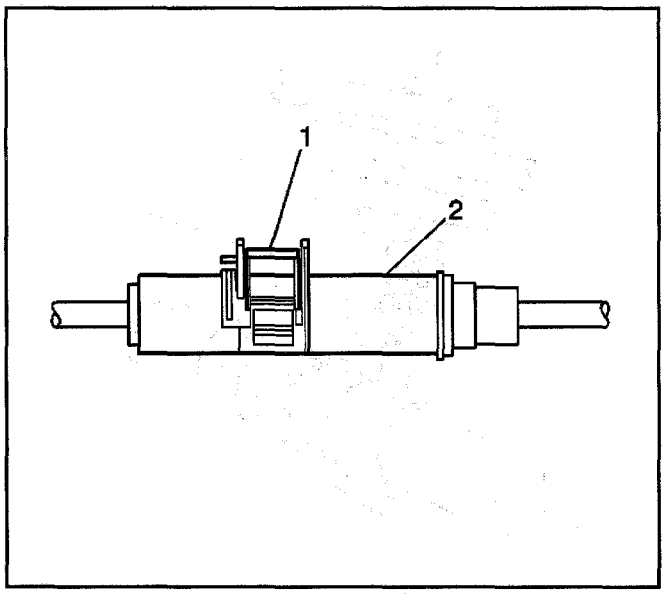
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16. Install the cruise control cable to the servo cable adjuster.


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17. Install the cruise control servo cable adjuster cover.
18. Adjust the cruise control cable as needed. Refer to *Cruise Control Cable Adjustment.*


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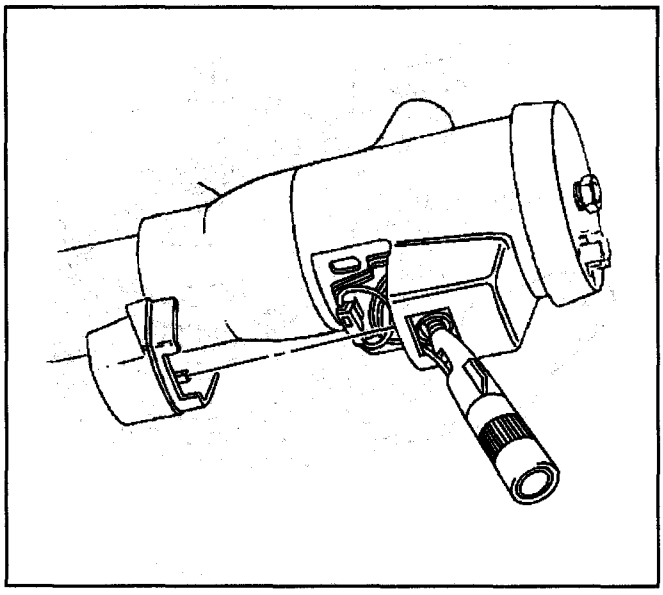
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Cruise Control Cable Adjustment

1. Lift the adjustment lock button (1) up.
2. Pull the cable adjustment slider (2) rearward until all slack is removed from cable, but without opening the throttle.
3. Push down the cable adjustment lock button (1) until it snaps and locks in place

Important: The cruise control cable must not have more than 2.0 mm (0.07 in) of slack. Excess slack in the cable may cause poor performance. For example, the cruise control system may hesitate when engaged.

Important: Cable should never be adjusted so tightly that tension from the cable will not allow the throttle to close properly. Pulling the cable too tight will prevent the engine from returning to idle and could cause an unstable idle quality.

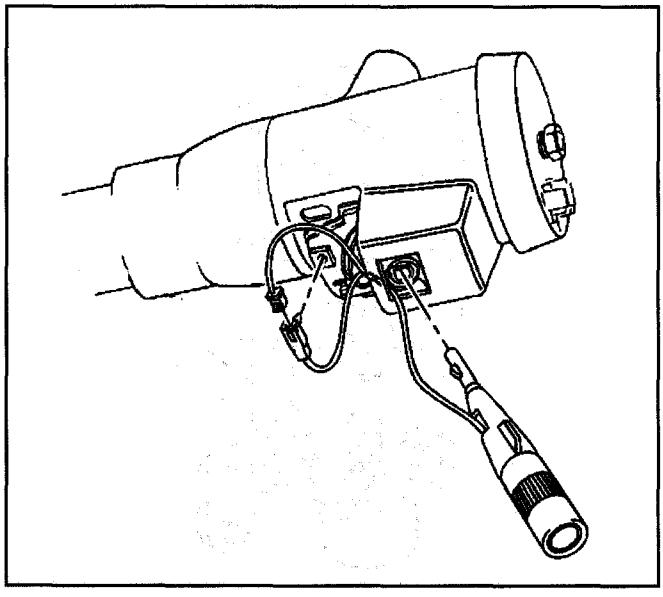


367666

Multifunction Lever Replacement

Removal Procedure

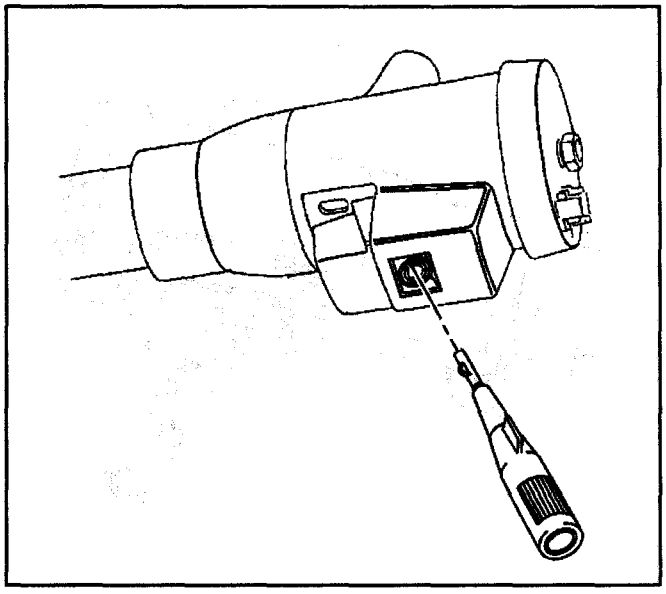
1. Remove the steering column access cover.



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2. Disconnect the multifunction lever electrical connector.

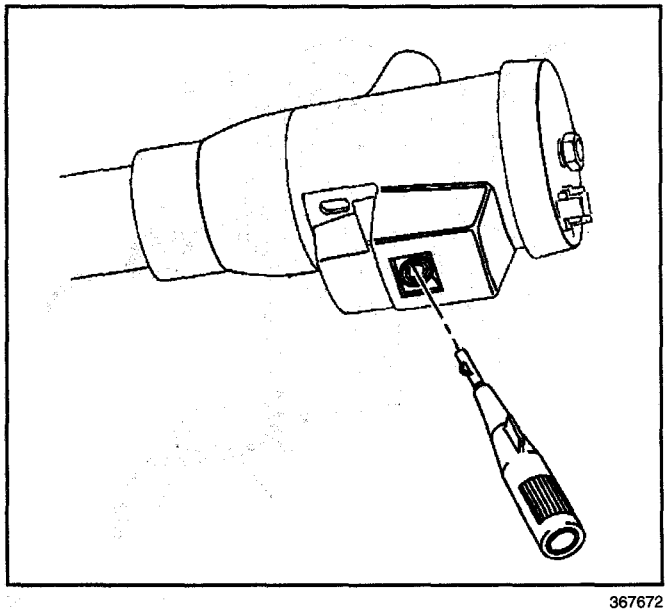
3. Remove the multifunction lever.



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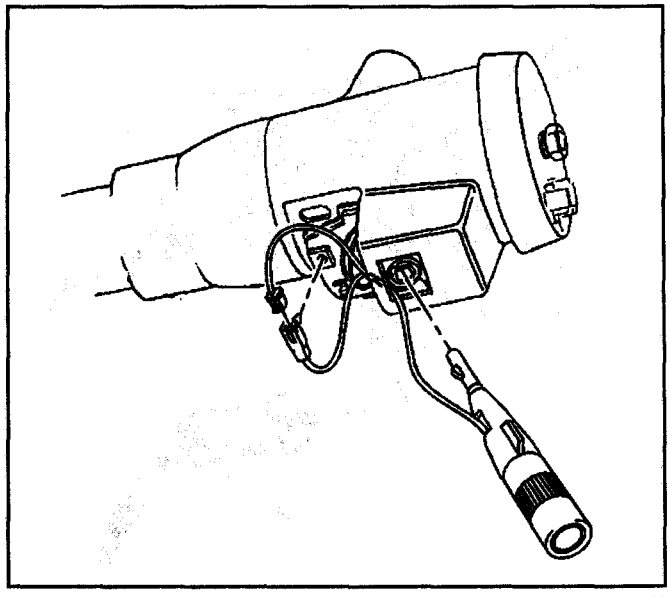
Installation Procedure

1. Install the multifunction lever.

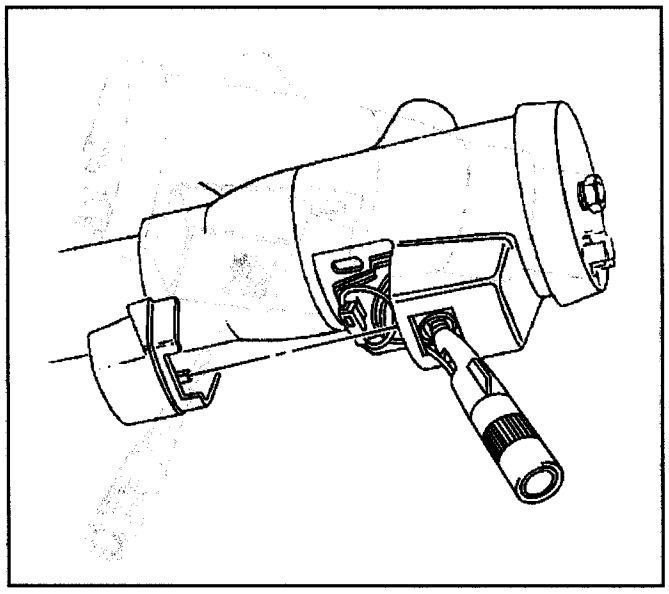


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2. Connect the multifunction lever electrical connector.

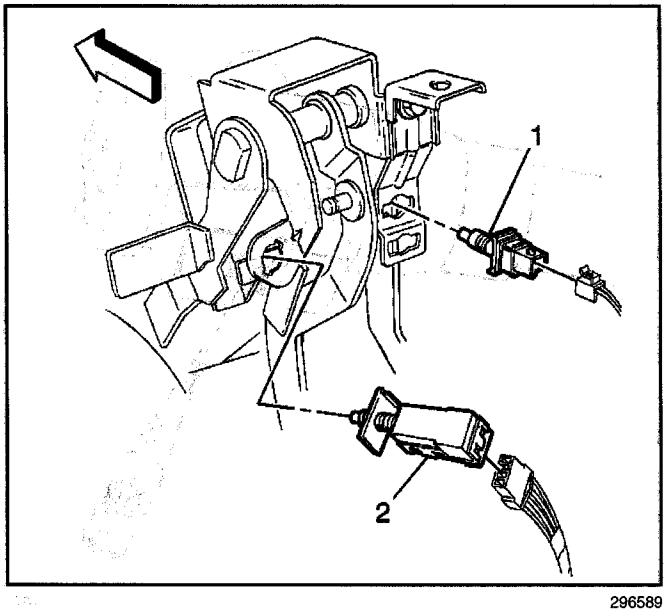


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3. Install the steering column access cover.

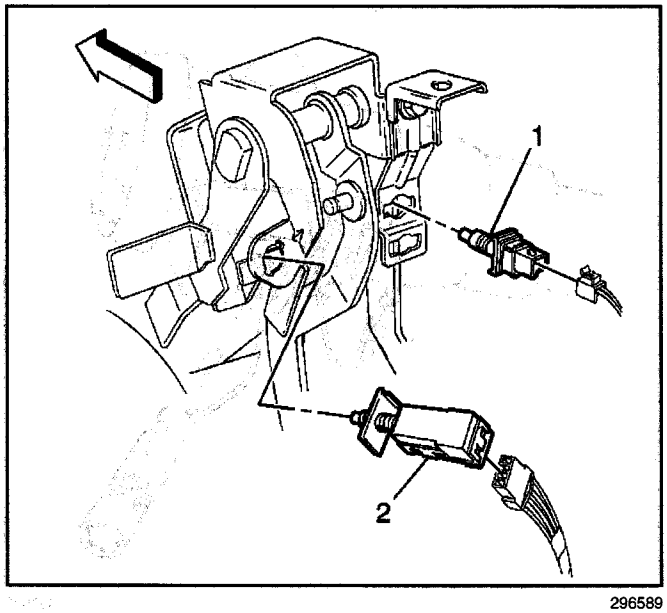


296589

Cruise Release Switch Replacement

Removal Procedure

1. Remove the left instrument panel sound insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.
2. Disconnect the cruise control release switch (1) electrical connector.
3. Remove the cruise control release switch (1).



296589

Installation Procedure

1. Install the cruise control release switch (1).
2. Connect the cruise control release switch (1) electrical connector.
3. Adjust the cruise control release switch as needed. Refer to *Cruise Release Switch Adjustment*.
4. Install the left instrument panel sound insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.

Cruise Release Switch Adjustment

Adjust the release switch (1) at the same time the stoplamp and torque converter clutch (TCC) is adjusted.

Use the following procedure in order to adjust the cruise control switch:

1. Depress the brake pedal or the clutch pedal.

   Insert the switch into the pedal bracket until the retainer is fully seated on the switch:

   1.1. The release switch (1)

   1.2. The stoplamp and TCC switch

   1.3. The clutch switch or the clutch anticipate switch

2. Slowly pull the brake or clutch pedal rearward with a force of 222 N·m (50 lb) until click sounds are not heard.

   The switch retainers will be in their original positions.

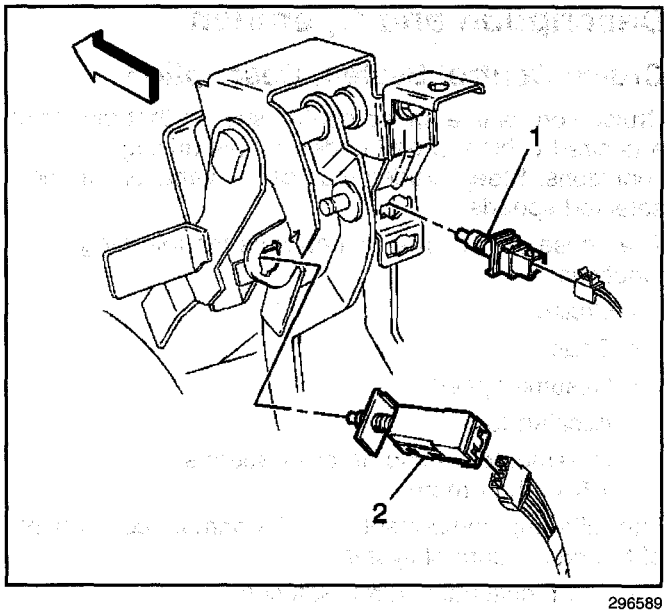
3. Ensure that the following contacts open at 25.4 mm (1 in) or less of pedal travel:

   3.1. The release switch (1)

   3.2. The stoplamp and TCC switch

4. Ensure that the switches open simultaneously or before the onset of braking.

   The brake pedal may travel up to 25.4 mm (1 in) before the cruise control system disengages.



296589

Description and Operation

Cruise Control System Description

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions. Steep grades may cause variations in the selected speeds.

The cruise control system performs the following functions:

- Cruise
- Coast
- Resume speed
- Accelerate
- Incrementally raise or lower speeds 1.6 km/h (1 mph)

The following components are the primary components of the cruise control system:

- The functional control switches
- The cruise control module
- The vehicle speed sensor
- The cruise control release switch
- The stoplamp and torque converter clutch (TCC) switch
- The cruise control switches
- The cruise control switch wiring harnesses

The cruise control system uses a cruise control module in order to obtain the desired vehicle cruise operation. The cruise control module is mounted on the left engine compartment inner side rail. The module contains the electronic controller and the electric stepper motor. The cruise control module contains a low speed limit that will prevent system engagement below a minimum speed of 40 km/h (25 mph). The module is not serviceable. The module uses the following 2 important components for cruise operation:

1. An electronic controller
   - The controller monitors the vehicle speed.
   - The controller operates the electric stepper motor.
2. An electric stepper motor
   - The electric stepper motor moves a ribbon and the throttle linkage in order to maintain the desired cruise speed.
   - Movement to the ribbon and the throttle linkage is in response the electronic controller.

The cruise control operations are located on the multifunction turn signal lever.

The following cruise control switches disengage the cruise control system:

- The release (brake) switch
- The stoplamp and TCC switch
- The clutch switch or the clutch anticipate switch

These switches are mounted on the following components:

- The brake pedal bracket
- The clutch pedal bracket

When the brake pedal or clutch pedal is depressed, the following actions occur:

- The cruise control system is electrically disengaged.
- The throttle returns to the idle position.

If the vehicle is equipped with traction control (acceleration slip regulation), the cruise control will disengage in a low traction situation.

Cruise Control System Operation

Cruise Control Switches

The following cruise control switches disengage the cruise control system:

- The release switch
- The stoplamp and TCC switch
- The clutch switch or the clutch anticipate switch

These switches are mounted on the following components:

- The brake
- The accelerator
- The clutch pedal bracket

When the brake pedal or clutch pedal is depressed, the cruise control system is electrically disengaged.

Electrical disengagement is accomplished by activating the brake cut-out input to the cruise control module. The set speed will be retained in memory when the brakes are activated.

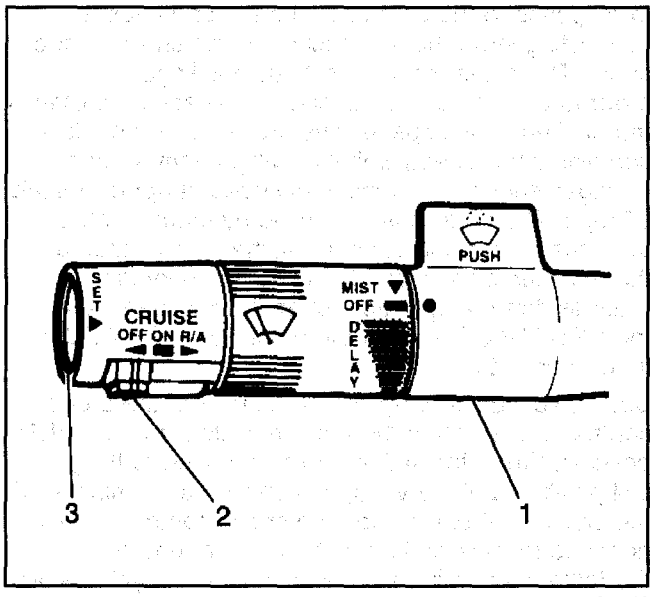
For an automatic transmission only, the stoplamp and TCC switch contains the following items:

- A 3-wire stop lamp connector
- A 2-wire TCC switch connector

The cruise control release switch has a 2-wire cruise control disable connector.

The clutch switch has a 2-wire cruise control disable connector.

The clutch anticipate switch has a 4-wire cruise control disable connector.



296590

Important: The vehicle is equipped with a Set To Get Cruise feature. This requires the operator to use the SET/COAST button before the RESUME/ACCEL slider switch will activate.

The OFF-ON-R/A switch (2) has the following 3 positions:

1. The OFF position
2. The ON position
3. The Resume Acceleration (R/A) position

When the R/A switch is held in for more than 1 second, the system starts the acceleration mode and accelerates the vehicle.

1. Hold in the switch until the desired speed is reached.
2. Release the switch. The vehicle will maintain the selected speed.

For operation of the acceleration mode, ensure that the following 2 requirements are met:

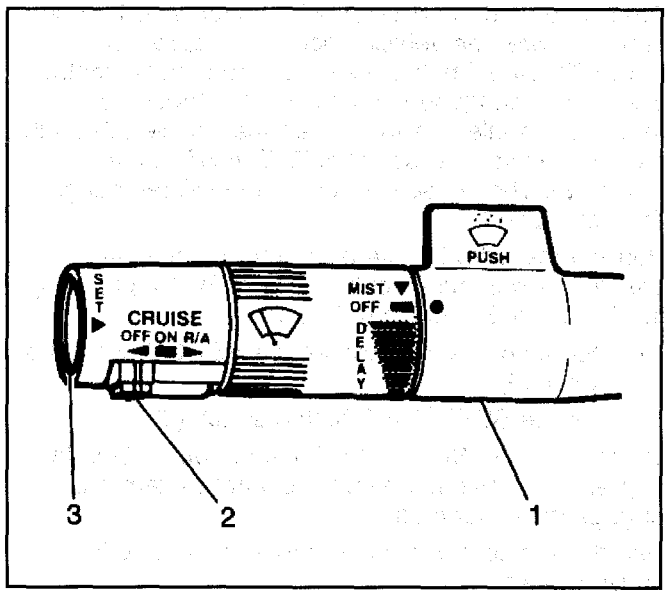
1. Turn the OFF-ON-R/A switch ON.
2. The vehicle is above the minimum speed limit of 40 km/h (25 mph) with a set speed already in memory.

The OFF-ON-R/A switch is used in order to incrementally raise the vehicle speed.

Follow these procedures in order to utilize this function:

1. Engage the cruise control system.
2. Quickly press the OFF-ON-R/A switch (2) towards the R/A position.
3. Quickly release the OFF-ON-R/A switch (2).
4. Tap the OFF-ON-R/A switch (2) in order to increase the speed by 1.6 km/h (1 mph).
5. Do not hold the OFF-ON-R/A switch (2) in the R/A position, the system will engage the accelerator mode.

Set/Coast Button Switch



296590

The cruise control SET/COAST button switch (3) is located in the end of the turn signal multifunction lever. The cruise control SET/COAST button switch (3) has the following 2 positions:

- NORMAL
- DEPRESSED

Perform the following steps in order to set the cruise speed:

1. Press the SET/COAST button switch (3) when you have reached the desired speed.
2. Release the SET/COAST button switch (3).

Set Position

Ensure that the following conditions are met:

- The OFF-ON-R/A switch (2) is ON.
- The vehicle exceeds the minimum speed limit of 40 km/h (25 mph).

The system will cruise within 1.6 km/h (1 mph) of the actual selected speed.

The system will cruise until one of the following actions occur:

- The OFF-ON-R/A switch (2) is turned to the OFF position.
- The ignition switch is turned OFF.
- The SET/COAST button switch (3) is fully pushed in and held in.

Pressing the brake pedal will cause the SET/COAST button switch (3) to release. This does not release the resume capability.

Coast Position

Press and hold the SET/COAST button switch (3) in order to lower the vehicle speed. By depressing the SET/COAST button switch (3), the cruise control system is disengaged and allows the throttle to return to the idle position. When the vehicle attains the desired speed, release the SET/COAST button switch (3). The cruise control system will re-engage at this new speed.

Perform the following steps in order to lower the cruise speed in increments of 1.6 km/h (1 mph) using the SET/COAST button switch (3):

1. Quickly press and release the SET/COAST button switch (3).
2. Tap the SET/COAST button switch (3).

Do not hold the SET/COAST button switch (3) in the depressed position, the cruise control system will engage the coast mode.

Use the accelerator pedal in order to override the cruise system.

Release the accelerator pedal in order to return to the previous cruise speed.

Cruise Control System Circuit Description (V8 VIN G)

The electro-motor cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions. The system has the capability to perform the following actions:

- CRUISE
- COAST
- RESUME SPEED
- ACCELERATE
- TAP-UP
- TAP-DOWN
- CANCEL

The driver may cancel the cruise control by simultaneously depressing the following buttons:

- SET
- R/A

The cruise control module contains the following components:

- An electronic controller
- An electric motor

The controller performs the following operations:

- Monitors vehicle speed
- Operates the electric motor

In response to the controller, the motor moves a connecting strap that is attached to the cruise control cable. The cable moves the throttle linkage in order to vary the throttle position. This action maintains the desired cruise speed. The cruise control module contains a low speed limit that will prevent system engagement below a minimum speed of approximately 25 mph. The module is controlled by mode control switches. The mode control switches are located on the multi-function lever. Cruise control operation requires that the operator set an initial speed using the SET/COAST button before the RESUME/ACCEL function is active.

Battery voltage is applied to terminal F of the cruise control module when the ignition switch is in the RUN position. When the slider switch is moved to the ON position, battery voltage is applied to terminal A of the cruise control module. The cruise control module needs to receive brake input voltage at one of the following terminals once each ignition cycle before allowing cruise to operate:

- Terminal D
- Terminal G

The brake input voltage is received at the cruise control module through the following components:

1. The A/C CRUISE Fuse 12
2. The cruise control release brake switch
3. The cruise control clutch switch on vehicles equipped with a manual transmission

The voltage to the cruise control module terminal D is interrupted if either of the above switches is open. Terminal G must see a ground path through the CHMSL bulb in order for the cruise to operate properly. If the brake pedal is depressed, battery voltage is present at the module terminal G. When the slider switch is moved to the RESUME/ACCEL position, battery voltage is applied to terminal C of the module. With the set switch depressed, battery voltage is present at cruise module terminal B. Cruise module connector terminal K is the speed signal terminal. During operation the voltage will oscillate between the following levels:

- A high of 4 to 5 volts
- A low of near ground

The cruise module ground is at module terminal E.

Cruise Control System Circuit Description (V6 VIN K)

For V8 VIN G vehicles refer to *Cruise Control System Circuit Description (V8 VIN G).*

The electro-motor cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions. The system has the capability to perform the following actions:

- CRUISE
- COAST
- RESUME SPEED
- ACCELERATE
- TAP-UP
- TAP-DOWN
- CANCEL

The driver may cancel the cruise control by simultaneously depressing the following buttons:

- SET
- R/A

The cruise control module contains the following components:

- An electronic controller
- An electric motor

The controller performs the following operations:

- Monitors vehicle speed
- Operates the electric motor

In response to the controller, the motor moves a connecting strap that is attached to the cruise control cable. The cable moves the throttle linkage in order to vary the throttle position. This action maintains the desired cruise speed. The cruise control module contains a low speed limit that will prevent system engagement below a minimum speed of approximately 25 mph. The module is controlled by mode control switches. The mode control switches are located on the multi-function lever. Cruise control is in Standby Disabled until all the conditions inconsistent with cruise control operation are cleared.

Battery voltage is applied to terminal F of the cruise control module when the ignition switch is in the RUN position. When the slider switch is moved to the ON position, battery voltage is applied to terminal A of the cruise control module. The cruise control module needs to receive brake input voltage at one of the following terminals once each ignition cycle before allowing cruise to operate:

- Terminal D
- Terminal G

Terminal G must see a ground path through the CHMSL bulb in order for the cruise to operate properly. If the brake pedal is depressed, battery voltage is present at the module terminal G. When the slider switch is moved to the RESUME/ACCEL position, battery voltage is applied to terminal C of the module. With the set switch depressed, battery voltage is present at cruise module terminal B. Cruise module connector terminal K is the speed signal terminal. During operation the voltage will oscillate between the following levels:

- A high of 4 to 5 volts
- A low of near ground

The cruise module ground is at module terminal E. Terminal J is used to signal the powertrain control module (PCM) when cruise control is engaged. The PCM determines the correct shift pattern for the transmission. Terminal H is used by the PCM in order to inhibit cruise control when the conditions are not consistent with cruise operation are present. The following lists the cruise control inhibit criteria:

- The vehicle speed sensor (VSS) is less than 25 mph.
- The PARK, REVERSE, NEUTRAL or 1st GEAR is indicated by the transaxle range switch.
- An over/under battery voltage condition exists.
- The engine RPM is low.
- The engine RPM is high (fuel cutoff).

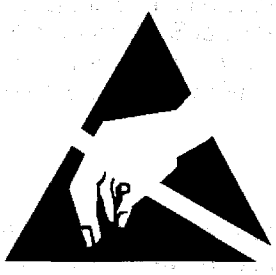
Retained Accessory Power

Schematic and Routing Diagrams

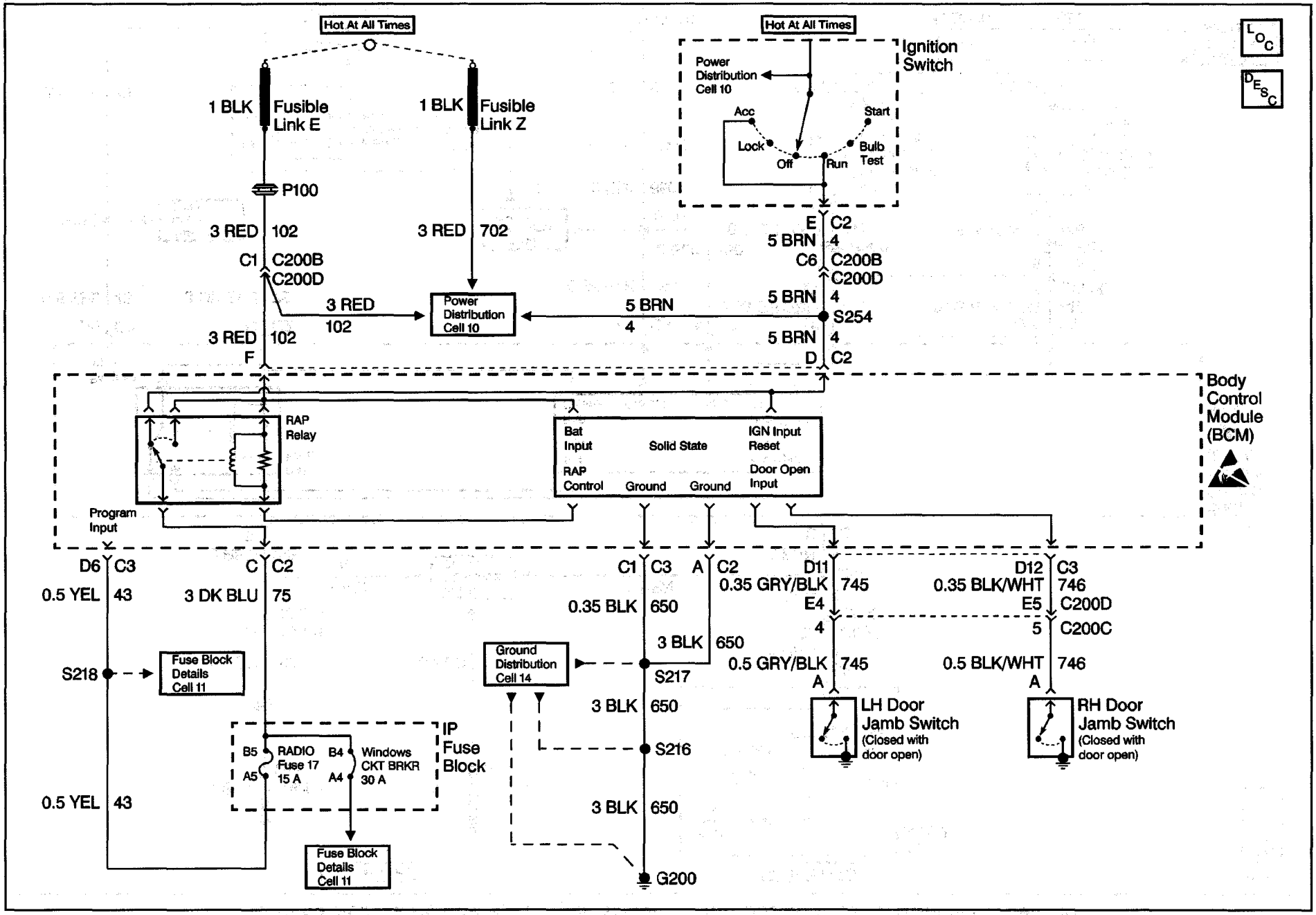
RAP Schematic References

Reference on Schematic	Section Number Subsection Name
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems

RAP Schematic Icons

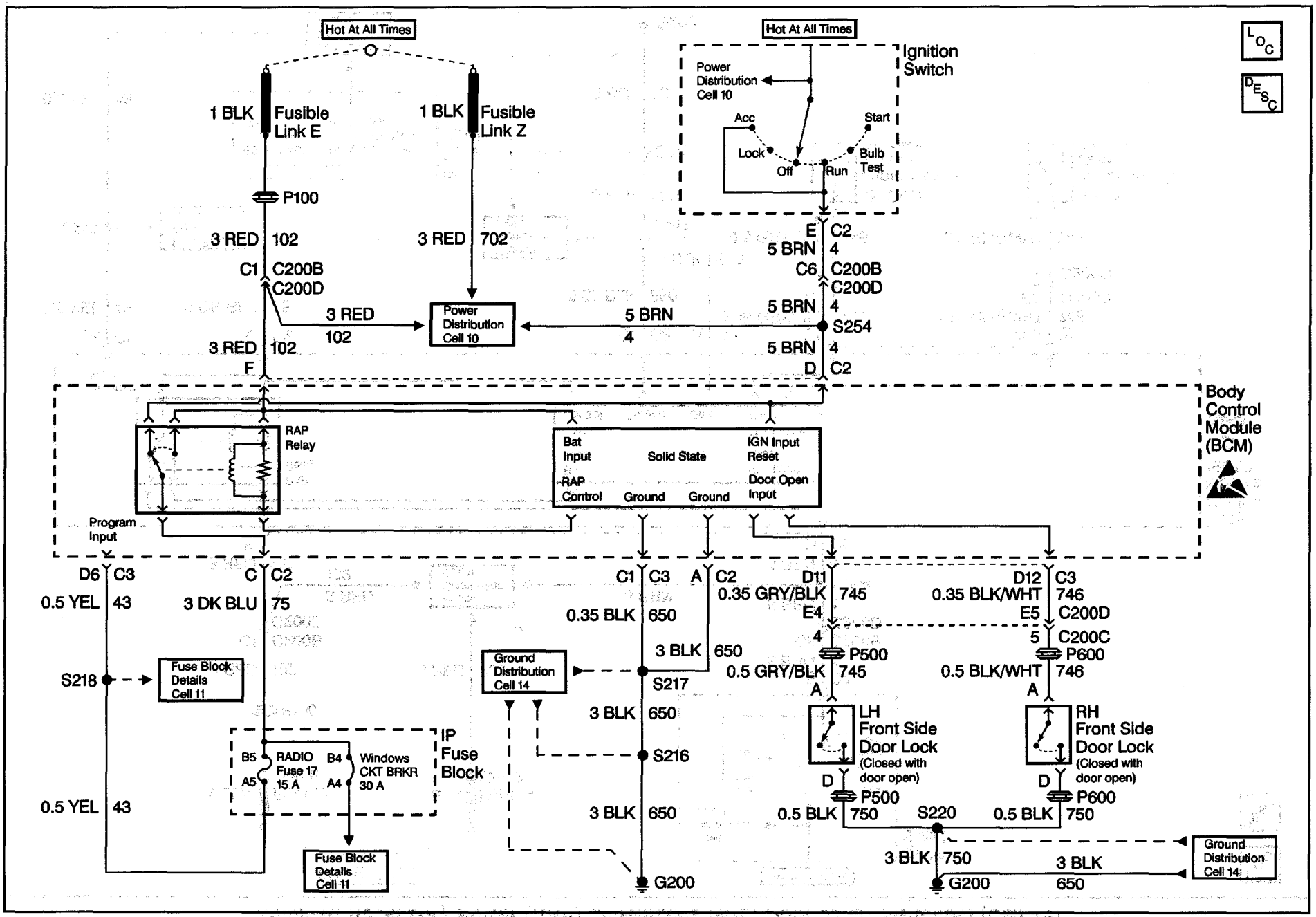
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Cautions and Notices.

Retained Accessory Power (RAP) Schematics (With Door Jamb Switches) (Cell 15)



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Retained Accessory Power (RAP) Schematics (Without Door Jamb Switches) (Cell 15)



Component Locator

RAP Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Door Jamb Switch	Near base of left and right A-pillar	*Harness Routing Views* in Wiring Systems	—
Front Side Door Lock	Inside the rear of the door	*Power Door Systems Component Views* in Doors	—
Fusible Links	Forward of the left front wheelhouse, behind the underhood electrical center 2	—	—
Ignition Switch	Part of the steering column	*Harness Routing Views* in Wiring Systems	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
C200B (18 cavities)	Forward lamp to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P100	Left side in the dash panel, engine to the passenger compartment	—	—
P500	Between the driver door and A-pillar	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S218	In the instrument panel harness, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S254	In the instrument panel harness, approximately 7 cm (3 in) from C200 breakout	—	—

Diagnostic Information and Procedures

RAP System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
Important: Disconnect the aftermarket equipment and test the system again if both of the following conditions exist: • Aftermarket equipment is installed on any circuit(s) that is designated for the retained accessory power (RAP) system. • A problem exists with the RAP system operation. The following conditions must exist before you begin the following diagnostic steps: • The related fuses are good. • The windows circuit breaker is good.			
1	1. Turn the ignition switch to the ACCY position or the RUN position. 2. Turn the ignition to the OFF position. 3. Open either the driver door or the passenger door.	The following equipment does not operate: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	*RAP On After Timeout*
2	1. Close the doors. 2. Turn the ignition switch to the ACCY position or the RUN position. 3. Turn the ignition switch to the OFF position. 4. Attempt to operate the following equipment: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	The following equipment operates for approximately 10 minutes: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	• *RAP On After Timeout* • *RAP Inoperative*
3	1. Turn the ignition switch to the RUN position. 2. Turn the ignition switch to the OFF position. 3. Open either the driver door or the passenger door. 4. Attempt to operate the following equipment: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	The following equipment is disabled immediately when a door is opened: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	• *RAP On After Timeout* • *RAP Inoperative*
4	1. Close the doors. 2. Attempt to operate the following equipment: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	The following equipment remains disabled when the doors are closed: • The power folding top • The radio • The power windows • The rear fog lamps (Export)	*RAP On After Timeout*

RAP On After Timeout

Step	Action	Value(s)	Yes	No
1	Check for body control module (BCM) for diagnostic troble code (DTC) 23/33. Refer to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems. Is BCM DTC23/33 present?	—	Refer to *DTC 23/33 RAP Feed Shorted to Ground or Battery*	*Go to Step 2*
2	Replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

RAP Inoperative

Step	Action	Value(s)	Yes	No
Verify the following conditions exist before beginning this diagnostic procedure: • The related fuses are good • The related circuit breaker is good • The problem is not caused by installed aftermarket equipment				
1	1. Turn the ignition switch to the RUN position. 2. Turn the radio on. Does the radio operate?	—	*Go to Step 2*	*Go to Step 9*
2	With a test light to the ground, backprobe the Body Control Module (BCM) connector C2 terminal F. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 6*
3	1. Disconnect BCM connector C2 and connector C3. 2. Connect a test lamp between the BCM connector C2 terminal F and the BCM connector C3 terminal C1. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 7*
4	Connect a test lamp between the BCM connector C2 terminal F and terminal A. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 8*
5	1. Test for poor connections BCM connector C2 and connector C3. 2. If OK, replace the BCM, refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
6	Repair the open in CKT 102, between the BCM connector C2 terminal F and C200. Is the repair complete?	—	System OK	—
7	Repair the open in circuit 650 between the BCM connector C3 terminal C1 and S217. Is the repair complete?	—	System OK	—
8	Repair the open in circuit 650 between the BCM connector C2 terminal A and S217. Is the repair complete?	—	System OK	—
9	1. Leave the ignition switch in the RUN position. 2. Using a test lamp connected to ground, backprobe the BCM connector C2 terminal D. Does the test lamp light?	—	*Go to Step 10*	*Go to Step 13*
10	Using a test lamp connected to ground, backprobe the BCM connector C2 terminal C. Does the test lamp light?	—	*Go to Step 11*	*Go to Step 12*

RAP Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
11	Repair the open in circuit 75 between the BCM and the IP fuse block. Is the repair complete?	—	System OK	—
12	1. Test for a poor connection at the BCM connector C2 terminal C and terminal D. 2. If the connections are OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Controls Systems. Is the repair complete?	—	System OK	—
13	Repair the open in circuit 4 between the BCM connector C2 terminal D and S254. Is the repair complete?	—	System OK	—

Description and Operation

Retained Accessory Power Circuit Description

The retained accessory power (RAP) system is a subsystem of the body control module (BCM). The RAP system provides the following features:

- Convenience
- Increased security

The RAP system applies battery voltage to the following components:

- The radio fuse 17
- The windows circuit breaker

The RAP system allows operation of the following components:

- The power folding top
- The radio
- The power windows
- The rear fog lamps (Export)

The RAP system allows operation of the above components for approximately 10 minutes after the ignition switch is turned to the OFF position. Operation is interrupted before the end of 10 minutes if a door is opened.

The RAP system also allows the operation of the door locks and the rear compartment lid release with the ignition switch in the OFF position. This is true in the following situations:

- The rear compartment lid release is operated from the remote control door lock transmitter.
- Either door is open.
- Less than 35 seconds have passed since both doors closed. After 35 seconds the doors will lock once but not unlock.

If the universal theft deterrent system (UTD) is armed within 35 seconds of the doors closing, the unlock command is disabled. All of the components in these circuits are enabled as long as the ignition switch is in one of the following positions:

- ACCY
- RUN

All of the components in these circuits are enabled for approximately 10 minutes when the following conditions exist:

- The ignition switch is in the OFF position.
- Both of the doors are closed.

If either of the doors opens, the 10 minute timer is canceled. The door locks will remain enabled for as long as the door is opened. The door locks will not operate with the door open if both of the following conditions exist:

- The key is in the ignition.
- The lockout prevention feature is enabled.

Refer to Door Locks.

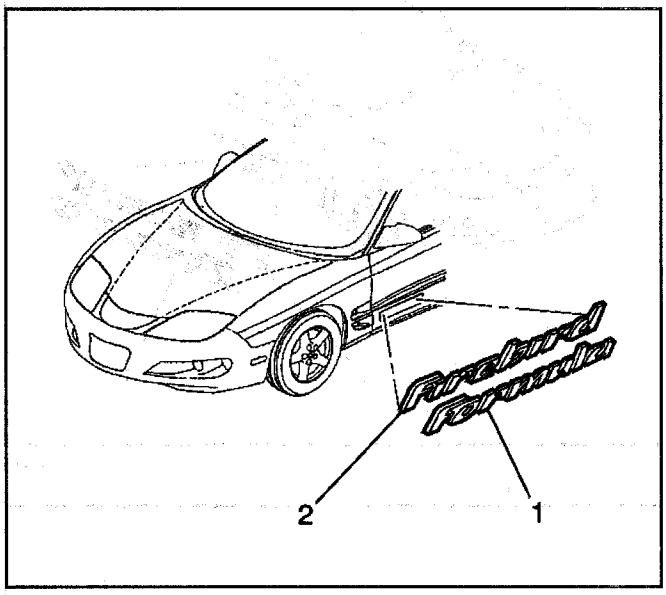
Exterior Trim

Repair Instructions

Molding/Nameplate Replacement - Exterior Trim (Firebird/Formula Door Emblem)

Removal Procedure

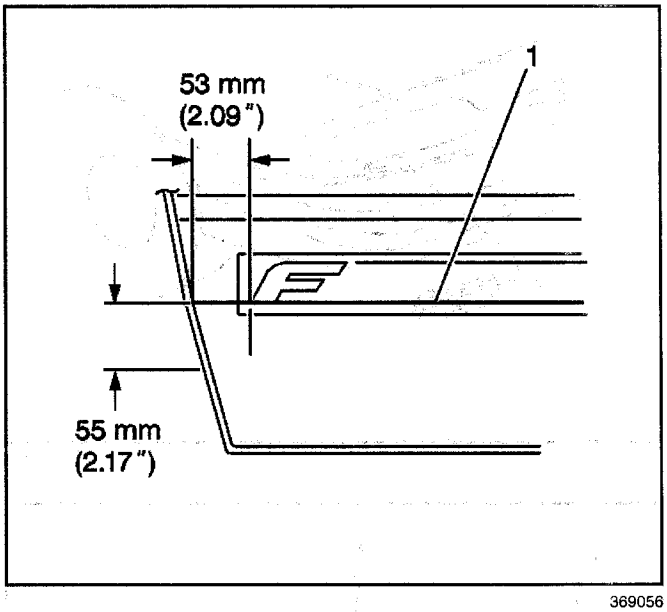
1. Mark the position of the emblem (1 or 2) with a length of masking tape.
2. Remove the old emblem (1 or 2) from the door.
3. Wash the door with soapy water and wipe dry.
4. Remove all traces of adhesive from the door using a oil-free naptha or alcohol.



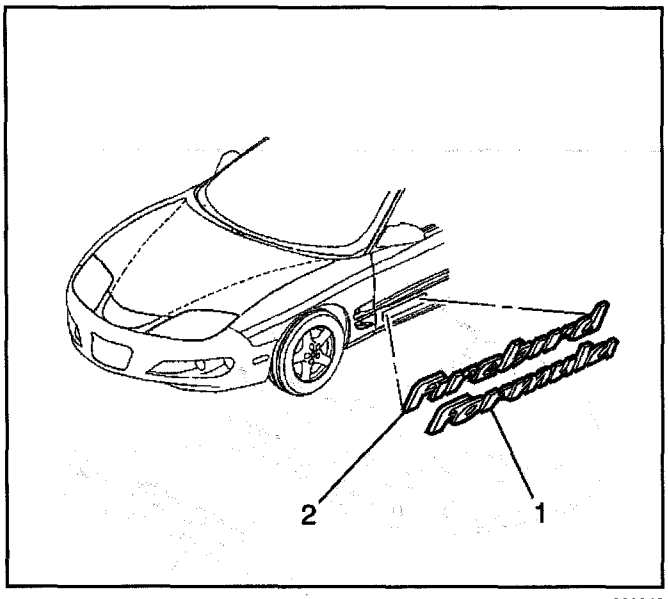
369048

Installation Procedure

1. Remove the backing paper from the emblem.
2. Measure 53.0 mm (2.09 in) from the front edge of the door to the front edge of the emblem (1).

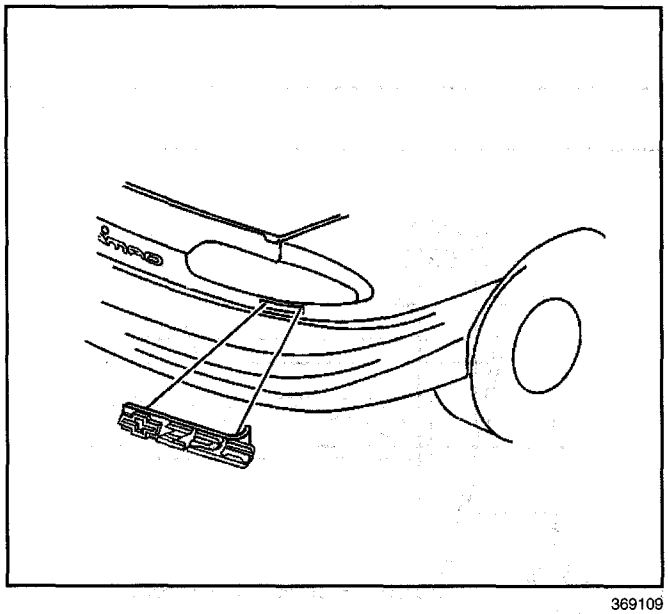


369056



369048

3. Align the emblem to the tape guideline and press firmly in place.

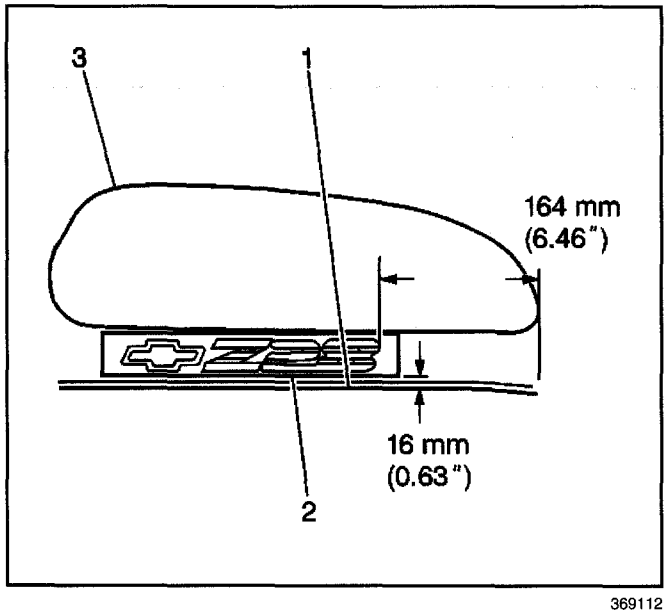


369109

Molding/Nameplate Replacement - Exterior Trim (Z28 Rear End Finish Panel)

Removal Procedure

1. Mark the position of the emblem with a length of masking tape.
2. Remove the old emblem from the rear end finish panel.
3. Wash the rear fascia with soapy water and wipe dry.
4. Remove all traces of adhesive from the fascia using oil-free napthe or alcohol.

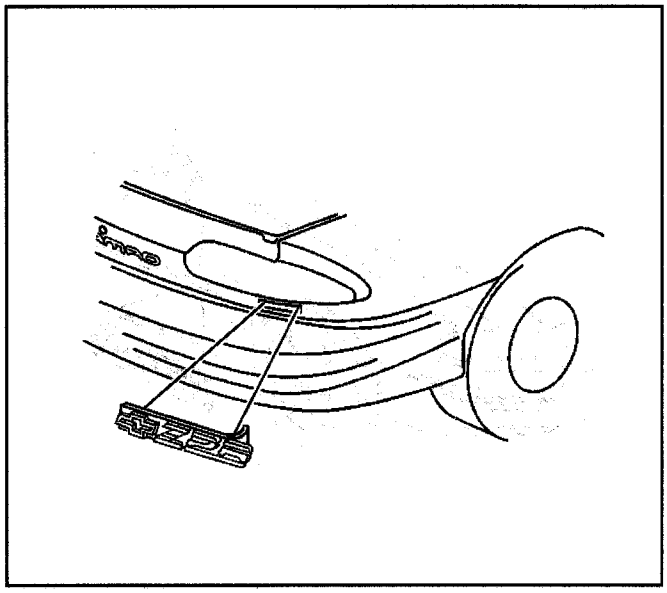


369112

Installation Procedure

1. Remove the backing paper from the emblem.
2. Measure 164.0 mm (6.46 in) from the outer edge of the taillight lens (3) to the edge of the emblem (2).
3. Measure 16.0 mm (.63 in) from the bottom edge of the rear end finish panel (1) to the bottom edge of the emblem (2).

4. Align the emblem to the tape guideline and press firmly in place.

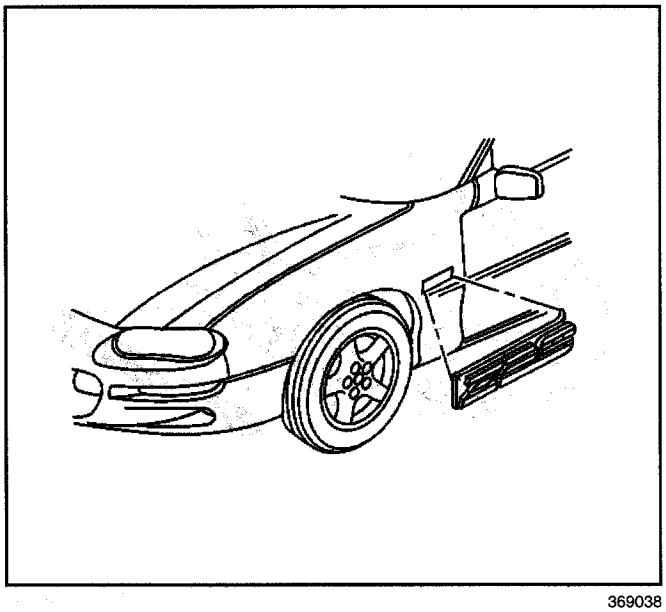


369109

Molding/Nameplate Replacement - Exterior Trim (Z28 Fender Emblem)

Removal Procedure

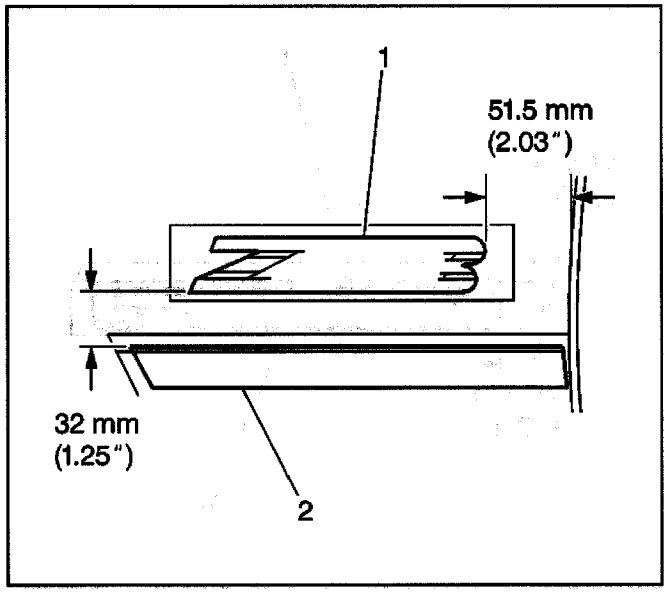
1. Mark the position of the emblem with a length of masking tape.
2. Remove the old emblem from the front fender.
3. Wash the fender with soapy water and wipe dry.
4. Remove all traces of adhesive from the fender using a oil-free naptha or alcohol.



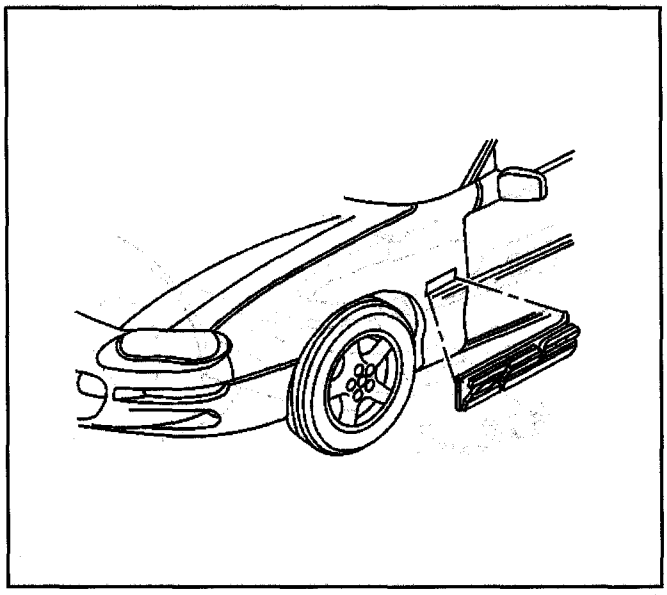
369038

Installation Procedure

1. Remove the backing paper from the emblem.
2. Measure 51.5 mm (2.03 in) from the front edge of the door to the rear edge of the emblem (1).
3. Measure 32.0 mm (1.25 in) from the bottom edge of the emblem (1) to the top edge of the molding (2).

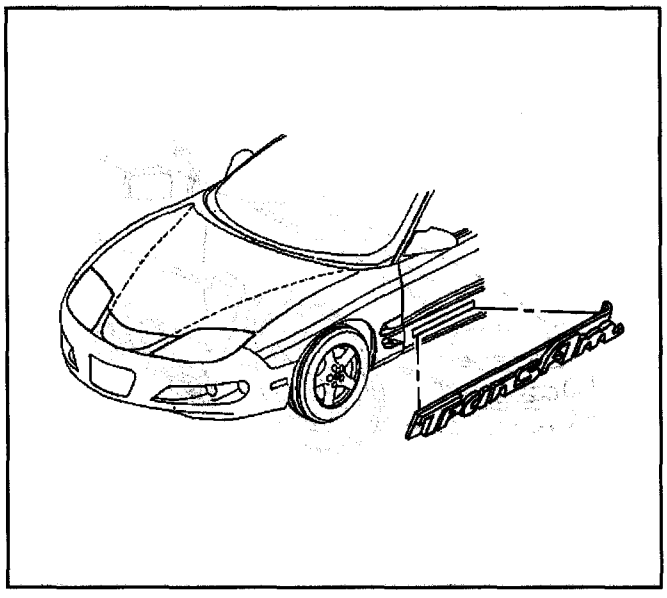


369042



369038

4. Align the emblem to the tape guideline and press firmly in place.

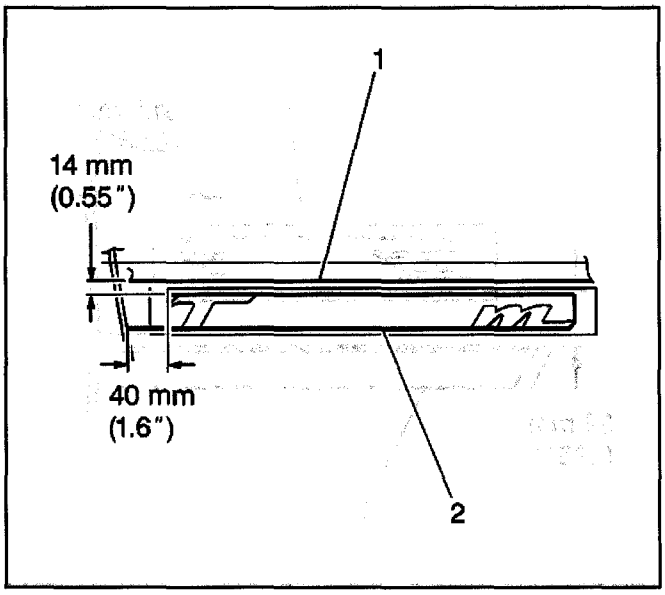


369045

Molding/Nameplate Replacement - Exterior Trim (Trans Am Door Emblem)

Removal Procedure

1. Mark the position of the emblem with a length of masking tape.
2. Remove the old emblem from the door.
3. Wash the door with soapy water and wipe dry.
4. Remove all traces of adhesive from the door using a oil-free naptha or alcohol.

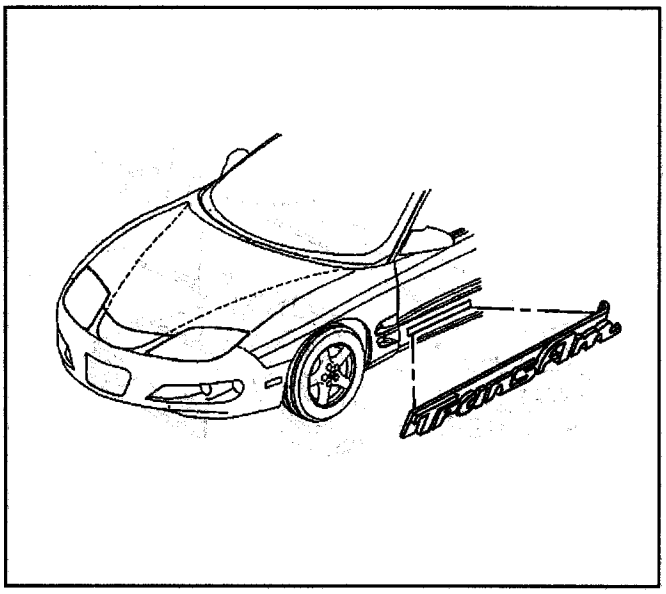


369046

Installation Procedure

1. Remove the backing paper from the emblem.
2. Measure 40.0 mm (1.6 in) from the front edge of the door to the front edge of the emblem (2).
3. Measure 14.0 mm (0.55 in) from the top edge of the emblem (2) to the bottom edge of the molding (1).

4. Align the emblem to the tape guideline and press firmly in place.

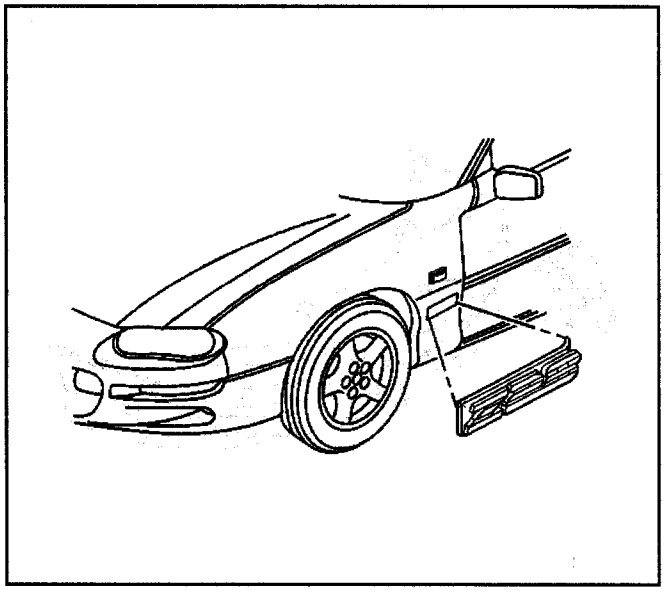


369045

Molding/Nameplate Replacement - Exterior Trim (Z28 Fender Emblem (Export))

Removal Procedure

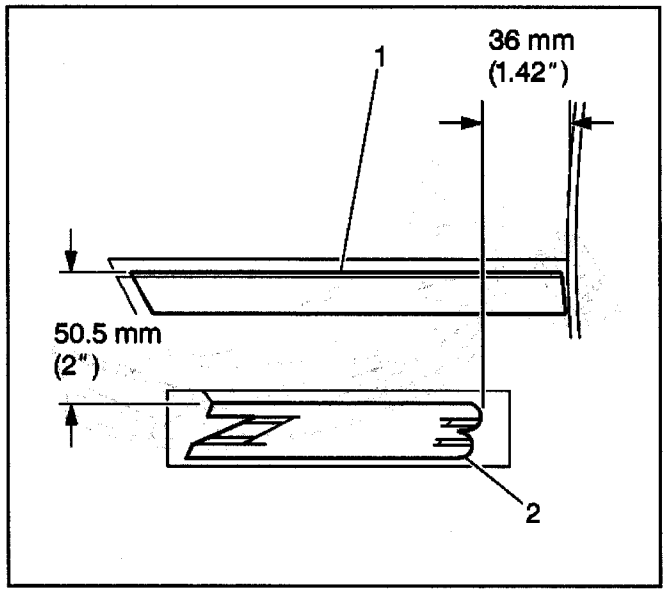
1. Mark the position of the emblem with a length of masking tape.
2. Remove the old emblem from the door.
3. Wash the door with soapy water and wipe dry.
4. Remove all traces of adhesive from the fender using a oil-free naptha or alcohol.



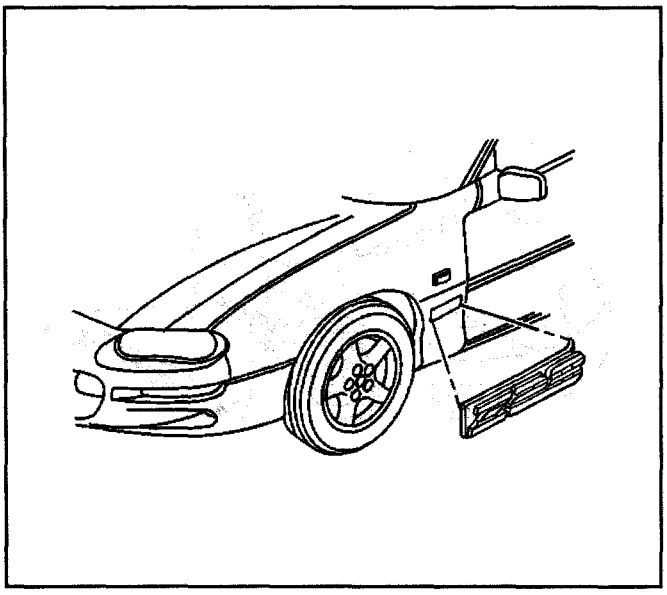
369059

Installation Procedure

1. Remove the backing paper from the emblem.
2. Measure 36.0 mm (1.42 in) from the rear edge of the fender to the rear edge of the emblem (2).
3. Measure 50.5 mm (2.0 in) from the top edge of the molding to the tope edge of the emblem (1).

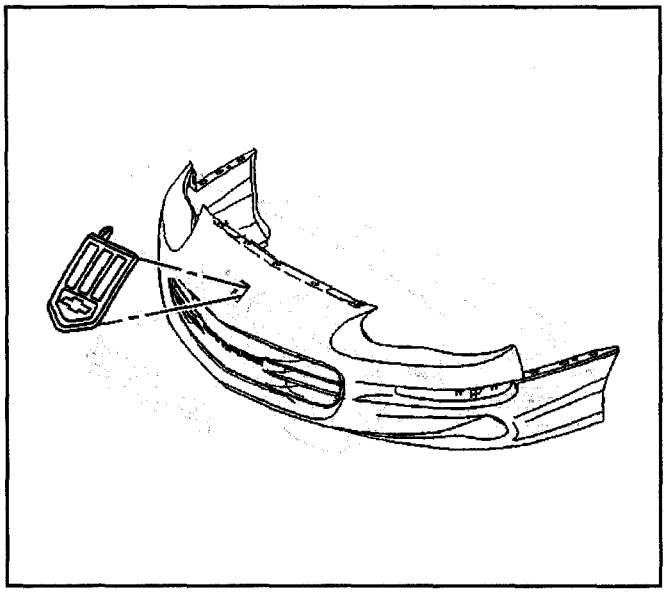


369061



369059

4. Align the emblem to the tape guideline and press firmly in place.

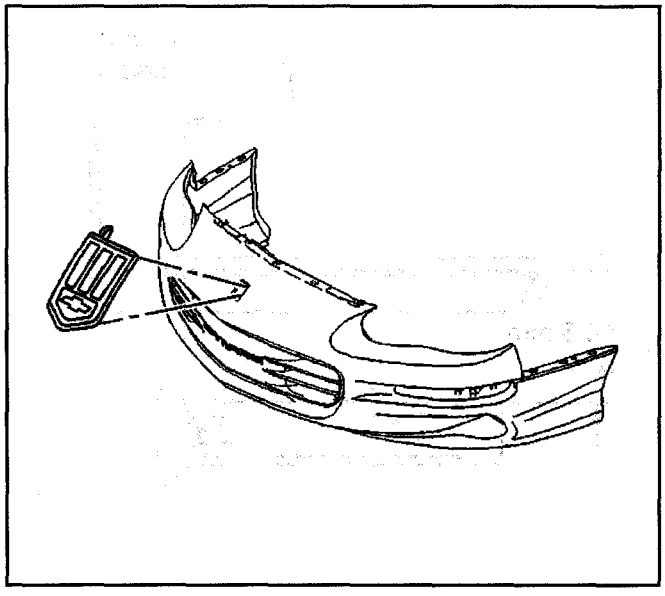


369035

Emblem Replacement - Front Bumper Fascia

Removal Procedure

1. Mark the position of the emblem with a length of masking tape.
2. Remove the old emblem from the fascia.
3. Wash the fascia with soapy water and wipe dry.
4. Remove all traces of adhesive from the fascia using a oil-free naptha or alcohol.



369035

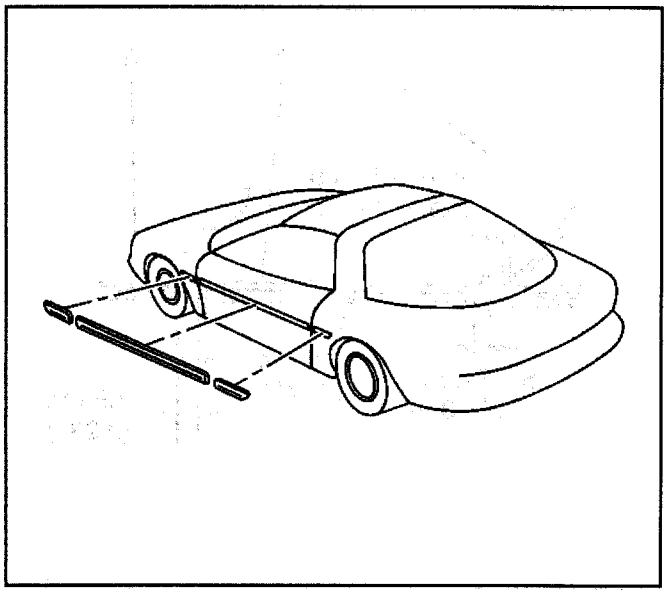
Installation Procedure

1. Remove the backing paper from the emblem.
2. Align the emblem to the tape guideline and press firmly in place.

Molding Replacement - Front Fender Rear

Removal Procedure

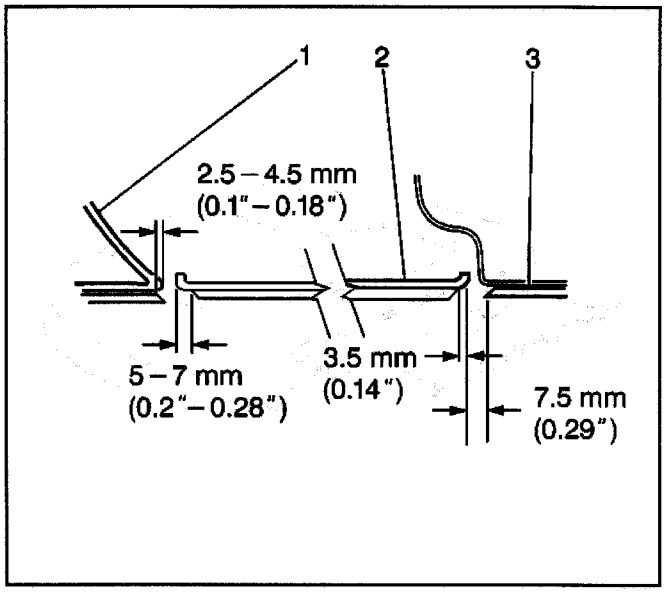
1. Remove the old molding from the front fender.
2. Mark the position of the molding with a length of masking tape.
3. Wash the area with soapy water and wipe dry.
4. Remove all traces of adhesive using a oil-free naptha or alcohol.



369114

Installation Procedure

1. Remove the backing paper from the molding.
2. Measure 2.5–4.5 mm (0.1–0.18 in) from the rear edge of the fender (1) to the inside of the molding.
3. Measure 3.5 mm (0.14 in) from the rear of the molding to the edge of the door (2).
4. Align the molding to the guideline and press firmly in place.

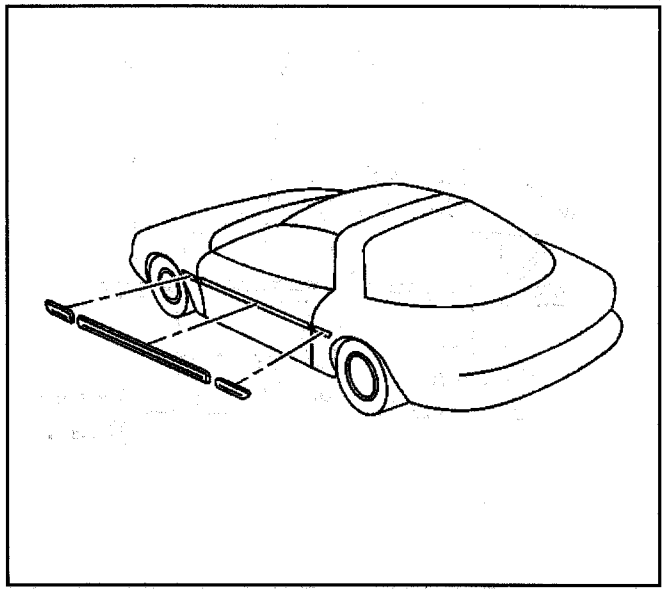


369117

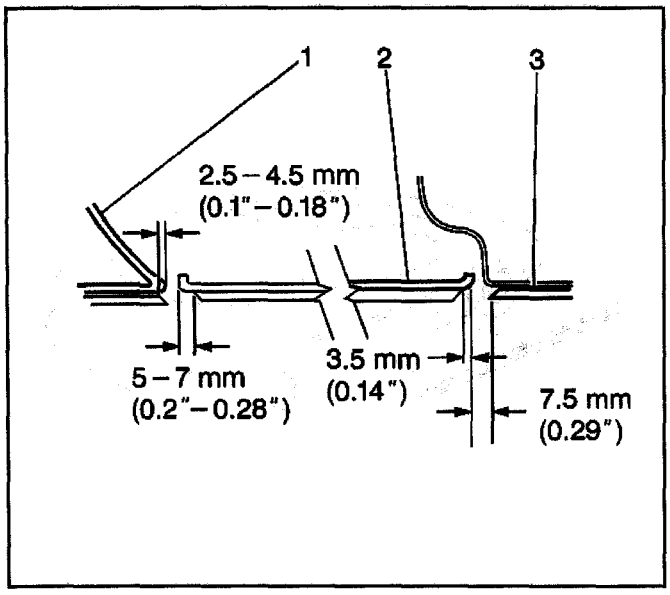
Molding Replacement - Body Side Door

Removal Procedure

1. Remove the old molding from the door.
2. Mark the position of the molding with a length of masking tape.
3. Wash the area with soapy water and wipe dry.
4. Remove all traces of adhesive from the door using a oil-free naptha or alcohol.



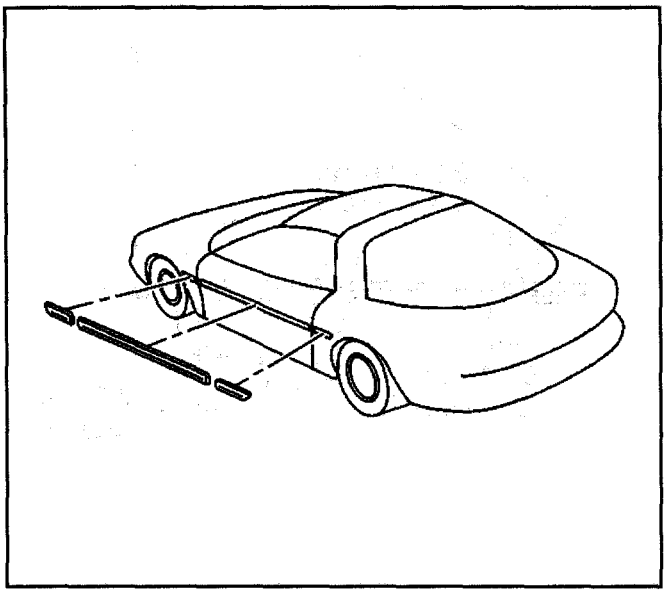
369114



369117

Installation Procedure

1. Remove the backing paper from the molding.
2. Measure 5.0–7.0 mm (0.2–0.28 in) from the front edge of the door (2) to the front edge of the molding.
3. Align the molding to the tape guideline and press firmly in place.

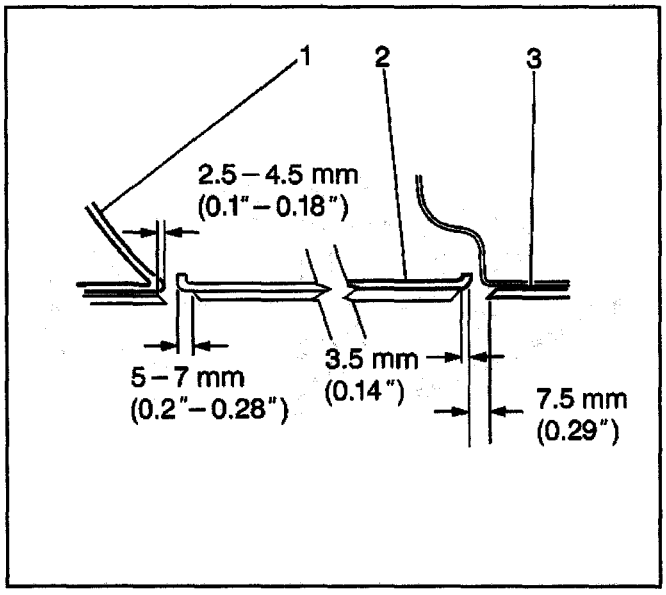


369114

Molding Replacement - Rear Quarter

Removal Procedure

1. Remove the old molding from the rear fender.
2. Mark the position of the molding with a length of masking tape.
3. Wash the area with soapy water and wipe dry.
4. Remove all traces of adhesive from the fender using a oil-free naptha or alcohol.



369117

Installation Procedure

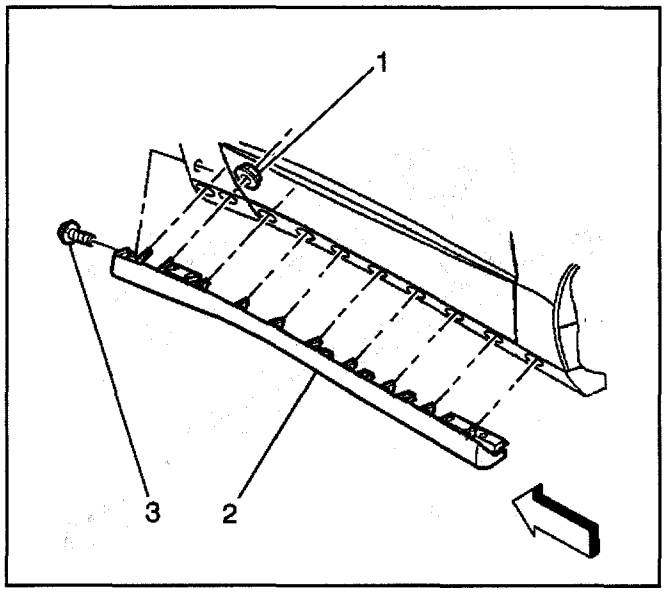
1. Remove the backing paper from the emblem.
2. Measure 7.5 mm (0.29 in) from the rear edge of the door to the front edge of the rear molding (3).
3. Align the molding to the tape guideline and press firmly in place.

Molding Replacement - Rocker Panel

Removal Procedure

1. Raise and suitable support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the rear wheelhouse panel liner attachments.

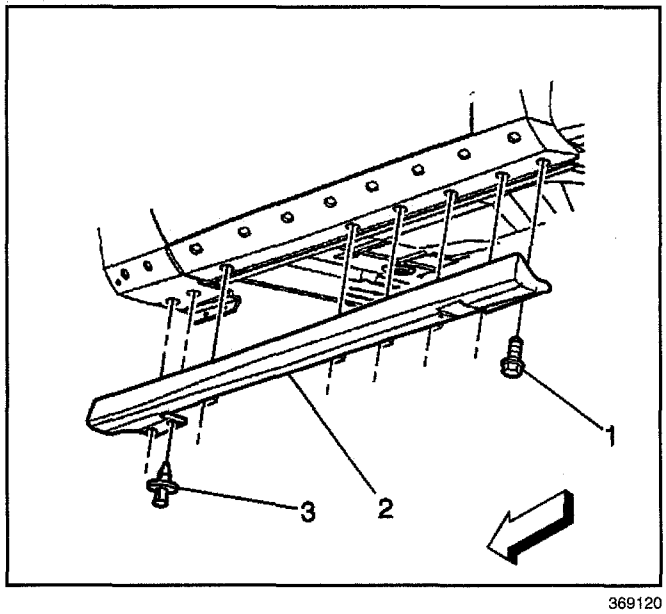
   Pull rear portion of liner away from fender.
3. Remove the rocker panel molding end retainer (3).
4. Remove the rocker panel molding retainer nuts (1).



369122

5. Remove the rocker panel molding lower retainers (3).

   Pull the center knob out half way to remove the retainer.
6. Remove the rocker panel molding bolts (1).
7. Remove the rocker panel molding (2) from the vehicle.



369120

Installation Procedure

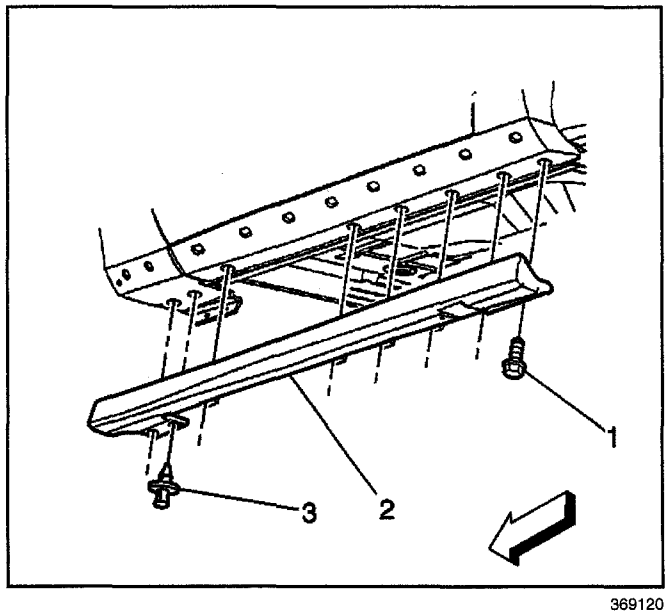
1. Install the rocker panel molding (2) to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

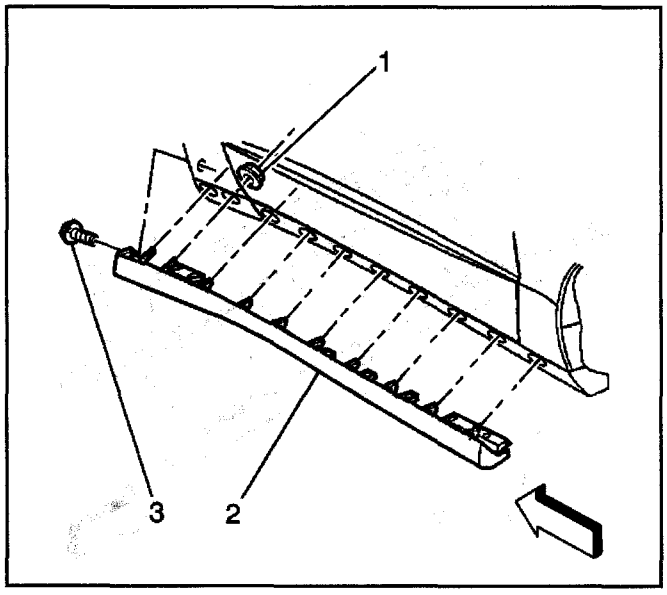
2. Install the rocker panel molding bolts (1).

   Tighten

   Tighten the rocker panel molding bolts (1) to 1.5 N·m (13 lb in).
3. Install the rocker panel molding lower retainers (3).



369120



369122

4. Install the rocker panel molding retainer nuts (1).

   Tighten

   Tighten the rocker panel molding nuts (1) to 6 N·m (53 lb in).
5. Install the rocker panel molding end retainer (3).
6. Install the rear wheelhouse panel liner attachments.
7. Lower the vehicle.

Weld Stud Replacement

If during a repair procedure, a weld stud becomes damaged, the following procedure may be used to replace the weld stud:

1. Drill a hole into the same location as the damaged weld stud.
2. Drive a screw into the drilled hole.
3. Use screws to retain clips and moldings in the same manner used with weld studs.
4. If the body surface becomes marred, repair and/or refinish to provide a smooth surface.

Washing and Waxing

1. Wash the vehicle in lukewarm or cold water.
2. Do not wash the vehicle in hot water.
3. Do not use strong soap or chemical detergents.
4. Flush all the cleaning agents from the surface while wet.
5. Apply body wax to the painted surfaces immediately after the vehicle has been cleaned. In order to ensure continuing protection of the finish, periods between applications should be short.

Description and Operation

Adhesive Retained Molding and Emblem Description

Securing Loose Moldings/Emblems

Moldings/emblems that are attached to body panels with adhesive tape require preparation prior to replacement. To ensure a good molding/emblem replacement, the panel surface should be warm, 21–32°C (70–90°F), clean and free of any wax or oily film.

Important: Care should be taken not to use any harsh chemicals when cleaning areas around the exterior lamps. Suggested cleaners are a mild soap and water solution, or Varnish Makers and Painters (VM&P) Naptha. VM&P naptha is a specific type of naptha and should not be substituted by any other naptha.

1. Wash the affected area with soap and water. wipe the panel and adhesive side of the molding/emblem with a clean cloth using oil-free naptha or alcohol.
2. If the molding/emblem has pulled loose from the adhesive backing do not remove the tape from the body.
3. Clean the back of the molding/emblem and tape on the body with oil-free naptha or alcohol.
4. To be certain that the molding/emblem is straight, masking tape may be applied as a guide.
5. Apply Loctite® 414 adhesive GM P/N 12345093 or equivalent to the back of the molding/emblem and press into place.
6. Apply constant pressure to the molding/emblem for 30 seconds or until a firm bond has been made.

Molding/Emblem Replacement

1. Wash affected panel area with soap and water and wipe dry.
2. Remove all traces of adhesive from the body panel and back of the molding/emblem using a oil-free naptha or alcohol.
3. Mark the proper position of the molding/emblem with a length of masking tape as a guide.
4. If the vehicle body is below 21°C (70°F) due to shop temperature or outside temperature, warm the body panel with a heat gun before proceeding.
5. apply a double-coated acrylic foam tape such as 3M Super Automotive Attachment Tape P/N 06380 (which has a white backing) or 06382 (which has a black backing) or equivalent, to the molding/emblem.
6. Align the molding/emblem to the tape guideline and press firmly in place.

Waterleaks

Specifications

Recommended Materials (Waterleak Repair)

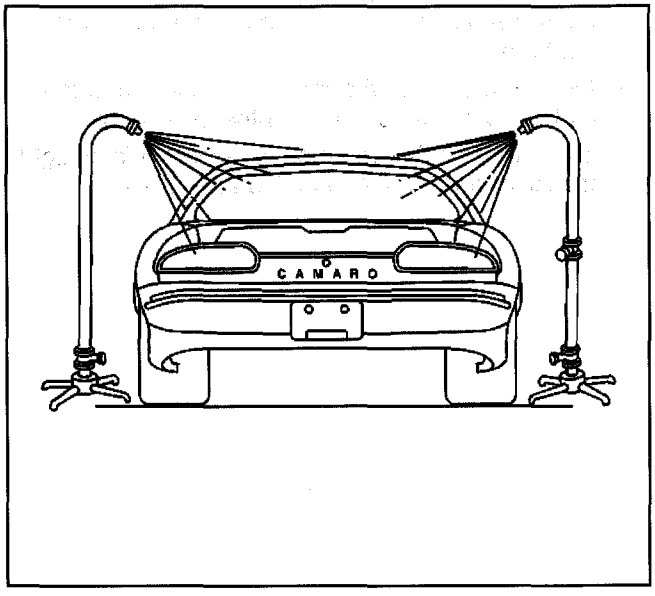
Leak Area	Repair Material(s)
Bolts, Studs, Screws, and other Transition Areas	Strip Caulk/3M Thumb Grade Sealer 08578
Cracks and Holes (General, Large)	3M All Around Autobody Sealant 8500
Cracks and Holes (General, Small)	3M Drip-Chek Sealer
Drip Moldings	3M Auto Bedding and Glazing Compound
Joints (Metal)	Brushable/Paintable Seam Sealer
Rear Window	Urethane Adhesive Caulking Kit GM P/N 12346284
Ventilation Ducts	3M Auto Bedding and Glazing Compound
Weatherstrip Retainers	Foam Tape
Windshield	Urethane Adhesive Caulking Kit GM P/N 12346284

Diagnostic Information and Procedures

Body Waterleak Repair

- GM vehicles are designed to operate under normal environmental conditions.
- The design criteria for sealing materials and components takes into consideration the sealing forces required to withstand the natural elements. These specifications cannot take into consideration all artificial conditions such as high pressure car washes.
- The water leak test procedure has been correlated to the natural elements and will determine the ability of a vehicle to perform under normal operating conditions.
- The first step in diagnosing a leak is determining the conditions under which a leak occurs. If the general leak area can be found, the exact entry point can be isolated using a water hose or air hose. Some trim panels or components may need to be removed in order to repair the leak.
- A leak around a door, a rear lift window, or a roof lift off panel does not necessarily indicate a bad weatherstrip. An adjustment of a door, a door window, a rear lift window panel, or a roof lift off panel, may resolve the condition.

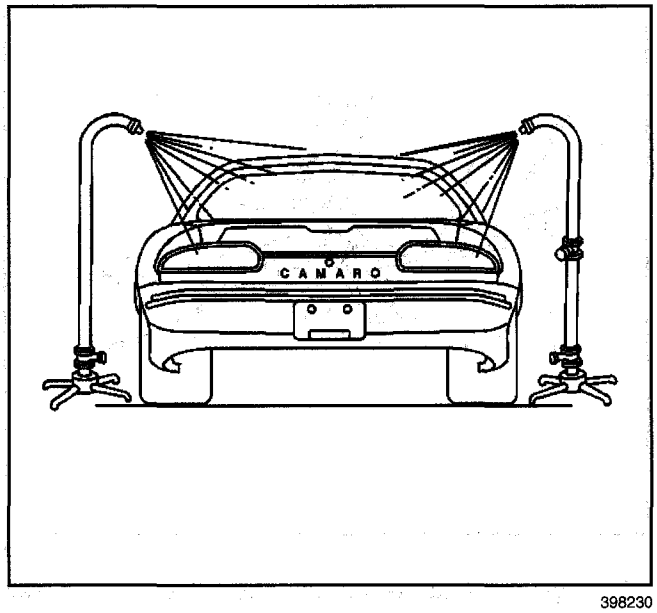
Waterleak Test Preparation



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1. Park the vehicle on a flat surface.
2. Inspect the fit of the door glass to the weatherstrips.
3. Inspect the fit of the removable roof panel, if equipped to the body.
4. Inspect the fit of the convertible top, if equipped to the body.
5. Inspect the joint of the roof side weatherstrip to the A-pillar and the B-pillar weatherstrip.
6. Inspect the windshield weatherstrip.
7. Perform a generalized water test using a test stand this is necessary to determine where to preform a localized test.

Generalized Testing



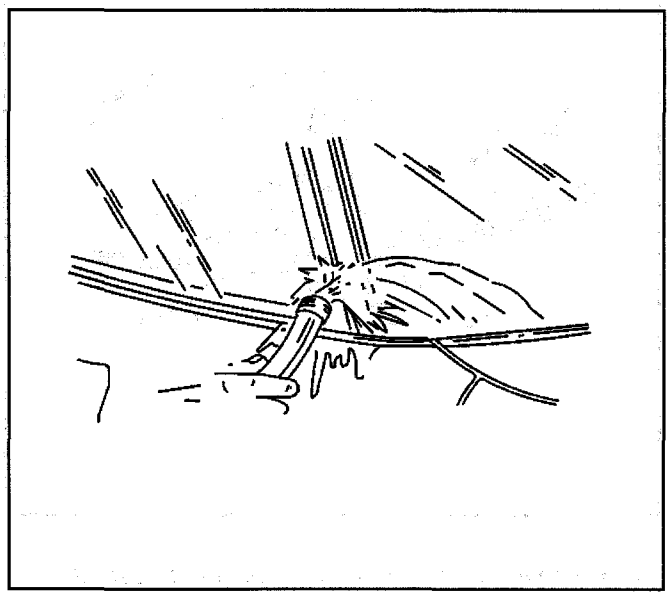
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If the leak source is not obvious the generalized test method using water test stands should be used. Once the general leak area is located one of the localized test procedures can be used to pin point the leak. Refer to *Localized Testing (Spot Testing)*, *Water Hose Test* or *Air Hose Test*.

1. Submit the vehicle to a water spray of 155 kPa (22 psi) for 10 to 20 minutes.
2. When testing the windshield seal, tape off the weatherstrip, sealing the front of the roof lift off panel or convertible top, and set the stands so the nozzles point approximately 30 degrees down and 45 degrees toward the rear of the vehicle.
3. When testing the windshield header and front body pillar weatherstrips set the stands so the nozzles point approximately 30 degrees down and 45 degrees toward the rear of the vehicle.
4. When testing the side of the vehicle set the stands so the nozzles point approximately 30 degrees down and 45 degrees toward the rear of the vehicle.
5. When testing the rear window and rear compartment lid set the stands 600 mm (24 in) from the corner of the rear window with the nozzles pointing approximately 30 degrees down and 30 degrees toward the front of the vehicle.

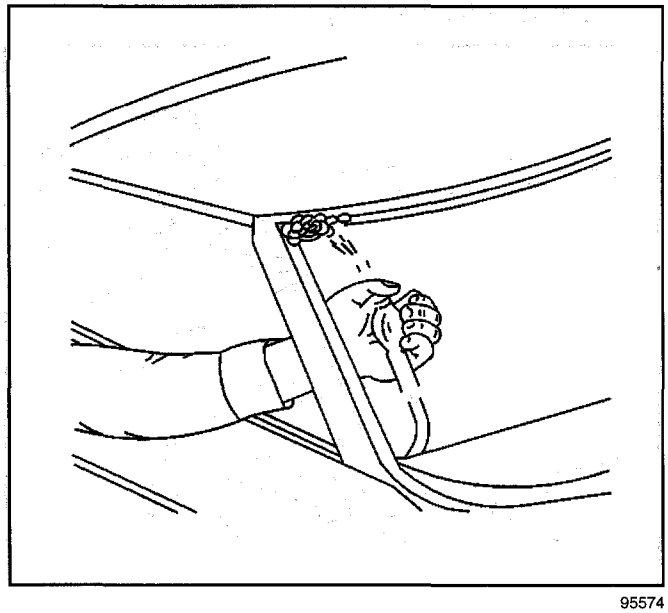
Localized Testing (Spot Testing)

Localized testing may be done either using water or air.



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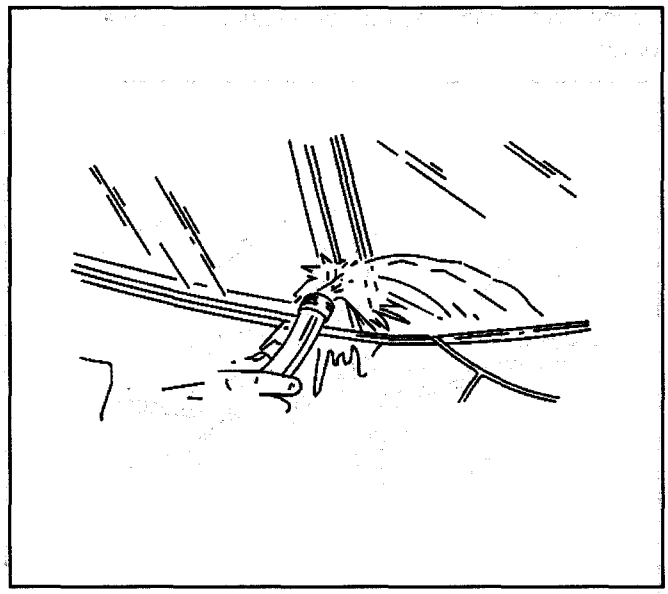
1. Begin the test at the base of the suspected area and continue up slowly until the leak is located.



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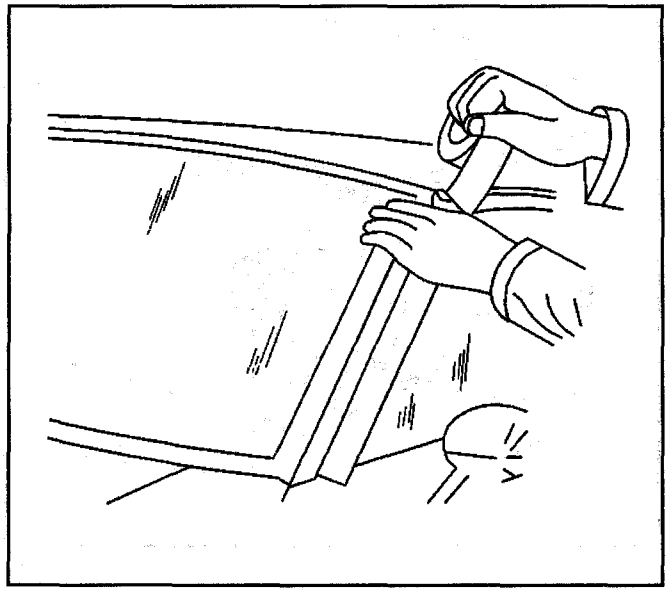
2. Pinpoint the leak area before any repair is made. Random repair may only temporarily restrict water entry and make future diagnosis and repair more difficult.
3. Continue localized testing in the same general area in order to confirm that all of the leaks have been located.

Water Hose Test



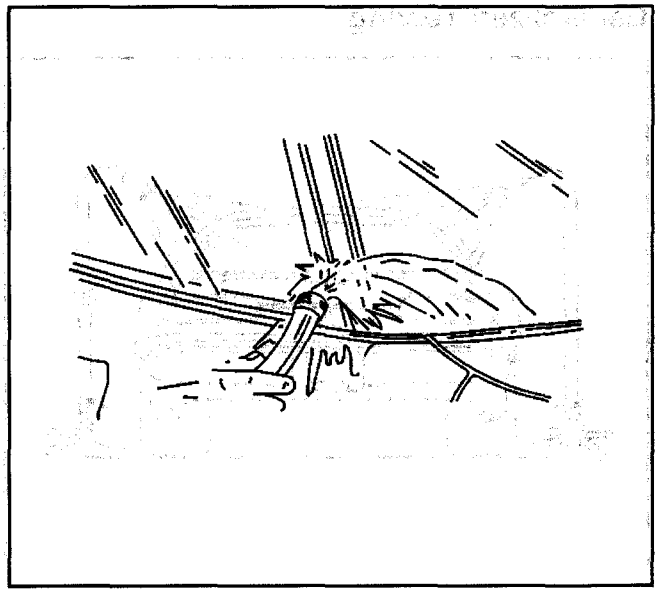
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1. Remove any trim that might obstruct your view.
2. Have a helper inside the vehicle to detect the actual leak point.
3. Use a unrestricted water flow (a hose with no nozzle).



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4. When water testing weatherstrips:
   - Aim the water so that the water falls only on the window side or only on the body panel side of a weatherstrip, or tape across the weatherstrip between the body panel and the weatherstrip.
   - Remove the tape and test again. This will help in determining whether the leak is between the weatherstrip and the window or between the weatherstrip and the retainer.

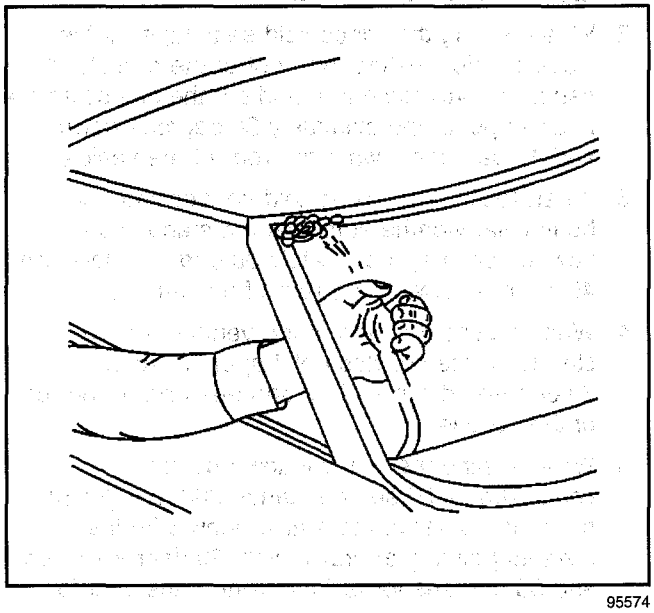


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5. Begin the water test at the base of suspected leak area and move slowly upward.
6. Mark the location of the leak.

Air Hose Test

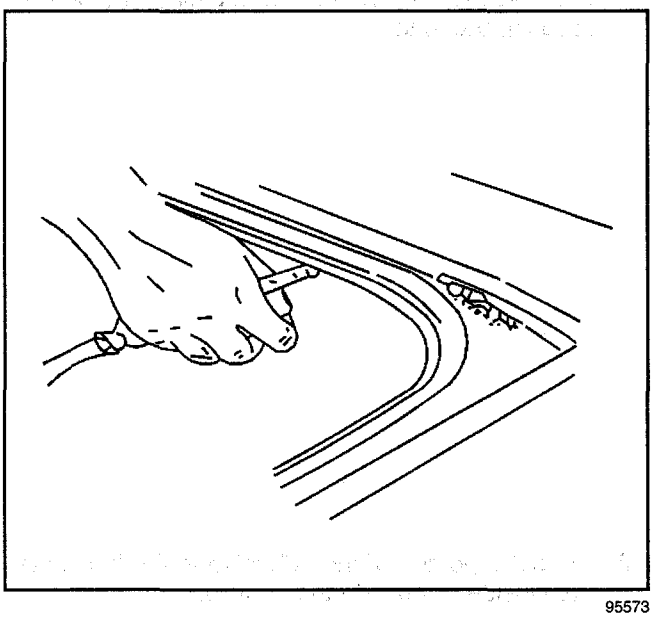
Notice: The air hose test should only be used on fully cured urethane adhesive. Otherwise, damage to the urethane adhesive bead could result in additional leaks.



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1. Apply soapy water to the outside of the suspected leak area.

2. Apply air pressure using an air hose from inside of the vehicle.
   - Do not exceed 205 kPa (30 psi) of air pressure.
   - Do not apply air pressure unless the urethane has completely cured.



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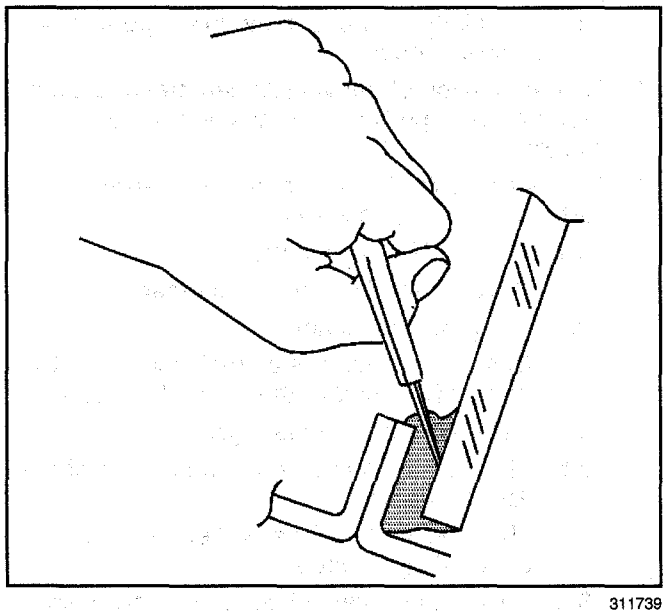
3. Watch for bubbles on the outside of the vehicle at the suspected leak area.
4. Mark the leak area.

Dust Leaks

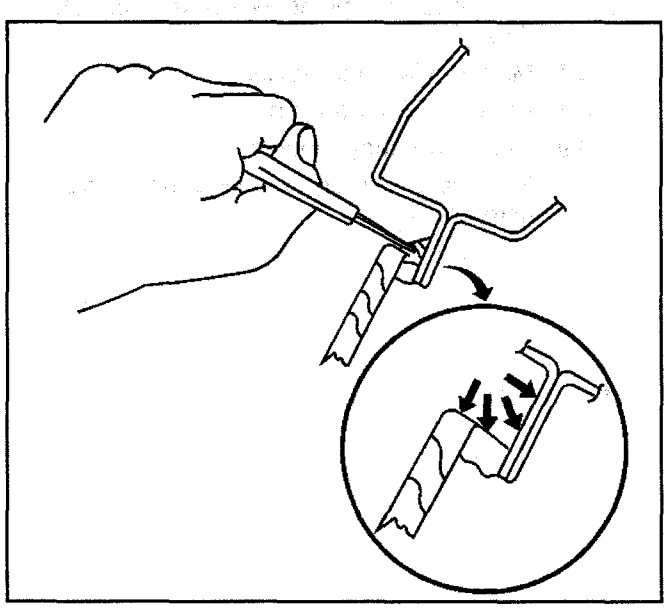
1. Dust will leak into the vehicle where water will not. This particularly happens in the lower portion of the vehicle's interior.
2. Forward motion of the vehicle can create a slight vacuum which pulls air and dust inside the vehicle.
3. To determine the location of the dust leaks, perform the following steps:
   - 3.1. Remove the floor mats.
   - 3.2. Drive the vehicle on a dusty road.
   - 3.3. Examine the interior.

     Dust in the shape of a small cone or slit will usually be found at the point of leakage.
   - 3.4. Mark the points of leakage.
   - 3.5. Shine bright lamps on the underside of the floor and cowl.

     The interior should be darkened when performing this step.
   - 3.6. Have an assistant check the inside of the vehicle for any points where the light shines through.
   - 3.7. Mark the leakage points.
   - 3.8. Check the welded joints.
   - 3.9. Check the body mounts.
   - 3.10. Seal leaks with an air drying, body sealing compound.



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Repair Instructions

Body Waterleak Repair

1. Depending on the location of the water leak, you may have to remove the trim molding or headliner to repair the leak.
2. Cut out a portion of the adhesive in the leak area from inside or outside the vehicle.
3. Clean and remove all loose particles from the area.
4. Caulk the adhesive between the window and the pinchweld flange where the old adhesive has been cut away.

   Feather the adhesive out to several inches past the leak area. Use urethane adhesive from GM P/N 12346284 or equivalent.
5. Mist the newly applied adhesive with water to cure the adhesive.
6. Test for leaks.
7. Install the molding(s).
8. Allow the adhesive to dry for several hours.
9. Test for water leaks. Refer to the appropriate procedure from the following list:
   - *Waterleak Test Preparation*
   - *Water Hose Test*
   - *Air Hose Test*

Weatherstrip Waterleak Repair

Removal Procedure

Before removing the weatherstrip attempt to repair the water leak by adjusting or shimming, the weatherstrip, door, door glass, folding top, or the panel.

If the weatherstrip is removed the weatherstrip should be replaced.

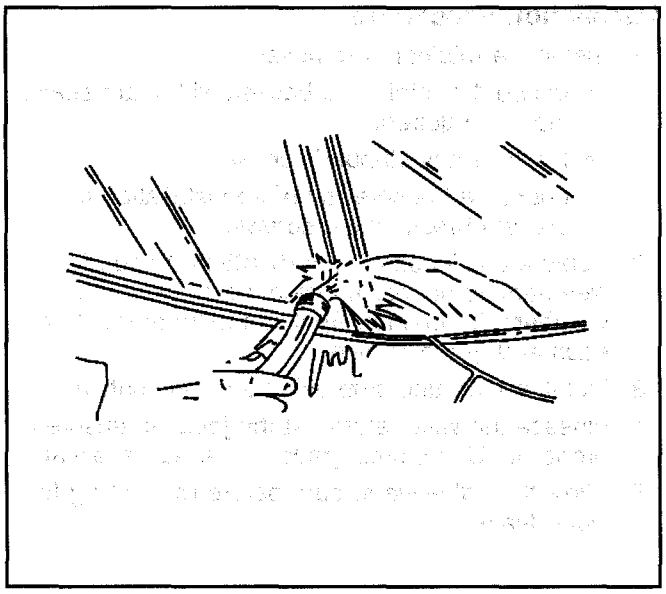
1. Pull the weatherstrip from the retainer while cutting through the adhesive with a spatula.
   - Most weatherstrips are bonded to the retainers with adhesive.
   - Try not to tear the weatherstrip, keeping the weatherstrip intact aids in removal.
2. Remove all the old adhesive from the retainer or remove the retainer.

Important: Most retainers are backed with foam sealing tape. To avoid scratching an acrylic roof panel do not use a scraper to remove the foam sealing tape adhesive from the panel.

3. If a weatherstrip retainer is removed, remove all the old foam sealing tape and adhesive from the mating surface.
4. Remove any broken screws.

Installation Procedure

1. Install the retainer, if removed.
   - Insure the retainer is backed with foam sealing tape, if required.
   - Replace any stripped screws.
   - Lubricate the screws before installation to prevent breaking the screws.
2. Apply a continuous 3 mm (0.125 in) bead of weatherstrip adhesive inside the center of the weatherstrip retainer. Apply an extra amount at each end of the retainer.
3. Install the weatherstrip using a nylon spatula.
4. Finesse the weatherstrip at the joints to ensure a proper fit. Use thump grade sealer as necessary.
5. Allow the adhesive to cure before rechecking for water leaks.



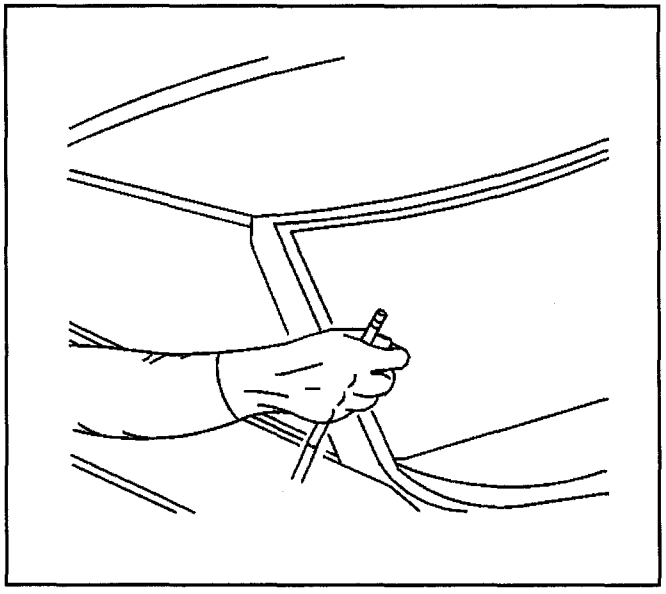
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Stationary Window Waterleak Repair

Tools Required

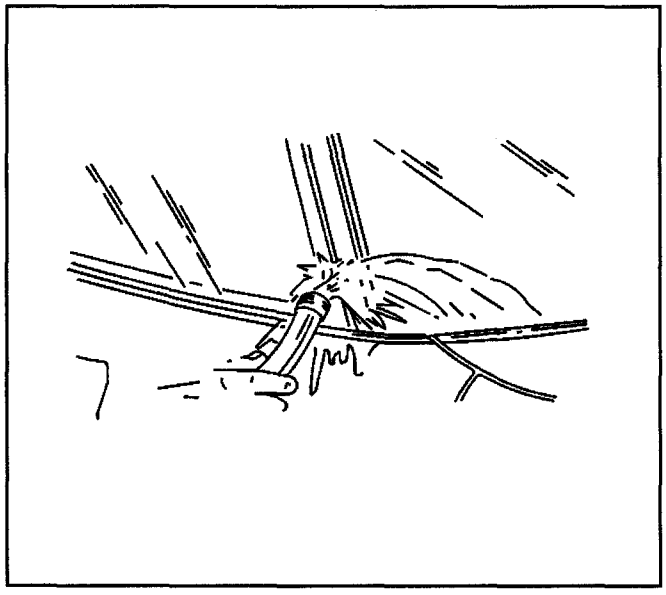
- Adhesive Kit GM P/N 12346284
- Air Hose
- Water hose without a nozzle

1. Remove the window garnish moldings if area of leak is hidden. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* or *Windshield Side Garnish Molding Replacement (With Lift Off Window Pan)* in Stationary Windows.
2. Remove any auxiliary seal or reveal moldings, if necessary to uncover the urethane seal.
3. Apply a small stream of water while carefully pushing outward on the window in the area of the leak.
4. Mark the extent of the leak area.



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5. Using a sharp knife, trim off any uneven edges of urethane material at the leak point 75-100 mm (3-4 in) on each side of the leak point.
6. Clean away any dirt from the leak area with water.
7. Dry the leak area with an air hose.
8. Prime the leak area with black primer #2 from the adhesive kit.
9. Allow the primer to dry for 5 minutes.
10. Apply new urethane to the area trimmed away.
11. Work the new urethane into the trimmed area using a flat-bladed tool.



95572

12. Water test the original leak area.
13. Continue to work the adhesive into the leak area or apply additional adhesive as needed.
14. Install the window garnish moldings. Refer to *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)* or *Windshield Side Garnish Molding Replacement (With Lift Off Window Pan)* in Stationary Windows.

Air/Wind Noise

Diagnostic Information and Procedures

Air/Wind Noise

Caution: An assistant should drive the vehicle while the technician checks for the location of the reported condition. Otherwise, personal injury could result.

To analyze a reported windnoise condition, test drive the vehicle to determine the origin of the noise. Choose a regular route for the road test. The road should consist of smooth and straight streets that run in all 4 directions, North, South, East, and West. The area should have little traffic or little noise to eliminate interference with the test.

Important: Often there is one primary leak source and one or more secondary leaks that contribute to the noise condition. Repairing only one of the contributing leak sources may not completely repair the total condition but only reduce the condition.

The following are four common methods for diagnosing wind noise:

The vehicle will be driven at the speed in which the customer noticed the noise, or until the noise is heard. Maintain safe and legal speeds.

Many of the waterleak diagnosis tests are also used for the windnoise diagnosis.

Most of the windnoise is caused by either leaking seals or misaligned body surfaces. The following are three basic types of wind noise:

- Whistle
- Roar
- Rush

When moving at highway speeds, air pressure inside the vehicle becomes significantly greater than the air pressure outside. When a leak occurs, the escaping air causes a hiss or a whistle.

Wind roar occurs when air passes over or through an opening between the two body surfaces. To correct the condition, adjust the alignment to the body surfaces.

Wind rush occurs when air passes over the vehicle's body, and is related to the aerodynamics of the vehicle. Wind whistle and wind roar are serviceable. Rule out wind whistle and wind roar before concluding that the wind noise is due to wind rush.

Diagnose wind whistle or wind roar using the following procedure:

1. Note the detail for wind noise:
   - The perceived location
   - The location where the noise is the loudest
   - When the noise occurs
   - The vehicle speed
   - The interior fan speed
   - The position of the windows.
   - What the noise sounds like
2. Inspect the vehicle for the possible cause of the windnoise.
3. Test drive the vehicle and determine if the windnoise is external or internal.
4. Perform a visual inspection of the following components:
   - Loose fasteners
   - Torn weatherstrips
   - Broken weld joints
   - Sealer and/or adhesive skips

Tracing Powder or Chalk Test

Clean the weatherstrips and the contact surfaces with cleaning solvent.

1. Apply powder or calk in an unbroken line to the contact surface of the weatherstrip surrounding the perimeter of the suspected areas. Ensure that the areas are free of chalk or powder.
2. Close the panel completely without slamming the panel. Closing the panel completely presses the weatherstrip firmly against the mating surface.
3. Inspect the applied line on the weatherstrip. The applied line is marred where contact is good. A corresponding imprint is on the mating surfaces.
4. Gaps or irregularities in the powder or the chalk line on the mating surfaces indicate the areas with a poor seal.

Air Pressure Test

1. Mask off the pressure relief valve.
2. Turn on the vehicle's ventilation fan.
3. Close all of the windows and doors.
4. To listen for escaping air along the door and window seals use a stethoscope or length of heater hose.

A smoke or dusting powder can be used if preferred. The exact leak location can be seen as smoke or powder travels through the poor seal.

Soap Suds or Bubble Test

1. Cover the pressure relief valve.
2. Turn the vehicle's ventilation fan to high.
3. Close all windows and doors.
4. Apply a soapy solution to all potential leak areas.
5. Look for bubbles that reveal escaping air.
6. Consider the following as an alternative to pressurizing the vehicle's interior:
   - Use compressed air
   - Do not exceed 207 kPa (30 psi)

Repair Instructions

Exterior Windnoise

Notice: If masking the grille or headlamp bezel areas, care must be taken not to restrict airflow. Restricting airflow can cause vehicle overheating.

Exterior windnoise is louder when the vehicle is driven with one or more windows down. Exterior windnoise occurs when air passes over the body panels, the seams, or the openings. Use the following items during the test drive in order to aid in the detection of leaks.

- Mechanic's stethoscope or heater hose
- Masking tape 51 mm (2 in) in width
- Strip caulk
- China marking pencil

1. While driving, determine the location of the exterior windnoise by lowering one window at a time. If the location corresponds with the condition in step 2, pull over and make a temporary repair with 51 mm (2 in) wide masking tape.
2. Tape over the gaps and the moldings one at a time. Test between each taping. Taping over the gaps and moldings will correct the condition.
3. Temporarily repair the condition with masking tape. Adjust the tape when needed.
4. Continue testing in order to determine if the noise has been eliminated or other leak areas exist.
5. When all the reported leak conditions are located, make permanent repairs using the proper alignment techniques and the sealing materials.

Interior Windnoise

Interior windnoise is not heard when the window is lowered. Interior windnoise is caused by the air leaving the inside of the vehicle through a seal or a seam.

1. Tape over the relief valves to cause added air pressure within the vehicle.
2. Test drive the vehicle and listen for windnoise or a whistle.
3. Pull the vehicle over and make the temporary repairs using masking tape. If you cannot determine the source of the windnoise, perform one or more of the following diagnostic tests:
   - *Tracing Powder or Chalk Test*
   - *Air Pressure Test*
   - *Soap Suds or Bubble Test*

Squeaks and Rattles

Diagnostic Information and Procedures

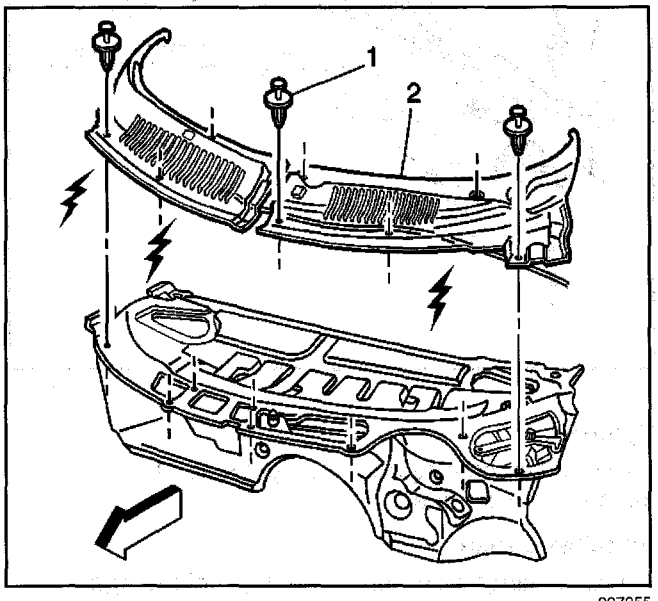
Squeaks and Rattles

Unwanted noises are usually caused by improperly controlled relative motion between components. There are four means to prevent noises after component replacement or repair.

- Attach the components securely so there is no relative motion during operation.
- Separate the components so there is no contact under normal operating conditions.
- Insulate the components so no sound occurs with relative motion between the surfaces.
- Provide a low friction surface to eliminate a stick slip motion.

Noise Diagnosis - Front of Vehicle (Air Inlet Screen to Windshield Itch)

Air Inlet Screen to Windshield Itch



397255

Symptom:

Itching sound from the bottom of the windshield.

Possible Cause:

The air inlet screen (2) is rubbing against the bottom edge of the windshield.

Diagnosis:

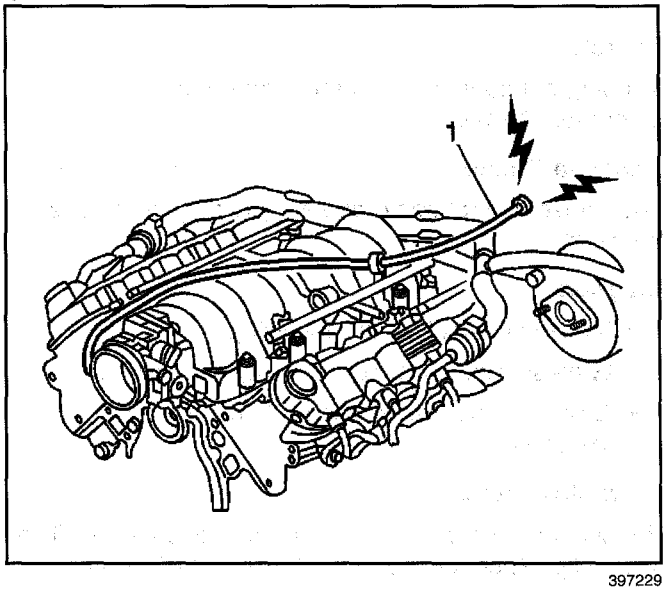
Remove the air inlet screen (2). Look for witness marks from the windshield on the air inlet screen (2).

Corrective Active:

1. Apply isolation (vinyl nitril foam or equivalent) to the inlet screen and windshield interface.
2. Add foam tape to the right and/or left side of the air inlet screen(s) (2).
3. Foam strips are to be installed 1.0 to 3.0 mm inboard from the glass interface edge of the inlet screen
   - A single (10 in x 1 in) foam strip added to the interference, may be sufficient.
   - Or, two strips may be required:
     Foam strips are to butted together at the center where the left and right inlet screens interlock.
     - Right side foam strip length is 955 mm (37.60 in).
     - Left side foam strip length is 1055 mm (41.54 in).

Noise Diagnosis - Front of Vehicle (Accelerator Control Cable Tap)

Accelerator Control Cable Tap



397229

Symptom

Tapping sound is heard coming from the instrument panel area.

Possible Cause

The accelerator control cable (1) is tapping against the cowl.

Diagnosis

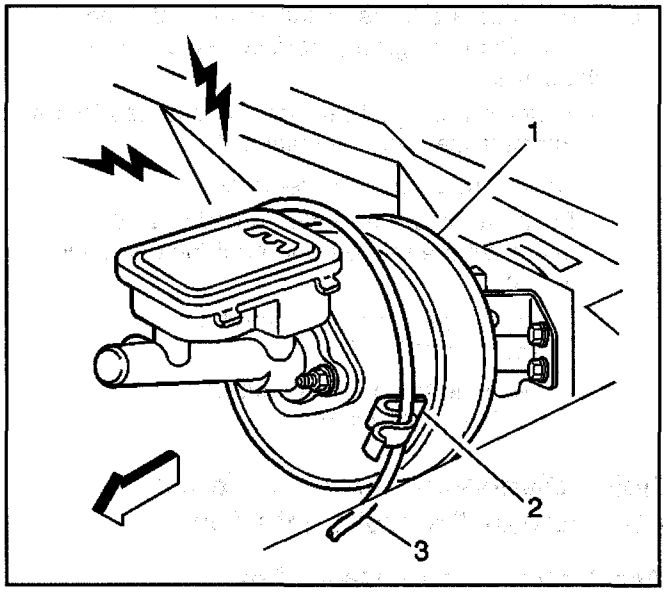
- Visually inspect for the following:
- Witness marks on the cable and/or cowl
- Control cable (1) resting against the cowl

Corrective Action

Re-route the cable. The rerouted cable (1) must provide a minimum of 3.0 mm (0.118 in) clearance to the cowl.

Noise Diagnosis - Front of Vehicle (Cruise Control Servo Cable Tap)

Cruise Control Servo Cable Tap



397232

Symptom

Tapping sound is heard coming from the instrument panel.

Possible Cause

The cruise control servo cable (3) is tapping against the cowl.

Diagnosis

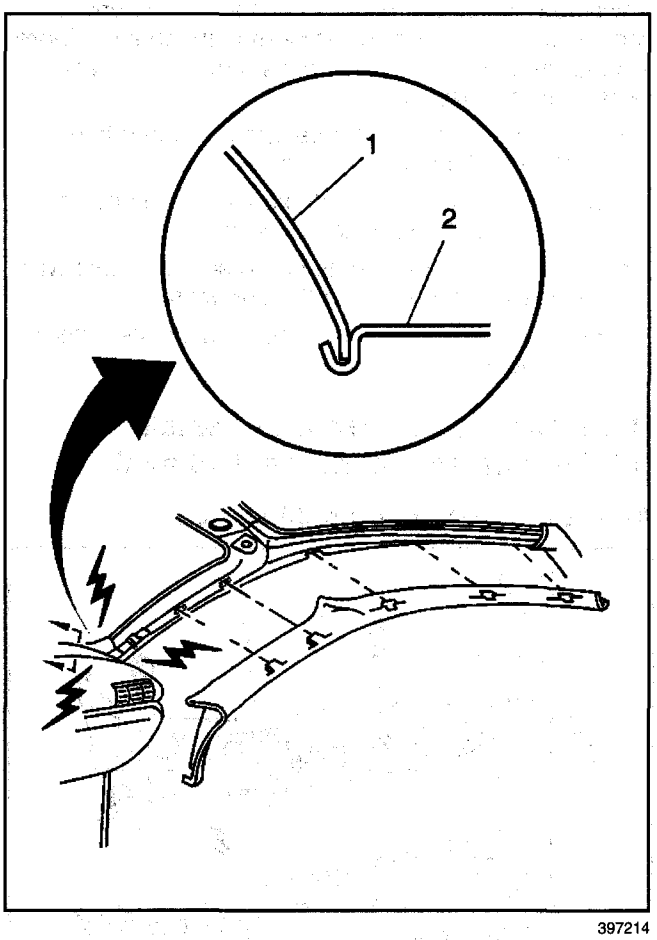
- Visually inspect for the following:
- Witness marks on the cable (3) and/or cowl
- Cruise control servo cable (3) resting against the cowl

Corrective Action

Reposition the cable (3) on the brake booster (1). The cable clip (2) should be in the three o'clock position.

Noise Diagnosis - Instrument Panel and Header (IP Hinge Pillar Trim Panel Rattle Or)

Instrument Panel Hinge Pillar Trim Panel Rattle Or Itch



397214

Symptom:

Rattle or itch coming from the right side of the instrument panel area.

Possible Cause:

- Body hinge pillar trim panel (1) rubbing against the upper extension panel (2).
- Body hinge pillar trim panel (1) contacts the right side wall of the instrument panel.

Diagnosis:

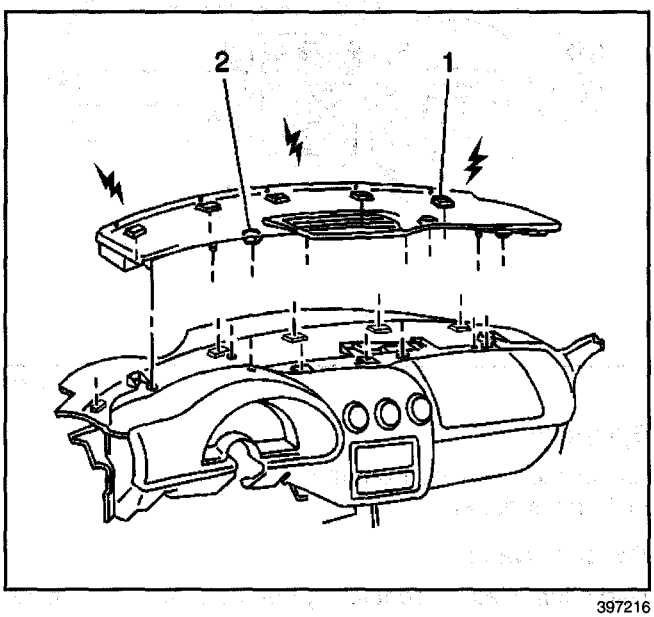
- Look for witness marks on the following:
- Hinge pillar trim panel (1)
- Upper extension panel (2)
- Side wall of the instrument panel
- Push down on the corner of the upper extension panel (2) to see if it is able to spring back and touch the hinge pillar trim panel (1).
- Push against the instrument panel wall to see if it is able to spring back and touch the hinge pillar trim panel (1).

Corrective Action:

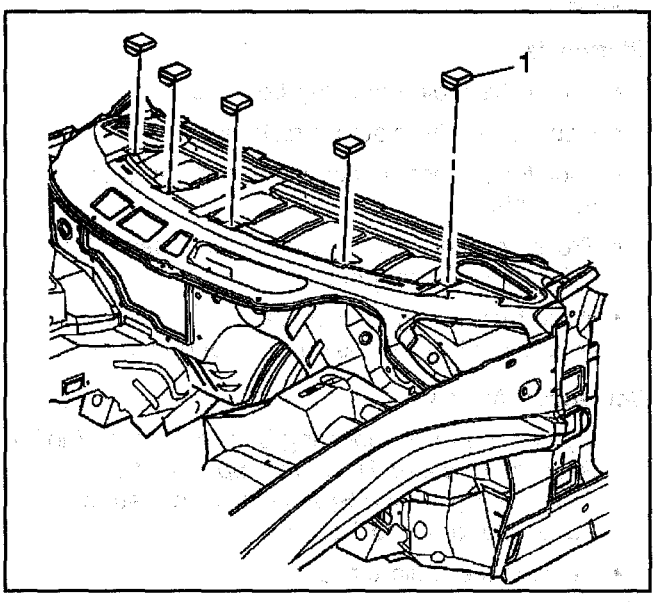
- Apply felt tape to the upper extension panel (2) at the point of contact.
- Apply felt tape to the instrument panel wall at the point of contact.

Noise Diagnosis - Instrument Panel and Header (Instrument Panel Upper Trim Rattle)

Instrument Panel Upper Trim Rattle



397216



397218

Symptom

Rattle from the top of the instrument panel.

Possible Cause

- Check the retaining clips (2) and dual lock fasteners (1) for the following:
  - Missing
  - Damaged
  - Not fully engaged
- The adhesive attaching the dual lock fasteners (1) fails.

Diagnosis

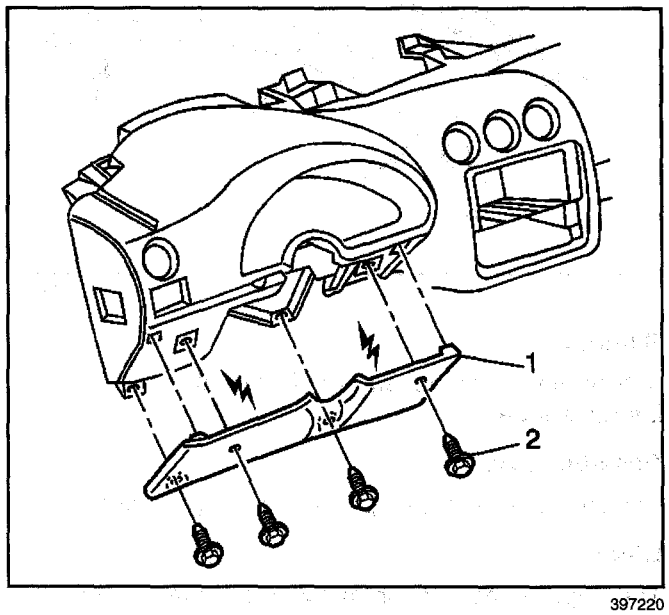
While test driving the vehicle, apply pressure to the upper trim panel and listen for changes in noise.

Corrective Action

- If the adhesive has failed, replace the dual lock fastener.
- Fully engage all clips and dual locks
- Replace any damaged or missing clips (2) or dual lock fasteners (1).

Noise Diagnosis - Instrument Panel and Header (Instrument Panel Knee Bolster Itch)

Instrument Panel Knee Bolster Itch



397220

Symptom

Itching sound from below the steering column.

Possible Cause

Knee bolster rubbing against the cluster bezel.

Diagnosis

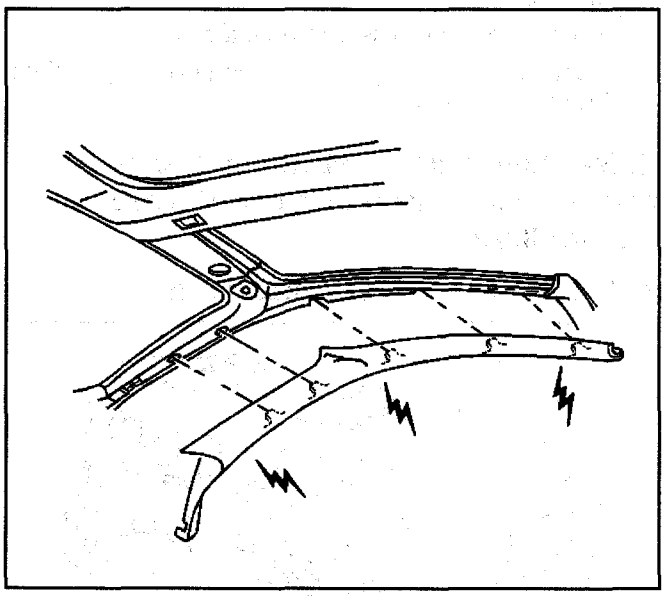
While test driving apply hard upward pressure and listen for the itch to change.

Corrective Action

- Loosen knee bolster bolts.
- Reposition knee bolster downward and forward to create clearance to the bezel.
- Retighten the bolts to 1.9 N·m (17 lb in). Refer to *Fastener Tightening Specifications* Fastener Tightening Specificationsin Instrument Panel, Gauges and Console.

Noise Diagnosis - Instrument Panel and Header (Windshield Side Upper Garnish Molding)

Windshield Side Upper Garnish Molding Itch



397222

Symptom

Itch coming from the left or right side of the instrument panel.

Possible Cause

Windshield side upper garnish molding is loose.

Diagnosis

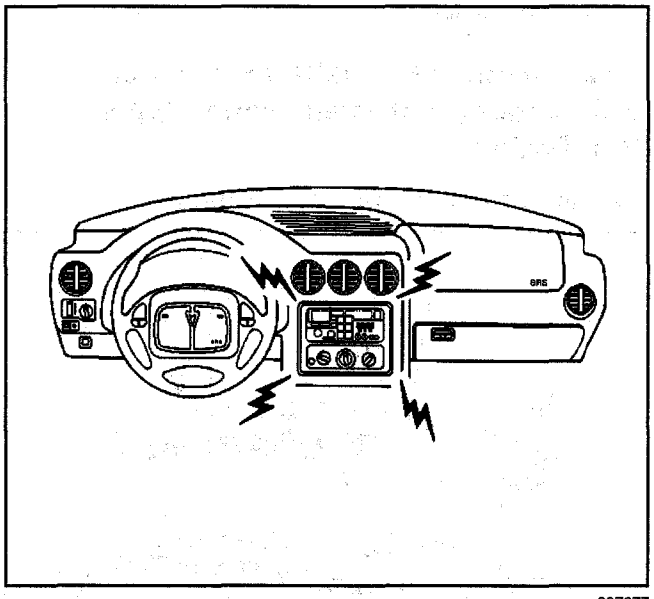
The edge of the garnish molding is contacting the windshield and/or upper trim panel.

Corrective Action

- Replace the damaged clips on the garnish molding.
- Replace the garnish molding if the clip area is broken.

Noise Diagnosis - Instrument Panel and Header (Radio Trim Plate Itch Or Buzz)

Radio Trim Plate Itch Or Buzz



397277

Symptom

Itch or buzz coming from the radio area of the instrument panel.

Possible Cause

Radio trim plate is contacting the radio at one or more locations.

Diagnosis

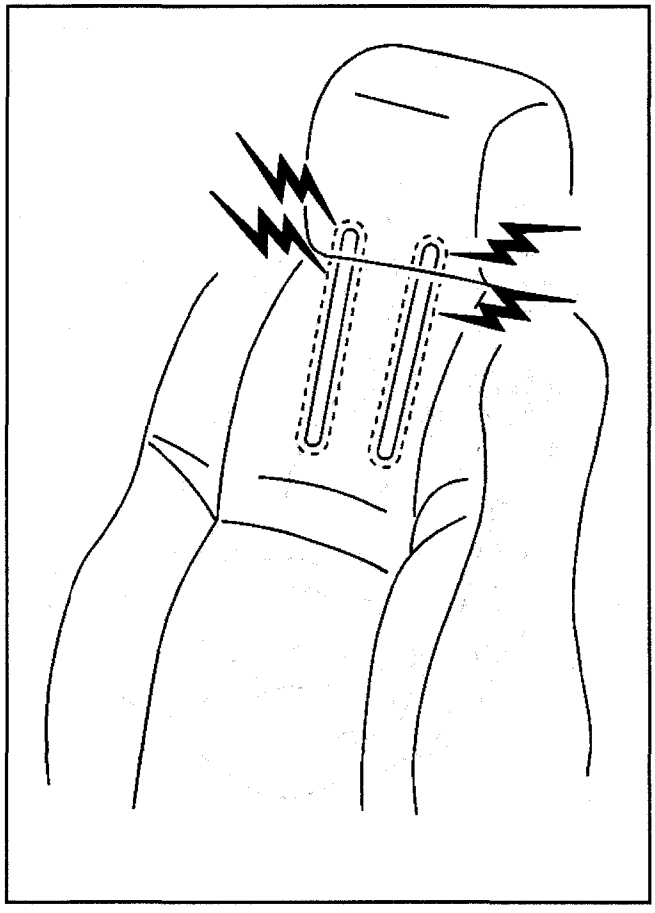
- Check the radio mounting bolt torque.
- Inspect the trim plate for distortion.
- Look for witness marks on the radio and/or trim plate.
- Press against the radio trim plate to see if the noise can be generated.
- While test driving the vehicle, apply press the radio trim plate and listen for changes in noise.

Corrective Action

- Tighten the radio mounting bolts to 8 N·m (7 lb in). Refer to *Fastener Tightening Specifications* Fastener Tightening Specificationsin Instrument Panel, Gauges and Console.
- Replace the radio trim plate.
- Apply felt tape to the radio and/or edge of the radio trim plate at the point(s) of contact.

Noise Diagnosis - Seat (Head Restraint Rattle)

Head Restraint Rattle



397223

Symptom:

Rattle coming from the head restraint area.

Possible Cause:

Head restraint posts rattling in the receiver holes.

Diagnosis:

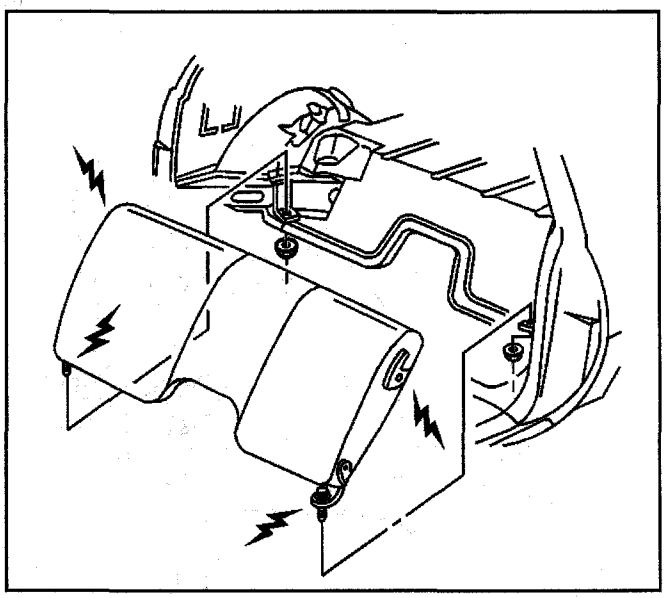
Test drive the vehicle, and apply pressure to the head restraint.

Corrective Action:

- Remove the head restraint.
- Bend the posts approximately 25.4 mm (1.0 in) outward. This pre-loads the posts in the receiver holes.

Noise Diagnosis - Seat (Rear Seatback Cushion Rattle)

Rear Seatback Cushion Rattle



397226

Symptom

Rattle from the rear seatback rest area.

Possible Cause

- Check for the seat belt buckle hitting the seat trim.
- Rear seatback is not in tension against to the striker bolt. This allows the latch to rattle on the striker bolt.

Diagnosis

Test drive the vehicle, apply pressure to the rear seatback, listen for the rattle.

Corrective Action

- Insure that the rear seat is in the proper location (rearward as far as possible).
- Loosen the lower hinge bolt.
- Push the bottom of the seat rearward and apply pressure rearward.

Notice: Refer to *Fastener Notice* Fastener Noticein Cautions and Notices.

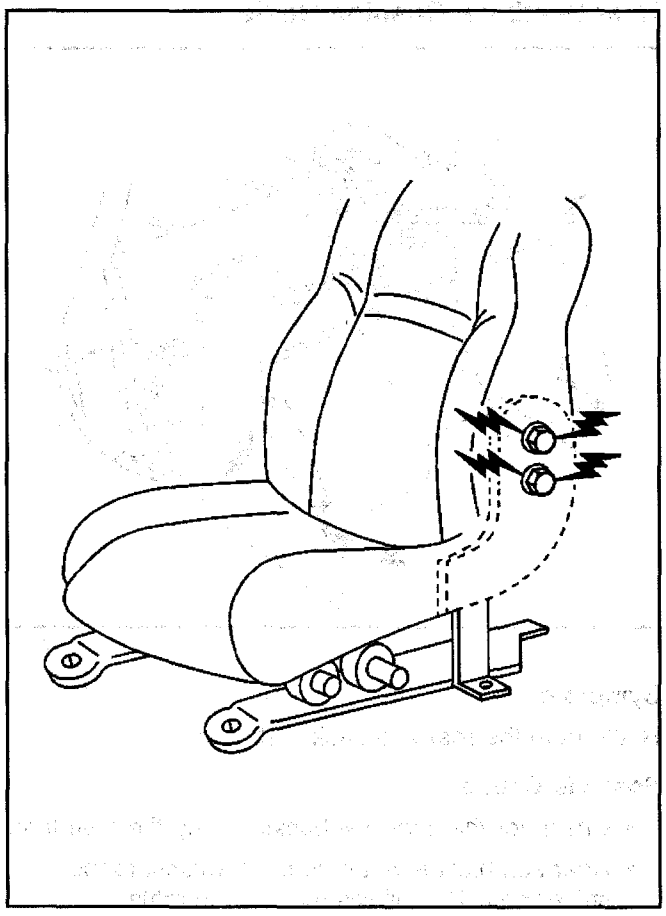
- Retighten the nuts.

  Tighten

  Tighten the pivot support nut to 24 N·m (18 lb ft).
- Reevaluate. If condition persists, loosen striker and reposition rearward as far as possible. Bend striker with mallet to create and interference fit.

Noise Diagnosis - Seat (Front Seat Creak)

Front Seat Creak



397227

Symptom

Creak heard in seat back when occupants weight shifts.

Possible Cause

Seatback hinge recliner bolts not tightened to specifications.

Diagnosis

Check bolt torque.

Corrective Action

Notice: Refer to *Fastener Notice.*

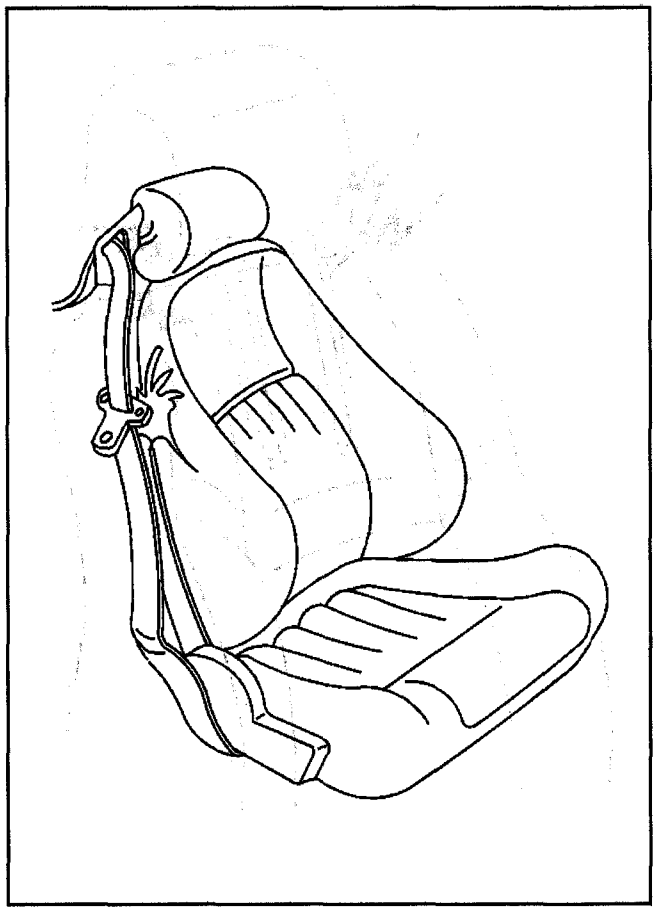
Tighten bolt to specifications.

Tighten

Tighten the seatback hinge recliner bolts to 24 N·m (18 lb ft).

Noise Diagnosis - Seat (Front Seat Belt Rattle)

Front Seat Belt Rattle



397228

Symptom

Rattle from the side of the front seat.

Possible Cause

The seat belt latch rattles against the plastic trim of the seat.

Diagnosis

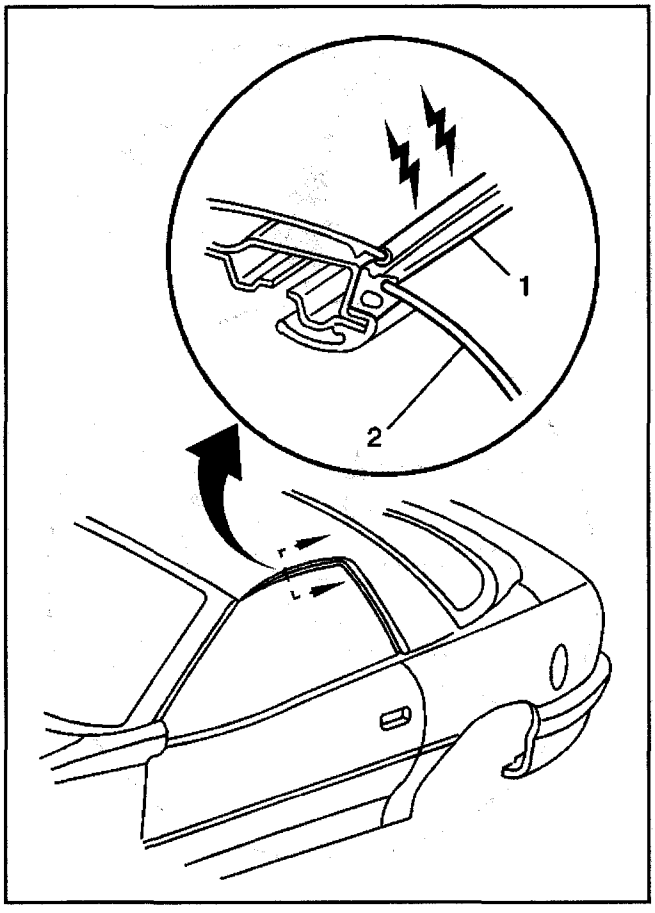
Visually inspect the seat belt latch and seat for contact.

Corrective Action

Add felt tape to the plastic part of the seat belt latch.

Noise Diagnosis - Door (Front Side Door Weatherstrip Itch)

Front Side Door Weatherstrip Itch



397252

Symptom:

Itching noise heard at the door window (1) to weatherstrip (1) interface.

Possible Cause:

Door glass (2) rubbing against the weatherstrip (1).

Diagnosis:

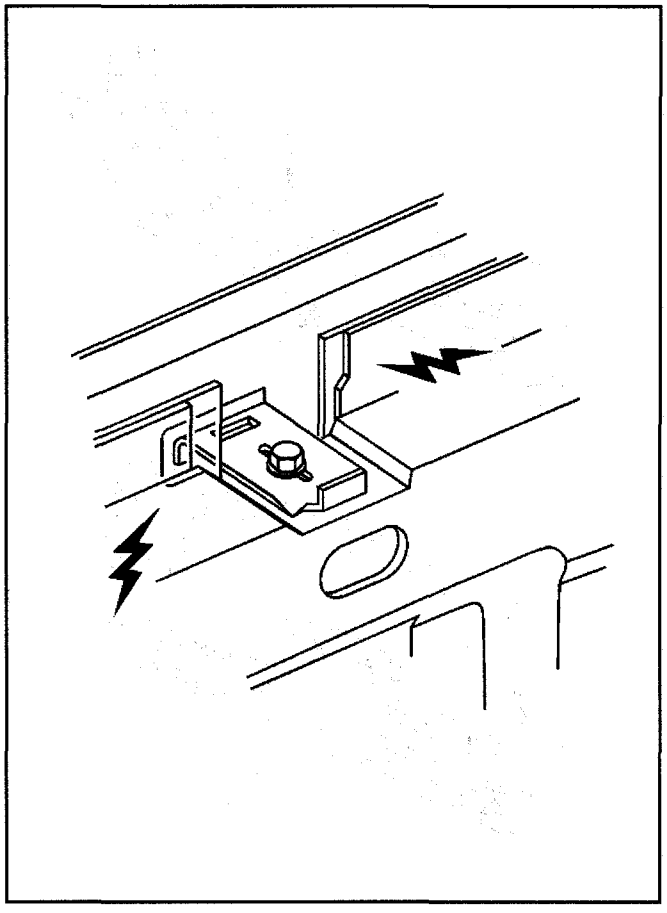
Test drive the vehicle, roll the window (2) down so it is just off the weather-strip (1).

Corrective Action:

Apply Krytox weatherstrip lubricant (GM P/N 9985767) to weatherstrip/glass interface. Use Krytox oil only, after application, let stand 30 minutes. Wipe off excess.

Noise Diagnosis - Door (Front Side Door Glass Rattle)

Front Side Door Glass Rattle



397256

Symptom

Rattle coming from the bottom of the door to door glass area when the window is completely up.

Possible Cause

The window guide stabilizer is not adjusted properly.

Diagnosis

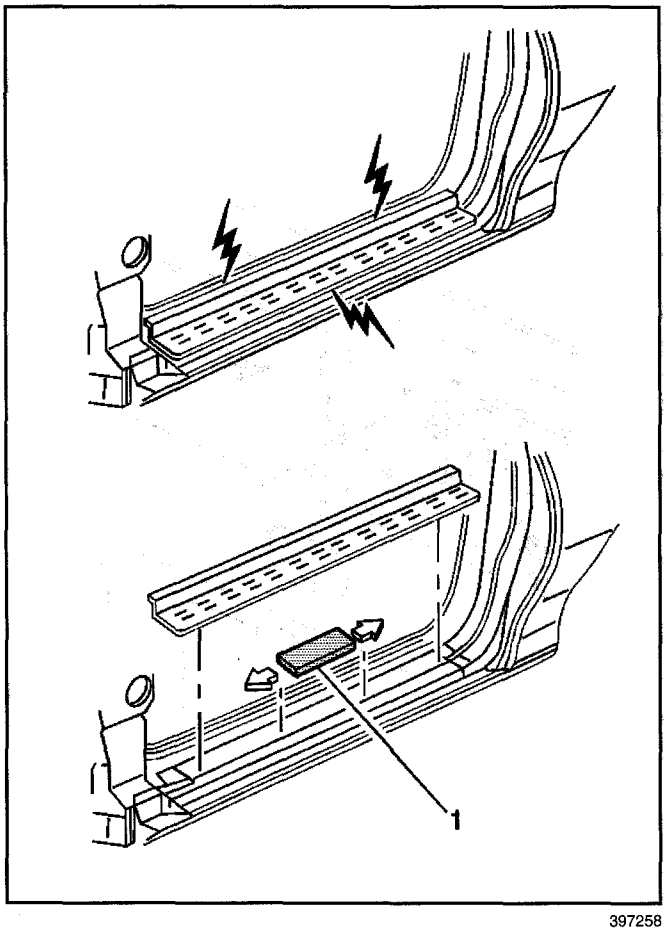
Close door completely. Push on the bottom of the door glass to check for movement.

Corrective Action

- Adjust the window guide stabilizer.
- The stabilizers should be adjusted to 18.5 mm (0.73 in) from the inner edge of the door to the back of the stabilizer.
- If symptom continues, replace the window guide stabilizer.

Noise Diagnosis - Door (Side Door Sill Plate Buzz)

Side Door Sill Plate Buzz



397258

Symptom

Buzzing sound coming from the lower door area.

Possible Cause

- The side door sill plate is loose and emits a buzzing sound.
- The clips on the sill plate are broken.

Diagnosis

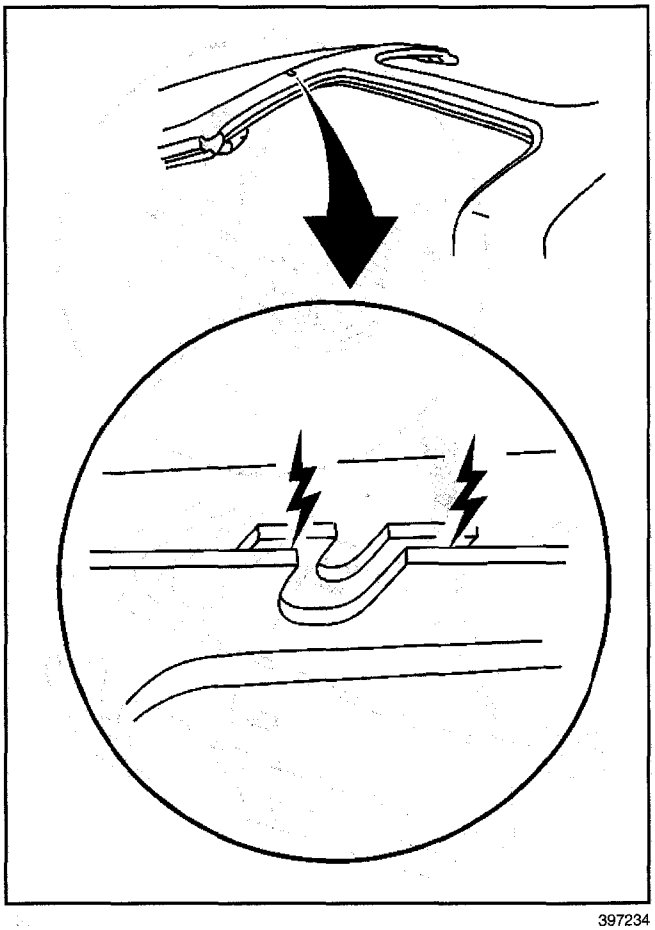
Open door, push sill plate back and forth to check for movement.

Corrective Action

- Place foam tape underneath the plate in sensitive areas.
- Replace the sill plate.

Noise Diagnosis - Roof (Header Sheet Meltal Tap)

Header Sheet Metal Tap



397234

Symptom:

A tapping sound is heard along the windshield header.

Possible Cause:

Sheet metal is tapping.

Diagnosis:

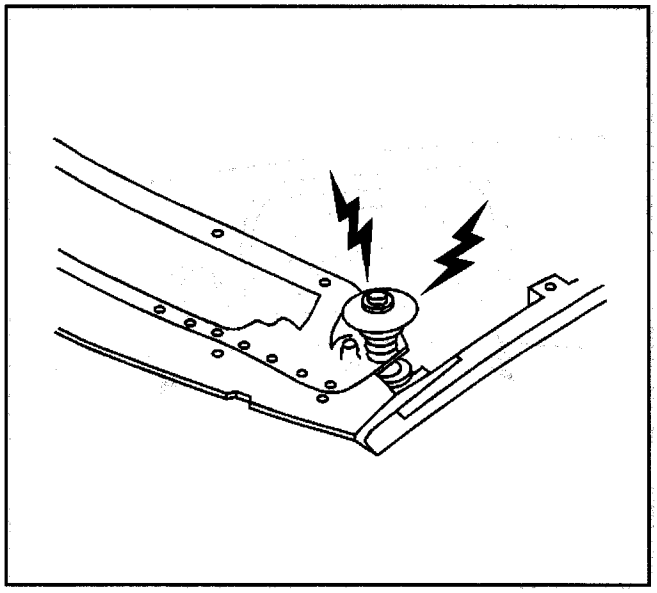
Test drive the vehicle and pry on location shown.

Corrective Action:

Pry apart the two layers of metal.

Noise Diagnosis - Roof (Folding Top Creak)

Folding Top Creak



397236

Symptom

Creak sound coming from the #1 bow.

Possible Cause

The #1 bow to side rail bolt is loose.

Diagnosis

Check torque on the side rail bolt.

Corrective Action

- Apply blue LOCTITE® to the side rail bolt.

Notice: Refer to *Fastener Notice* Fastener Noticein Cautions and Notices.

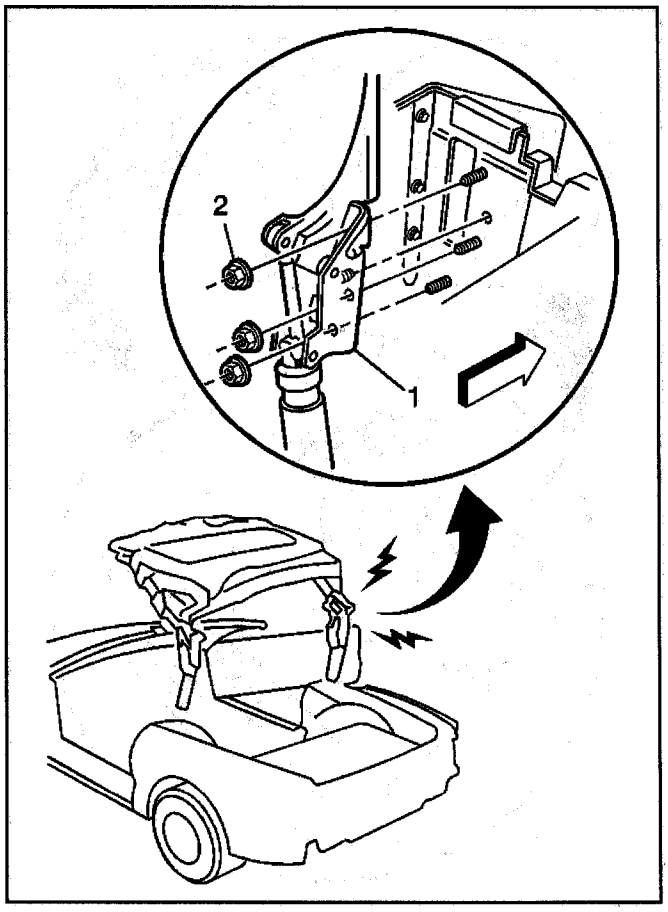
- Tighten the side rail bolt to specification.

  Tighten

  Tighten the side rail bolt to 17 N·m (13 lb ft).

Noise Diagnosis - Roof (Creak Or Rattle In B-Pillar Area)

Creak Or Rattle In B-Pillar Area



397239

Symptom

- Rattle in the B-pillar area.
- Creak in the B-pillar area.

Possible Cause

Folding top pivot bracket bolts (2) may be loose.

Diagnosis

Check pivot bracket bolt for looseness.

Corrective Action

Notice: Refer to *Fastener Notice* Fastener Noticein Cautions and Notices.

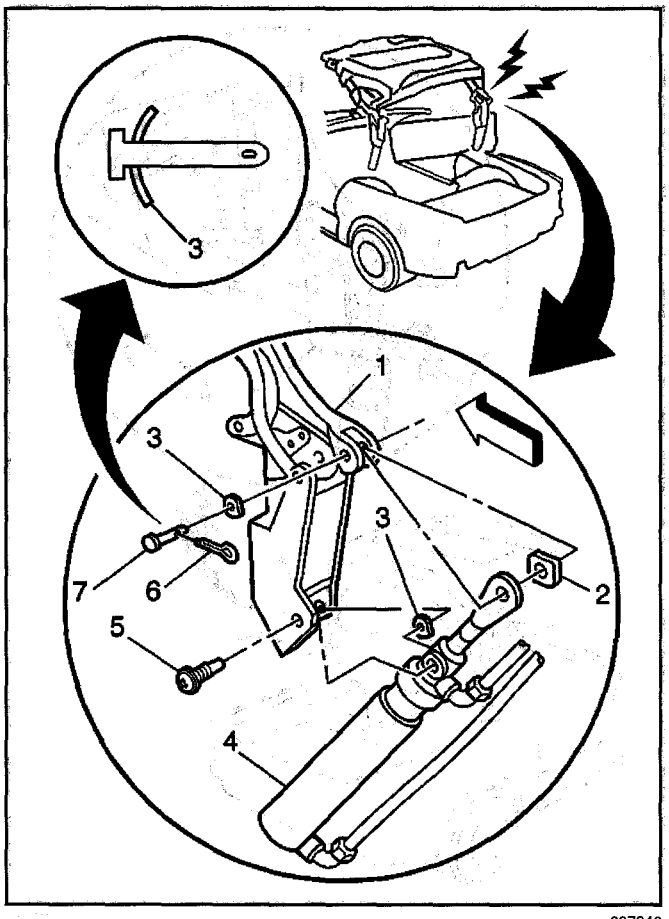
Tighten the pivot bracket bolt to specification.

Tighten

Tighten the pivot bracket bolt to 27 N·m (20 lb ft).

Noise Diagnosis - Roof (Creak Or Rattle In B-Pillar Area)

Creak Or Rattle In B-Pillar Area



397246

Symptom

- Ratle in the B-pillar area.
- Creak in the B-pillar area.

Possible Cause

- Folding top cylinder pivot pin (7) is dry.
- Spring washer (3) may not be installed properly.
- Folding top cylinder bolt (5) is loose.

Diagnosis

- Check cylinder bolt (5) for looseness.
- Check spring washer (3) for correct orientation.

Corrective Action

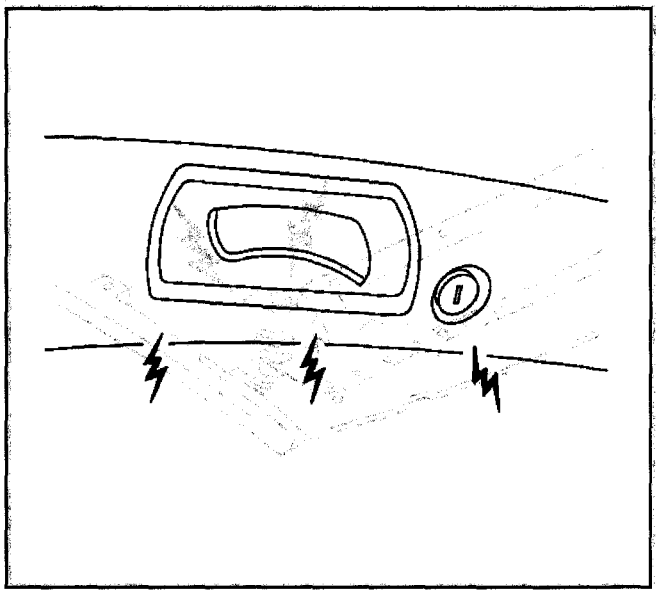
- Lubricate the cylinder pivot pin (7).
- Tighten the cylinder bolt (5) to specification.

  Tighten

  Tighten the cylinder bolt (5) to 50 N·m (37 lb ft).

Noise Diagnosis - Roof (T-Top Handle/Lock Mechanism Rattle)

T-Top Handle/Lock Mechanism Rattle



397274

Symptom

Over modeate to rough road surfaces, a tapping sound or rattle is heard in the t-top handle location.

Possible Cause

- Looseness in riveted joints between the crank plate and rods (front and rear).
- Flat spring and/or lock bracket is contacting the lock rod(s).

Diagnosis

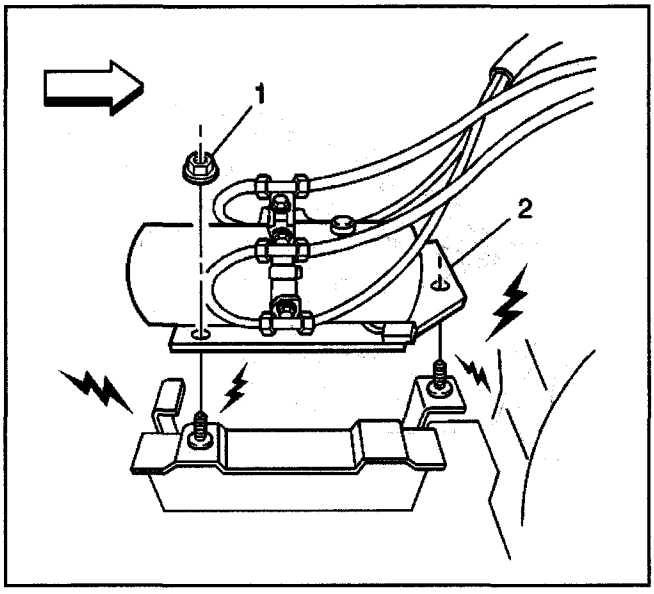
- Inspect for looseness in the riveted joints (front and rear).
- Look for witness marks and lock rod contact to the flat spring and/or lock bracket.

Corrective Action

- Vehicles that have looseness in the riveted joints, order and install new T-tops.
- Flock interfaces between the flat spring and lock bracket and rod(s) so rod(s) do not contact.

Noise Diagnosis - Rear of Vehicle (Folding Top Pump Rattle)

Folding Top Pump Rattle



397250

Symptom:

Rattle coming from the rear of the vehicle.

Possible Cause:

- Folding top pump mounting nuts (1) loose or missing.
- Mounting stud(s) missing or broken.

Diagnosis:

Visually inspect for mounting studs and nuts (1).

Corrective Action:

- Replace missing or broken studs with bolts.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

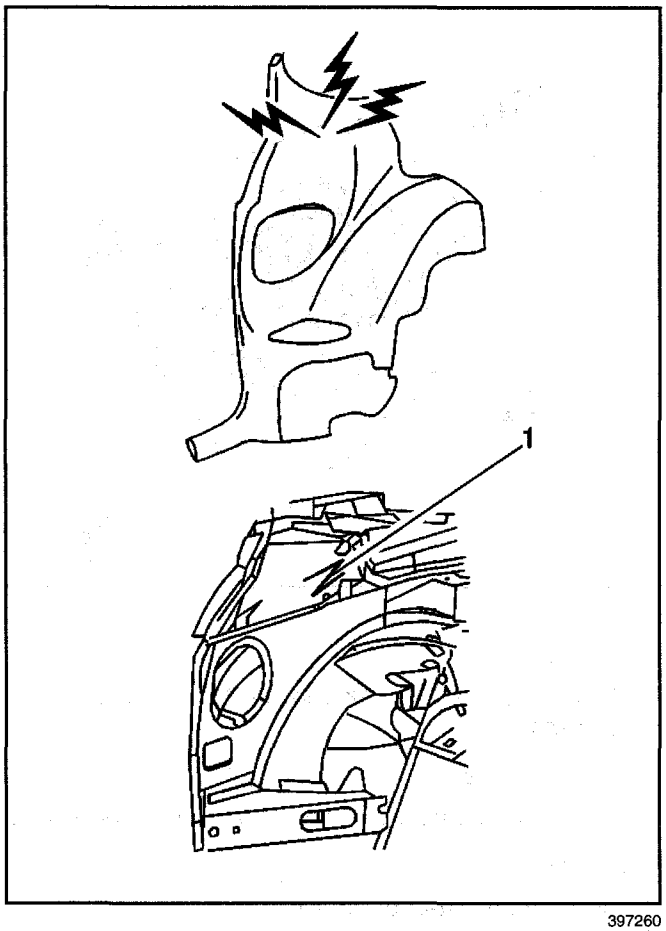
- Tighten the mounting nuts to specification.

  Tighten

  Tighten the pump mounting nuts (1) to 6 N·m (53 lb in).

Noise Diagnosis - Rear of Vehicle (Passenger Side B-Pillar Creak)

Passenger Side B-Pillar Creak



397260

Symptom

Creak coming from the upper B-pillar/roof area on the passenger side. Usually only happens over 16°C (60°F) ambient temperature.

Possible Cause

Sheet metal interference in the middle to the upper area of the B-pillar.

Diagnosis

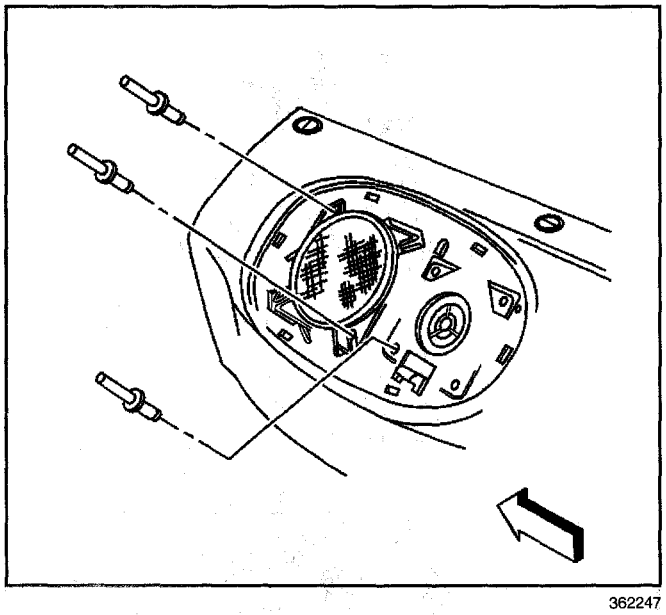
Remove B-pillar quarter inner trim finishing panel. Test drive the vehicle, listen for noise over rough roads.

Corrective Action

Strike the B-pillar sheet metal, inside the vehicle, with a ball peened hammer to put a slight indentation in the inside body panel.

Noise Diagnosis - Rear of Vehicle (Radio Rear Speaker Rattle)

Radio Rear Speaker Rattle



362247

Symptom

Rattle from the rear speaker located on the rear quarter trim panel.

Possible Cause

The rivets do not hold well due to improper installation.

Diagnosis

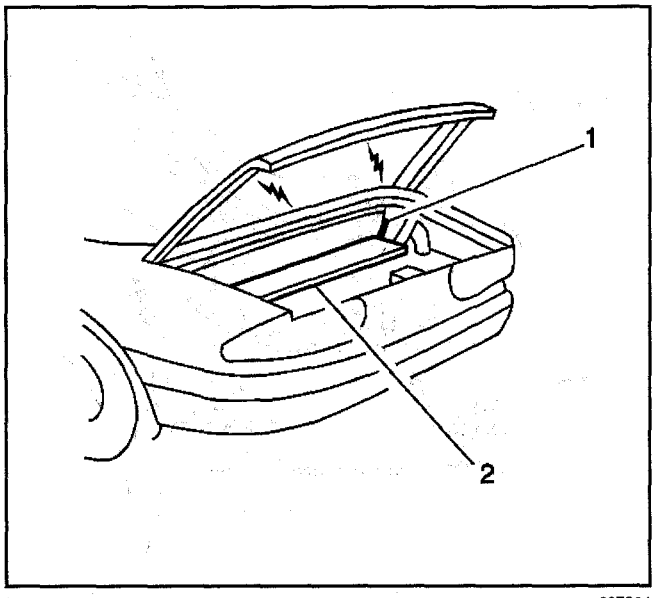
- Remove the rear quarter trim.
- Check speaker attachment to the trim for looseness.

Corrective Action

Install new rivets or isolation material as necessary.

Noise Diagnosis - Rear of Vehicle (Rear Compartment Closeout Panel Rattl)

Rear Compartment Closeout Panel Rattle



397264

Symptom

Rattle from the rear of the vehicle.

Possible Cause

Rear compartment closeout panel (2) rattles against the side trim.

Diagnosis

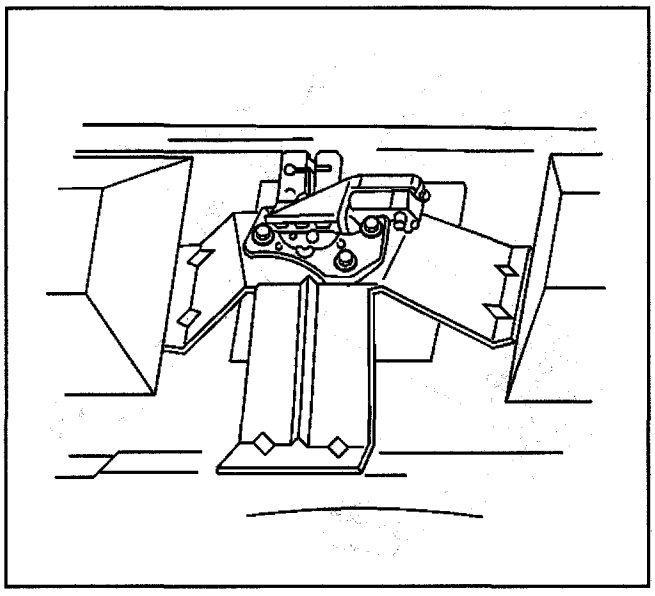
Remove the closeout panel (2) and test drive the vehicle.

Corrective Action

Apply a 2 in x 5

Noise Diagnosis - Rear of Vehicle (Hatch Rattle)

Hatch Rattle



397266

Symptom

A rattle coming from the rear hatch area.

Possible Cause

- The hatch latch is not in the correct position, both cross-car and up/down.
- Overslam bumpers are not properly set.

Diagnosis

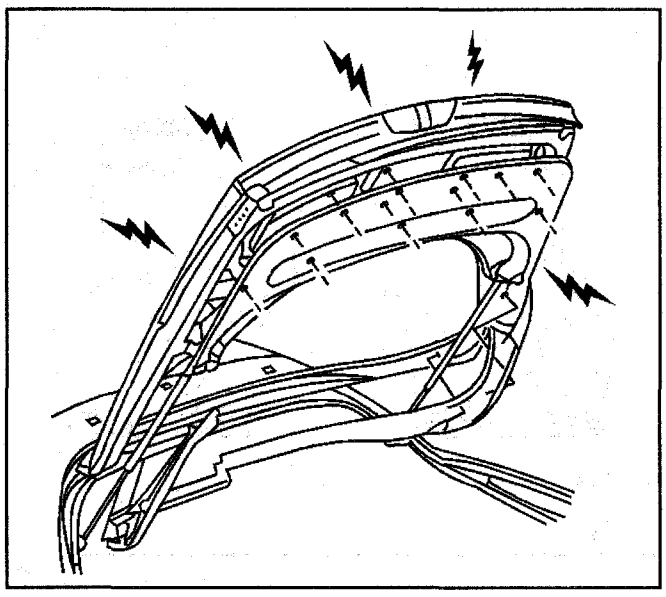
Test drive the vehicle and, with the aid of a helper, push up on the rear compartment lift window panel to stop the noise.

Corrective Action

- Loosen the latch.
- Center with the striker and retighten. Be sure to provide equal clearance to the latch sides.
- Lower the lift window pane and run bumpers out to a point that a single piece of paper can barely be pulled out when the rear panel is fully closed.

Noise Diagnosis - Rear of Vehicle (Rear Compartment Lift Window Panel Co)

Rear Compartment Lift Window Panel Cover Rattle



397267

Symptom

Rattle from the rear compartment trim area.

Possible Cause

Trim is loose due to misinstalled or missing fasteners.

Diagnosis

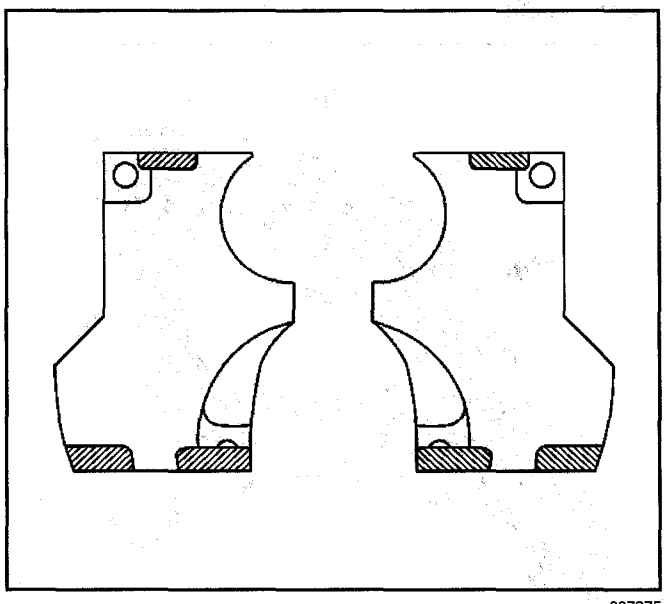
Carefully pull the rear compartment trim down to view behind, look for misinstalled or missing fasteners.

Corrective Action

Install new fastener.

Noise Diagnosis - Rear of Vehicle (Rear Quarter Panel Styrofoam Itch)

Rear Quarter Panel Styrofoam Itch



397275

Symptom

High pitched itch coming from the rear (right, left or both) of the vehicle over moderate to rough roads. Sounds similar to sheet metal joint creaks.

Possible Cause

The stryofoam inserts located behind the quarter trim panel are contacting and rubbing against the quarter inner sheet metal surfaces.

Diagnosis

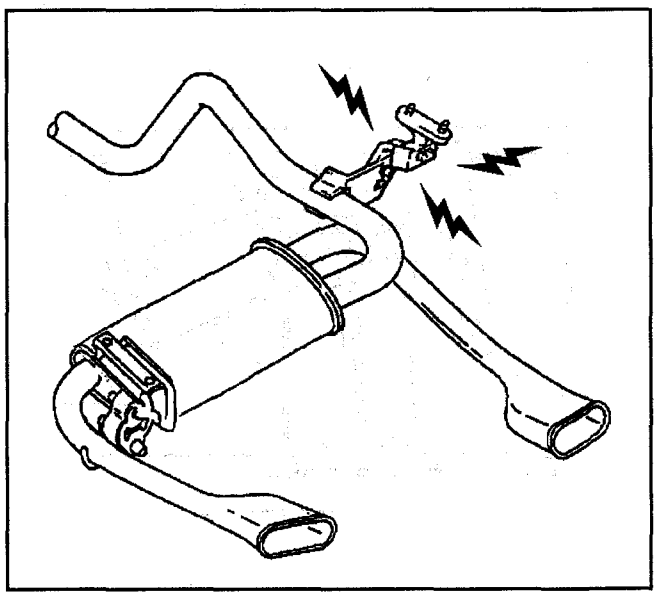
Look for witness marks on the styrofoam insert of the quarter panel inner sheet metal surface.

Corrective Action

Apply 3 pieces of 30 x 80 mm GM 6068M closed cell foam (P/N 22638774) or similar isolation material at specified location. Wrap foam around edges approximately 1/4 inch.

Noise Diagnosis - Under Vehicle (Exhaust Hanger Rattle)

Exhaust Hanger Rattle



397269

Symptom:

Rattle from the underside of the vehicle.

Possible Cause:

The slots on the exhaust hangers increase in size over time.

Diagnosis:

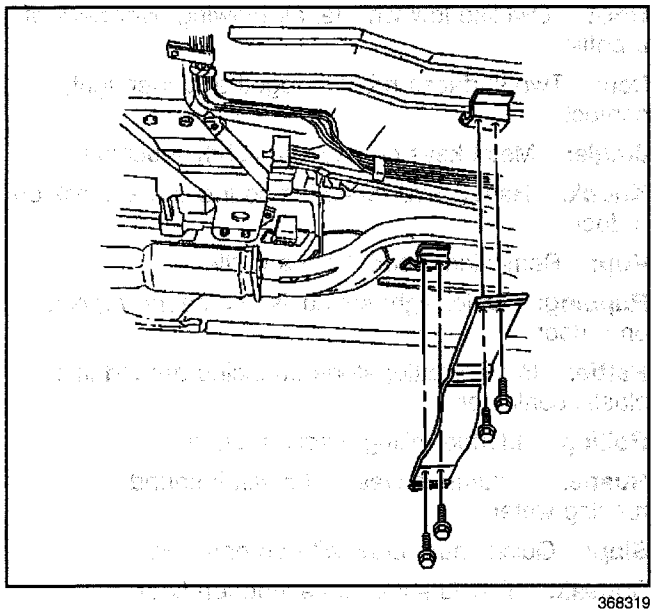
Visual inspection for excessive gap in exhaust hanger where exhaust system blade is inserted.

Corrective Action:

Replace hanger(s).

Noise Diagnosis - Under Vehicle (Exhaust Pipe Rattle)

Exhaust Pipe Rattle



368319

Symptom

Underbody rattle.

Possible Cause

The exhaust system intermediate pipe is hitting the cross brace.

Diagnosis

Look for witness marks on the pipe and cross brace. Minimum clearance between the pipe and the brace should be:

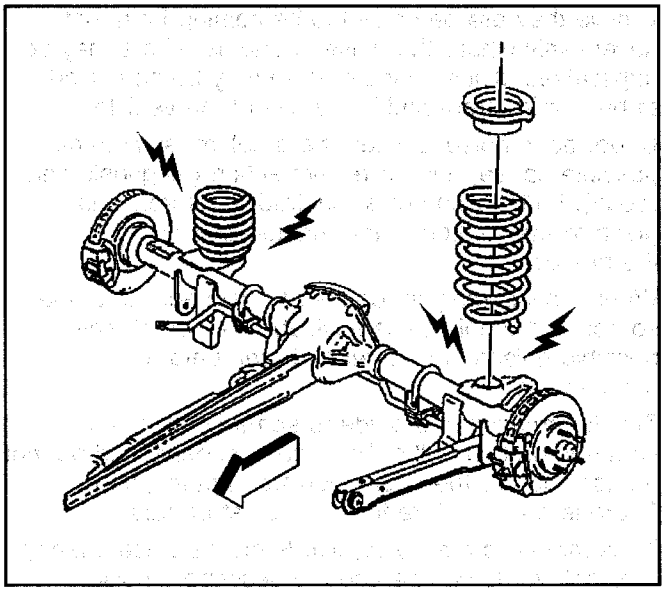
- For the 3800 V6 the specification is 19.0 mm (0.748 in)
- For the 5.7L V8 the specification is 14.0 mm (0.551 in)

Corrective Action

- Reposition exhaust system to provide minimum clearance using the above specifications.
- Loosen the slip joint, converter bracket hanger and take down pipe to manifold.
- Raise exhaust system with a single post jack.
- Retighten the system starting with the converter bracket, then tighten the take downs at the manifolds, lastly tighten the pipe clamp.

Noise Diagnosis - Under Vehicle (Rear Suspension Clunk)

Rear Suspension Clunk



397273

Symptom

A clunk is heard in the rear of the vehicle.

Possible Cause

- Spring isolator is mispositioned.
- A rear suspension component is not tighten to specification.

Diagnosis

- Visually inspect the isolator position on top of the spring. The spring tail end should be pointed forward.
- Check all rear suspension attachments for proper torque.

Corrective Action

Tighten all bolts, nuts to specifications.

Description and Operation

Noise Description

Noises are listed in this section under the area of the vehicle they are perceived to be coming from, not necessarily where the noise ordinates. There may be duplications since a single noise may be perceived to be coming from multiple areas of the vehicle.

Under each noise is listed the problem (symptom), possible cause, and corrective action (diagnosis and repair). If disassembly is required, a reference is given to the section in the manual describing the process.

When disassembly is required to gain access to the source of the noise, it is advisable to correct other possible noises in that general area before reassembly.

This information is a guide to some of the more common problems that have been experienced but not a substitute for the user's powers of perception. There is no substitute for a good set of ears.

To communicate a noise, words must be used. Many different words can be used to describe a noise. The noise description table lists noises and their description as used in the book.

Bang: Wooden screen door slamming

Buzz: A flying bumblebee

Chatter: Windshield wiper on a dry windshield

Chirp: A bird, or a cricket

Clunk: A heavy door closing

Creak: Rusty door hinge opening

Hoot: Owl like low whistle; air blowing over neck of a bottle

Itch: Two surfaces rubbing together under light contact

Jingle: Metal keys on key ring lightly touching

Knock: Heavy loud repeating sound like a knock on a door

Pop: Removing a cork from a bottle

Rapping: Quick light sound like someone rapping on a door

Rattle: Baby's rattle; stone bouncing around in a plastic container

Rolling: Marble rolling across a table

Rustle: Autumn leaves in the wind; sound of rushing water

Slap: Quick sharp blow with an open hand

Squeak: Tennis shoes on a wooden floor

Thump: A deep muffled knock such as a wooden bat hitting a tire

Ticking: Clock; tapping pencil lead on a table

Stationary Windows

Specifications

Fastener Tightening Specifications

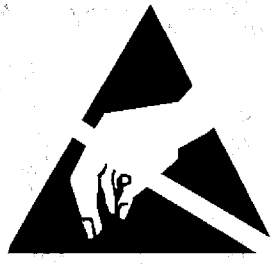
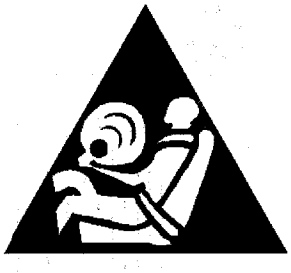
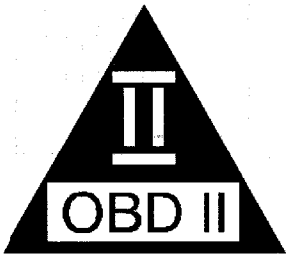
Application	Specification	
	Metric	English
Garnish Molding Screw	1.7 N·m	15 lb in

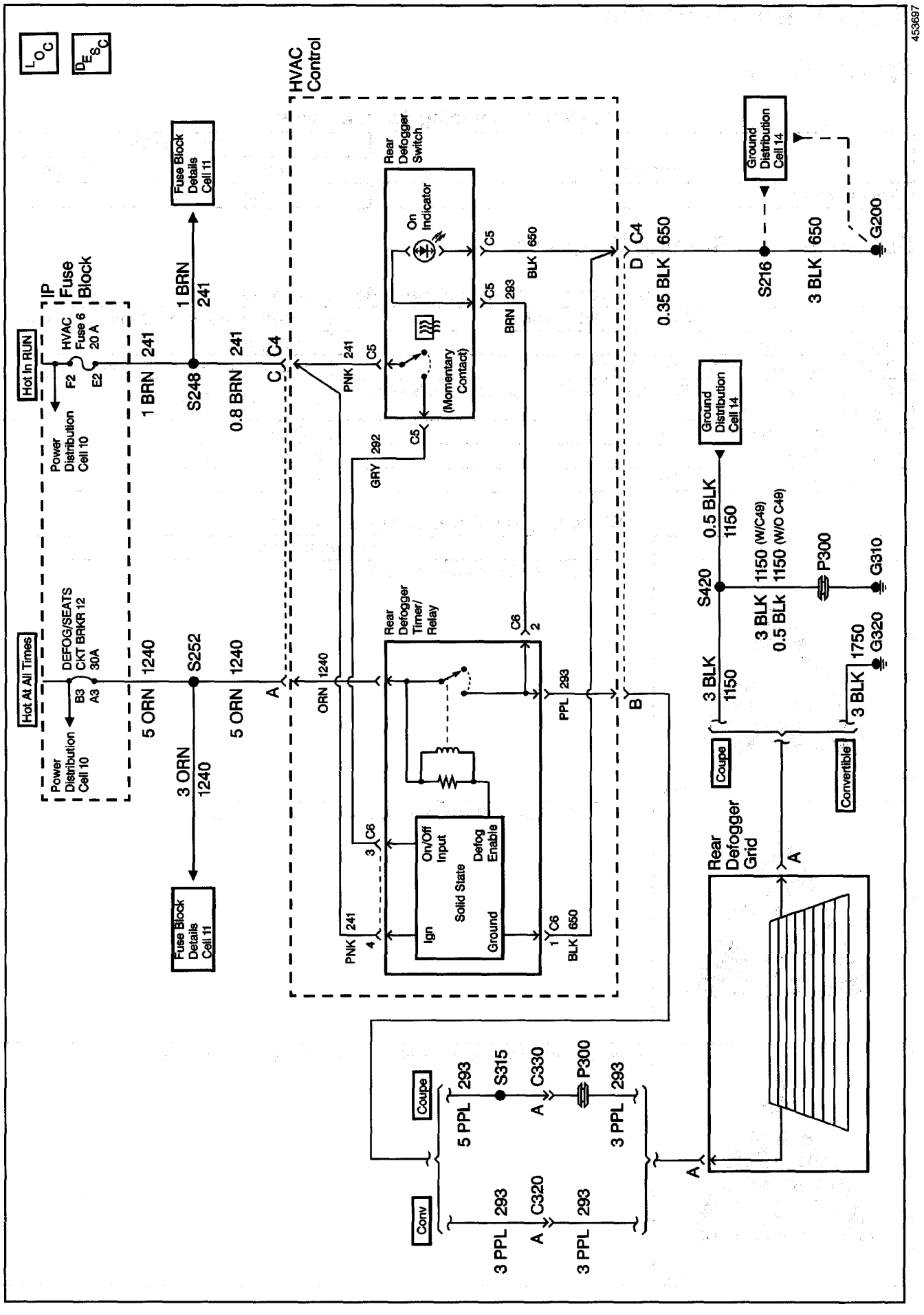
Schematic and Routing Diagrams

Stationary Windows Schematic References

Reference on Schematic	Section Number - Subsection Name
Ground Distribution Cell 14	8-Wiring Systems
HVAC Blower Controls Schematics Cell 63	1-Heater and Ventilation (without A/C)
HVAC Compressor Controls Schematics/HVAC Compressor/Condener Fan Controls Schematics Cell 64	1-HVAC with A/C Manual
Memory Seats Schematics Cell 141	8-Seats
Power Distribution Cell 10	8-Wiring Systems
Power Seats Schematics Cell 140	8-Seats

Stationary Windows Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Caution and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Caution and Notices.
 19385	Refer to *OBD II Symbol Description Notice* in Caution and Notices.


Defogger Schematics (Cell 61)
453697
LOC
DESC
HVAC Control
IP Fuse Block
Hot In RUN
HVAC Fuse 6 20 A
F2
E2
Power Distribution Cell 10
Hot At All Times
DEFOG/SEATS CKT BRKR 12 30A
B3
A3
Fuse Block Details Cell 11
Rear Defogger Switch
On Indicator
(Momentary Contact)
Rear Defogger Timer/ Relay
On/Off Input
Defog Enable
Solid State
Ign
Ground
Ground Distribution Cell 14
Rear Defogger Grid
Coupe
Conv
Convertible
1 BRN
241
0.8 BRN
5 ORN
3 ORN
1240
PNK
GRY
292
293
PPL
BLK
650
0.35 BLK
0.5 BLK
1150
1150 (W/C49)
1150 (W/O C49)
3 BLK
1750
5 PPL
3 PPL
S248
S252
S315
S420
S216
P300
G200
G310
G320
C4
C5
C6
C330
C320

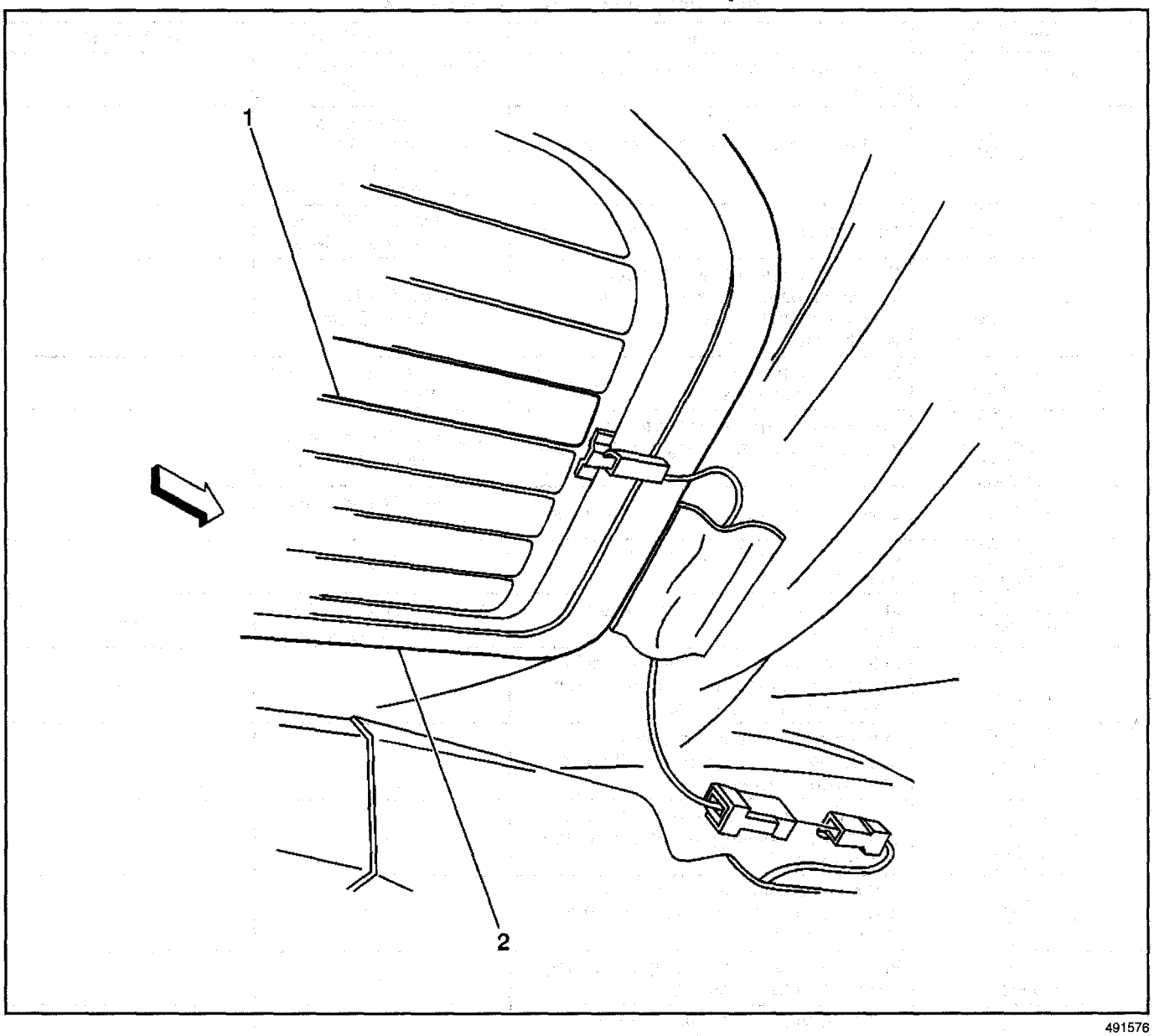
Component Locator

Stationary Windows Components

Name	Location	Locator View	Connector End View
HVAC Control	In the center of the instrument panel, above the radio	*HVAC Component Views* in HVAC	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Rear Defogger Grid	Mounted on the rear windshield	*Stationary Windows Component Views*	—
C320 (1 cavity) Convertible	Convertible rear defogger jumper to instrument panel harness, under left interior trim molding, above left rear wheelhouse	*Harness Routing Views* in Wiring Systems	—
C330 (2 cavities) Coupe	Hatch to instrument panel harness, center of roof near dome lamp	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G310	Bolted to the roof, left of the dome lamp	*Harness Routing Views* in Wiring Systems	—
G320	Bolted to the roof, to the left of the dome lamp	—	—
P300	In the rear center of the roof, near the dome lamp	*Harness Routing Views* in Wiring Systems	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S248	In the instrument panel harness, approximately 2 cm (1 in) from the radio connectors breakout	—	—
S252 (Coupe)	In the instrument panel harness, main branch, approximately 33 cm (13 in) from G305 breakout	—	—
S252 (Convertible)	In the instrument panel harness, main branch, approximately 48 cm (19 in) from G200 breakout	—	—
S315 (Coupe)	Instrument panel harness, approximately 19 cm (7 in) back from C330	—	—
S420	In the hatch harness, main branch, approximately 7 cm (3 in) from P300 breakout	—	—

Stationary Windows Component Views

Inside Rear Convertible Top



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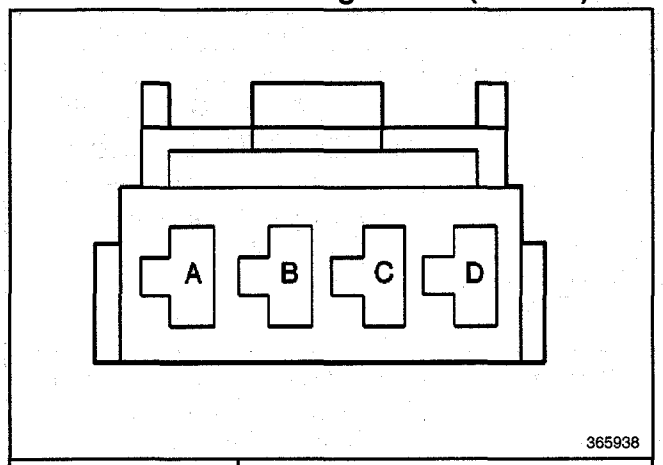
Legend

(1) Rear Defogger Grid

(2) Folding Top Glass

Stationary Windows Connector End Views

Rear Window Defog Switch (Pontiac)



Connector Part Information	• 12015664 • 4 Way F Metri-Pack 630 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	ORN	1240	Fuse Output—Battery—Type III fuse
B	PPL	293	Rear Defogger Element Feed
C	BRN	241	Fuse Output—Ignition 3—Type 3 Fuse
D	BLK	650	Ground

Diagnostic Information and Procedures

Defogger System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Start the engine.	• The defogger ON indicator is off. • The defogger is off.	• *Defoggers Always On - Rear Window (With Ignition in RUN)* • *Defogger Indicator Always On*
2	1. Press and release the defogger switch 1 time. 2. Wait approximately 11 minutes.	• The defogger ON indicator comes on. • The defoggers come on. • The defogger ON indicator and the defogger turns off after 10 minutes.	• *Defogger Indicator Inoperative* • *Defoggers Inoperative - Rear Window*
3	1. Press and release the defogger switch 1 time. 2. Wait 6 minutes.	• The defogger ON indicator comes on. • The defoggers come on. • The defogger ON indicator and the defoggers turn off after 5 minutes.	• *Defogger Indicator Inoperative* • *Defoggers Inoperative - Rear Window* • *Defogger Indicator Always On* • *Defoggers Always On - Rear Window (With Ignition in RUN)*
4	1. Press and release the defogger switch 1 time. 2. Wait approximately 15 seconds. 3. Press and release the defogger switch a second time. This must be done before time-out occurs.	• The defogger ON indicator comes on. • The defoggers come on. • Pressing the switch for the second time causes the defogger ON indicator and the defoggers to turn off immediately.	• *Defogger Indicator Inoperative* • *Defoggers Inoperative - Rear Window* • *Defogger Indicator Always On*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Defoggers Always On - Rear Window (With Ignition in RUN)

Step	Action	Value(s)	Yes	No
1	Was the entire Defogger System Check performed?	—	Go to *Step 2*	Go to *Defogger System Check*
2	1. Turn the ignition switch to the OFF position. 2. Disconnect the HVAC control connector C4. 3. Turn the ignition switch to the RUN position. Is the rear defogger on?	—	Go to *Step 3*	Go to *Step 4*
3	Repair the short to B+ in circuit 293. Is the repair complete?	—	Go to *Step 5*	—
4	Replace the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems with A/C-Manual. Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Defogger System Check*	—

Defoggers Inoperative - Rear Window

Step	Action	Value(s)	Yes	No
1	Was the entire Defogger System Check performed?	—	Go to *Step 2*	Go to *Defogger System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a test light in order to backprobe between the HVAC control connector C4 terminals A and D. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	1. Connect a test light in order to backprobe between the HVAC control connector C4 terminals C and D. 2. Turn the ignition switch to the RUN position. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Connect a test light in order to backprobe between the HVAC control connector C4 terminal A and ground. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
5	1. Connect a test light in order to backprobe between the HVAC control connector C4 terminal B and ground. 2. Press the rear defogger switch. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 10*
6	Repair a poor connection or open in circuit 241. Is the repair complete?	—	Go to *Step 15*	—
7	Repair a poor connection or open in circuit 650. Is the repair complete?	—	Go to *Step 15*	—
8	Repair a poor connection or open in circuit 1240. Is the repair complete?	—	Go to *Step 15*	—
9	Connect a test light in order to backprobe between the rear defogger grid circuits 293 and 1150/1750. Does the test light illuminate?	—	Go to *Step 11*	Go to *Step 12*
10	Replace the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems with A/C-Manual. Is the repair complete?	—	Go to *Step 15*	—
11	Replace the rear defogger grid. Refer to *Grid Line Repair.* Is the repair complete?	—	Go to *Step 15*	—
12	Connect a test light in order to backprobe between the rear defogger grid circuit 1150/1750 and B+. Does the test light illuminate?	—	Go to *Step 13*	Go to *Step 14*
13	Check for a short to ground in circuit 293. Is there a short present in circuit 293?	—	Go to *Step 16*	Go to *Step 17*
14	Repair a poor connection or open in circuit 1150/1750. Is the repair complete?	—	Go to *Step 15*	—
15	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Defogger System Check*	—
16	Repair a short to ground in circuit 293. Is the repair complete?	—	Go to *Step 15*	—
17	Repair a poor connection or open in circuit 293. Is the repair complete?	—	Go to *Step 15*	—

Defogger Indicator Inoperative

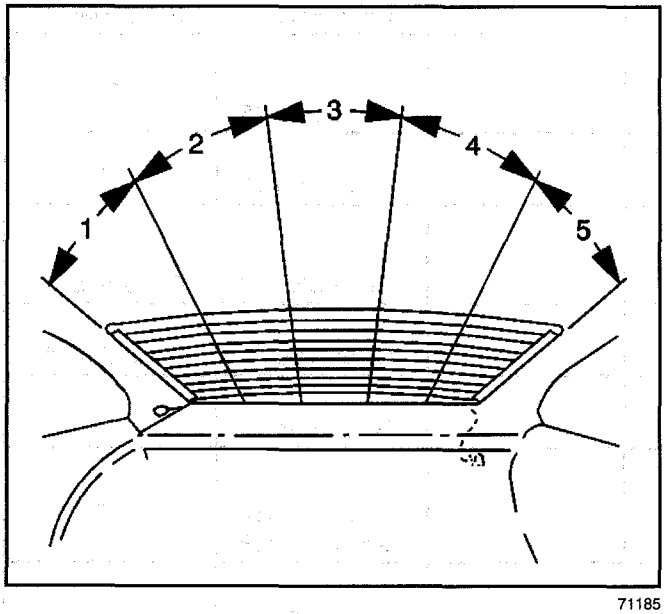
Step	Action	Value(s)	Yes	No
1	Was the entire Defogger System Check performed?	—	Go to *Step 2*	Go to *Defogger System Check*
2	Replace the HVAC control. Refer to *Control Assembly Replacement* in HVAC Systems with A/C-Manual. Is the repair complete?	—	Go to *Defogger System Check*	—

Defogger Indicator Always On

Step	Action	Value(s)	Yes	No
1	Was the entire Defogger System Check performed?	—	Go to *Step 2*	Go to *Defogger System Check*
2	1. Turn the ignition switch to the OFF position. 2. Disconnect the HVAC control connector C4. 3. Turn the ignition switch to the RUN position. Is the rear defogger on?	—	Go to *Step 3*	Go to *Step 4*
3	Repair the short to B+ in circuit 293. Is the repair complete?	—	Go to *Step 5*	—
4	Replace the HVAC control. Refer to *Control Assembly Replacement* Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Defogger System Check*	—

Defogger Grid Lines Diagnosis

Test Procedure



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1. Start the engine.
2. Activate the rear window defogger system.
3. Ground one test lamp lead.
4. Contact the other test lamp lead to each of the grid lines at points 1 through 5 as shown in the figure.

   Specification Normal Test Lamp Brilliance

   4.1. Number 1 No Bulb Brilliance
   4.2. Number 2 1/4 Bulb Brilliance
   4.3. Number 3 1/2 Bulb Brilliance
   4.4. Number 4 3/4 Bulb Brilliance
   4.5. Number 5 Full Bulb Brilliance
5. Compare the test lamp brilliance pattern with the normal test lamp brilliance in order to check for proper grid operation:

Important: The lamp brilliance will decrease proportionately to the increased resistance in the grid line as the probe is moved from the feed bus wire to the ground bus wire. Test all of the grid lines in at least two places in order to eliminate the possibility of bridging a break. The range of test lamp brilliance may vary from one window to another.

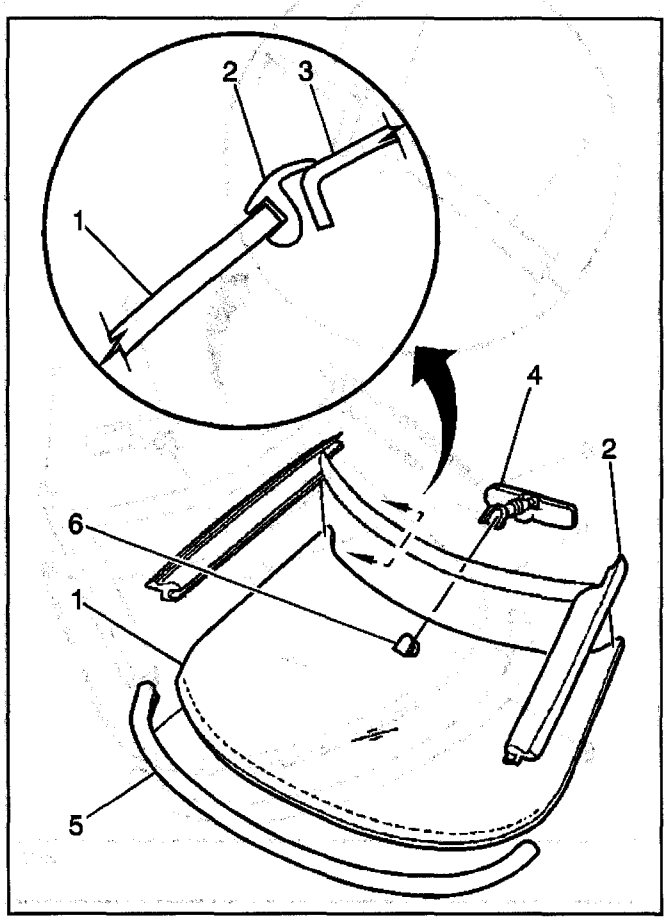
- If the test lamp shows full brilliance at both ends of the grid lines, inspect for a loose ground wire contact to body ground.
- If an abnormal lamp reading is apparent on a specific grid line, place the test lamp lead on that grid at the feed bus bar and move the lead toward the ground bus bar until the lamp goes out. This will indicate the location of the break.

Repair Instructions

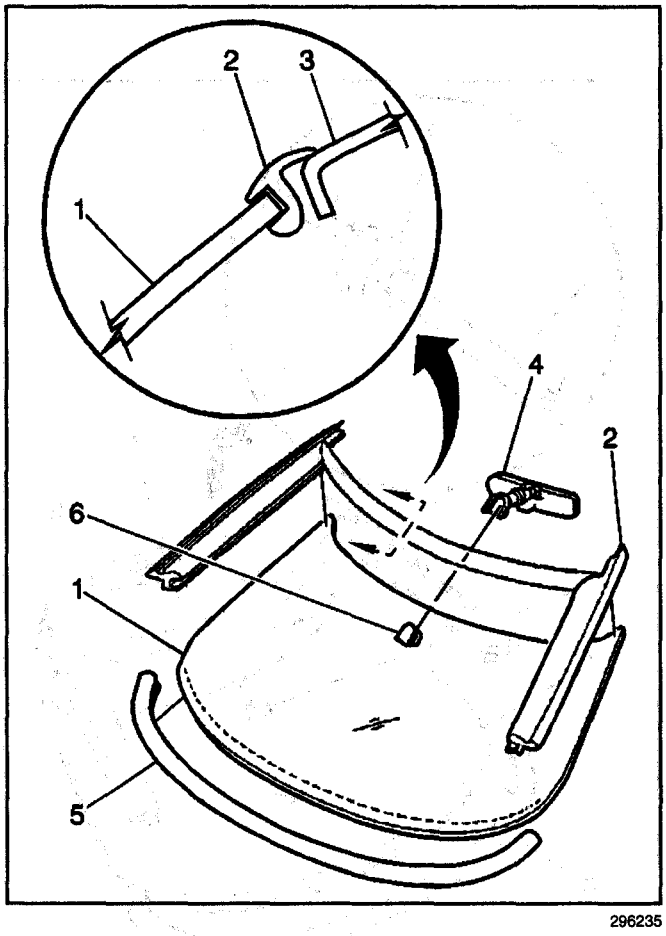
Windshield Reveal Molding Replacement

Removal Procedure

1. Use a screwdriver in order to carefully pry the end of the reveal molding (2) out approximately 76 mm (3 in) away from the body (3).
2. Use pliers in order to grasp the reveal molding (2). Slowly pull the reveal molding (2) away from the body (3).
3. Inspect the reveal molding (2).
4. If the original reveal molding (2) cannot be reused, discard the old reveal molding. Replace with a new reveal molding.
5. Pre-fit the new reveal molding. Determine and verify the location and correct size of the new reveal molding (2) on the body (3) before installation.
6. Use an alcohol-dampened cloth in order to clean the windshield (1) of all traces of urethane.



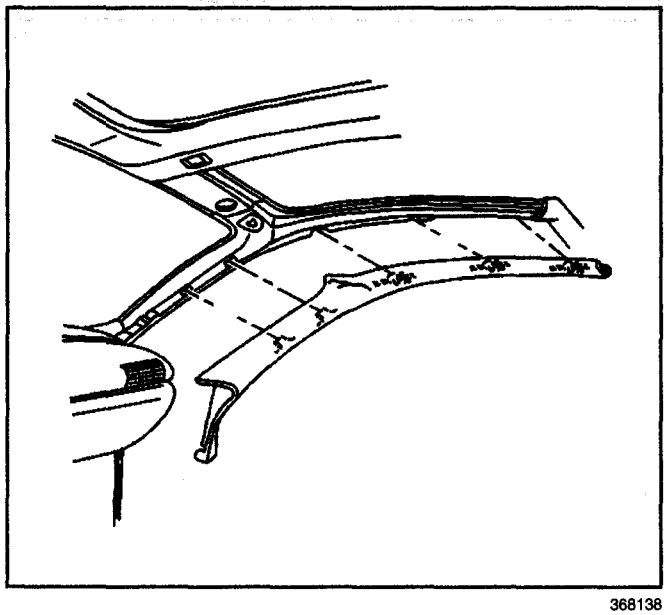
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Installation Procedure

1. Apply the glass preparation primer #1 (clear) from the urethane adhesive kit to the glass edge channel of the reveal molding (2).
2. Apply the glass primer #2 (black) from the urethane adhesive kit over the clear primer.
3. Evenly apply the urethane adhesive from the kit in the glass edge channel of the reveal molding (2) over the black primer.
4. Install the reveal molding (2).
5. Start from the center and hand press the reveal molding (2) in place over the edge of the windshield (1).
6. Apply tape in order to keep the reveal molding (2) flush with the body (3).
7. Flood the reveal molding (2) with warm water in order to accelerate the setup of the adhesive.



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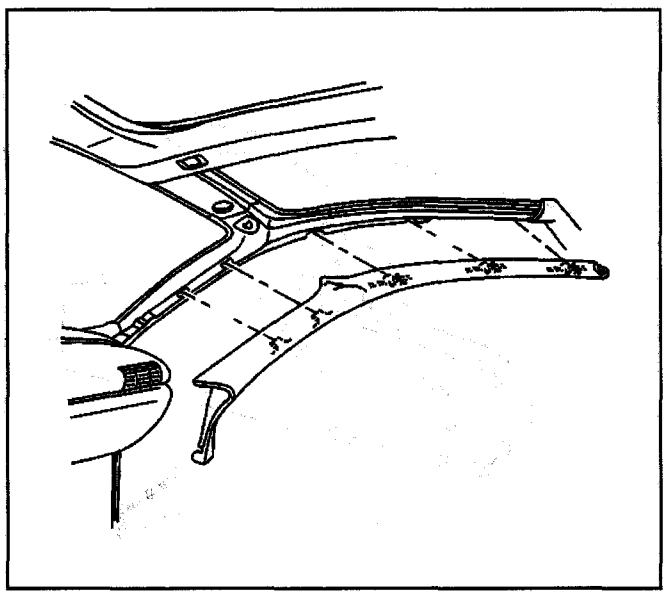
Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan)

Removal Procedure

1. Open the vehicle door.
2. Remove the windshield upper garnish molding by pulling away from the inner side frame.

Installation Procedure

1. Install the windshield upper garnish molding.
   - Align tabs on garnish molding to holes in inner side frame and apply pressure to secure.
   - Align S-clips on garnish molding to door opening flange and apply pressure to secure.
2. Close the vehicle door.

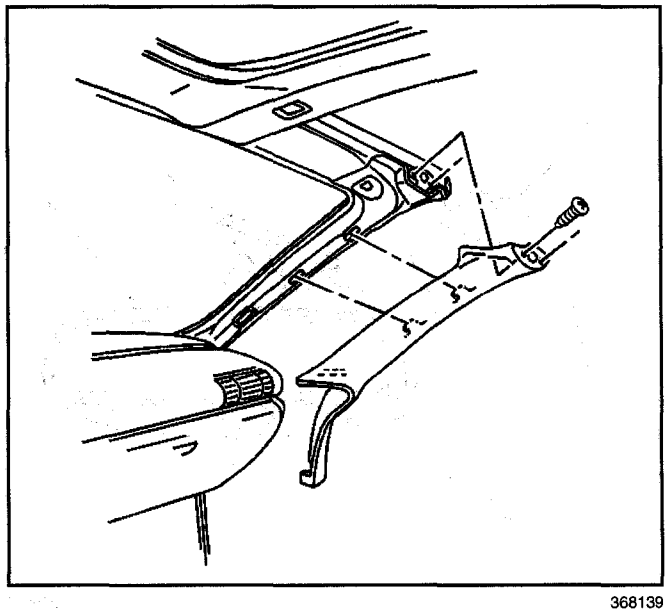


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Windshield Side Garnish Molding Replacement (With Lift Off Window Pan)

Removal Procedure

1. Open the vehicle door.
2. Remove the lift-off window panel.
3. Remove the garnish molding screws.
4. Remove the windshield upper garnish molding by pulling away from the inner side frame.



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Installation Procedure

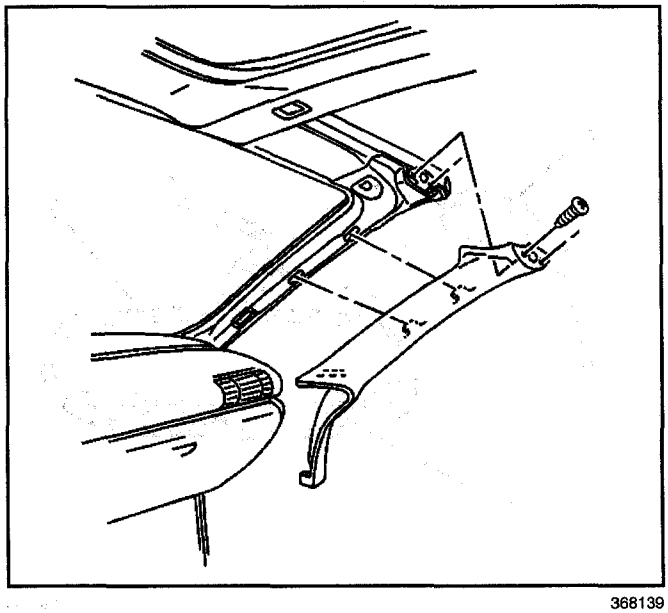
1. Install the upper garnish molding.
   - Align the clips to the holes on the inner side frame and apply pressure to secure.
   - Align S-clips on upper garnish molding to door opening flange and apply pressure to secure.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

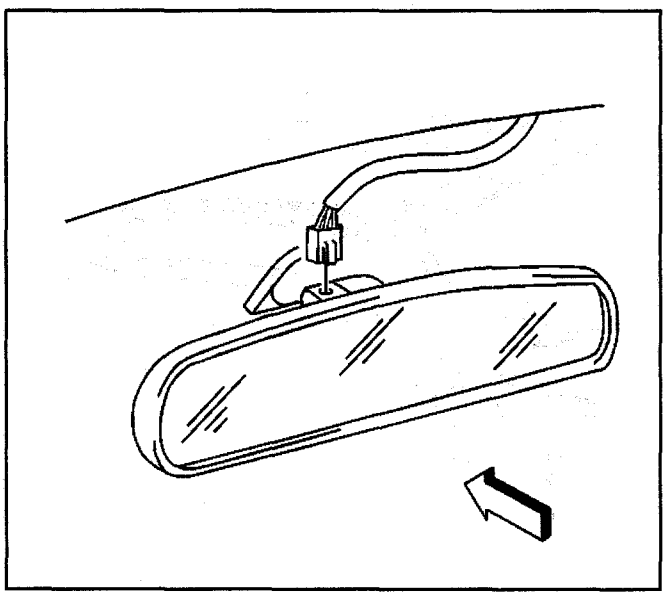
2. Install the garnish molding screws.

   Tighten

   Tighten the garnish molding screws to 1.7 N·m (15 lb in).
3. Install the lift-off window panel.
4. Close the vehicle door.



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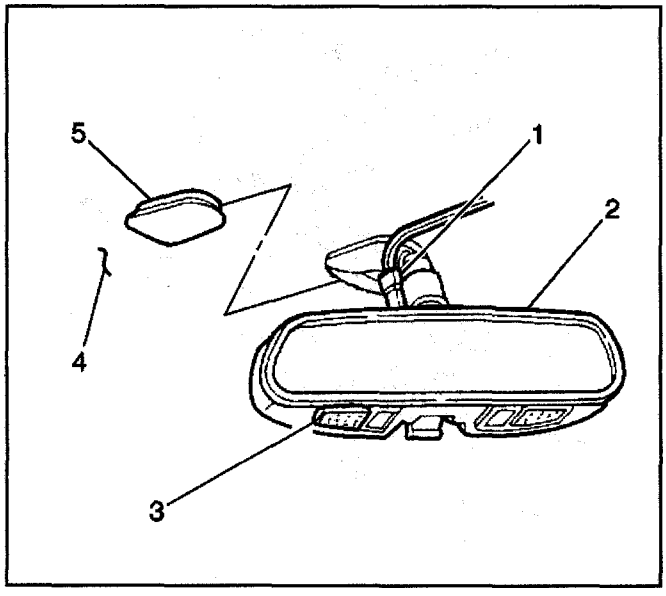
Rearview Mirror Replacement

Removal Procedure

The inside rearview mirror is fastened to an inside rearview mirror support. The inside rearview mirror support is secured to the windshield.

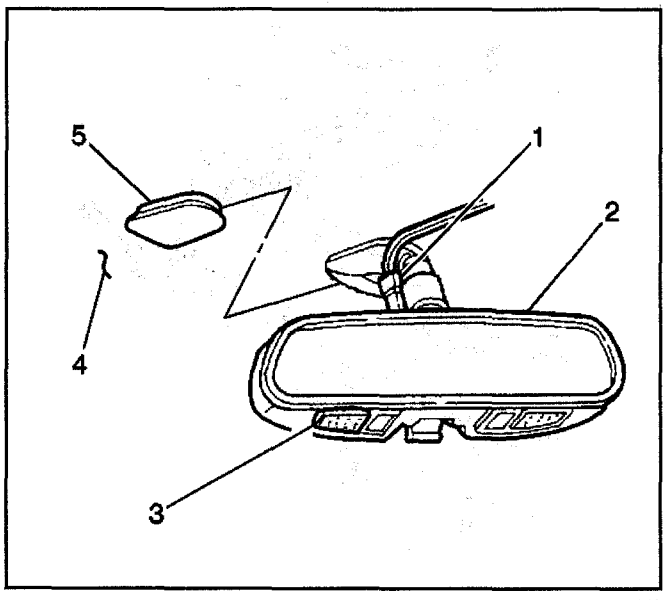
The rearview mirror is a breakaway type mirror. Breakaway rearview mirrors are designed to detach from the windshield in the event of an inflatable restraint deployment. The mirror attaches to the support on the windshield, but break away in a different manner. Follow the appropriate procedure when servicing the rearview mirror.

1. Disconnect the rearview mirror electrical connector.



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2. Remove the rearview mirror (2) from the rearview mirror support (5).
   2.1. Use one hand in order to support one end of the rearview mirror (2) against the windshield (4).
   2.2. Use the other hand in order to pull the rearview mirror (2) away from the mirror support (5).



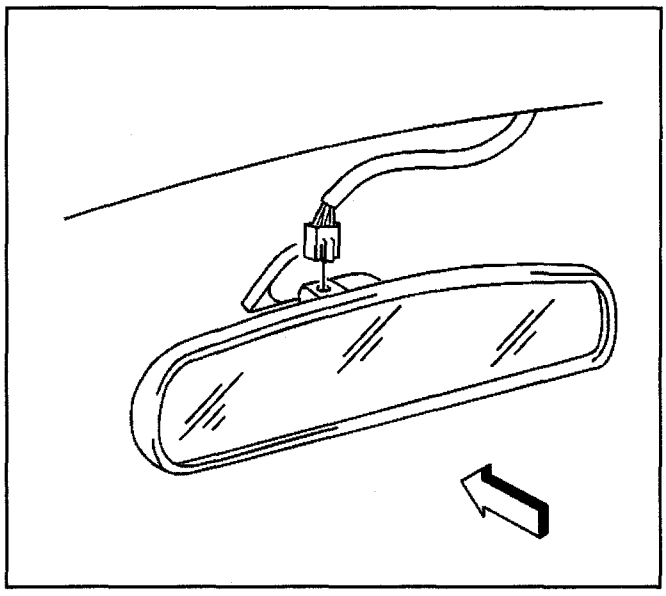
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Installation Procedure

1. Center the bottom of the rearview mirror (2) to the top of the mirror support (5).
2. Slide the rearview mirror (2) onto the mirror support (5). Keep the rearview mirror (2) parallel to the windshield (4).
3. Apply 90 N·m (20 lbs) of force in order to fully seat the rearview mirror (2) onto the mirror support (5).

   An audible click will be heard when the rearview mirror (2) is fully seated.

4. Connect the rearview mirror electrical connector (1).



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Rearview Mirror Support Replacement

Tools Required

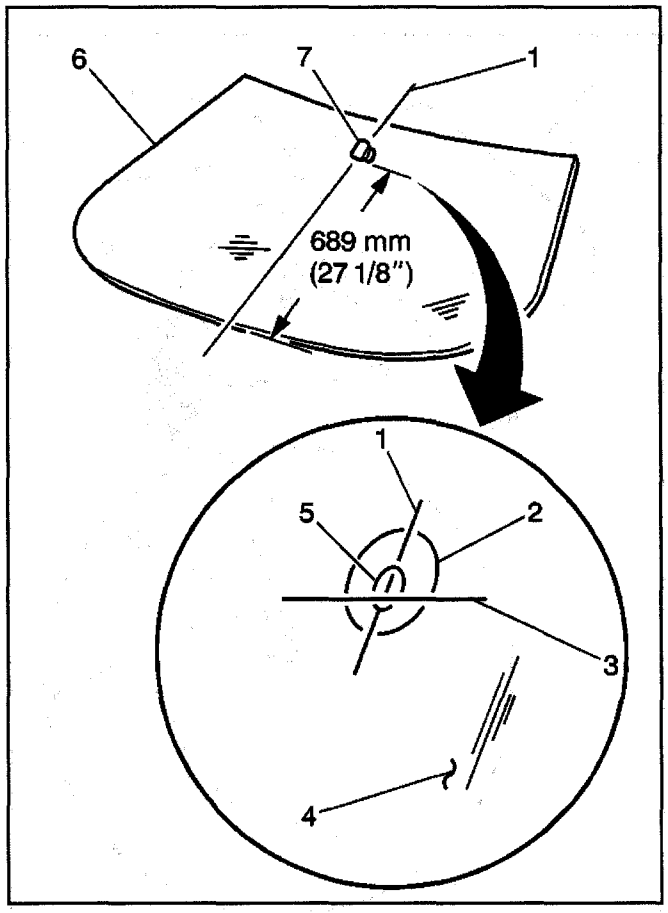
- GM P/N 1052369, Loctite 312 Adhesive kit, 2-component pack or the equivalent
- A mirror support (4)
- A wax marking pencil or crayon
- A window cleaning solution or window polishing compound
- Rubbing alcohol
- Clean paper towels
- Fine grit emery cloth or sandpaper, number 320 or number 360
- A clean toothpick

The rearview mirror support is installed by the window supplier, using a plastic-polyvinyl butyl adhesive.

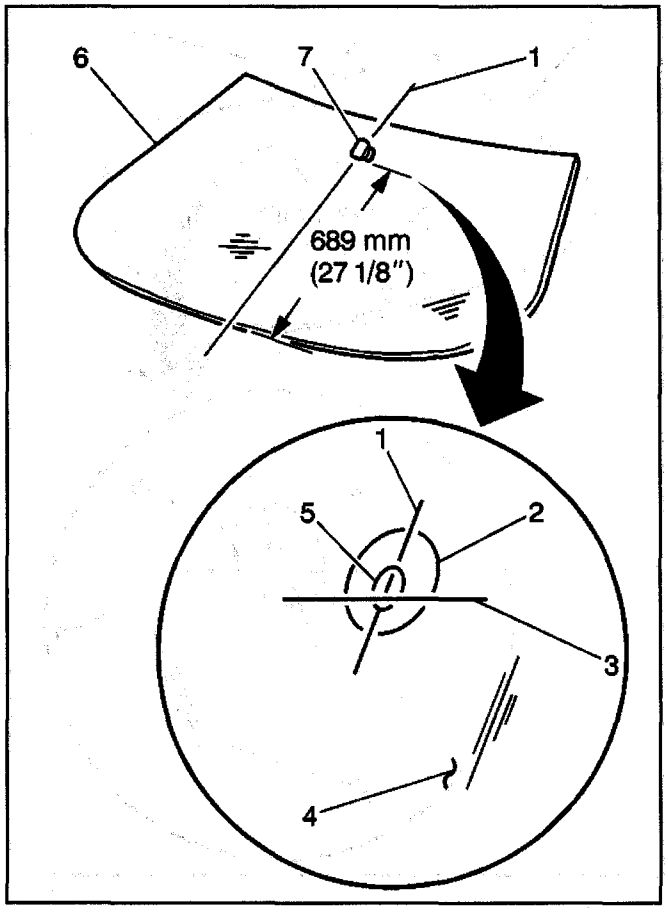
Service replacement windshields have the rearview mirror support bonded to the windshield.

Notice: Do not use tools or other objects to pry the mirror mount or the mirror away from the windshield. Using tools may damage the mirror mount, the mirror or the windshield.

1. Measure the distance from the bottom of the windshield (6) in order to determine the location of the rearview mirror support (7).
2. Locate the rearview mirror support (7) at the center (5) of the windshield (6) 689 mm (27 1/8 in) from the base of the windshield (6) to the base of the rearview mirror support (7).
3. Use a wax pencil or crayon in order to mark the location on the outside of the windshield (6).
4. Make a larger diameter circle (2) around the marked location on the outside windshield (6) surface.



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5. Clean the area of the large circle on the inside windshield (6) surface using a paper towel and one of the following items:
   - Window cleaning solution
   - Window polishing compound
6. Rub the area until the area is completely clean and dry.
7. When the area is dry, clean the area using an alcohol-saturated paper towel in order to remove any traces of cleaning solution or polishing compound.
8. Sand the bonding surface of the new or detached original rearview mirror support (7) using a piece of fine grit every cloth or sandpaper, number 320 or number 360.
9. If you are reusing the original mirror support (7), remove all traces of the old adhesive.
10. Wipe the sanded rearview mirror support (7) with a clean paper towel saturated with alcohol.
11. Allow the mirror support (7) to dry.

Installation Procedure

1. Follow the directions on the adhesive kit GM P/N 1052369 or the equivalent in order to prepare the rearview mirror support (7) prior to installation on the windshield (6).
2. Lightly apply the adhesive accelerator to the bonding surfaces of the following components:
   - The rearview mirror support (7)
   - The windshield (6)
3. Allow the adhesive accelerator to dry completely.

Important: Due to the rapid bonding action of the adhesive, immediately perform the following steps:

4. Rub the area until the area is completely clean and dry.
5. When the area is dry, clean the area using an alcohol-saturated paper towel in order to remove any traces of cleaning solution or polishing compound.
6. Sand the bonding surface of the new or detached original rearview mirror support (7) using a piece of fine grit every cloth or sandpaper, number 320 or number 360.
7. If you are reusing the original mirror support (7), remove all traces of the old adhesive.
8. Wipe the sanded rearview mirror support (7) using a clean paper towel saturated with alcohol.
9. Allow the mirror support (7) to dry.

Windshield Replacement

Removal Procedure

Tools Required

- *J 24402-A* Glass Sealant Remover (Cold Knife)
- *J 24709-01* Urethane Glass Sealant Remover (Hot Knife)
- *J 39032* Stationary Glass Removal Tool

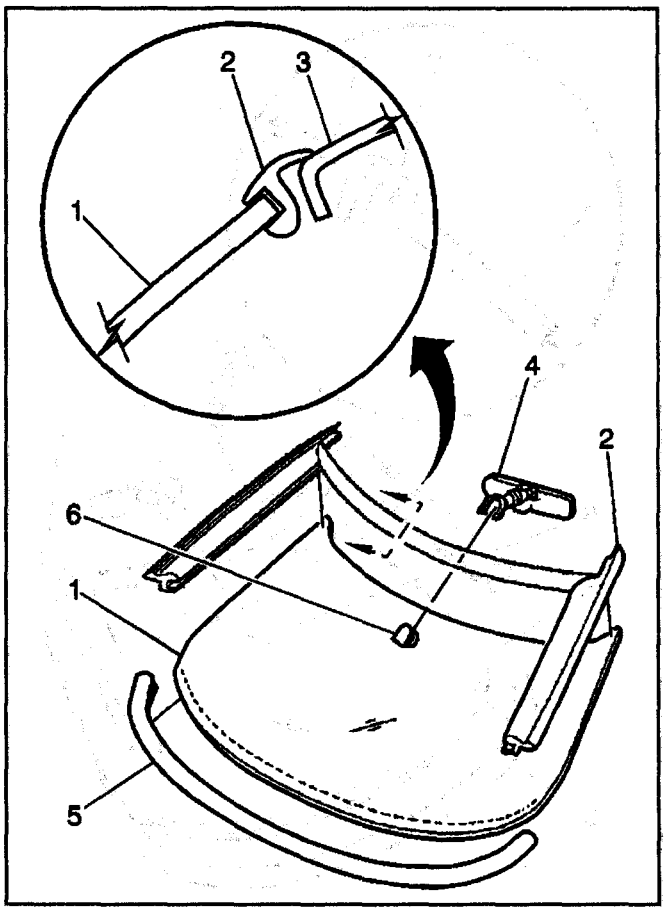
Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

Caution: If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause injuries. To help avoid personal injury, cover the defroster outlets before replacing windows.

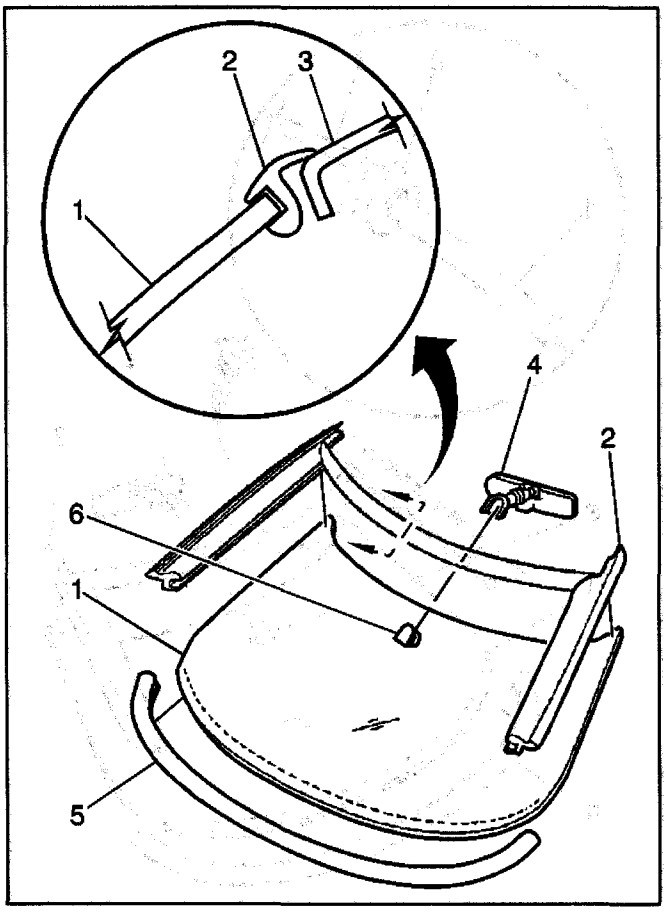
1. Remove the T-tops, if equipped.
2. Remove the wiper arms. Refer to Windshield Wiper/Washer Systems.
3. Remove the air inlet grille. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
4. Remove the windshield reveal molding. Refer to *Windshield Reveal Molding Replacement.*
5. Place masking tape around the windshield opening in order to protect the painted surfaces and in order to aid in cleanup after the installation.
6. Use the *J 24402-A* or the equivalent to make a preliminary cut into the urethane adhesive around the perimeter of the windshield (1) except for the lower corners. Stay as close to the edge of the windshield as possible.
7. Remove the I/P upper trim pad. Refer to *Trim Pad Replacement - IP Upper* in Interior Trim.
8. Cover the defroster outlets.
9. Remove the inside rearview mirror. Refer to *Rearview Mirror Replacement.*
10. Use the *Installing the Case Bushing* or the equivalent cut around the perimeter of the windshield from inside the vehicle.

Caution: If a window is cracked but still intact, it should be crisscrossed with masking tape in order to reduce the risk of damage or personal injury.

11. Remove the windshield (1).



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Installation Procedure

Tools Required

- A solvent for cleaning the edge of the window. Use GM Glass Cleaner P/N 1050427 or isopropyl alcohol
- A household cartridge type caulking gun
- A commercial type razor knife in order to cut around the edge of the window
- Rubber suction grips

1. Install the I/P upper trim pad. Refer to *Trim Pad Replacement - IP Upper* in Interior Trim.
2. With the aid of an assistant, dry fit the windshield (1) in the opening to determine the correct position. Use the following procedure:
   2.1. Position the windshield (1) in the opening.
   2.2. Use masking tape in order to mark the location of the windshield (1) in the opening.
   2.3. Slit the masking tape at the window edge.
   2.4. Remove the windshield (1) from the opening.
   2.5. Place the windshield (1) inside up on a clean protected surface.
3. Clean the surface around the inside edge of the windshield (1) where the urethane adhesive will be applied. Use a dampened cloth with either isopropyl alcohol or GM Window Cleaner P/N 1050427 or the equivalent.

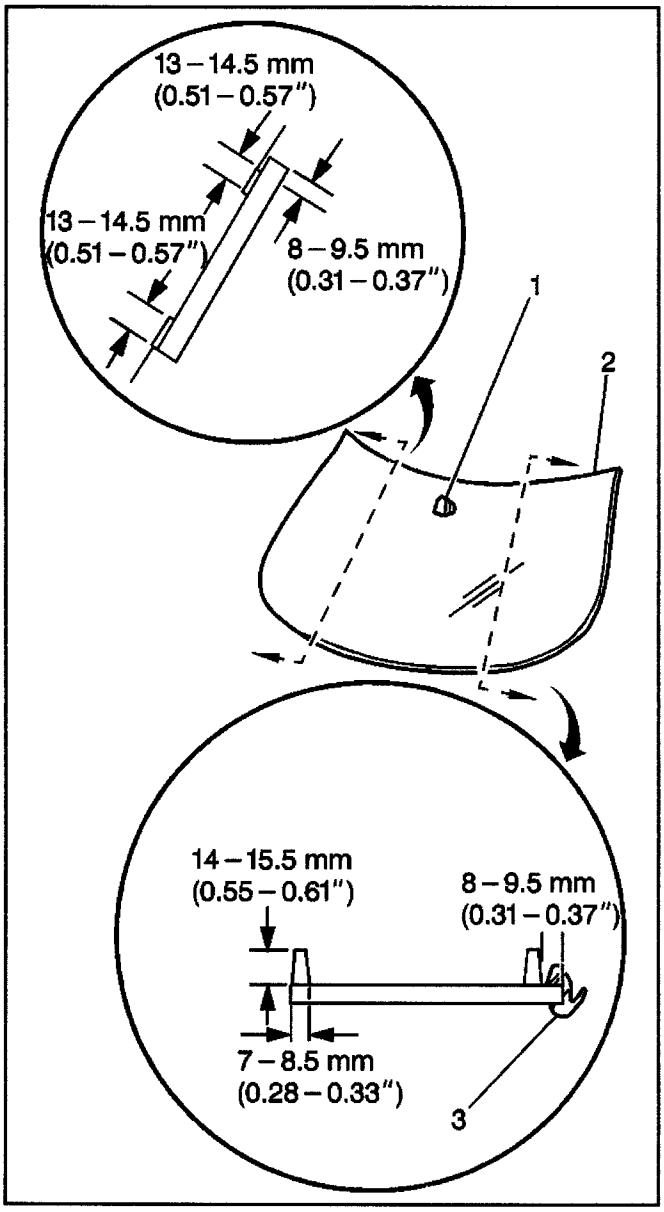
Caution: When replacing stationary windows, Urethane Adhesive Kit GM P/N 12346392, or a urethane adhesive system meeting GM Specification GM3651M, must be used to maintain original installation integrity. Failure to use the urethane adhesive kit will result in poor retention of the window which may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

Caution: Failure to prep area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

4. If you are using the extended method of installation, perform the following:
   - Shake the pinchweld primer #3 (black) well.
   - Apply the primer to any exposed painted surfaces (or scratches to bare metal) on the pinchweld flange.
   - Allow the primer to dry 10 minutes.

5. If you are using the short method, DO NOT prime the existing bead of urethane adhesive on the body.
6. Refinish the pinchweld flange in order to present a Primer Only surface if the following conditions exist:
   - Corrosion of the pinchweld flange is present
   - Sheet metal repairs or replacements are required
   - If paint repairs are required, mask the flange bonding area first
   - Appropriate materials for these primer applications are typically two component, catalyzed products such as BASF DE17, DUPONT2610, PPG DP90 or equivalent applied by following the manufacturers directions for mix, application and dry times.
   - After repairing the opening as indicated, perform the following:
     - Shake the pinchweld primer #3 (black) well.
     - Apply the pinchweld primer to the primed surface of the flange in the bonding area.
     - Allow to dry 10 minutes.
7. If reusing the original windshield (1), remove any existing urethane adhesive from the windshield (1) edge and surface. Use a razor knife or the equivalent.
8. If you are using the original reveal molding (2) or production type reveal molding, install the molding (2) along the edge of the window.
9. Install a new sealing strip weatherstrip (5) on the windshield (1), as needed.
10. If you are using the extended method, use the following procedure:
    - Apply a dam material approximately 12 to 18 mm (0.47 to 0.71 in) from the outer edge of the window and around the perimeter of the window to control urethane squeeze out.
    - For dam material, use Norton Windshield Dam Replacement.

Important: Do not allow the window preparation #1 (clear) to drip or spill onto the vision area of the windshield (1). The primer dries instantly and may stain the viewing area if not applied evenly.



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11. Use a new dauber to apply the glass preparation #1 (clear) approximately 10 to 16 mm (0.39 to 0.63 in) around the entire perimeter of the inner surface. Also apply the glass preparation to any exposed edge of the window (2).

    Wipe dry the area using a clean cloth.
12. Shake the window primer #2 (black) well. Use a new dauber to apply the primer over the glass preparation #1 (clear) that was applied in the previous step.
13. Allow the primer to dry for 6 to 10 minutes.

Important: Do not apply the clear primer over the black primer. Do not touch the primer coated surface.

14. If you are using the short method, cut the tip of the applicator nozzle to provide a bead of urethane adhesive 4.5 mm (0.18 in) in diameter.
15. If you are using the extended method, cut the applicator nozzle to provide a bead of urethane adhesive 7–8.5 mm (0.28 to 0.33 in) wide by 14–15.5 mm (0.55 to 0.61 in) high.
16. Use a cartridge type caulking gun in order to apply a smooth continuous bead of urethane adhesive.

    Use either of the 2 following procedures:
    - For the short method, apply urethane adhesive to the existing bead of urethane adhesive on the body.
    - For the extended method, use the edge of the windshield (2) or the inside edge of the reveal molding (3) as a guide for the nozzle.

      Apply the urethane adhesive to the inner surface of the windshield (2).
    - Use rubber suction cups to install the windshield (2).

      Use as assistant to help with the installation.
17. Align the windshield (2) with the previously installed masking tape.
18. Firmly press the windshield (2) into place.
19. Tape the windshield (2) to the body in order to minimize movement and in order to clean up any urethane squeeze out.

Important: Do not direct a hard stream of high pressure water at the fresh adhesive.

20. Immediately watertest the window.
21. Use a soft spray of warm or hot water in order to accelerate the cure of the adhesive.

    Refer to *Water Hose Test* in Waterleaks for the water test procedures.
22. If leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.

23. Remove the protective tape and coverings.

Caution: At least 24 hours are required for complete curing of repair material. The repair area should not be physically disturbed until after that time. Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

24. Allow the vehicle to remain at room temperature, 22°C (72°F) and 30 percent relative humidity for a minimum of 6 hours.
25. Partially lower a door window in order to prevent pressure build up when closing the doors before the urethane adhesive cures.

    Do not drive the vehicle until the urethane adhesive is cured.

    Do not drive the vehicle for a minimum of 6 hours.

    Do not use compressed air in order to dry the urethane adhesive.
26. Install the T-tops, if equipped.
27. Install the air inlet grille. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
28. Install the wiper arms. Refer to Windshield Wiper/Washer Systems.
29. Remove the windshield reveal molding. Refer to *Windshield Reveal Molding Replacement.*
30. Install the inside rearview mirror. Refer to *Rearview Mirror Replacement.*

Rear Lift Window Replacement

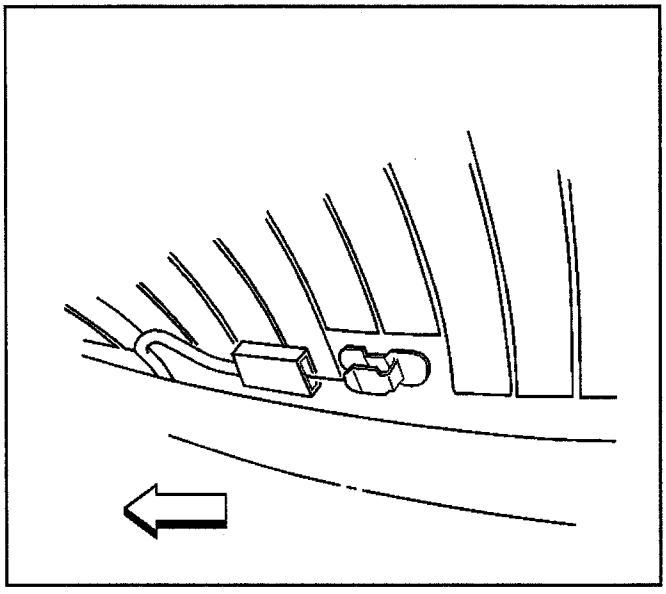
Removal Procedure

Tools Required

- *J 24402-A* Glass Sealant Remover (Cold Knife)
- *J 39032* Stationary Glass Removal Tool

Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

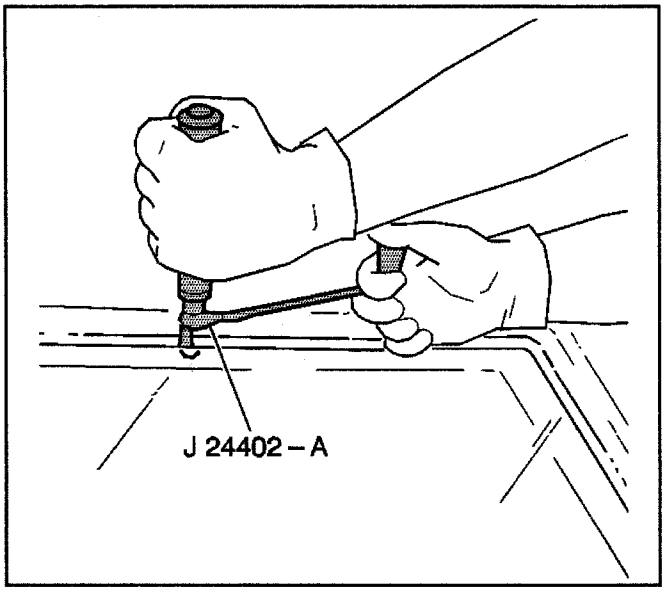
1. Remove the rear window reveal molding. Refer to Rear Window Reveal Molding Replacement.
2. Remove the rear compartment lift window inner panel.



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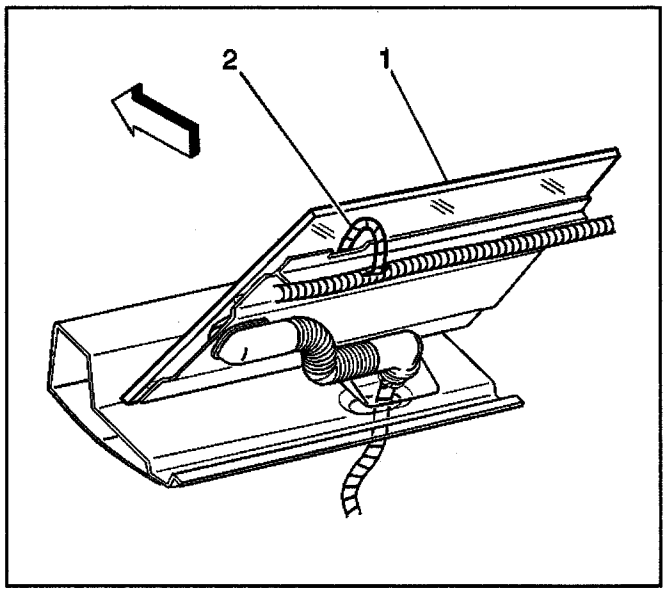
3. Disconnect the rear window defogger connectors on both sides of the window, if equipped
4. Mask area around window to protect the painted surfaces and to aid in clean up.

   Tape must not touch window sealant surface.



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5. Using the *J 24402-A* or equivalent, cut the primary inner urethane bead from the rear window.
6. Using the *J 39032* or equivalent, cut the secondary rear inner urethane bead from the rear window.



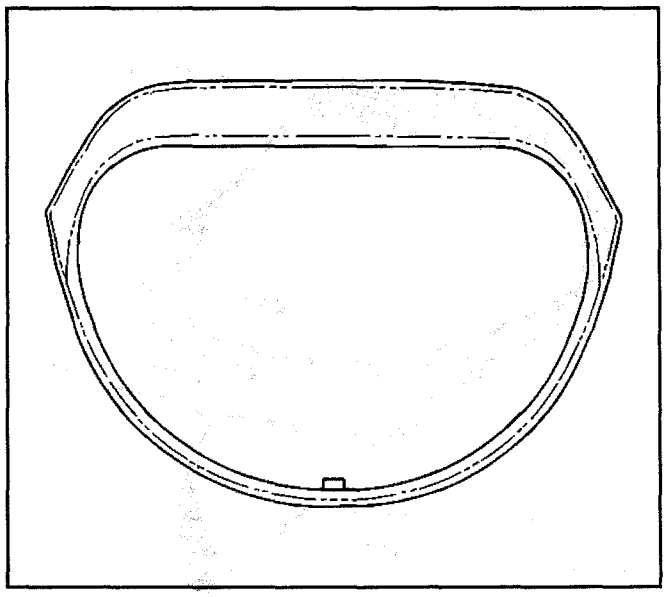
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7. When cutting the secondary rear inner urethane bead DO NOT cut through the wiring harness (2) in the urethane.

Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

Caution: If a window is cracked but still intact, it should be crisscrossed with masking tape in order to reduce the risk of damage or personal injury.

8. Remove the window.
9. Clean any loose material from the window.
10. Remove any old urethane from a reusable rear window.
11. Vacuum the vehicle interior to remove any traces of shattered glass or pieces of urethane.



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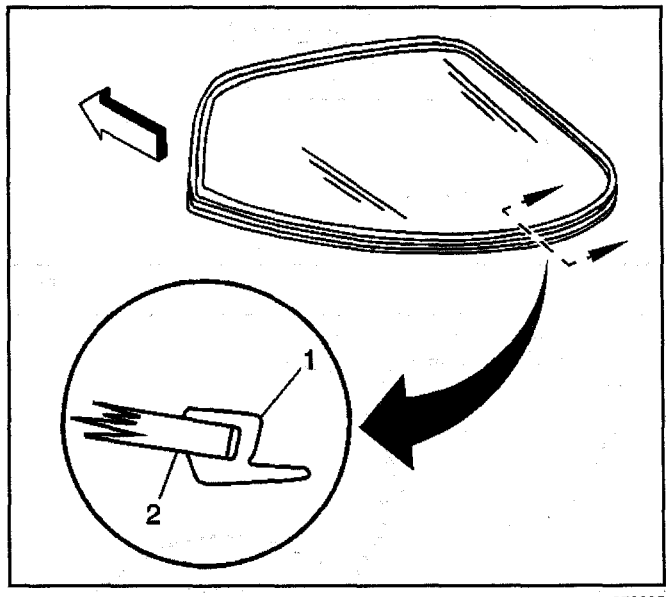
Installation Procedure

Tools Required

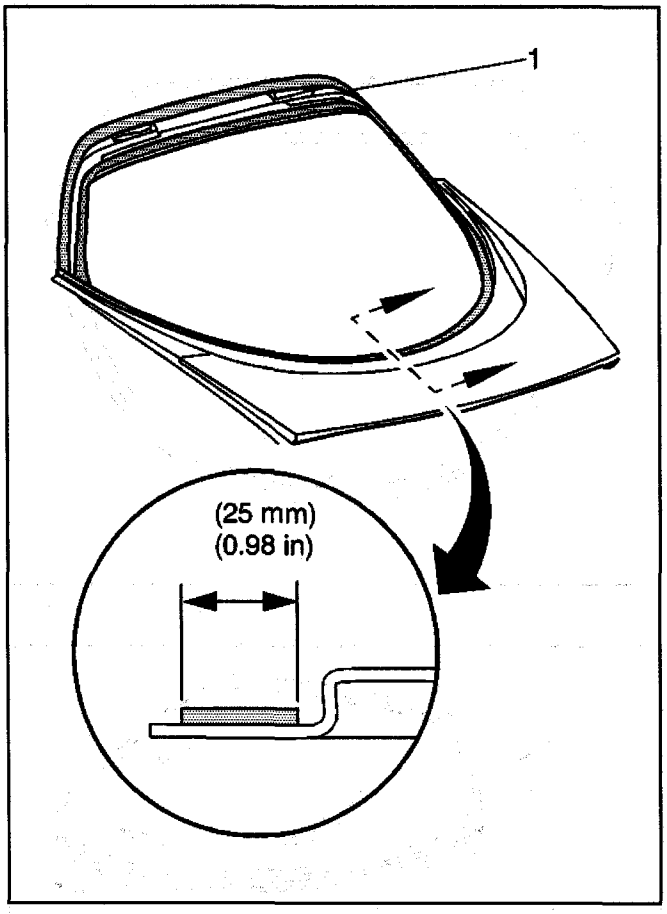
- GM P/N 123456284 Urethane Adhesive Kit, or equivalent
- GM Glass Cleaner P/N 1050427 or isopropyl alcohol
- Household cartridge type caulking gun
- Commercial type razor knife
- Rubber suction cups

1. Install the window reveal molding (1) to the window (2).
2. With suction cups and the aid of a helper, dry fit the window to the window panel.
3. Clean the window surface to which the urethane is to be applied with an alcohol dampened cloth. Allow the alcohol surface to air dry.

Caution: Failure to prep area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.



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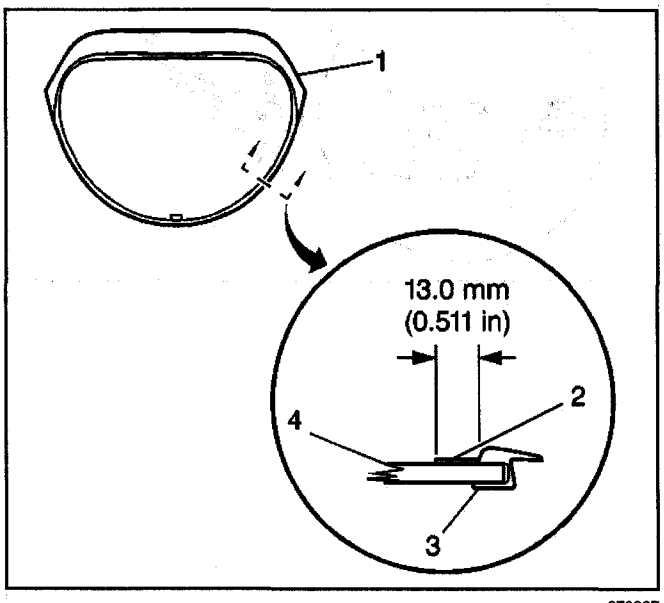


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4. Apply the pinchweld primer #3 (1) to any exposed painted surfaces on the lift window panel.

   Primer Bead Specification

   Primer bead 25 mm (0.98 in).



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Caution: When replacing stationary windows, Urethane Adhesive Kit GM P/N 12346392, or a urethane adhesive system meeting GM Specification GM3651M, must be used to maintain original installation integrity. Failure to use the urethane adhesive kit will result in poor retention of the window which may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

5. Apply Clear Glass Prep #1 (2) with a clean dauber to the surface of the window (4) that will contact the urethane area of the panel. Wipe the window dry with a clean lint free cloth.
6. Apply Black Glass Primer #2 with a clean dauber to the surface of the window that will contact the urethane and allow the primer to air dry for 6 to 10 minutes.

   Primer Bead Specification

   Primer bead 13 mm (0.512 in).

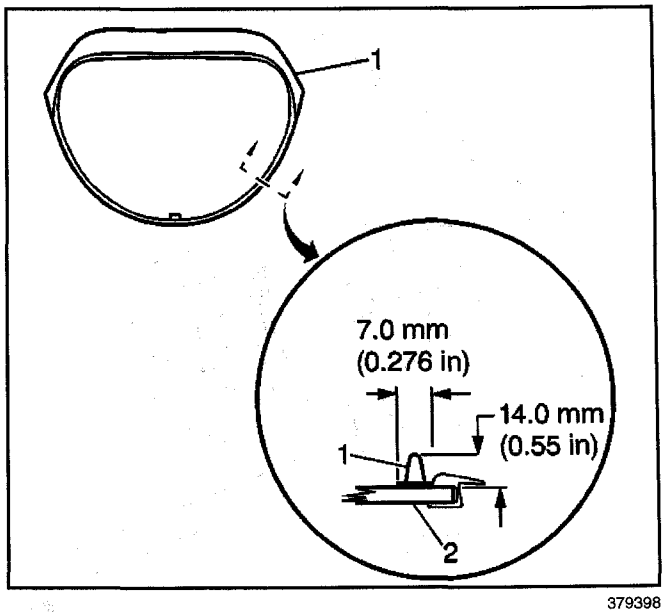
   Urethane will not bond to the window unless Black Primer #2 has been applied to the window.

Important: Do not apply Black Primer to the existing urethane on the lift window panel.

7. With a cartridge-type caulking gun and nozzles provided, apply smooth continuous bead of urethane adhesive around the lift window panel.

   Adhesive Specification

   - Urethane adhesive bead 7 mm (0.276 in) wide.
   - Urethane adhesive bead 14 mm (0.55 in) high.



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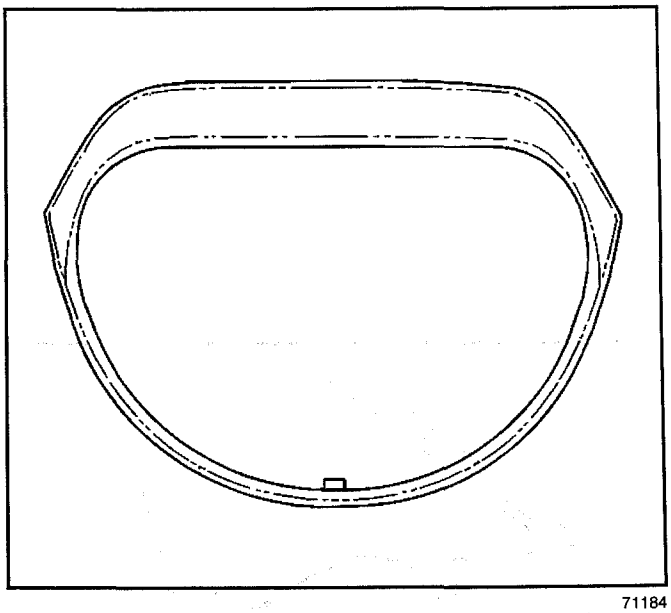
8. Install the window to the lift window panel with the aid of a helper.

   Use suction cups to position the window.

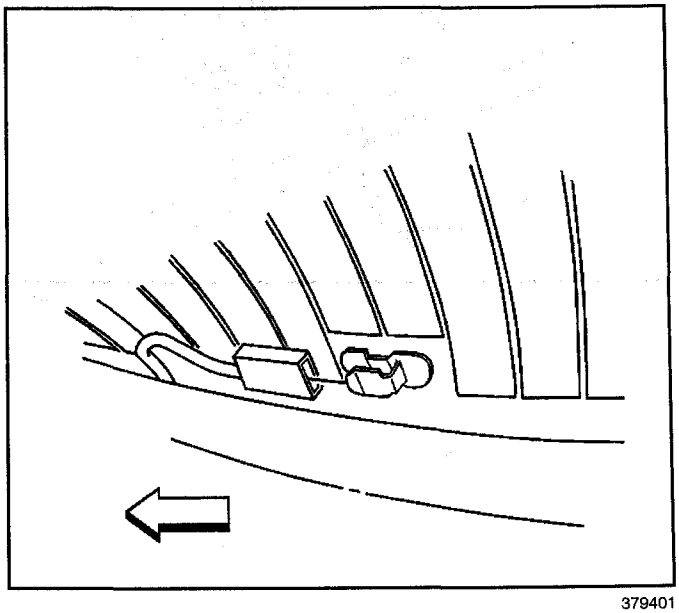
9. Press the window down firmly to wet-out and set the adhesive.

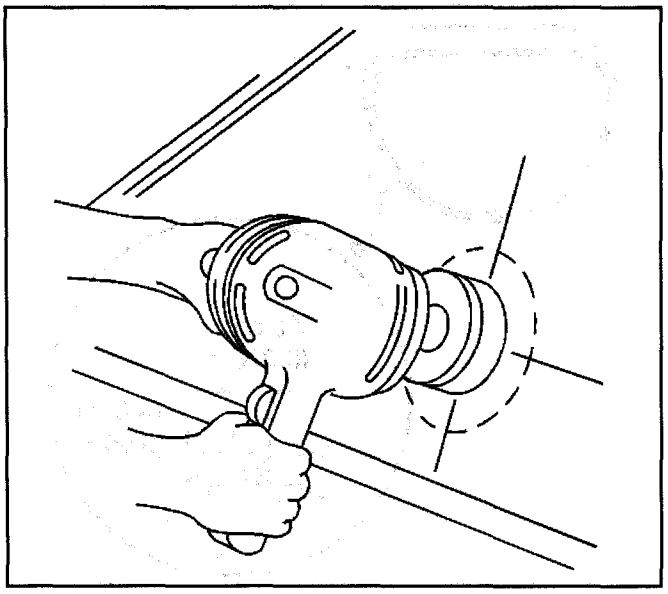
   Avoid squeezing out excess adhesive that would cause an appearance problem.

Important: Allow the vehicle to remain at room temperature for 4 to 6 hours prior to installing the remaining components.


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10. Connect the rear window defogger connectors on both sides of the window, if equipped
11. Install the rear compartment lift window inner panel.


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Window Polishing

Minor Scratch and Abrasion Removal

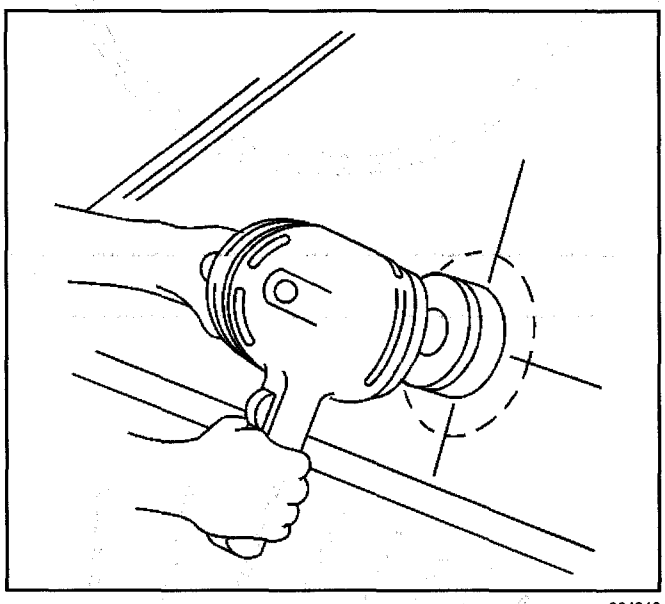
1. Remove or reduce minor scratches and abrasions by following the polishing procedure.
2. Take precautions in order to prevent distortions of vision.
3. Double vision may result if an attempt is made to remove deep scratches. Do not remove deep scratches from an area in the driver's line of vision. Replace the glass.
4. The following procedure was developed using a cerium oxide compound. Following the manufacturer's directions when any other materials are used.

Recommended Equipment

- A low speed (600-130 RPM) rotary polisher.
- A wool felt, rotary polishing pad 7 mm (3 in) in diameter and 51 mm (2 in) thick.
- Powered cerium oxide mixed with water. This is the abrasive compound.

Polishing Procedure

1. Mix at least 44 ml (1.5 oz) of the cerium oxide compound with enough water to obtain a creamy consistency.
   - If the mixture is too thick it will cake on the felt pad more quickly.
   - If the mixture is too runny, more polishing time will be required.
2. Draw a circle around the scratches on the opposite side of the glass with marking crayon or equivalent.
3. Draw a line directly behind the scratches in order to serve as a guide for locating the scratch while polishing.
4. Cover the surrounding area with masking paper in order to catch the drippings or splattered polish.
5. Dip the felt pad attached to the polisher into the mixture.
   - Do not submerge the pad.
   - Do not allow the pad to stay in the mixture as it may loosen the bond between the pad and the metal plate.



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Notice: Never hold the tool in one spot or operate the tool on the window any longer than 30 to 45 seconds. If the window becomes hot to touch, let it air cool before proceeding further. Cooling with cold water may crack heated window. Avoid excessive pressure. It may cause overheating of the window.

6. Polish the scratched area. When polishing the scratched area, note the following items:
   - Agitate the mixture as often as needed in order to maintain the creamy consistency of the cerium oxide compound.
   - Use moderate but steady pressure when applying the polish.
   - Hold the pad flat against the glass.
   - Use a feathering-out motion.
   - Dip the felt pad into the cerium oxide mixture every 15 seconds in order to ensure that the wheel and the glass are always wet during the polishing operation. A dry pad causes excessive heat to develop.
   - Keep the pad free of dirt and other foreign substances.

Window Cleaning

Clean the windows on a regular basis. Use GM Glass Cleaner P/N 1050427 or equivalent to remove normal tobacco smoke and dust films. A non-abrasive cleaner may by used on the outside of the windshield. Use the following procedure in order to clean the wiper blades:

1. Clean the wiper blades with a cloth soaked in a solution of water and GM Optikleen or equivalent. A solution of water and methanol may also be used.
2. Rinse the wiper blade with water.

Grid Line Repair

Repair Procedure

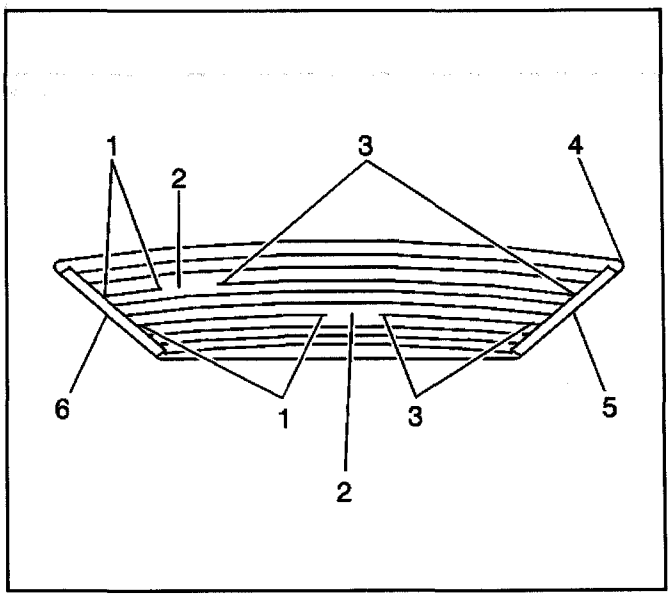
Caution: To avoid personal injury:

- ***Do not allow the repair material to come in contact with your skin or eyes and avoid breathing the vapors.***
- ***Do not use near sparks or open flame.***

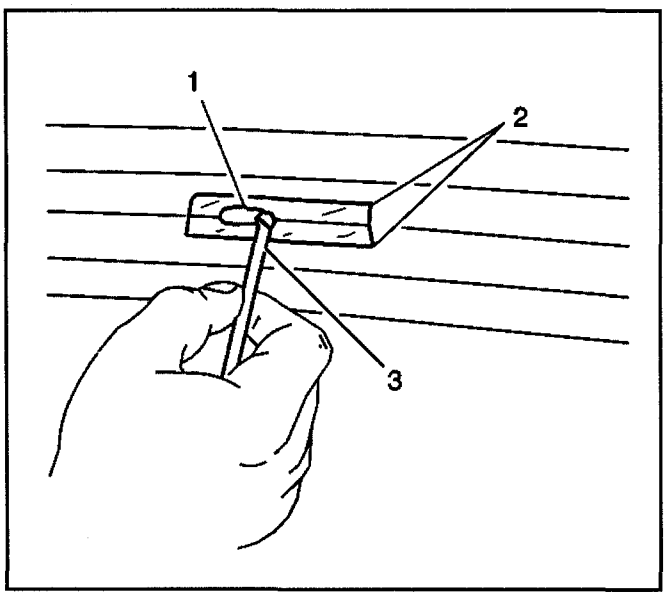
Tools Required

- Rear Window Defogger Repair Kit GM P/N 12346001, or equivalent.
- Heat Gun

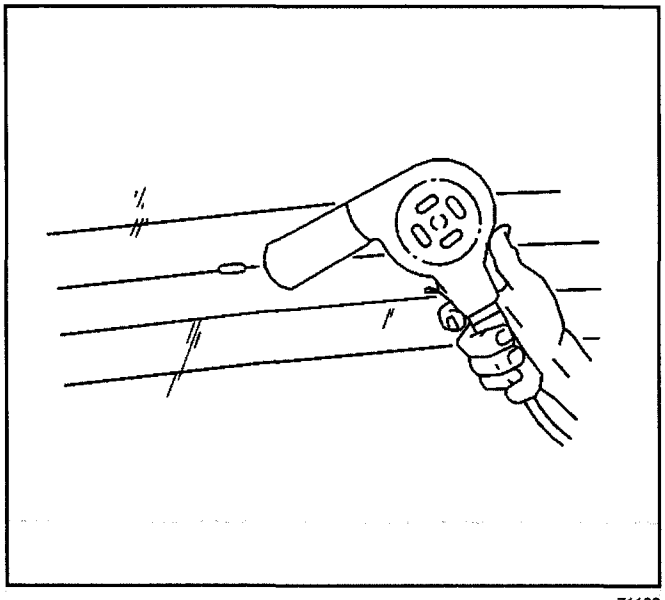
1. Remove the rear window defogger fuse.
2. Prep the area to be repaired:
   - Buff the grid line to about 6.0 mm (0.25 in) beyond each side of the break with fine steel wool.
   - Wipe the area clean using a cloth dampened with alcohol.



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3. Install a grid line repair decal, or install two strips of tape one positioned above and one below the repair area
   - A repair decal, or tape strips, must be used to control width of repair.
   - If a decal is used, be sure the die-cut metering slot is the same width as the grid line.
   - If tape strips are used space them the width of the grid line apart.
4. Mix the grid line repair material per manufacturers instructions or until a uniform silver color appears.
5. Insure that the window is at room temperature, 22°C (72°F).
6. Apply the grid repair material to the repair area using a small plastic paddle (or equivalent).
7. Remove the decal or tape.

Important: Protect Trim From Heat Damage.

8. Using a heat gun apply heat to the repair area.
   - Hold the heat gun nozzle 25 mm (1 in) from the repair surface.
   - Use a minimum temperature of 50°C (200°F).
   - Apply heat for 2 to 3 minutes.
9. Replace the rear defogger fuse.
10. Test the defogger operation to verify the grid line is repaired.
11. Inspect the grid line repair for appearance.
    11.1. Apply tincture of iodine to the grid line using a pipe cleaner or a fine brush if the grid line appears discolored.
    11.2. Allow the iodine to dry for at least 30 seconds.
    11.3. Wipe off any excess iodine using a lint free cloth.
12. Allow the repair area to cure undisturbed for at least 24 hours.

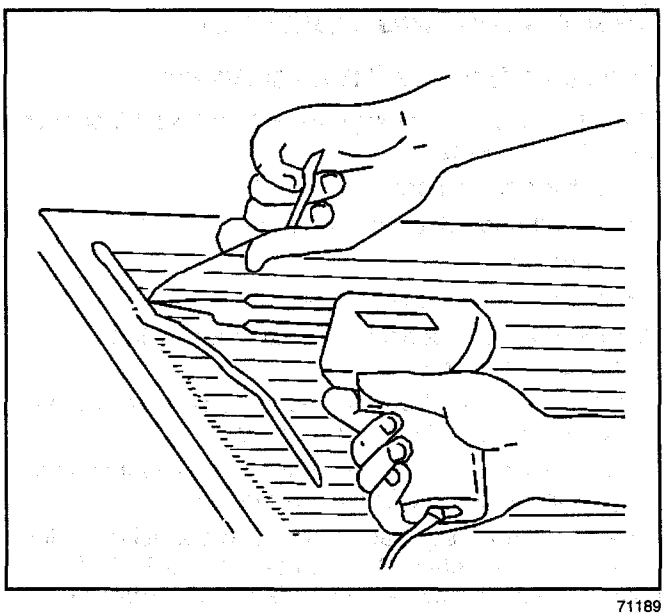
Rear Window Defogger Braided Lead Wire

Installation Procedure

1. Obtain a solder containing 3 percent silver and a rosin flux paste.
2. Remove the rear window defogger fuse.
3. Protect the interior of the vehicle from the repair material.
4. Buff the repair area with a fine steel wool in order to remove any oxide coating formed during window manufacturing.
5. Apply a paste-type rosin flux in small quantities to the wire lead and bus bar repair area using a brush.

Important: Use only enough heat to melt the solder. Use only enough solder to ensure a complete repair. Hold the iron tip in contact with the bus bar as short a time as possible.

6. Tin the bus bar and the braided wire:
   6.1. Coat the soldering iron with the solder.
   6.2. Draw the soldering iron tip across the fluxed area.
   6.3. Thinly coat the bus bar and the braided wire with solder.
7. Solder the braided wire to the bus bar:
   - Do not overheat the wire.
   - Apply heat to the top of the lead wire braid.
   - Hold the wire lead and the bus bar until the solder has solidified.
   - Wipe away excess flux with a solvent.
8. Replace the rear window defogger fuse.



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Bus Bar Lead Terminal Repair

You may reattach a rear defogger bus bar lead wire or a terminal by soldering. Use a solder containing the following items:

- 3% silver
- A rosin flux paste

1. Before soldering the bus bar, buff the repair area using a fine steel wool. This removes the oxide coating formed during the window manufacture.
2. Coat the soldering iron tip with solder before you begin soldering. Use only enough heat in order to complete the following operations:
   - Melt the solder
   - Ensure a complete repair
3. Use a brush in order to apply the paste-type flux in small quantities to the wire lead and bus bar repair area.
4. Do not overheat the wire when soldering the wire to the bus bar.

Description and Operation

Adhesive Service Kit Description

The GM Adhesive Caulking Kit P/N 10952983 contains the following items:

- 2 different primers
- A urethane adhesive with a nozzle
- Daubers
- Instructions with warnings

Use the urethane adhesive caulking kit for the following procedures:

- Replacement of any urethane adhesive-installed window using the short method
- Replacement of any urethane adhesive-installed window using the extended method

You may use an equivalent urethane adhesive system if the system meets GM Specification GM 3651M. Always follow the system manufacturer's instructions for application, handling, and curing.

Short Method Description

Use the short method where the original urethane adhesive bead left on the window opening pinchweld flange (after window removal) can serve as a base for the new window. This method uses a small bead of urethane adhesive in order to adhere the window in the opening to the original urethane adhesive bead.

Use the short method when the original bead of urethane adhesive meets one of the following conditions:

- Intact, without portions of the bead missing
- Solidly adhered to the pinchweld flange with no corrosion present on the flange
- Uniform in shape. Smooth, without multiple cuts or loose material present

Also use the short method under the following conditions:

- When repainting of the opening or collision repair/sheet metal replacement is not required.
- When urethane adhesive deterioration is not evident (no powdery residue).

Extended Method Description

Use the extended method when the original urethane adhesive bead left on the window opening pinchweld flange (after window removal) cannot serve as a base for the new window, or in any case where the use of the short method is in doubt.

This method includes the following cases:

- The replacement of a majority of the urethane adhesive bead, where a thin film of the original bead remains
- Applying pinchweld primer to any exposed painted areas on the pinchweld flange

No mounds or loose pieces of urethane adhesive should remain on the pinchweld flange. Do not remove all traces of urethane adhesive.

Important:

- If corrosion of the pinchweld flange is present, or if sheet metal repairs or replacements are required, refinish the pinchweld flange in order to present a clean, primer-only surface.
- If paint repairs are required, mask the flange bonding area (prior to applying the color coat) in order to provide a clean, primer-only surface.
- Appropriate materials for these primer applications are typically two component catalyzed products such as BASF DE17, DUPONT 2610, PPG DP90, or an equivalent. Follow the manufacturer's directions for the mix, the application, and the drying times.
- After repairing the opening as indicated, shake the pinchweld primer #3 (black) well. Using a new dauber, apply the primer to the primed surface of the flange in the bonding area. Allow the primer to dry for 10 minutes.
- Use the extended method of replacement and the appropriate urethane bead size when installing the window.

Stationary Window Description

Most stationary windows, specifically windshields, are retained to the body with urethane adhesive which adheres the window to the body. This increases structural integrity. The reinstallation of the windows with urethane adhesive requires either partial or complete replacement of the urethane adhesive bead:

- The short method (also known as short cut or close cut) is the partial replacement.
- The extended method (also known as long method, full strip, or full cut) is the complete replacement.

Reveal Molding Description

The reveal molding for the windshield and rear window are a vinyl trim that fits between the edge of the window and the body. The reveal moldings are hand pressed into place. The reveal moldings are retained with urethane adhesive. Trim the reveal molding if needed for certain applications. Trim the reveal moldings as needed to allow room for both the molding and urethane adhesive to fit in the cavity between the window and the body.

Rear Window Defogger Description

The rear window defogger system consists of the following components:

- A tinted glass

  The tinted glass has a number of horizontal ceramic silver compound lines.
- Two vertical bus bars

  The bus bars are baked into the inside surface during the glass forming operation.

The feed wire terminal is soldered to the bus bar on the left side. The ground wire terminal is soldered to the bus bar on the right side. This system operates on battery voltage. Heat from the window may not be detected by finger touch. The length of time required in order to remove interior fog from the rear window will very with the following conditions:

- Vehicle speed
- Outside window temperature
- Atmospheric pressure
- Number of passengers inside the vehicle

This system uses a switch with an integral indicator lamp. After 5 to 10 minutes of system operation, an automatic timer will automatically turn the system off. Turn one of the following switches to OFF in order to turn off the system during the operating period.

- Defogger switch
- Ignition switch

Rear Window Defogger Operation

The rear window defogger system consists of the following components:

- A rear window defogger switch
- A rear window that has a number of grid lines
- 2 bus bars on the inside surface of the rear window

The feed terminal (+) and the ground terminal (–) are soldered to the bus bar.

Rear Window Defogger Circuit Description

When the ignition switch is turned to the RUN position voltage is applied through the HVAC Fuse 6. The voltage travels to the following components:

- The rear defogger switch
- The rear defogger timer/relay

When the rear defogger switch is pressed, voltage is momentarily applied to the rear defogger timer/relay through CKT 292. When voltage is applied to the rear defogger timer/relay, the rear defogger timer/relay will close the internal contacts.

The internal contacts remain closed until one of the following actions occur:

- The defog cycle is complete.
- The rear defogger switch is pressed a second time.

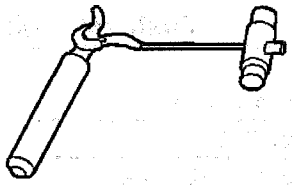
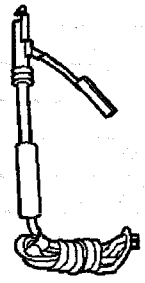
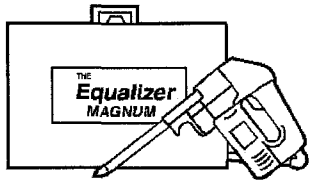
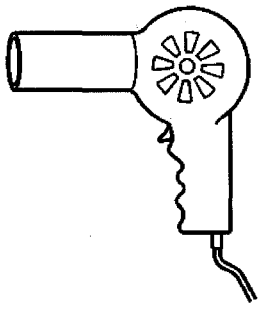
When the internal contacts of the rear defogger timer/relay are closed, voltage is applied to the rear defogger grid and indicator.

The rear defogger timer/relay contains an internal timer in order to control the time the internal contacts are closed. The defog cycle lasts 10 minutes when the following actions occur:

- The ignition switch is turned to RUN.
- The rear defogger switch pressed for the first time.

Further operation will result in 5 minute defog cycles. The defog cycle is reset to 10 minutes when the ignition switch is turned to the OFF position and back to the RUN position.

Special Tools and Equipment

Illustration	Tool Number/ Description
 3898	J 24402-A Glass Sealant Remover (Cold Knife)
 3899	J 24709-01 Urethane Glass Sealant Remover (Hot Knife)
 3905	J 39032 Stationary Glass Removal Tool
 78337	J 25070 Heat Gun

Bumpers

Specifications

Fastener Tightening Specifications

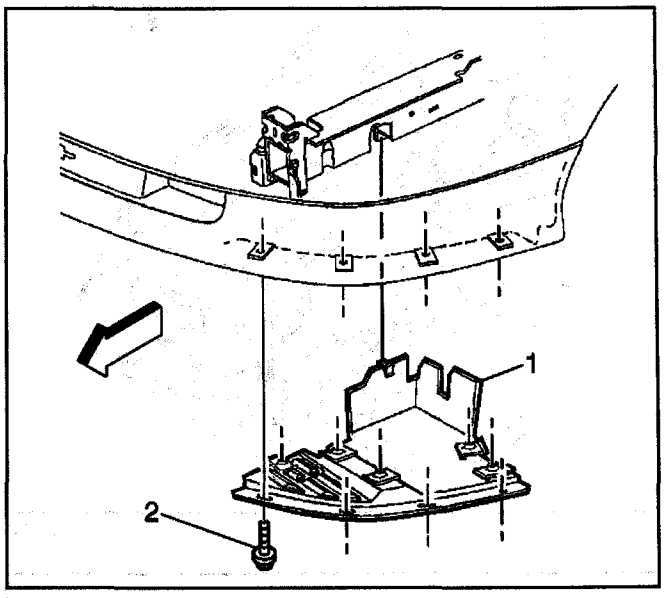
Application	Specification	
	Metric	English
Front End Fascia Outer Deflector Bolt	10 N·m	89 lb in
Front Bumper Fascia Outer Support Bolt/Screw	5 N·m	44 lb in
Front Bumper Fascia Outer Support Nut	9 N·m	80 lb in
Front Bumper Impact Bar Anchor Plate Nut	25 N·m	18 lb ft
Grille Nut	2.4 N·m	21 lb in
License Pocket Cover Screw	2.0 N·m	18 lb in
Rear Bumper Fascia Bolt	2 N·m	18 lb in
Rear Bumper Fascia Nut	6 N·m	53 lb in
Rear Bumper Impact Bar Nut	15 N·m	11 lb ft
Rear End Fascia Energy Absorber Bolt	5.5 N·m	49 lb in
Rear License Plate Bracket Screw (Export)	5.0 N·m	44 N·m

Repair Instructions

Air Deflector Replacement - Front Bumper Fascia

Removal Procedure

1. Remove the front end fascia outer deflector bolts (2) from the following components:
   - The front fascia
   - The front bumper fascia lower deflector (1)
2. Remove the front end fascia outer deflector (1) from the vehicle.



296270

Installation Procedure

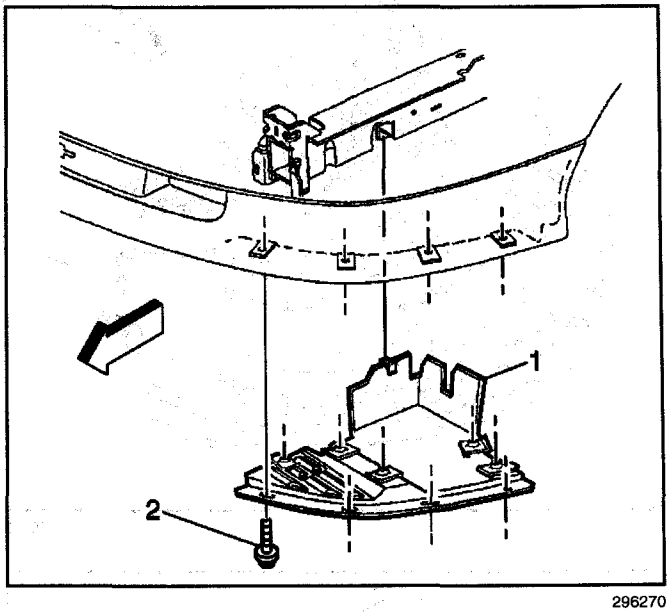
1. Install the front end fascia outer deflector (1) to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

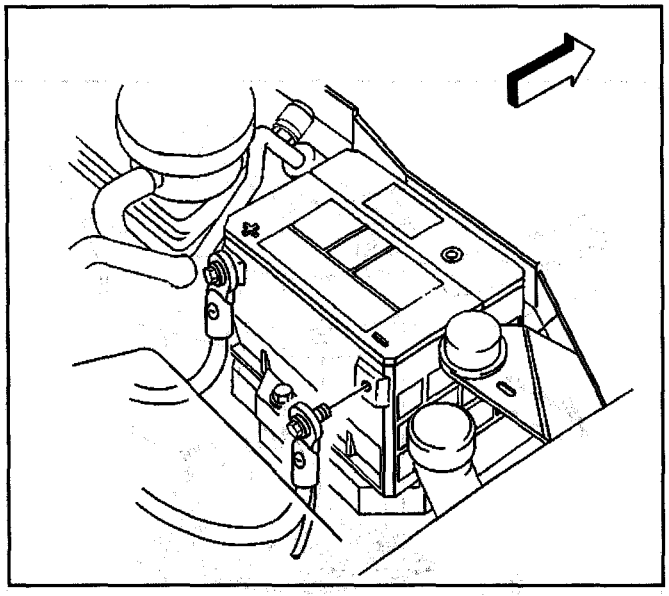
2. Install the front end fascia outer deflector bolts (2) to the following components:
   - The front fascia
   - The front bumper fascia lower deflector (1)

   Tighten

   Tighten the front end fascia outer deflector bolts (2) to 10 N·m (89 lb in).



296270



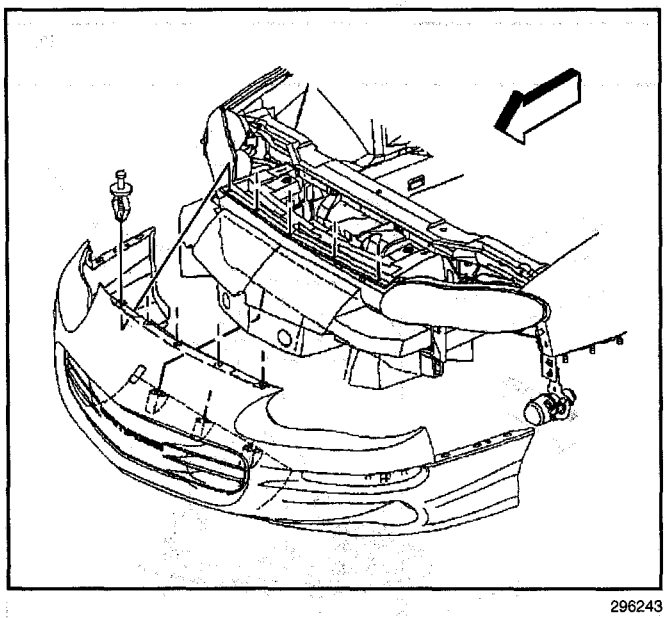
208241

Fascia Replacement - Front Bumper (Chevrolet)

Removal Procedure

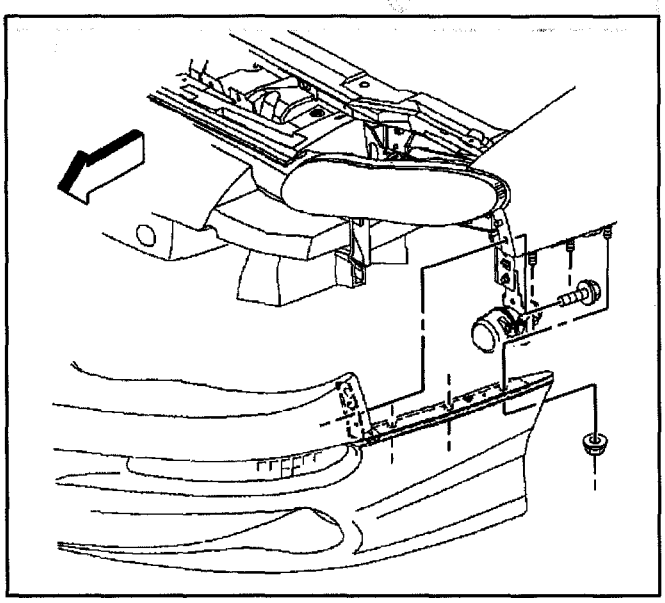
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure.*



296243

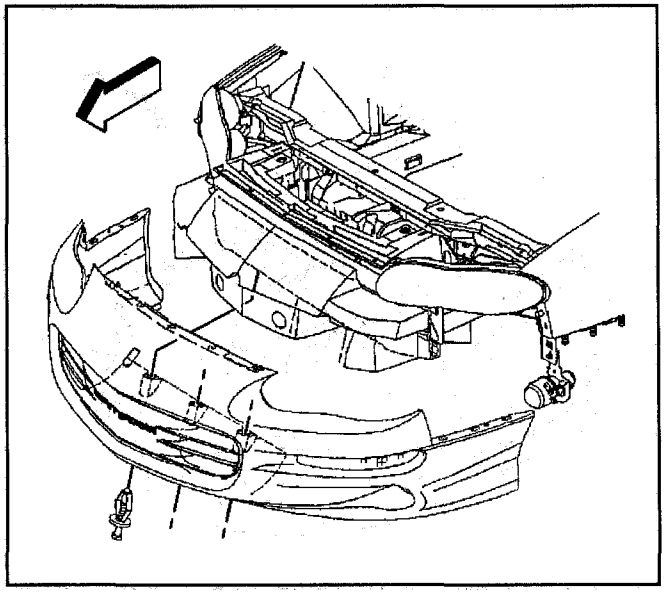
2. Remove the upper fascia retainers along the radiator support.
3. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
4. Remove the front end fascia outer deflectors. Refer to *Air Deflector Replacement - Front Bumper Fascia.*



296246

5. Remove the fascia outer support nuts and bolts.
6. Disconnect all the electrical connectors from the fascia.

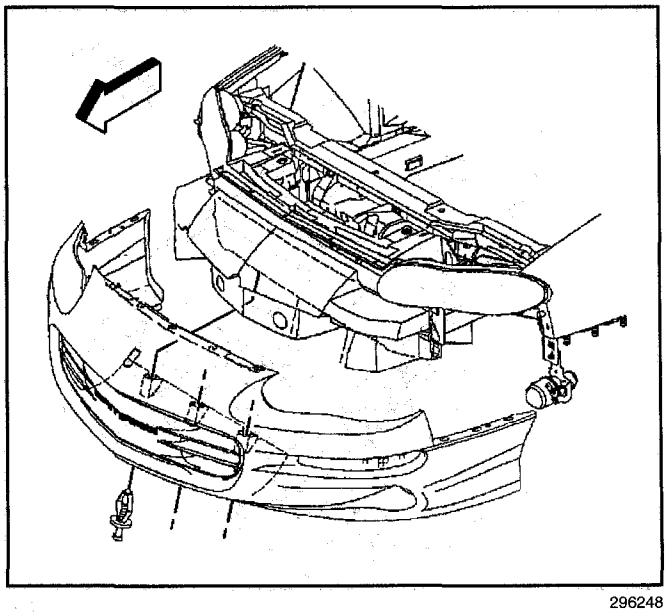
7. Remove the lower fascia retainers along the impact bar.
8. Remove the front fascia.
9. Transfer all necessary parts, if required.



296248

Installation Procedure

1. Install the front fascia.
2. Install the lower fascia retainers along the impact bar.
3. Connect all the electrical connectors to the fascia.



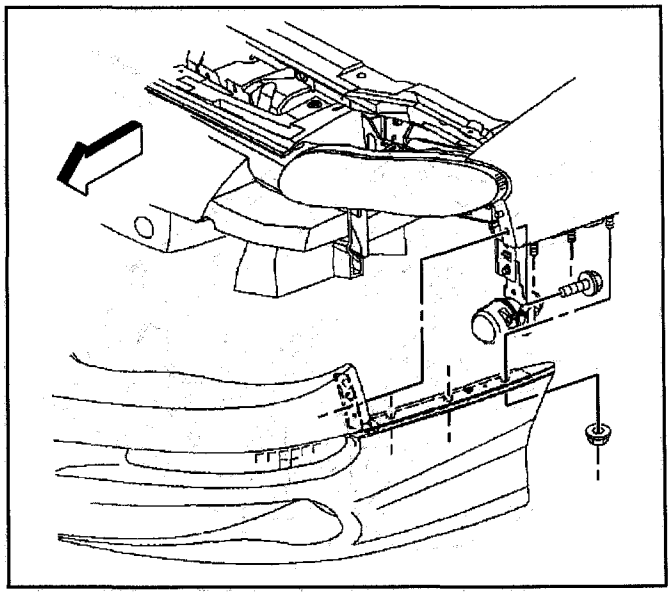
296248

Notice: Refer to *Fastener Notice* in Cautions and Notices.

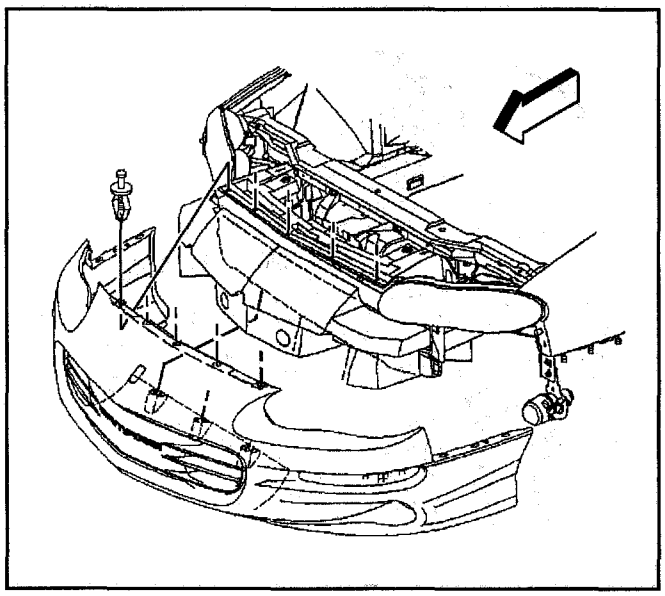
4. Install the fascia outer support nuts and bolts.

   Tighten

   - Tighten the fascia outer support nuts to 9 N·m (80 lb in).
   - Tighten the fascia outer support bolts to 5 N·m (44 lb in).
5. Install the front end fascia outer deflectors. Refer to *Air Deflector Replacement - Front Bumper Fascia*
6. Lower the vehicle.

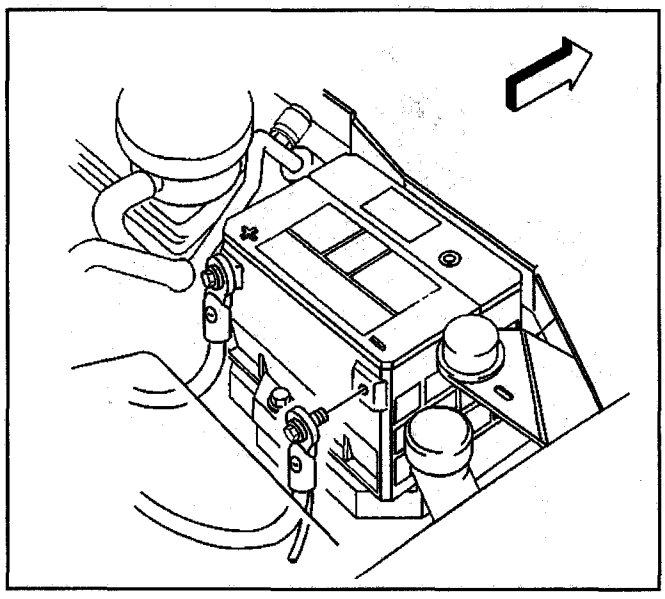


296246



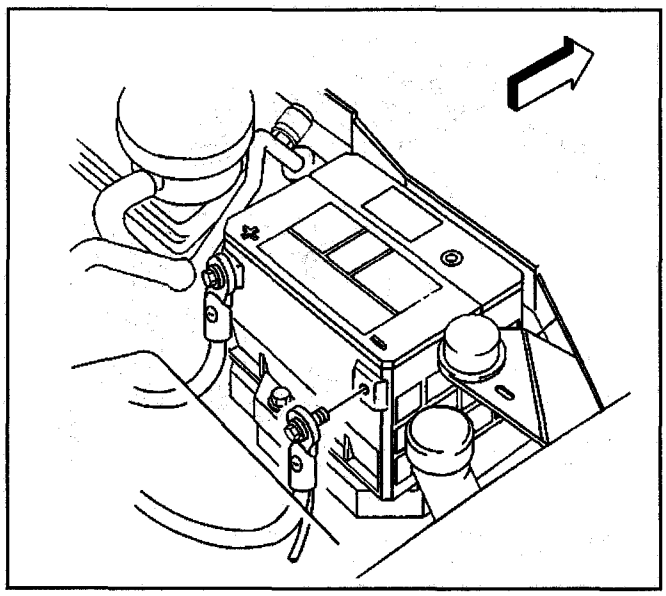
296243

7. Install the upper fascia retainers along the radiator support.



208241

8. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.



208241

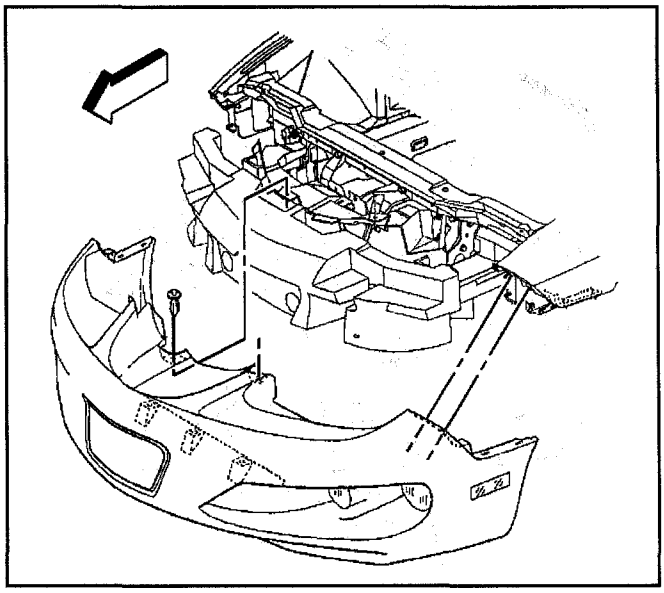
Fascia Replacement - Front Bumper (Pontiac)

Removal Procedure

Caution: Refer to Battery Disconnect Caution

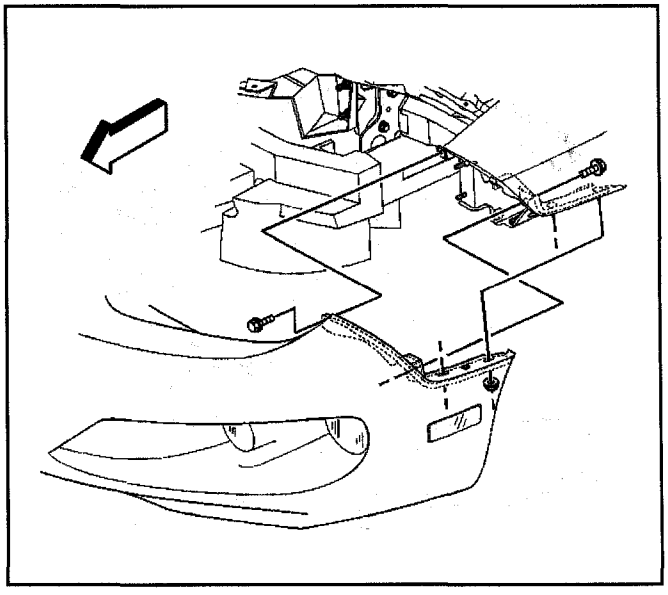
1. Disconnect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.

2. Remove the upper fascia retainers along the radiator support.
3. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
4. Remove the front end fascia outer deflectors. Refer to *Air Deflector Replacement - Front Bumper Fascia*.



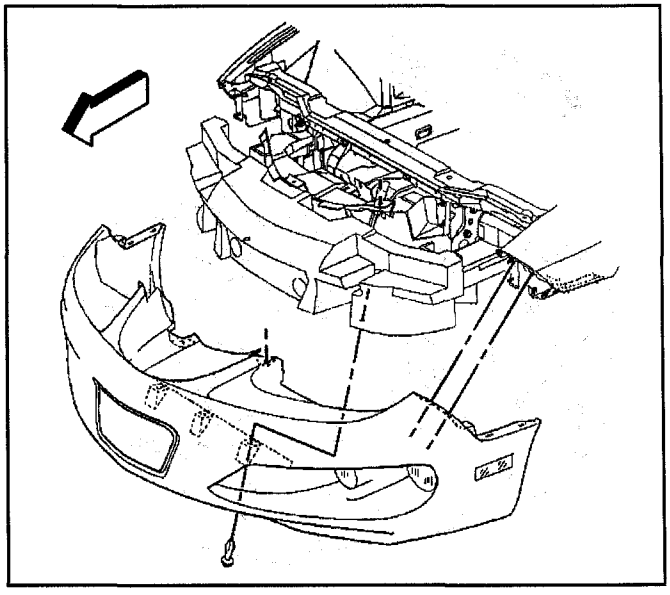
296250

5. Remove the fascia outer support nuts and bolts.
6. Disconnect all the electrical connectors from the fascia.

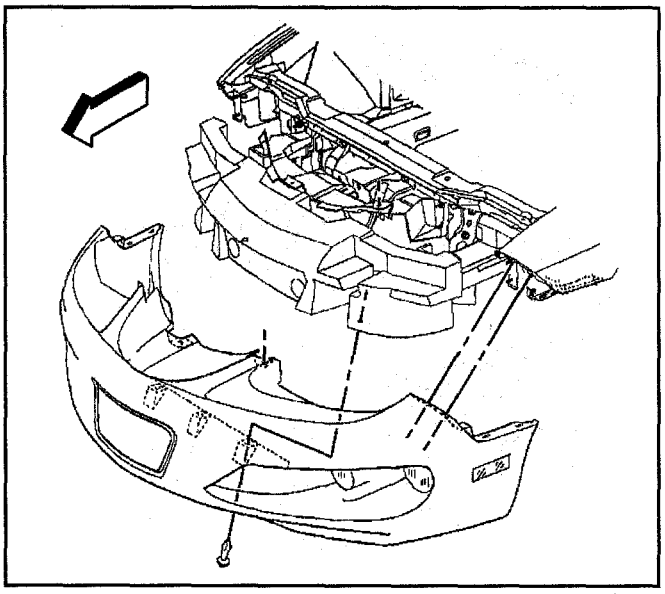


296252

7. Remove the lower fascia retainers along the impact bar.
8. Manually raise the headlamps.
9. Remove the front bumper fascia.



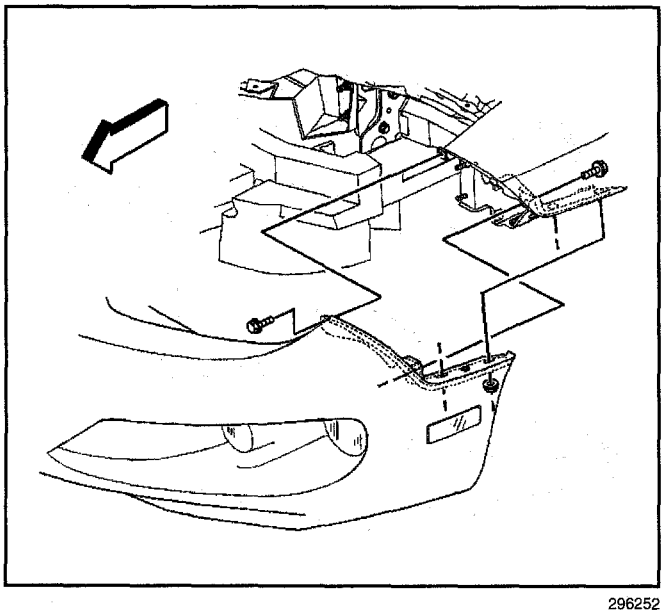
296255



296255

Installation Procedure

1. Install the front bumper fascia.
2. Manually lower the headlamps.
3. Install the lower fascia retainers along the impact bar.
4. Connect all the electrical connectors to the fascia.



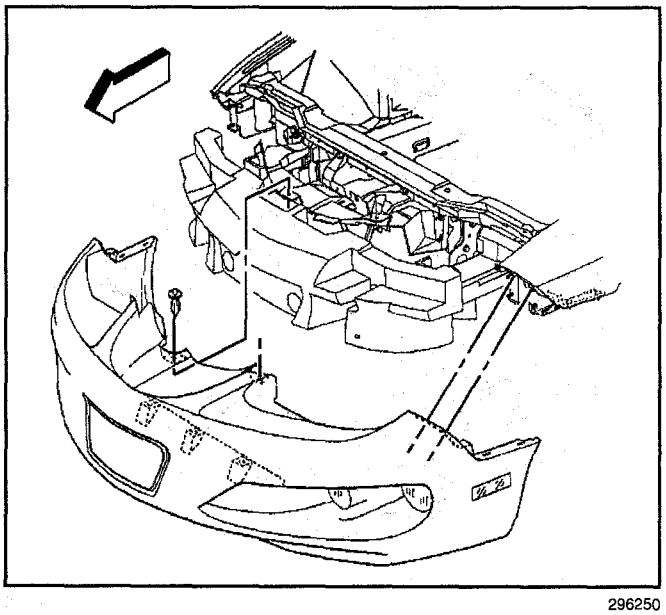
296252

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the fascia outer support nuts and bolts.

   Tighten

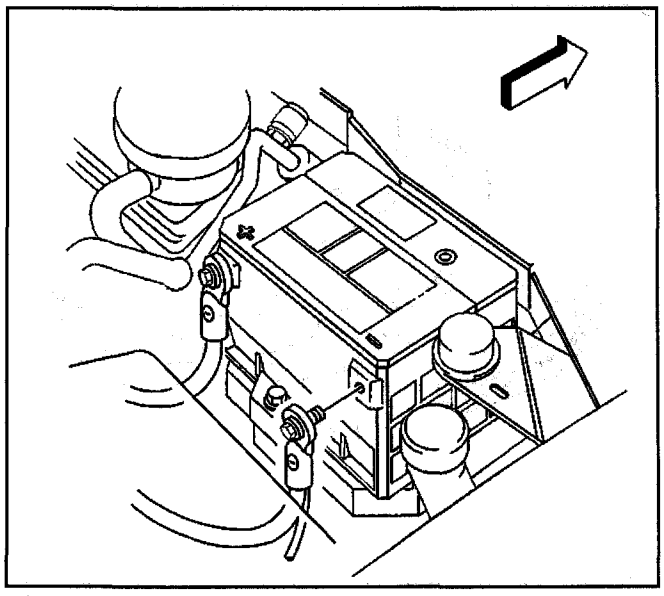
   - Tighten the fascia outer support nuts to 9 N·m (80 lb in).
   - Tighten the fascia outer support bolts to 5 N·m (44 lb in).
6. Install the front end fascia outer deflectors. Refer to *Air Deflector Replacement - Front Bumper Fascia*
7. Lower the vehicle



296250

8. Install the upper fascia retainers along the radiator support.

9. Connect the negative battery cable. Refer to *Battery Negative Cable Disconnect/Connect Procedure* in Engine Electrical.

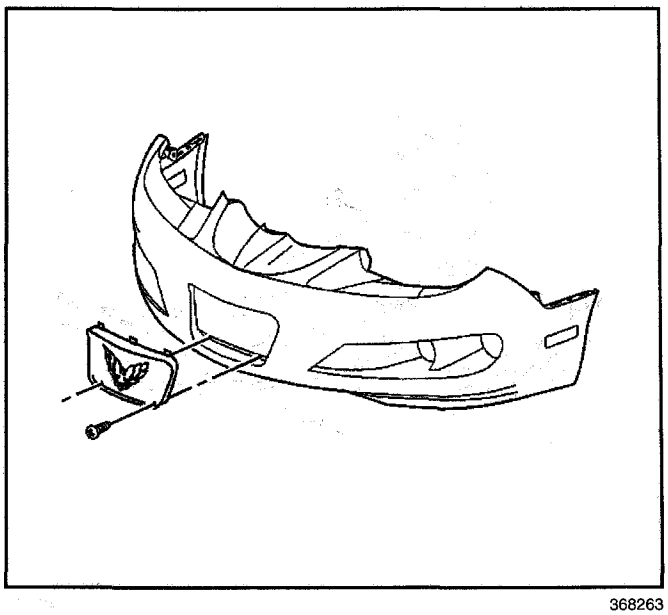


208241

License Pocket Cover Replacement - Front

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the license pocket cover screws.
3. Remove the license pocket cover from the vehicle.



368263

Installation Procedure

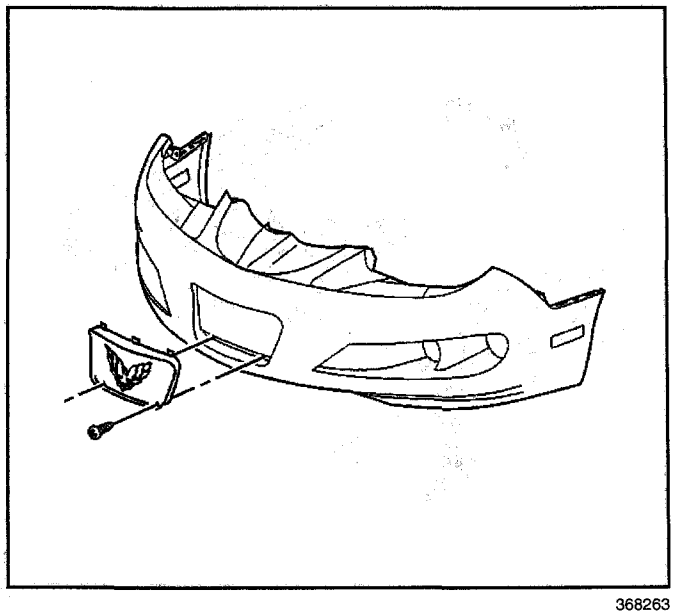
1. Install the license pocket cover to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

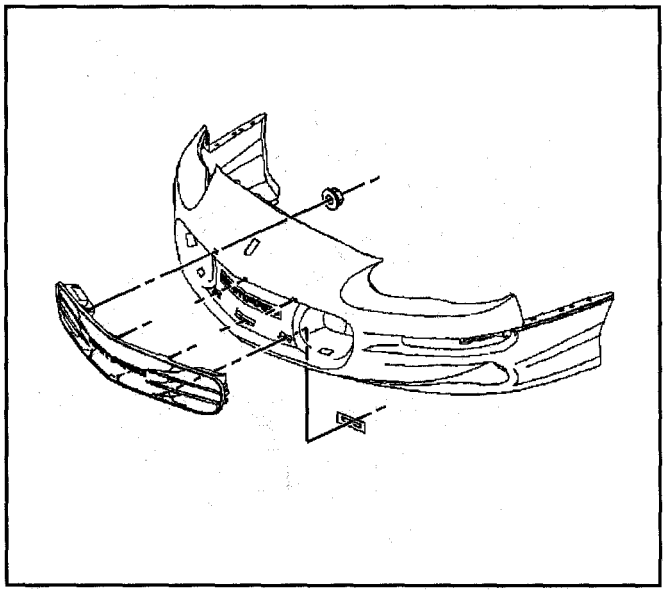
2. Install the license pocket cover screws.

   Tighten

   Tighten the license pocket cover screws to 2.0 N·m (18 lb in).
3. Lower the vehicle.



368263

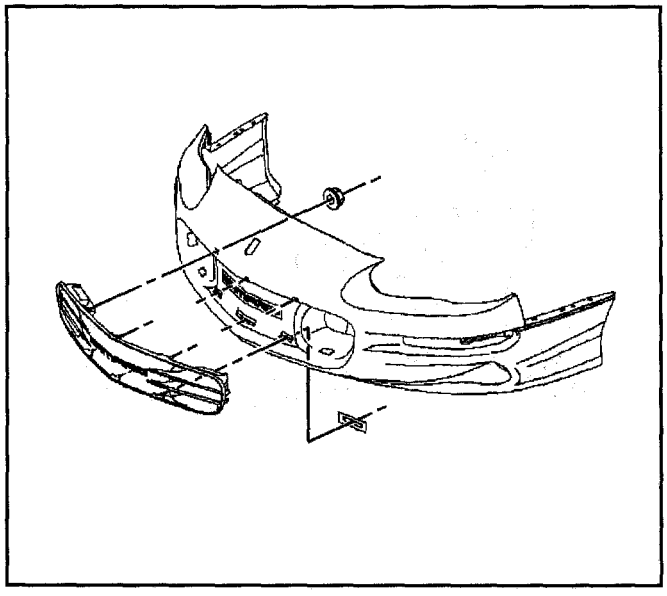


296257

Fascia Grille Replacement - Front Bumper Lower

Removal Procedure

1. Remove the front fascia. Refer to *Fascia Replacement - Front Bumper (Chevrolet)*
2. Remove the grille nuts.
3. Remove the grille retainer clips.



296257

Installation Procedure

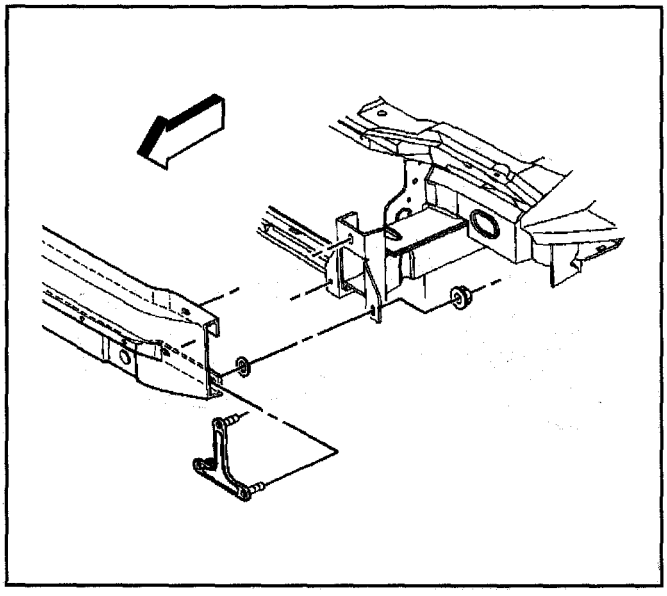
1. Install the grille retainer clips.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the grille nuts.

   Tighten

   Tighten the grille nuts to 2.4 N·m (21 lb in).
3. Install the front fascia. Refer to *Fascia Replacement - Front Bumper (Chevrolet)*



296267

Impact Bar Replacement - Front Bumper

Removal Procedure

1. Remove the front bumper energy absorber. Refer to the appropriate procedure:
   - *Energy Absorber Replacement - Front (Chevrolet)*
   - *Energy Absorber Replacement - Front (Pontiac)*
2. Remove the impact bar nuts from the anchor plate studs.
3. Remove the front bumper impact bar from the vehicle.
4. Remove the impact bar stud plate retainers from the impact bar, if necessary.
5. Remove the impact bar stud plate from the impact bar, if necessary.

Installation Procedure

1. Install the impact bar stud plate to the impact bar, if necessary.
2. Install the impact bar stud plate retainers to the impact bar, if necessary.
3. Install the front bumper impact bar to the vehicle.

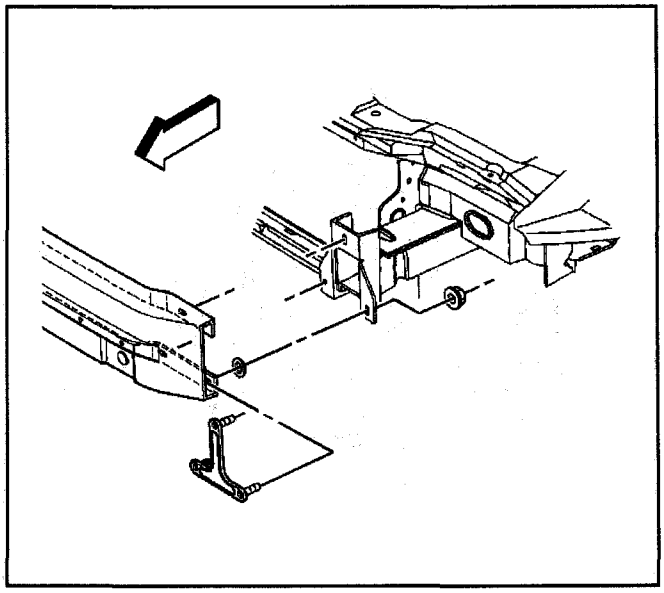
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the impact bar nuts to the anchor plate studs.

   Tighten

   Tighten the impact bar anchor plate nuts to 25 N·m (18 lb ft).

5. Install the front bumper energy absorber. Refer to the appropriate procedure:
   - *Energy Absorber Replacement - Front (Chevrolet)*
   - *Energy Absorber Replacement - Front (Pontiac)*

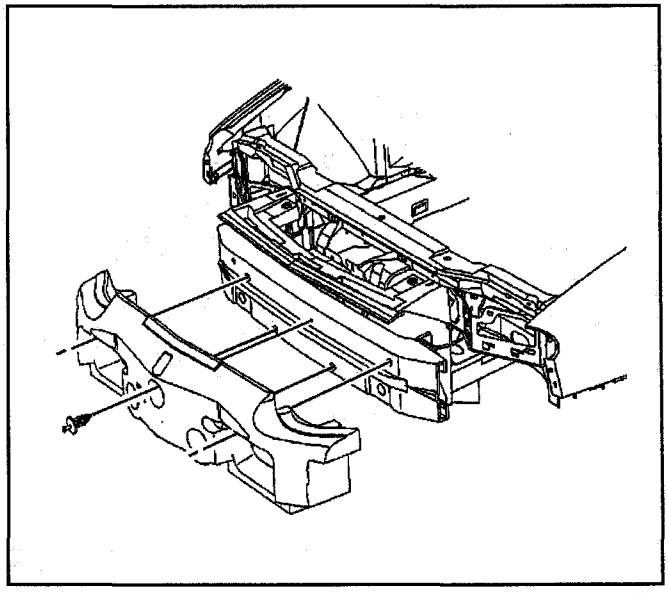


296267

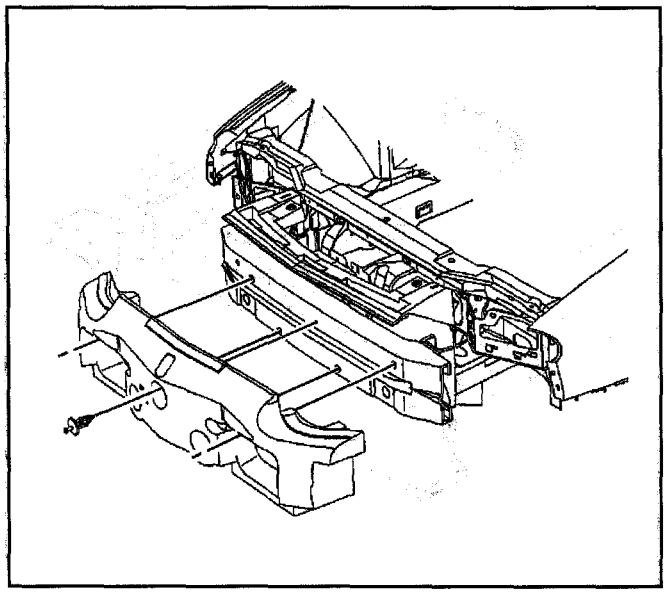
Energy Absorber Replacement - Front (Chevrolet)

Removal Procedure

1. Remove the front fascia. Refer to *Fascia Replacement - Front Bumper (Chevrolet)*
2. Remove the front bumper energy absorber push-in retainers.
3. Remove the front bumper energy absorber from the vehicle.



296261

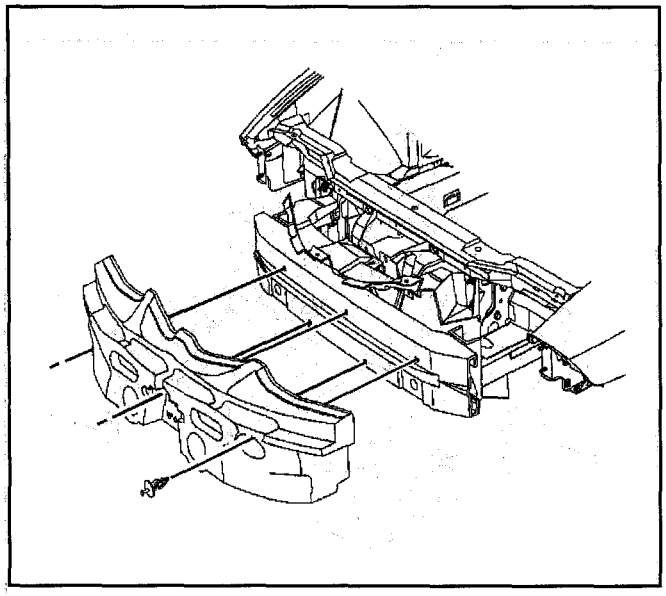


296261

Installation Procedure

1. Install the front bumper energy absorber to the vehicle.
2. Install the front bumper energy absorber push-in retainers.

   Start installing the retainers at the center of the energy absorber and work outboard.
3. Install the front bumper fascia. Refer to *Fascia Replacement - Front Bumper (Chevrolet)*

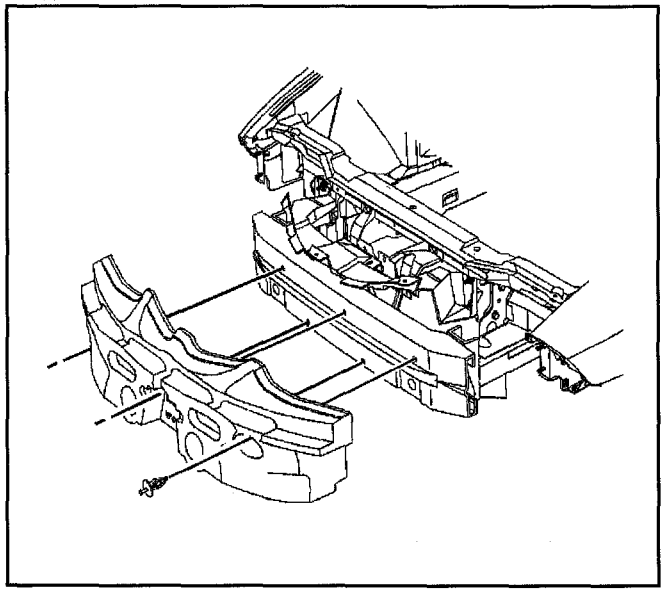


296264

Energy Absorber Replacement - Front (Pontiac)

Removal Procedure

1. Remove the front bumper fascia. Refer to *Fascia Replacement - Front Bumper (Pontiac)*
2. Remove the energy absorber push-in retainers.
3. Remove the front bumper energy absorber from the vehicle.



296264

Installation Procedure

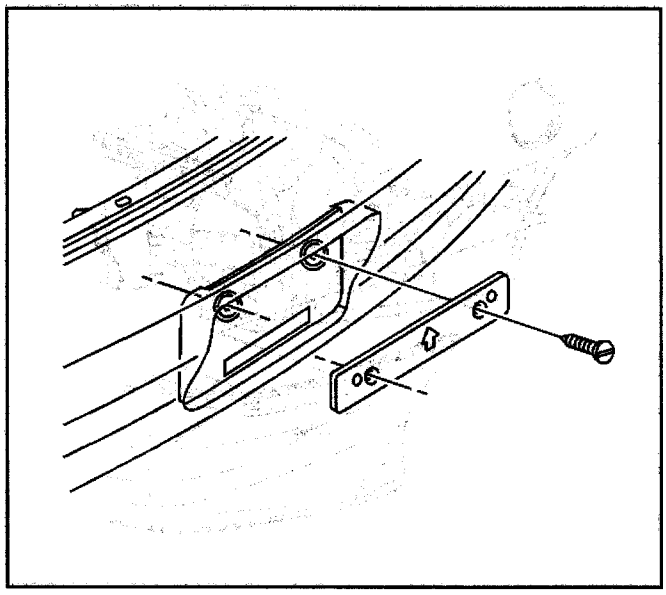
1. Install the front bumper energy absorber to the vehicle.
2. Install the energy absorber push-in retainers.

   Start at the center of the energy absorber and work outboard.
3. Install the front bumper fascia. Refer to *Fascia Replacement - Front Bumper (Pontiac)*

License Bracket Replacement - Rear

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the rear license plate.
3. Remove the rear license plate bracket screws.
4. Remove the rear license plate bracket from the vehicle.



379407

Installation Procedure

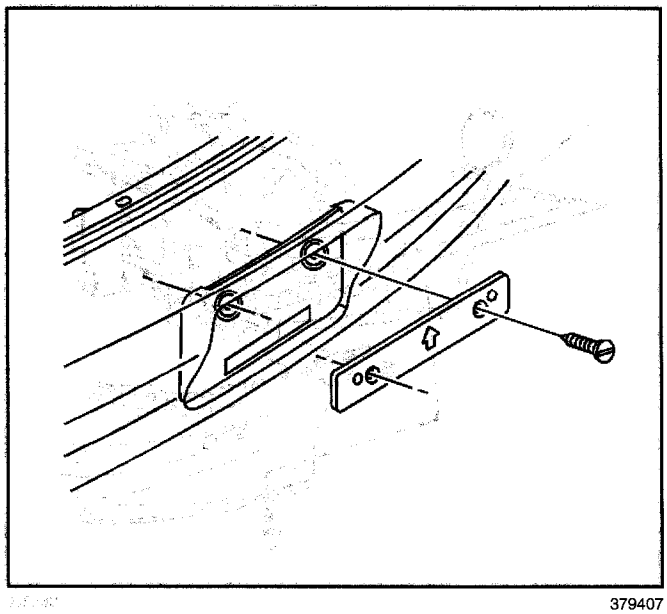
1. Install the rear license plate bracket to the vehicle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the rear license plate bracket screws.

   Tighten

   Tighten the rear license plate bracket screws to 5 N·m (44 lb in).
3. Install the rear license plate.
4. Lower the vehicle.

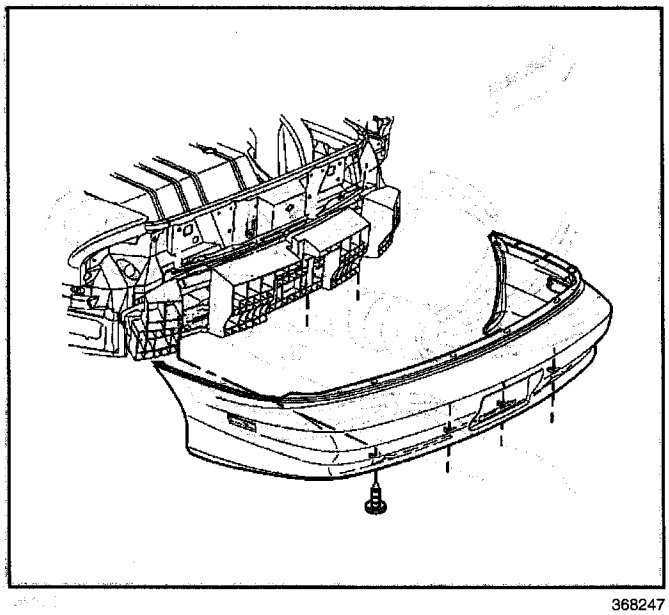


379407

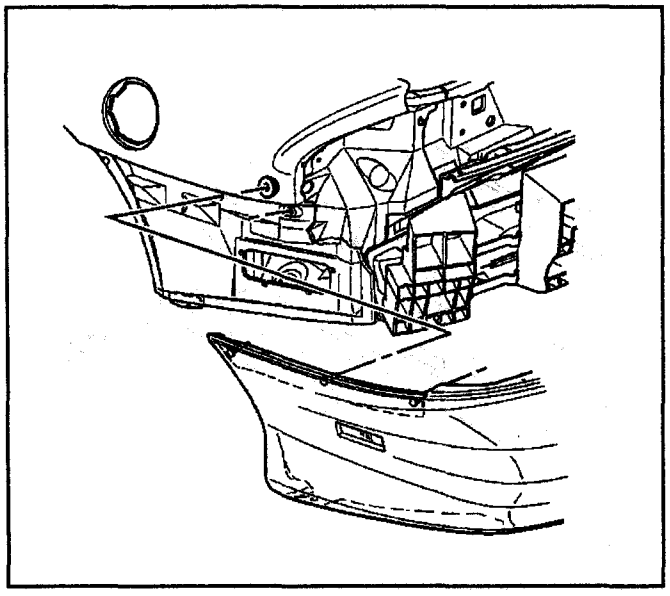
Fascia Replacement - Rear Bumper (Chevrolet)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the push-in retainers located under the fascia.

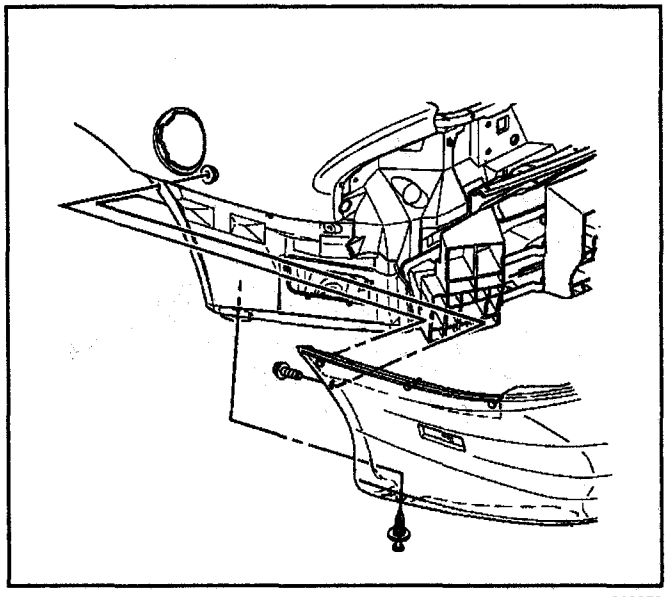


368247



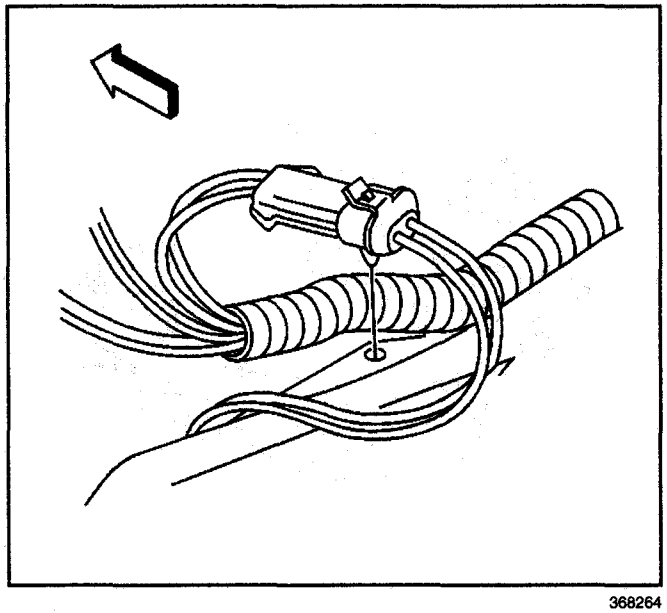
368249

3. Remove the bumper fascia nuts.



368250

4. Remove the bumper fascia bolts.
5. Lower the vehicle.
6. Remove the rear end finish panel.
7. Remove the spare tire and jack.
8. Remove the upper push-in retainers from the top of the fascia.

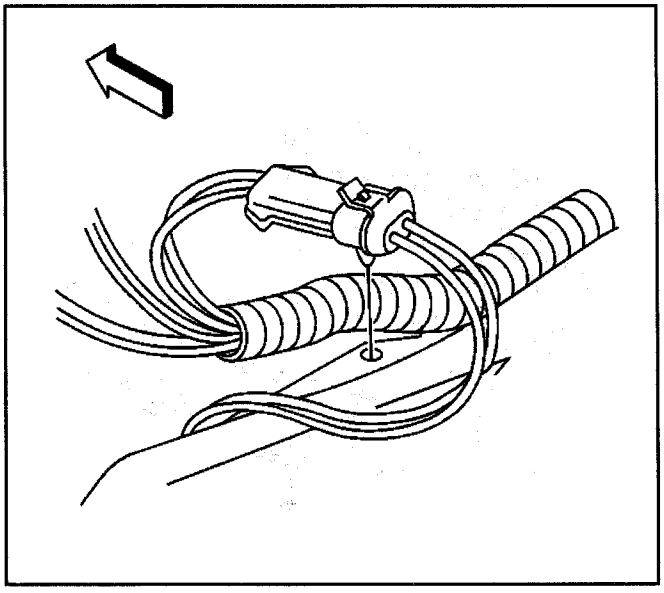


368264

9. Remove the harness connector rosebud clip from the fascia.
10. Disconnect the rear body wiring harness connector from the fascia wiring harness connector.
11. Remove the rear bumper fascia from the vehicle.

Installation Procedure

1. Install the rear bumper fascia to the vehicle.
2. Connect the rear body wiring harness connector to the rear fascia wiring harness connector.
3. Connect the harness connector rosebud clip to the fascia.
4. Install the upper push-in retainers to the top of the fascia.
5. Install the spare tire and jack.
6. Install the rear end finish panel.
7. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.



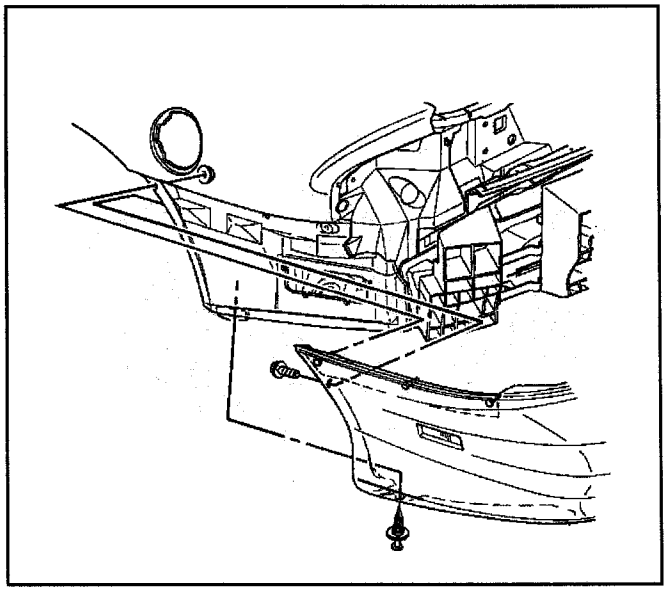
368264

Notice: Refer to *Fastener Notice* in Cautions and Notices.

8. Install the bumper fascia bolts.

   Tighten

   Tighten the bumper fascia bolts to 2 N·m (18 lb in).

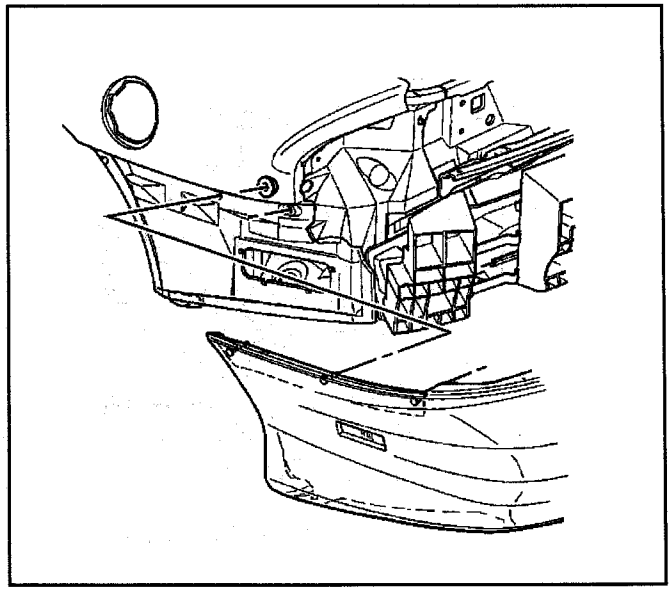


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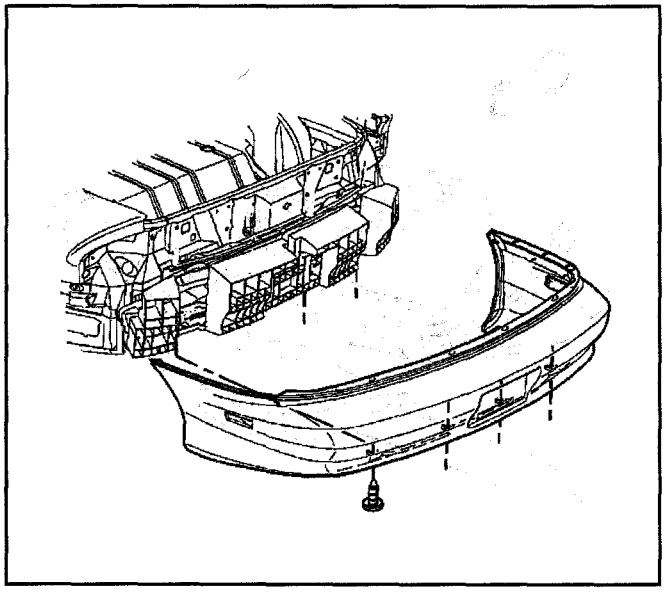
9. Remove the bumper fascia nuts.

   Tighten

   Tighten the bumper fascia nuts to 6 N·m (53 lb in).

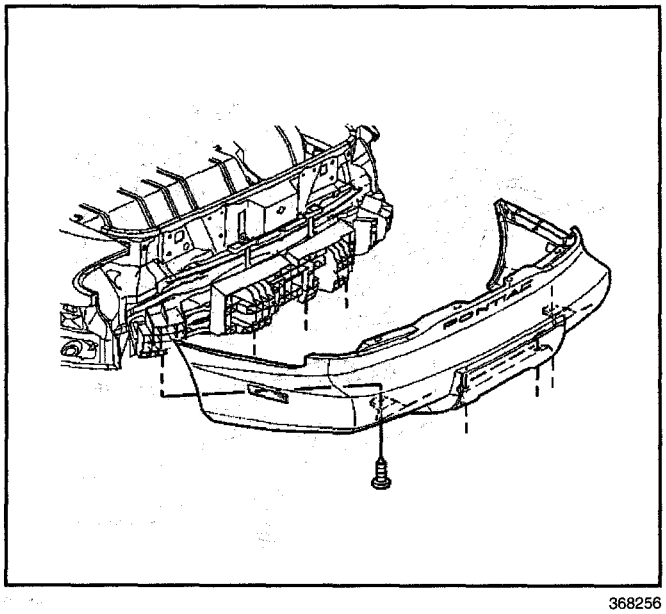


368249



368247

10. Install the push-in retainers located under the fascia.
11. Lower the vehicle.

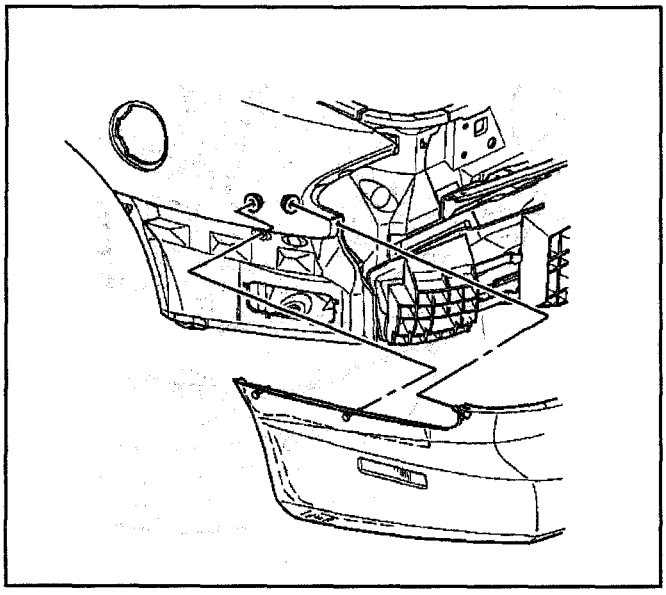


368256

Fascia Replacement - Rear Bumper (Pontiac)

Removal Procedure

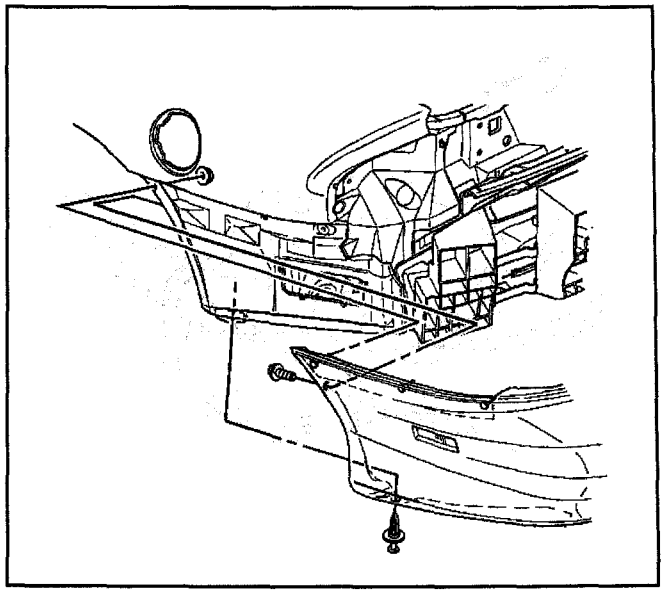
1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the push-in retainers located under the fascia.



368258

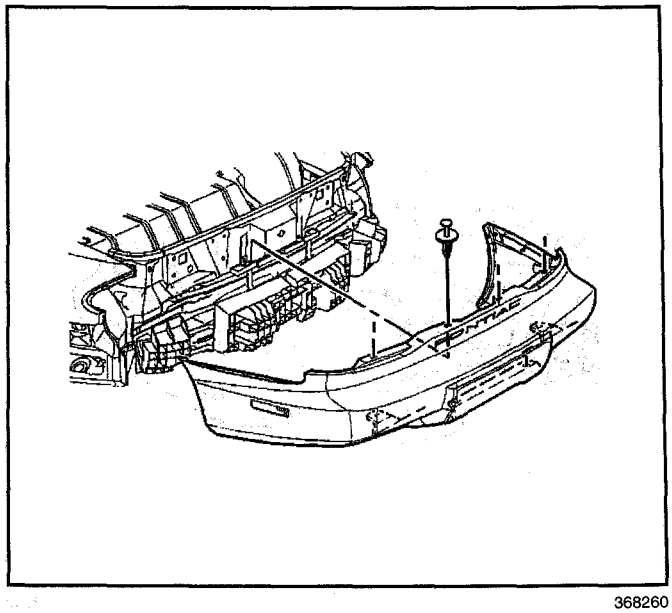
3. Remove the bumper fascia nuts.

4. Remove the bumper fascia bolts.
5. Lower the vehicle.
6. Remove the rear end finish panel.
7. Remove the spare tire and jack.



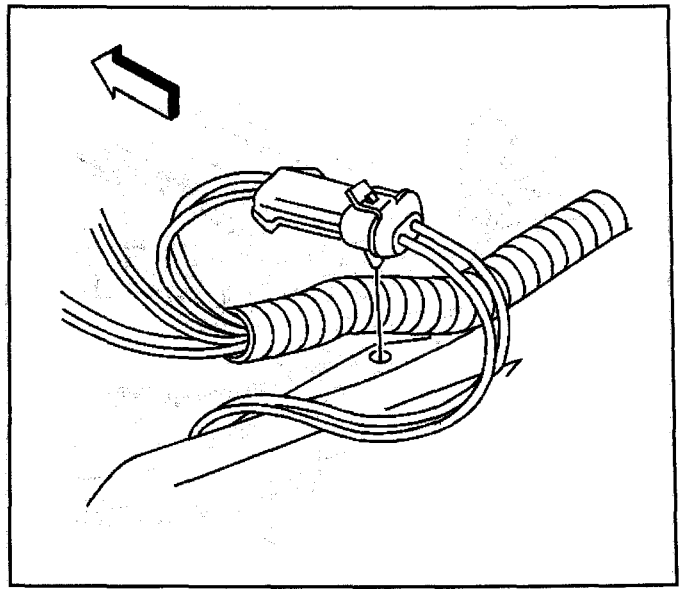
368250

8. Remove the push-in retainers from the top of the fascia.

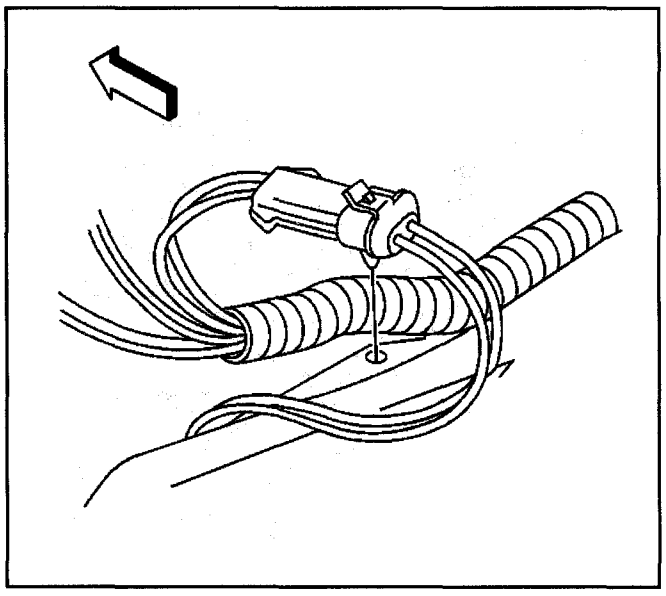


368260

9. Remove the harness connector rosebud clip from the fascia.
10. Disconnect the rear body wiring harness connector from the fascia wiring harness connector.
11. Remove the rear bumper fascia from the vehicle.



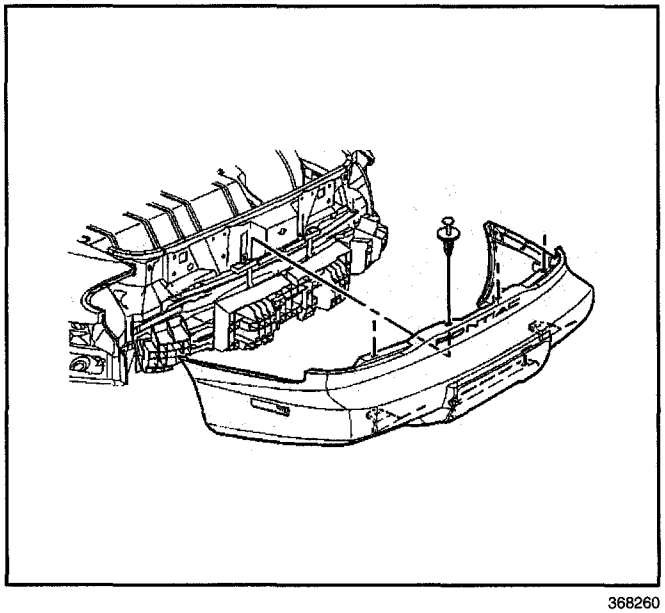
368264



368264

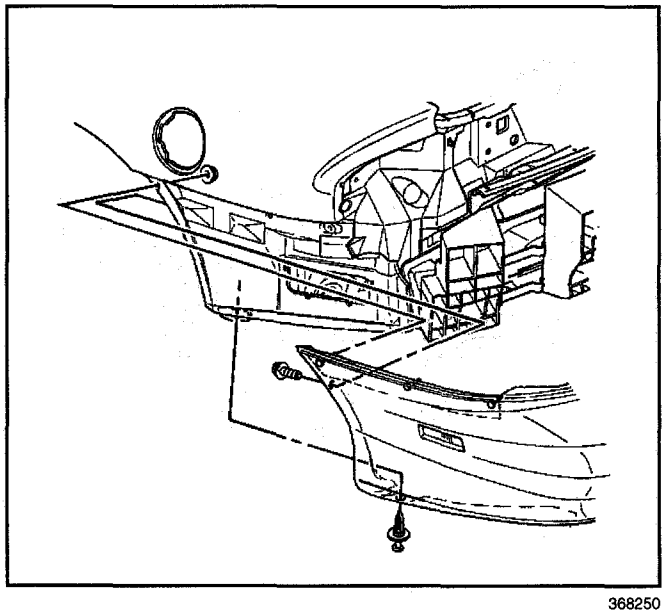
Installation Procedure

1. Install the rear bumper fascia to the vehicle.
2. Connect the rear body wiring harness connector to the rear fascia wiring harness connector.
3. Connect the harness connector rosebud clip to the fascia.



368260

4. Remove the push-in retainers from the top of the fascia.
5. Install the spare tire and jack.
6. Install the rear end finish panel.
7. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.



368250

Notice: Refer to *Fastener Notice* in Cautions and Notices.

8. Install the bumper fascia bolts.

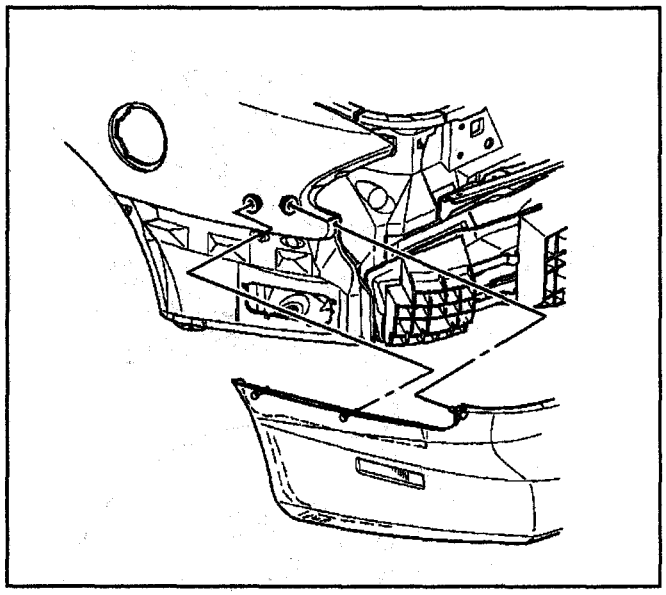
   Tighten

   Tighten the bumper fascia bolts to 2 N·m (18 lb in).

9. Install the bumper fascia nuts.

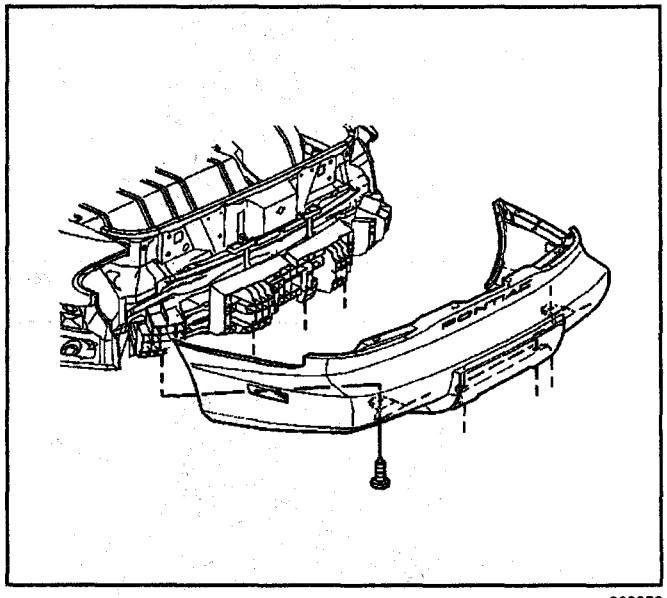
   Tighten

   Tighten the bumper fascia nuts to 6 N·m (53 lb in).

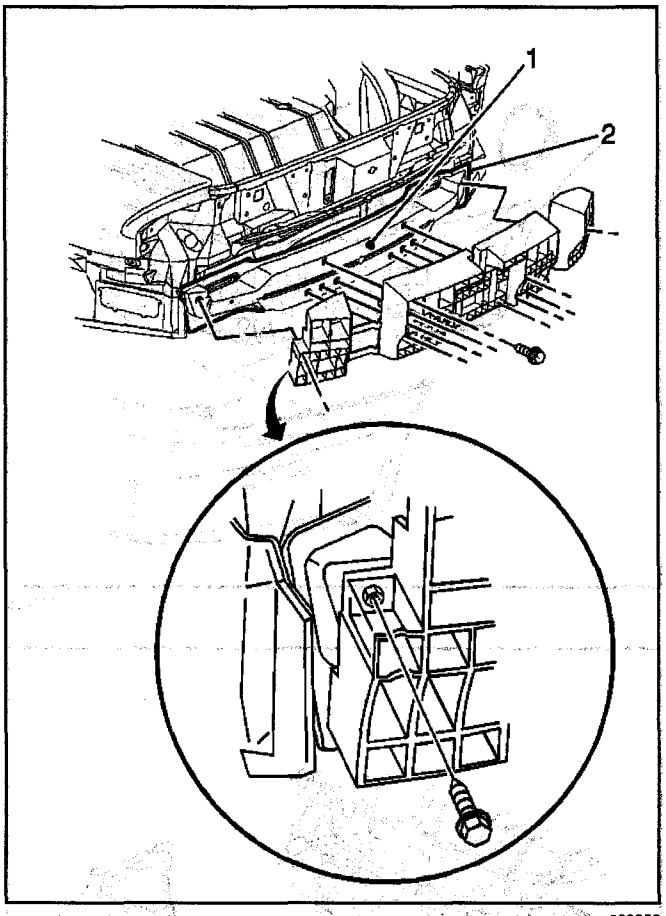


368258

10. Remove the push-in retainers located under the fascia.
11. Lower the vehicle.



368256

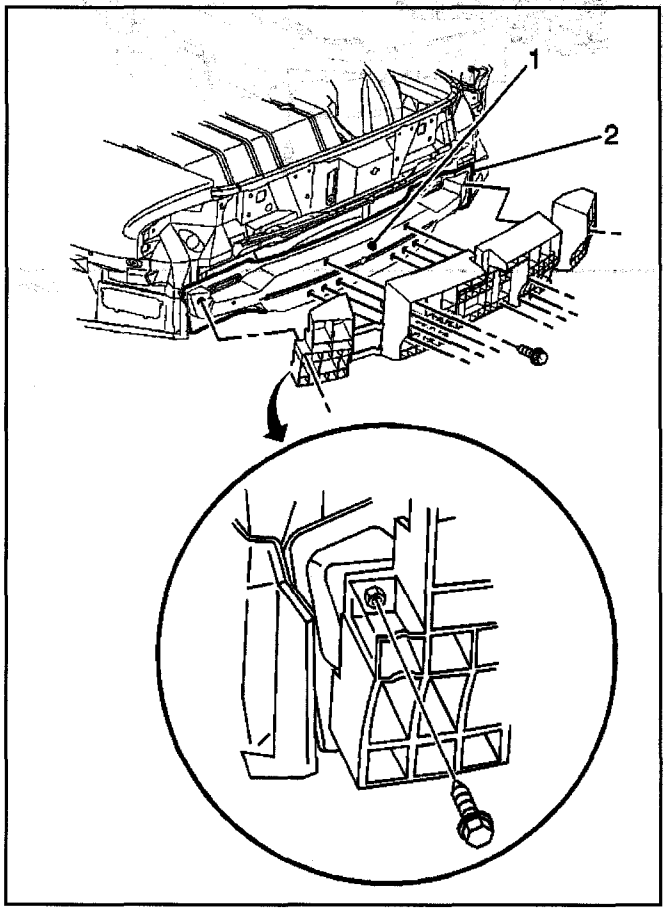


368252

Energy Absorber Replacement - Rear (Chevrolet)

Removal Procedure

1. Remove the rear fascia. Refer to *Fascia Replacement - Rear Bumper (Chevrolet)*
2. Remove the energy absorber bolts.
3. Remove the energy absorber from the impact bar (2).



368252

Installation Procedure

1. Install the rear bumper energy absorber.

   Position the hole at the center of the rear bumper energy absorber over the locating boss (1) at the center of the rear bumper impact bar (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the energy absorber bolts.

   Install the bolts at the center of the energy absorber and work outboard.

   Tighten

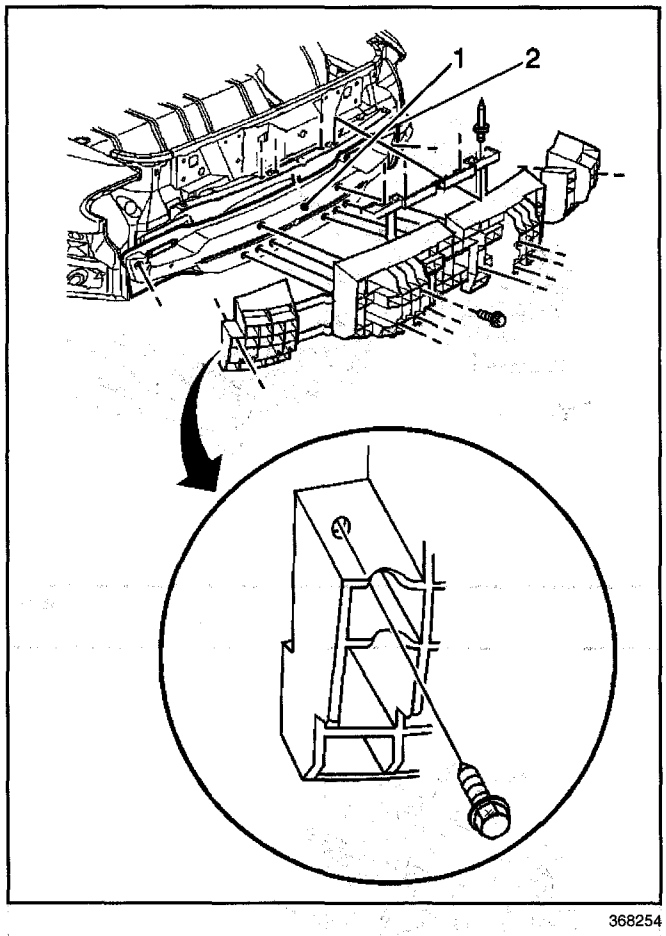
   Tighten the energy absorber bolts to 5.5 N·m (49 lb in).

3. Install the rear fascia. Refer to *Fascia Replacement - Rear Bumper (Chevrolet)*

Energy Absorber Replacement - Rear (Pontiac)

Removal Procedure

1. Remove the rear fascia. Refer to *Fascia Replacement - Rear Bumper (Pontiac)*
2. Remove the energy absorber rivets using a drill bit.
3. Remove the energy absorber bolts.
4. Remove the energy absorber from the impact bar (2).



368254

Installation Procedure

1. Install the rear bumper energy absorber.

   Position the hole at the center of the rear bumper energy absorber over the locating boss (1) at the center of the rear bumper impact bar (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

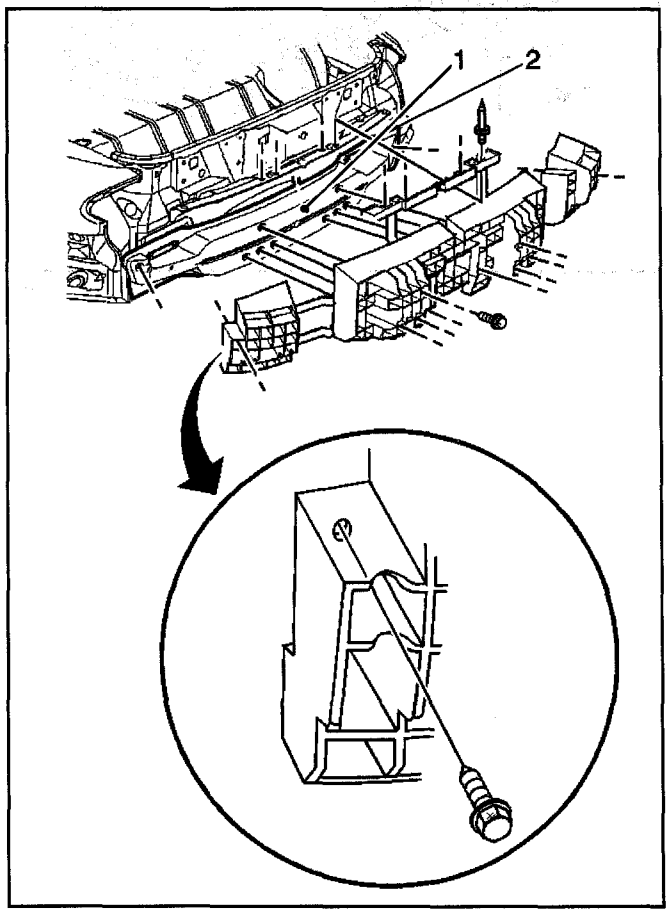
2. Install the energy absorber bolts.

   Install the bolts at the center of the energy absorber and work outboard.

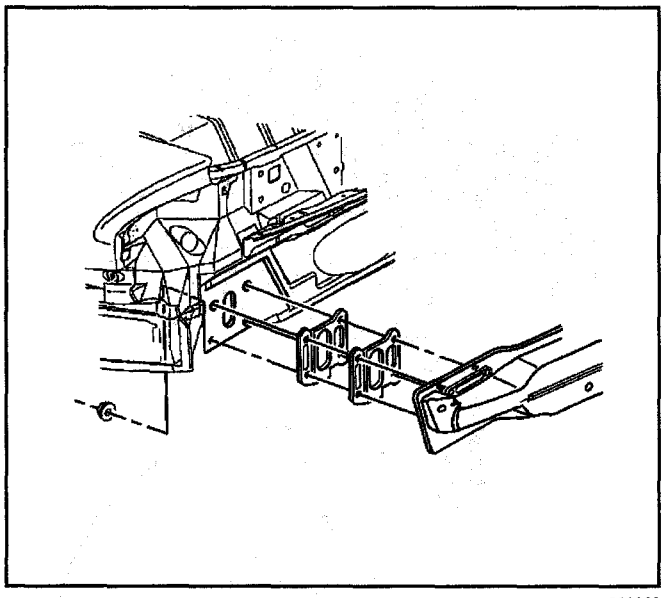
   Tighten

   Tighten the energy absorber bolts to 5.5 N·m (49 lb in).

3. Snap the absorber attachment into the slots in the fascia support bracket.
4. Install the energy absorber rivets.



368254



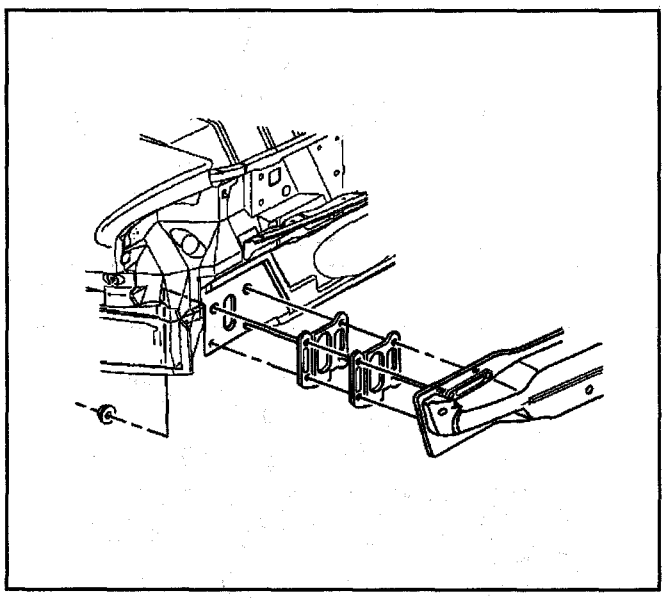
368262

Impact Bar Replacement - Rear Bumper

Removal Procedure

1. Remove the rear bumper energy absorber. Refer to the appropriate procedure:
   - *Energy Absorber Replacement - Rear (Chevrolet)*
   - *Energy Absorber Replacement - Rear (Pontiac)*
2. Remove the rear bumper impact bar nuts from the plate studs.
3. Remove the rear bumper impact bar.

   Note the number of shims prior to removing the impact bar.



368262

Installation Procedure

1. Install the rear bumper impact bar and shims.

   Place the shims into the location from which the shims were removed.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the rear bumper impact bar nuts to the plate studs.

   Tighten

   Tighten the rear bumper impact bar nuts to 15 N·m (11 lb ft).
3. Install the rear bumper energy absorber. Refer to the appropriate procedure:
   - *Energy Absorber Replacement - Rear (Chevrolet)*
   - *Energy Absorber Replacement - Rear (Pontiac)*

Description and Operation

Bumper and Fascia Description (Chevrolet)

Bumpers

The front and rear bumper design incorporates a full-width honeycomb energy absorber. The energy absorber is made of guide flex (or equivalent) material backed up by rigidly mounted impact bars. The front bumper fascia is polyurea. The rear bumper fascia is polyurethane. Both of the fascias are painted the same color as the body.

For repair of the front and/or rear bumper fascia, refer to General Body Service.

Fascia Energy Absorber

General Motors passenger car bumper systems are designed to take a collision into a fixed barrier at 8 km/h (5 mph) without damage. After absorbing the energy of a collision, these bumper systems return to the original position.

Bumper and Fascia Description (Pontiac)

Bumpers

The front bumper design incorporates a full-width Styrofoam material energy absorber. The rear bumper design incorporates a full-width honeycomb energy absorber. The energy absorber is made of guide flex (or equivalent) material. Both of the bumpers are backed up by rigidly mounted impact bars. The front bumper fascia is polyurea. The rear bumper fascia is polyurethane. Both of the fascias are painted the same color as the body.

For repair of the front and/or rear bumper fascia, refer to General Body Service.

Fascia Energy Absorber

General Motors passenger car bumper systems are designed to take a collision into a fixed barrier at 8 km/h (5 mph) without damage. After absorbing the energy of a collision, these bumper systems return to the original position.

Body Front End

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Body Hinge Pillar Trim Panel Bolt/Screw	1.3 N·m	12 lb in
Door Jamb Switch	6 N·m	53 lb in
Fascia Outer Bracket Bolt/Screw	5.5 N·m	49 lb in
Front Bumper Fascia Outer Bracket Bolt/Screw	10 N·m	89 lb in
Front Fender Bolt/Screw	5.5 N·m	49 lb in
Front Fender Rear Center Bracket Bolt/Screw	5.5 N·m	49 lb in
Front Fender Rear Upper Bracket Bolt/Screw	5.5 N·m	49 lb in
Front Wheelhouse Panel Liner Bolt/Screw	1.3 N·m	12 lb in
Front Wheelhouse Panel Liner Bolt/Screw (Lower)	10 N·m	89 lb in
Headlamp Housing Panel Bracket and Pivot Support Bracket Bolt/Screw	1.7 N·m	15 lb in
Headlamp Housing Panel Bolt/Screw	8 N·m	71 lb in
Headlamp Housing Panel Bracket Bolt/Screw	10 N·m	89 lb in
Headlamp Housing Panel Bracket Bolt/Screw	5.5 N·m	49 lb in
Headlamp Housing Panel Support Bolt/Screw	10 N·m	89 lb in
Headlamp Housing Panel Upper Bracket Bolt/Screw	10 N·m	89 lb in
Hood Air Extractor Nut	3 N·m	27 lb in
Hood Air Extractor Screen Bolt/Screw	1.7 N·m	15 lb in
Hood Hinge Bolt/Screw	10 N·m	89 lb in
Hood Hinge Bolt/Screw (Body Side)	27 N·m	20 lb ft
Hood Hinge Bracket Bolt/Screw	27 N·m	20 lb ft
Hood Hinge Nut	25 N·m	18 lb ft
Hood Open Assist Rod Bolt/Screw	10 N·m	89 lb in
Hood Open Assist Rod Bracket Bolt/Screw	23 N·m	17 lb ft
Hood Primary Latch Bolt/Screw	25 N·m	18 lb ft
Hood Primary Latch Release Cable Bolt/Screw	7 N·m	62 lb in
Hood Primary Latch Support Bolt/Screw	18 N·m	13 lb ft
Hood Primary Latch Striker Bolt/Screw	27 N·m	20 lb ft
Hood Secondary Latch Bolt/Screw	12 N·m	106 lb in
Hood Strut Ball Stud	21 N·m	16 lb ft
Negative Battery Cable	15 N·m	11 lb ft
Radiator Air Lower Deflector Bolt/Screw	10 N·m	89 lb in

Repair Instructions

Hood Adjustment

The net build consists of the following components which can only be minimally adjusted:

- The hood
- The front fenders
- The hood hinges

1. Inspect the structural body for damage or misalignment. Refer to *Alignment Checking* in Frame and Underbody.
2. Loosen the hood hinge bolts/screws and adjust the following components:
   - The hood
   - The bumpers

Raising or Lowering Rear Corners of Hood

Hood Adjust Front Bumper

1. Close the hood firmly.
2. Determine the amount of adjustment needed. Refer to *Alignment Checking* in Frame and Underbody.
3. Open the hood.
4. Change the height by turning the hood bumpers up or down.
5. Repeat steps 1 through 4 until the hood is properly aligned.

Fore and Aft Adjustment

Important: Adjust one side at a time for the best appearance.

1. Loosen the following components:
   1.1. The hood hinge to body bolts/screws (4)
   1.2. The nuts (5)
2. Move the hood forward or rearward. Refer to *Alignment Checking* in Frame and Underbody.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the following components:
   3.1. The nuts (5)

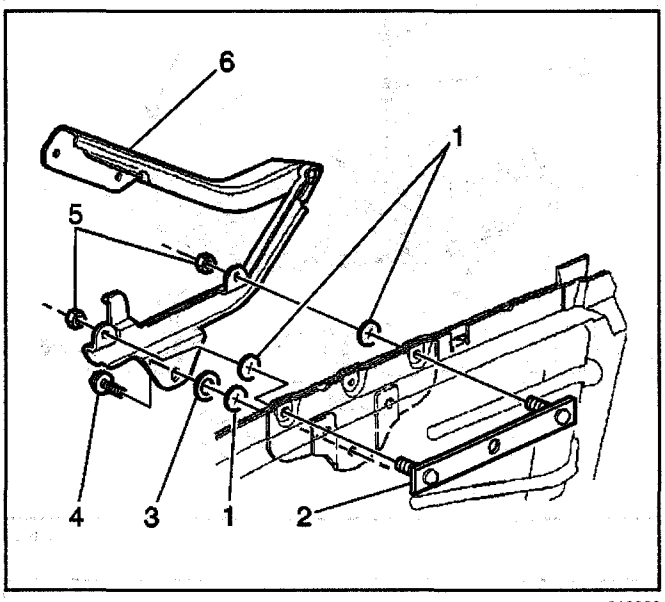
   Tighten

   Tighten the hood hinge nuts (5) to 25 N·m (18 lb ft).

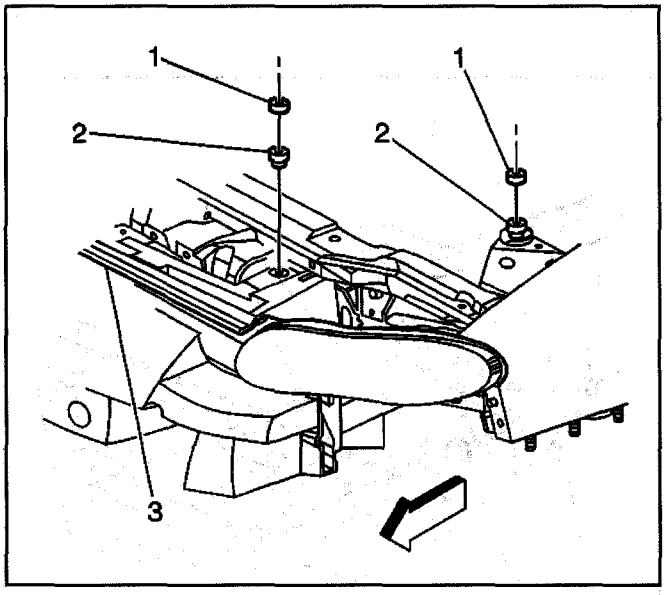
   3.2. The hood hinge to body bolts/screws (4)

   Tighten

   Tighten the hood hinge to body bolts/screws (4) to 10 N·m (89 lb in).



318920

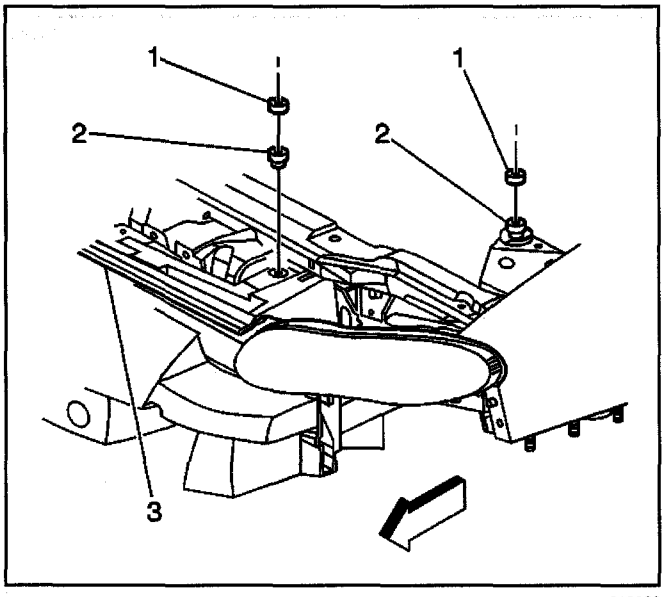


318933

Hood Bumper Replacement

Removal Procedure

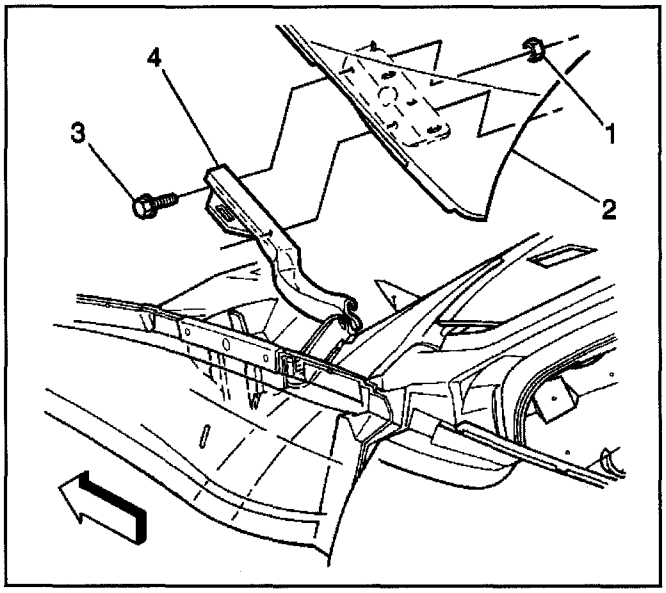
1. Measure the hood adjust front bumper (2) height.
2. Record the measurements.
3. Raise the hood to the full open position.
4. Remove the hood adjust front bumper (2).
5. Rotate the hood adjust front bumper (2) counterclockwise.



318933

Installation Procedure

1. Install the hood adjust front bumper (2).
2. Rotate the hood adjust front bumper (2) clockwise until the hood adjust front bumper (2) is at the same height as measured before removal.
3. Inspect the hood alignment. Refer to *Hood Adjustment*.
4. Close the hood.



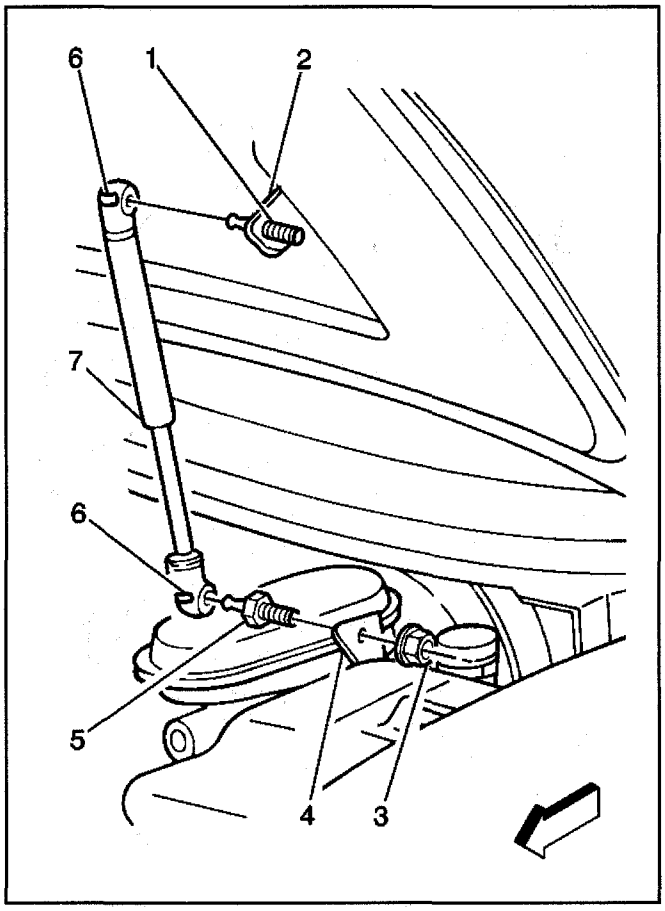
318914

Hood Replacement

Removal Procedure

1. Open the hood (2).

2. Complete the following steps in order to remove the hood open assist rod (7) from the strut stud (1):
   2.1. Pry the clip (6) out with a flat bladed tool.
   2.2. Pull the assist rod (7) from the strut stud (1).
   2.3. Remove the hood open assist rod (7).
3. Remove the following components from the hood hinges (4):
   3.1. The hood hinge bolts/screws (3)
   3.2. The hinge bracket nuts (1)
4. Remove the hood (2) from the vehicle with the aid of a helper.



318913

Installation Procedure

1. Install the hood (2) to the vehicle with the aid of a helper.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

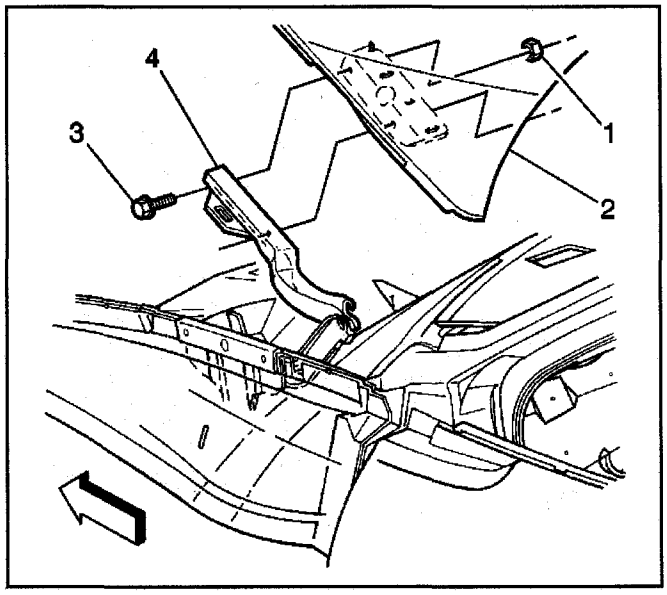
2. Install the following components to the hood hinges (4):
   2.1. The hinge bracket nuts (1)

   Tighten

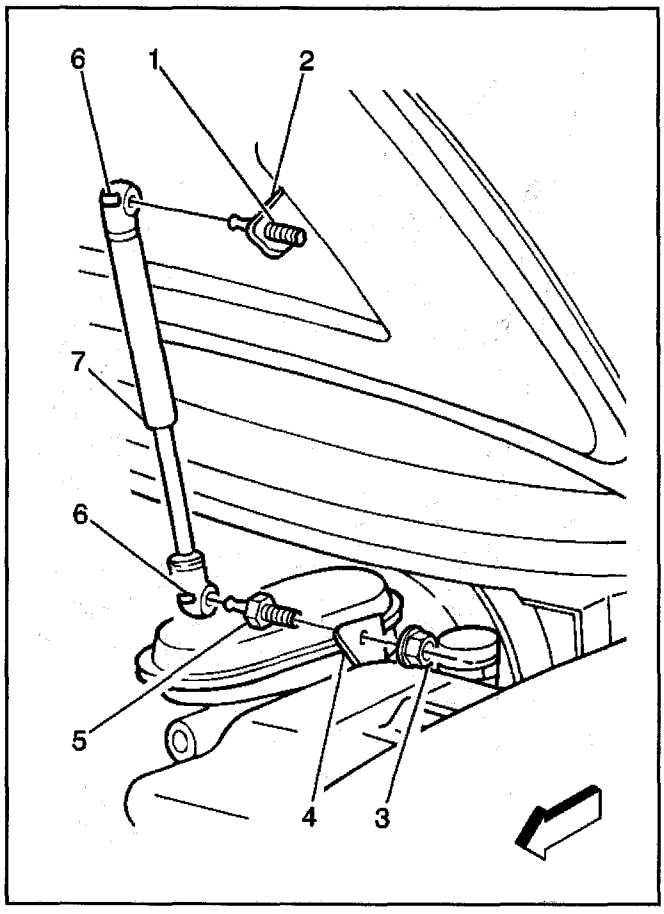
   Tighten the hood hinge bracket nuts (1) to 27 N·m (20 lb ft).
   2.2. The hood hinge bolts/screws (3)

   Tighten

   Tighten the hood hinge bolts/screws (3) to 27 N·m (20 lb ft).

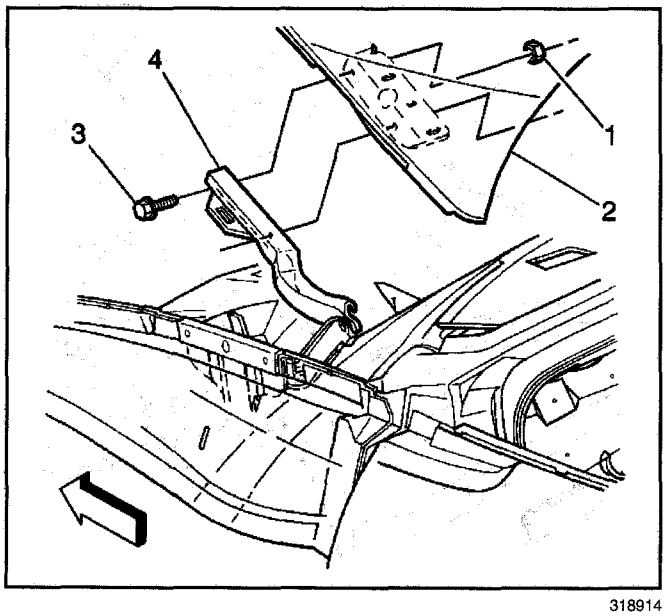


318914



318913

3. Install the hood open assist rod (7) to the strut stud (1).



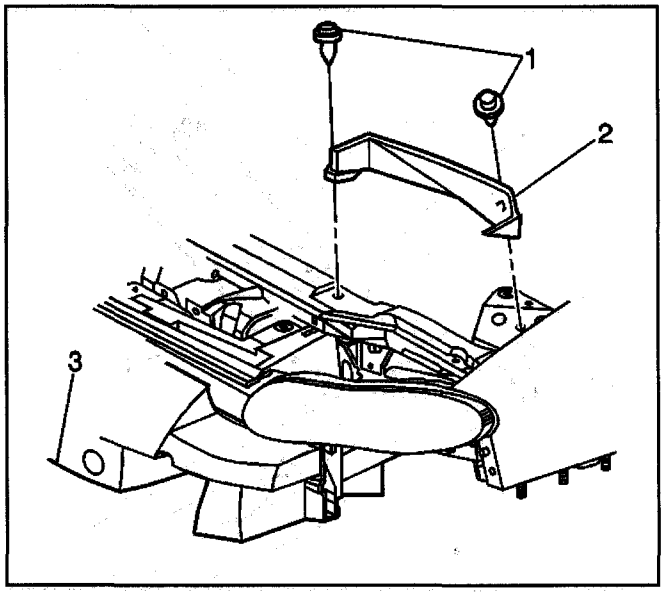
318914

4. Close the hood (2) slowly.
5. Inspect the clearance between the following components:
   - The hood (2)
   - The front fenders
   - For Pontiac vehicles only, the headlamp opening doors
6. Inspect the alignment of the hood (3). Refer to *Alignment Checking* in Frame and Underbody.
7. Adjust the hood as needed. Refer to *Hood Adjustment*.

Hood Close Out Filler Replacement

Removal Procedure

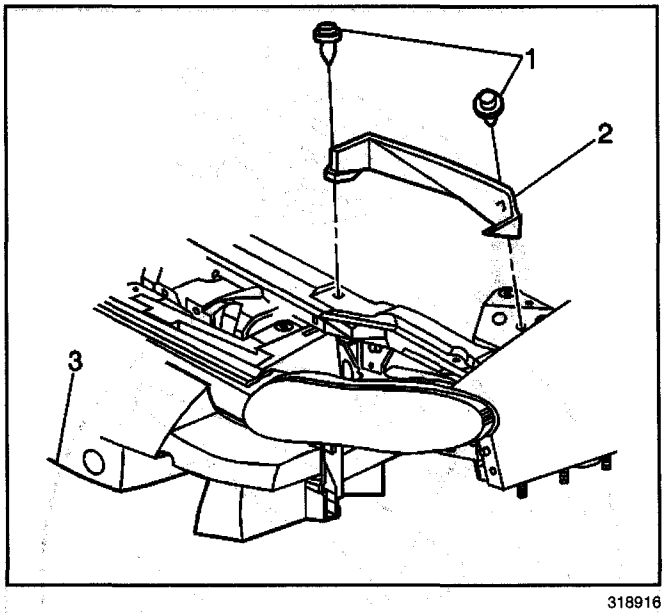
1. Raise the hood to the full open position.
2. Remove the close-out filler retainers (1).
3. Remove the hood close-out filler (2).



318916

Installation Procedure

1. Install the hood close-out filler (2).
2. Install the close-out filler retainers (1).
3. Close the hood.

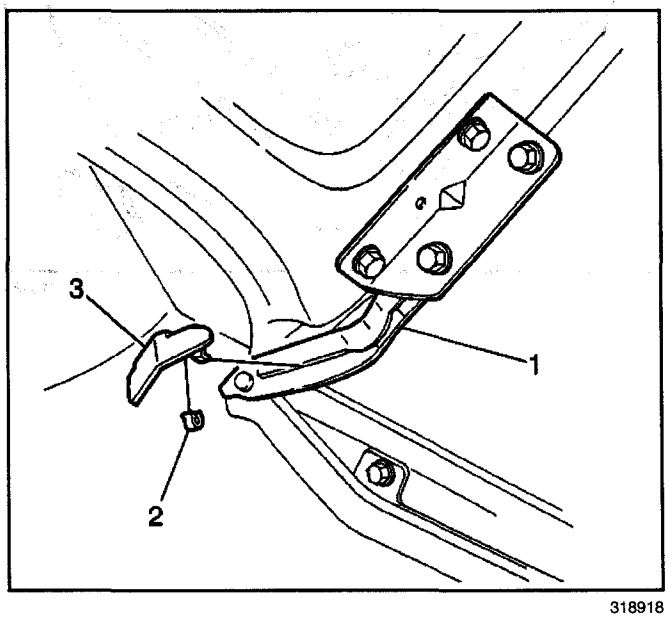


318916

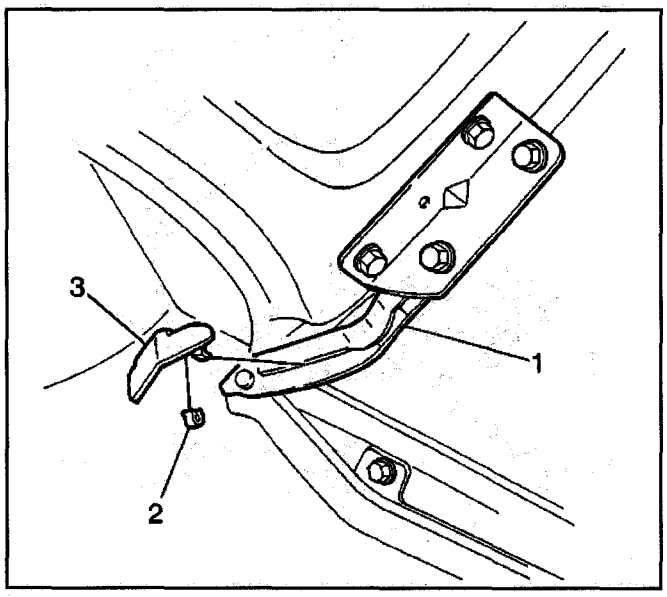
Hood Hinge Cover Replacement

Removal Procedure

1. Open the hood.
2. Remove the hood hinge cover retainer (2).
3. Remove the hood hinge cover (3).



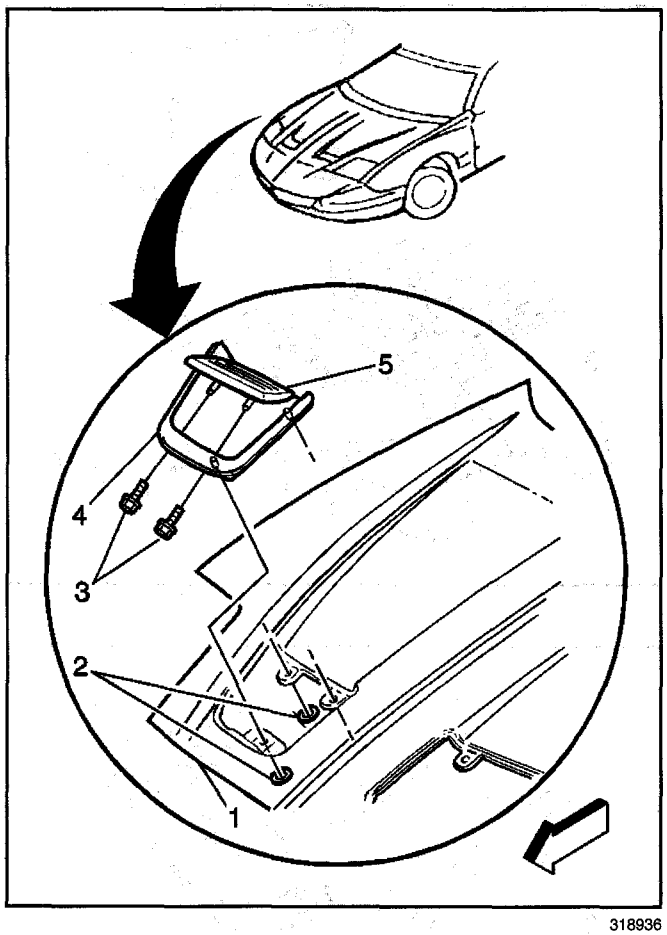
318918



318918

Installation Procedure

1. Install the hood hinge cover (3).
2. Install the hood hinge cover retainer (2).
3. Close the hood.



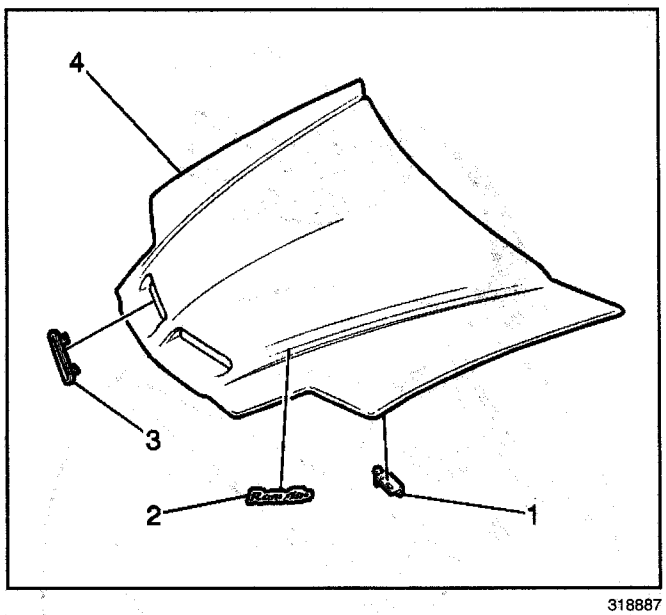
318936

Hood Air Extractor Replacement (Pontiac)

Removal Procedure

1. Remove the hood insulator front attachments.
2. Remove the hood air extractor nuts.
3. Remove the hood air extractor (4).
4. Remove the hood air extractor screen bolts/screws (3).
5. Remove the hood air extractor screen (5).

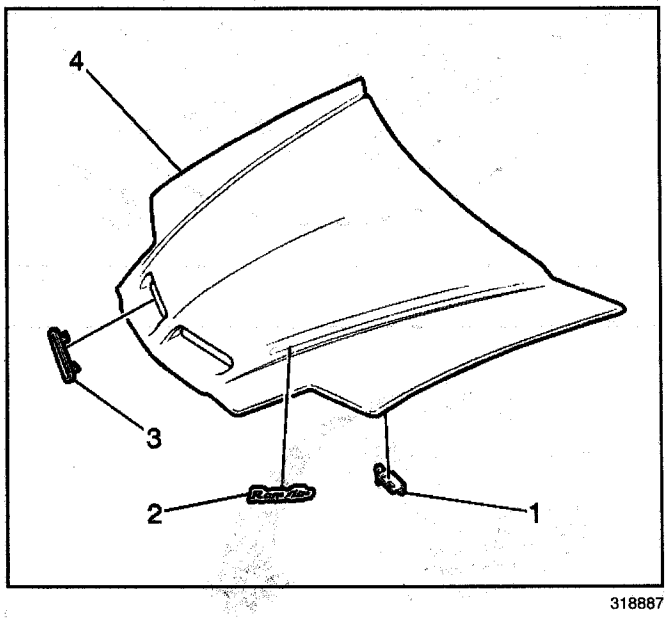
6. Unsnap the hood air extractor screen (3) from the hood (4).



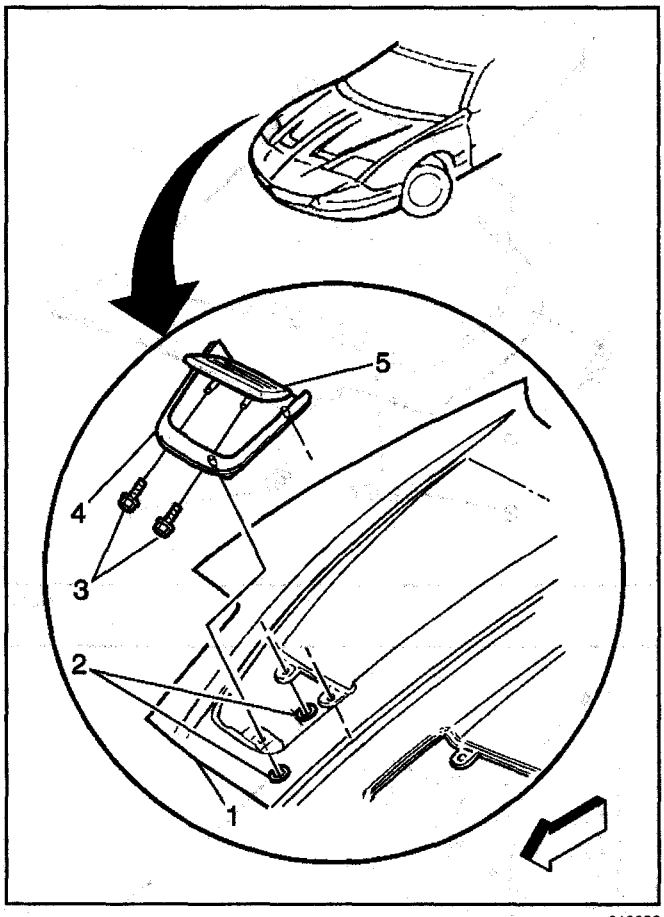
318887

Installation Procedure

1. Snap the hood air extractor screen (3) to the hood (4).



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2. Install the hood air extractor screen (5) to the hood air extractor (4).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the hood air extractor screen bolts/screws (3).

   Tighten

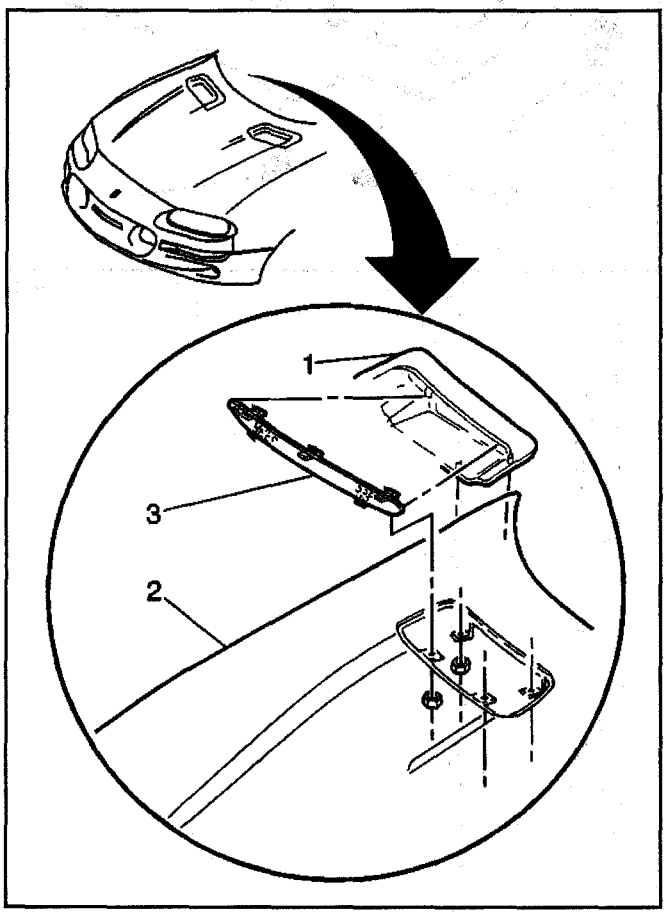
   Tighten the hood air extractor screen bolts/screws to 1.7 N·m (15 lb in).

4. Install the hood air extractor (4) to the hood (1).
5. Install the hood air extractor nuts (2).

   Tighten

   Tighten the hood air extractor nuts to 3 N·m (27 lb in).

6. Install the hood insulator front attachments.



318937

Hood Air Extractor Replacement (Chevrolet)

Removal Procedure

1. Remove the hood insulator front attachments.
2. Remove the hood air extractor nuts.
3. Remove the hood air extractor (1).
4. Remove the hood air extractor screen (5).

Installation Procedure

1. Install the hood air extractor screen (3) to the hood air extractor (1).
2. Install the hood air extractor (1) to the hood (2).

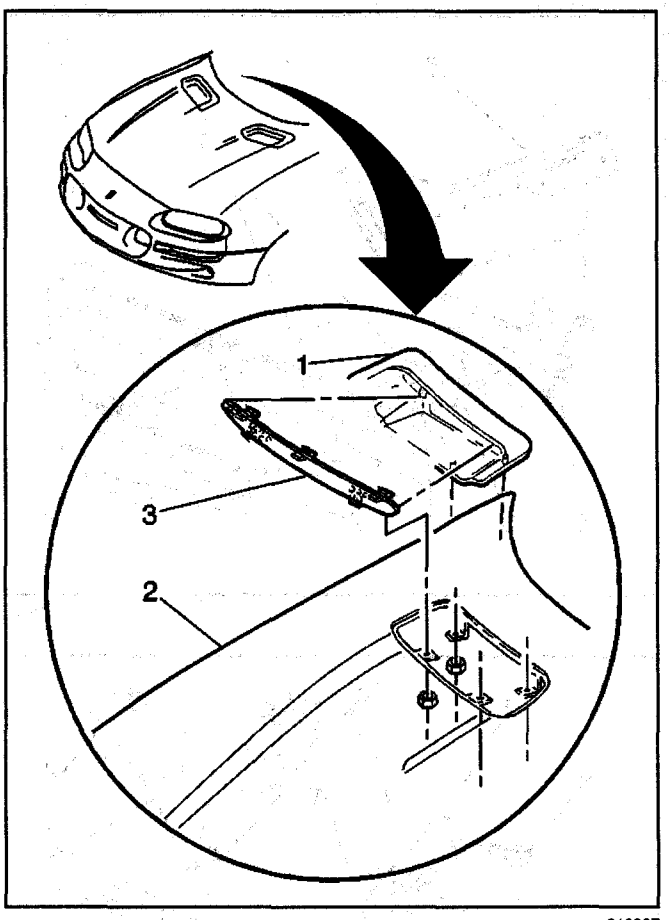
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the hood air extractor nuts.

   Tighten

   Tighten the hood air extractor nuts to 3 N·m (27 lb in).

4. Install the hood insulator front attachments.

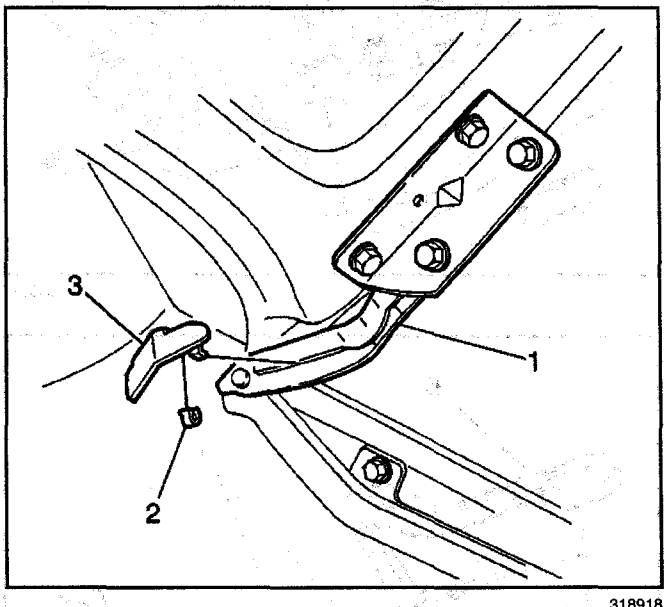


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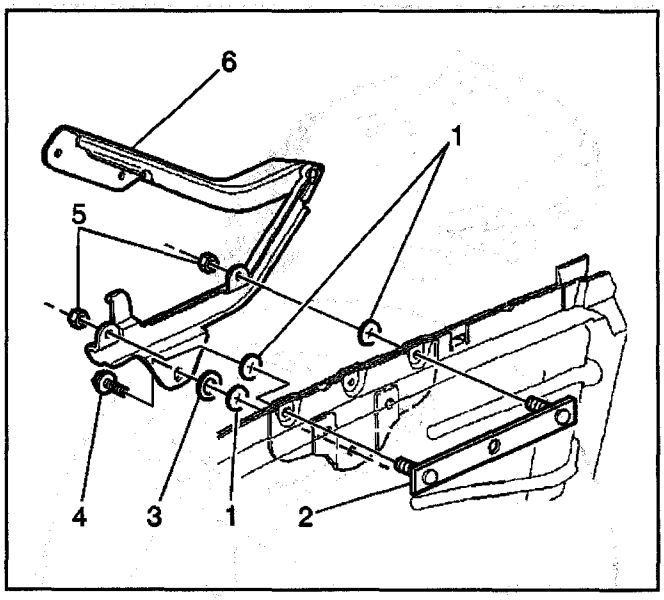
Hood Hinge Replacement

Removal Procedure

1. Open the hood (2). Support the hood with the hood support.

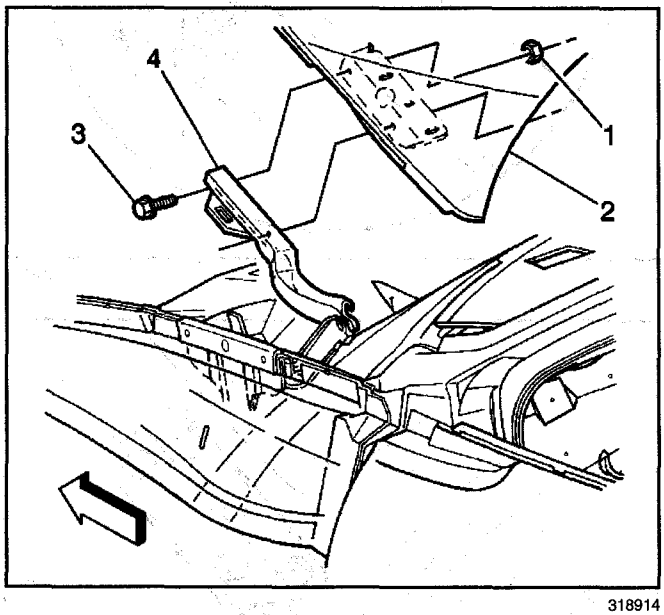


318918



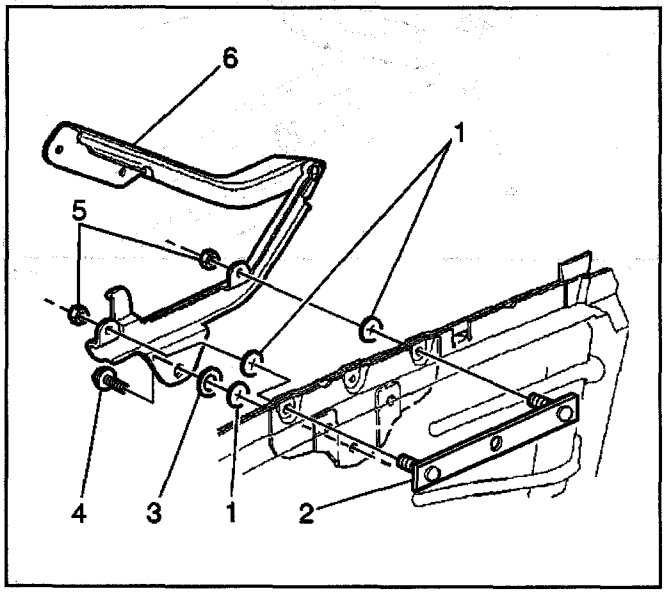
318920

2. Remove the following components:
   - The hood hinge bolt/screw (4)
   - The shim (3)



318914

3. Remove the following components from the hood:
   - The hood hinge screws (3)
   - The hinge bracket nuts (1)



318920

4. Remove the hood hinge nuts (5) from the lower attachment of the hood hinge (6).
5. Remove the hood hinge (6).
6. Complete the following steps in order to remove the hood hinge mount plate (2), as needed:
   6.1. Remove the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement*.
   6.2. Pry off the retainers (1) from the plate studs with a flat-bladed tool.
   6.3. Remove the hood hinge mount plate (2).

Installation Procedure

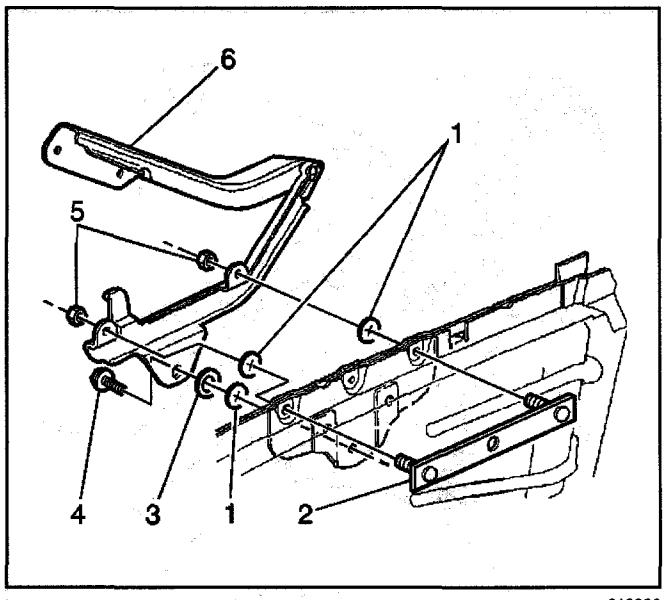
1. Complete the following steps in order to install the hood hinge mount plate (2), as needed:
   1.1. Hold the hood plate (2) in position and press the retainers (1) over the plate studs.
   1.2. Install the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement.*
2. Install the hood hinge (6).

Notice: Refer to *Fastener Notice*

3. Install the hood hinge nuts (5) to the lower attachment of the hood hinge (6).

   Tighten

   Tighten the hood hinge nuts (5) to 25 N·m (18 lb ft).



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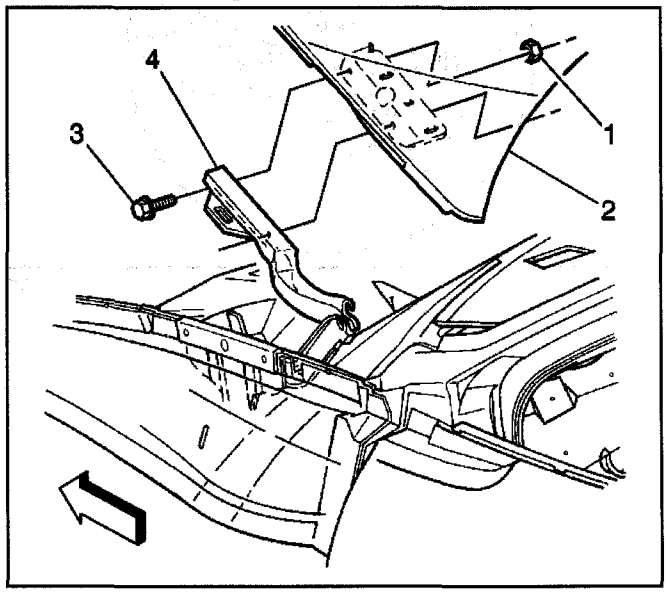
4. Install the following components to the hood (2):
   - The hood hinge screws (3)

     Tighten

     Tighten the hood hinge screws (3) to 27 N·m (20 lb ft).
   - The hinge bracket nuts (1)

     Tighten

     Tighten the hinge bracket nuts (1) to 25 N·m (18 lb ft).

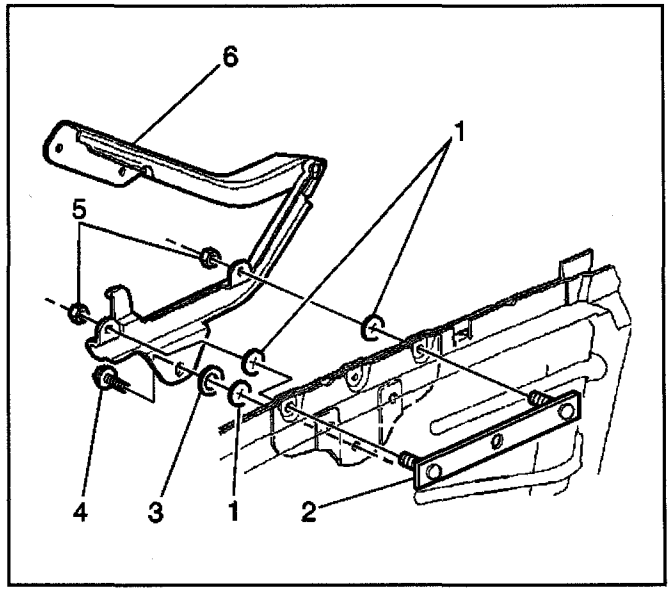


318914

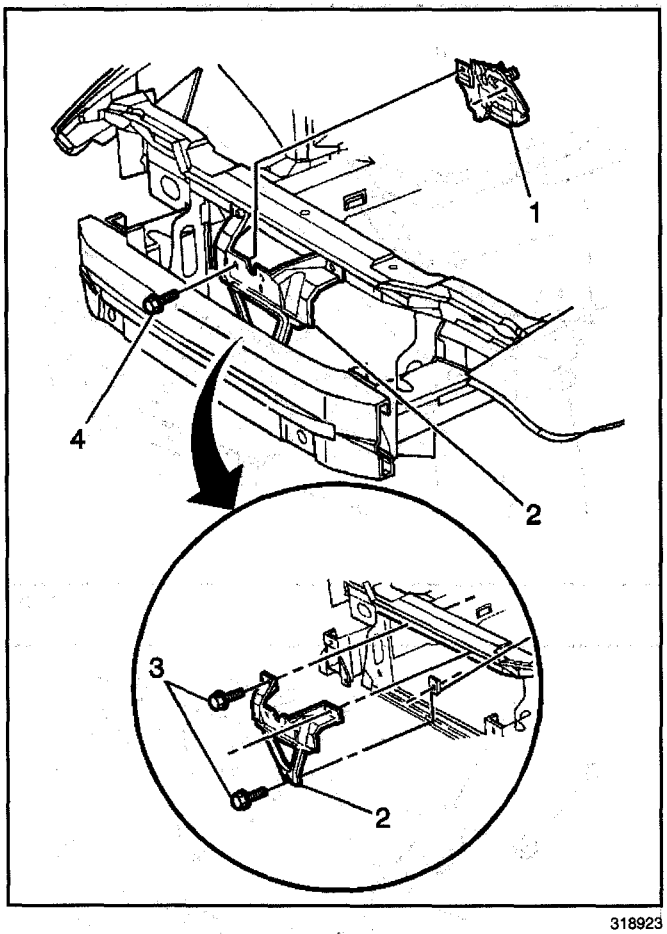
5. Install the following components to the lower attachment of the hood hinge (6):
   - The shim (3)
   - The hood hinge bolt/screw (4)

     Tighten

     Tighten the hood hinge bolt/screw (4) to 10 N·m (89 lb in).
6. Remove the hood support from the hood (2).
7. Inspect the hood (2) for alignment. Refer to *Hood Adjustment.*



318920



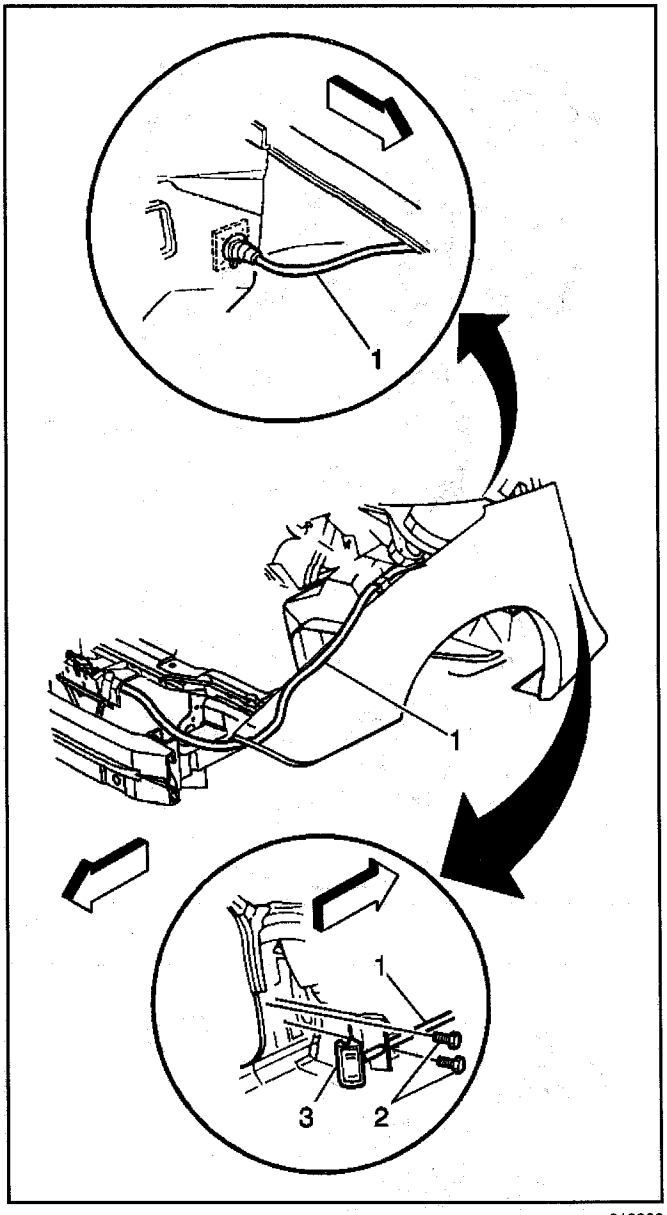
318923

Hood Latch Replacement - Primary

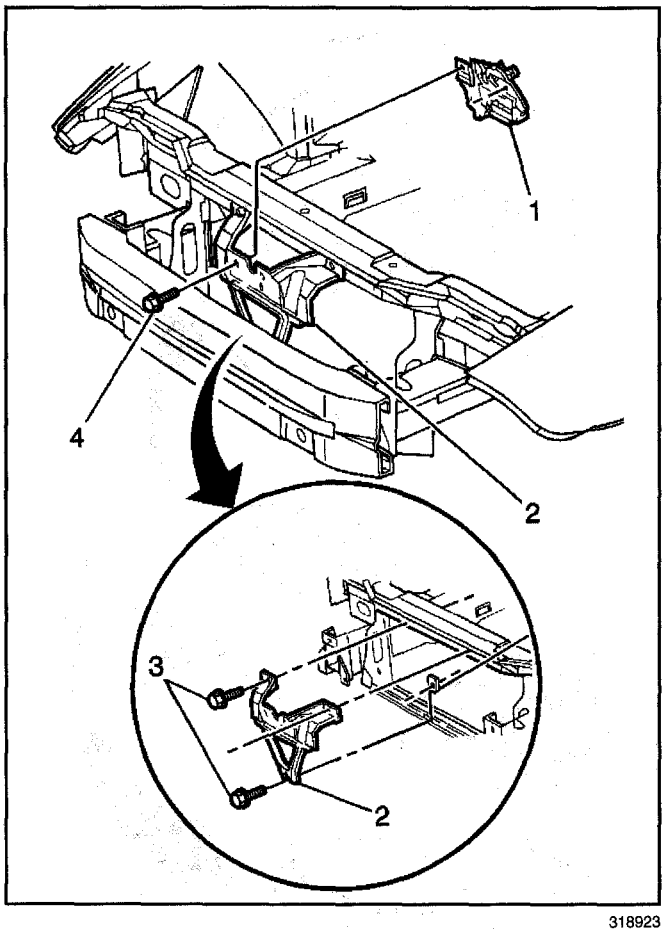
Removal Procedure

1. Mark the position of the hood primary latch bolts/screws (4) on the latch support (2).
2. Remove the hood primary latch bolts/screw (4).

3. Remove the hood latch release cable (1) from the hood primary latch.
4. Insert a screwdriver into the latch clip and lift the hood latch release cable (1) from the hood primary latch.

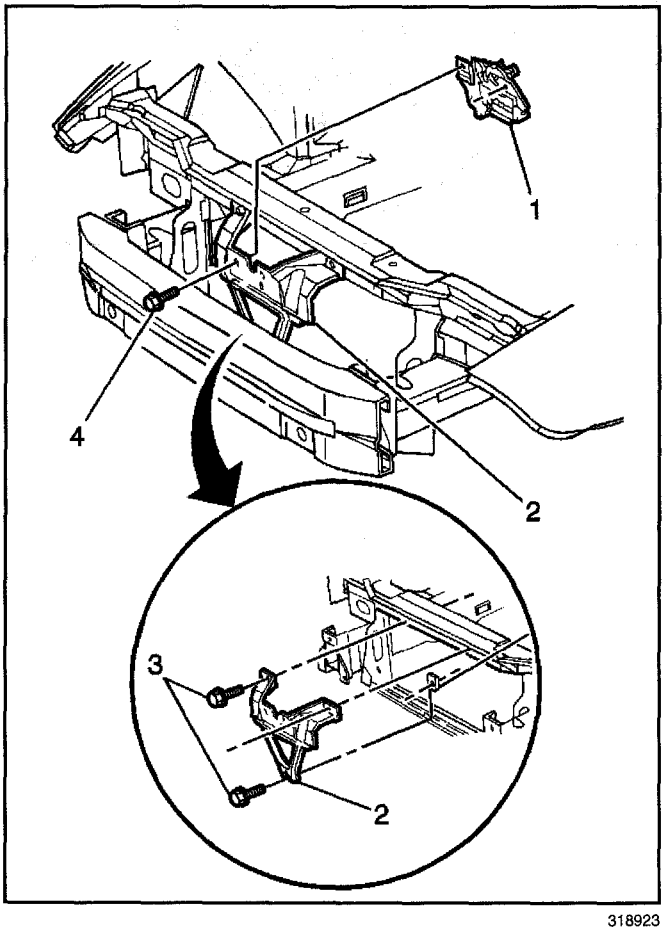


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5. Complete the following steps in order to remove the primary latch support (2), as needed:
   5.1. Mark the location of the hood primary latch (1) on the upper radiator support.
   5.2. Remove the headlamp housing panel and bracket. Refer to *Headlamp Housing Panel Replacement* and *Headlamp Bracket Replacement (Chevrolet)* or *Headlamp Bracket Replacement (Pontiac)*.
   5.3. Remove the windshield washer solvent reservoir. Refer to Windshield Washer Solvent Reservoir Replacement in Wipers Washer System.
   5.4. Remove the primary latch support bolts/screws (4). and the latch support (2).



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Installation Procedure

1. Complete the following steps in order to install the primary latch support (2), as needed:
   1.1. Position the primary latch support (2) with the marks made during removal.

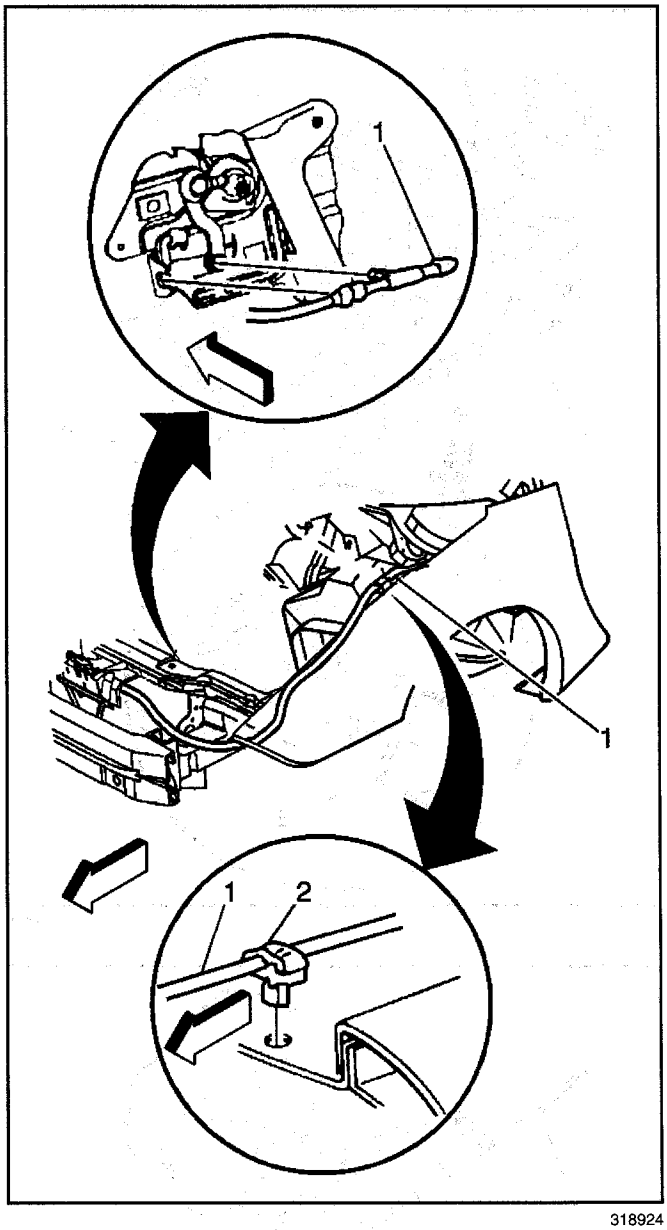
Notice: Refer to *Fastener Notice* in Cautions and Notices.

   1.2. Install the following components:
      1.2.1. The primary latch support (2)
      1.2.2. The primary latch support bolts/screws (4)

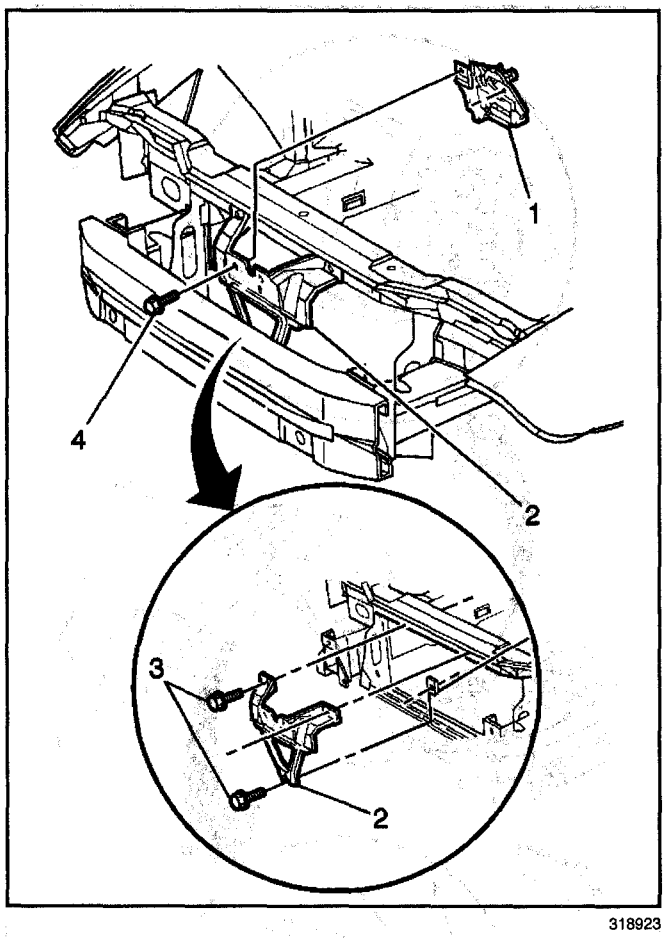
      Tighten

      Tighten the bolts/screws (4) to 18 N·m (13 lb ft).
   1.3. Install the windshield washer solvent reservoir. Refer to Windshield Washer Solvent Reservoir Replacement in Wipers Washer System.
   1.4. Install the headlamp housing panel and bracket. Refer to *Headlamp Housing Panel Replacement* and *Headlamp Bracket Replacement (Chevrolet)* or *Headlamp Bracket Replacement (Pontiac)*.

2. Install the hood latch release cable (1) to the hood primary latch with the following procedure:
   2.1. Insert the end of the hood latch release cable (1) to the hood primary latch in order to connect the hood latch release cable (1).
   2.2. Connect the latch clip (2) to the hood primary latch.



318924

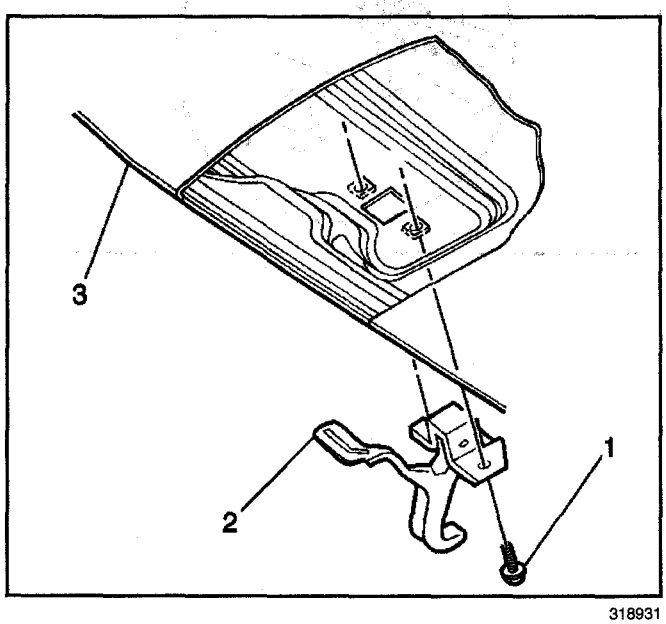


318923

3. Install the hood primary latch (1) to the primary latch support (2).
4. Position the hood primary latch (1) in order to line up the bolts/screws with the marks on the primary match support (2).
5. Install the hood primary latch bolts/screws (4).

   Tighten

   Tighten the bolts/screws (4) to 18 N·m (13 lb ft).
6. Inspect the hood alignment.
7. Adjust the hood as needed. Refer to *Hood Adjustment*.
8. Complete the following steps in order to adjust the hood primary latch (1), as needed:
   - 8.1. Loosen the hood primary latch bolts/screws (4).
   - 8.2. Adjust the hood primary latch (1) up or down to the specifications noted during inspection.



318931

Hood Latch Replacement - Secondary

Removal Procedure

1. Open the hood (3).
2. Remove the hood secondary latch bolts/screws (1).
3. Remove the hood secondary latch (2) from the hood (3).

Installation Procedure

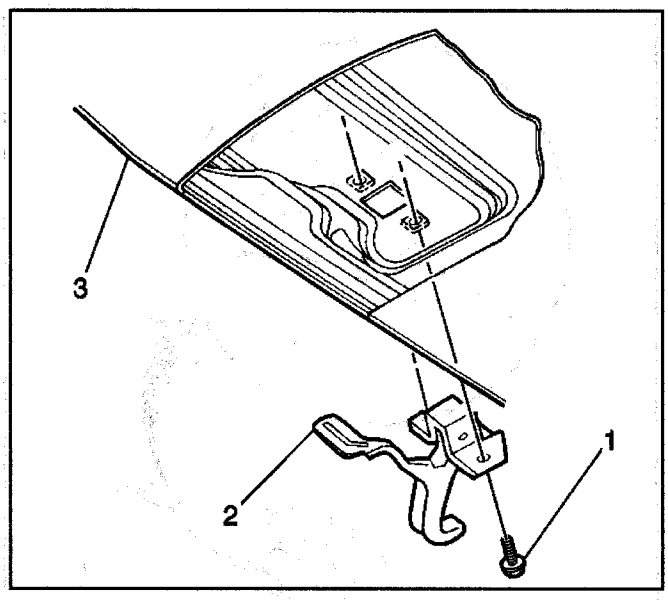
1. Install the hood secondary latch (2) to the hood (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the hood secondary latch bolts/screws (1).
3. Close the hood.

Tighten

Tighten the hood secondary latch bolts/screws (1) to 12 N·m (106 lb in).

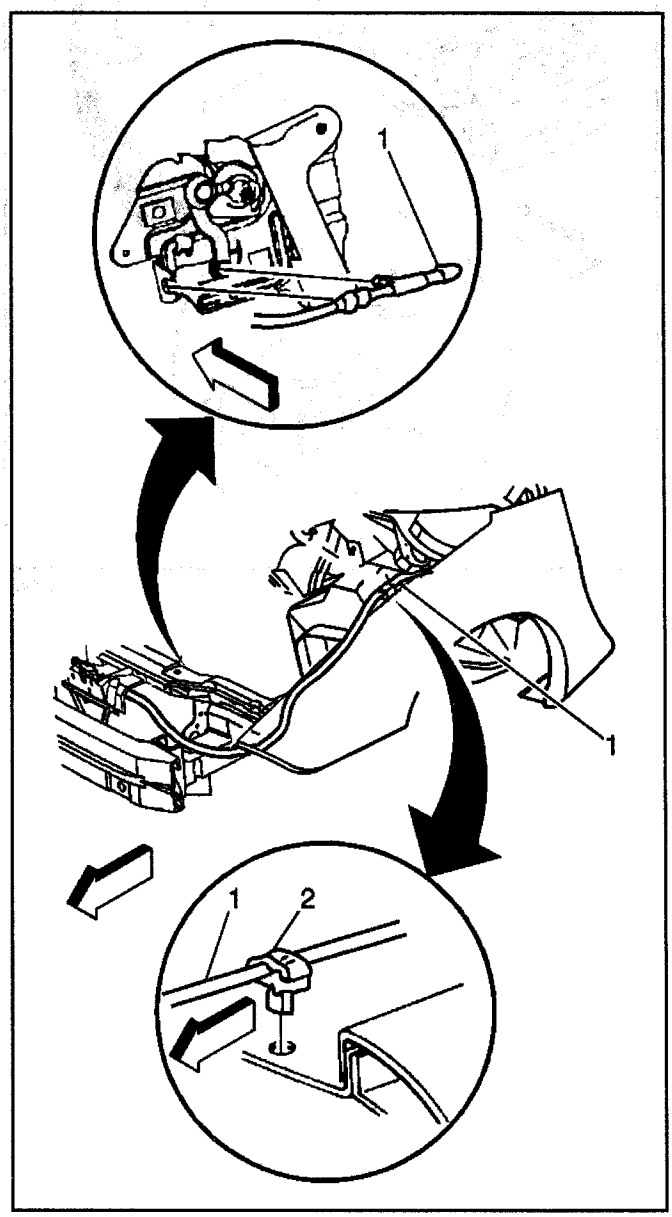


318931

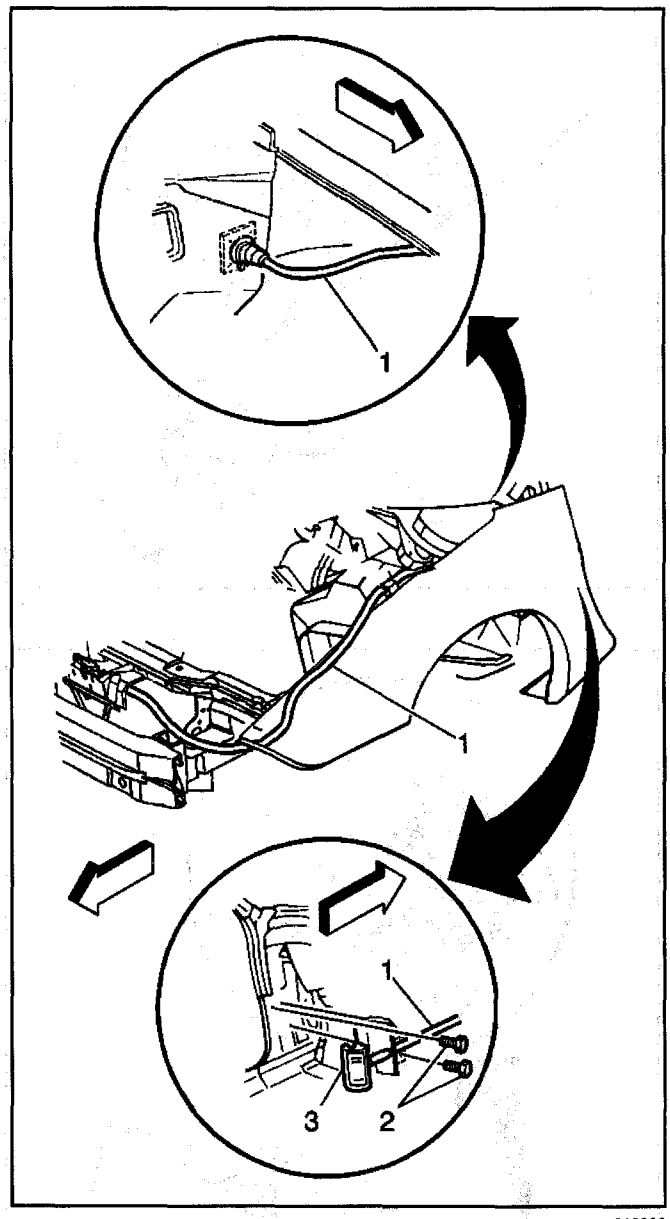
Hood Latch Release Cable Replacement

Removal Procedure

1. Complete the following steps in order to remove the hood primary latch release cable (1) from the primary latch and the radiator support:
   1.1. Insert a screwdriver in to the latch clip (2) from the primary latch in order to disconnect the cable (1).
   1.2. Pry the cable grommet from the primary latch.
   1.3. Pull the primary latch release cable (1) out through the hole in the radiator support.
2. Remove the driver side body hinge pillar trim panel. Refer to *Trim Replacement - Hinge Pillar* in Interior Trim.



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3. Remove the hood primary latch release cable bolts/screws (2).
4. Remove the hood primary latch release cable handle (3).
5. Use a screwdriver in order to pry the cowl grommet. Remove the cowl grommet.
6. Record the hood primary latch release cable route.

Important: Do not damage the hood cable patch sealing pad surrounding the through hole. Be careful when removing the hood primary release cable from the front dash through the hole. A possible water intrusion may develop if care is not used.

7. Remove the hood primary latch release cable (1).

Installation Procedure

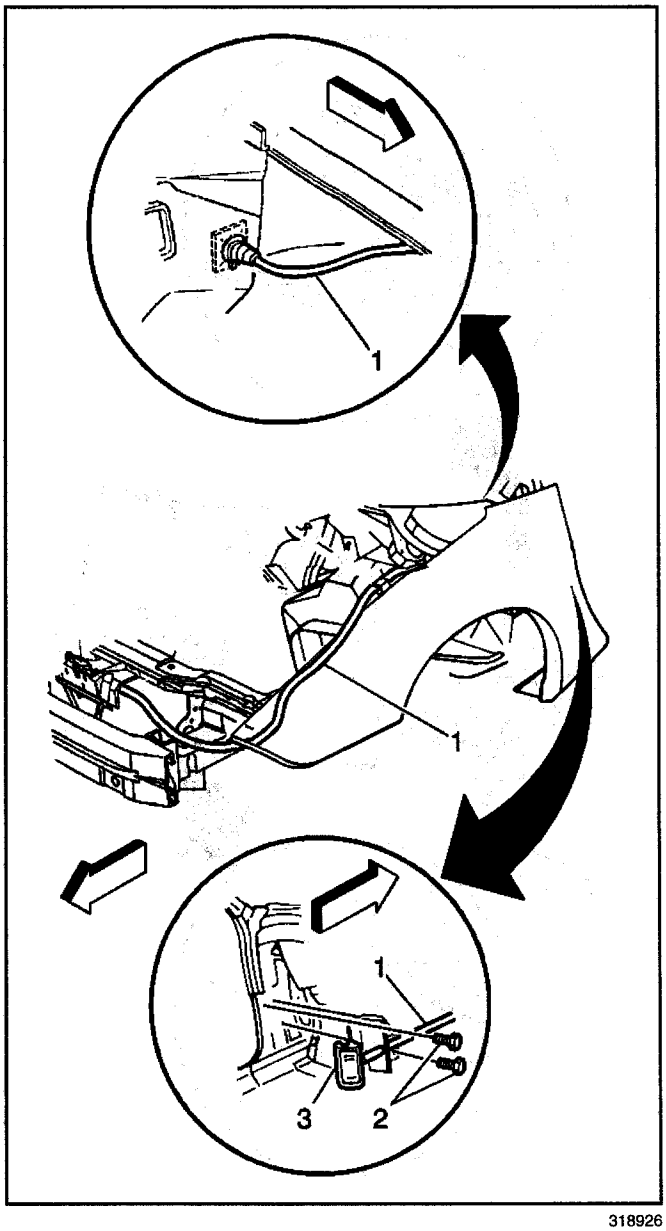
1. Route the hood primary latch release cable (1) properly.
2. Install the hood primary latch release cable (1) through the cowl.
3. Install the cowl grommet.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

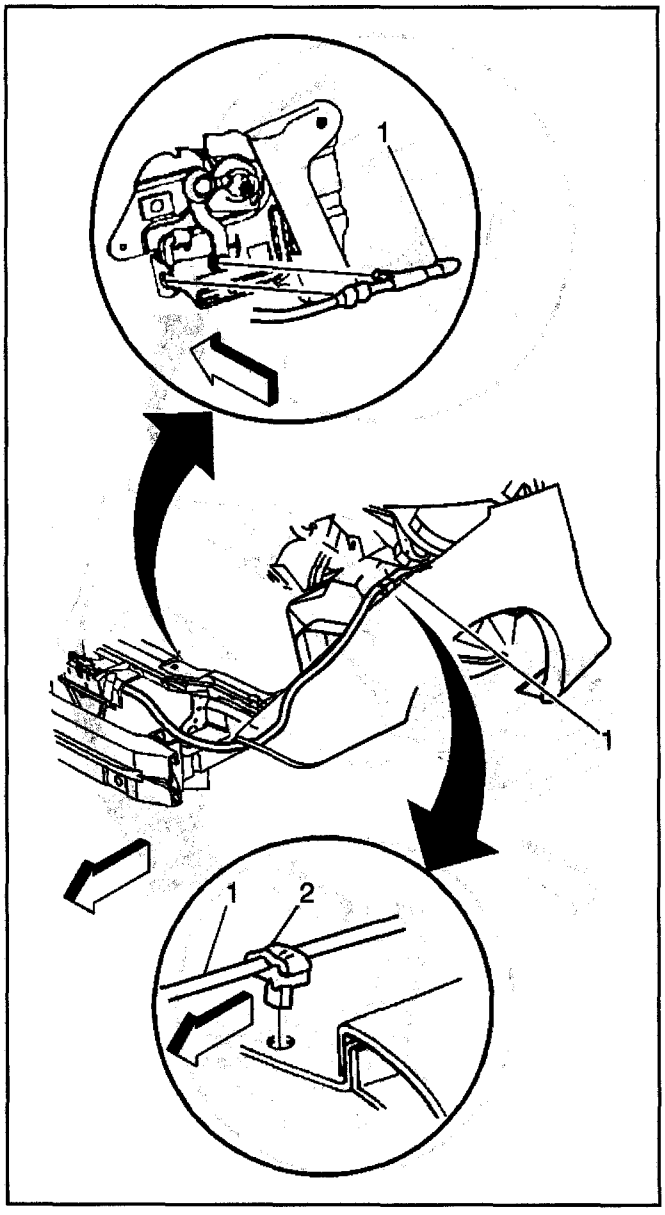
4. Install the following components:
   - 4.1. The hood primary latch release cable handle (3)
   - 4.2. The hood primary latch release cable bolts/screws (2)

     Tighten

     Tighten the bolts/screws (2) to 7 N·m (62 lb in).
5. Install the driver side body hinge pillar trim panel. Refer to *Trim Replacement - Hinge Pillar* in Interior Trim.

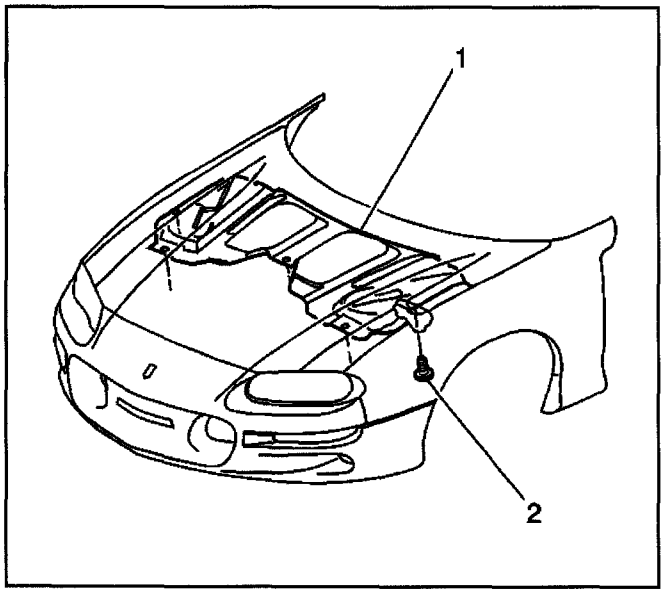


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6. Install the hood primary latch release cable (1) to the primary latch with the following procedure:
   6.1. Connect the hood primary latch release cable (1) to the cable clip (2).
   6.2. Route the hood primary latch release cable (1) through the hole in the radiator support.
   6.3. Insert the end of the hood primary latch release cable (1) into the latch clip and attach the cable grommet.



318915

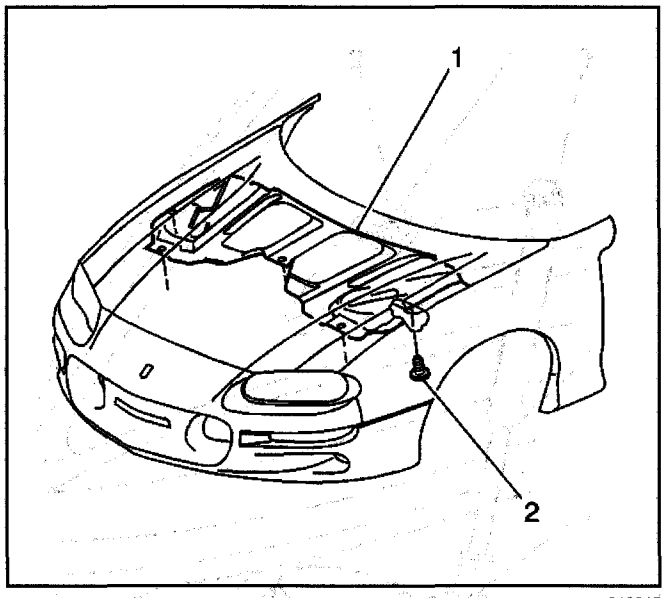
Hood Insulator Replacement

Removal Procedure

1. Open the hood.
2. Remove the retainers (2). attaching the hood insulator (1) to the hood.
3. Remove the hood insulator (1) from the vehicle.

Installation Procedure

1. Install the hood insulator (1) to the vehicle.
2. Install the retainers (2).
   Install the retainers at the front of the hood insulator (1) and work rearward. Refer to *Body Front End Description*.
3. Close the hood.



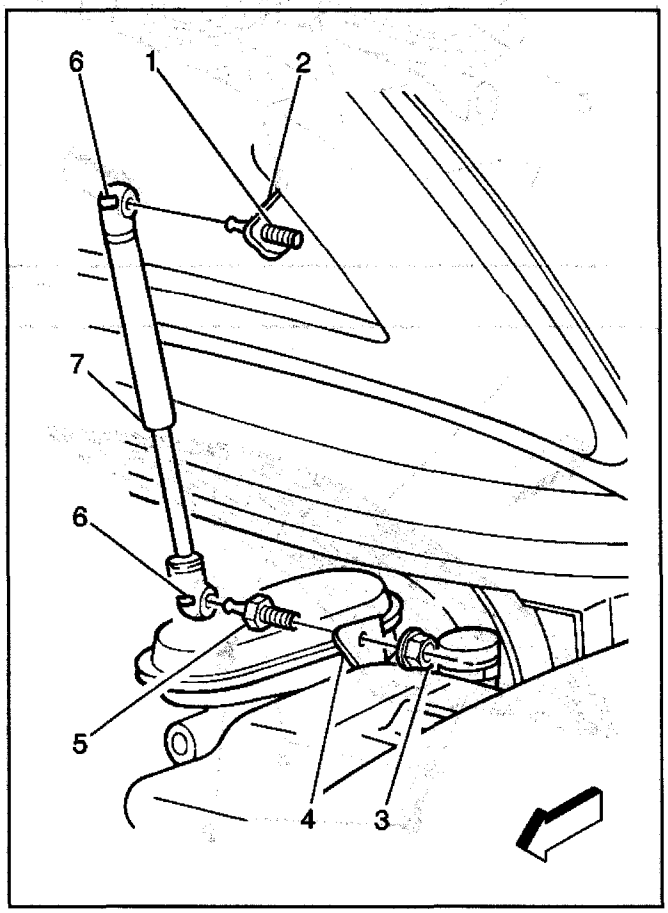
318915

Assist Rod Replacement - Hood

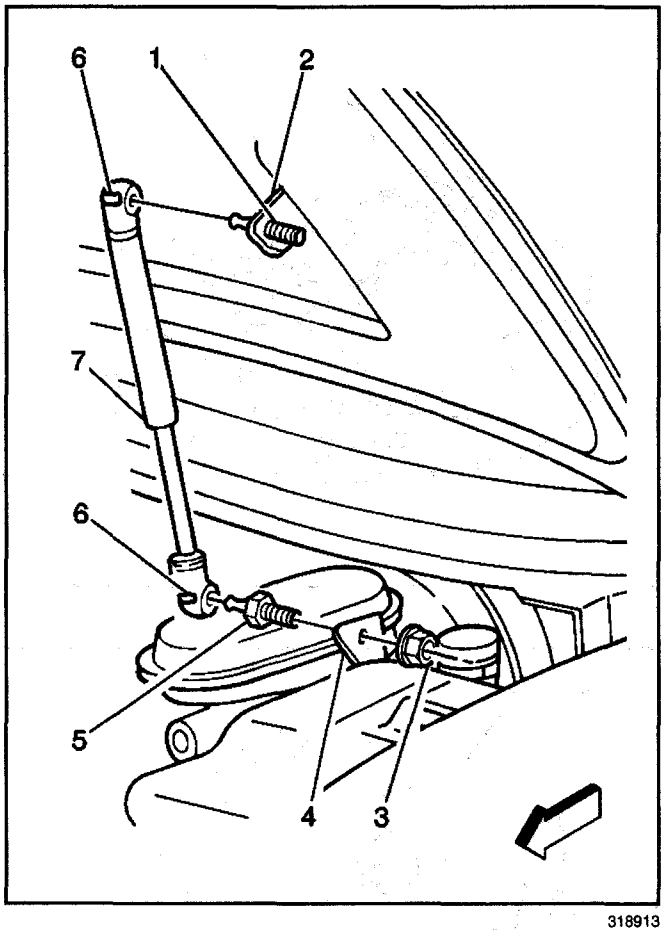
Removal Procedure

Important: If you replace both rods, replace one rod at a time.

1. Open the hood and safely support.
2. Complete the following steps in order to remove the hood open assist rod (7) from the hood strut stud (1):
   2.1. Use a flat bladed tool in order to pry out the clip (6).
   2.2. Pull the assist rod (7) from the hood strut stud (1).
3. Complete the following steps in order to remove the hood open assist rod (7) from the hood strut ball stud:
   3.1. Pry the clip (6) out with a flat bladed tool.
   3.2. Pull the assist rod (7) from the hood strut ball stud (5).



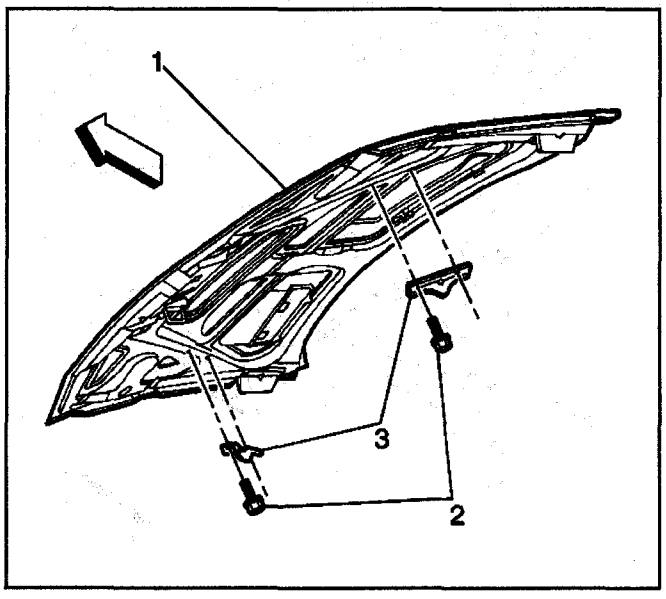
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318913

Installation Procedure

1. Snap the hood open assist rod (7) into the hood strut ball stud (5).
2. Snap the hood open assist rod (7) onto the hood strut stud (1).
3. Remove the hood support.



318932

Assist Rod Ball Stud Replacement - Hood

Removal Procedure

1. Open the hood (1). Safely support the hood.
2. Complete the following steps in order to remove the hood open assist rod from the hood strut stud:
   2.1. Pry the clip out with a flat bladed tool.
   2.2. Pull the assist rod from the hood strut stud.
3. Remove the hood open assist rod bracket bolts/screws (2).
4. Remove the hood open assist rod bracket (3).

Installation Procedure

1. Install the hood open assist rod bracket (3).

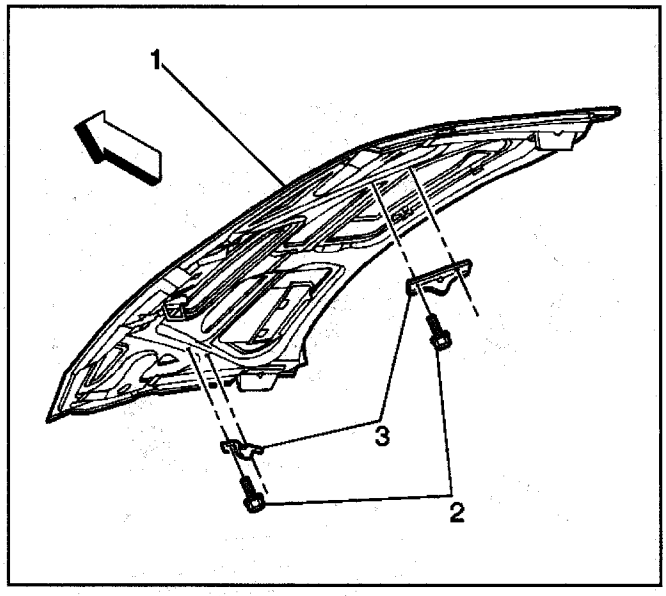
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the hood open assist rod bracket bolts/screws (2).

   Tighten

   Tighten the hood open assist rod bracket bolts/screws (2) to 23 N·m (17 lb ft).

3. Remove the hood support.

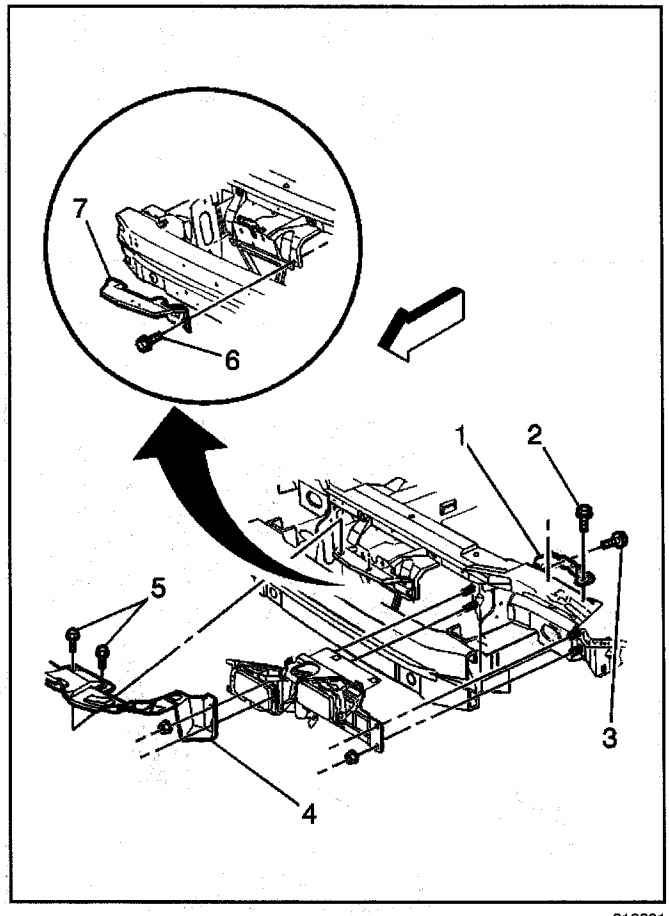


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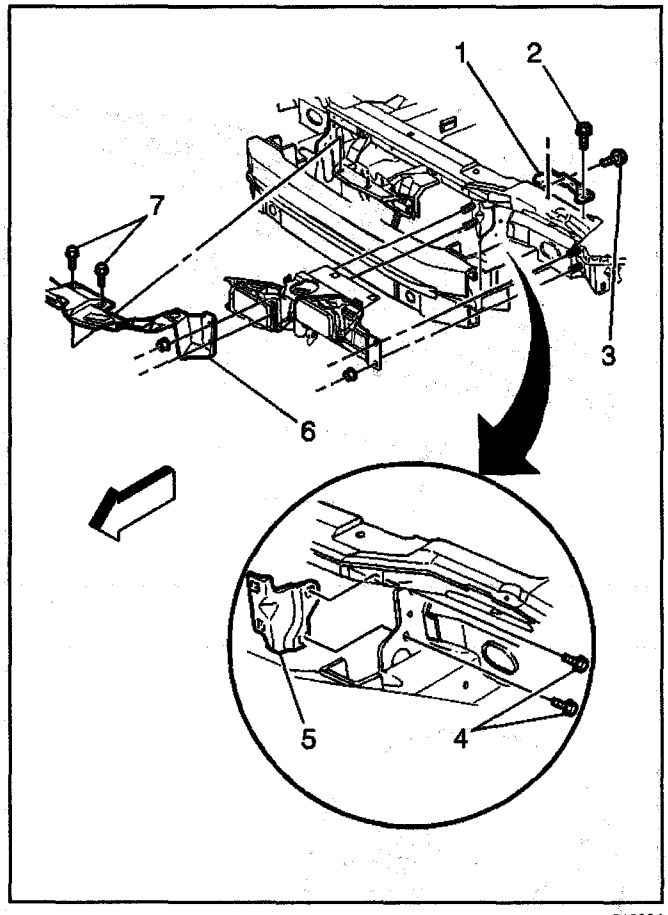
Headlamp Housing Panel Replacement

Removal Procedure

1. Remove the front bumper fascia. Refer to *Fascia Replacement - Front Bumper (Pontiac)* or *Fascia Replacement - Front Bumper (Chevrolet)* in Bumpers.
2. Remove the headlamp housing panel bracket bolt/screws (3) from the pivot support brackets and headlamp housing panel bracket (1).
3. Remove the headlamp housing panel bolts/screws (5) from the headlamp housing panel (4).
4. Slide the headlamp housing panel (4) slightly out in order to gain access to the headlamp electrical connectors.
5. Disconnect the electrical connectors.
6. Remove the headlamp housing panel (4).

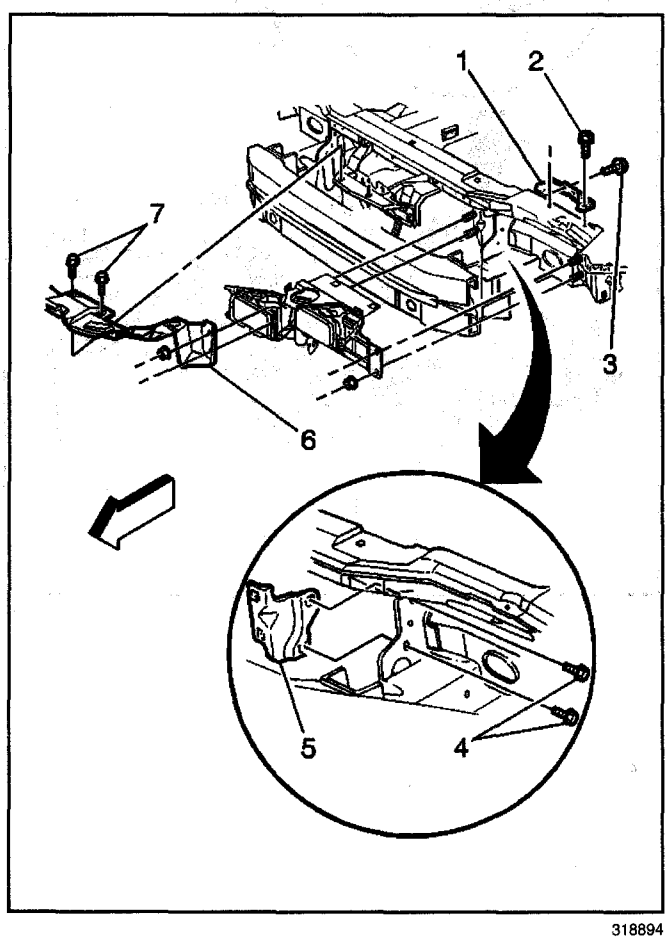


318891



318894

7. Remove the following components:
   7.1. The headlamp housing panel support bolts/screws (4)
   7.2. The panel supports (5)



318894

Installation Procedure

1. Install the headlamp housing panel supports (5).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the panel support bolts/screws (4).

   Tighten

   Tighten the panel support bolts/screws (4) to 10 N·m (89 lb in).

3. Install the headlamp housing panel (6).

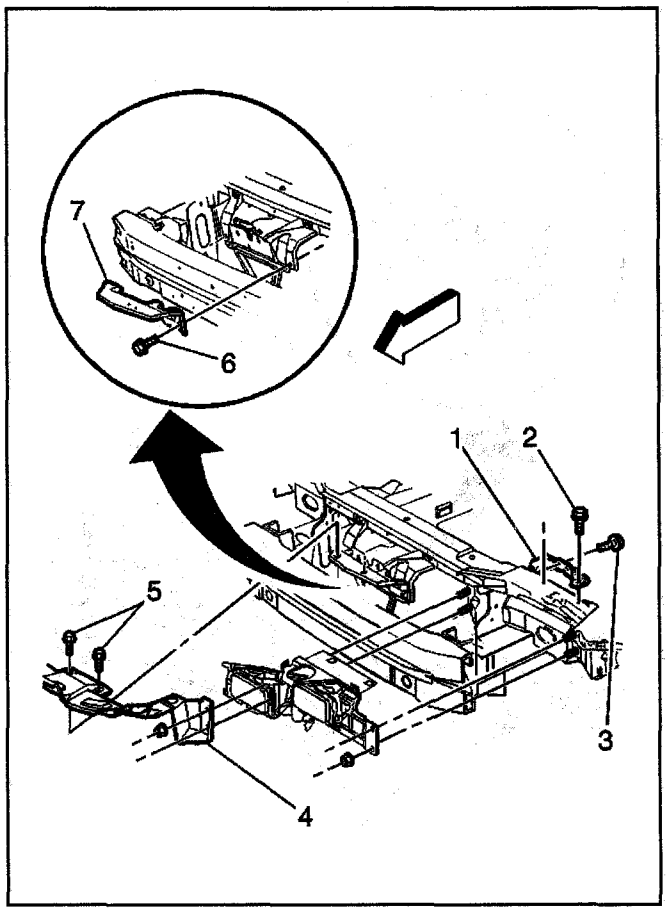
4. Slide the headlamp housing panel (4) slightly out in order to gain access to the headlamp electrical connectors.
5. Connect the electrical connectors.
6. Install the headlamp housing panel bolts/screws (5) to the headlamp housing panel (4).

   Tighten

   Tighten the headlamp housing panel bolts/screws (5) to 8 N·m (71 lb in).
7. Install the headlamp housing panel bracket bolts/screws (5) to the headlamp housing panel (4).

   Tighten

   Tighten the headlamp housing panel bolts/screws (5) to 1.7 N·m (15 lb in).
8. Install the front fascia bumper. Refer to *Fascia Replacement - Front Bumper (Pontiac)* or *Fascia Replacement - Front Bumper (Chevrolet)* in Bumpers.

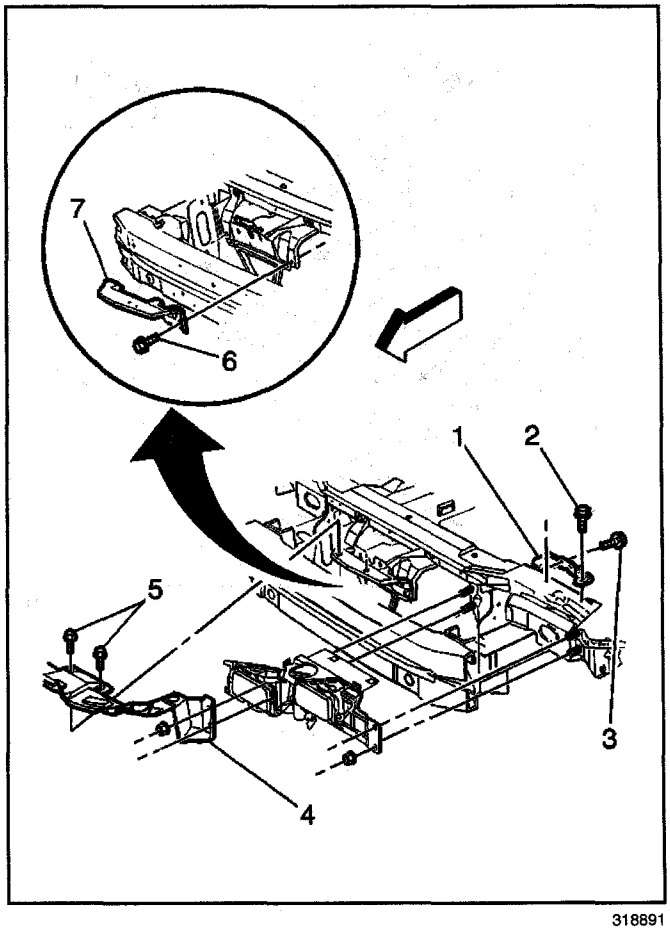


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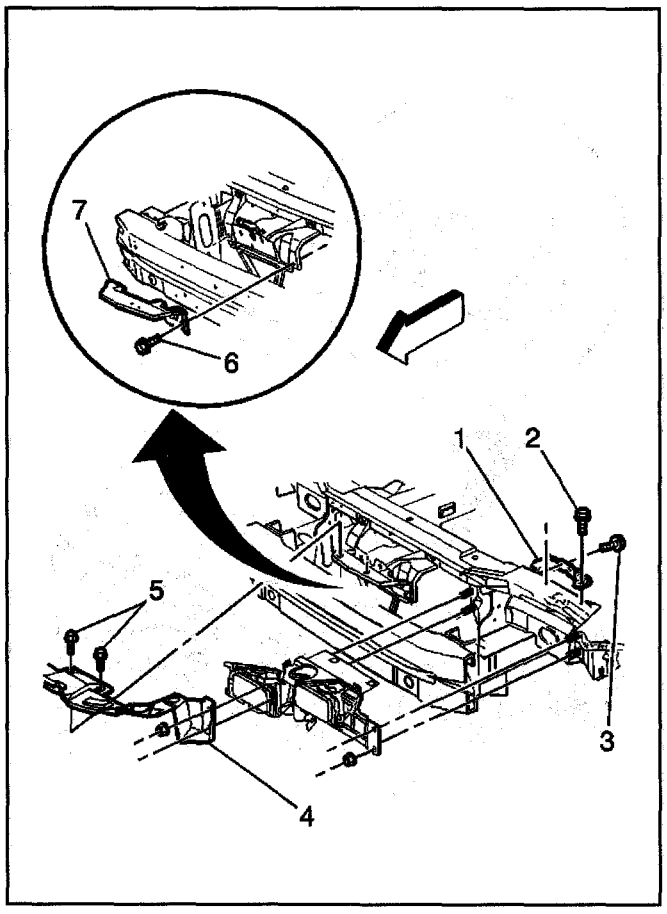
Headlamp Bracket Replacement (Pontiac)

Removal Procedure

1. Remove the front bumper fascia. Refer to *Fascia Replacement - Front Bumper (Pontiac)* in Bumpers.
2. Remove the headlamp housing panel bracket bolt/screws (3) from the pivot support brackets and headlamp housing panel bracket (1).
3. Remove the following components:
   3.1. The headlamp housing panel bracket bolts/screws (2)
   3.2. The panel brackets (1)
4. Remove the following components:
   4.1. The headlamp housing panel bracket bolts/screws (6)
   4.2. The upper bracket (7)



318891



318891

Installation Procedure

1. Install the following components:
   1.1. The headlamp housing panel upper brackets (7)

Notice: Refer to *Fastener Notice* in Cautions and Notices.

   1.2. The upper bracket bolts/screws (6)

Tighten

Tighten the upper bracket bolts/screws (6) to 10 N·m (89 lb in)

2. Install the following components:
   2.1. The headlamp housing panel bracket (1)
   2.2. The panel bracket bolts/screws (2)

Tighten

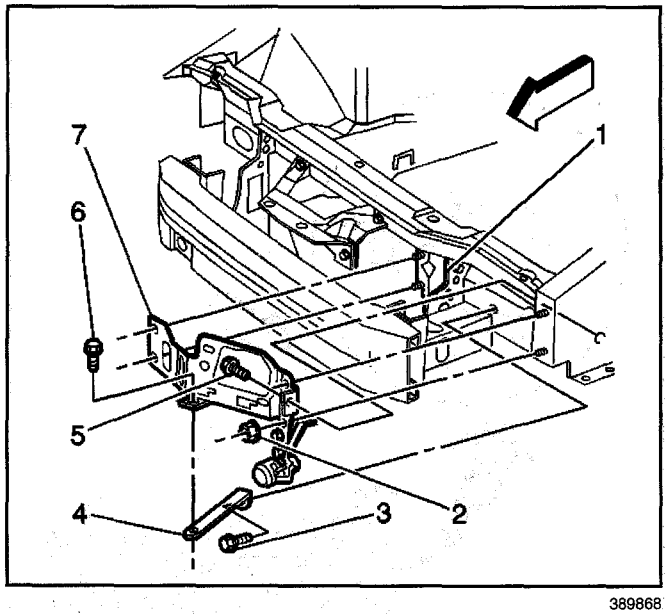
Tighten the panel bracket bolts/screws (2) to 5.5 N·m (49 lb in).

3. Install the headlamp housing panel bracket bolts/screws (5) to the headlamp housing panel (4).

Tighten

Tighten the headlamp housing panel bolts/screws (5) to 1.7 N·m (15 lb in).

4. Install the front fascia bumper. Refer to *Fascia Replacement - Front Bumper (Pontiac)* in Bumpers.



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Headlamp Bracket Replacement (Chevrolet)

Removal Procedure

1. Open hood,install fender covers.
2. Disconnect battery.
3. Disconnect electrical connections to headlamps.
4. Remove the headlamp bracket bolts (3, 5, & 6), bracket nut (2), and the headlamp bracket brace (4) from the headlamp bracket (7).
5. Remove the headlamp bracket (7) from mounting bracket studs (1).

Installation Procedure

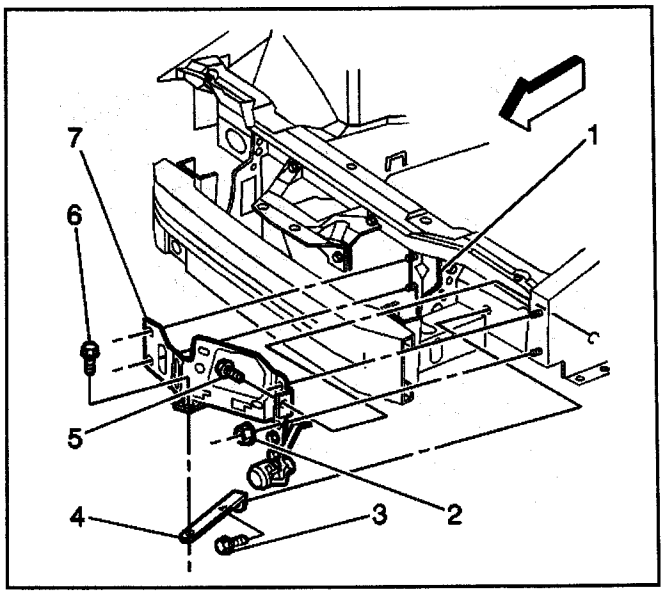
1. Install the headlamp bracket (7) to the vehicle radiator support (1).
2. Install the headlamp bracket bolts (3, 5, & 6), bracket nut (2), and the headlamp bracket brace (4) to the headlamp bracket (7).

   Tighten

   Tighten the bolts (3, 5, & 6) and nut (2) to 10 N·m (89 lb in).
3. Connect electrical connection to headlamps.
4. Connect battery.
5. Remove fender covers and close hood.
6. Install the headlamp assembly. Refer to *Headlamp Replacement (Chevrolet)* or *Headlamp Replacement (Pontiac)* in Lighting Systems.
7. Install the front bumper support and support bolts.

   Tighten

   Tighten the bolts to 9 N·m (80 lb in).
8. Install the front fascia bumper. Refer to *Fascia Replacement - Front Bumper (Chevrolet)* or *Fascia Replacement - Front Bumper (Pontiac)* in Bumpers.
9. Verify headlamp alignment and projection.

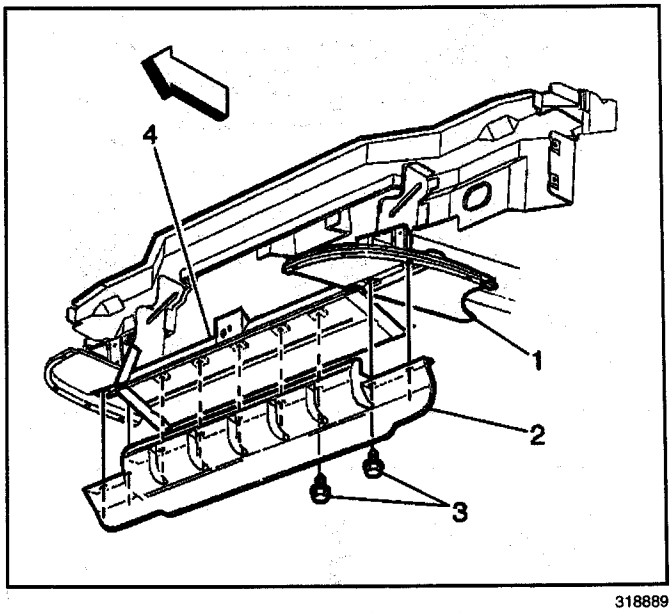


389868

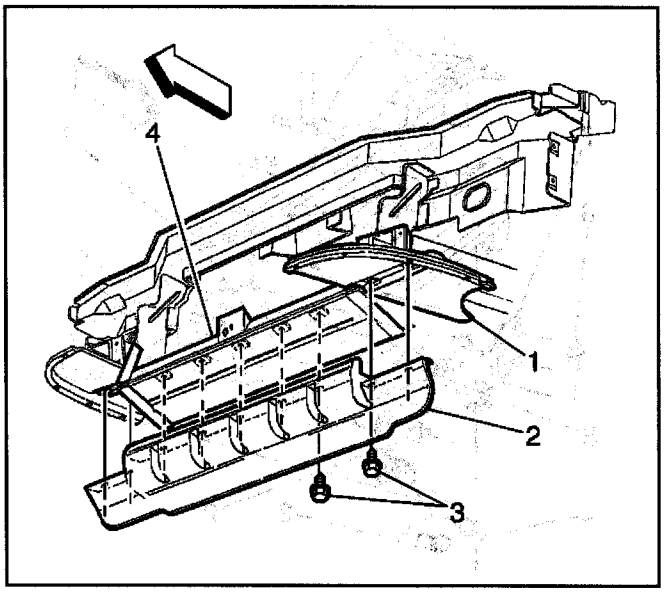
Air Deflector Replacement - Radiator

Removal Procedure

1. Remove the following components from the attached deflector (2):
   1.1. The radiator air lower deflector bolts/screws (3)
   1.2. The bumper fascia lower deflectors (1)
2. Remove the radiator air lower deflector (2)



318889



318889

Installation Procedure

1. Install the radiator air lower deflector (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the radiator air lower deflector bolts/screws (3).

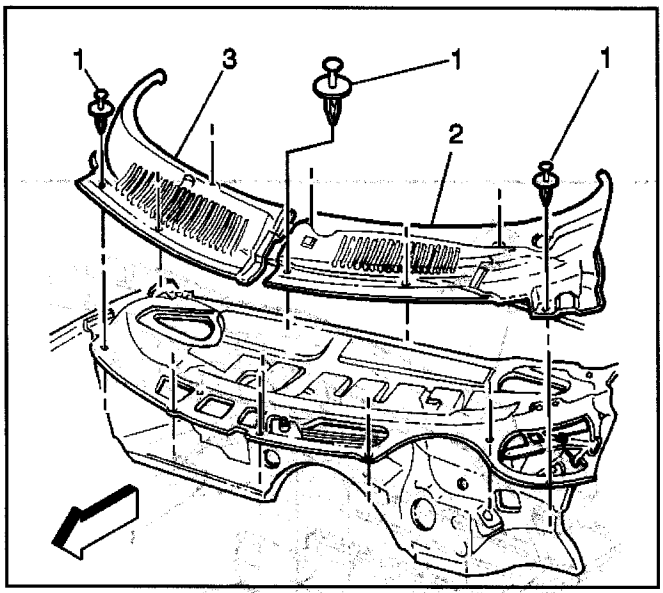
   Tighten

   Tighten the radiator air lower deflector bolts/screws (3) to 10 N·m (89 lb in).

Air Inlet Grille Panel Replacement

Removal Procedure

1. Remove the hood rear seal. Refer to *Seal Replacement - Hood Rear.*
2. Remove the air inlet screen retainers (1) from the driver side screen (2).
3. Remove the windshield wiper arms. Refer to Windshield Wiper Arm Replacement in Wipers/Washer System.
4. Remove the driver side screen (2).
5. Remove the windshield washer nozzle hose clips from the driver side screen (2).
6. Remove the air inlet screen retainers (1) from the passenger side screen (3).
7. Remove the passenger side screen (3).
8. Remove the windshield washer nozzle hose clips from the passenger side screen (3).

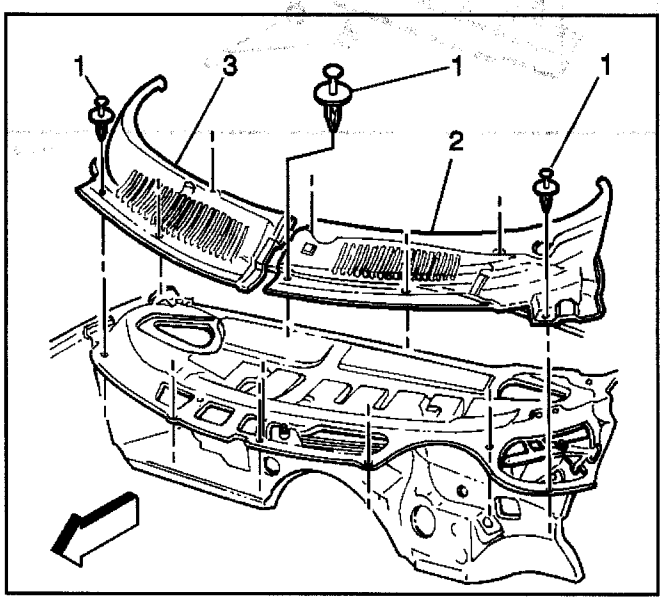


318938

Installation Procedure

Important: Install the air inlet screens prior to water testing in order to prevent damage to the windshield washer motor.

1. Route the windshield washer nozzle hose clips to the passenger side screen (3).
2. Install the passenger side screen (3).
3. Install the air inlet screen retainers (1) to the passenger side screen (3).
4. Install the windshield washer nozzle hose clips to the driver side screen (2).
5. Install the driver side screen (2).
6. Install the air inlet screen retainers (1) to the driver side screen (2).



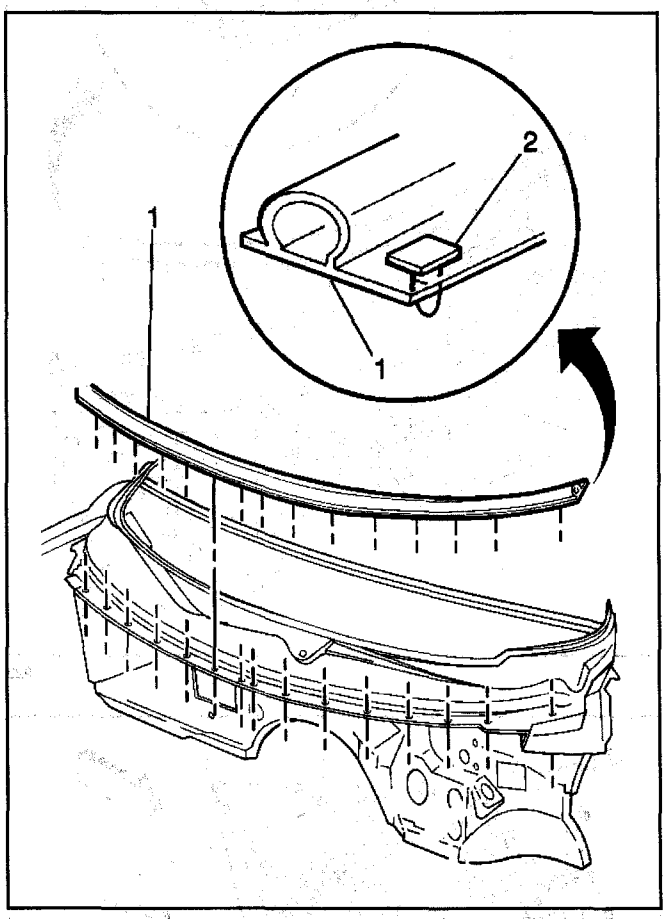
318938

7. Install the windshield wiper arms. Refer to Windshield Wiper Arm Replacement in Wipers/Washer System.
8. Inspect for the proper operation of the Wipers/Washer System.
9. Install the rear hood seal. Refer to *Seal Replacement - Hood Rear*.

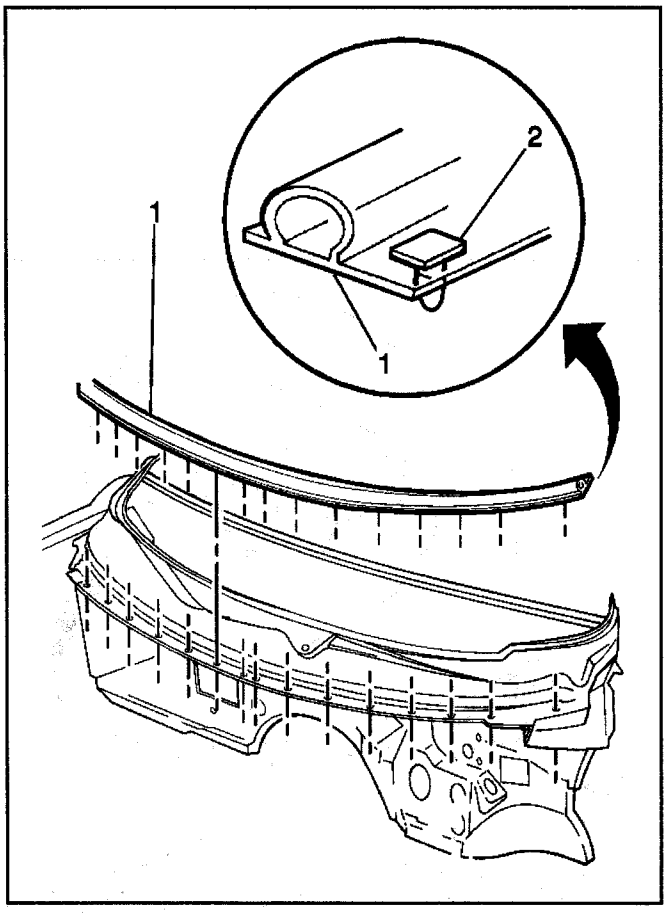
Seal Replacement - Hood Rear

Removal Procedure

1. Open the hood.
2. Remove the hood rear seal fasteners (2).
3. Remove the hood rear seal (1).



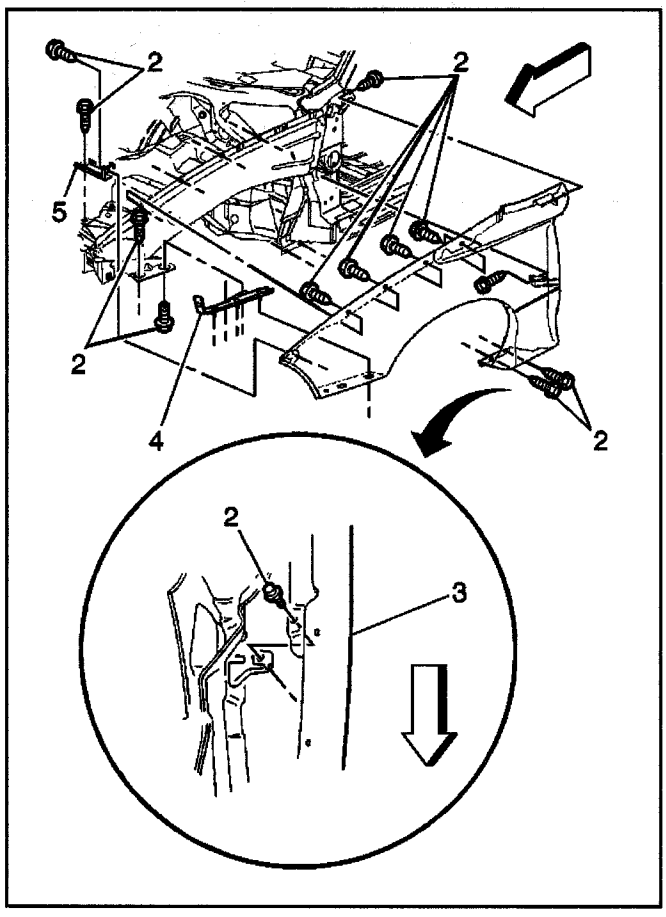
318928



318928

Installation Procedure

1. Install the hood rear seal (1).
2. Install the hood rear fasteners (2).
3. Close the hood.



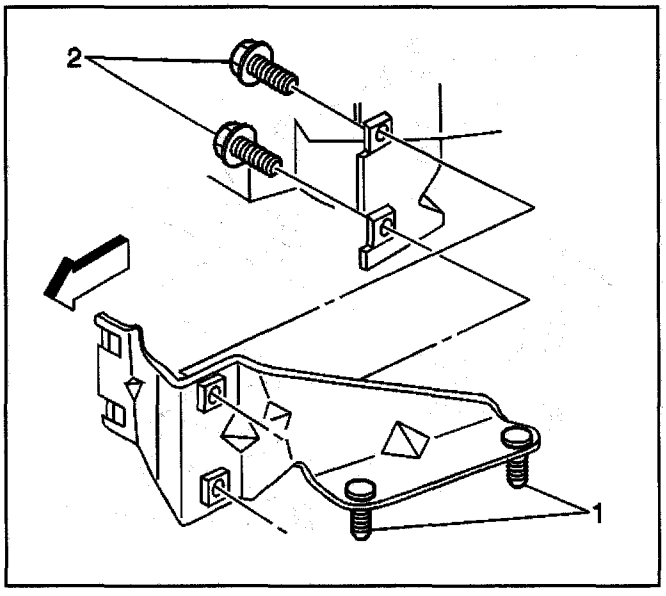
318908

Panel Replacement - Front Side (Chevrolet)

Removal Procedure

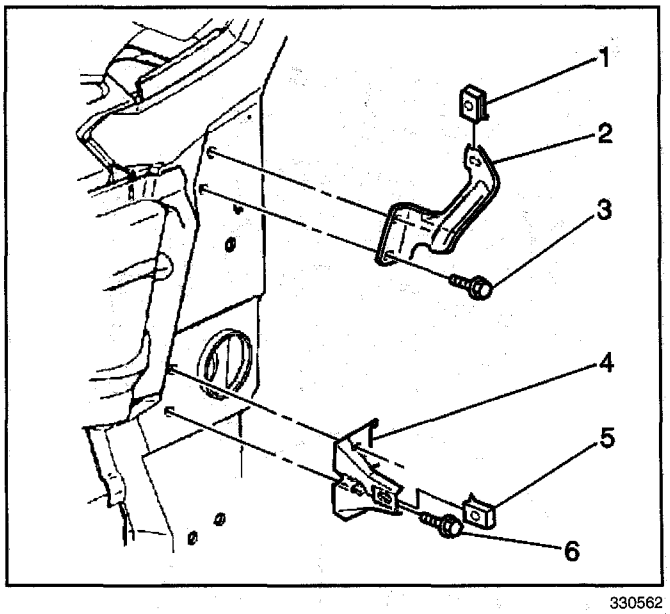
1. Remove the fender bolts/screws (2).
2. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
3. Remove the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement.*
4. Remove the front fender (3).

5. Remove the following components as needed:
   5.1. The fascia outer bracket bolts/screws (2)
   5.2. The fascia outer bracket (1)



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6. Remove the following components as needed:
   6.1. The fender rear upper bracket bolts/screws (3)
   6.2. The fender rear upper bracket (2)
7. Remove the following components as needed:
   7.1. The fender rear center bracket bolts/screws (6)
   7.2. The fender rear center bracket (4)



330562

Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

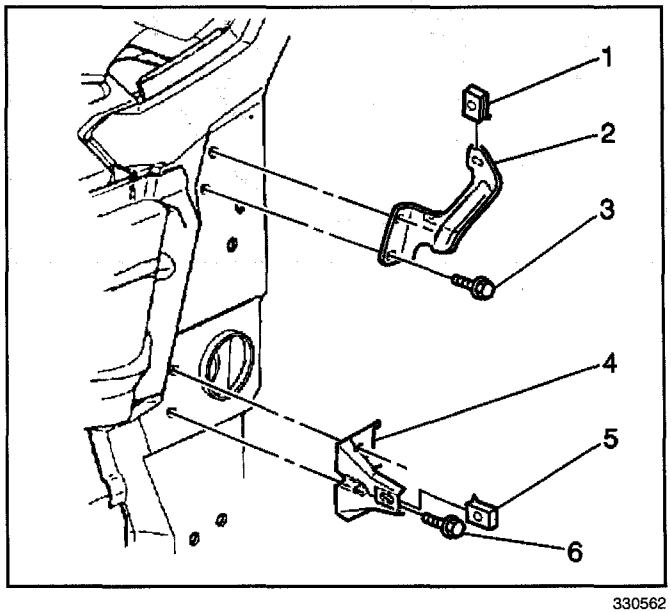
1. Install the following components if removed:
   1.1. The fender rear center bracket (4)
   1.2. The fender rear center bracket bolts/screws (6)

   Tighten

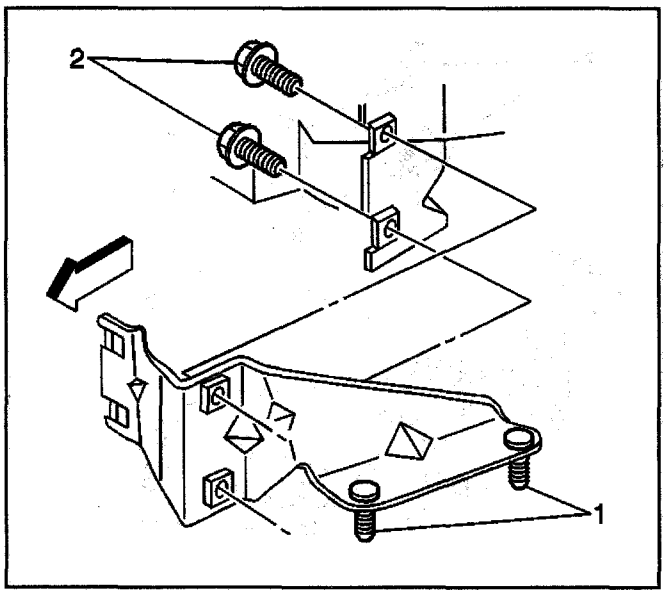
   Tighten the fender rear center bracket bolts/screws (6) to 5.5 N·m (49 lb in).
2. Install the following components if removed:
   2.1. The fender rear upper bracket (2)
   2.2. The fender rear upper bracket bolts/screws (3)

   Tighten

   Tighten the fender rear upper bracket bolts/screws (3) to 5.5 N·m (49 lb in).



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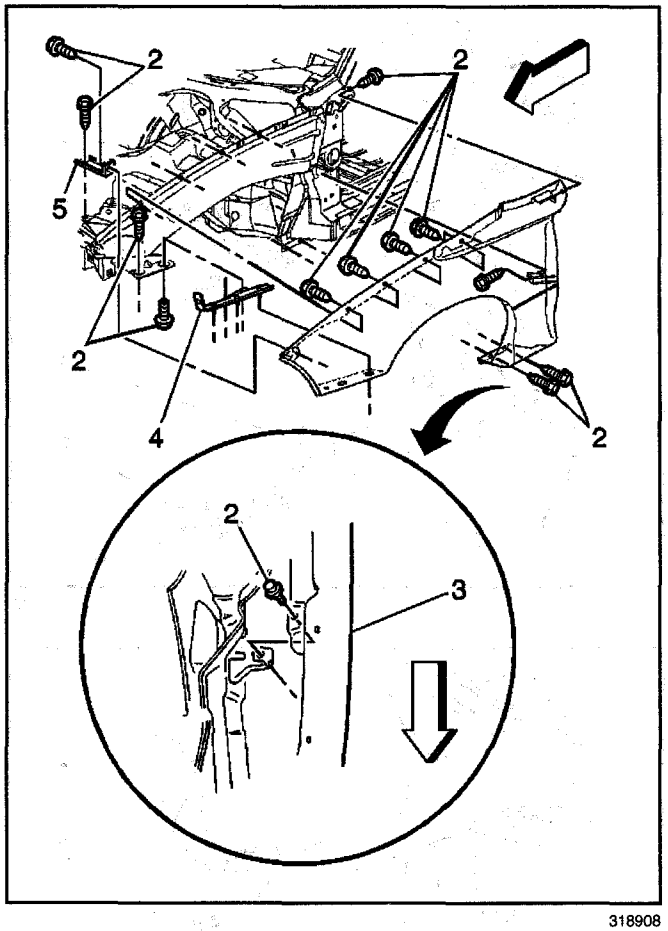


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3. Install the following components if removed:
   3.1. The fascia outer bracket (1)
   3.2. The fascia outer bracket bolts/screws (2)

   Tighten

   Tighten the fascia outer bracket bolts/screws (2) to 5.5 N·m (49 lb in).



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4. Install the front fender (3).

   Install the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement.*
5. Lower the vehicle.
6. Install the fender bolts/screws (2).

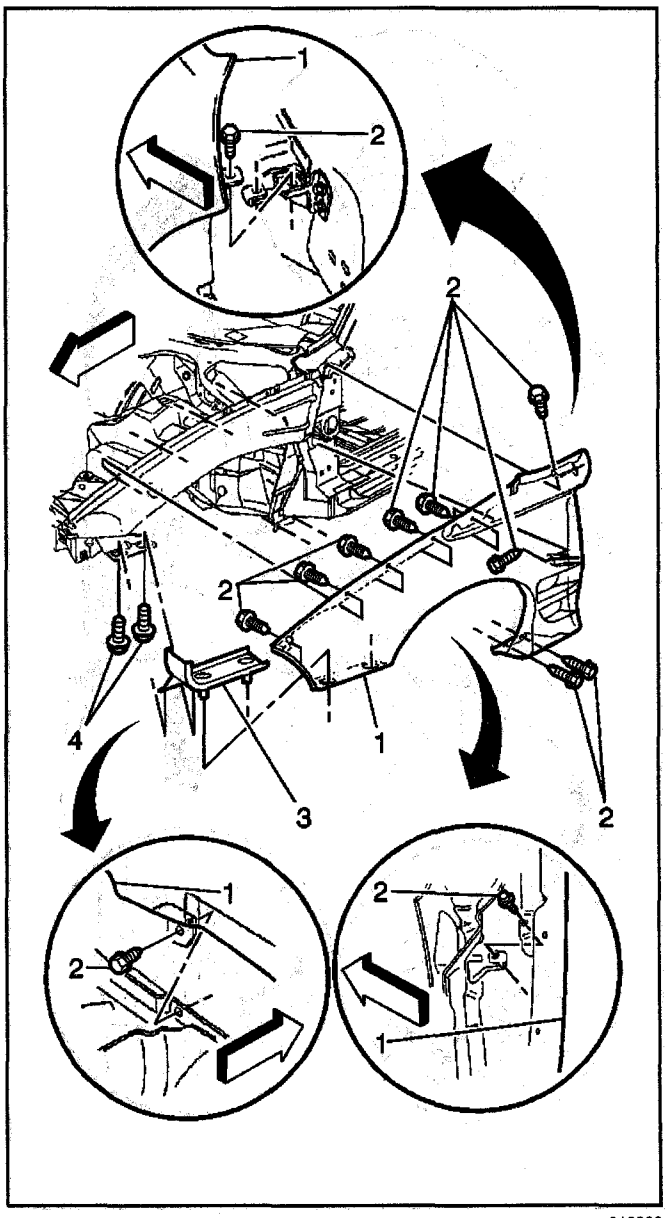
   Tighten

   Tighten the fender bolts/screws (2) to 5.5 N·m (49 lb in).

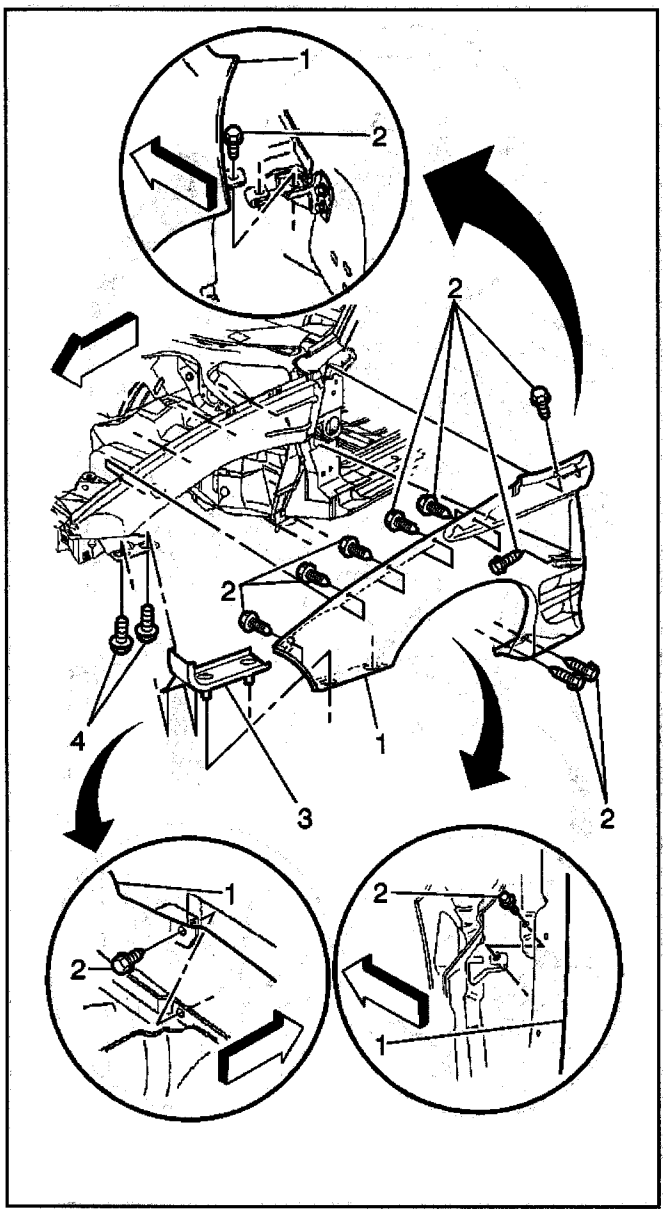
Panel Replacement - Front Side (Pontiac)

Removal Procedure

1. Remove the fender bolts/screws (2).
2. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
3. Remove the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement.*
4. Remove the front fender (1).
5. Remove the following components as needed:
   - 5.1. The fascia outer bracket bolts/screws (1)
   - 5.2. The fascia outer bracket (2)
6. Remove the following components as needed:
   - 6.1. The fender rear upper bracket bolts/screws (3)
   - 6.2. The fender rear upper bracket (2)
7. Remove the following components as needed:
   - 7.1. The fender rear center bracket bolts/screws (6)
   - 7.2. The fender rear center bracket (4)



318906



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Installation Procedure

Notice: Refer to *Fastener Notice* in Cautions and Notices.

1. Install the following components if removed:
   1.1. The fender rear center bracket (4)
   1.2. The fender rear center bracket bolts/screws (6)

   Tighten

   Tighten the fender rear center bracket bolts/screws (6) to 5.5 N·m (49 lb in).
2. Install the following components if removed:
   2.1. The fender rear upper bracket (2)
   2.2. The fender rear upper bracket bolts/screws (3)

   Tighten

   Tighten the fender rear upper bracket bolts/screws (3) to 5.5 N·m (49 lb in).
3. Install the following components if removed:
   3.1. The fascia outer bracket (2)
   3.2. The fascia outer bracket bolts/screws (1)

   Tighten

   Tighten the fascia outer bracket bolts/screws (1) to 5.5 N·m (49 lb in).
4. Install the front fender (3).

   Install the wheelhouse panel liner. Refer to *Wheelhouse Panel Replacement*.
5. Lower the vehicle.
6. Install the fender bolts/screws (2).

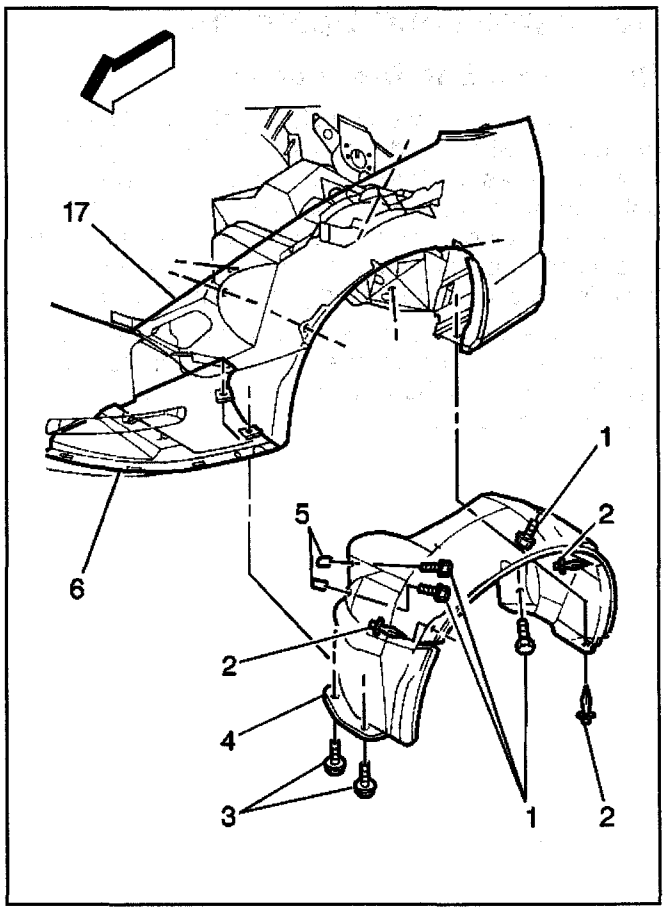
   Tighten

   Tighten the fender bolts/screws (2) to 5.5 N·m (49 lb in).

Wheelhouse Panel Replacement

Removal Procedure

1. Remove the front wheelhouse panel liner bolt/screw caps (5).
2. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
3. Remove the front tire and wheel. Refer to Tire and Wheel Removal and Installation.
4. Remove the wheelhouse panel liner bolts screws (3) from the following components:
   - The liner (4)
   - The lower deflector (6)
5. Remove the front wheelhouse panel liner bolts/screws (1) from the liner (4).
6. Remove the front wheelhouse panel liner retainers (2).
7. Remove the wheelhouse panel liner (4).



318902

Installation Procedure

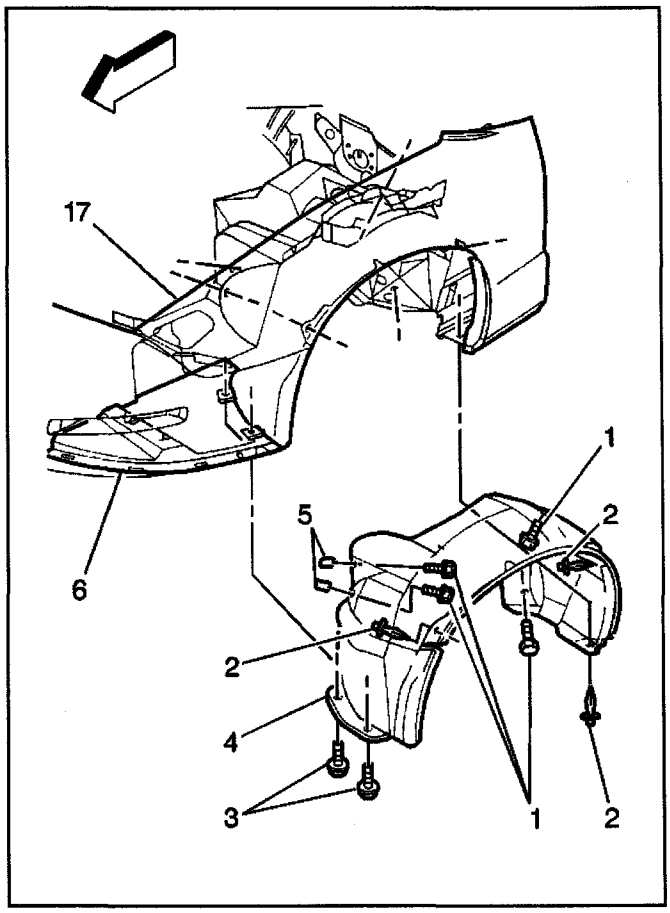
1. Install the wheelhouse panel liner (4).
2. Install the front wheelhouse panel liner retainers (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the front wheelhouse panel liner bolts/screws (1) from the liner (4).

   Tighten

   Tighten the front wheelhouse panel liner bolts/screws (1) to 1.3 N·m (12 lb in).
4. Install the wheelhouse panel liner bolts screws (3) to the following components:
   - The liner (4)
   - The lower deflector (6)
5. Install the front tire and wheel. Refer to Tire and Wheel Removal and Installation.
6. Lower the vehicle.
7. Install the front wheelhouse panel liner bolt/screw caps (5).



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Description and Operation

Body Front End Description

The hood is composed of 2-sided galvanized steel, except in Z-28 SS and Trans Am WS6 packages in which cases the hoods are fiberglass. Rigidity is obtained by the use of reinforcement braces and brackets located so no interference with the adjustment or service repair hood will occur. The hood primary latch is attached to the hood primary latch support.

The front fenders are composed of reinforced reaction injection molded (RRIM) urethane. The front fenders attach to the both the unibody structure and the wheelhouse panels.

Lubrication

For lubrication of the hood hinges, hood latch release pawl, hood latch and pivots, headlamp door, etc., refer to Maintenance and Lubrication.

Anti-Corrosion Materials

Anti-corrosion materials are part of the coating on most metal panels to provide rust resistance. When servicing these panels, use only GM replacement parts and recoat with specified service primers and paints.

Doors

Specifications

Fastener Tightening Specifications

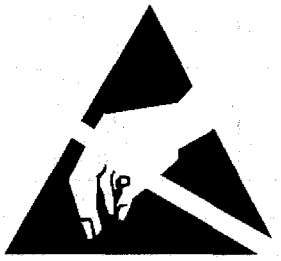
Application	Specification	
	Metric	English
Door Control Module Screw	3 N·m	37 lb in
Door Hinge to Hinge Door Bolt	30 N·m	22 lb ft
Door Hinge to Hinge Pillar Bolt	30 N·m	22 lb ft
Door Lock Screw	10 N·m	89 lb in
Door Lock Striker Screw	24 N·m	18 lb ft
Door Speaker Assembly Screw	2.5 N·m	22 lb in
Inside Handle Bezel Screw	1.4 N·m	12 lb in
Inside Handle Screw	5 N·m	44 lb in
Mirror Nut	10 N·m	89 lb in
Outside Door Handle Bolt	10 N·m	89 lb in
Seat Belt Guide Nut	40 N·m	29 lb ft
Side Door Armrest Bolt	4.5 N·m	40 lb in
Window Regulator Channel Stud Nut	10 N·m	89 lb in
Window Regulator Motor Nut	10 N·m	89 lb in
Window Regulator Window Clamp Nut	10 N·m	89 lb in

Schematic and Routing Diagrams

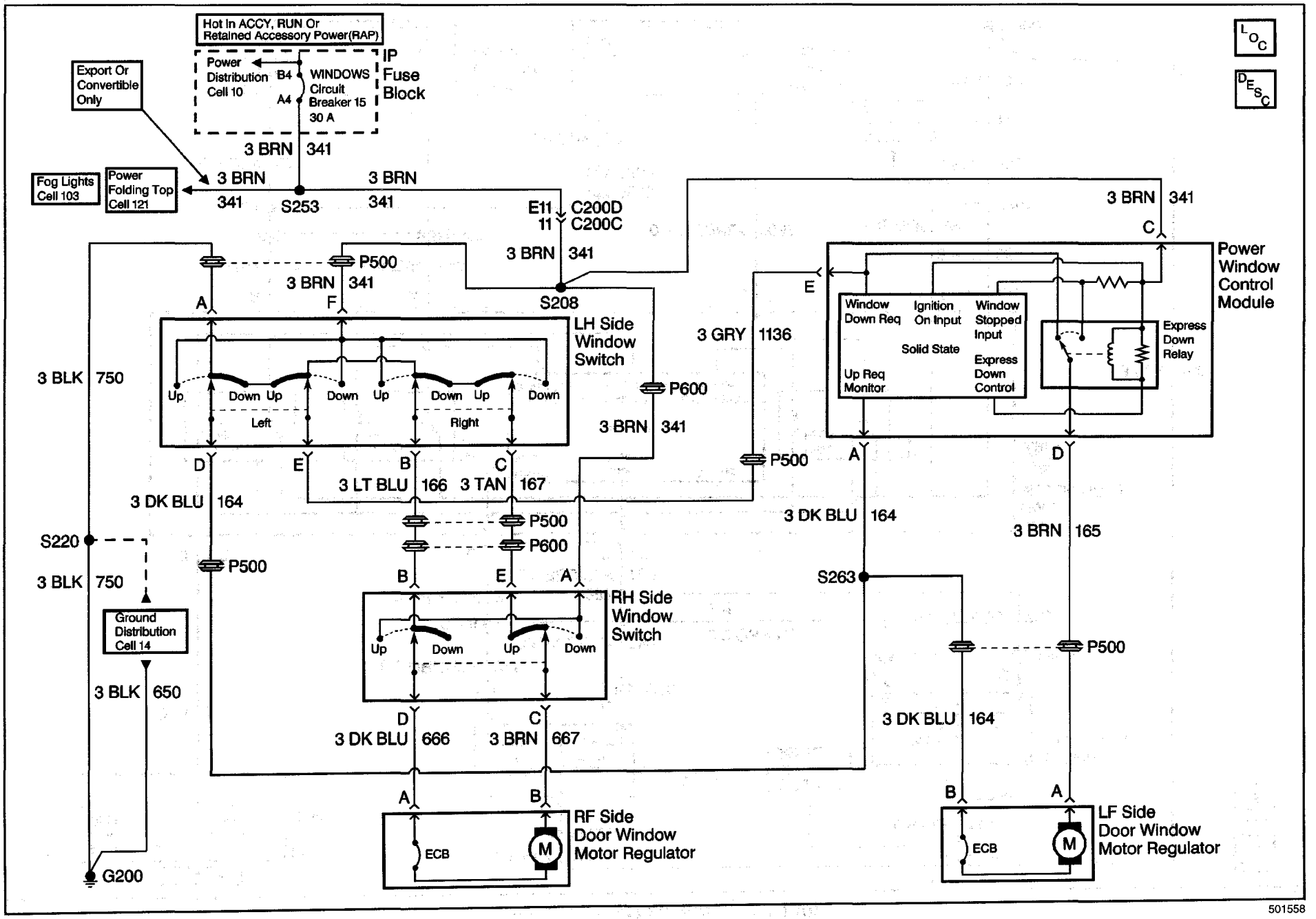
Power Door Systems Schematic References

Reference on Schematic	Section Number Subsection Name
Exterior Lights Cell 110	8—Lighting Systems
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems
Power Folding Top Cell 120	8—Roof

Power Door Systems Schematic Icons

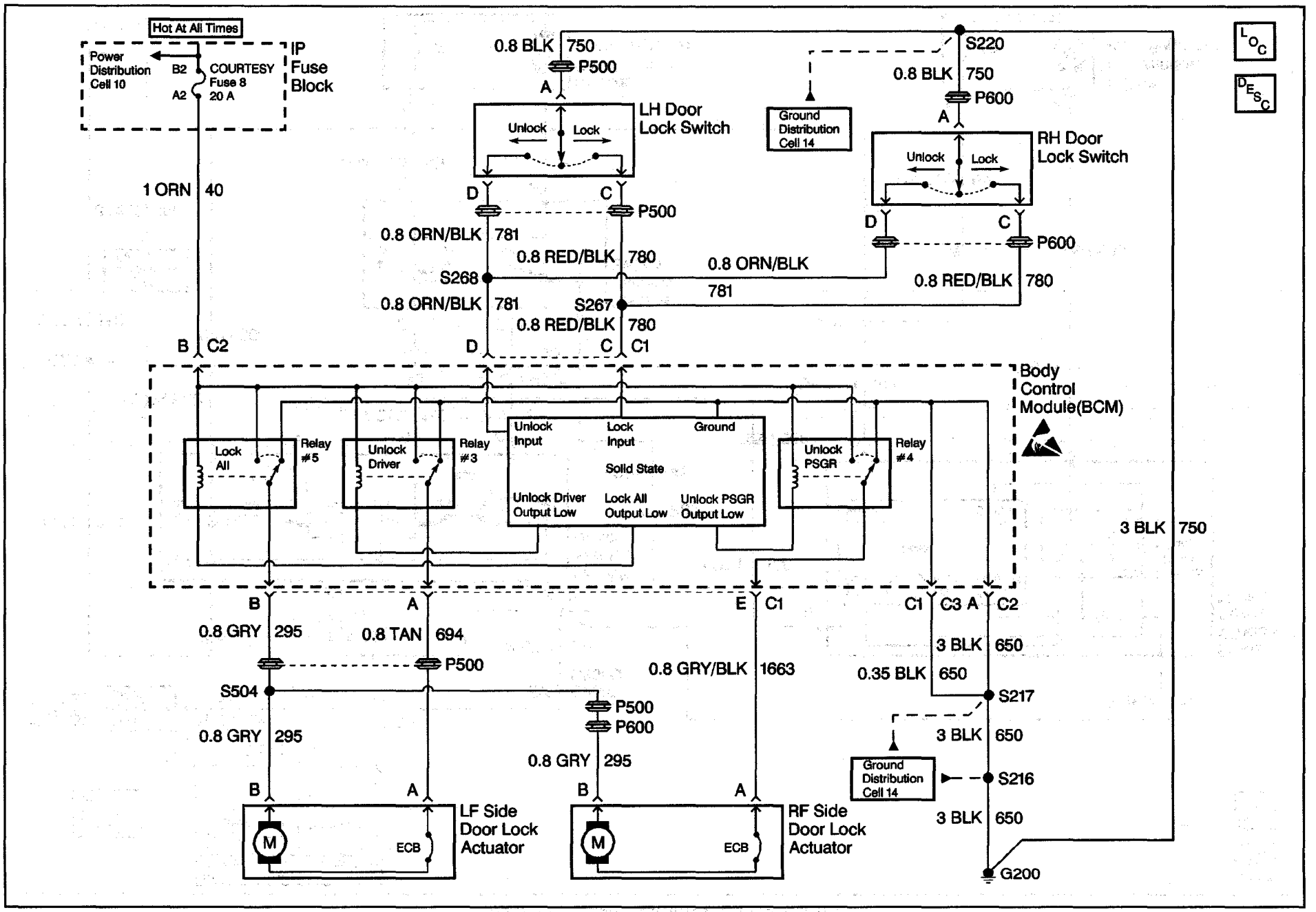
Icon	Icon Definition
 19384	Refer to *ESD Notice* in Caution and Notices.

Power Windows Schematics (Cell 120)



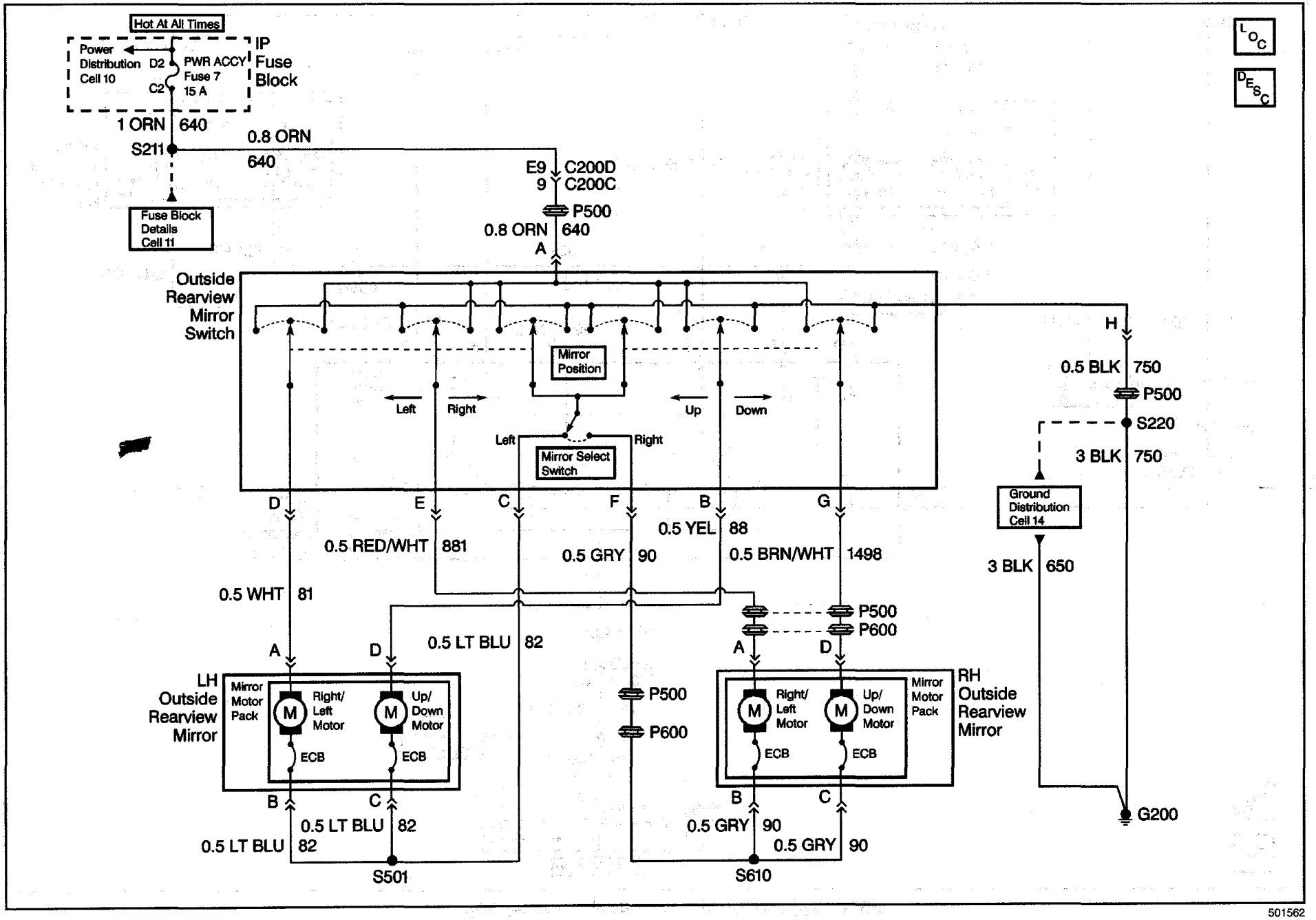
501558

Door Locks Schematics (Cell 130)



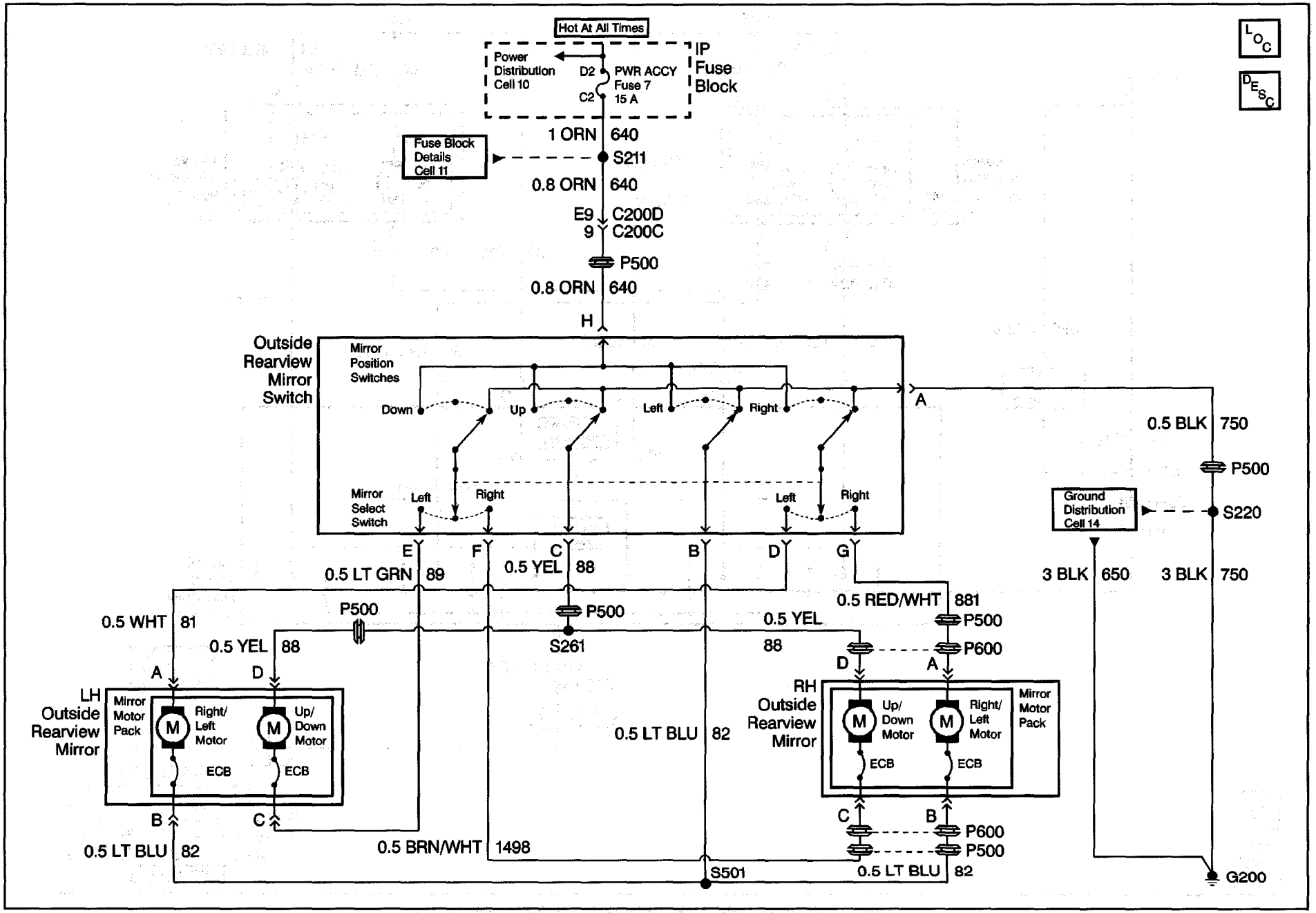
501559

Outside Mirrors Schematics (Cell 147 (Chevrolet))



501562

Outside Mirrors Schematics (Cell 147 (Pontiac))



501563

Component Locator

Power Door Systems Components

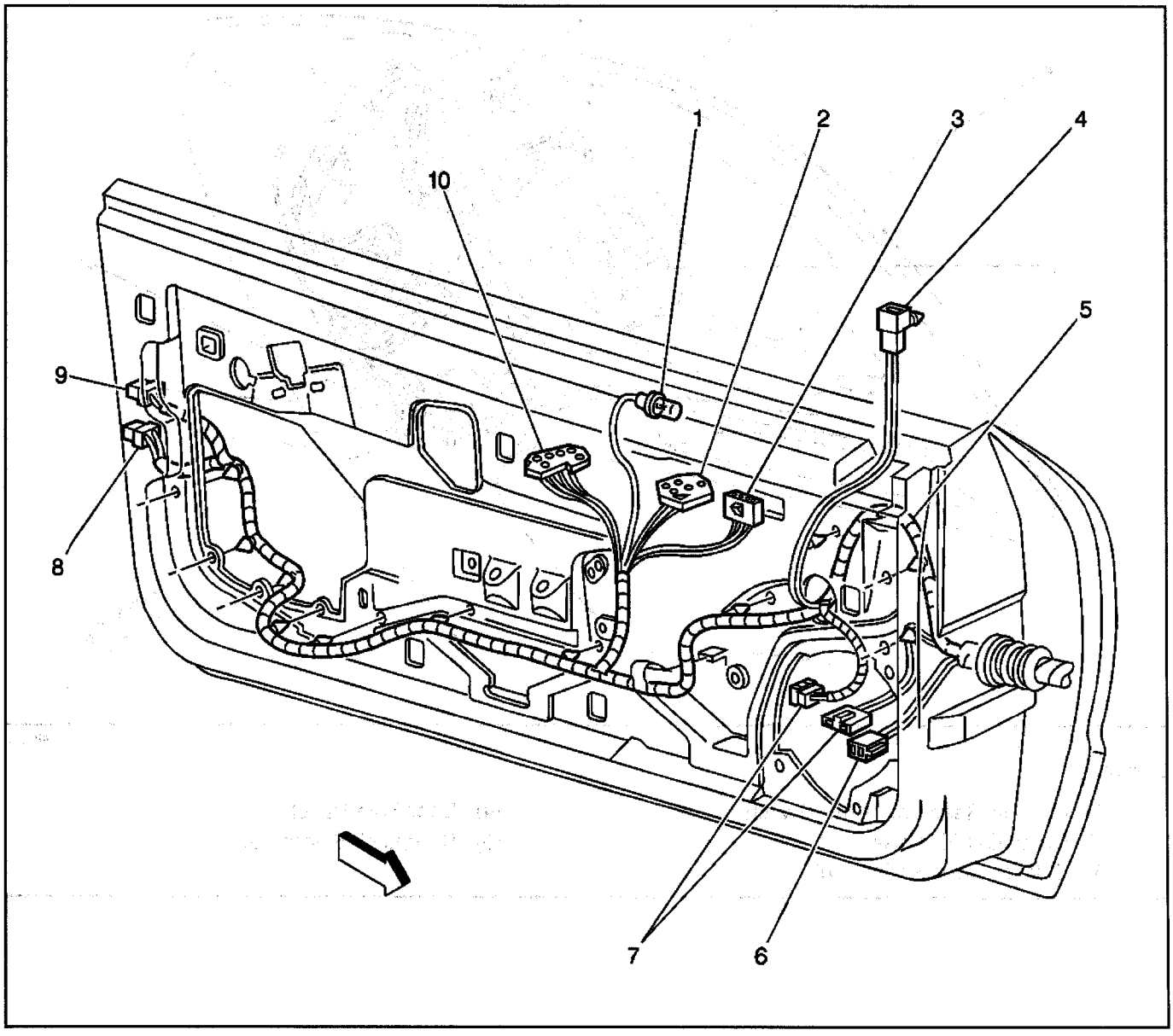
Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Door Lock Switch	Mounted in the door armrest	*Power Door Systems Component Views*	—
Front Side Door Lock Actuator	Inside the rear of the door	*Power Door Systems Component Views*	—
Front Side Door Window Regulator Motor	Inside front door	*Power Door Systems Component Views*	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Outside Rearview Mirror	Mounted to the left and right front doors	*Power Door Systems Component Views*	—
Outside Rearview Mirror Switch	Mounted in the door armrest	*Power Door Systems Component Views*	*Power Door Systems Connector End Views*
Power Window Control Module	Mounted to the center of the dash mat, above the floor tunnel	*Harness Routing Views* in Wiring Systems	—
Side Window Switch	Mounted in the door arm rest	*Power Door Systems Component Views*	—
C200C (13 cavities)	Cross car to instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C200D (48 cavities)	Part of the instrument panel harness, between the left kick panel and the steering column	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
P500	Between the driver door and A-pillar	*Harness Routing Views* in Wiring Systems	—
P600	Between the passenger door and A-pillar	*Harness Routing Views* in Wiring Systems	—
S208	In the cross car harness, main branch, approximately 26 cm (10 in) from the power window control module breakout	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S220	In the cross car harness, main branch, approximately 9 cm from C200C breakout	—	—
S253 (Convertible)	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the instrument cluster breakout	—	—

Power Door Systems Components (cont'd)

Name	Location	Locator View	Connector End View
S261 (Pontiac)	Cross car harness, approximately 6 cm (3 in) from body control module (BCM) breakout	—	—
S263	Cross car harness, approximately 16 cm (6 in) from the C200C breakout	—	—
S267	Cross car harness, main branch, approximately 24 cm (9 in) from inside rearview mirror breakout	—	—
S268	Cross car harness, main branch, approximately 18 cm (7 in) from inside rearview mirror breakout	—	—
S501	Cross car harness, approximately 4 cm (2 in) from left outside rearview mirror breakout	—	—
S504	Cross car harness, approximately 11 cm (4 in) from left outside rearview mirror breakout	—	—
S610 (Chevrolet)	Cross car harness, approximately 7 cm (3 in) from left outside rearview mirror breakout	—	—

Power Door Systems Component Views

Left Side Door (Right Door Similar)

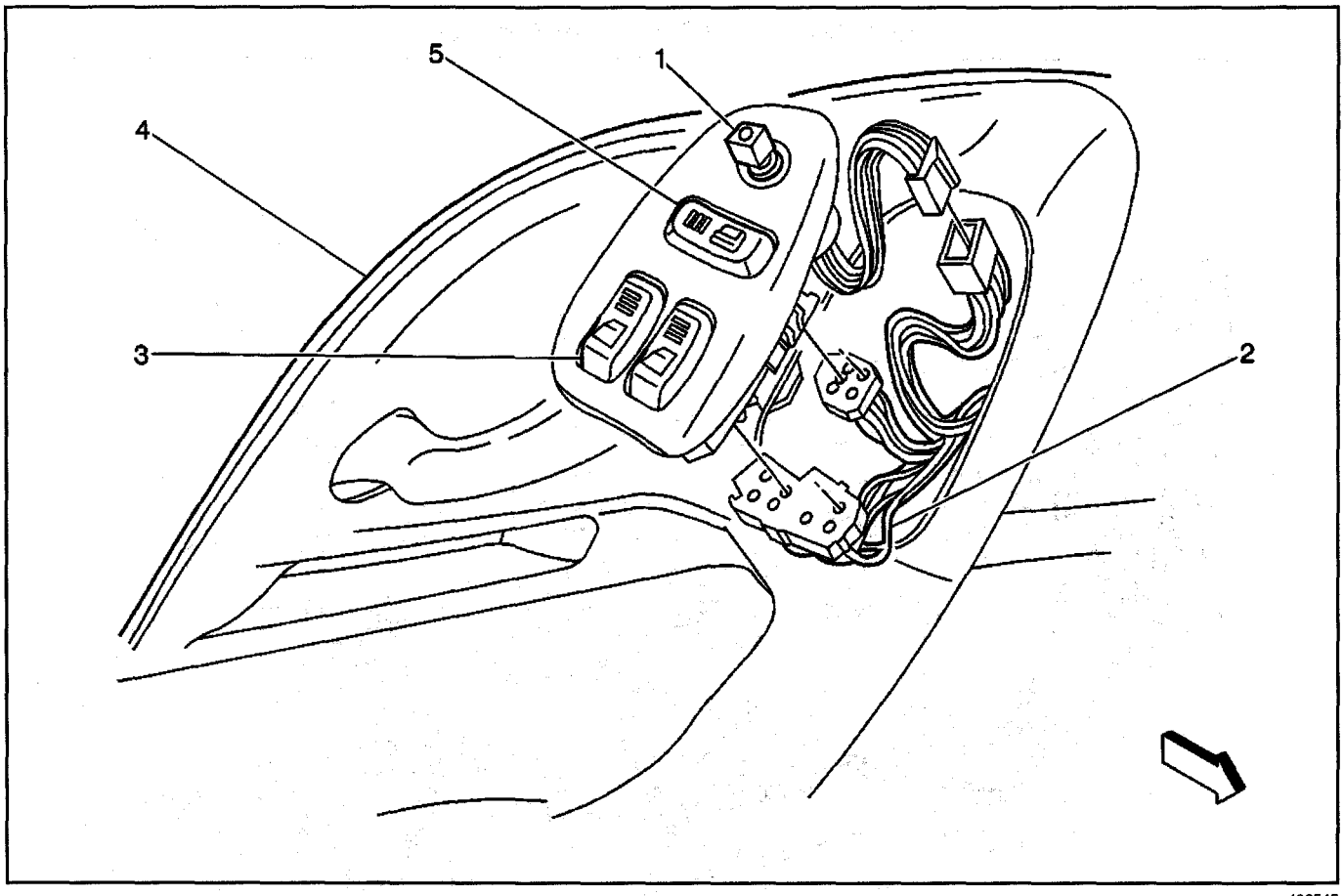


483368

Legend

(1) Door Illumination Lamp
(2) Door Lock Switch Connector
(3) Outside Rearview Mirror Select Switch Connector
(4) Outside Rearview Mirror Connector
(5) Cross Car Harness
(6) Front Side Door Window Regulator Motor Connector
(7) Speaker Connectors (Base UQ0 and UZ7: One Connector Used) (W54, W55, W59, W73: Two Connectors Used)
(8) Front Side Door Lock Actuator Connector
(9) Front Side Door Lock Connector
(10) Side Window Switch Connector

Left Door Armrest (Chevrolet)

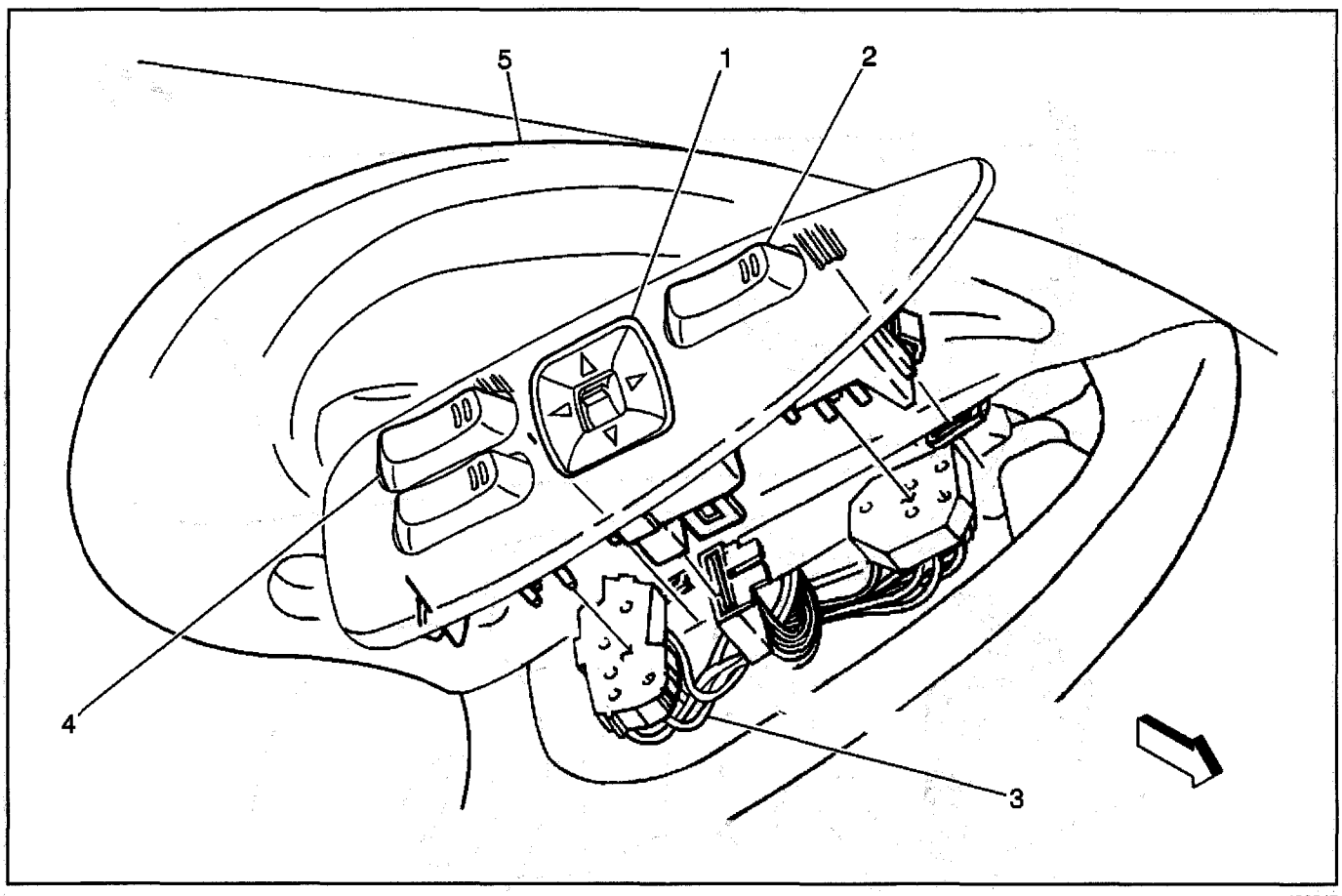


483545

Legend

(1) Outside Rearview Mirror Switch
(2) Cross Car Harness
(3) Side Window Switch, Left
(4) Door Trim Panel
(5) Door Lock Switch, Left

Left Door Armrest (Pontiac)

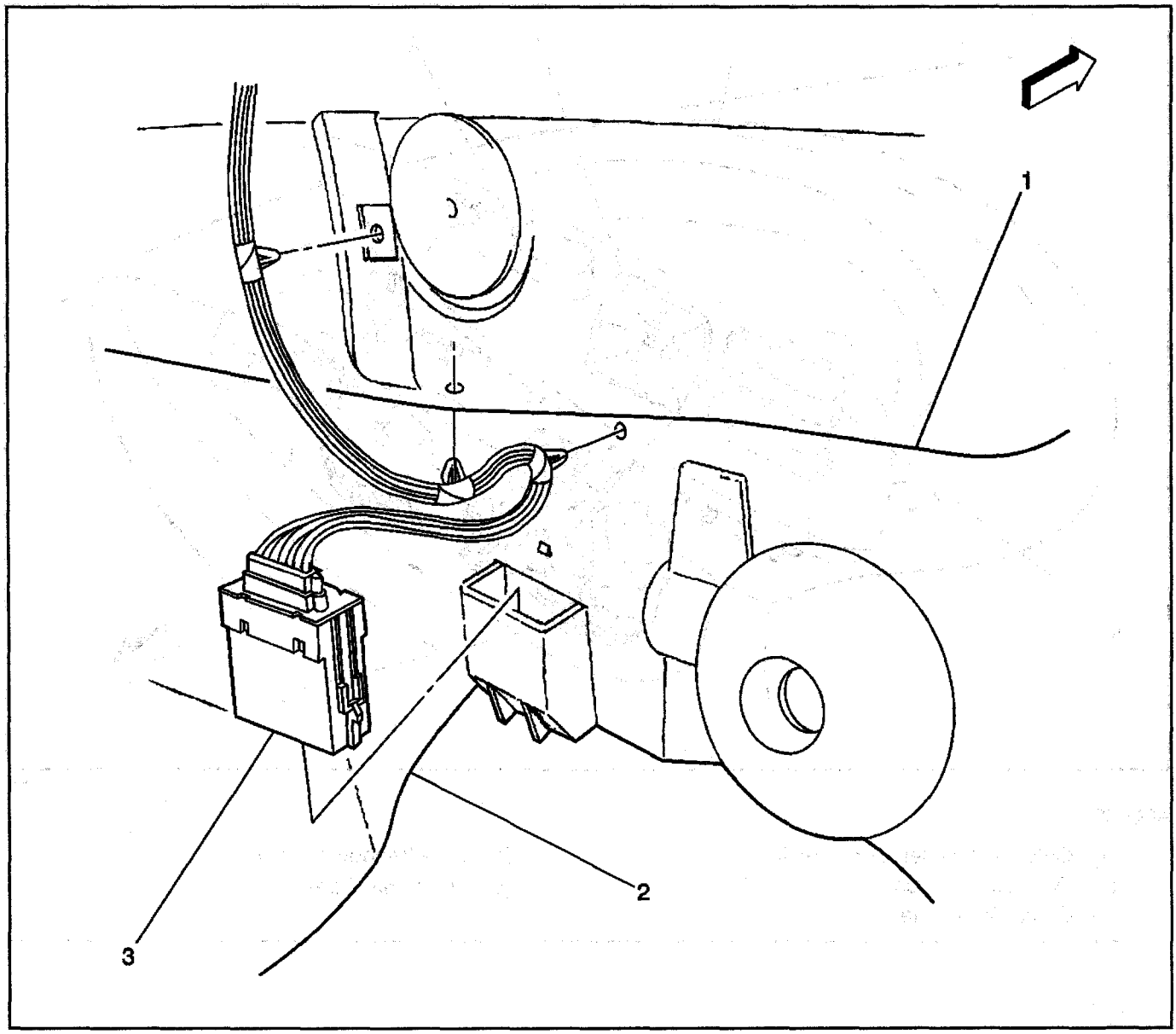


483547

Legend

(1) Outside Rearview Mirror Switch
(2) Door Lock Switch
(3) Cross Car Harness
(4) Side Window Switch
(5) Door Trim Panel

Center of Dash Mat Above Floor Tunnel



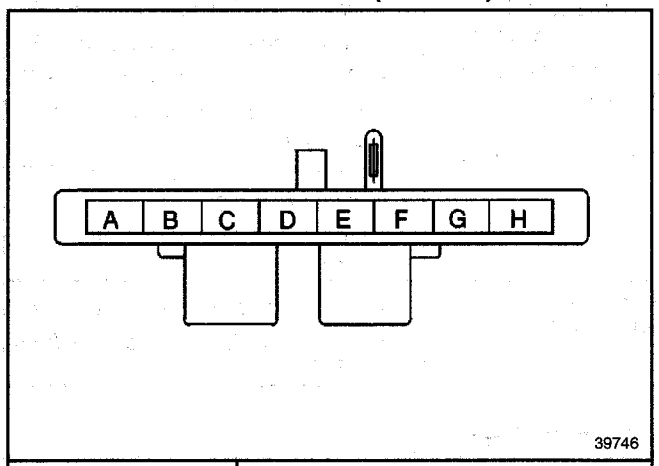
483548

Legend

(1) Dash Mat
(2) Floor Tunnel
(3) Power Window Control Module

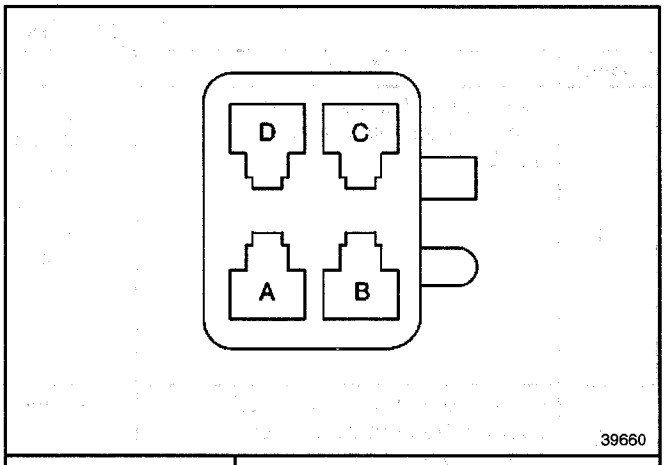
Power Door Systems Connector End Views

Outside Remote Control Rearview Mirror Select Switch (Pontiac)



Connector Part Information	• 1206-4862 • 8 Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	750	Ground
B	LT BLU	82	Power mirror motor feed—left horizontal motor—left direction
C	YEL	88	Power mirror motor feed—left vertical motor—up direction
D	WHT	81	Power mirror motor feed—left horizontal motor—right direction
E	LT GRN	89	Power mirror motor feed—left vertical motor—down direction
F	BRN/WHT	149	Courtesy lamp feed
G	RED/WHT	881	Power mirror motor feed—right horizontal motor—right direction
H	ORN	640	Fuse output—battery—type III fuse

Outside Rearview Mirror Motor RH and LH



Connector Part Information	• 1206-6498 • 4 Way M Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	RED/WHT	881	Power Mirror motor feed—right horizontal motor—right direction (RH Mirror)
A	WHT	81	Power Mirror motor feed—left horizontal motor—right direction (LH Mirror)
B	GRY	90	Power Mirror motor feed—right horizontal motor—left direction (RH Mirror)
B	LT BLU	82	Power Mirror motor feed—left horizontal motor—left direction (LH Mirror)
C	GRY	90	Power Mirror motor feed—right horizontal motor—left direction (RH Mirror)
C	LT BLU	82	Power Mirror motor feed—left horizontal motor—left direction (LH Mirror)
D	DK BLU/WHT	149	Power Mirror motor feed—right vertical motor—up direction (RH Mirror)
D	YEL	88	Power Mirror motor feed—left vertical motor—up direction (LH Mirror)

Diagnostic Information and Procedures

Power Windows System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Using the left window switch, operate each window UP and DOWN.	• Each window operates quietly and smoothly, with no sticking. • The left front window rolls down all the way without the switch being held. This is the express down feature.	• *Power Windows Inoperative - All* • *Power Window Inoperative - LF* • *Power Window Inoperative - RF* • *Power Windows Inoperative from LF Switch* • *Power Window Inoperative - RF from LF Switch* • *Power Windows Inoperative - Express*
2	Using the right window switch, operate the right window UP and DOWN.	The right window operates quietly and smoothly, with no sticking.	• *Power Window Inoperative - RF* • *Power Windows Inoperative from RF Switch*

Power Door Locks System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Remove the key from the ignition lock key cylinder. 2. Close both of the vehicle doors. 3. Observe the door locks while you press the driver door lock switch to the lock position.	Both of the doors lock when you press the driver door lock switch.	• *Power Door Locks - Lock Inop, Unlock Operates* • *Power Door Locks Inoperative* • *Power Door Locks Switch Lock Function Inoperative - One*
2	Observe the door locks while you press the driver door lock switch to the unlock position.	Both of the doors unlock when you press the driver door unlock switch.	• *Power Door Locks - Unlock Inop, Lock Operates* • *Power Door Locks Inoperative* • *Power Door Locks Switch Unlock Function Inop - One*
3	Observe the door locks while you press the passenger door lock switch to the lock position.	Both of the doors lock when you press the passenger door lock switch.	• *Power Door Locks - Lock Inop, Unlock Operates* • *Power Door Locks Inoperative* • *Power Door Locks Switch Lock Function Inoperative - One*
4	Observe the door locks while you press the passenger door lock switch to the unlock position.	Both of the doors unlock when you press the passenger door unlock switch.	• *Power Door Locks - Unlock Inop, Lock Operates* • *Power Door Locks Inoperative* • *Power Door Locks Switch Unlock Function Inop - One*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Outside Mirrors System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Move the mirror select switch to the LEFT position. 2. Operate the mirror position switch in the UP and DOWN positions.	The left outside rearview mirror moves smoothly upward and downward.	• *Power Mirrors Inoperative* • *Power Mirrors Inoperative - One (Chevrolet)* • *Power Mirrors Inoperative - One (Pontiac)* • *One Mirror Inoperative in Up/Down Direction (Chevrolet)* • *One Mirror Inoperative in Up/Down Direction (Pontiac)*
2	Operate the mirror position switch in the LEFT and RIGHT positions.	The left outside rearview mirror moves smoothly to the left and the right.	• *Power Mirrors Inoperative* • *Power Mirrors Inoperative - One (Chevrolet)* • *Power Mirrors Inoperative - One (Pontiac)* • *Power Mirrors Inop in Left/Right Direction - One (Chevrolet)* • *Power Mirrors Inop in Left/Right Direction - One (Pontiac)*
3	1. Move the mirror select position to the RIGHT position. 2. Operate the mirror position switch in the UP and DOWN positions.	The right outside rearview mirror moves smoothly upward and downward.	• *Power Mirrors Inoperative* • *Power Mirrors Inoperative - One (Chevrolet)* • *Power Mirrors Inoperative - One (Pontiac)* • *One Mirror Inoperative in Up/Down Direction (Chevrolet)* • *One Mirror Inoperative in Up/Down Direction (Pontiac)*
4	Operate the mirror position switch in the LEFT and RIGHT positions.	The right outside rearview mirror moves smoothly to the left and the right.	• *Power Mirrors Inoperative* • *Power Mirrors Inoperative - One (Chevrolet)* • *Power Mirrors Inoperative - One (Pontiac)* • *Power Mirrors Inop in Left/Right Direction - One (Chevrolet)* • *Power Mirrors Inop in Left/Right Direction - One (Pontiac)*

Power Windows Inoperative - All

Step	Action	Value(s)	Yes	No
1	Did you test for BCM diagnostic trouble codes?	—	*Go to Step 2*	Go to *Diagnostic Trouble Code (DTC) Displaying* in Body Control Systems
2	1. Turn the ignition switch to the RUN position. 2. Using a test lamp, backprobe the left window switch connector from terminal F to the ground. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 3*
3	1. Test for a poor connection at C200 terminal E11. 2. If OK, repair the open in CKT 341, between windows circuit breaker 15 and left window switch assembly connector terminal F. Is the repair complete?	—	System OK	—
4	Using a test lamp, backprobe the left side window switch connector between terminal F and terminal A. Does the test lamp light?	—	*Go to Step 5*	*Go to Step 6*
5	1. Test the left window switch assembly connector for a poor connection. 2. If OK, replace the switch. Refer to *Power Window Switch Replacement (Chevrolet)* or *Power Window Switch Replacement (Pontiac)*. Is the repair complete?	—	System OK	—
6	Repair the open in CKT 750, between left window switch assembly connector terminal A and S220. Is the repair complete?	—	System OK	—

Power Windows Inoperative - Express

Step	Action	Value(s)	Yes	No
1	1. Disconnect the power window control module connector. 2. Connect a test lamp from power window control module connector terminal A to terminal C. 3. Turn the ignition switch to RUN. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Check for an open in circuit 164 between the power window control module terminal A and splice S263. 2. If circuit 164 is OK, repair the open in circuit 341 between the power window control module and splice S208. Is the repair complete?	—	System OK	—
3	1. Check for a poor connection at the power window control module. 2. If the connections are OK, replace the power window control module. Is the repair complete?	—	System OK	—

Power Window Inoperative - LF

Step	Action	Value(s)	Yes	No
1	1. Place the ignition switch into the RUN position. 2. Using a test lamp, backprobe the left window switch connector from terminal D to terminal E. 3. Press the left window UP switch and the left window DOWN switch at the left side window switch. Does the test lamp light after both actions?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the left power window switch connector. 2. If OK, replace the left power window switch. Refer to *Power Window Switch Replacement (Chevrolet)* or *Power Window Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe the power window control module connector from terminal A to terminal E. 2. Press the left window switch UP and the left window switch DOWN at the left side window switch. Does the test lamp light in both cases?	—	*Go to Step 5*	*Go to Step 4*
4	1. Test for an open in CKT 1136, between the left side window switch terminal E and the power window control module terminal E. 2. If OK, repair the open in CKT 164, between left side window switch terminal D and power window control module terminal A. Is the repair complete?	—	System OK	—
5	1. Using a test lamp, backprobe the power window control module connector from terminal A to terminal D. 2. Press the left window UP and the left window DOWN switch at the left side window switch. Does the test lamp light druing both actions?	—	*Go to Step 7*	*Go to Step 6*
6	1. Test for poor connections at the power window control module. 2. If OK, replace the power window control module. Is the repair complete?	—	System OK	—
7	1. Disconnect the left front side door window motor connector. 2. Connect a test lamp between terminal A and terminal B of the left front side door window motor connector. 3. Press the left window UP and the left window DOWN switch at the left window switch. Does the test lamp light during both actions?	—	*Go to Step 8*	*Go to Step 9*
8	1. Test for poor connections at the left front side door window motor. 2. If OK, replace the left window motor. Refer to *Window Regulator Motor Replacement - Door.* Is the repair complete?	—	System OK	—
9	1. Test for an open in CKT 165, between power window control module terminal D and left front side door window motor terminal A. 2. If OK, repair the open in CKT 164, between the left front side door window motor and S263. Is the repair complete?	—	System OK	—

Power Window Inoperative - RF from LF Switch

Step	Action	Value(s)	Yes	No
1	Inspect the left side window switch connector for a poor connection. Is there a poor connection at the left side window switch?	—	*Go to Step 3*	*Go to Step 2*
2	Replace the left side window switch. Refer to *Power Window Switch Replacement (Pontiac)* or *Power Window Switch Replacement (Chevrolet).* is the repair complete?	—	System OK	—
3	Repair the poor connection at the left side window switch. Is the repair complete?	—	System OK	—

Power Window Inoperative - RF

Step	Action	Value(s)	Yes	No
1	1. Place the ignition switch into the RUN position. 2. Using a test lamp, backprobe the left side window switch connector from terminal B to terminal C. 3. While observing the test lamp and using the left side window switch, press the right window switch UP and then DOWN. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the left side window switch. 2. If OK, replace the left side window switch. Refer to *Power Window Switch Replacement (Chevrolet)* or *Power Window Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe the right side window switch connector from terminal B to terminal E. 2. While observing the test lamp, and using the left side window switch, press the right window switch UP and then DOWN. Does the test lamp light during both actions?	—	*Go to Step 5*	*Go to Step 4*
4	1. Test for an open in CKT 166, between the left side window switch and the right side window switch. 2. If OK, repair the open in CKT 167, between the left side window switch and the right side window switch. Is the repair complete?	—	System OK	—
5	1. Using a test lamp, backprobe the right side window switch connector from terminal C to terminal D. 2. While observing the test lamp, press the right side window switch UP and then DOWN. Does the test lamp light during both actions?	—	*Go to Step 7*	*Go to Step 6*
6	1. Test the right power window switch for a poor connection. 2. If OK, replace the right power window switch. Refer to *Power Window Switch Replacement (Chevrolet)* or *Power Window Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
7	1. Using a test lamp, backprobe the right front side door window motor connector from terminal A to terminal B. 2. While observing the test lamp, press the right side window switch UP and then DOWN. Does the test lamp light during both actions?	—	*Go to Step 8*	*Go to Step 9*

Power Window Inoperative - RF (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Test for a poor connection at the right front side door window motor. 2. If OK, replace the right front side door window motor. Refer to *Window Regulator Motor Replacement - Door* Is the repair complete?	—	System OK	—
9	1. Test CKT 666, between the right side window switch and the right front side door window motor for an open. 2. If OK, repair the open in CKT 666, between the right side window switch and the right front side door window motor. Is the repair complete?	—	System OK	—

Power Windows Inoperative from LF Switch

Step	Action	Value(s)	Yes	No
1	1. Disconnect the left side window switch connector. 2. Turn the ignition switch to RUN. 3. Connect a test lamp from left side window switch connector terminal F to ground. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Repair the open in circuit 341, between S208 and the left side window switch terminal F. Is the repair complete?	—	System OK	—
3	1. Test circuit 341 for a poor connection at the left side window switch terminal F. 2. If the connection is OK, replace the left side window switch. Refer to *Power Window Switch Replacement (Pontiac)* or *Power Window Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—

Power Windows Inoperative from RF Switch

Step	Action	Value(s)	Yes	No
1	1. Disconnect the right side window switch connector. 2. Connect a test lamp from the right side window switch connector terminal A to ground. 3. Turn the ignition switch to run. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Repair the open in circuit 341, between the right side window switch and S208. Is the repair complete?	—	System OK	—
3	1. Check for a poor connection at right side window switch terminal A. 2. If the connection is OK, replace the right side window switch. Refer to *Power Window Switch Replacement (Pontiac)* or *Power Window Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—

Power Door Locks - Lock Inop, Unlock Operates

Step	Action	Value(s)	Yes	No
1	1. Using a *J 39200* DMM, backprobe between body control module (BCM) connector C1 terminal C and ground. 2. While observing the *J 39200* DMM, move either door lock switch to the LOCK position. Is there continuity?	0 Ω	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at BCM connector C1 terminal C. 2. If OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	Repair the open in CKT 780, between the BCM and S267. Is the repair complete?	—	System OK	—

Power Door Locks - Unlock Inop, Lock Operates

Step	Action	Value(s)	Yes	No
1	1. Using a *J 39200* DMM, backprobe between body control module (BCM) connector C1 terminal D and ground. 2. While observing the *J 39200* DMM, move either door lock switch to the UNLOCK position. Is there continuity?	0Ω	*Go to Step 2*	*Go to Step 3*
2	1. Test for a poor connection at BCM connector C1 terminal D. 2. If OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—
3	Repair the open in CKT 781, between the BCM and S268. Is the repair complete?	—	System OK	—

Power Door Locks Inoperative

Step	Action	Value(s)	Yes	No
1	1. Disconnect the left door lock switch connector. 2. Connect a test lamp from left door lock switch connector terminal A to B+. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Repair the open in CKT 750, between G200 and S220. Is the repair complete?	—	System OK	—
3	1. Reconnect the left door lock switch connector. 2. Using a test lamp, backprobe between body control module BCM connector C1 terminal B and ground. 3. While observing the test lamp, move the left door lock switch to the LOCK position. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	Repair the open in CKT 295, between the BCM and S504. Is the repair complete?	—	System OK	—
5	1. Test body control module connector C1 for a poor connection. 2. If OK, replace the BCM. Refer to *Body Control Module Replacement* in Body Control Systems. Is the repair complete?	—	System OK	—

Power Door Locks Switch Lock Function Inoperative - One

Step	Action	Value(s)	Yes	No
1	1. Backprobe with a *J 39200* DMM, between inoperative door lock switch connector terminal C and ground. 2. While observing the *J 39200* DMM, move the inoperative door lock switch to the LOCK position. Is there continuity?	0Ω	*Go to Step 2*	*Go to Step 3*
2	Repair the open in CKT 780, between the inoperative door lock switch and S267. Is the repair complete?	—	System OK	—
3	1. Test for a poor connection at the inoperative door lock switch. 2. If OK, replace the door lock switch. Refer to *Power Door Lock Switch Replacement (Pontiac)* or *Power Door Lock Switch Replacement (Chevrolet).* If the repair complete?	—	System OK	—

Power Door Locks Switch Unlock Function Inop - One

Step	Action	Value(s)	Yes	No
1	1. Backprobe with a *J 39200* DMM, between the inoperative door lock switch connector terminal D and ground. 2. While observing the *J 39200* DMM, move the inoperative door lock switch to the UNLOCK position. Is there continuity?	0Ω	*Go to Step 2*	*Go to Step 3*
2	Repair the open in CKT 781, between the inoperative door lock switch and S268. Is the repair complete?	—	System OK	—
3	1. Test for a poor connection at the inoperative door lock switch. 2. If OK, replace the door lock switch. Refer to *Power Door Lock Switch Replacement (Pontiac)* or *Power Door Lock Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—

Power Mirrors Inoperative

Step	Action	Value(s)	Yes	No
1	• On Chevrolet vehicles, backprobe with a test lamp from the outside rearview mirror switch connector terminal A to ground. • On Pontiac vehicles, backprobe with a test lamp from the outside rearview mirror switch connector terminal H to the ground. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	Repair the open or poor connection in CKT 640, between the outside rearview mirror switch and S211. Is the repair complete?	—	System OK	—
3	Using a test lamp, backprobe between the outside rearview mirror switch connector terminal A and terminal H. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*

Power Mirrors Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
4	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the switch. Refer to *Power Mirror Switch Replacement (Chevrolet)* or *Power Mirror Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
5	• On Chevrolet vehicles, repair the open in circuit 750, from S220 to outside rearview mirror switch connector terminal H. • On Pontiac vehicles, repair the open in circuit 750, from S220 to outside rearview mirror switch connector terminal A. Is the repair complete?	—	System OK	—

Power Mirrors Inoperative - One (Chevrolet)

Step	Action	Value(s)	Yes	No
1	1. Use the mirror select switch to select the inoperative mirror. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal B to terminal C. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal G to terminal F. 4. While observing the test lamp, press the mirror position switch to the UP position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe from outside rearview mirror connector terminal D to terminal C. 2. Press the mirror position switch to the UP position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, repair the open in CKT 82, between mirror switch connector terminal C and S501. 2. If the right mirror is inoperative, repair the open in CKT 90, between mirror switch connector terminal F and S610. Is the repair complete?	—	System OK	—

Power Mirrors Inoperative - One (Pontiac)

Step	Action	Value(s)	Yes	No
1	1. Use the mirror select switch to select the inoperative mirror. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal C to terminal E. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal C to terminal F. 4. While observing the test lamp, press the mirror position switch to the UP position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Pontiac).* Is the repair complete?	—	*Go to Step 3*	System OK
3	1. Using a test lamp, backprobe from outside rearview mirror connector terminal D to terminal C. 2. Press the mirror position switch to the UP position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, test for an open in circuit 89, between mirror switch connector terminal E and mirror connector terminal C. 2. If the right mirror is inoperative, test for an open in circuit 1498, between mirror switch terminal F and mirror connector terminal C. 3. If OK, repair the open in circuit 88, between mirror connector terminal D and S261. Is the repair complete?	—	System OK	—

One Mirror Inoperative in Up/Down Direction (Chevrolet)

Step	Action	Value(s)	Yes	No
1	1. Set the mirror select switch to the LEFT or RIGHT position, as needed. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal B to terminal C. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal G to terminal F. 4. While observing the test lamp, press the mirror position switch to the UP position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe from outside rearview mirror connector terminal D to terminal C. 2. Press the mirror position switch to the UP position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, test for an open in circuit 88, between mirror switch terminal B and mirror connector terminal D. 2. If OK, repair the open in circuit 82, between S501 and mirror connector terminal C. 3. If the right mirror is inoperative test for an open in circuit 1498, between mirror switch terminal G and mirror connector terminal D. 4. If OK, repair the open in circuit 90, between S610 and mirror connector terminal B. Is the repair complete?	—	System OK	—

One Mirror Inoperative in Up/Down Direction (Pontiac)

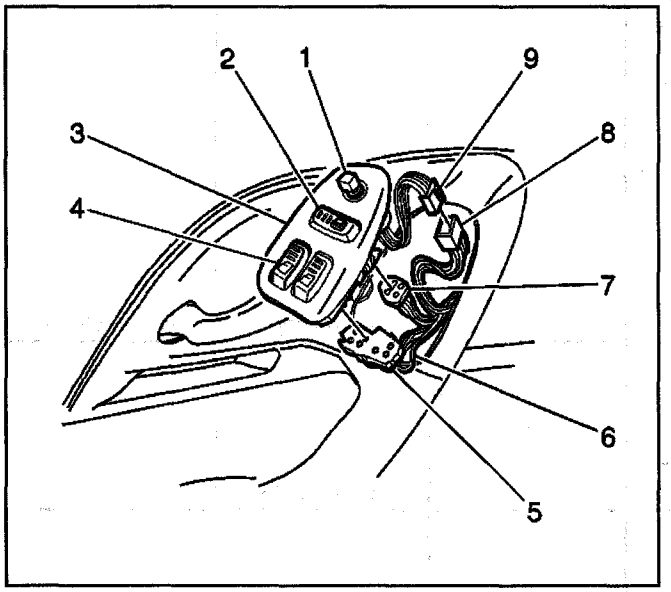
Step	Action	Value(s)	Yes	No
1	1. Use the mirror select switch to select the inoperative mirror. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal C to terminal E. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal C to terminal F. 4. While observing the test lamp, press the mirror position switch to the UP position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe from outside rearview mirror connector terminal D to terminal C. 2. Press the mirror position switch to the UP position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, test for an open in circuit 88, between mirror connector terminal D and S261. 2. If OK, repair the open in circuit 89, between mirror connector terminal C and mirror switch terminal E. 3. If the right mirror is inoperative test for an open in circuit 88, between mirror connector terminal D and S261. 4. If OK, repair the open in circuit 1498, between mirror connector terminal C and mirror switch connector terminal F. Is the repair complete?	—	System OK	—

Power Mirrors Inop in Left/Right Direction - One (Chevrolet)

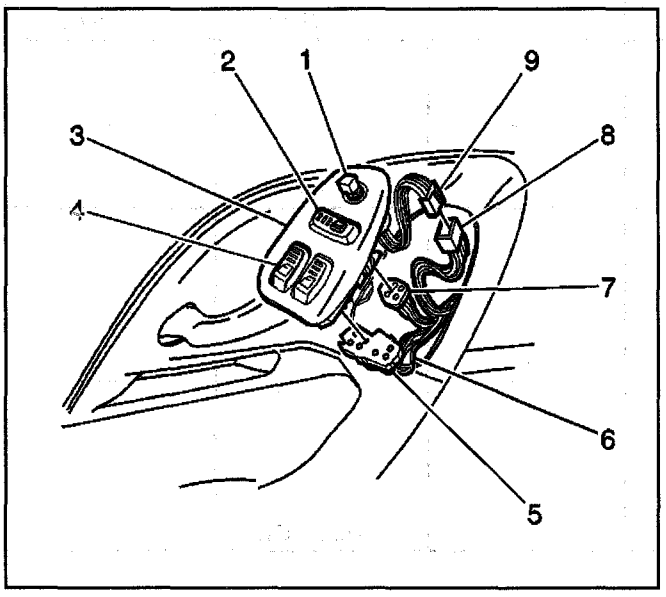
Step	Action	Value(s)	Yes	No
1	1. Use the mirror select switch to select the inoperative mirror. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal D to terminal C. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal E to terminal F. 4. While observing the test lamp, press the mirror position switch to the LEFT position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Chevrolet).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe from the outside rearview mirror connector terminal B to terminal A. 2. Press the mirror position switch to the LEFT position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, test for an open in circuit 81, between mirror switch connector terminal D and mirror connector terminal A. 2. If OK, repair the open in circuit 82, between S501 and mirror connector terminal B. 3. If the right mirror is inoperative test for an open in circuit 881, between mirror switch connector terminal E and mirror connector terminal A. 4. If OK, repair the open in circuit 90, between S610 and mirror connector terminal B. Is the repair complete?	—	System OK	—

Power Mirrors Inop in Left/Right Direction - One (Pontiac)

Step	Action	Value(s)	Yes	No
1	1. Use the mirror select switch to select the inoperative mirror. 2. If the left mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal D to terminal B. 3. If the right mirror is inoperative, backprobe with a test lamp from the outside rearview mirror switch connector terminal G to terminal B. 4. While observing the test lamp, press the mirror position switch to the LEFT position. Does the test lamp light?	—	*Go to Step 3*	*Go to Step 2*
2	1. Test for a poor connection at the outside rearview mirror switch connector. 2. If OK, replace the outside rearview mirror switch. Refer to *Power Mirror Switch Replacement (Pontiac).* Is the repair complete?	—	System OK	—
3	1. Using a test lamp, backprobe from outside rearview mirror connector terminal A to terminal B. 2. Press the mirror position switch to the LEFT position while observing the test lamp. Does the test lamp light?	—	*Go to Step 4*	*Go to Step 5*
4	1. Test for a poor connection at the outside rearview mirror connector. 2. If OK, replace the mirror motor pack within the power mirror. Refer to *Mirror Replacement.* Is the repair complete?	—	System OK	—
5	1. If the left mirror is inoperative, test for an open in circuit 81, between the mirror switch connector terminal D and the mirror connector terminal A. 2. If OK, repair the open in circuit 82, between S501 and mirror connector terminal B. 3. If the right mirror is inoperative test for an open in circuit 881, between the mirror switch connector terminal G and the mirror connector terminal A. 4. If OK, repair the open in circuit 82, between mirror connector terminal B and S501. Is the repair complete?	—	System OK	—



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Repair Instructions

Power Window Switch Replacement (Chevrolet)

Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

1. Pry up the rear edge of the driver side switch, the front edge of the passenger side switch.
2. Slide the driver side switch rearward, the passenger side switch forward, out of the door trim panel.
3. Disconnect the electrical connector (5) from the window switches (4).
4. Remove the power window switch (4) from panel.

Installation Procedure

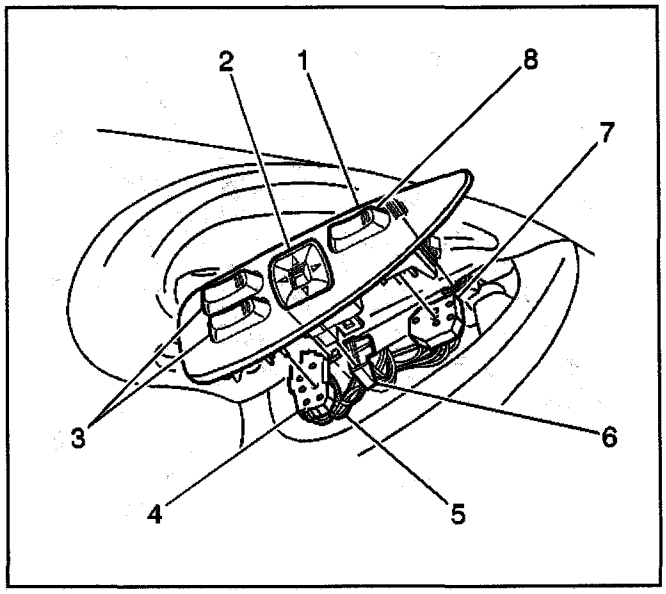
1. Insert switch assembly into panel.
2. Install the power window switch (4) to the panel.
3. Connect the electrical connector (5) to the switches (4).
4. Insert the front edge of the driver side switch, the rear edge of the passenger side switch, into the door trim panel.
5. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.

Power Window Switch Replacement (Pontiac)

Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

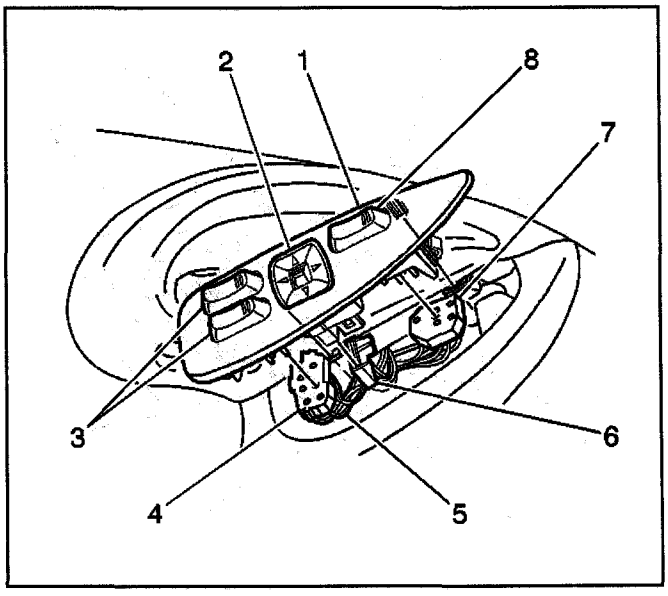
1. Pry up the rear of the driver side switch, the front edge of the passenger side switch.
2. Slide the driver side switch rearward, the passenger side switch forward, out of the door trim panel.
3. Disconnect the power window switch electrical connector (4).
4. Remove the power window switches (3) from the panel.



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Installation Procedure

1. Install the power window switches (3) to the panel.
2. Connect the power window switch electrical connector (4).
3. Insert the front edge of the driver side switch, the rear edge of the passenger side switch, into the door trim panel.
4. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.



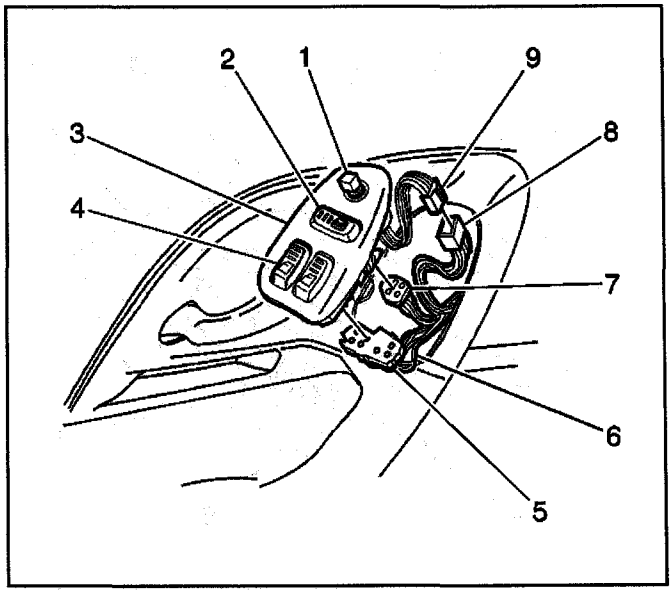
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Power Door Lock Switch Replacement (Chevrolet)

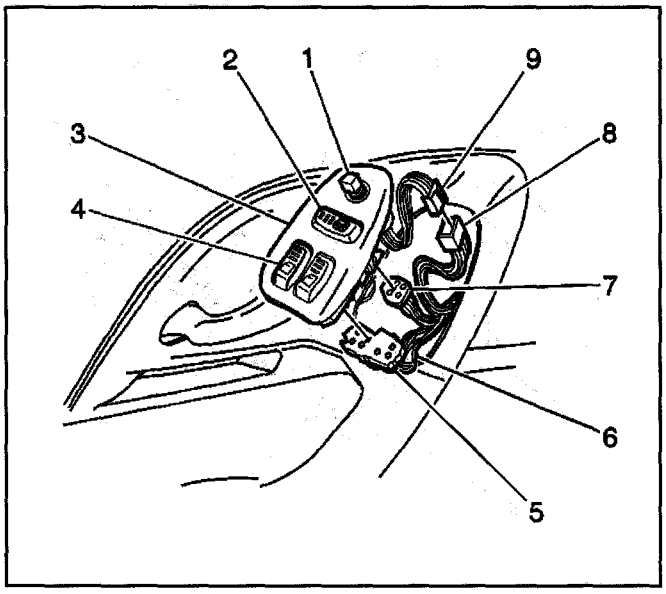
Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

1. Pry up the rear edge of the driver side switch, or the front edge of the passenger side switch.
2. Slide the driver side switch rearward, or the passenger side switch forward, out of the door trim panel.
3. Disconnect the electrical connector (7) from the power door switch (2).
4. Remove the power lock switch (2) from the panel.



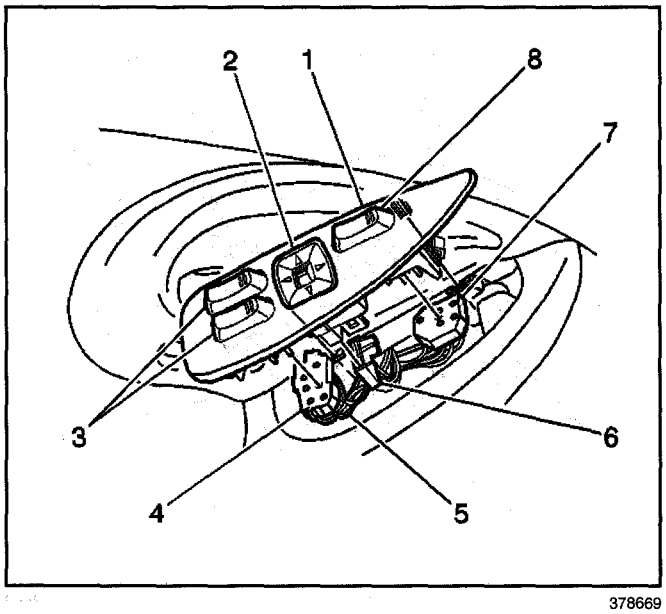
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Installation Procedure

1. Install the power lock switch (2) to the panel.
2. Connect the electrical connector (7) to the power door switch (2).
3. Insert the front edge of the driver side switch, the rear edge of the passenger side switch, into the door trim panel.
4. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.



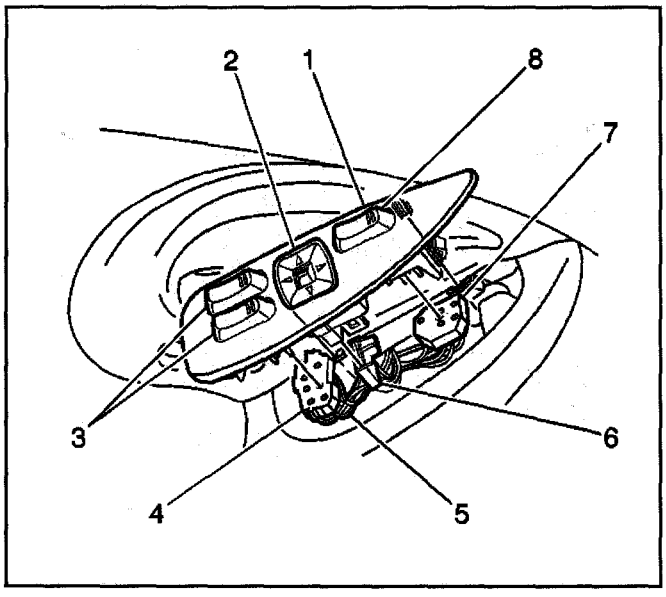
378669

Power Door Lock Switch Replacement (Pontiac)

Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

1. Pry up the rear edge of the driver side switch, or the front edge of the passenger side switch.
2. Slide the driver side switch rearward, or the passenger side switch forward out of the door trim panel.
3. Disconnect the power door lock electrical connector (7).
4. Remove the power door lock switch (8) from the panel.



378669

Installation Procedure

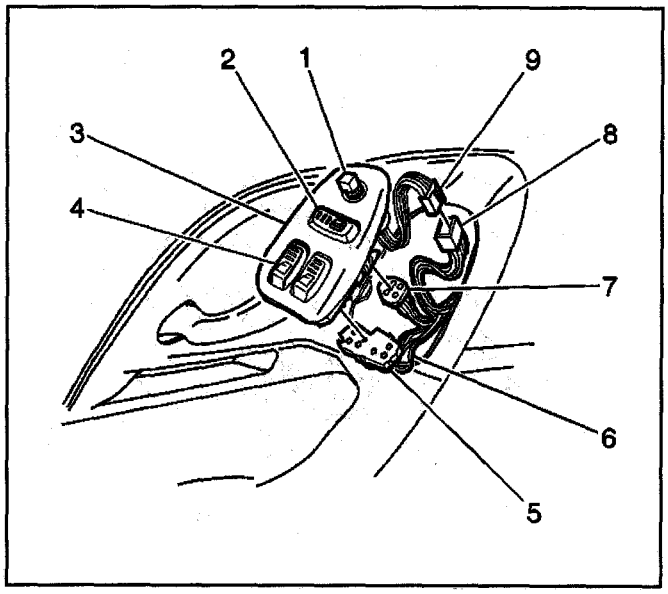
1. Install the power door lock switch (8) to the panel.
2. Connect the power door lock switch electrical connector (7).
3. Insert the front edge of the driver side switch, the rear edge of the passenger side switch into the door trim panel.
4. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.

Power Mirror Switch Replacement (Chevrolet)

Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

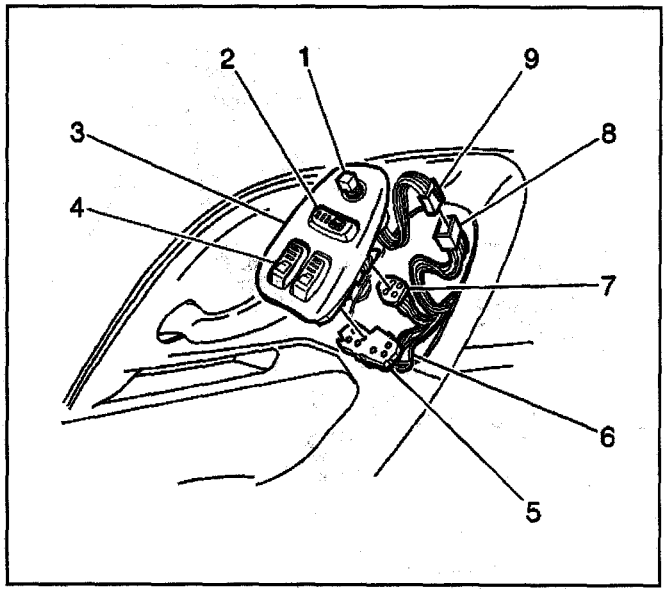
1. Pry up the rear edge of the driver side switch, the front edge of the passenger side switch.
2. Slide the driver side switch rearward, the passenger side switch forward, out of the door trim panel.
3. Disconnect the electrical connector (9) from the mirror switch (1).
4. Remove the power mirror switch (1) from panel.



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Installation Procedure

1. Install the power mirror switch (1) to the panel.
2. Connect the electrical connector (9) to the mirror switch (1).
3. Insert the front edge of the driver side switch, the rear edge of the passenger side switch, into the door trim panel.
4. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.



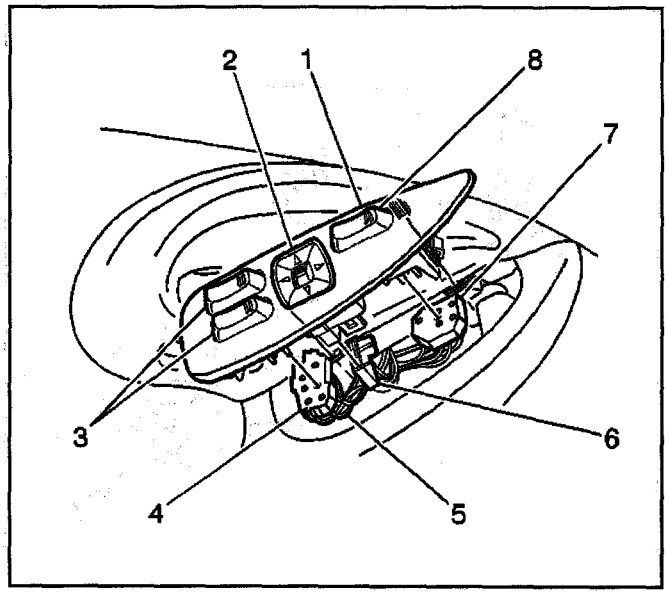
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Power Mirror Switch Replacement (Pontiac)

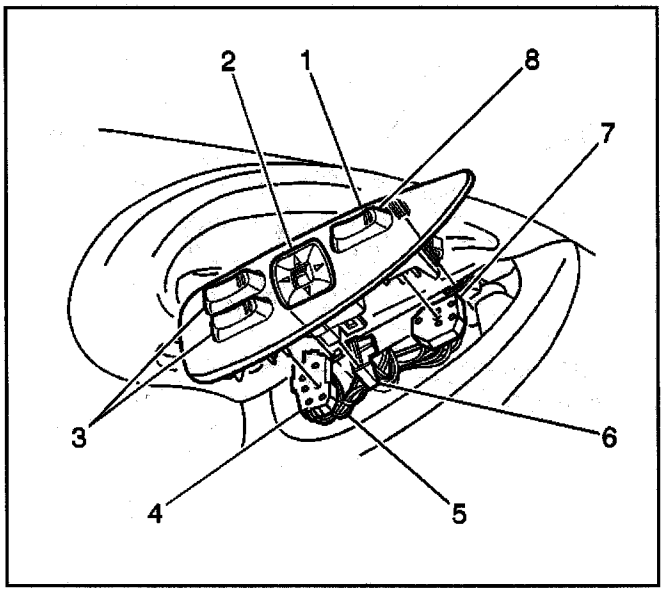
Removal Procedure

Important: Protect the trim panel with a rag when prying up the switch to prevent marring the trim panel.

1. Pry up the rear edge of the driver side switch, the front edge of the passenger side switch.
2. Slide the driver side switch rearward, the passenger side switch forward, out of the door trim panel.
3. Disconnect the electrical connector (6) from the mirror switch (2).
4. Remove mirror switch (2) from panel.



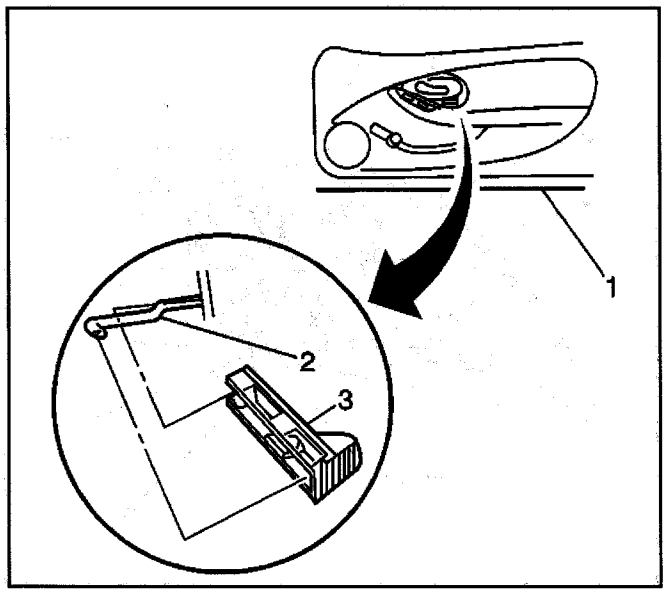
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Installation Procedure

1. Insert switch assembly into panel.
2. Install the mirror switch (2) to the panel.
3. Connect the electrical connector (6) to the mirror switch (2).
4. Insert the front edge of the driver side switch, the rear edge of the passenger side switch, into the door trim panel.
5. Press the rear edge of the driver side switch, the front edge of the passenger side switch, into the trim panel to secure.

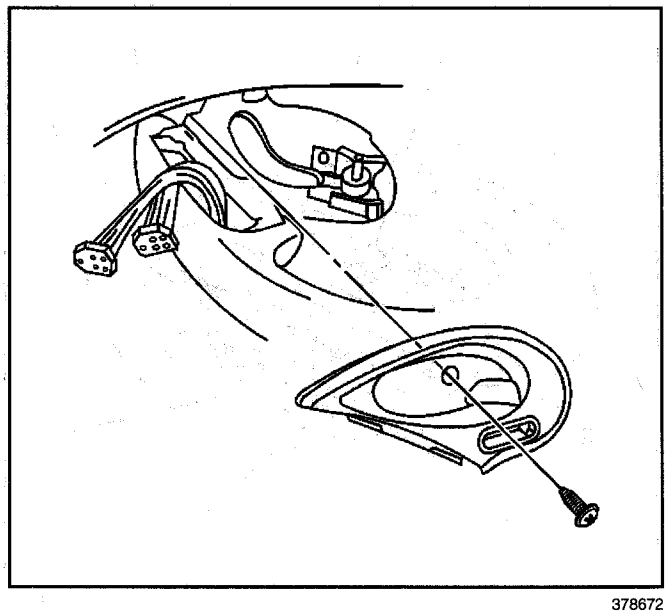


378680

Pull Handle Replacement

Removal Procedure

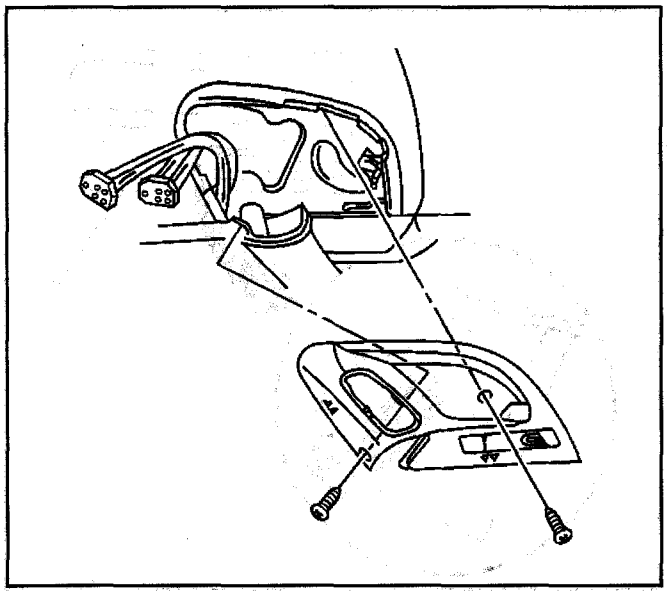
1. Remove the lock rod knob (3) from the lock rod (2).
2. Pull the door inside handle open to access the bezel screws.



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3. On Pontiac, remove the inside handle bezel screw.

4. On Chevrolet, remove the switch plate panel.
5. On Chevrolet, remove the inside handle bezel screws.
6. Unsnap the bezel from the door trim panel.
7. Disconnect the light bulb from the rear of the bezel.
8. Remove the inside door handle bezel from the vehicle.



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Installation Procedure

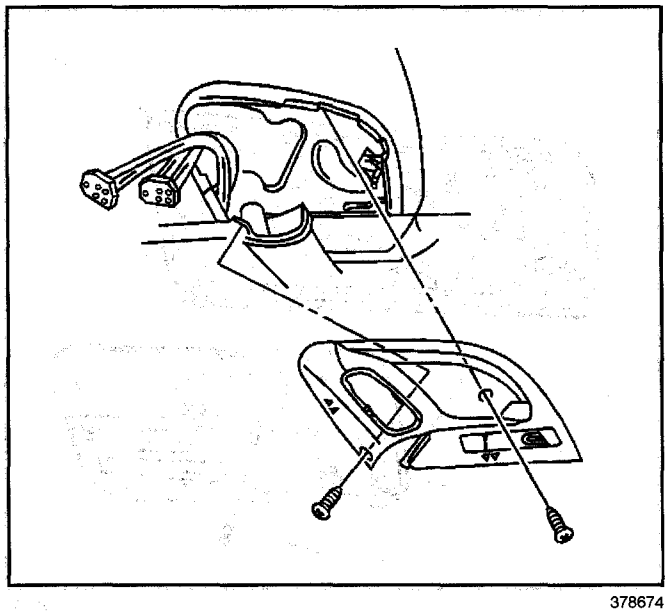
1. Install the inside door handle bezel to the vehicle.
2. Connect the light bulb to the rear of the bezel.
3. Snap the bezel to the door trim panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. On Chevrolet, install the inside handle bezel screws.

   Tighten

   Tighten the inside handle bezel screws to 1.4 N·m (12 lb in).
5. On Chevrolet, install the switch plate panel.

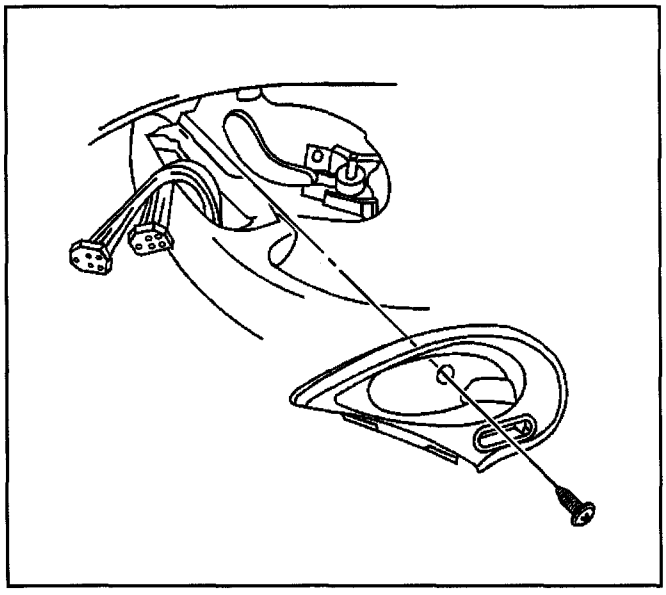


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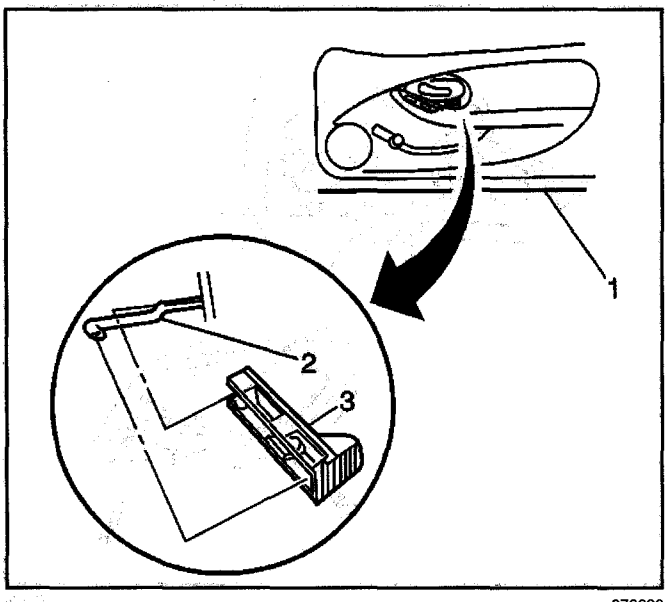
6. On Pontiac, install the inside door handle bezel screw.

   Tighten

   Tighten the inside handle bezel screws to 1.4 N·m (12 lb in).

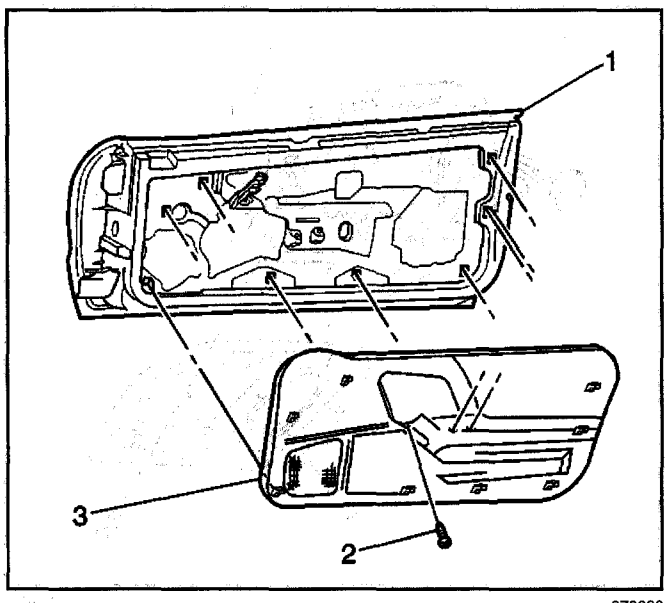


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7. Install the lock rod knob (3), perform the following:
   7.1. Pull the lock rod (2) forward in pocket or inside the bezel.
   7.2. Align the lock rod knob (3) over the lock rod (2).
   7.3. Insert rearward end of lock rod knob (3) through the hole inside the bezel.
   7.4. Pull the knob (3) rearward until the end of the rod (2) slides into the depression end of the knob (3).
   7.5. Apply pressure to snap knob (3) over lock rod (2).



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Trim Panel Replacement - Door

Removal Procedure

Tools Required

J 38778 Door Trim Pad and Garnish Clip Remover

1. Remove the accessory switch panel.
2. Remove the inside handle bezel. Refer to Handle Bezel Replacement - Inside.
3. Remove the window regulator handle and spacer, if equipped.
4. Remove the outside rearview mirror bezel. Refer to *Mirror Replacement.*
5. Remove the side door armrest bolts (2).

Important: To avoid breaking the trim panel fasteners be sure to insert the *J 38778* between the male fastener which is attached to the door trim panel and the female retainer which is in the door. Do not insert the *J 38778* between the female retainer and the door.

6. Remove the front side door trim from the door inner panel.
7. Pull the side door trim up from the door, making sure the hooks release from the holes in the door inner.
8. Disconnect the door speaker electrical connectors.
9. Remove the courtesy lamp socket from the door trim.

Installation Procedure

1. Install the courtesy lamp socket to the door trim.
2. Connect the door speaker electrical connectors.
3. Pull the side door trim up from the door, making sure the hooks release from the holes in the door inner.
4. Install the front side door trim to the door inner panel.

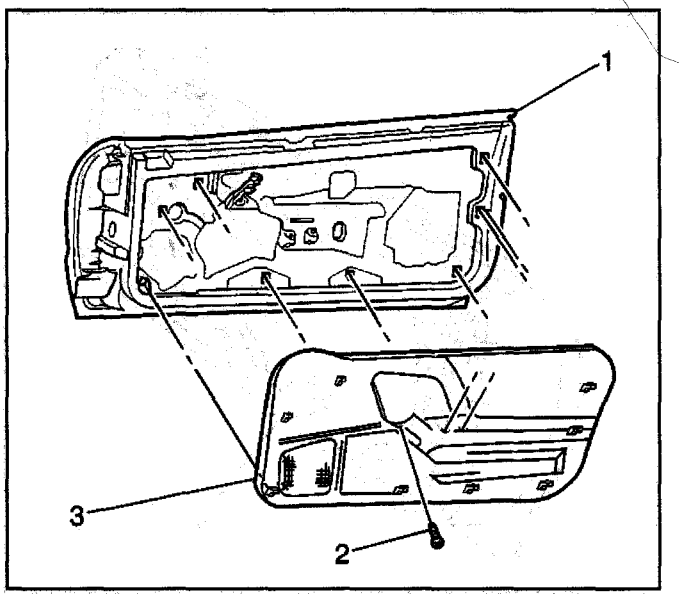
Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the side door armrest bolts (2).

   Tighten

   Tighten the side door armrest bolts to 4.5 N·m (40 lb in).

6. Install the outside rearview mirror bezel. Refer to *Mirror Replacement.*
7. Install the window regulator handle and spacer, if equipped.
8. Install the inside handle bezel. Refer to Handle Bezel Replacement - Inside.
9. Install the accessory switch panel.

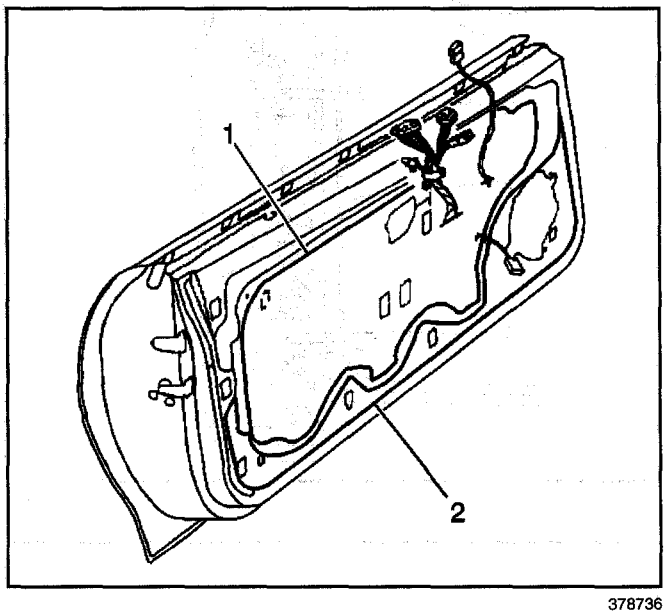


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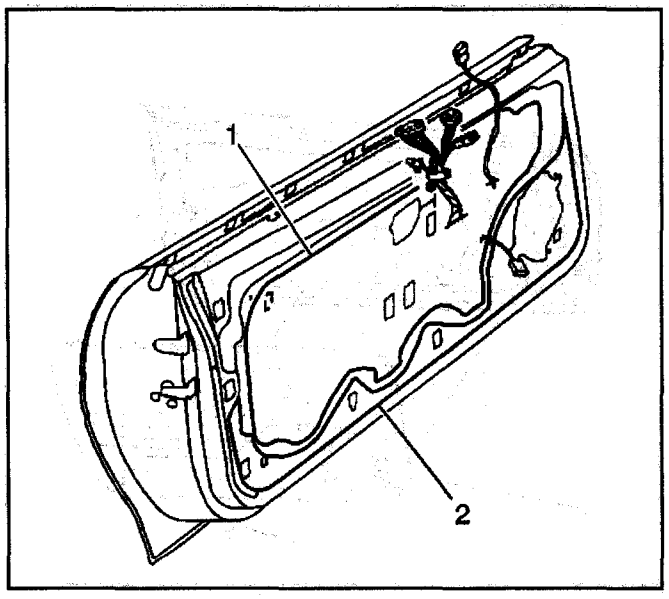
Water Deflector Replacement - Door

Removal Procedure

1. Remove the door trim panel. Refer to *Trim Panel Replacement - Door.*
2. Peel the water deflector (2) from the door inner panel.



378736

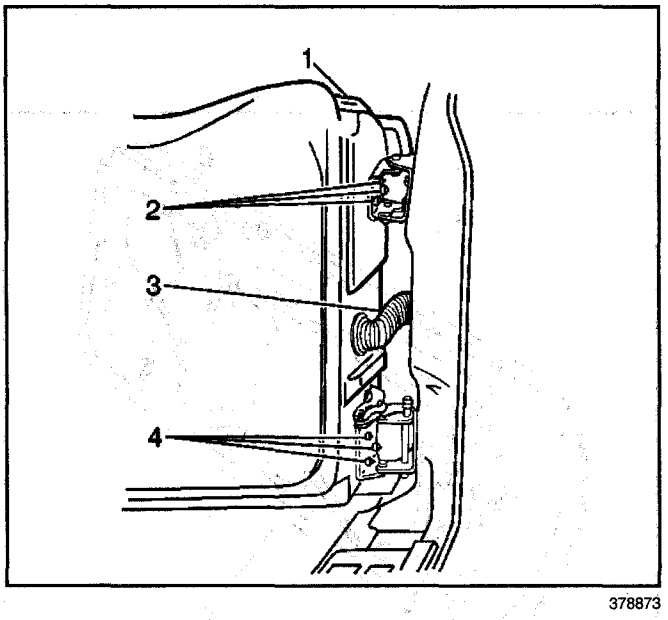


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Installation Procedure

1. Peel the backing paper from the adhesive on the new deflector.
2. Position the deflector over the large opening in the door.
3. Beginning at the bottom of the water deflector (2) press firmly to secure the adhesive (1).
4. Install the door trim panel. Refer to *Trim Panel Replacement - Door*.

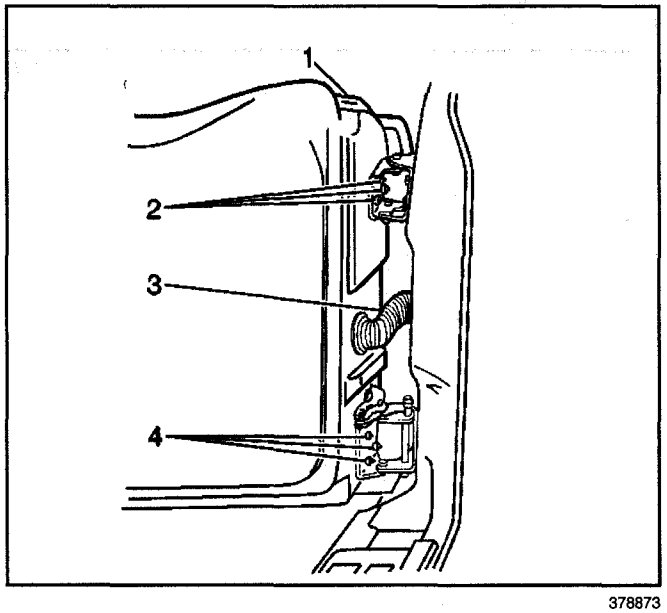
Door Replacement



378873

Removal Procedure

1. Remove front side door trim. Refer to *Trim Panel Replacement - Door*.
2. Remove water deflector. Refer to *Water Deflector Replacement - Door*.
3. Remove electrical connectors from all components in door.
4. Remove wiring harness grommet (3) from door (1).
5. Remove crosscar and front side door wiring harness from door.
6. Remove door spring.
7. Support door in preparation for door removal.
8. Remove upper (2) and lower hinge nuts (4).
9. Remove door from vehicle.



378873

Installation Procedure

1. Install door to upper and lower hinges.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install upper (2) and lower hinge nuts (4).

   Tighten

   Tighten the nuts to 50 N·m (37 lb ft).
3. Install door spring.
4. Install crosscar and front side door wiring harness from door.
5. Install wiring harness grommet (3) from door (1).
6. Install electrical connectors from all components in door.
7. Install water deflector. Refer to *Water Deflector Replacement - Door*.
8. Install front side door trim. Refer to *Trim Panel Replacement - Door*.

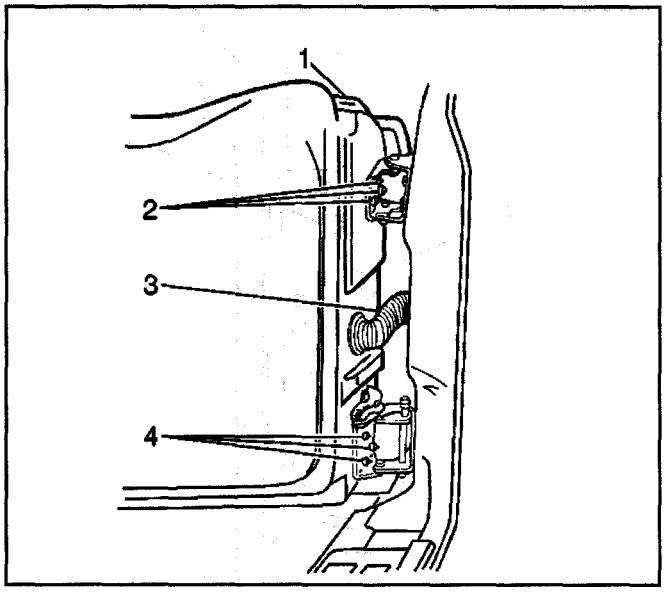
Hinge Replacement - Door (Lower Hinge)

Removal Procedure

Tools Required

J 36604 Door Hinge Spring Compressor

1. Mark the location of the lower hinge on the door and on the hinge pillar.
2. Support the door.
3. Remove the door hinge spring using *J 36604* on the lower hinge only.
4. Remove the bolts securing the lower hinge to the hinge pillar.
5. Remove the bolts securing the lower hinge to the door.
6. Remove the lower door hinge.



378873

Installation Procedure

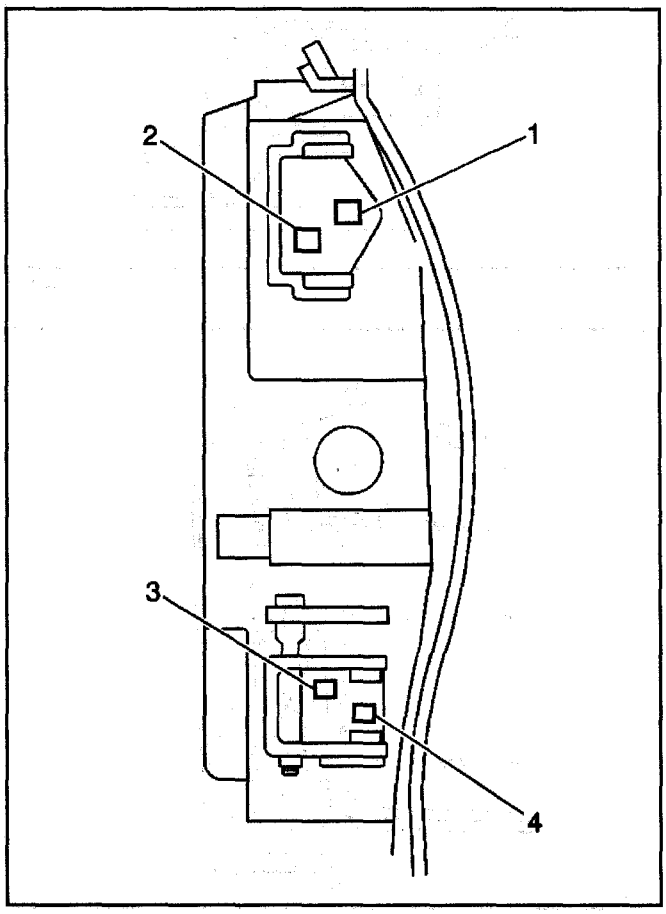
1. Position the hinge to the marks on the door.
2. Install the hinge to door bolts in sequence (1 through 4 as shown).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

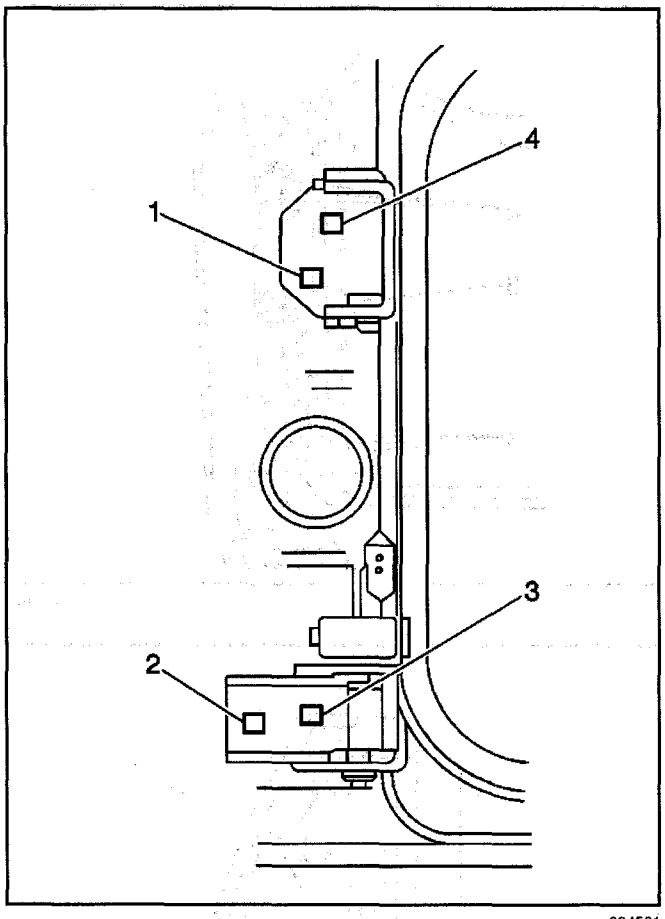
3. Install the bolts attaching the hinge to the door.

   Tighten

   Tighten the door hinge to door bolts to 30 N·m (22 lb ft).



378879

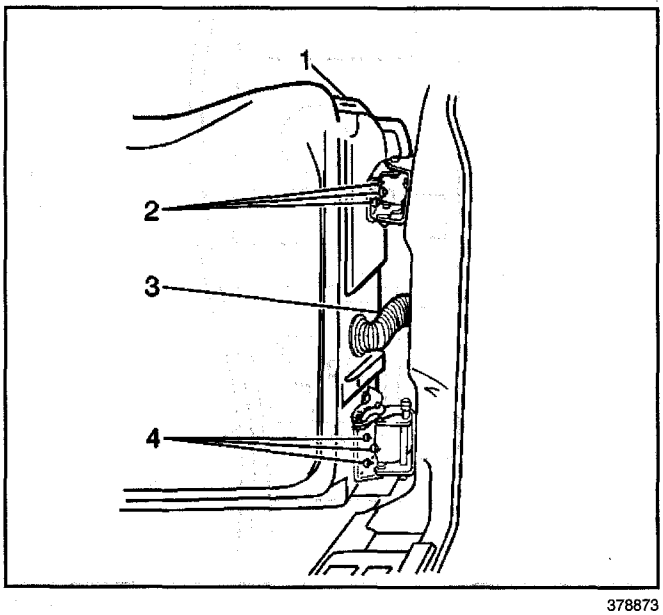


384561

4. Position the hinge to the marks on the hinge pillar.
5. Install the bolts in sequence (1 through 4 as in figure) attaching the hinge to the hinge pillar.

   Tighten

   Tighten the hinge to hinge pillar bolts to 30 N·m (22 lb ft).
6. Install the spring (lower hinge only).
7. Remove the door support and check the alignment of the door.



378873

Hinge Replacement - Door (Upper Hinge)

Removal Procedure

1. Support the door in the full open position.
2. Mark the position of the upper hinge on the door and hinge pillar.
3. Remove door upper hinge bolts.
4. Remove door upper hinge nuts (2).
5. Remove door upper hinge.

Installation Procedure

1. Install door upper hinge to position marked.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install upper hinge nuts and tighten.

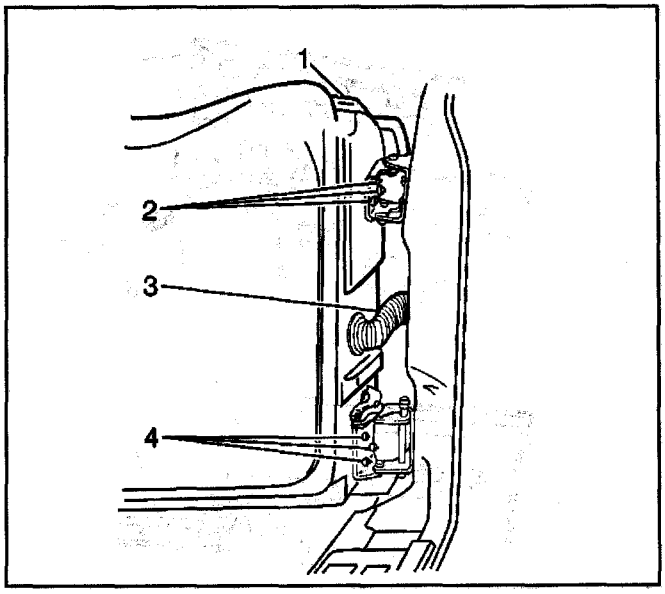
   Tighten

   Tighten the upper hinge nuts to 50 N·m (37 lb ft) in sequence.

3. Install upper hinge bolts (2).

   Tighten

   Tighten the upper hinge bolts to 50 N·m (37 lb ft).



378873

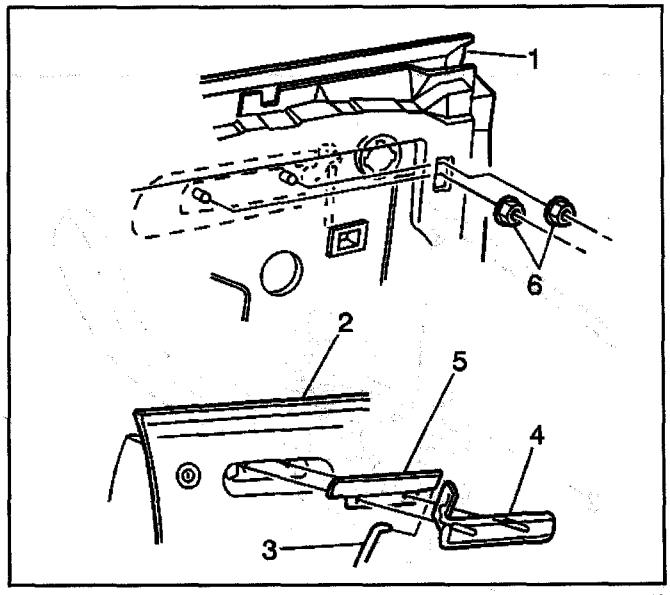
Door Handle Replacement - Outside

Removal Procedure

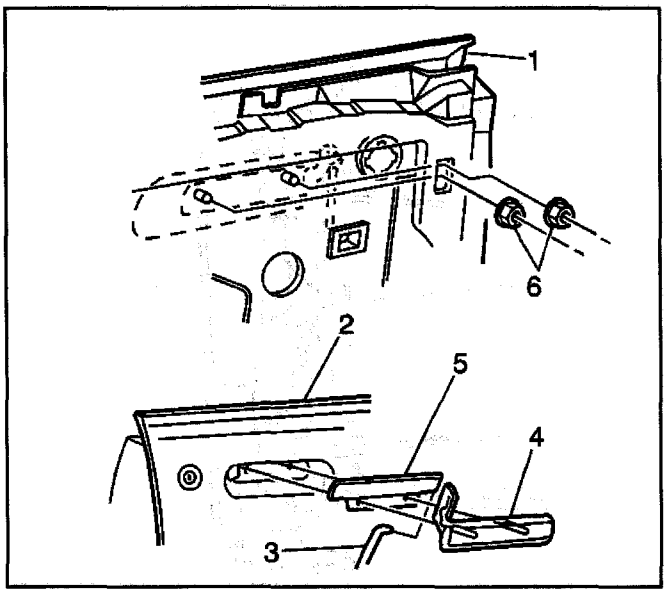
Caution: Disconnect the power window switch when working inside the drivers door. When operated, the Express Down feature allows the door window to drop very quickly, which could cause personal injury.

The clip retaining the outside door handle opening rod to the door lock is not to be reused. The clip must be replaced after being opened to release the rod.

1. Raise window.
2. Remove front side door trim panel. Refer to *Trim Panel Replacement - Door.*
3. Remove water deflector. Refer to *Water Deflector Replacement - Door.*
4. Remove outside handle rod (3) from the clip on the outside handle (4).
5. Remove outside handle nuts (6).
6. Remove outside handle (4) from door outer panel.
7. Remove outside door filler (5) from outside handle (4).



378759



378759

Installation Procedure

Caution: Disconnect the power window switch when working inside the drivers door. When operated, the Express Down feature allows the door window to drop very quickly, which could cause personal injury.

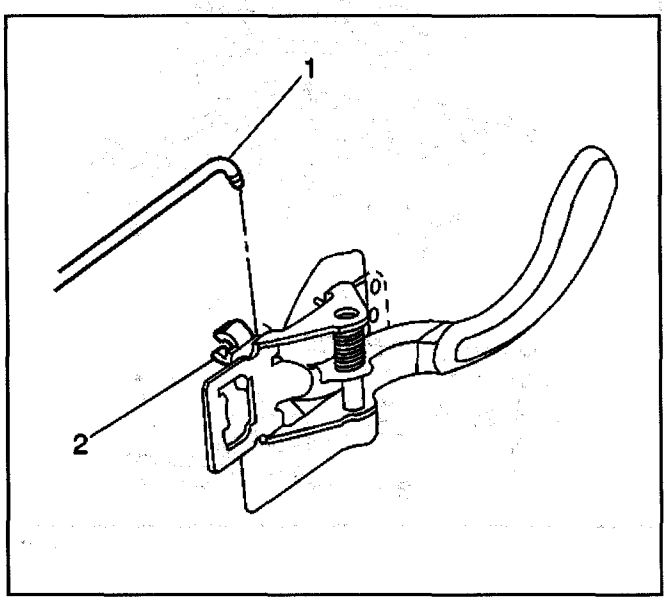
1. Install outside door filler (5) from outside handle (4).
2. Install outside handle (4) from door outer panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install outside handle nuts (6).

   Tighten

   Outside handle nuts to 9 N·m (80 lb. in.).
4. Install outside handle rod (3) from the clip on the outside handle (4).
5. Install water deflector. Refer to *Water Deflector Replacement - Door.*
6. Install front side door trim panel. Refer to *Trim Panel Replacement - Door.*



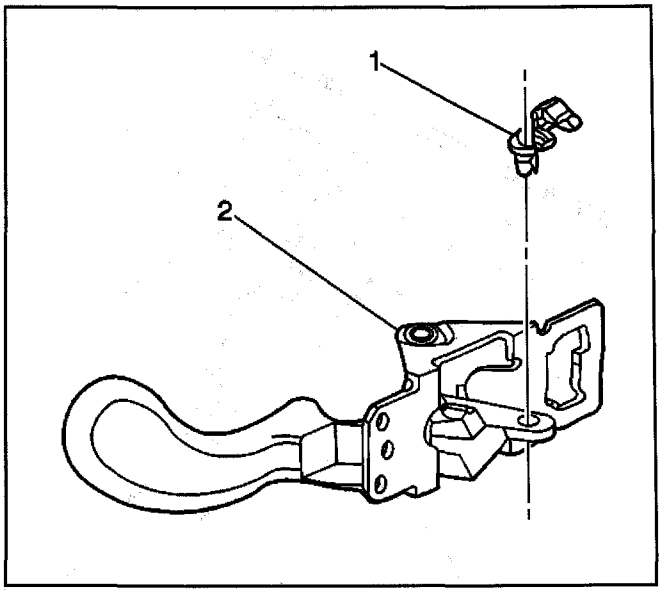
378768

Door Handle Replacement - Inside

Removal Procedure

1. Raise window.
2. Remove front side door trim. Refer to *Trim Panel Replacement - Door.*
3. Remove inside handle seal.
4. Remove water deflector. Refer to *Water Deflector Replacement - Door.*
5. Remove inside handle rivet by drilling out rivet with 3/16 drill bit and drill.
6. Remove handle tab from door inner panel slot by sliding handle rearward.
7. Remove inside handle rod from fastener on clip.
8. Remove inside handle rod (1) from clip (2).

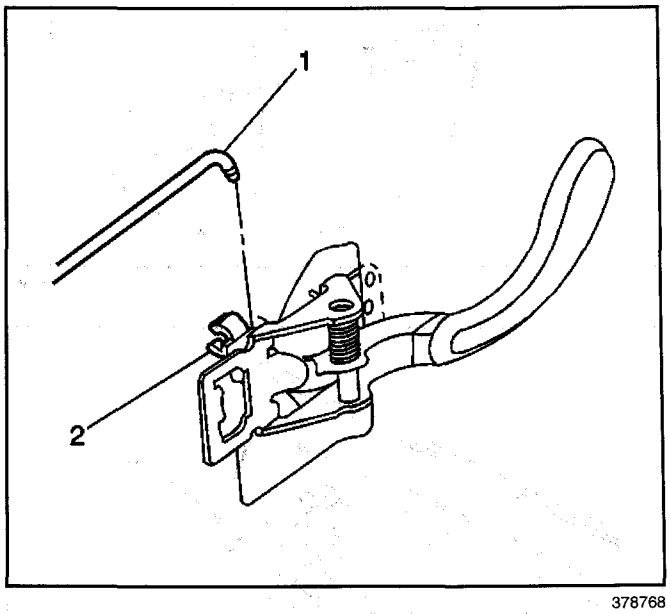
9. Remove inside handle from door inner panel.
10. Remove inside handle rod clip (1) from handle (2) by using needlenose pliers to squeeze clip and push from handle.



378764

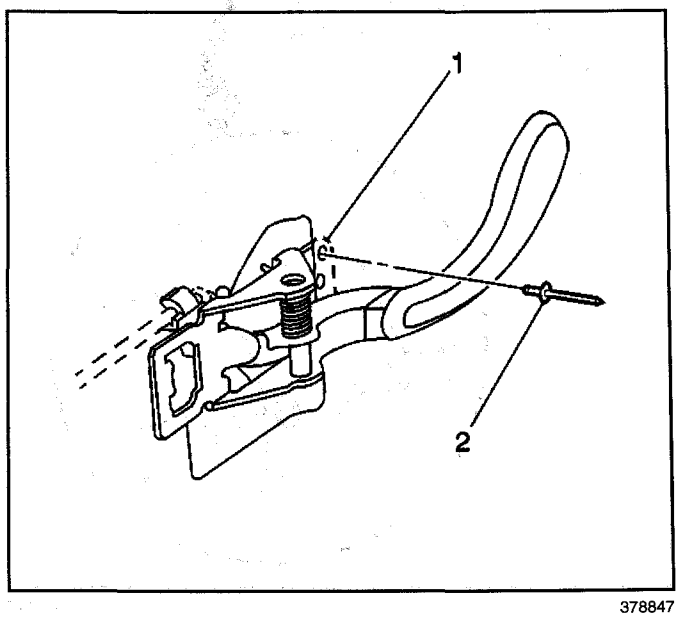
Installation Procedure

1. Install inside handle rod clip into handle.
2. Install inside handle to door inner panel by rotating the front of the handle into the slot.
3. Install inside handle rod (1) to clip (2).

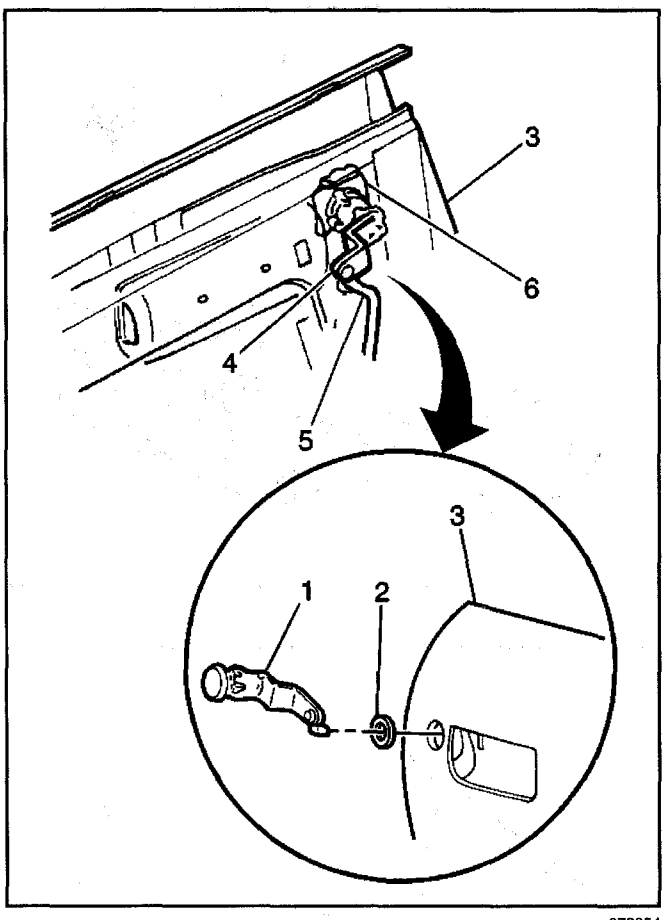


378768

4. Tap handle into slot on door inner panel by rotating and sliding forward.
5. Align hole in handle with hole in door inner panel.
6. Install handle rivet (2) to handle (1).
7. Install water deflector. Refer to *Water Deflector Replacement - Door.*
8. Install inside handle seal.
9. Install front side door trim. Refer to *Trim Panel Replacement - Door.*
10. Lower window.



378847

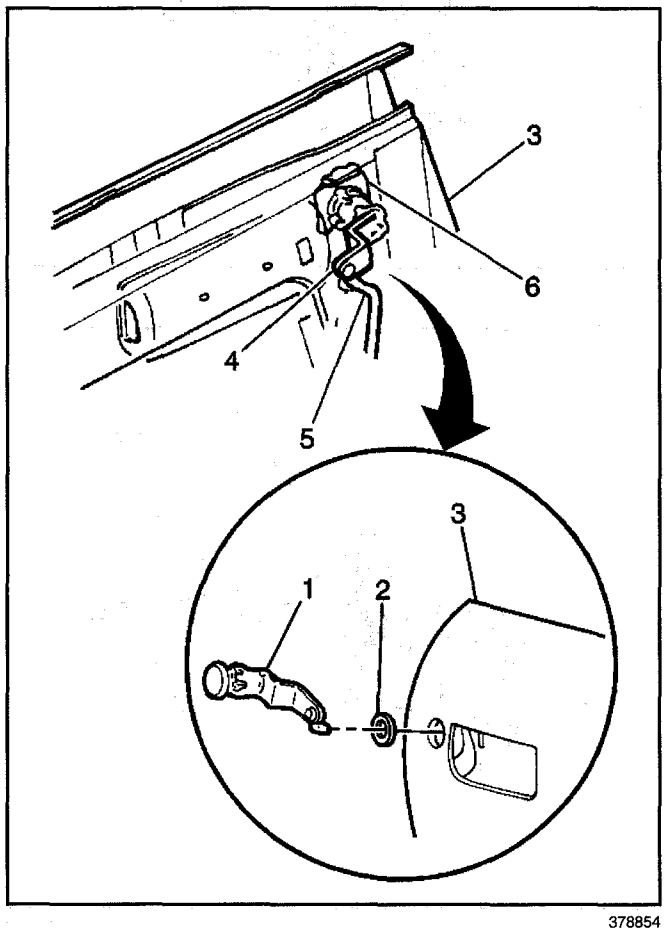


378854

Lock Replacement - Door

Removal Procedure

1. Raise window.
2. Remove front side door trim panel. Refer to *Lock Striker Adjustment - Door.*
3. Remove water deflector as needed. Refer to *Water Deflector Replacement - Door.*
4. Remove lock cylinder rod (5) from lock cylinder pawl clip (4).
5. Remove the lock cylinder retainer (2) using a screwdriver to slide the retainer upward.
6. Remove door lock cylinder (1) from door (3).
7. Remove lock cylinder gasket (2) from door (3).



378854

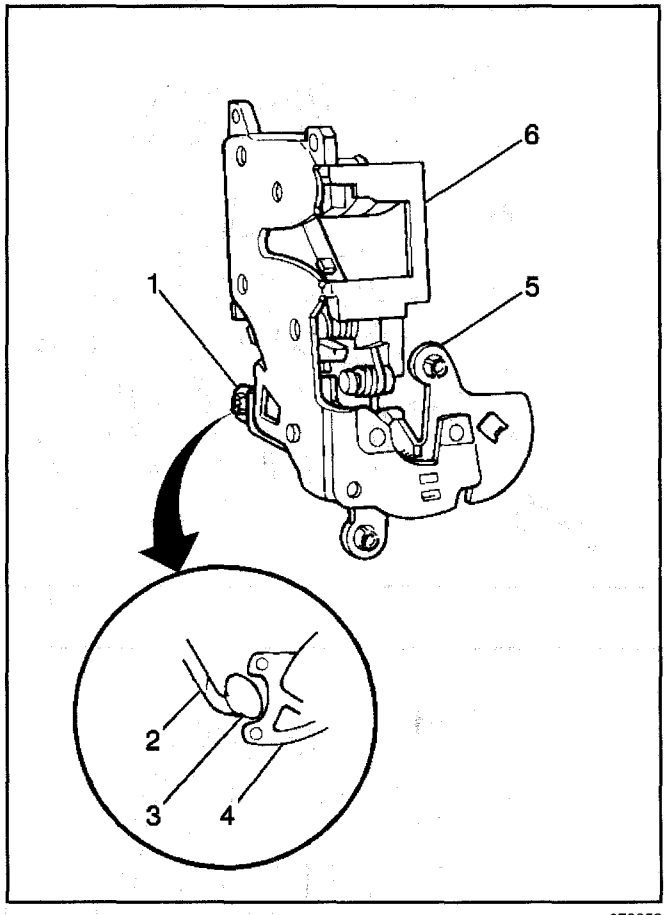
Installation Procedure

1. Install new lock cylinder gasket (2) to door (3).
2. Install door lock cylinder (1) from door (3).
3. Install the lock cylinder retainer (2) by using a screwdriver to slide the retainer downward into place.
4. Install lock cylinder rod (5) to lock cylinder pawl clip (4).
5. Install water deflector as needed. Refer to *Water Deflector Replacement - Door.*
6. Install front side door trim panel. Refer to *Lock Striker Adjustment - Door.*
7. Lower window.

Lock Actuator Replacement - Door

Removal Procedure

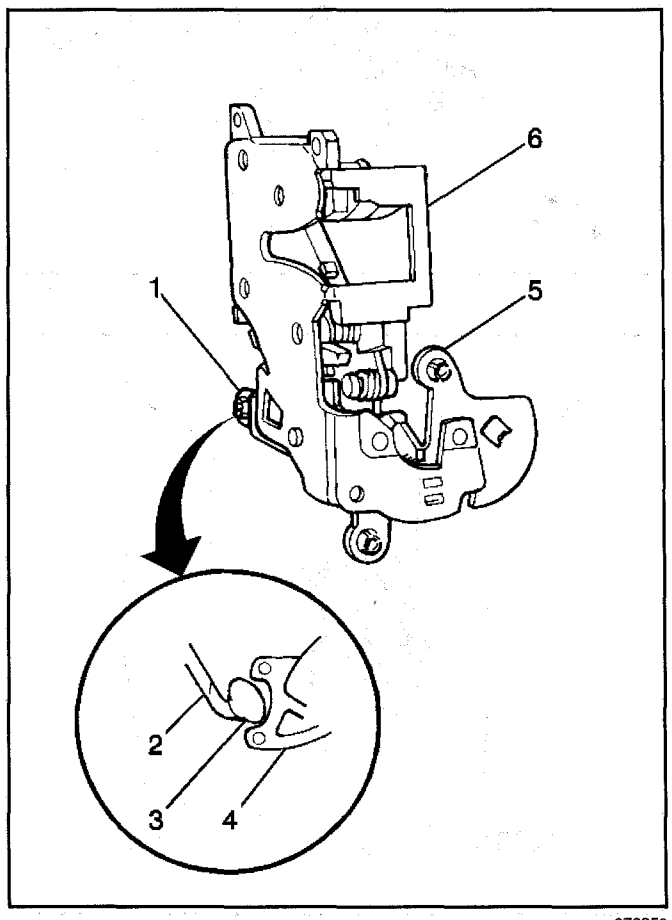
1. Remove the side door lock. Refer to *Lock Replacement - Door*.
2. Remove the actuator mounting bolts.
3. Remove the actuator (6).



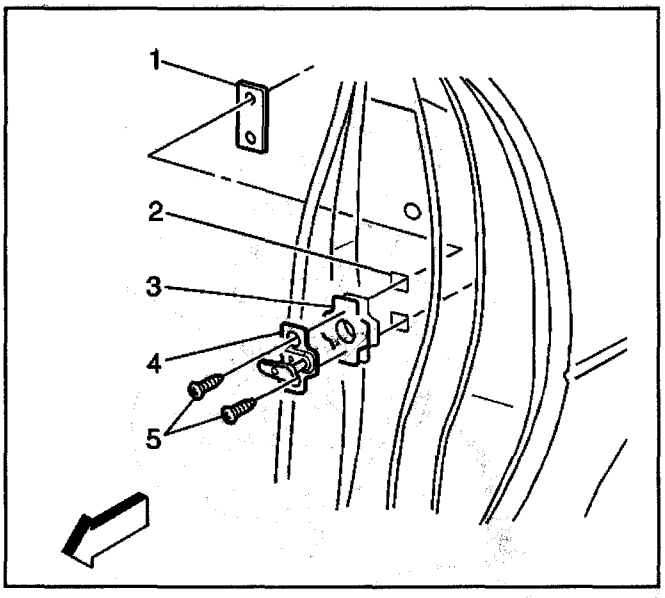
378859

Installation Procedure

1. Install the actuator (6).
2. Install the actuator mounting bolts.
3. Install the side door lock. Refer to *Lock Replacement - Door*.



378859

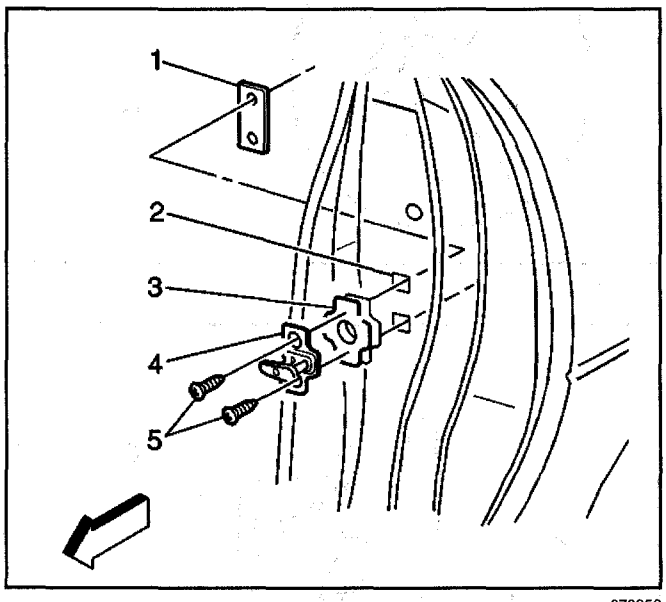


378850

Striker Replacement - Door

Removal Procedure

1. Open the door to gain access to the striker.
2. Remove the screws (5) attaching the striker (4) to the jamb (2).
3. Remove the shims (3) and the striker (4).



378850

Installation Procedure

1. Position the striker (4) and shims (3) to the lock pillar (2).
2. Loosely install the attaching screws.
3. Close the door to align the striker.

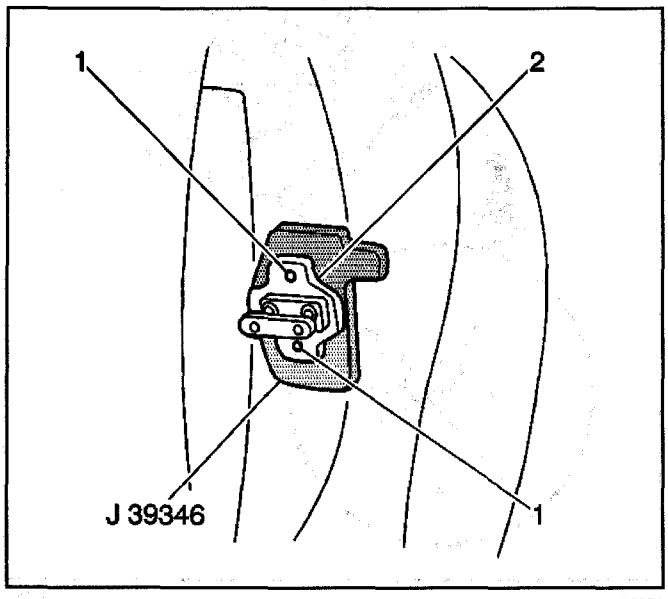
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Open the door and tighten the screws.

   Tighten

   Tighten the door lock striker screws to 24 N·m (18 lb ft).

5. Perform lock striker adjustment. Refer to *Lock Striker Adjustment - Door.*



378851

Lock Striker Adjustment - Door

Tools Required

J 39346-A Mini–Wedge Door Striker Aligner

Important: Door must be properly aligned before adjusting the striker.

1. Loosen door lock striker bolts/screws (1) just enough to allow movement of the lock striker (2).
2. Install *J 39346-A* to the lock striker (2).

Important: Do not slam door.

3. Close the door while holding the outside handle in the open position.

4. Open the door.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Retighten the lock striker bolts.

   Tighten

   Tighten the door lock striker bolts/screws (1) to 29 N·m (21 lb ft).

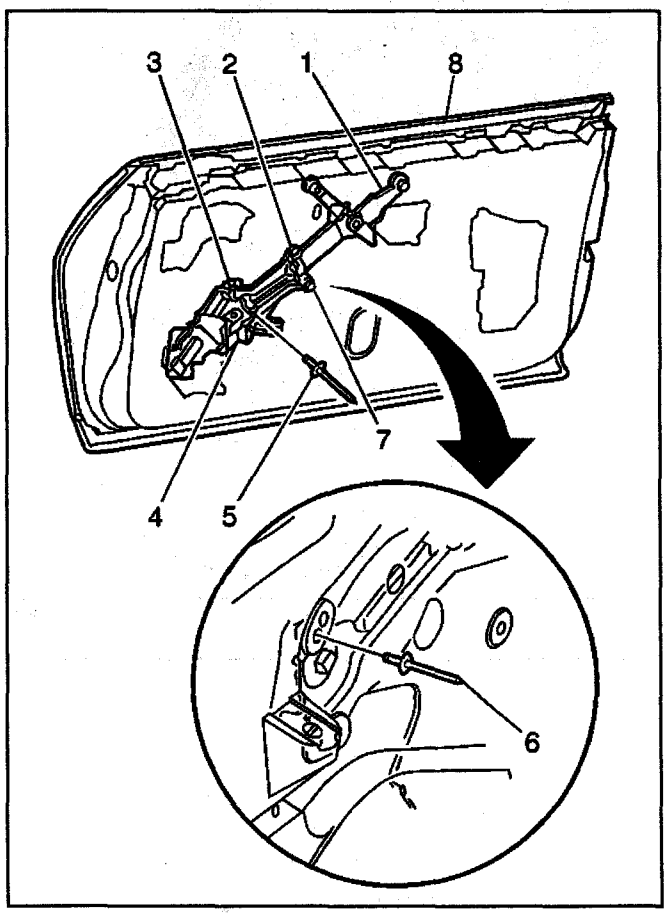
6. Remove *J 39346-A*.

Window Regulator Replacement

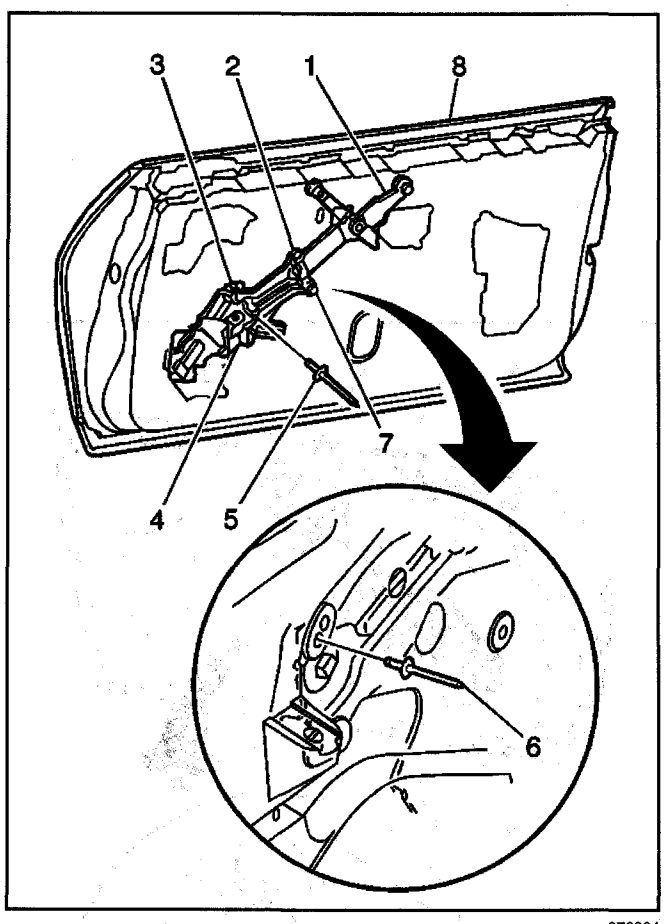
Removal Procedure

Caution: Disconnect the power window switch when working inside the drivers door. When operated, the Express Down feature allows the door window to drop very quickly, which could cause personal injury.

1. Place window in halfway down position.
2. Remove front side door trim panel. Refer to *Trim Panel Replacement - Door*.
3. Remove water deflector. Refer to *Water Deflector Replacement - Door*.
4. Support window in position by inserting rubber wedge door stops at front and rear of window between window and door inner panel.
5. Remove window rear guide nuts so rear guide channel can be moved.
6. Remove window regulator rivets by drilling out rivet with drill.
7. Remove electrical connectors from regulator motor by sliding motor and regulator rearward, if equipped.
8. Remove window regulator (3) from channels.
9. Remove window regulator with regulator motor attached if equipped through rear access hole.



378904

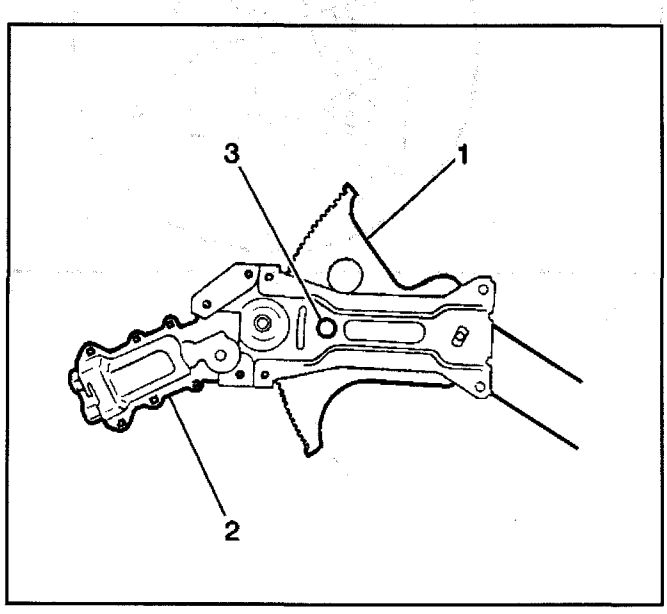


378904

Installation Procedure

Caution: Disconnect the power window switch when working inside the drivers door. When operated, the Express Down feature allows the door window to drop very quickly, which could cause personal injury.

1. Install window requlator with regulator motor theough rear access hole.
2. Install window regulator to channels in door.
3. Install electrical connector to regulator motor, if equipped.
4. Install regulator rivets to regulator
5. Install window rear guide channel nuts.
6. Install water deflector. Refer to *Water Deflector Replacement - Door.*
7. Install front side door trim panel. Refer to *Trim Panel Replacement - Door.*



378871

Window Regulator Motor Replacement - Door

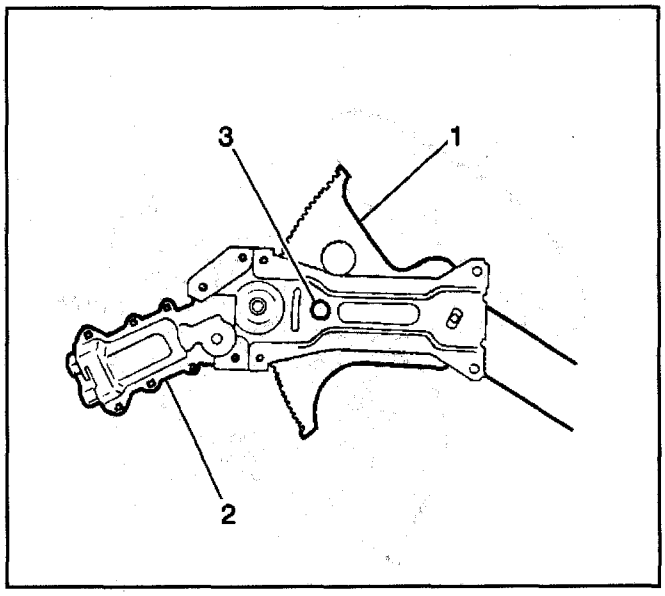
Coupe and sedan front doors use a cross arm regulator.

Removal Procedure

1. Remove window regulator assembly. Refer to *Window Regulator Replacement.*
2. Drill hole (3) through window regulator sector gear and backplate.
3. Install bolt and nut to lock sector gear into position.
4. Remove rivets by drilling out rivets with drill.
5. Remove regulator motor (2) from regulator (1).

Installation Procedure

1. Install regulator motor (2) to regulator (1).
2. Install rivets with rivet gun.
3. Remove bolt and nut used to secure sector gear.
4. Remove window regulator assembly. Refer to *Window Regulator Replacement*.



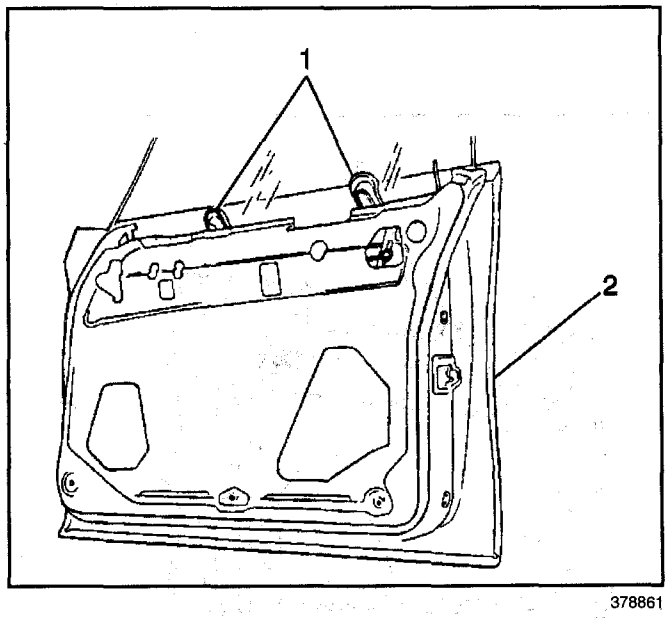
378871

Window Replacement - Door

Removal Procedure

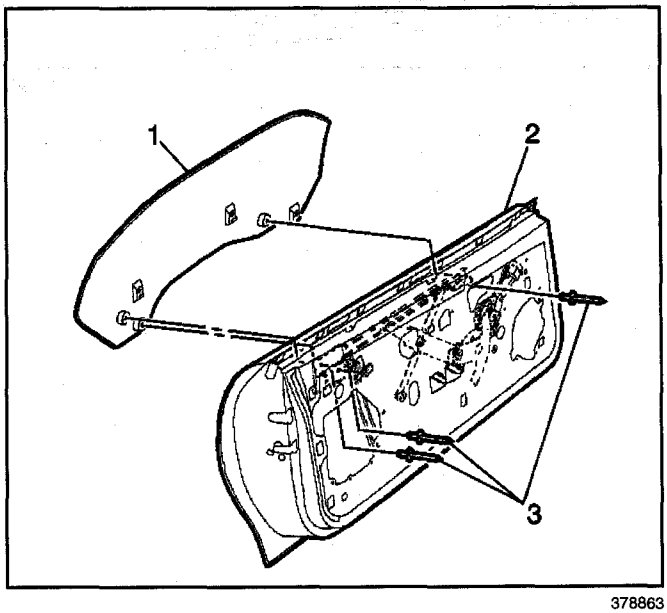
1. Lower window about halfway.
2. Remove front side door trim. Refer to *Trim Panel Replacement - Door*.
3. Remove water deflector. Refer to *Water Deflector Replacement - Door*.
4. Support the window in a position needed to access the window rivets by inserting rubber wedge door stops at the front and rear of the window between the window and the door inner panel.
5. Remove the window rivets with a 1/4 inch drill bit.
6. Remove window by raising out of door.

Important: Inspect window bushings, window bushing retainers, window front up stop, window stabilizer pins and window wedges on the window for damage.

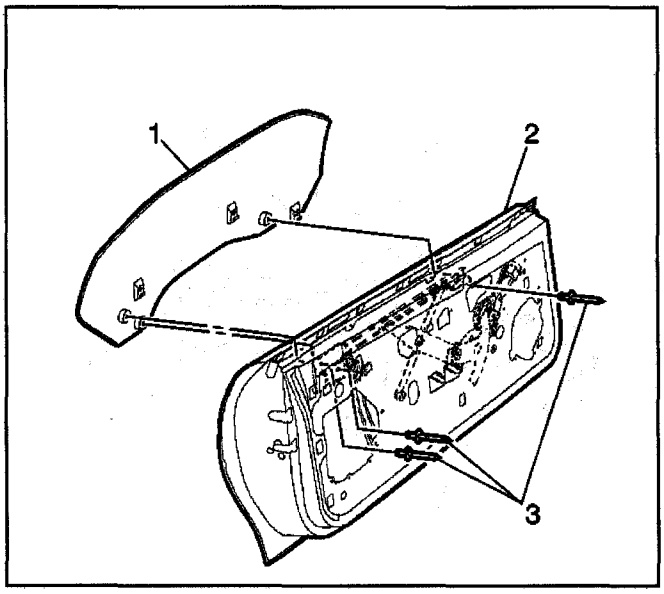


378861

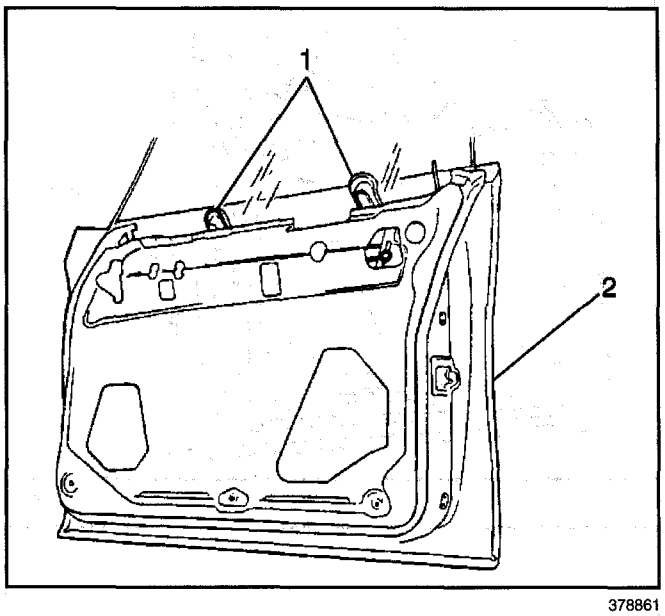
7. Remove window bushings and window bushing retainers if necessary, using a flat-bladed tool covered with cloth body tape.
8. Remove window front up-stop bolt/screw if necessary.
9. Remove window front up-stop, front up-stop nut and front up-stop washer if necessary.
10. Remove window stabilizer bolts/screws, if necessary.
11. Remove window stabilizer pins, stabilizer pin nuts and window wedges if necessary.



378863



378863



378861

Installation Procedure

1. Install window stabilizer pins, stabilizer pin nuts and window wedges if necessary.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install window stabilizer bolts/screws, if necessary.

   Tighten

   Tighten the bolts/screws to 7 N·m (62 lb in).

3. Install stabilizer pin nuts, if removed.

   Tighten

   Tighten the window stabilizer pin nuts to 8 N·m (71 lb in).

4. Install window front up-stop washer, if removed.
5. Install window front up-stop bolt/screw, if removed.

   Tighten

   Tighten the window front up-stop bolt/screw to 7 N·m (62 lb in).

6. Install window front up-stop nut if removed.

   Tighten

   Tighten the window front up-stop nut to 8 N·m (71 lb in).

7. Install window bushings and bushing retainers, if removed.
8. Install window into door so that holes in window bushings line up with holes in channel.
9. Install window rivets in sequence.
10. Install water deflector. Refer to *Water Deflector Replacement - Door.*
11. Install front side door trim. Refer to *Trim Panel Replacement - Door.*
12. Raise window.

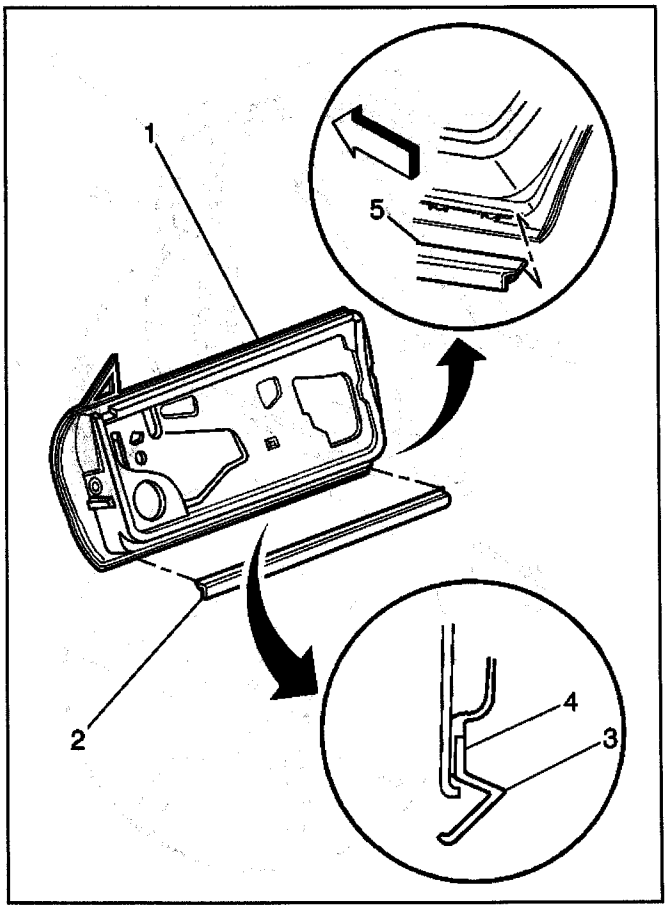
Door Seal Replacement

Removal Procedure

1. Open door to gain access to sealing strip.
2. Remove door sealing strip with heat gun or careful scraping.

Important: Ensure that sealing strip removal doesn't scratch door finish.

3. Clean area with suitable solution of isopropyl alcohol 50/50 mixture by volume with water or high flash naptha.
4. Clean and dry area with dry cloth.



378721

Installation Procedure

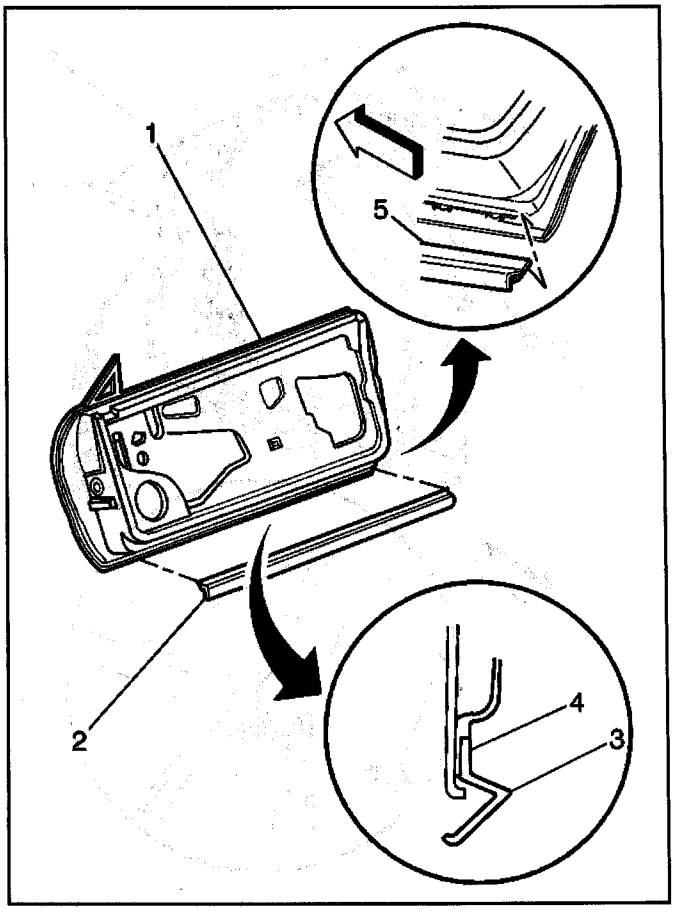
1. Install new door sealing strip (2) to door (1).

Important: Temperature must be 95 degrees +/- 5 degrees for proper adhesion of strip to door. If necessary, use heat gun to lightly warm strip prior to installation.

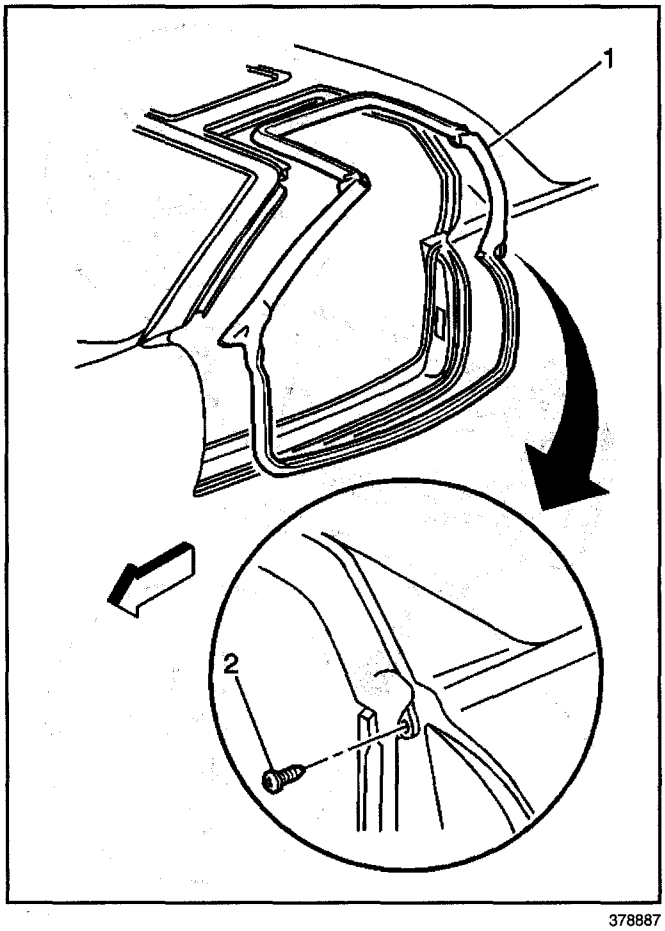
2. Remove protective liner from sealing strip.

Important: Position bottom sealing strip carefully. Sealing strip cannot be removed without reapplying adhesive after contact with vehicle.

3. Align bottom sealing strip to locating feature starting at rear edge of door inner panel.
4. Press bottom sealing strip into place and apply pressure along entire surface.



378721

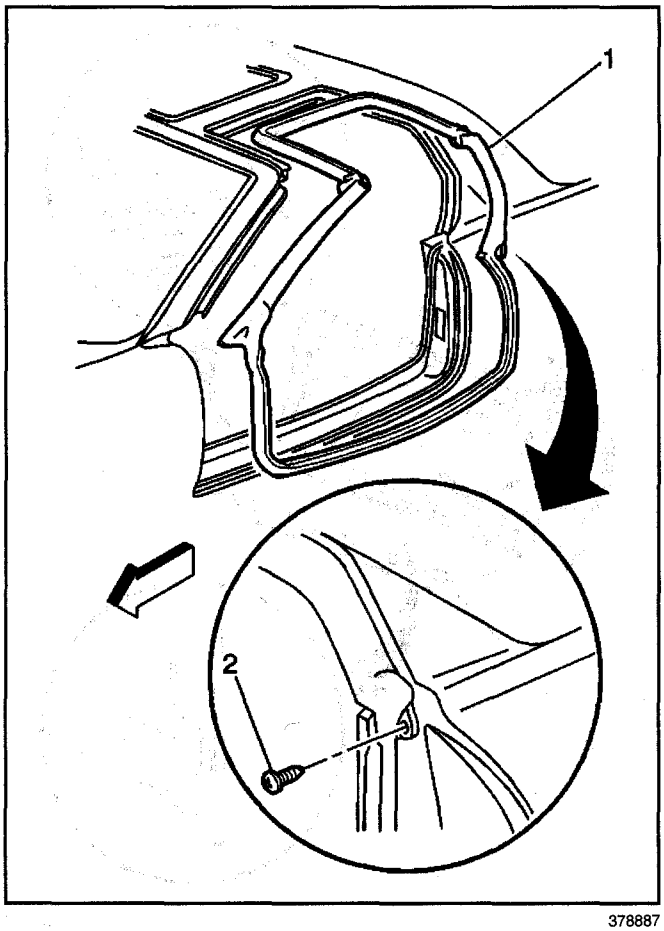


378887

Weatherstrip Replacement - Door

Removal Procedure

1. Remove body hinge pillar trim panel.
2. Remove windshield side upper garnish molding.
3. Remove rear quarter trim panel.
4. Remove roof lift off window (if equipped).
5. Remove lift window body side weatherstrip bolts/screws, if equipped.
6. Remove side door weatherstrip retainers.
7. Remove side door weatherstrip by pulling weatherstrip from flange and weatherstrip body retainers.



378887

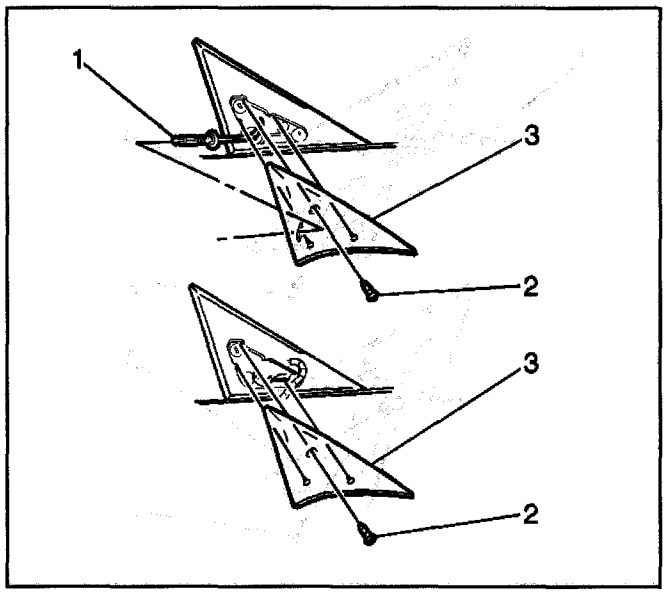
Installation Procedure

1. Install side door weatherstrip by pulling weatherstrip from flange and weatherstrip body retainers.
2. Install side door weatherstrip retainers.
3. Install lift window body side weatherstrip bolts/screws, if equipped.
4. Install roof lift off window (if equipped).
5. Install rear quarter trim panel.
6. Install windshield side upper garnish molding.
7. Install body hinge pillar trim panel.

Mirror Replacement

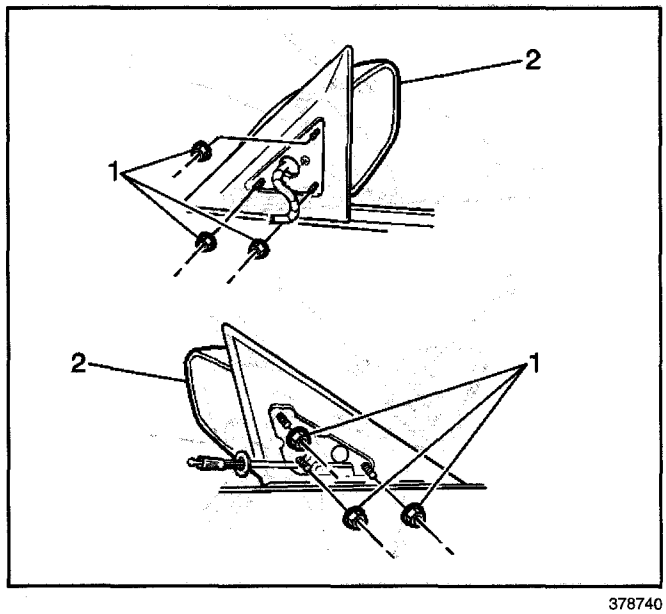
Removal Procedure

1. Remove mirror bezel bolt/screw.
2. Remove rearview mirror bezel.
3. Remove remote handle from bezel, if equipped.
4. Remove door trim panel from door. Refer to *Trim Panel Replacement - Door.*
5. Disconnect electrical connector, if equipped.
   5.1. Pull rosebud clip on electrical connector from mirror.
   5.2. Pull apart connection.



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6. Remove outside rearview mirror nuts (1) from mirror assembly (2).
7. Remove outside rearview mirror.



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Installation Procedure

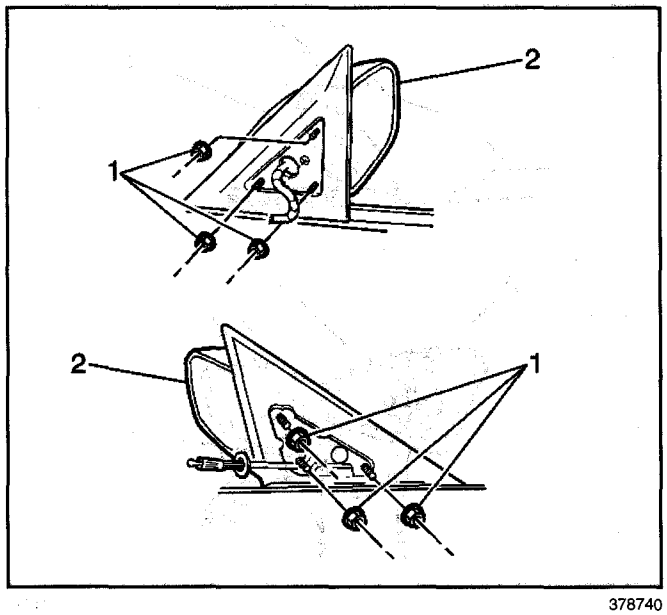
1. Install outside rearview mirror.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

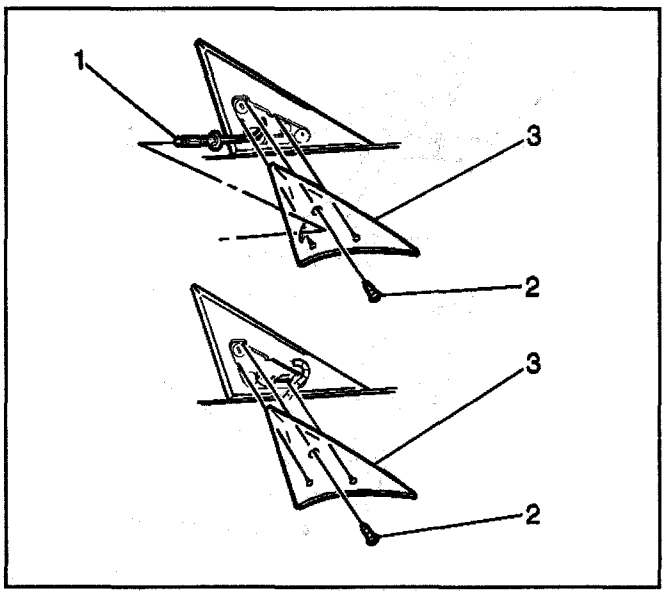
2. Install outside rearview mirror nuts (1) to mirror assembly (2).

   Tighten

   Tighten the outside rearview mirror nuts (1) to 12 N·m (106 lb in).
3. Connect electrical connector, if equipped.
   3.1. Push connectors together.
   3.2. Push rosebud clip into electrical connector.
4. Install door trim panel from door. Refer to *Trim Panel Replacement - Door.*
5. Install remote handle from bezel, if equipped.



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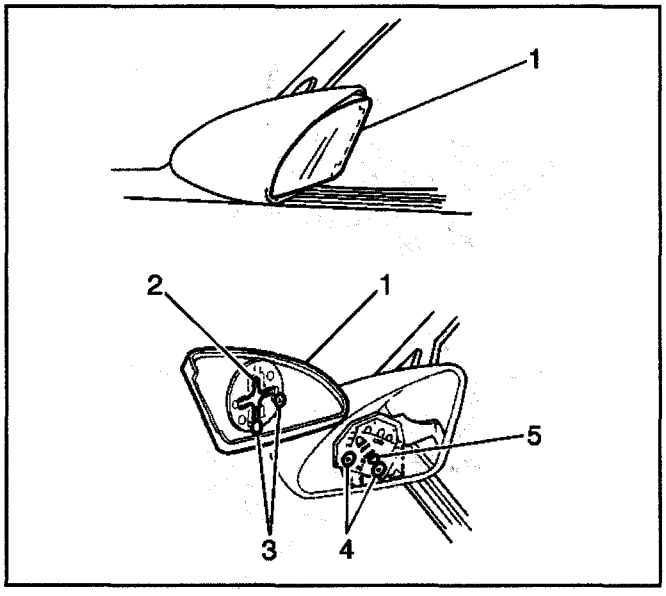
6. Install rearview mirror bezel.

Important: Ensure that retainer guides on back of bezel is aligned with holes in applique.

7. Install rearview mirror bezel bolt/screw.

   Tighten

   Tighten the bolt/screw to 2 N·m (18 lb in).



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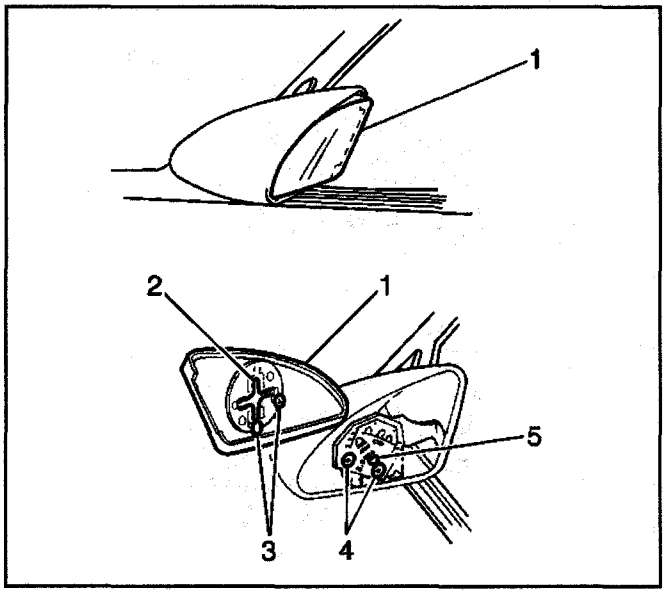
Mirror Face Replacement (Electrical)

Removal Procedure

Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

1. Push in on one edge of the mirror glass (1) tilting the mirror case to allow finger access.
2. Grasp the glass (1) case firmly and pull the case from the mirror body.
3. Remove the jackscrews (4) from the motor pack unit (5).

Important: Inspect the motor pack unit (5) and if damaged, replace entire mirror assembly.



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Installation Procedure

Caution: When working with any type of glass, use approved safety glasses and gloves to reduce the chance of personal injury.

1. Install the jackscrews (4) and trunion bars (2) to the new glass (1).
2. Install new rearview mirror glass.
   2.1. Align jackscrews (3) perpendicular to the glass (1).
   2.2. Align trunnion bar parallel (2) to glass
   2.3. Position end of jackscrews (3) at opening approximately 13 mm (0.5 inch) into pack unit (5).
   2.4. Visually align trunnion bar with receptor by lifting inboard corner of glass.
   2.5. Apply pressure with palm of hand until glass is seated firmly to receptor.
   2.6. Manually rotate glass to check for proper installation.

Mirror Face Replacement (Manual)

Removal Procedure

1. Place tape over glass surface of mirror.
2. Break glass.
3. Remove broken pieces from mirror mount.
4. Clean mounting surface with clean cloth.

Installation Procedure

1. Remove protective liner to expose adhesive.
2. Press new glass firmly onto center of mirror.
3. Ensure that glass is firmly affixed to mirror.

Description and Operation

Power Windows Circuit Description

Circuit Operation

Important: The power windows system has voltage applied by the Windows circuit breaker. The body control module (BCM) contains the Retained Accessory Power (RAP) subsystem. The RAP subsystem allows the windows to operate for 10 minutes after the ignition is turned off or until a door is opened. Refer to retained accessory power for a complete understanding of RAP operation.

With the ignition switch in the RUN or ACCY position or the BCM in the RAP mode, voltage is applied to the Windows circuit breaker. Circuit 341 applies the voltage from the Windows circuit breaker to the left side window switch, right side window switch and the power window control module. The front side door window motors and the switches are grounded by circuit 750 and G200 through the left switch. The right window can be operated from the right and left switches. The left window can only be operated from the left switch. The windows are driven by reversible motors. Each window is controlled by a switch that is normally closed to ground. When any switch is moved to the up position, battery voltage is applied to the window motor through circuit 164 or circuit 666. The motor is grounded through circuit 165 or circuit 667. When any switch is moved to the down position the voltage polarity at the window motor is reversed. Battery voltage is applied to the motor through circuit 165 or circuit 667. The motor is grounded through circuit 164 or circuit 666.

Each window motor contains an internal electronic circuit breaker. If a window switch is held in the up or down position after the window is fully opened or closed, the circuit breaker opens to stop the motor. The circuit breaker also opens to stop the window when the window becomes obstructed during operation. The circuit breaker resets when the voltage to the motor is interrupted.

Express Down Feature

The power window system also includes an express down feature. The feature allows the left window to open completely when the left window switch is momentarily pressed in the down position. All of the solid state circuitry for the express down feature is contained in the power window control module.

Power Door Locks Circuit Description

Circuit Operation

Important: Power door locks are controlled by the body control module (BCM). The BCM contains the Retained Accessory Power (RAP) subsystem. The RAP subsystem allows the door locks to operate for 10 minutes after the ignition is turned off and both of the doors remain closed. The RAP subsystem also allows the door locks to operate for 35 seconds after exiting the vehicle and closing the doors. The door locks are enabled whenever either door is open unless the ignition key is in the ignition and the lockout prevention feature is enabled. Refer to retained accessory power for a complete understanding of RAP operation.

Both door lock actuators lock or unlock when either door lock switch is pressed. The locks are operated by reversible actuators. The door lock switches operate the actuators by applying a ground input signal to the BCM. The BCM then commands the actuators to lock or unlock. When the right door lock switch or the left door lock switch is moved to the lock position, the BCM applies battery voltage to both actuators through circuit 295. The actuators are grounded by the BCM through circuit 694 and circuit 1663. When the right door lock switch or the left door lock switch is moved to the lock position, the BCM applies battery voltage to the actuators through circuit 694 and circuit 1663. Both of the actuators are grounded by the BCM through circuit 295. The ground is supplied to the BCM by G200 through circuit 650.

Door Lock Feature Customization

The body control module (BCM) can be programmed to customize the power door lock operation. The two programmable functions are described below. Refer body control systems for BCM programming information.

Last Door Closed Locking

The last door closed locking feature allows delayed door locking on all vehicles equipped with power door locks. This feature assures that all vehicle doors are locked after the driver and all passengers have exited the vehicle. When the driver door lock switch is pressed, an audible warning tone sounds three times to indicate that the last door closed locking function is initiated. The doors lock automatically, three seconds after both doors are closed. Pressing the door lock switch to the unlock position after the warning tones cancels the last door closed locking function. Pressing the door lock switch to the lock position twice locks the doors immediately. The last door closed locking function does not work if the ignition key is in the ignition switch and the lockout prevention feature is enabled. The last door closed locking feature is disabled from the factory. Refer to body control systems to enable the last door closed locking feature.

Lockout Prevention

The lockout prevention feature prevents the driver from locking the ignition key in the vehicle. The power door locks are disabled with the ignition key in the ignition and a door open. When the door lock switch is pressed with a door open an audible warning sounds five times as a reminder to remove the ignition key. The lockout prevention feature is disabled from the factory. Refer to body control systems to enable the lockout prevention feature.

Power Mirrors Circuit Description

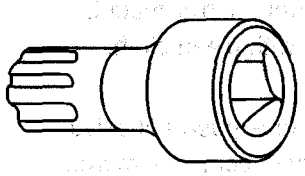
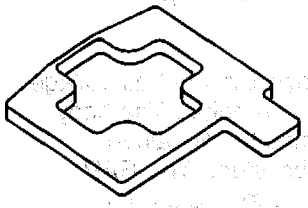
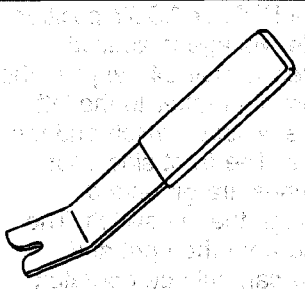
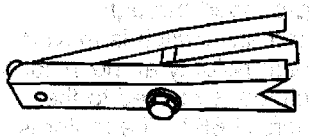
Each outside rearview mirror has two reversible motors. One motor adjusts the mirror up and down. The other motor adjusts the mirror left and right. The motors are controlled by the outside rearview mirror switch. The outside rearview mirror switch consists of two different switches. The mirror select switch is used to select the mirror to be adjusted. The mirror position switch controls the movement of the selected mirror.

The power mirror system has voltage applied by the PWR ACCY fuse through circuit 640 to the outside rearview mirror switch. When the left mirror is selected with the select switch, the mirror position switch controls the left mirror. When the position switch is pressed to the up position, voltage is applied through circuit 88 to the up/down motor of the left mirror. Ground is applied from G200 through circuit 750, the outside rearview mirror switch and circuit 82 (Chevrolet) or circuit 89 (Pontiac) to the up/down motor. The left mirror moves up. When the position switch is pressed to the down position, voltage is applied through circuit 82 (Chevrolet) or circuit 89 (Pontiac) to the up/down motor of the left mirror. Ground is applied through circuit 88 to the up/down motor. The voltage polarity to the left mirror is reversed and the mirror moves down. The left/right motor of the left mirror operates similar to the up/down motor. When the position switch is pressed to the left position, voltage is applied through circuit 82 to the left/right motor of the left mirror. Ground is applied through circuit 81 to the left/right motor. The left mirror moves to the left. When the position switch is pressed to the right position, voltage is applied through circuit 81 to the right/left motor of the left mirror. Ground is applied through circuit 82 to the right/left motor. The voltage polarity to the left mirror is reversed and the mirror moves to the right.

The right mirror operates the same way when the mirror select switch is moved to the right position.

Each mirror motor contains an internal electronic circuit breaker. If a mirror position switch is held in the up/down position or the left/right position after the mirror movement stops, the circuit breaker opens to protect the motor. The circuit breaker also opens to stop the motor if the mirror becomes obstructed during operation. The circuit breaker resets when the voltage to the motor is interrupted.

Special Tools and Equipment

Illustration	Tool Number/Description
 178587	J 29843-9 Door Lock Striker and Seat Belt Torx® Wrench
 298899	J 39346-A Mini-Wedge Door Striker Aligner
 178589	J 38778 Door Trim Pad and Garnish Clip Remover
 255335	J 36604 Door hinge spring Compressor

Roof

Specifications

Fastener Tightening Specifications

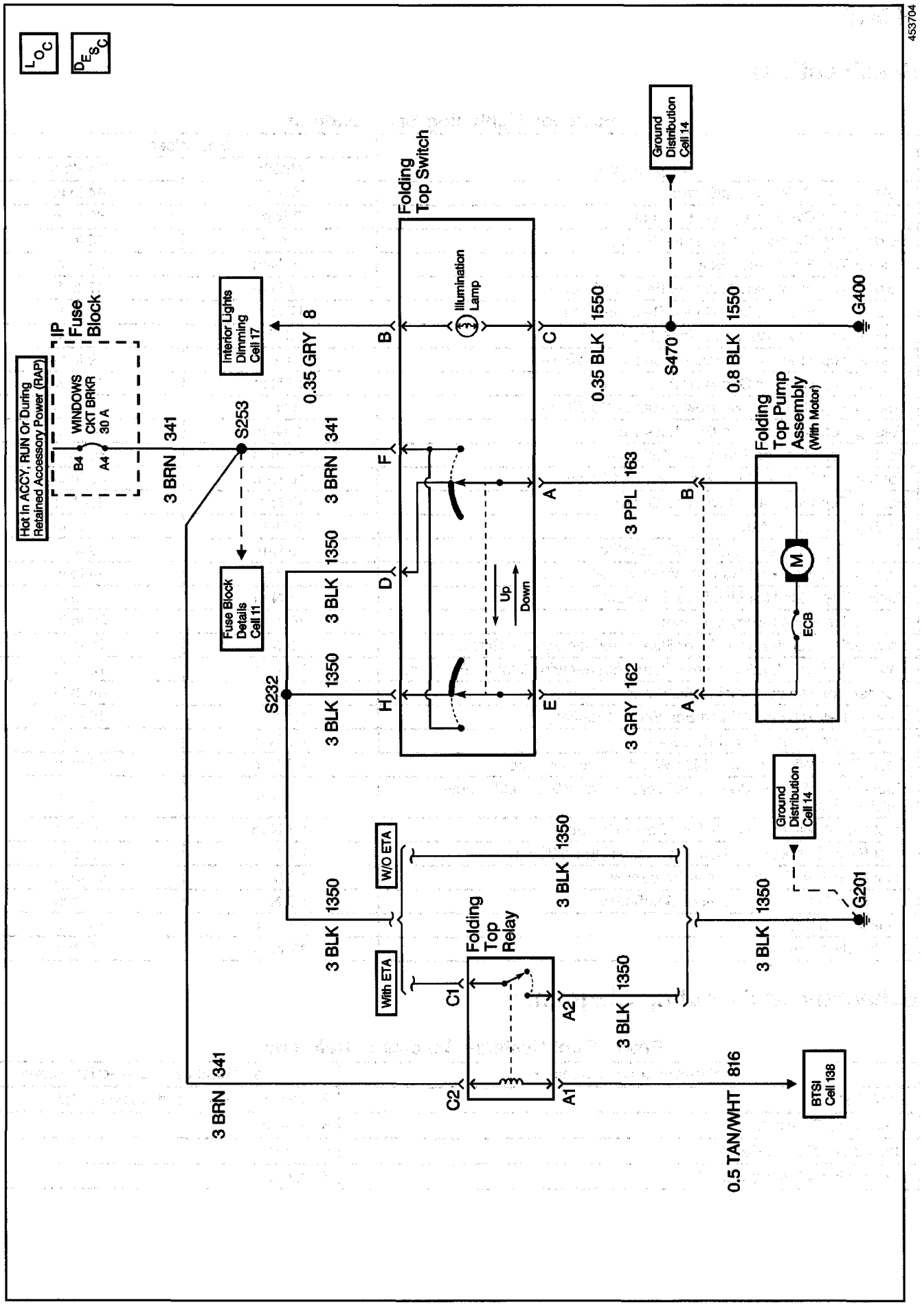
Application	Specification	
	Metric	English
Folding Top Cylinder Bolt/Screw	5 N·m	44 lb in
Folding Top Cylinder Upper Hose Fitting	7 N·m	62 lb in
Folding Top Cylinder Lower Hose Fitting	7 N·m	62 lb in
Folding Top Front Latch Bolt	10 N·m	89 lb in
Folding Top Front Side Rail Link Front Bolt/Screw	17 N·m	13 lb ft
Folding Top Front Side Rail Link Rear Bolt/Screw	17 N·m	13 lb ft
Folding Top Front Weatherstrip Bolt/Screw	1.3 N·m	12 lb in
Folding Top Front Weatherstrip Retainer Bolt/Screw	10 N·m	89 lb in
Folding Top Number One Bow Bolt/Screw	17 N·m	13 lb ft
Folding Top Number Two Bow Insulator Bolt/Screw	5 N·m	44 lb in
Folding Top Number Two Bow Lock Nut	5 N·m	44 lb in
Folding Top Number Three Bow Bolt/Screw	10 N·m	89 lb in
Folding Top Number Four Bow Link Bolt/Screw	10 N·m	89 lb in
Folding Top Outer Arm Pivot Bolt/Screw	17 N·m	13 lb ft
Folding Top Pump Nut	6 N·m	53 lb in
Folding Top Quarter Window Filler Bolt/Screw	10 N·m	89 lb in
Folding Top Side Rail Garnish Molding Bolt/Screw	5 N·m	44 lb in
Folding Top Side Rail Link Pivot Bolt/Screw	17 N·m	13 lb in
Front Latch Clamp Body Set Screw	10 N·m	89 lb in
Front Side Door Window Upper Rear Weatherstrip Bolt/Screw	1.3 N·m	12 lb in
Front Side Door Window Upper Rear Weatherstrip Retainer Bolt/Screw	1.3 N·m	12 lb in
Quarter Belt Reveal Molding Bolt/Screw (Chevrolet)	5 N·m	44 lb in
Quarter Belt Reveal Molding Bolt/Screw (Pontiac)	1.7 N·m	15 lb in
Quarter Trim Finish Panel Bolt/Screw	1.7 N·m	15 lb in
Roof Lift-Off Window Body Side Weatherstrip Bolt/Screw	1.3 N·m	15 lb in
Roof Lift-Off Window Body Side Weatherstrip Windshield Frame Retainer Bolt/Screw	1.3 N·m	12 lb in
Roof Lift-Off Window Latch Trim Cover Bolt/Screw	1.7 N·m	15 lb in
Roof Panel Longitudinal Bow Finish Molding Bolt/Screw	1.7 N·m	15 lb in
Roof Rear Panel Latch Striker Bolt/Screw	10 N·m	89 lb in
Roof rail Weatherstrip Retainer Bolt/Screw	1.3 N·m	12 lb in
Sunshade Bolt/Screw	1.7 N·m	15 lb in
Upstop Jam Nut	17 N·m	13 lb ft

Schematic and Routing Diagrams

Power Roof Systems Schematic References

Reference on Schematic	Section Number - Subsection Name
BTSI Cell 138	2 - Steering Wheel and Column - Tilt
Fuse Block Details Cell 11	8 - Wiring
Ground Distribution Cell 14	8 - Wiring
Interior Lights Diming Cell 117	8 - Lighting

Power Folding Top Schematics (Cell 121)



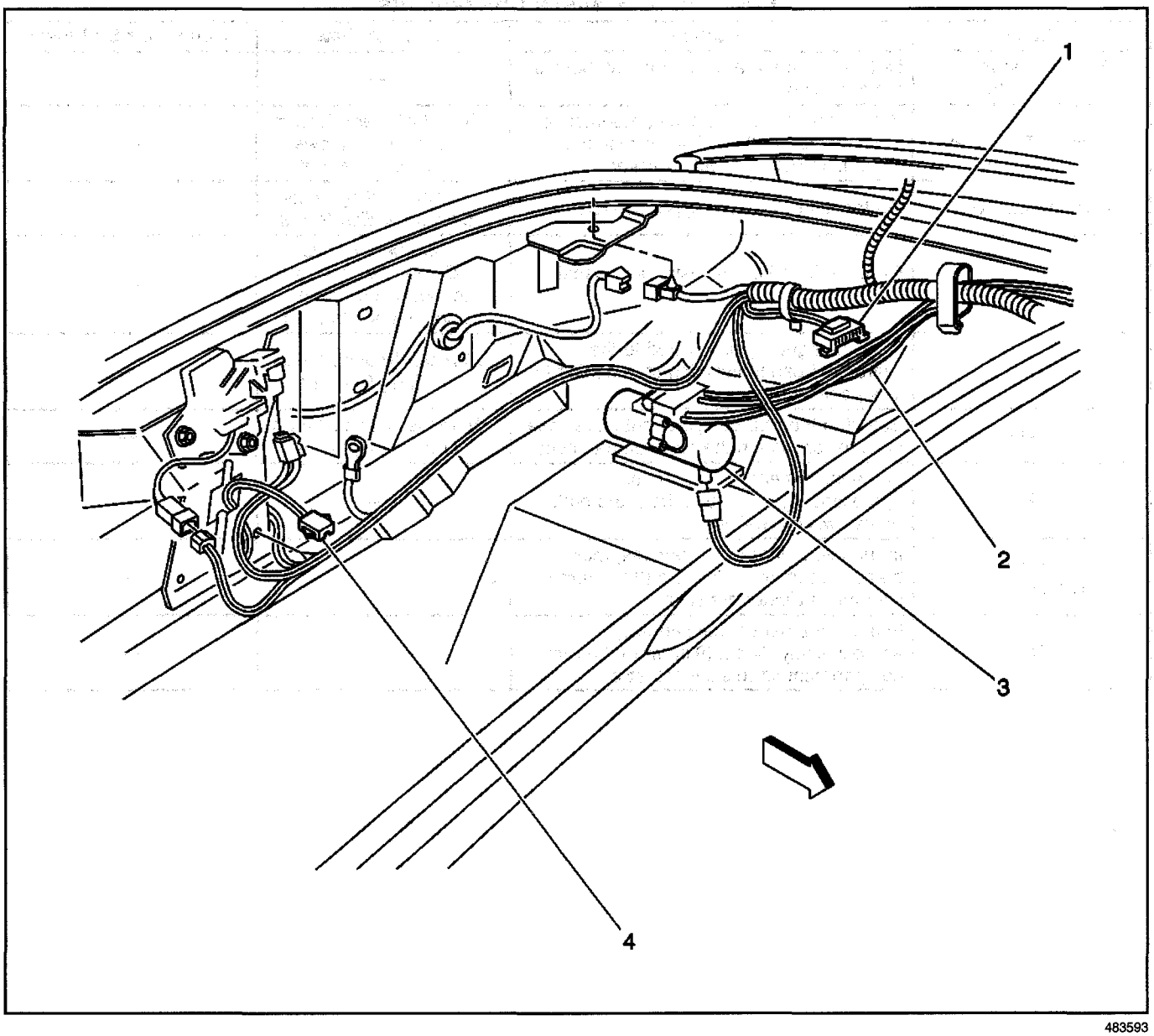
Component Locator

Power Roof Systems Components

Name	Location	Locator View	Connector End View
Folding Top Pump (with Motor)	Left side of the rear compartment, behind the carpeting	—	—
Folding Top Relay	Behind the instrument panel, mounted to the right side of the inflatable restraint instrument panel module bracket	*Theft Deterrent System Component Views* in Theft Deterrent	—
Folding Top Switch	On the left side of the upper console	*Power Roof Systems Connector End Views*	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
G201	Near the right A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views* in Wiring Systems	—
S232	In the instrument panel harness, approximately 7 cm (3 in) from the park brake switch breakout	—	—
S253 (Convertible)	In the instrument panel harness, main branch, approximately 4 cm (2 in) from the instrument cluster breakout	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—

Power Roof Systems Component Views

Left Side of Rear Compartment (Convertible)



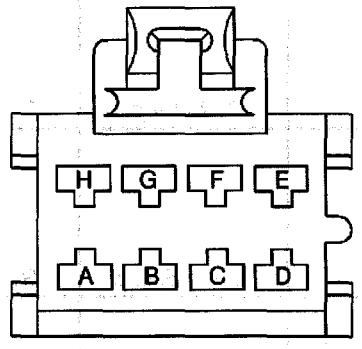
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Legend

(1) Remote CD Player
(2) Folding Top Hydraulic Lines
(3) Folding Top Hydraulic Pump Motor
(4) Rear Compartment Courtesy Lamp Connector

Power Roof Systems Connector End Views

Convertible Folding Top Switch



62469

Connector Part Information		• 1206-4998 • 8-Way F Metri-Pack Series 280 (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	PPL	163	Power folding top motor feed—down
B	GRY	8	Instrument panel lamp feed
C	BLK	1550	Ground
D	BLK	1350	Ground
E	GRY	162	Power convertible top motor feed—up
F	BRN	341	Fuse output—Ignition 3— type III fuse
G	—	—	Not used
H	BLK	1350	Ground

Diagnostic Information and Procedures

Power Folding Top System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Remove all items that may obstruct the convertible top switch. 2. Lower both of the sun visors. 3. Release the 2 latches. One latch is located above each sun visor. 4. Turn the ignition switch to the RUN position. 5. Lower all of the side windows. 6. Move the folding top switch to the DOWN position.	The convertible top lowers quietly and smoothly with no binding.	*Power Folding Top Does Not Open*
2	Move the folding top switch to the UP position.	The convertible top raises quietly and smoothly with no binding.	*Power Folding Top Does Not Close*

Power Folding Top Does Not Open

Step	Action	Value(s)	Yes	No
1	Was the entire Power Folding Top System Check performed?	—	*Go to Step 2*	Go to *Power Folding Top System Check*
2	1. Turn the ignition switch to the RUN position. 2. Use a test light in order to backprobe between folding top switch connector terminal F and ground. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	1. Use a test light in order to backprobe between folding top switch connector terminal A and ground. 2. While observing the test light, press the folding top switch to the DOWN position. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Repair the open in circuit 341, between the folding top switch terminal F and the IP fuse block. Is the repair complete?	—	*Go to Step 13*	—
5	Use a test light in order to backprobe between folding top switch connector terminal E and B+. Does the test light illuminate?	—	*Go to Step 8*	*Go to Step 7*
6	1. Test for a poor connection at the folding top switch connector terminal A and terminal F. 2. If the connection is OK, replace the folding top switch. Is the repair complete?	—	*Go to Step 13*	—
7	Use a test light in order to backprobe between folding top switch connector terminal H and B+. Does the test light illuminate?	—	*Go to Step 14*	*Go to Step 15*
8	1. Disconnect the folding top pump assembly connector. 2. Connect a test light between folding top pump assembly connector terminal B (the instrument panel harness side) and ground. 3. While observing the test light, press the folding top switch to the DOWN position. Does the test light illuminate?	—	*Go to Step 10*	*Go to Step 9*
9	Repair an open or a short to ground in circuit 163, between the folding top switch and the convertible folding top pump assembly. Is the repair complete?	—	*Go to Step 13*	—
10	1. Connect a test lamp between top pump assembly connector terminal A (on the instrument panel harness side) and ground. 2. While observing the test light, press the folding top switch to the UP position. Does the test light illuminate?	—	*Go to Step 12*	*Go to Step 11*
11	Repair an open or a short to the ground in circuit 162, between the folding top switch and the folding top pump assembly. Is the repair complete?	—	*Go to Step 13*	—

Power Folding Top Does Not Open (cont'd)

Step	Action	Value(s)	Yes	No
12	1. Test for a poor connection at the folding top pump assembly. 2. If the connection is OK, replace the folding top pump assembly. Refer to *Power Folding Top Pump with Motor Replacement.* Is the repair complete?	—	*Go to Step 13*	—
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Folding Top System Check*	—
14	1. Test for a poor connection at folding top switch connector terminal E. 2. If the connection is OK, replace the folding top switch. Is the repair complete?	—	*Go to Step 13*	—
15	Repair the poor connection or open in circuit 1350. Is the repair complete?	—	*Go to Step 13*	—

Power Folding Top Does Not Close

Step	Action	Value(s)	Yes	No
1	Was the entire Power Folding Top System Check performed?	—	*Go to Step 2*	Go to *Power Folding Top System Check*
2	1. Turn the ignition switch to the RUN position. 2. Use a test light in order to backprobe between folding top switch connector terminal F and ground. Does the test light illuminate?	—	*Go to Step 3*	*Go to Step 4*
3	Use a test light in order to backprobe between folding top switch connector terminal A and B+. Does the test light illuminate?	—	*Go to Step 5*	*Go to Step 6*
4	Repair the open in circuit 341, between the folding top switch connector terminal F and S253. Is the repair complete?	—	*Go to Step 13*	—
5	1. Use a test light in order to backprobe between folding top switch connector terminal E and ground. 2. While observing the test light, press the folding top switch to the UP position. Does the test light illuminate?	—	*Go to Step 7*	*Go to Step 9*
6	Use a test light in order to backprobe between folding top switch connector terminal D and B+. Does the test light illuminate?	—	*Go to Step 9*	*Go to Step 10*
7	1. Disconnect the folding top pump assembly connector. 2. Connect a test light between convertible folding top pump assembly connector terminal B (the instrument panel harness side) and ground. 3. While observing the test light, press the folding top switch to the DOWN position. Does the test light illuminate?	—	*Go to Step 8*	*Go to Step 11*

Power Folding Top Does Not Close (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Connect a test light between folding top pump assembly connector terminal A (on the instrument panel harness side) and ground. 2. While observing the test light, press the folding top switch to the UP position. Does the test light illuminate?	—	*Go to Step 12*	*Go to Step 14*
9	1. Test for a poor connection at folding top switch connector terminal. 2. If the connection is OK, replace the folding top switch. Is the repair complete?	—	*Go to Step 13*	—
10	Repair a poor connection or an open in circuit 1350. Is the repair complete?	—	*Go to Step 13*	—
11	Repair an open or a short to ground in circuit 163, between the folding top switch and the folding top pump assembly. Is the repair complete?	—	*Go to Step 13*	—
12	1. Test for a poor connection at the folding top pump assembly. 2. If the connection is OK, replace the folding top pump assembly. Refer to *Power Folding Top Pump with Motor Replacement.* Is the repair complete?	—	*Go to Step 13*	—
13	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Folding Top System Check*	—
14	Repair an open or a short to the ground in circuit 162, between the folding top switch and the folding top pump assembly. Is the repair complete?	—	*Go to Step 13*	—

Repair Instructions

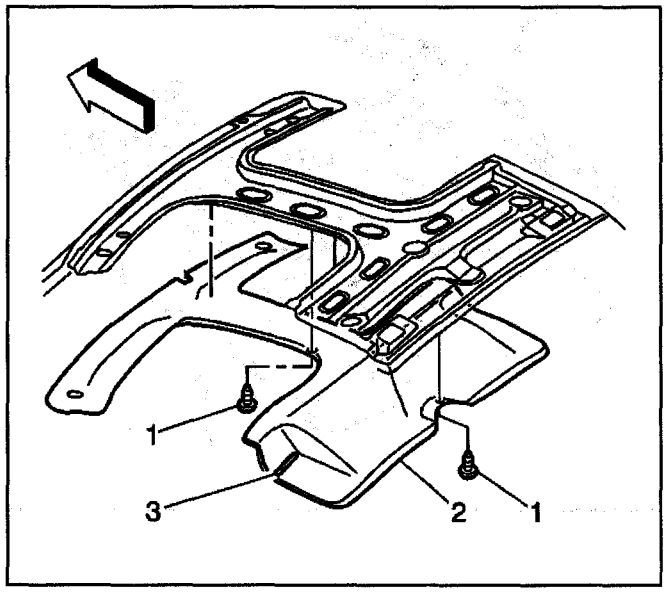
Hard Top Headliner Replacement

Removal Procedure

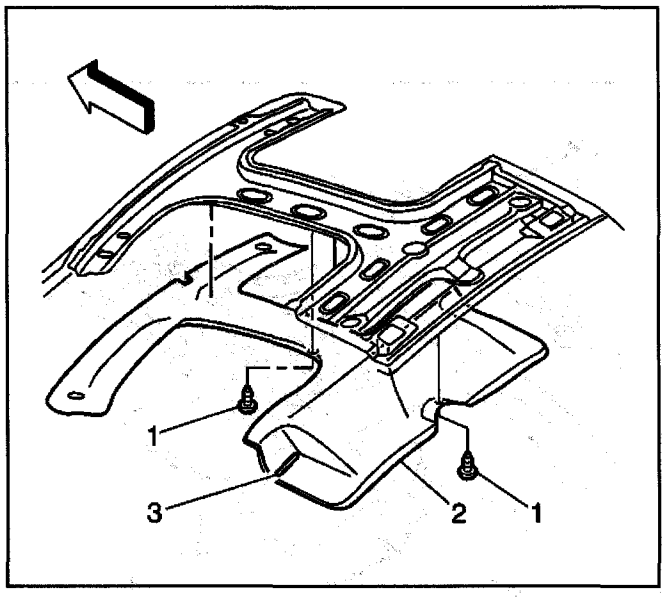
Important: The headlining panel (2) is partially held in place with headlining panel tape or 2 color matched retainers (1) with lift-off windows. The headlining panel (2) is completely held in place when the following components are installed:

- The interior moldings
- The sunshade
- The dome lamp housing

1. Open the rear compartment lift window.
2. Remove the sunshade. Refer to *Sunshade Panel Replacement.*
3. Remove the dome lamp housing. Refer to *Dome and Reading Lamp Bulb Replacement.*
4. Remove the windshield side upper garnish molding. Refer to one of the following procedures in Interior Trim:
   - *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan).*
   - *Windshield Side Garnish Molding Replacement (With Lift Off Window Pan).*
5. Remove the quarter trim finish panel. Refer to Quarter Trim Finish Panel Replacement in Rear Quarters.
6. Loosen the seat belt escutcheons.
7. Slide the seat belt downward.
8. Remove the retainers (1) from the headlining panel (2).
9. Pull on the headlining panel (2) in order to remove the headlining panel from the roof panel.
10. Slide the seat belt through the seat belt slots.
11. Remove the headlining panel (2) from the vehicle through the rear compartment lift window opening.



311039



311039

Installation Procedure

1. Peel the backing from the new headlining panel tape.

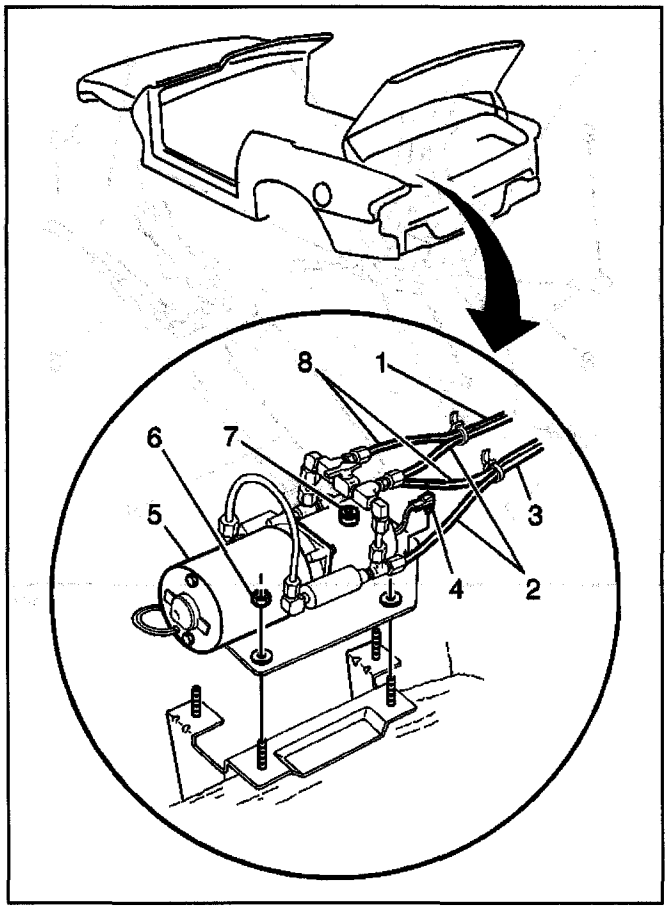
   Apply the tape to the depressions in the roof panel (without the lift-off windows).
2. Place the headlining panel (2) in the vehicle through the rear compartment lift window opening.
3. Insert the seat belt into the seat belt slots.
4. Pull the dome lamp electrical connector through the opening.
5. Apply pressure at the centerline of the headlining panel (2) in order to engage the headlining panel tape (without lift-off windows).
6. Install the retainer (1) to the headlining panel (2).
7. Slide the seat belt escutcheons up the seat belt.
8. Snap the escutcheons into the retractor.
9. Install the quarter trim finish panel. Refer to Quarter Trim Finish Panel Replacement in Rear Quarters.
10. Install the windshield side upper garnish molding. Refer to one of the following procedures in Interior Trim:
    - *Windshield Side Garnish Molding Replacement (Without Lift Off Window Pan).*
    - *Windshield Side Garnish Molding Replacement (With Lift Off Window Pan).*
11. Install the dome lamp housing. Refer to *Dome and Reading Lamp Bulb Replacement.*
12. Install the sunshade. Refer to *Sunshade Panel Replacement.*
13. Close the rear compartment window.

Power Folding Top Pump with Motor Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the negative battery cable.
2. Remove the left rear compartment side trim.
3. Disconnect the electrical connector from the pump.
4. Remove the cylinder hose (1,3) from the pump (5).
5. Use a shop towel in order to control hydraulic oil leakage.
6. Remove the pump nuts (6).
7. Remove the pump (5) with the motor.



311056

Installation Procedure

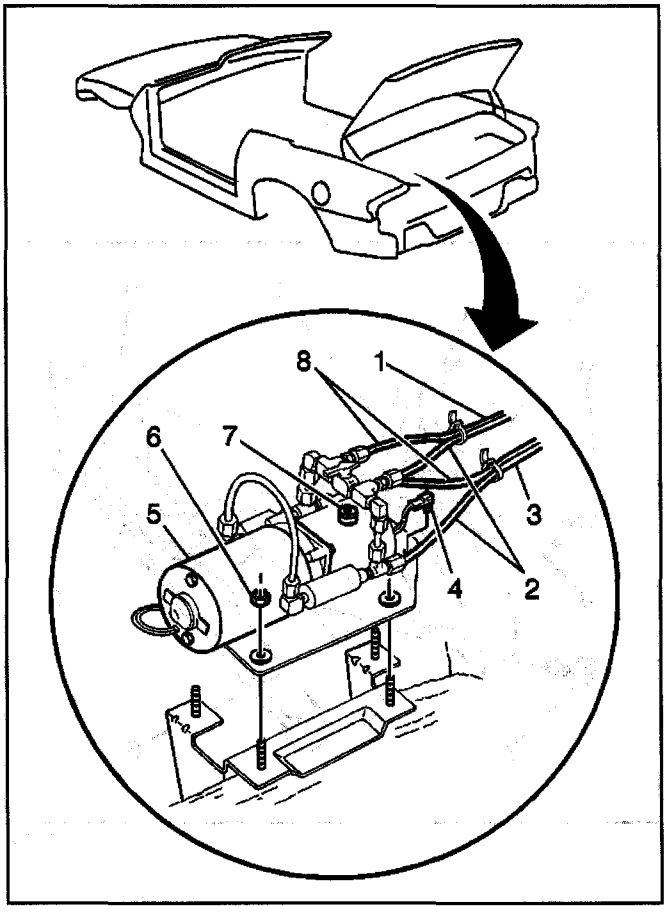
1. Install the pump (5) with the motor.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

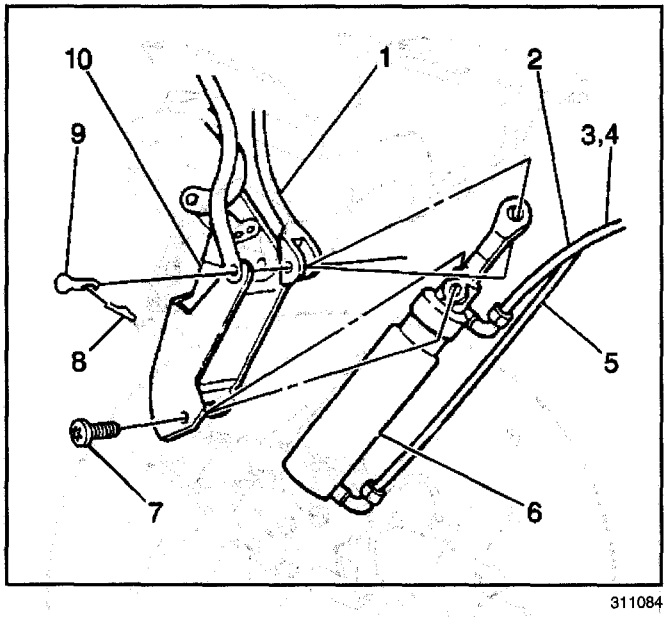
2. in Cautions and Notices.
   Install the pump nuts (6).
   Tighten
   Tighten the nuts to 6 N·m (53 lb in).
3. Install the cylinder hose (1, 3) to the pump (5).
   Tighten
   Tighten the cylinder hose fittings to 7 N·m (62 lb in).
4. Connect the electrical connector to the pump.
5. Install the left rear compartment side trim.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

6. Connect the negative battery cable.



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Power Folding Top Cylinder Replacement

Removal Procedure

Each hose consists of 1 white and 1 pink hose bundled together. The upper hose controls the left cylinder. The lower hose control the right cylinder. The pink hoses attach to the top of each cylinder. The white hoses attach to the bottom of each cylinder.

Ensure the hoses remain connected as indicated. If the hoses are switched, 1 cylinder may extend while the other cylinder retracts. This will damage the folding top.

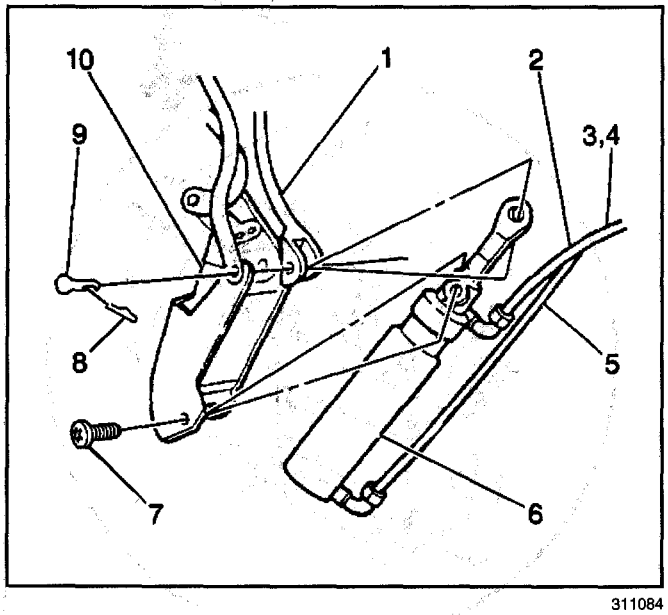
Important: When servicing the hydraulic system, leave the folding top raised and unattached from the windshield header in order to keep the cylinder rods extended and minimize fluid leakage.

1. Turn the pump bypass valve fully clockwise to the open position. Refer to Manual Operation under Folding Top Operation.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the battery negative cable.
3. Remove the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel Replacement in Body Rear End.
4. Remove the speakers. Refer to *Speaker Replacement - Rear* in Entertainment.
5. Remove the following components:
   - The pivot bracket locking pin (8)
   - The cylinder pivot pin (9)
6. Remove the cylinder (6) from the outer arm.
7. Remove the cylinder bolt (7).
8. Remove either the left cylinder upper hose (4) or the right lower hose (3) from the cylinder.

   Use a shop towel in order to control hydraulic oil leakage.



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Installation Procedure

Important: Replacement cylinders are supplied filled with oil. Do not remove the sealing caps from the cylinder until you are ready to connect the cylinder hose.

1. Install either the left cylinder upper hose (4) or the right lower hose (3).
2. Install the cylinder (6).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the cylinder bolt (7).

   Tighten

   Tighten the bolt to 5 N·m (44 lb in).
4. Install the cylinder (6) to the outer arm (1).

5. Install the following components:
   - The cylinder pivot pin (9)
   - The pivot bracket locking pin (8)

   Tighten
   Tighten the cylinder hose fittings to 7 N·m (62 lb in).
6. Install the speaker. Refer to *Speaker Replacement - Rear* in Entertainment.
7. Install the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel Replacement in Body Rear End.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

8. Connect the battery negative cable.
9. Raise the folding top.
10. Turn the pump bypass valve fully counter-clockwise to the closed position. Refer to Manual Operation under Folding Top Operation.
11. Bleed the hydraulic system. Refer to Hydraulic System Bleeding Procedure.

Power Folding Top Bow Replacement

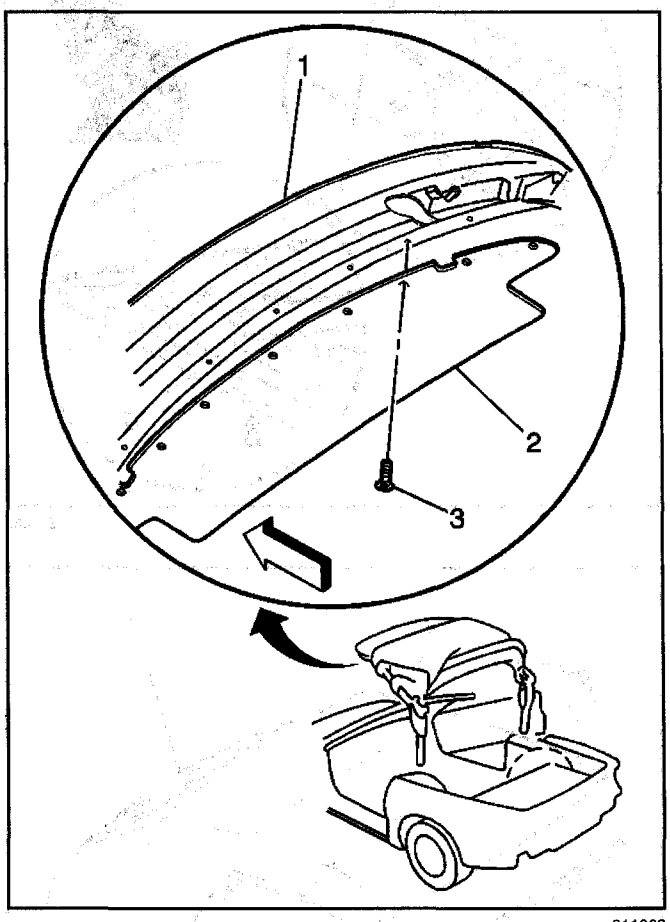
Folding Top Number 1 Bow

Removal Procedure

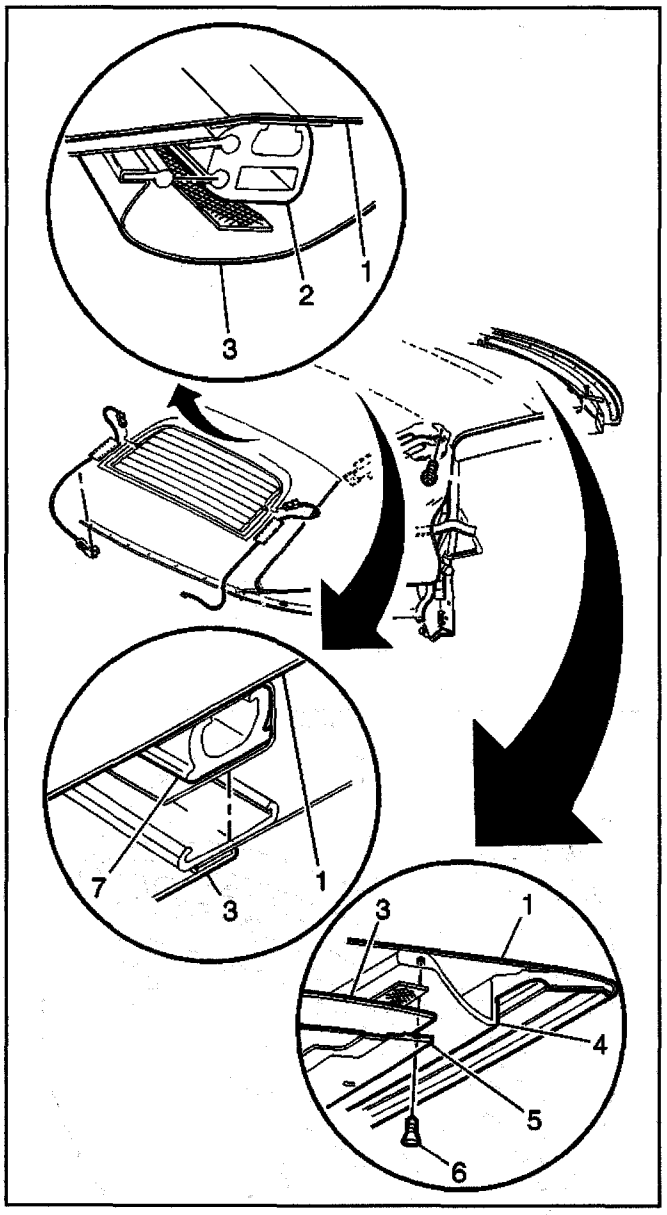
1. Remove the lower folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Turn the pump bypass valve fully clockwise to the open position. Refer to Manual Operation in Folding Top Operation.
4. Remove the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
5. Remove the number 1 bow garnish molding bolt (3).
6. Remove the number 1 garnish molding (2).



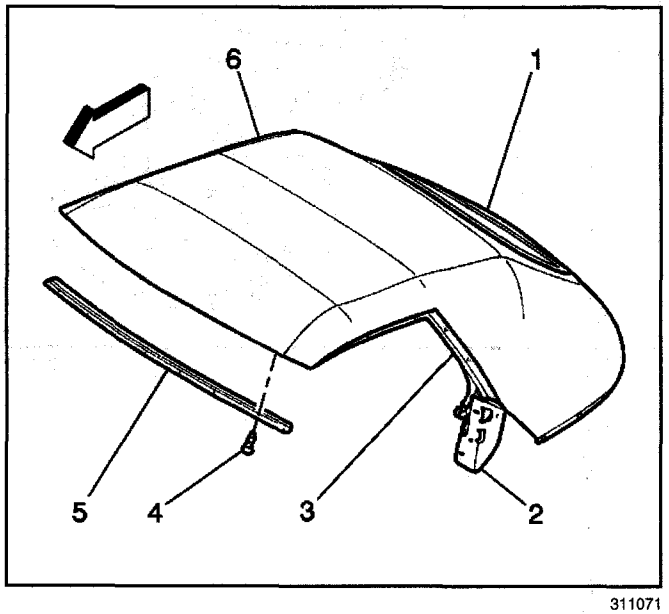
311062



311068

7. Remove the rivets at each corner of the headlining trim finish panel (3).

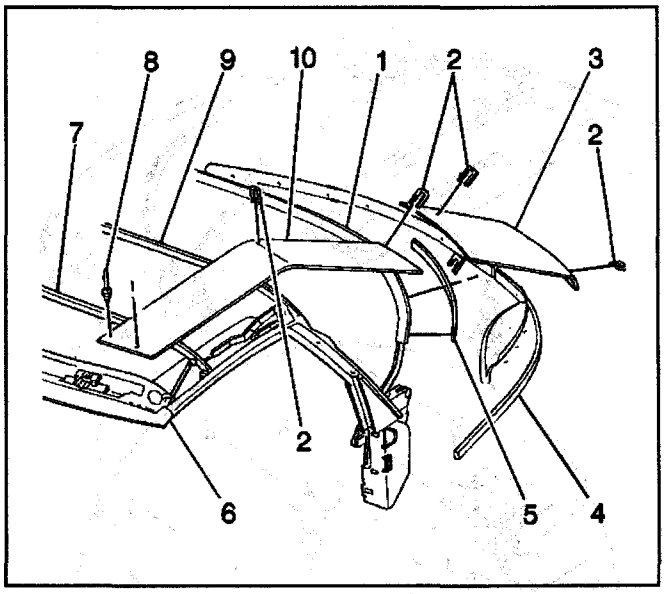
   Use a 5/32 inch drill bit in order to drill out the rivets.
8. Peel the headlining trim finish panel away from the adhesion in order to remove the headlining trim finish panel (3) from the number 1 bow (4).
9. Mark the top cover in order to show the leading edge of the number 1 bow (4).



311071

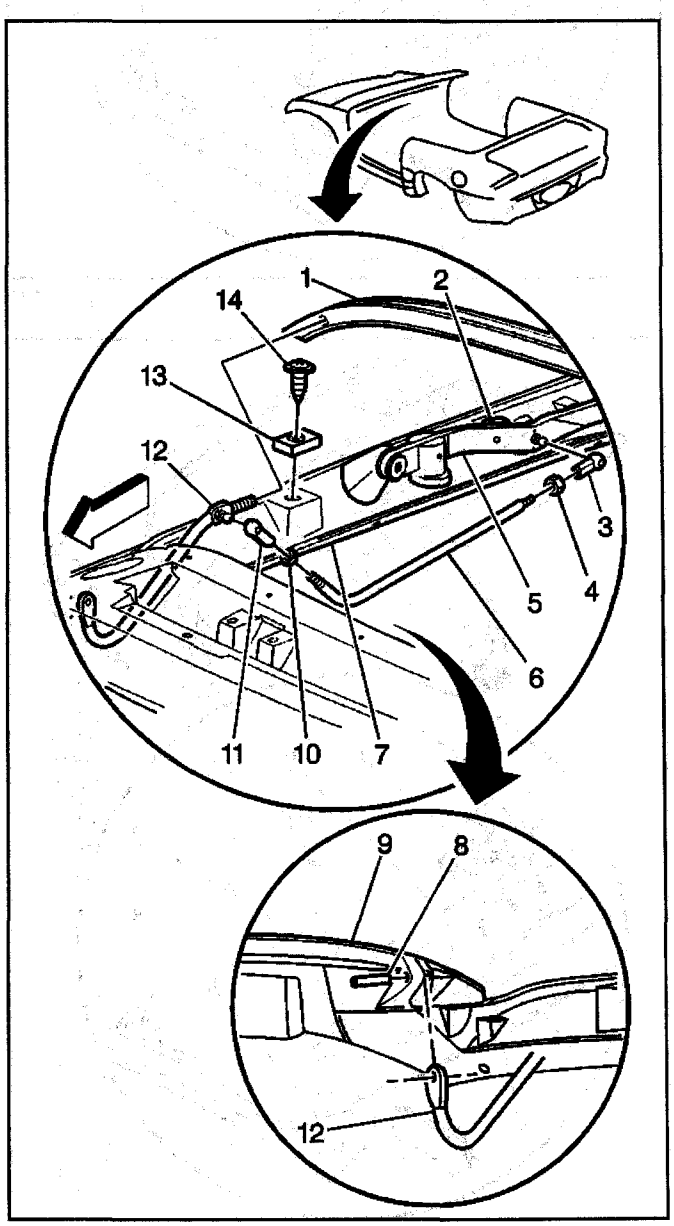
10. Remove the front cover number 1 bow retainer bolt (4).
11. Remove the front cover number 1 bow retainer (5).

12. Peel the cover away from the adhesive in order to remove the cover from the number 1 bow (6).
13. Remove the black tape covering the side front stay rivets (8).
14. Remove the side front stay rivets (8).
    Use a 5/32 inch drill bit in order to drill out the rivets.
15. Remove the number 1,2,3, and 4 bow position pad (10).

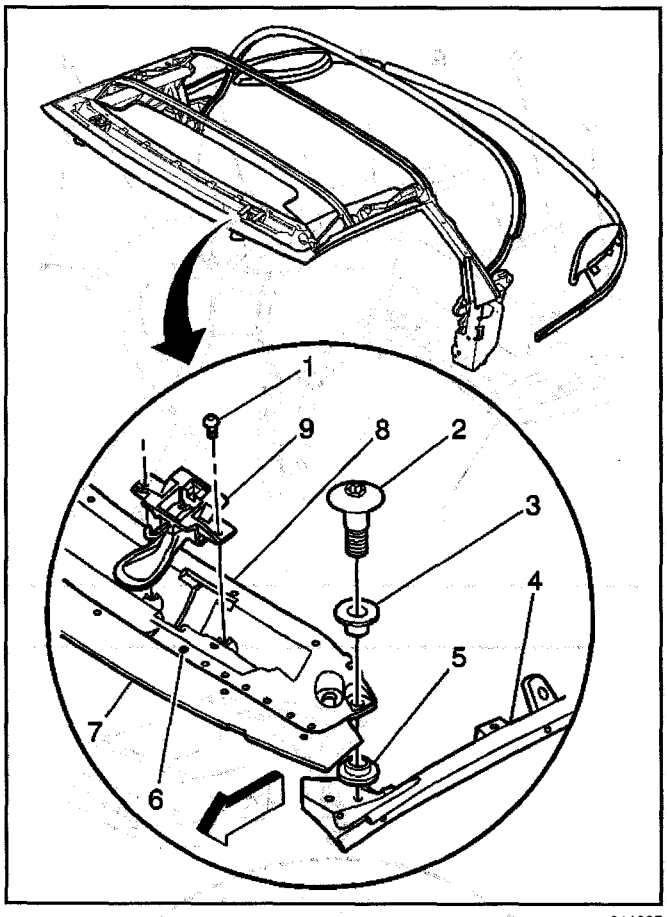


311079

16. Remove the number 1 bow links (8) from the number 1 bow (9) by punching out the pins.

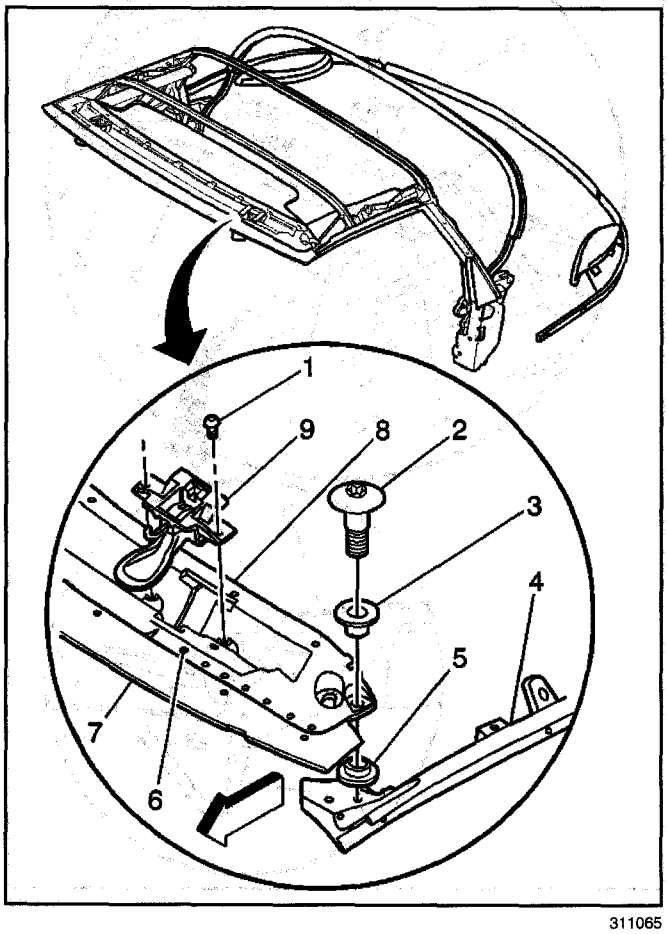


311072



311065

17. Remove the number 1 bow bolts (2) and bushings (3).
18. Remove the number 1 bow (8).
19. Remove the old adhesive from the side rail weatherstrip and the number 1 bow (8).



311065

Installation Procedure

1. Install the number 1 bow (8).
2. Use CluberLube Microlube GL-261 or equivalent in order to lubricate the number 1 bushings (3) and bolts (2).

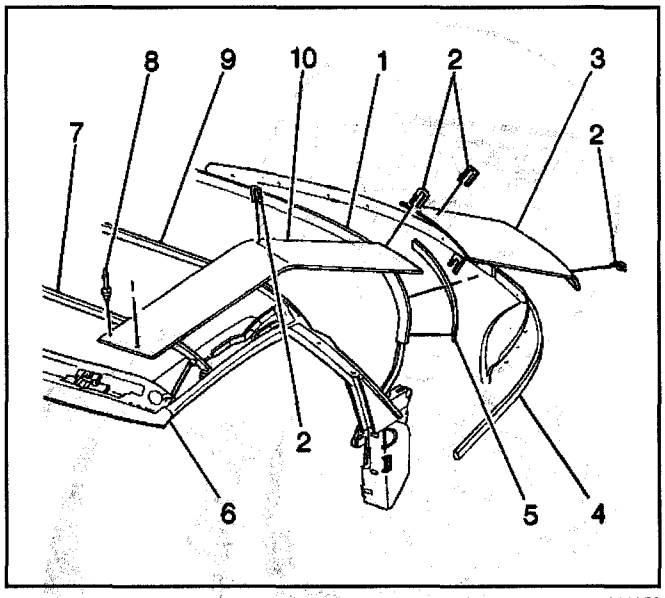
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the number 1 bow bushings (3) and the bolts (2).

   Tighten

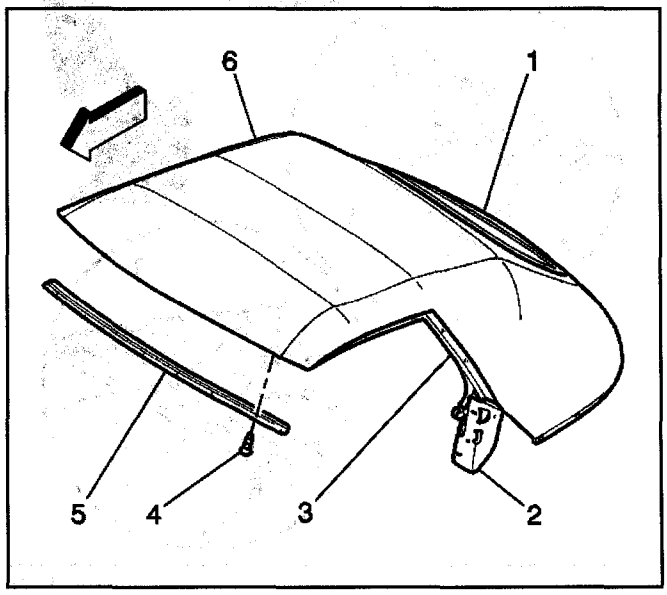
   Tighten the bolts (2) to 17 N·m (13 lb ft).

4. Install the number 1, 2, 3, and 4 bow position pad (10) to the number one bow (39).
5. Install the side front stay rivets (8).
6. Use black tape in order to cover the side front stay rivets (8).
7. Install the cover to the number 1 bow (6). Refer to Folding Top Cover.

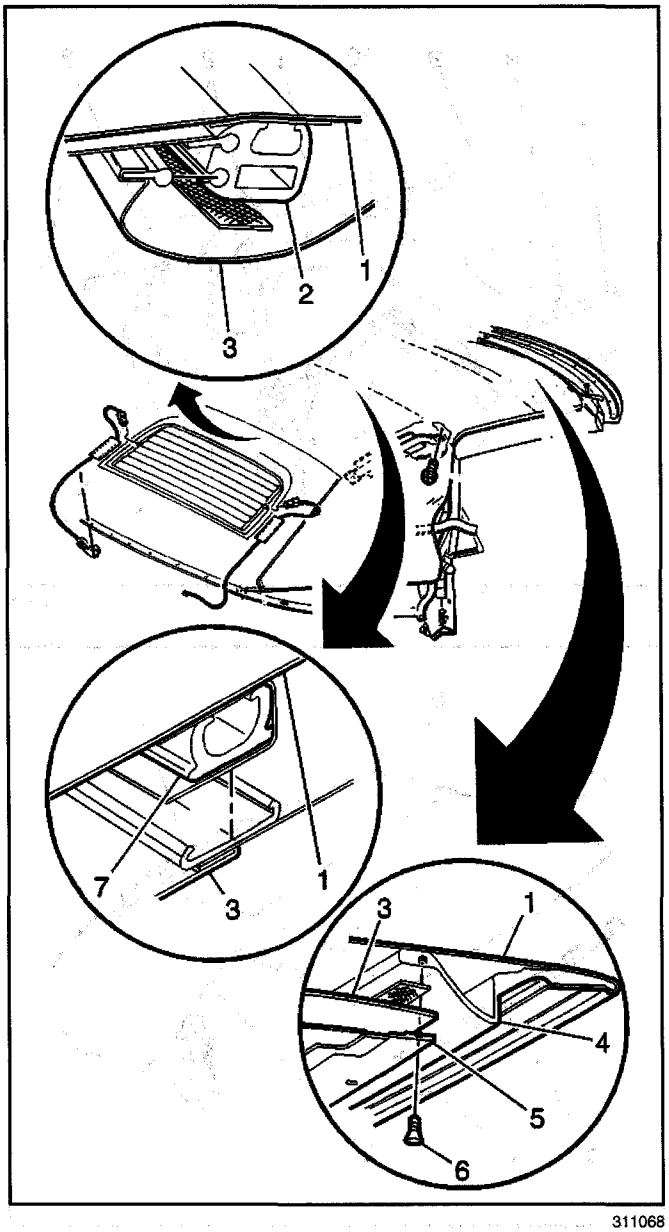


311079

8. Install the front cover number 1 bow retainer (5).
9. Install the front cover number 1 bow retainer bolts (4).



311071



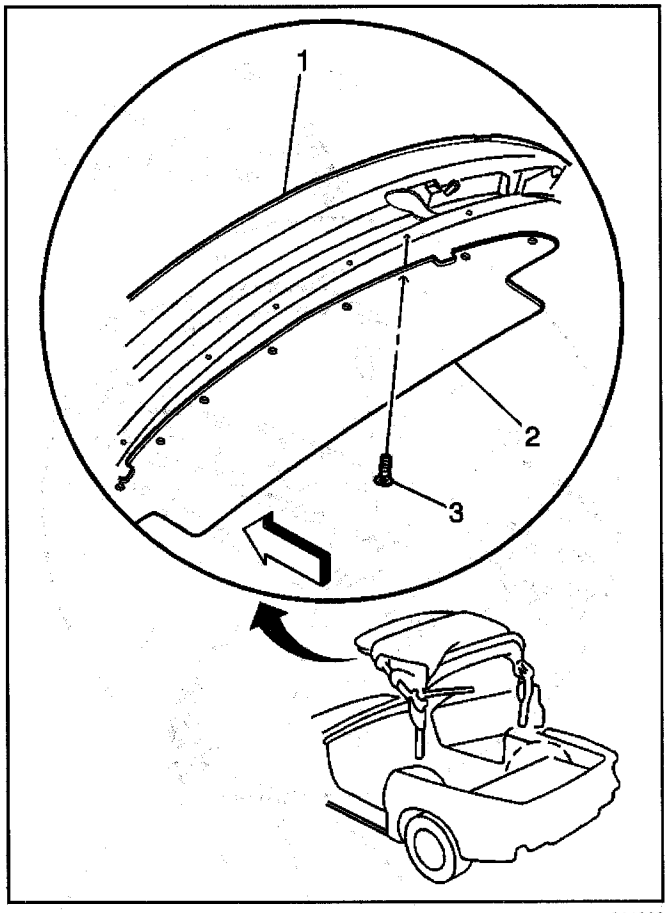
311068

10. Install the headlining trim finish panel (3) to the number 1 bow (4). Refer to *Finish Panel Replacement - Upper Rear Trim.*
11. Install the headlining trim finish panel rivets.

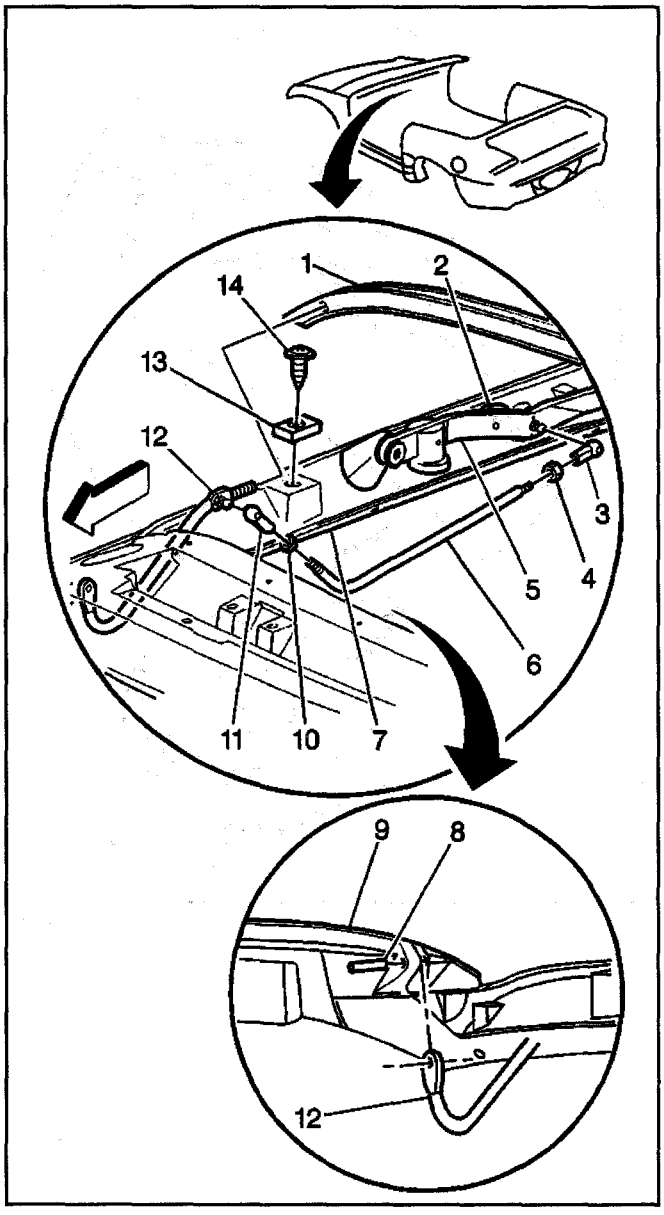
12. Install the number 1 bow garnish molding (2).
13. Install the number 1 bow garnish molding bolts (3).
14. Install the side rail garnish moldings. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

15. Disconnect the negative battery cable.
16. Turn the pump bypass valve fully counter-clockwise to the closed position. Refer to Manual Operation in Folding Top Operation.



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Folding Top Bow Link Replacement

Removal Procedure

1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Turn the pump bypass valve fully clockwise to the open position. Refer to Manual Operation in Folding Top Operation.
4. Remove the side rail garnish molding. Refer to Frame Replacement.
5. Remove the outer locknuts from the number 2 bow links (6).
6. Remove the number 2 bow links (6) from the number 1 bow links (12).
7. Remove the number 1 bow links (12) from the number one bow (9) by punching out the pins.
8. Remove the ball stud clips from the front side rail link (11).
9. Remove the number 2 bow links (6).

Installation Procedure

1. Install the number 2 bow links (6).
2. Install the ball stud clip to the front side rail link (5).
3. Install the number 1 bow links (12) to the number 1 bow (9).

   Install the pins.
4. Install the number 2 bow links (6) to the number 1 bow links (12).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

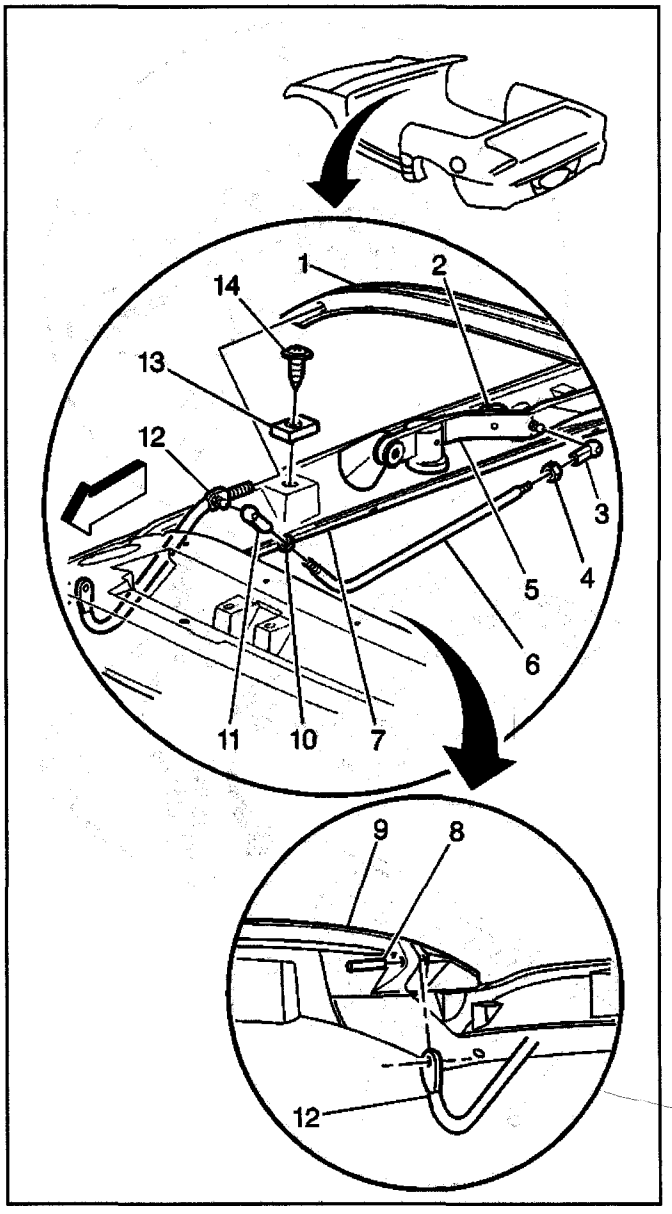
5. Install the outer locknuts to the number 2 bow links (6).

   Tighten

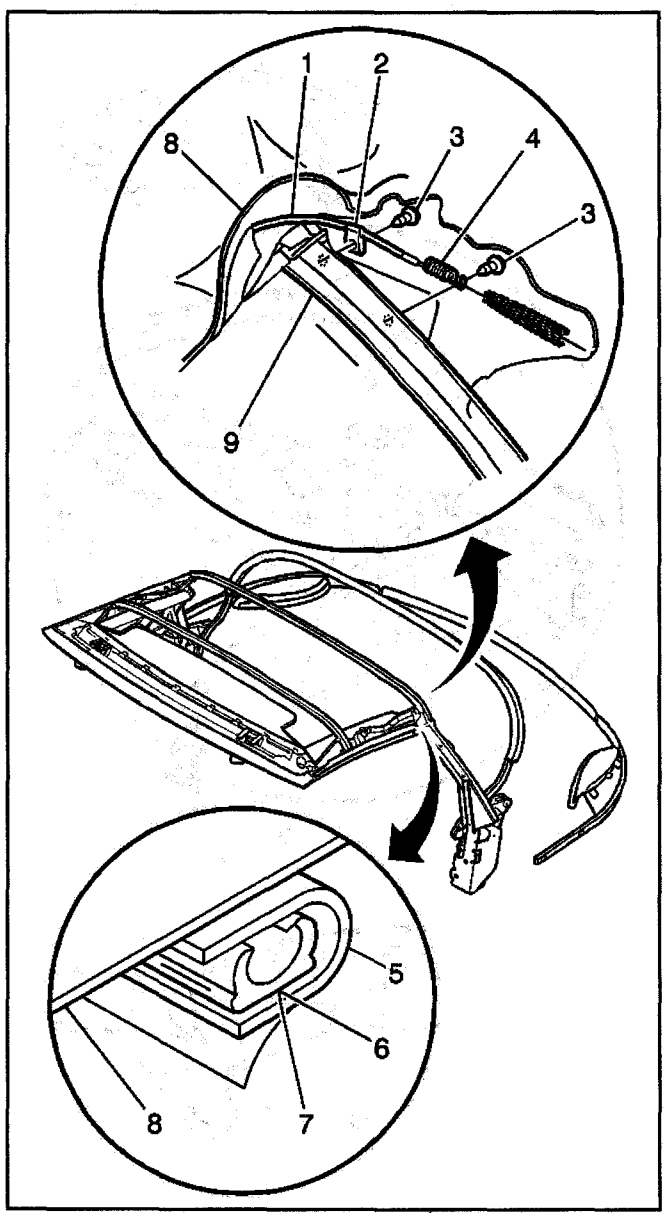
   Tighten the locknut to 5 N·m 44 lb in).
6. Install the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
7. Turn the pump bypass valve fully counter-clockwise to the closed position. Refer to Manual Operation in Folding Top Operation.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

8. Connect the negative battery cable.



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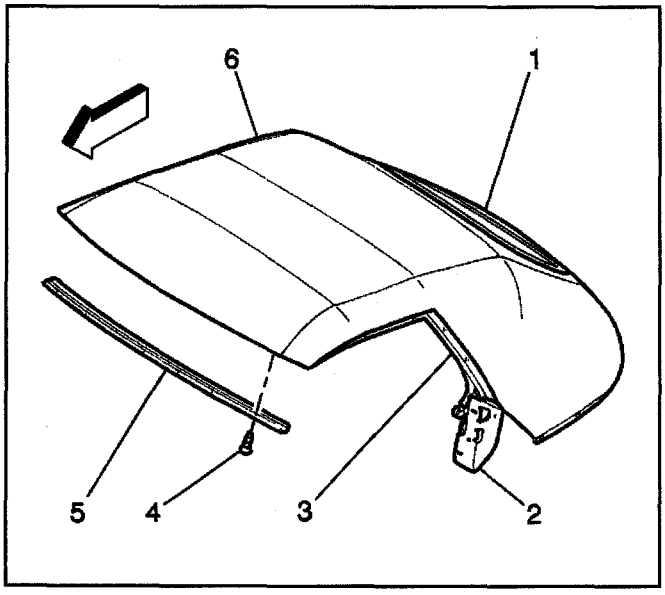
Folding Top Side Rail Replacement

Removal Procedure

1. Remove the lower folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

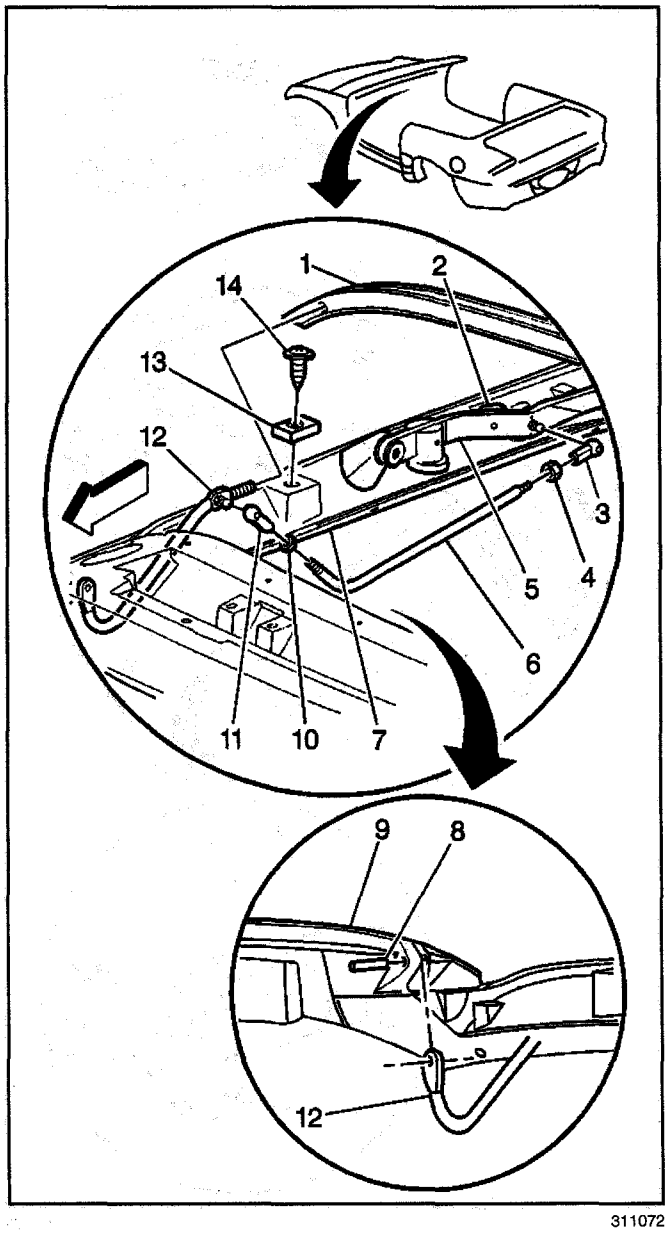
2. Disconnect the negative battery cable.
3. Turn the pump fully clockwise to the open position. Refer to Manual Operation in Folding Top Operation.
4. Remove the side rail weatherstrip. Refer to Folding Top Side Rail Weatherstrip.
5. Remove the side rail weatherstrip retainer. Refer to Folding Top Side Rail Weatherstrip Retainers.
6. Remove the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
7. Remove the bolts (3) attaching the cover retainer cable (1) to the outer arm (9).



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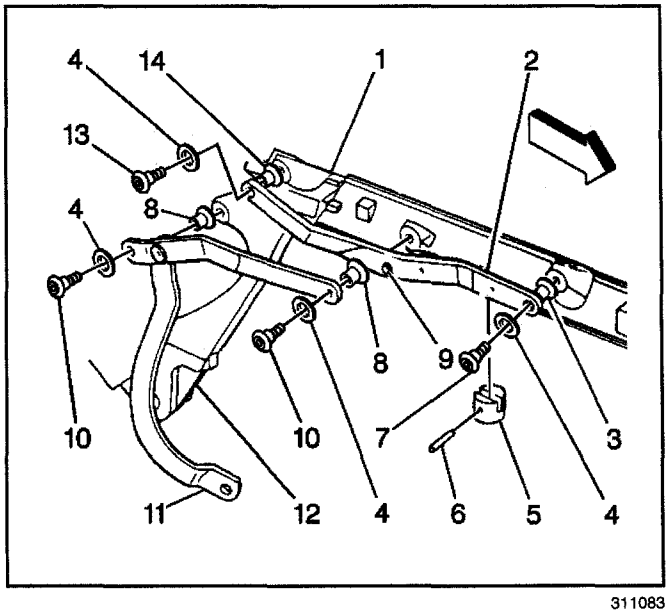
8. Remove the folding top cover retainer number 1 bolt (4).
9. Remove the front cover number 1 bow retainer (5).

10. Mark the top cover fabric along the front edge of the number 1 bow (9) for reference.
11. Peel back the top cover from the number 1 bow in order to reveal the number 1 bolts. Refer to *Power Folding Top Bow Replacement.*
12. Remove the number 1 bow bolts. Refer to *Power Folding Top Bow Replacement.*

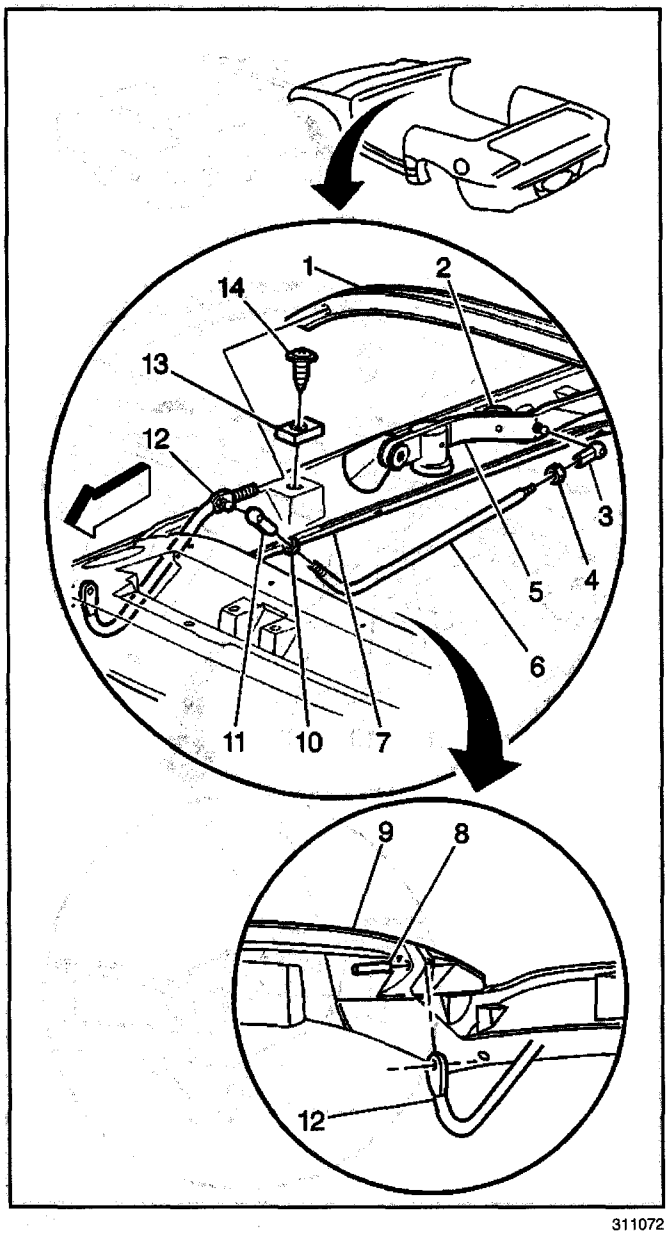


311072

13. Remove the following components in order to remove the front side rail link to the side rail:
    - The bolt (7)
    - The washer (4)
    - The bushing (3)
14. Remove the following components in order to remove the side rail link (11) to the side rail (1):
    - The bolt (10)
    - The washer (4)
    - The bushing (8)



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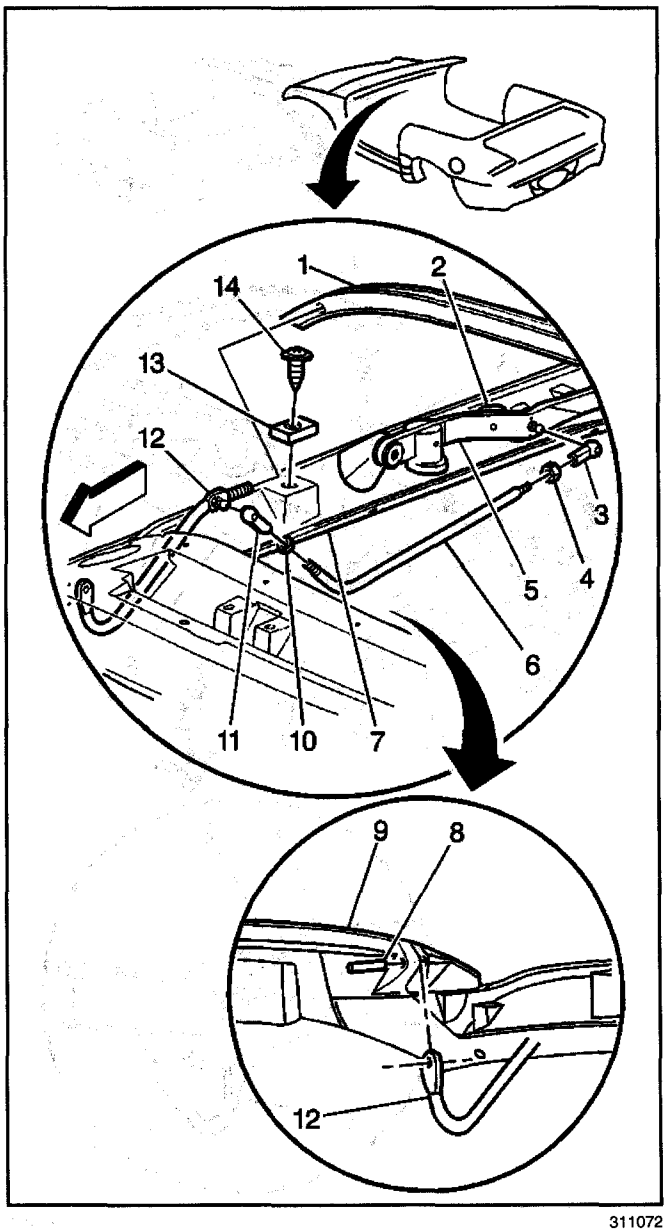


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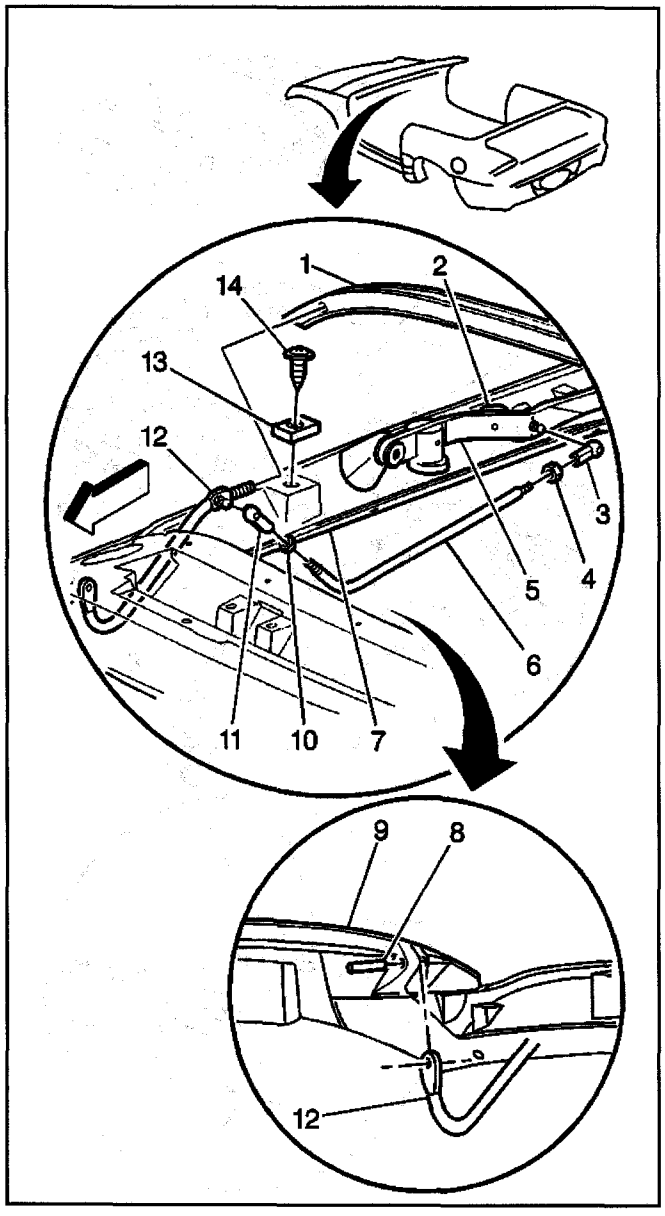
15. Remove the cover retainer cable.
16. Remove the side rail (7).

Disassembly Procedure

1. Remove the number 2 bow insulator bolt (14).
2. Remove the number 2 bow insulator (13) from the side rail (7).



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Assembly Procedure

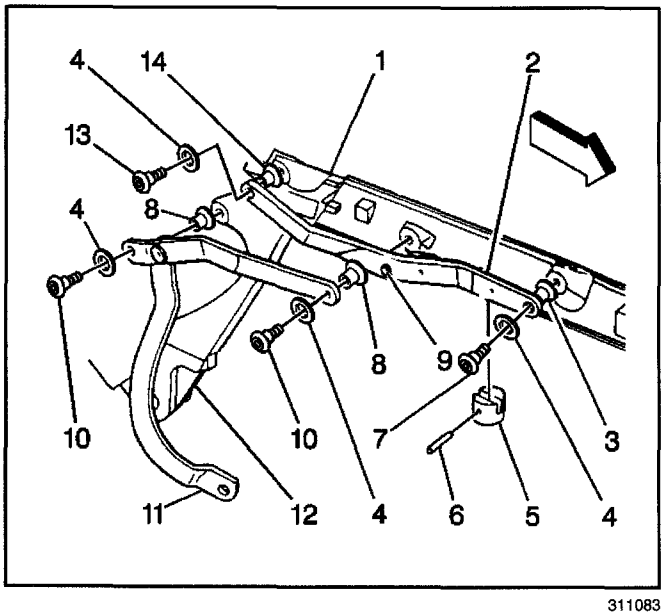
1. Install the number 2 bow insulator (13) to the side rail (7).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the number 2 bow insulator bolt (14).

   Tighten

   Tighten the bolts to 5 N·m (44 lb in).



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Installation Procedure

1. Install the side rail (12).
2. Install the cover retainer cable at the front end of the side rail (12).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the following components in order to attach the side rail link to the side rail (12):
   - The bushing (8)
   - The washer (4)
   - The bolt (10)

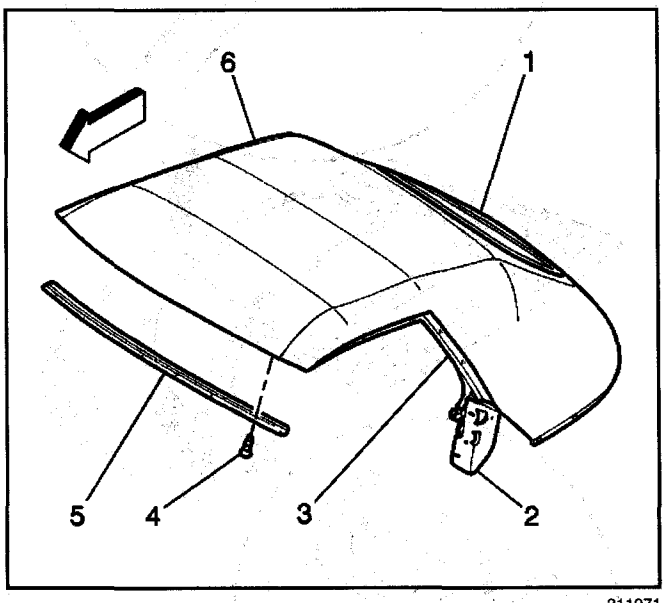
   Tighten

   Tighten the bolt (10) to 17 N·m (13 lb ft).

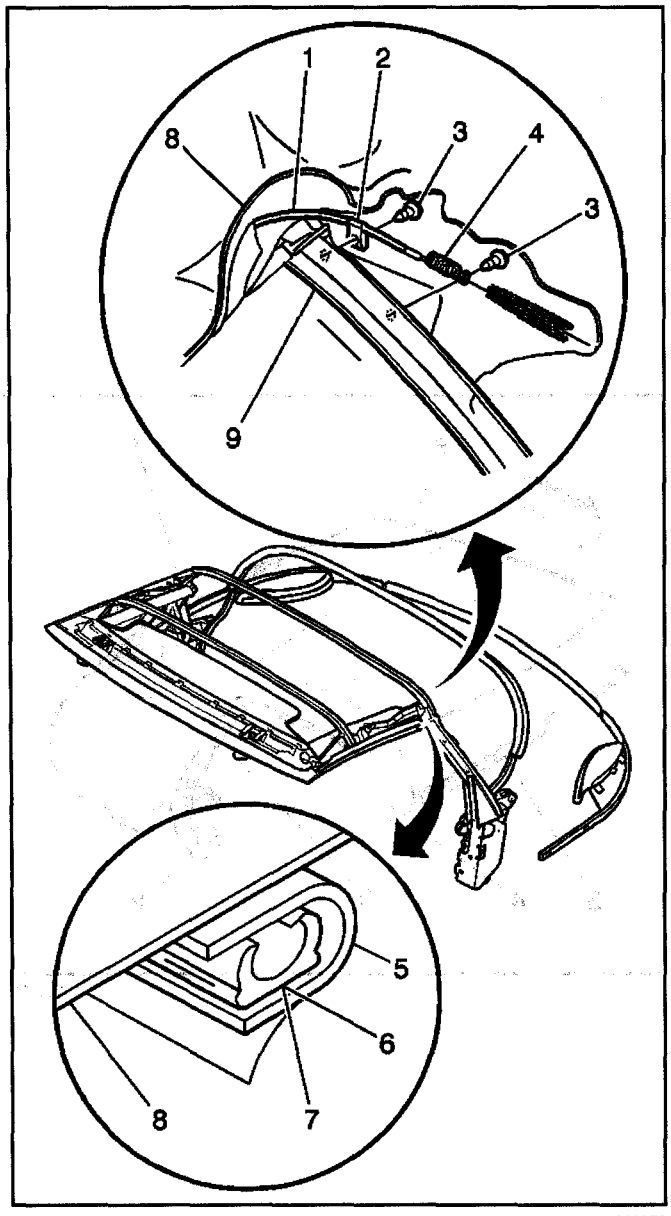
4. Install the following components in order to attach the side rail link (2) to the side rail (1):
   - The bushing (3)
   - The washer (4)
   - The bolt (7)

   Tighten

   Tighten the bolt (7) to 17 N·m (13 lb ft).
5. Install the number 1 bow bolts. Refer to *Power Folding Top Bow Replacement*.
6. Install the top cover. Refer to *Power Folding Top Bow Replacement*.
7. Install the front cover number 1 bow retainer (5).
8. Install the bolts (4).



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9. Install the cover retainer cable (1) at the front of the side rail.
10. Install the bolts (3).
11. Install the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
12. Install the side rail weatherstrip retainer. Refer to Folding Top Side Rail Weatherstrip Retainers.
13. Install the side rail weatherstrip. Refer to Folding Top Side Rail Weatherstrip.
14. Turn the pump bypass valve fully counter-clockwise to the closed position. Refer to Manual Operation in Folding Top Operation.
15. Reconnect the negative battery cable.
16. Raise the folding top.

Folding Top Side Rail Link Replacement

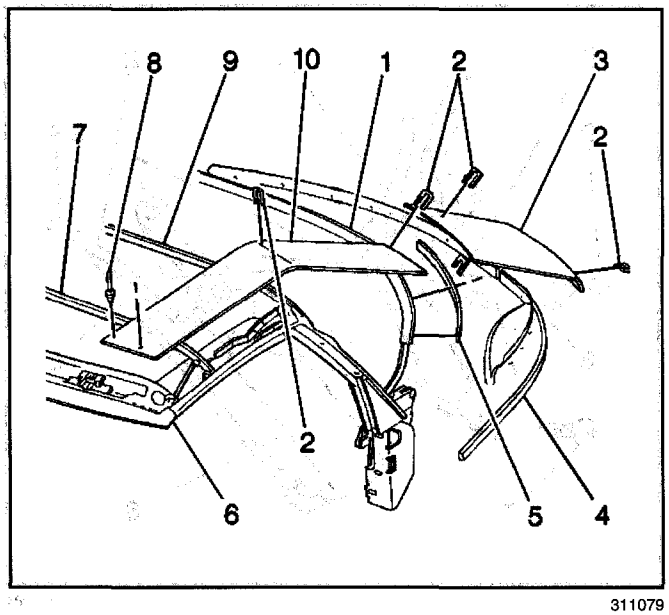
Removal Procedure

1. Lower the folding top halfway down and prop the top with a suitable support.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the outer arm weatherstrip. Refer to Folding Top Outer Arm Weatherstrip.
4. Remove the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side*.
5. Remove the quarter window filler bolts (4).
6. Remove the quarter window filler (2).
7. Remove the cover from the outer arm (1) by removing the bolts and peeling the cover away from the adhesive.
8. Remove the cover retainer cable.
9. Remove the staples connecting the number 1, 2, 3, and 4 bow position pad (10) to the number 3 bow (9).

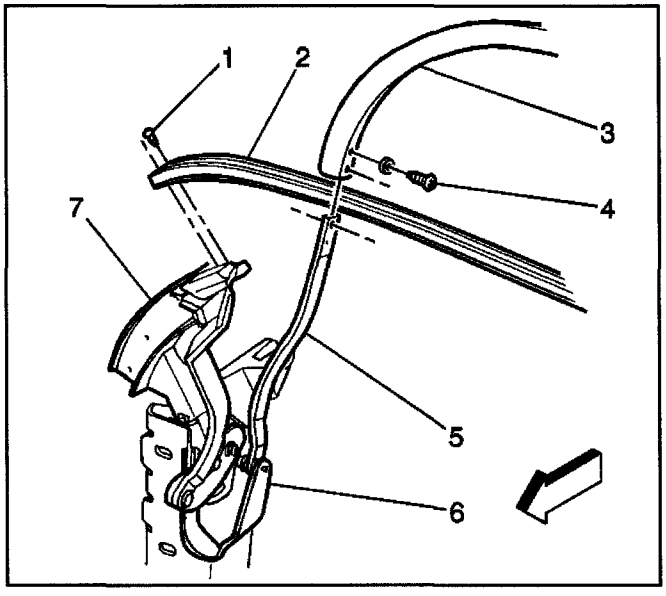
   Mark the location of the pad.



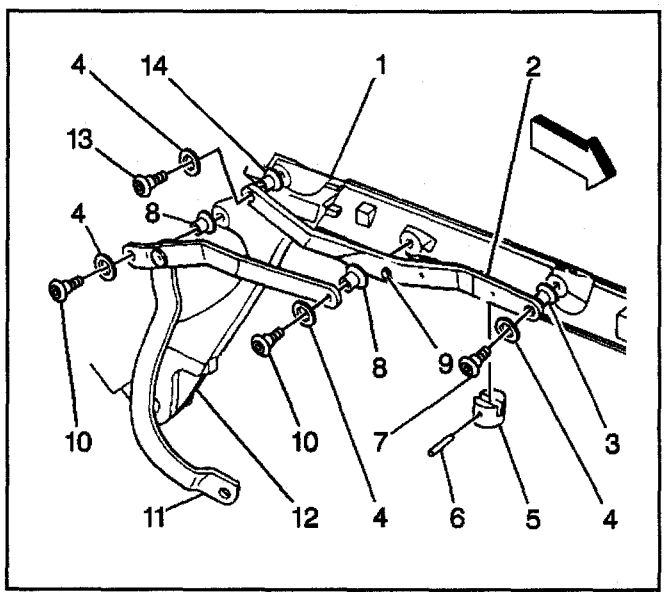
311079

10. Slide the plastic tackstrip along the channel in the number 3 bow in order to reveal the bolts.

    Remove the bolts (1) from the number 3 bow (2).

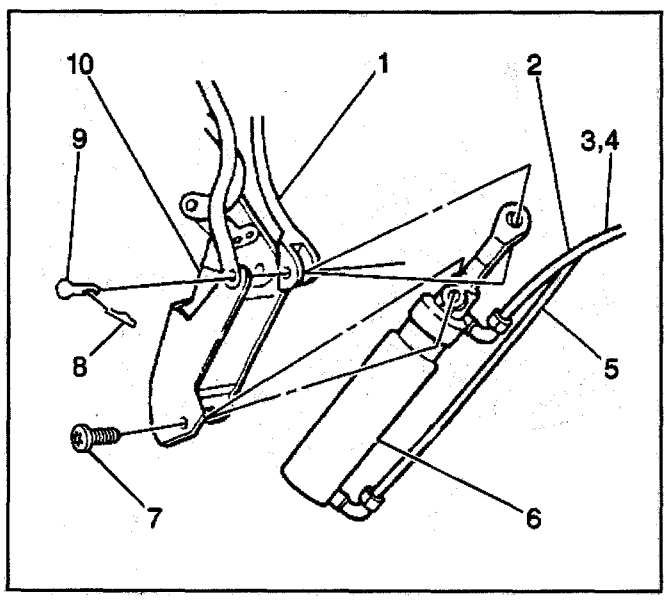


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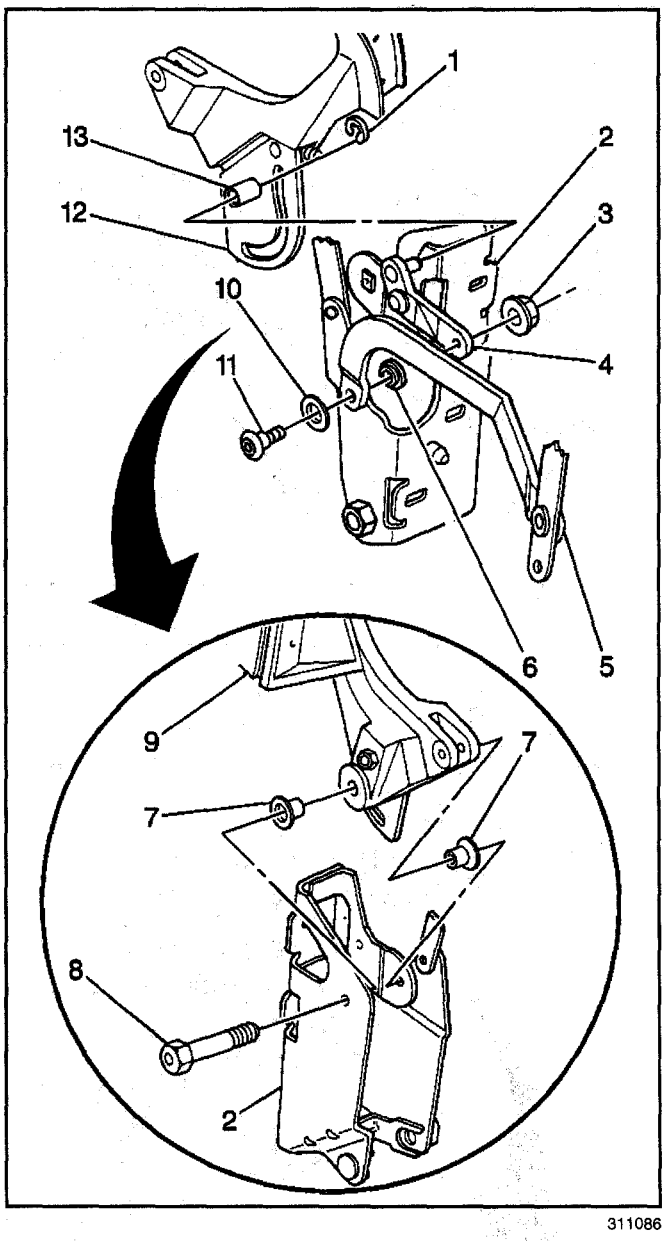
11. Remove the bolts (13) and washers (4).
12. Remove the side rail link (2) and the bushing (14) from the outer arm (12).
13. Remove the front side rail link (11) and bushing (8) from the outer arm (12).



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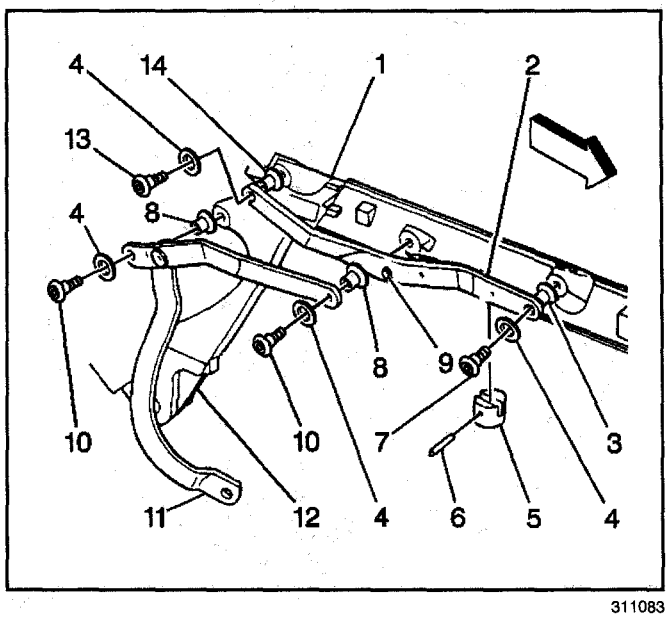
14. Remove the pivot bracket locking pin (8) and cylinder pivot pin (9).
15. Remove the cylinder (6) from the outer arm (1).

16. Remove the bolt (8) attaching the outer arm (9) to the pivot bracket (2).
17. Remove the outer arm pivot pin retainer (1).
18. Remove the outer arm (9) with the inner arm link cam (12) attached.
19. Remove the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel in Rear Quarters.
20. Remove the speakers. Refer to Speaker Replacement in Rear Quarters.
21. Remove the cylinder bolt.
22. Remove the number 4 bow links. Refer to *Folding Top Bow Link Replacement.*
23. Remove the side rail weatherstrip. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
24. Remove the side rail weatherstrip retainer. Refer to Weatherstrip Replacement - Folding Top.
25. Remove the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.

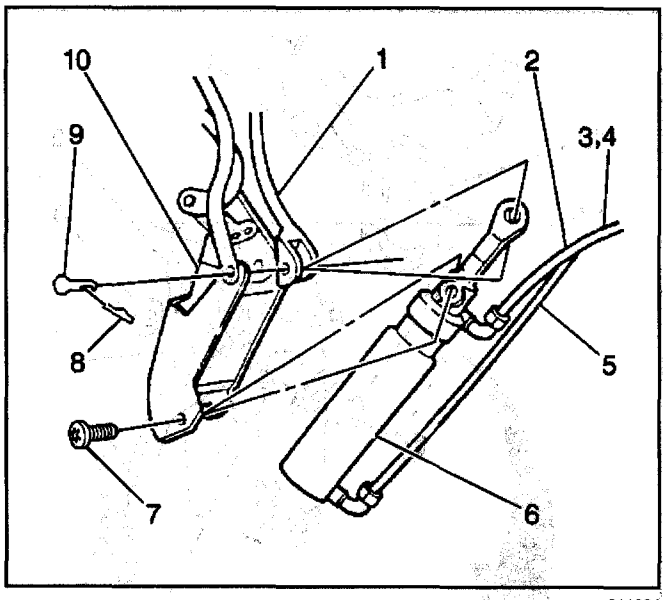


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26. Remove the bolts (10) and washers (4).
27. Remove the side rail link (2) and the bushing (8) from the side rail (1).
28. Remove the pivot bracket nuts.

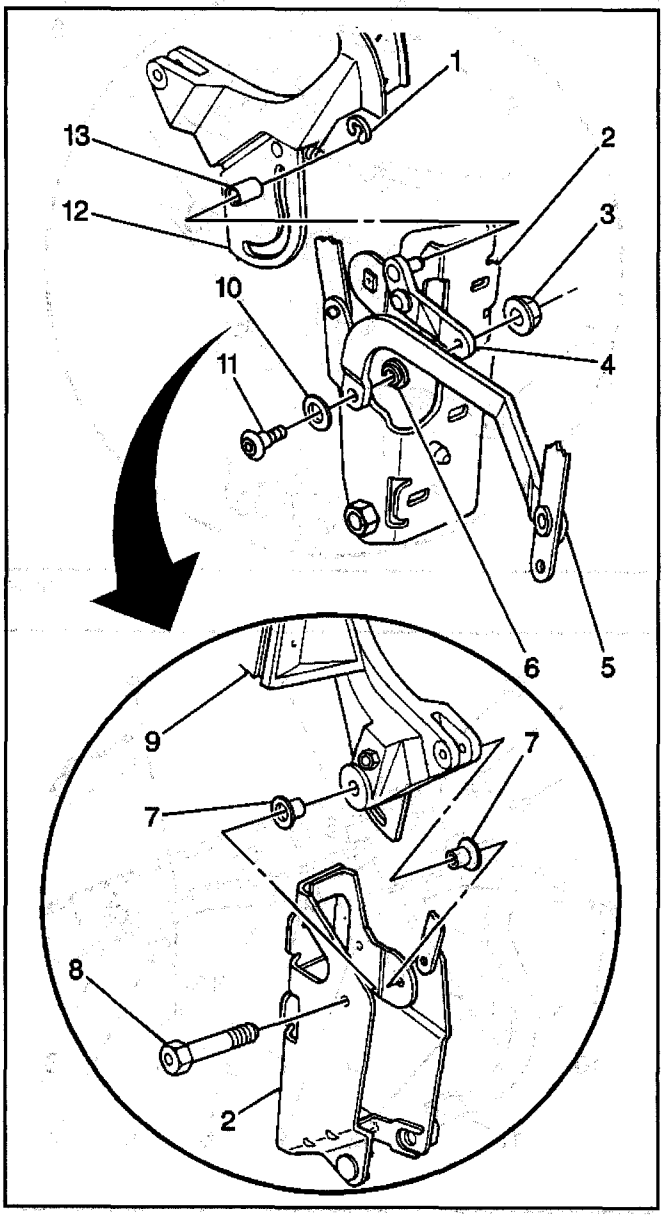


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29. Remove the pivot bracket (10).
30. Remove the old adhesive from the outer arm (1).



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Disassembly Procedure

1. Remove the side rail link pivot bolt (11), washer (10), and the rear side rail link nut (3).
2. Remove the balance link part of the side rail link and the bushing (6) from the idler link part of the pivot bracket.

Assembly Procedure

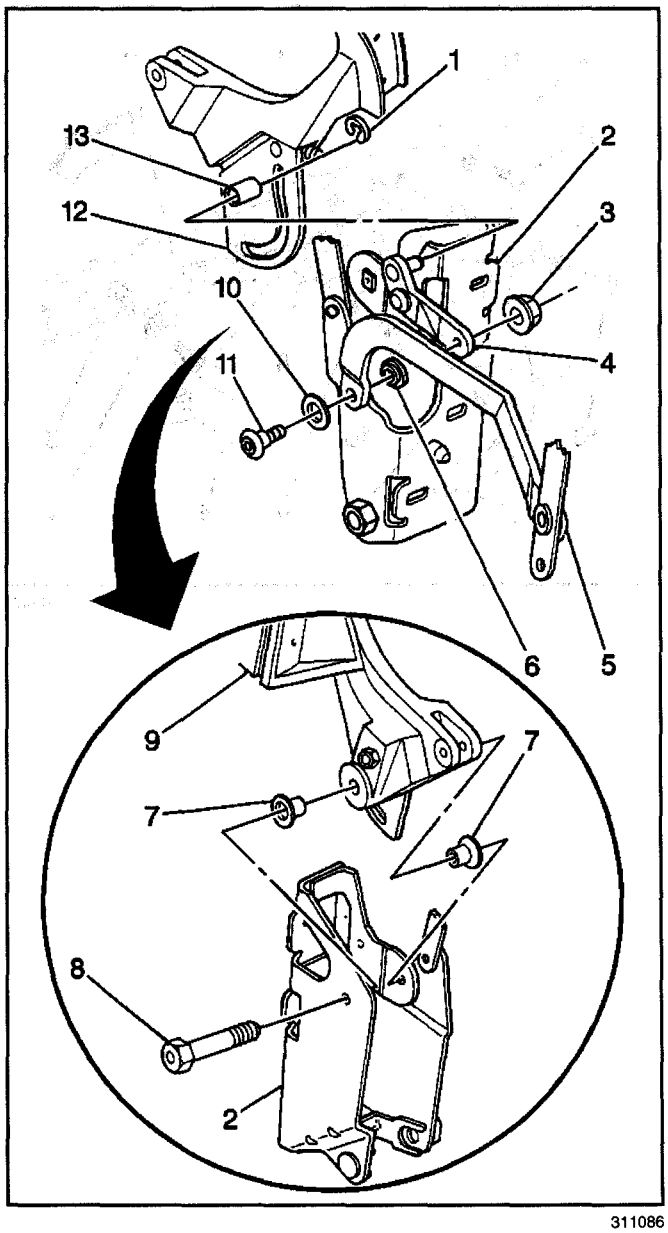
1. Install the balance link and bushing (6) to the idler link.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the side rail link pivot bolt (11), the washer (10), and the rear side rail link nut (3).

   Tighten

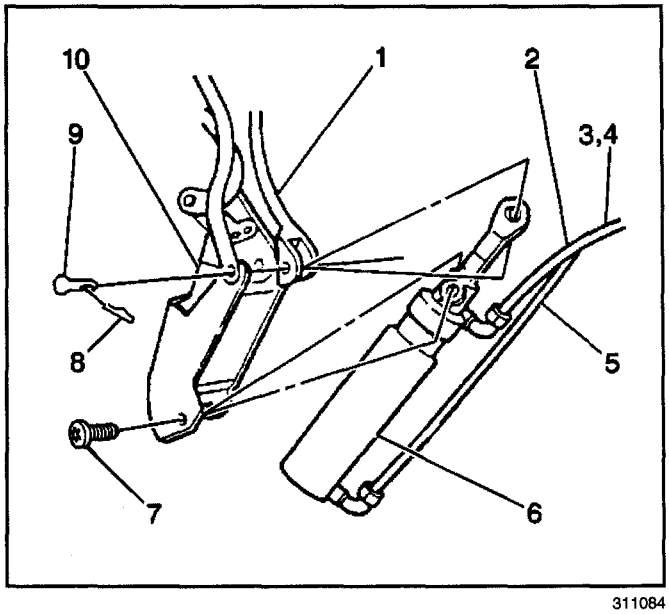
   Tighten the bolt (11) to 17 N·m (13 lb ft).



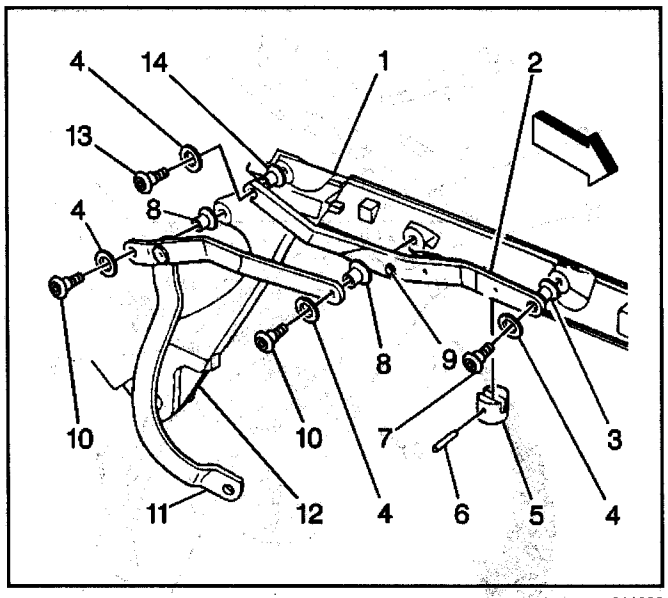
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Installation Procedure

1. Use Hughes P/N HC-4183, 3M P/N 8046, or equivalent adhesive on headliner or top cover attaching surfaces.
2. Install the pivot bracket (10).
3. Install the pivot bracket nuts.



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4. Install the side rail link (2) and bushing (8) to the side rail (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the bolts (10) and the washers (4).

   Tighten

   Tighten the bolts (10) to 17 N·m (13 lb ft).

6. Install the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
7. Install the side rail weatherstrip retainer. Refer to Weatherstrip Replacement - Folding Top.
8. Install the side rail weatherstrip. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
9. Install the number 4 bow links. Refer to *Folding Top Bow Link Replacement.*
10. Install the cylinder bolt.

    Tighten

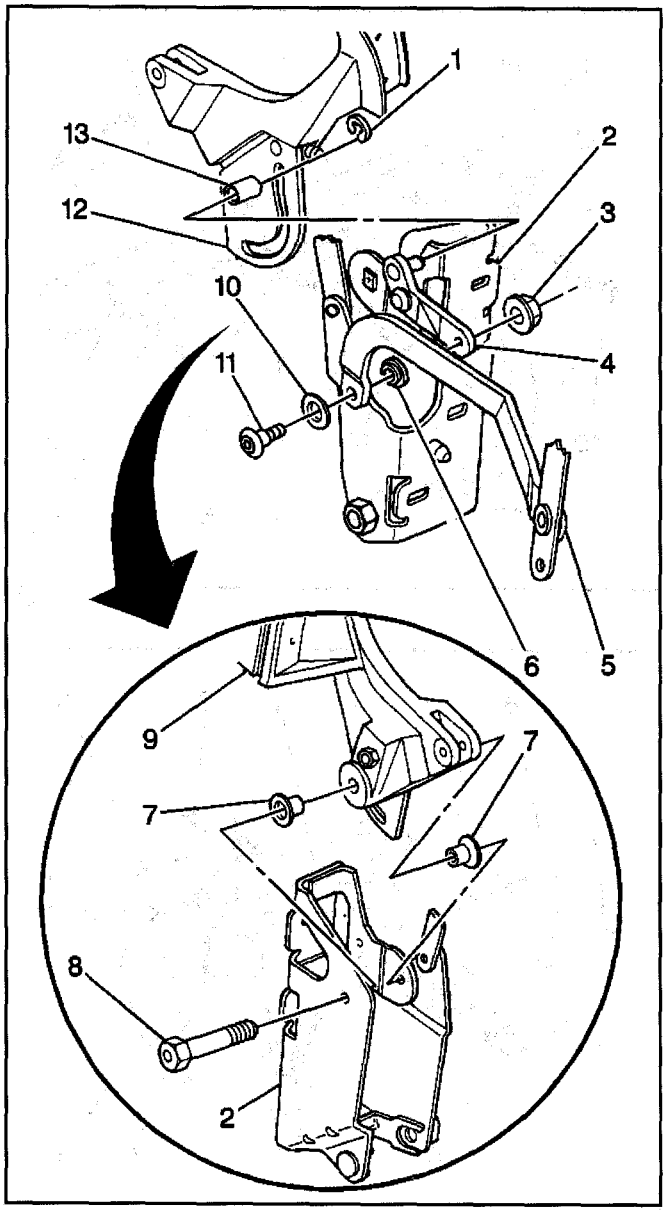
    Tighten the bolt to 5 N·m (44 lb in).

11. Install the speakers. Refer to *Speaker Replacement - Rear* in Entertainment.

12. Install the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel in Rear Quarters.
13. Install the outer arm (9) with the inner arm cam link (12) attached.
14. Install the outer arm pivot pin retainer (1).
15. Install the bolt (8) attaching the outer arm (9) to the pivot bracket (2).

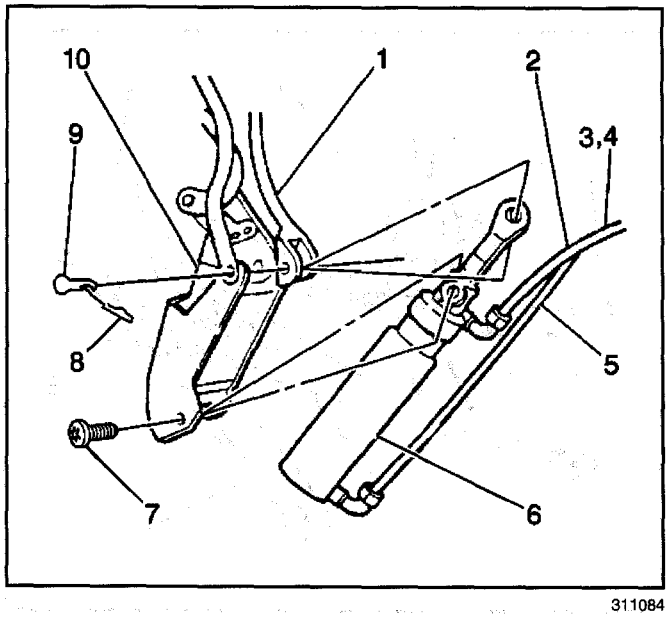
    Tighten

    Tighten the bolt (8) to 17 N·m (13 lb ft).

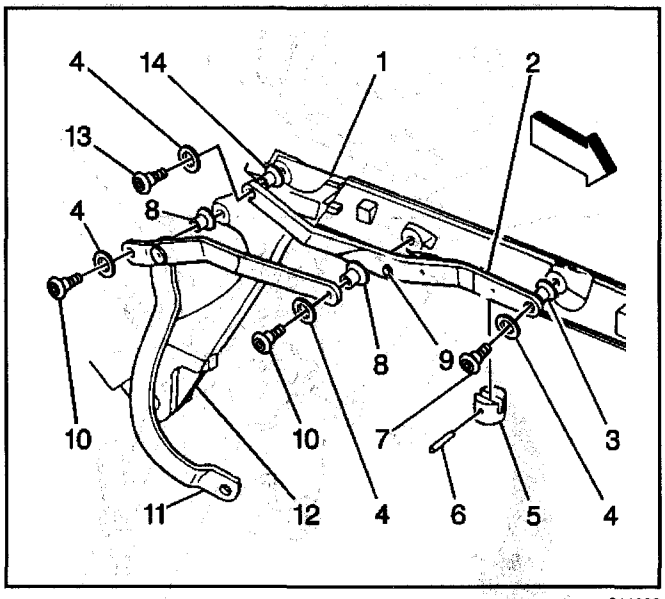


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16. Install the cylinder (6) to the outer arm (1).
17. Install the cylinder pivot pin (9) and the pivot bracket locking pin (8).



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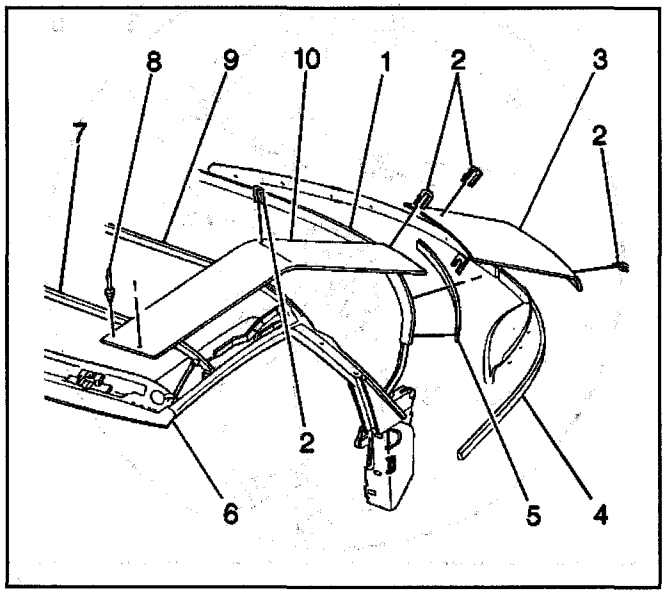


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18. Install the side rail link (2) and bushing (14) to the outer arm (12).
19. Install the bolt (13) and washer (4) and attaching the front side rail link (11) and bushing (8) to the outer arm (12).

Tighten

Tighten the bolt to 17 N·m (13 lb ft).



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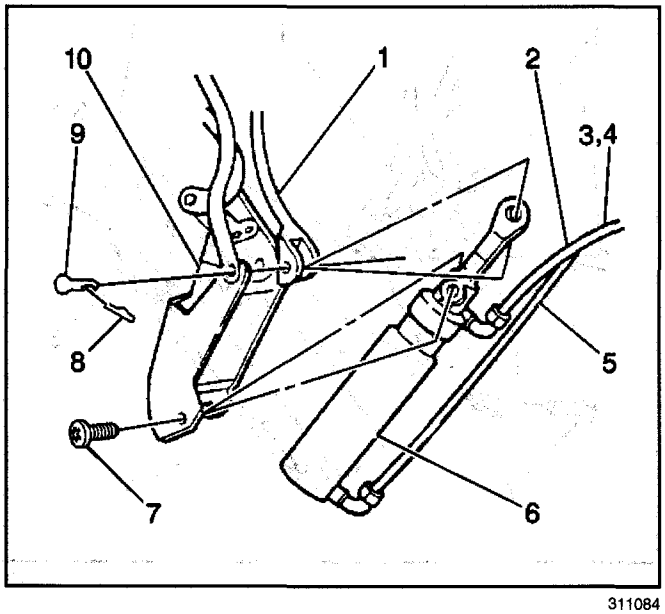
20. Install the number 3 bow bolts.

Tighten

Tighten the bolts (1) to 10 N·m (89 lb in).

21. Install the number 1, 2, 3, and 4 bow position pad (10) to the original position on the number 3 bow (9).

Install the staples at their original locations.



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22. Install the cover retainer cable.
23. Install the cover to the outer arm (1).
    23.1. Apply adhesive to the outer arm and to the portion of the cover being attached.
    23.2. Press the cover into place.
    23.3. Install the bolts.

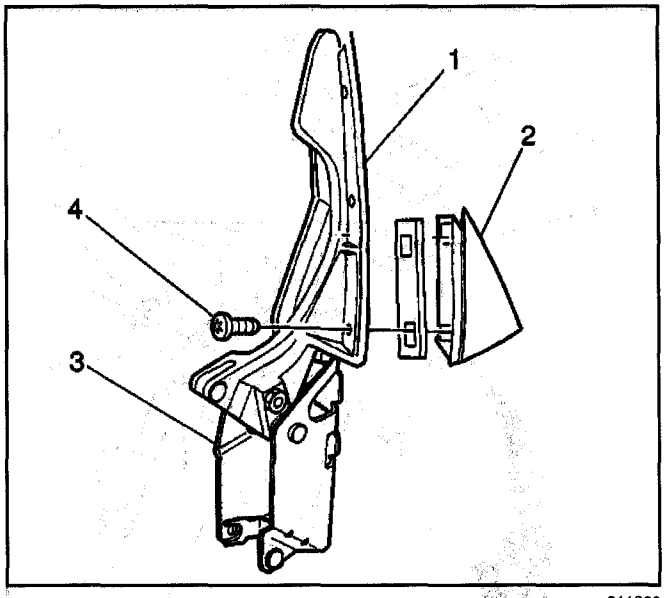
24. Install the quarter window filler (2).
25. Install the quarter window filler bolts (4).

    Tighten

    Tighten the bolts to 10 N·m (89 lb in).
26. Install the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side*.
27. Install the outer arm weatherstrip. Refer to Weatherstrip Replacement - Folding Top.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

28. Connect the negative battery cable.
29. Remove the support prop and raise the folding top.

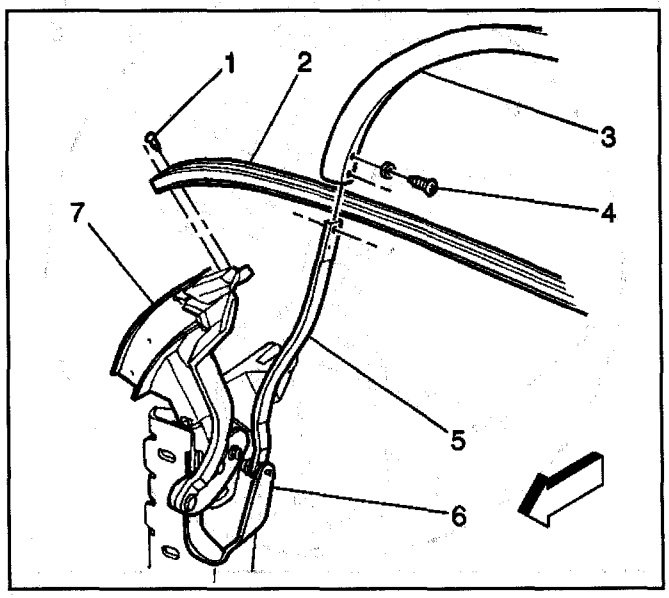


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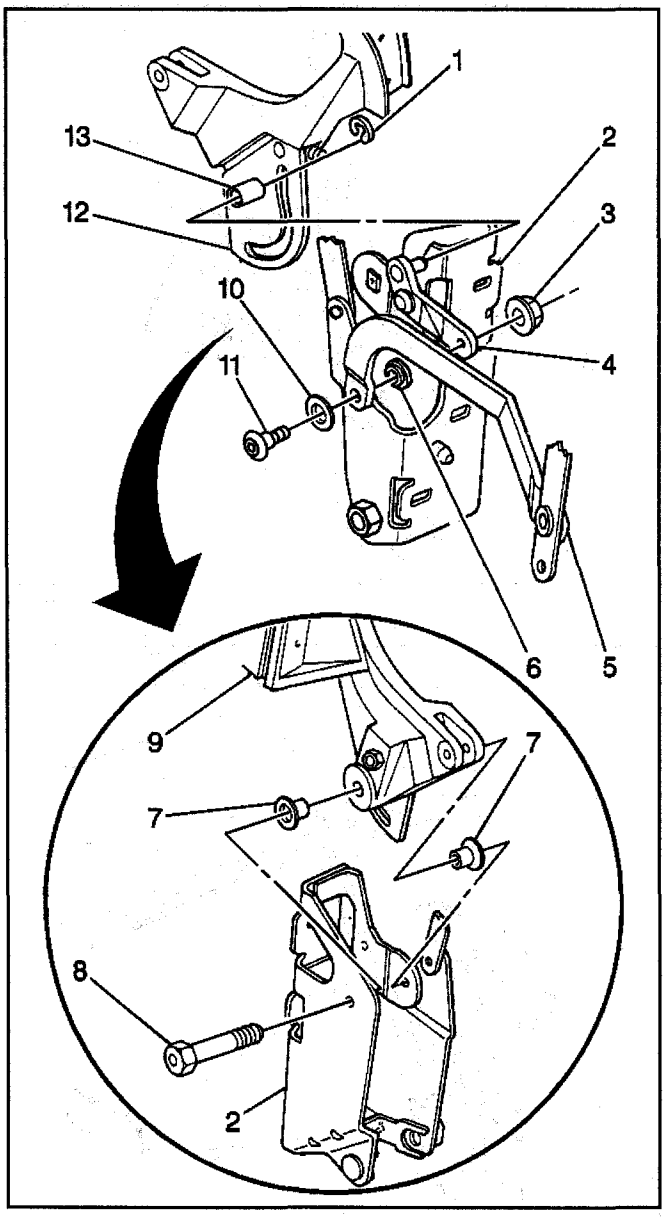
Folding Top Pivot Bracket Replacement

Removal Procedure

1. Remove the folding top from the vehicle.
2. Mark the end of the number 4 bow (3) on the number 4 bow links (5).
3. Remove the number 4 bow link bolts (4).
4. Remove the number 4 bow (3) from the number 4 bow links (5).



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5. Remove the following components from the side rail:
   - The bolts (11)
   - The washers (10)
   - The bushings (6)
   - The nuts (3)
6. Remove the balance link from the idler link.
7. Remove the E clip and the roller from the idler link.
8. Remove the outer arm pivot bolt (8).
9. Remove the pivot bracket (2) from the outer arm (9).

Installation Procedure

1. Install the pivot bracket (2) to the outer arm (9).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

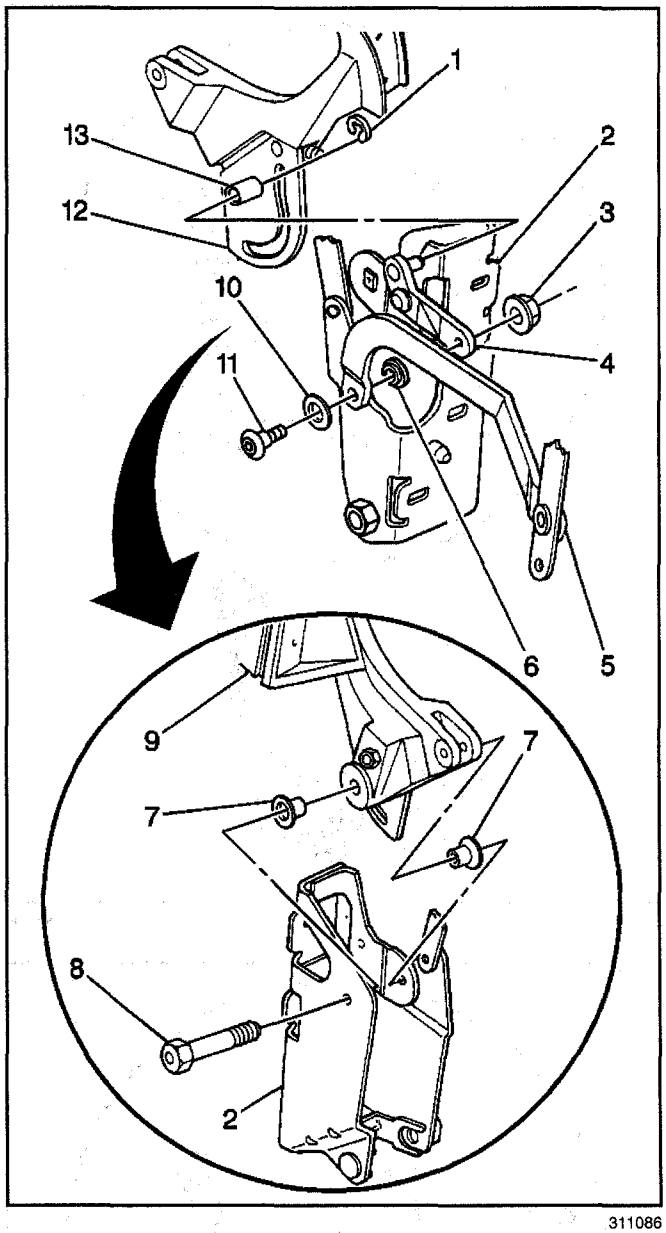
2. Install the outer arm pivot bolt (8).

   Tighten

   Tighten the bolt (8) to 17 N·m (13 lb ft).
3. Install the roller and the E clip to the idler link.
4. Install the balance link to the idler link.
5. Install the washers (10).
6. Install the bushings (6).
7. Install the nuts (3).
8. Install the side rail link pivot bolts (11).

   Tighten

   Tighten the bolts (11) to 17 N·m (13 lb ft).

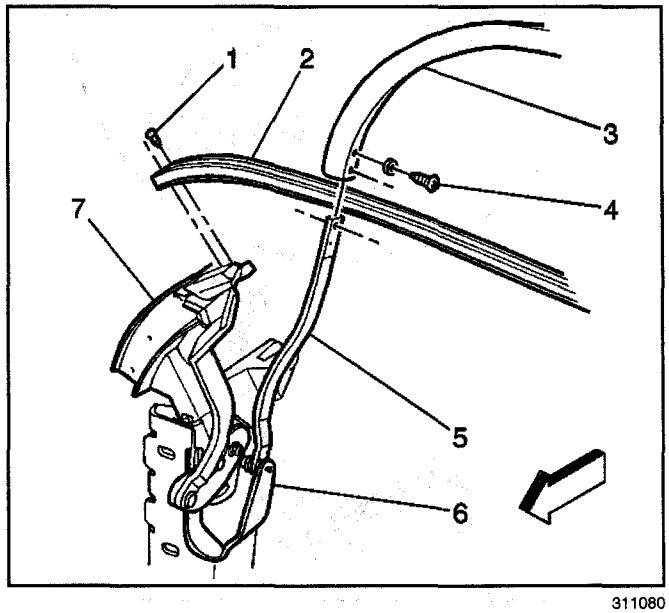


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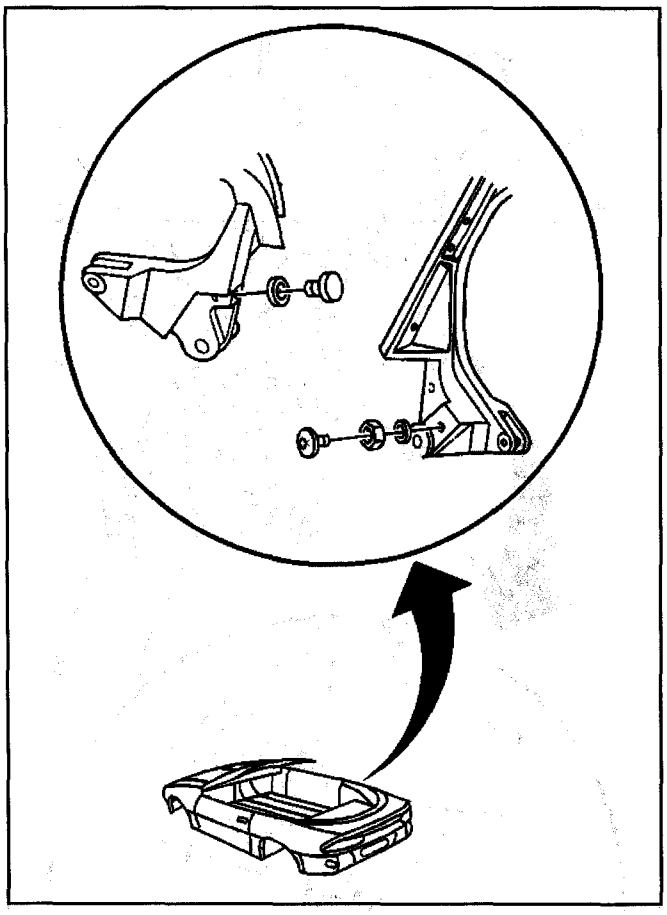
9. Install the number 4 bow (3) to the number 4 bow links (5).
10. Install the number 4 bow link bolts (4).

    Tighten

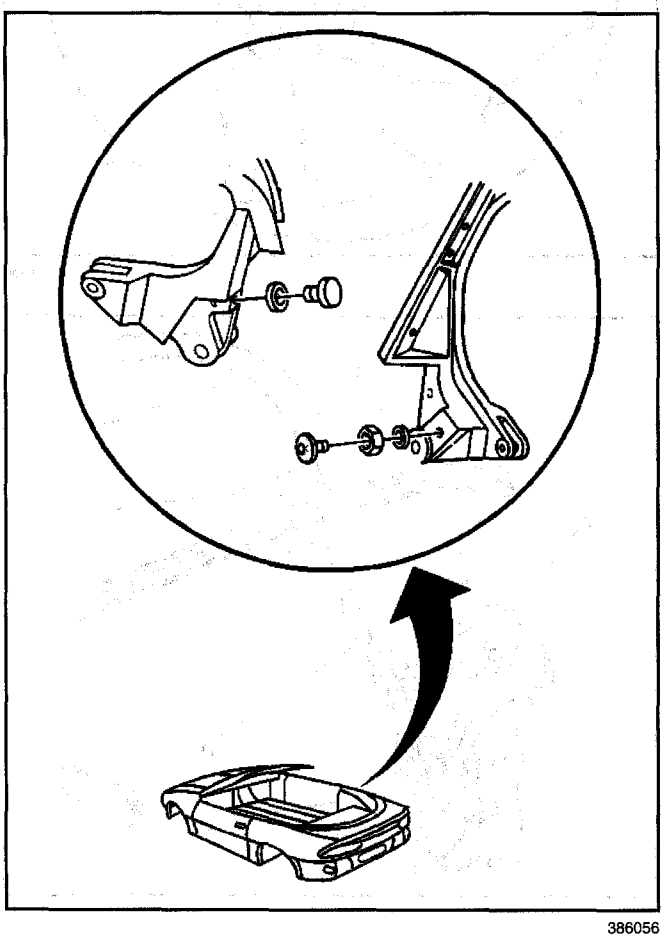
    Tighten the bolts (4) to 10 N·m (89 lb in).
11. Install the folding top to the vehicle. Refer to Folding Top Complete Replacement.



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Folding Top Adjustment

Downstop Adjustment

1. Turn pump bypass valve to open position (full clockwise).
2. Lower folding top by hand.
3. Lay straightedge level across rearmost edge of side rail garnish moldings with straightedge level extending to left and right edges of vehicle.
4. Reposition plastic splash shield to allow access to downstop bolts/screws.
5. Loosen downstop bolts/screws.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

6. Adjust octagonal downstop cams so that folding top is level from left to right along straightedge level and allows sufficient clearance for boot cover to be installed

   Tighten

   Tighten the downstop bolts/screws to 17 N·m (13 lb ft).
7. Remove straightedge level.
8. Turn pump bypass valve to closed position (full counterclockwise).
9. Perform upstop adjustment if necessary as outlined in the procedure below, otherwise raise top (automatically).

Upstop Adjustment

1. Turn pump bypass valve to open position (full clockwise).
2. Lower folding top by hand.
3. Turn upstops all the way in (clockwise).
4. Raise (manually) and latch folding top.
5. With top latched, turn each upstop counterclockwise (out) until they contact pivot bracket.
6. Lower folding top (manually).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

7. Turn upstops out of outer arm an additional 1/4 of a turn.

   Tighten

   Tighten the jamb nut on upstops to 17 N·m (13 lb ft).
8. Turn pump bypass valve to closed position (full counterclockwise).
9. Raise and latch convertible top.

Folding Top Front Side Rail Link Replacement

Removal Procedure

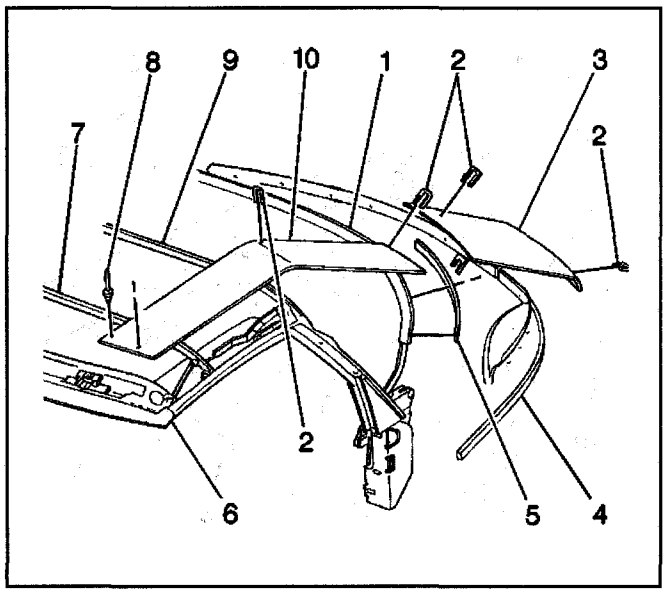
1. Lower the folding top halfway down and prop the top with a suitable support.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

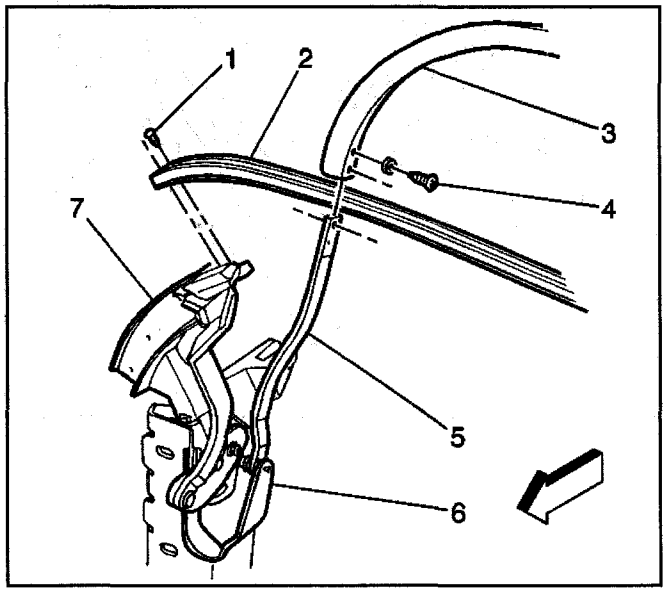
2. Disconnect the negative battery cable.
3. Remove the outer arm weatherstrip. Refer to Folding Top Outer Arm Weatherstrip.
4. Remove the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side*.
5. Remove the quarter window filler bolts (4).
6. Remove the quarter window filler (2).
7. Remove the cover from the outer arm (1) by removing the bolts and peeling the cover away from the adhesive.
8. Remove the cover retainer cable.
9. Remove the staples connecting the number 1, 2, 3, and 4 bow position pad (10) to the number 3 bow (9).

   Mark the location of the pad.
10. Slide the plastic tackstrip along the channel in the number 3 bow in order to reveal the bolts.

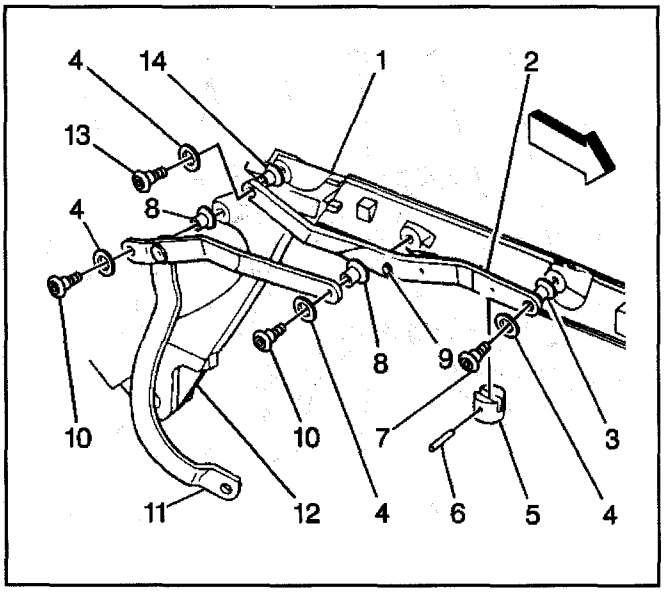
    Remove the bolts (1) from the number 3 bow (2).



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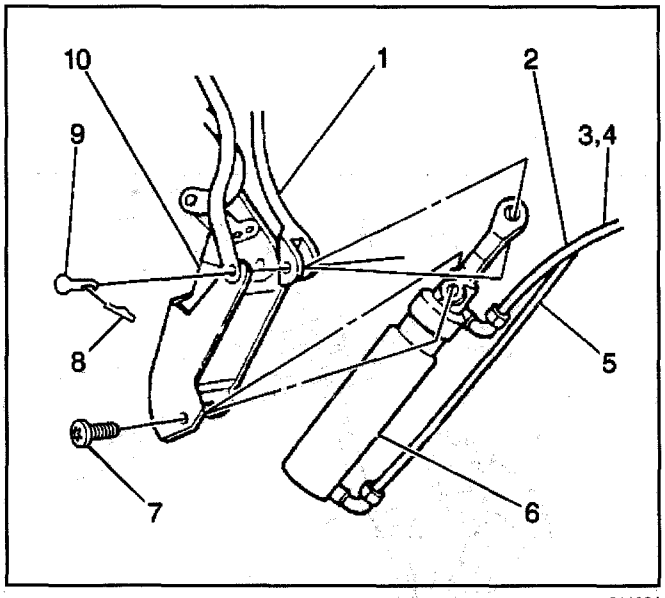


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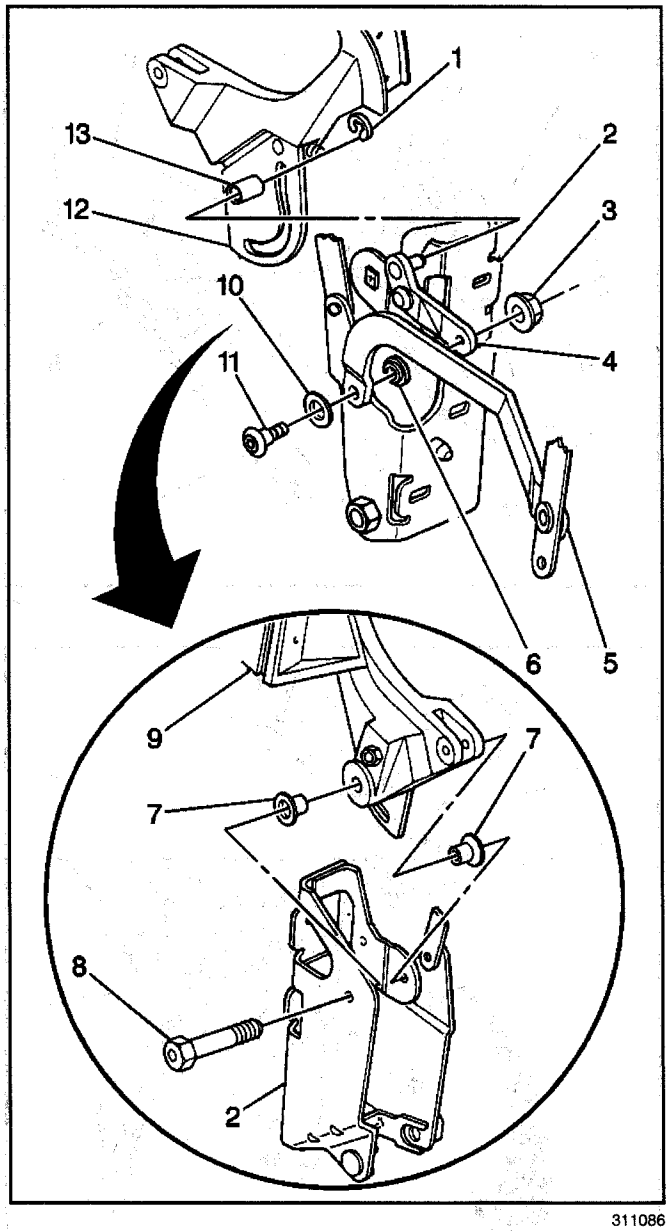
11. Remove the bolts (13) and washers (4).
12. Remove the side rail link (2) and the bushing (14) from the outer arm (12).
13. Remove the front side rail link (11) and bushing (8) from the outer arm (12).



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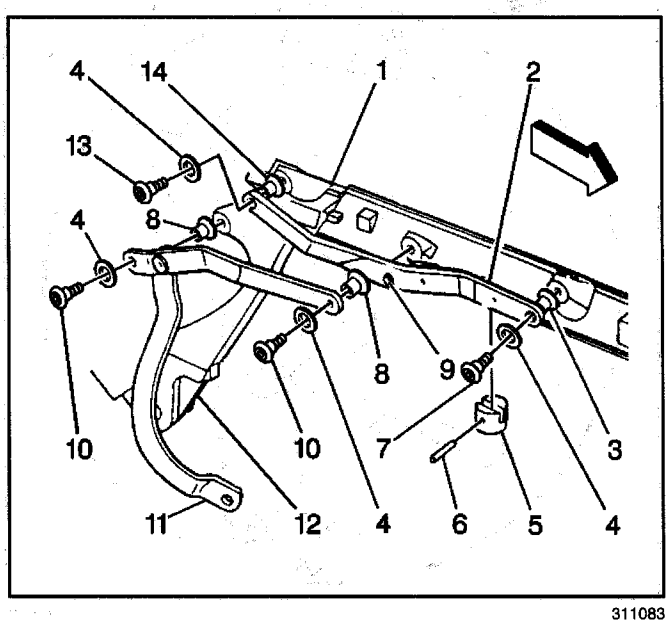
14. Remove the pivot bracket locking pin (8) and cylinder pivot pin (9).
15. Remove the cylinder (6) from the outer arm (1).

16. Remove the bolt (8) attaching the outer arm (9) to the pivot bracket (2).
17. Remove the outer arm pivot pin retainer (1).
18. Remove the outer arm (9) with the inner arm link cam (12) attached.
19. Remove the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel in Rear Quarters.
20. Remove the speakers. Refer to Speaker Replacement in Rear Quarters.
21. Remove the cylinder bolt.
22. Remove the number 4 bow links. Refer to *Folding Top Bow Link Replacement.*
23. Remove the side rail weatherstrip. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
24. Remove the side rail weatherstrip retainer. Refer to Weatherstrip Replacement - Folding Top.
25. Remove the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.

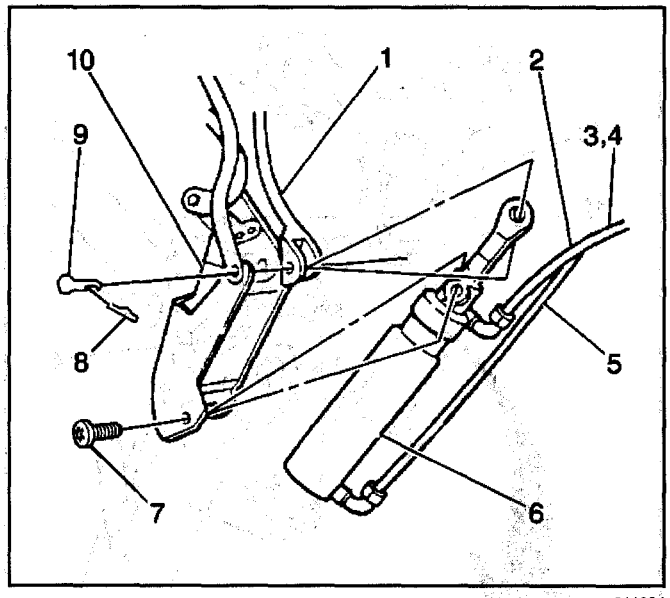


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26. Remove the bolts (10) and washers (4).
27. Remove the side rail link (2) and the bushing (8) from the side rail (1).
28. Remove the pivot bracket nuts.

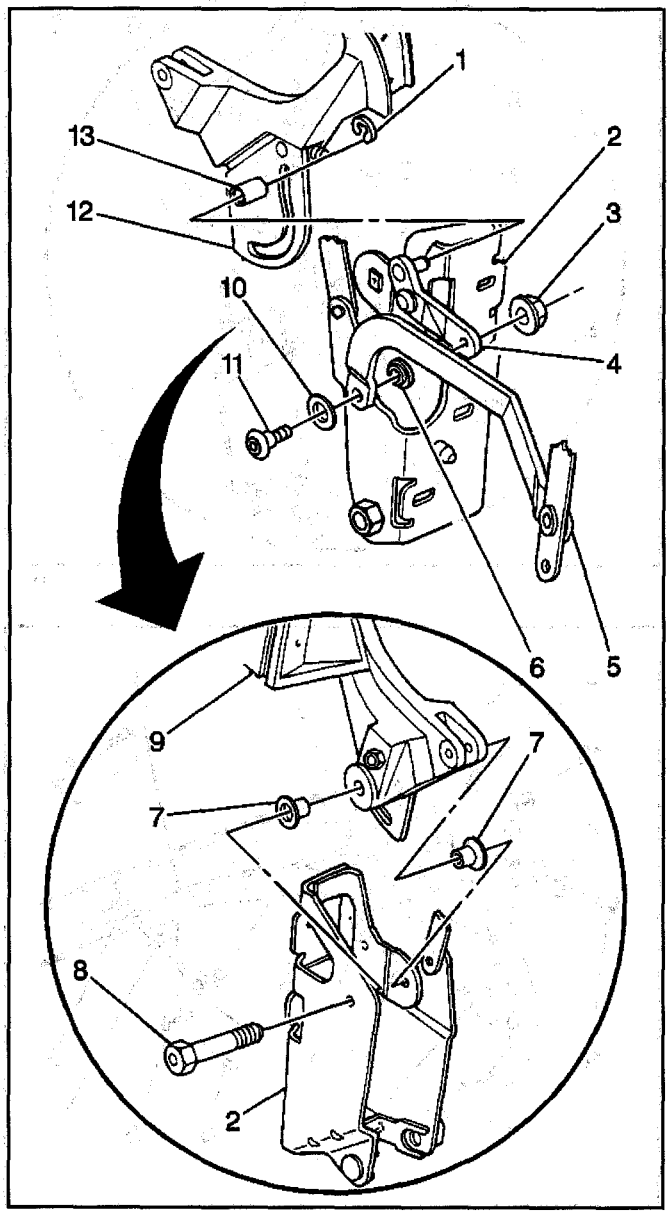


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29. Remove the pivot bracket (10).
30. Remove the old adhesive from the outer arm (1).



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Disassembly Procedure

1. Remove the side rail link pivot bolt (11), washer (10), and the rear side rail link nut (3).
2. Remove the balance link part of the side rail link and the bushing (6) from the idler link part of the pivot bracket.

Assembly Procedure

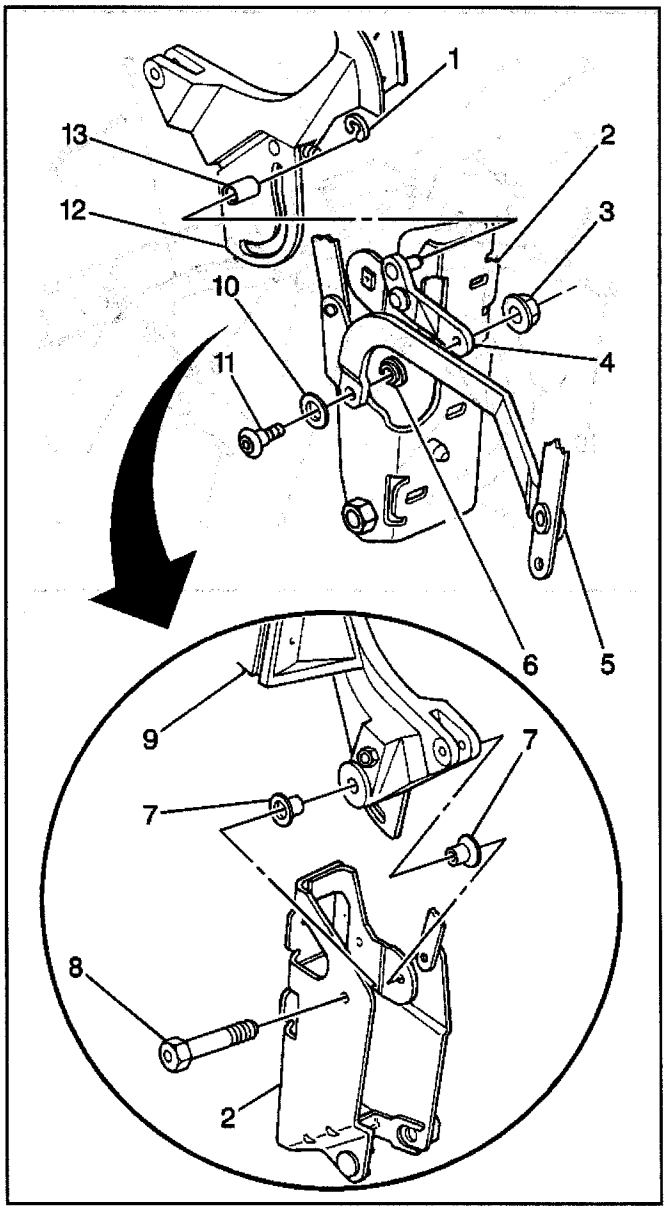
1. Install the balance link and bushing (6) to the idler link.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the side rail link pivot bolt (11), the washer (10), and the rear side rail link nut (3).

   Tighten

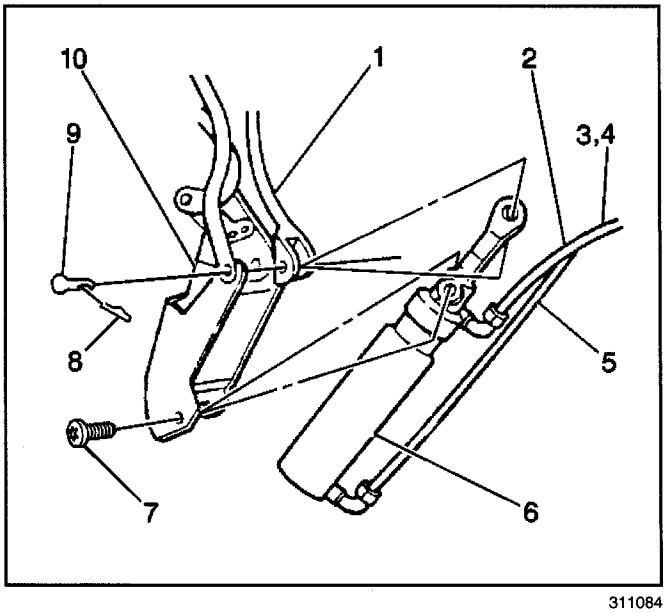
   Tighten the bolt (11) to 17 N·m (13 lb ft).



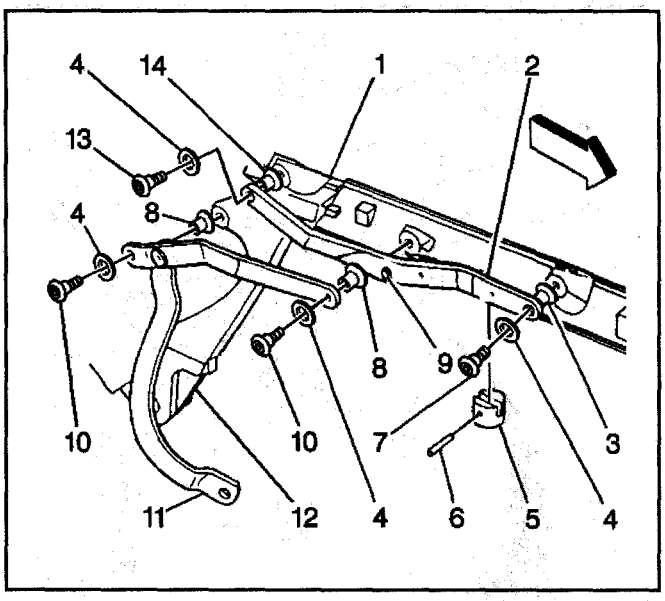
311086

Installation Procedure

1. Use Hughes P/N HC-4183, 3M P/N 8046, or equivalent adhesive on headliner or top cover attaching surfaces.
2. Install the pivot bracket (10).
3. Install the pivot bracket nuts.



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4. Install the side rail link (2) and bushing (8) to the side rail (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the bolts (10) and the washers (4).

   Tighten

   Tighten the bolts (10) to 17 N·m (13 lb ft).

6. Install the side rail garnish molding. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
7. Install the side rail weatherstrip retainer. Refer to Weatherstrip Replacement - Folding Top.
8. Install the side rail weatherstrip. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
9. Install the number 4 bow links. Refer to *Folding Top Bow Link Replacement.*
10. Install the cylinder bolt.

    Tighten

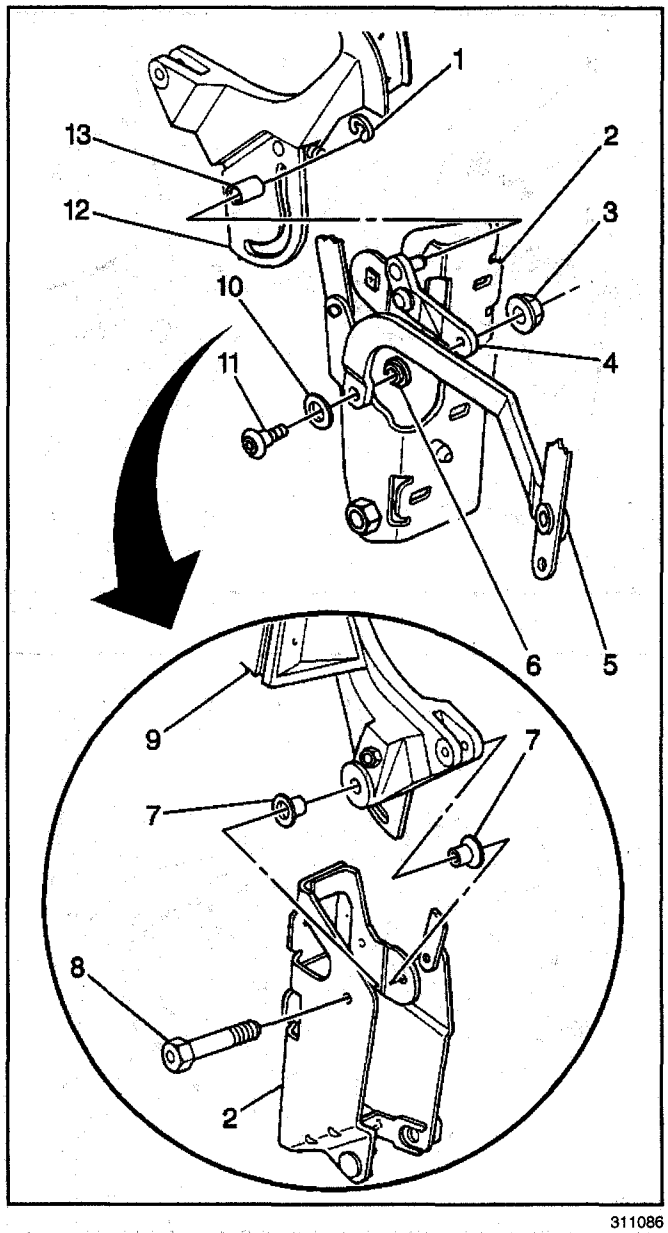
    Tighten the bolt to 5 N·m (44 lb in).

11. Install the speakers. Refer to *Speaker Replacement - Rear.*

12. Install the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel in Rear Quarters.
13. Install the outer arm (9) with the inner arm cam link (12) attached.
14. Install the outer arm pivot pin retainer (1).
15. Install the bolt (8) attaching the outer arm (9) to the pivot bracket (2).

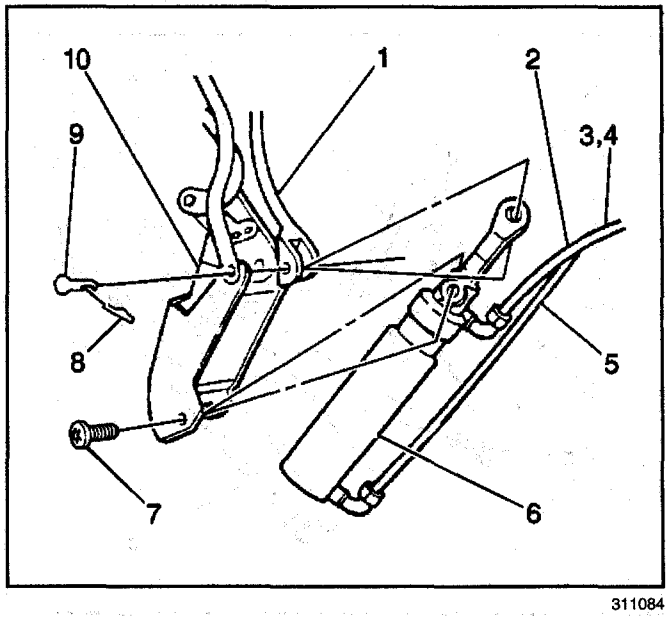
    Tighten

    Tighten the bolt (8) to 17 N·m (13 lb ft).

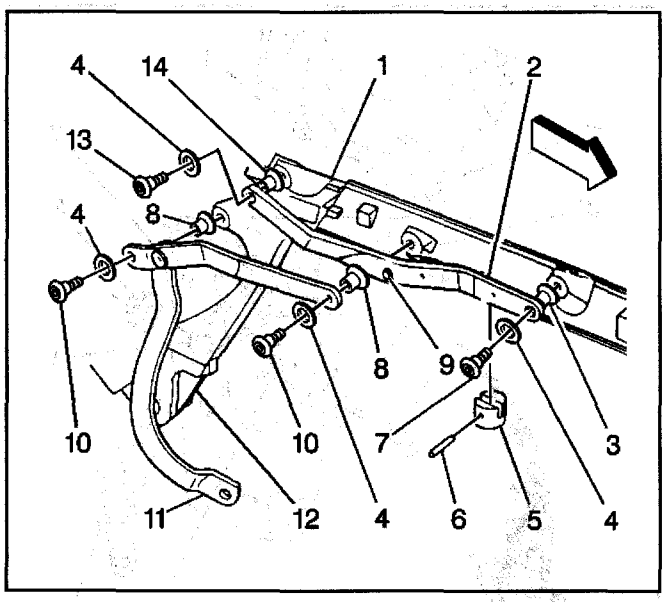


311086

16. Install the cylinder (6) to the outer arm (1).
17. Install the cylinder pivot pin (9) and the pivot bracket locking pin (8).



311084

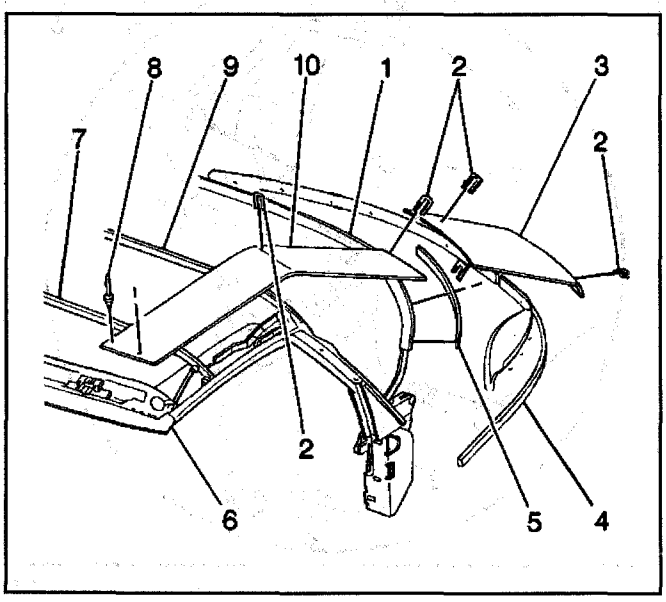


311083

18. Install the side rail link (2) and bushing (14) to the outer arm (12).
19. Install the bolt (13) and washer (4) and attaching the front side rail link (11) and bushing (8) to the outer arm (12).

Tighten

Tighten the bolt to 17 N·m (13 lb ft).



311079

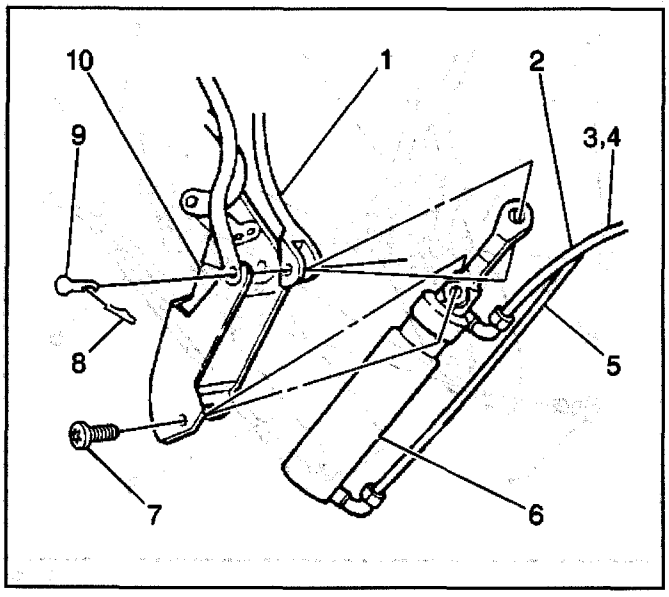
20. Install the number 3 bow bolts.

Tighten

Tighten the bolts (1) to 10 N·m (89 lb in).

21. Install the number 1, 2, 3, and 4 bow position pad (10) to the original position on the number 3 bow (9).

Install the staples at their original locations.



311084

22. Install the cover retainer cable.
23. Install the cover to the outer arm (1).
    - 23.1. Apply adhesive to the outer arm and to the portion of the cover being attached.
    - 23.2. Press the cover into place.
    - 23.3. Install the bolts.

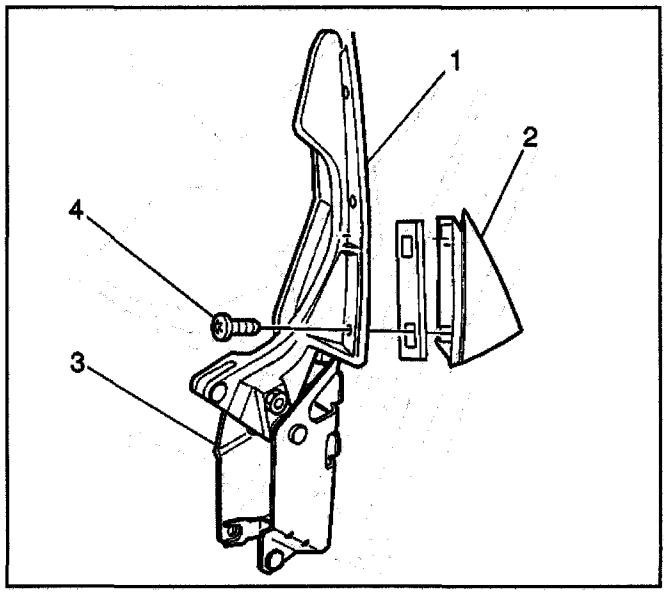
24. Install the quarter window filler (2).
25. Install the quarter window filler bolts (4).

    Tighten

    Tighten the bolts to 10 N·m (89 lb in).
26. Install the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
27. Install the outer arm weatherstrip. Refer to Weatherstrip Replacement - Folding Top.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

28. Connect the negative battery cable.
29. Remove the support prop and raise the folding top.



311089

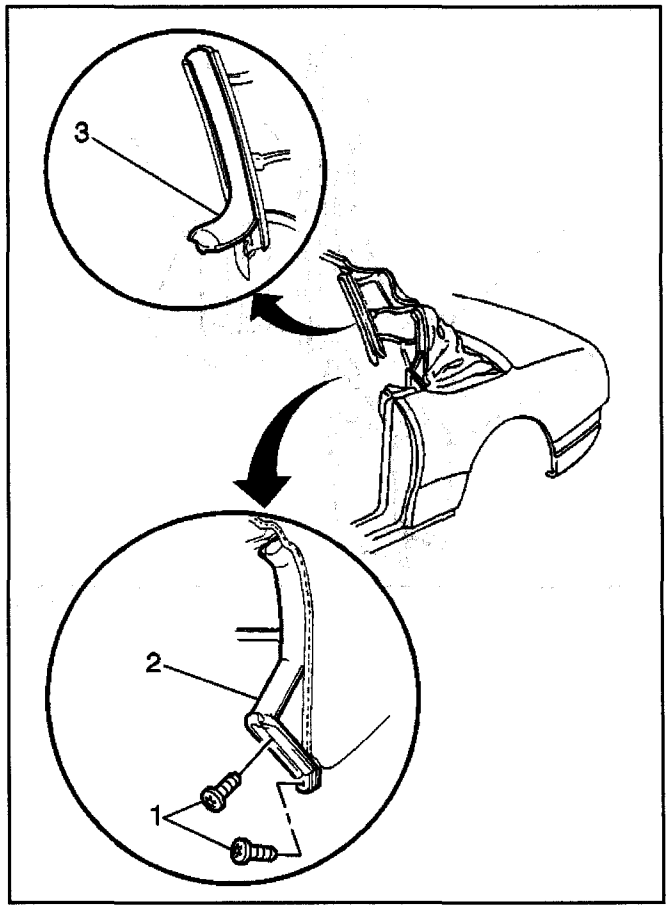
Folding Top Side Rail Assembly Replacement

Removal Procedure

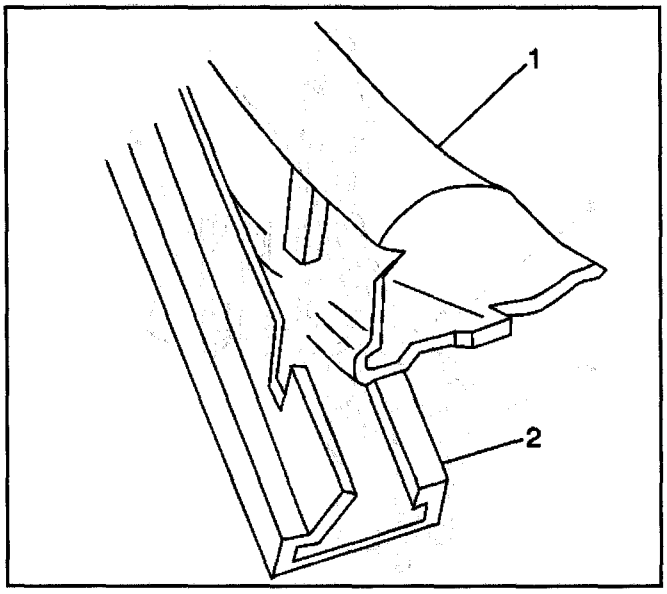
1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the roof side rail weatherstrip (3).



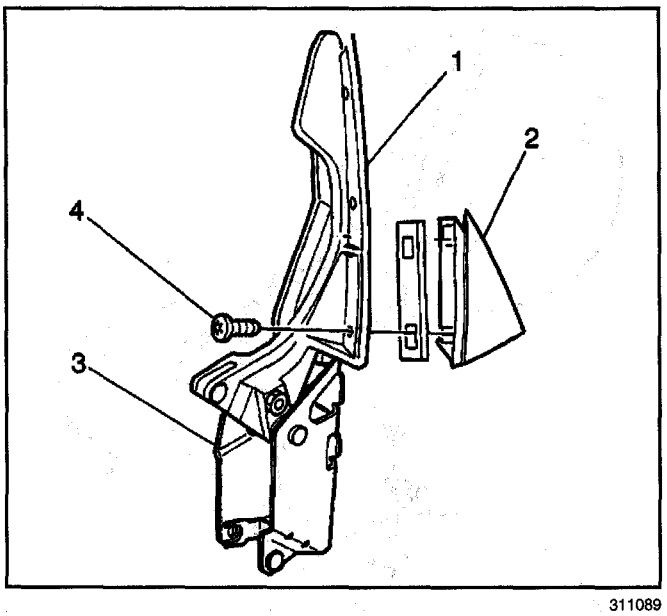
311091



311141

Installation Procedure

1. Install the roof side rail weatherstrip.
   1.1. Line up the bottom tab of the weatherstrip (1) into the notch in the weatherstrip retainer (2).
   1.2. Insert the weatherstrip (1) into the retainer (2).
   1.3. Roll the weatherstrip into place.
2. Reconnect the negative battery cable.
3. Raise the folding top.



311089

Folding Top Arm Replacement

Removal Procedure (On-Vehicle Service)

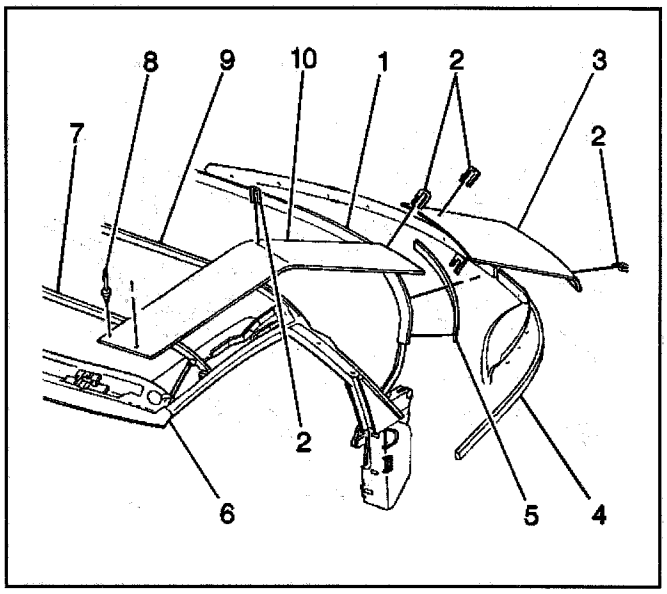
Important: If servicing an outer arm on only one side of the vehicle, follow the procedure titled On-Vehicle Service. If servicing an outer arm on both sides of the vehicle, follow the procedure titled Off-Vehicle Service.

1. Lower the folding top approximately halfway down. Prop the top with a suitable support.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

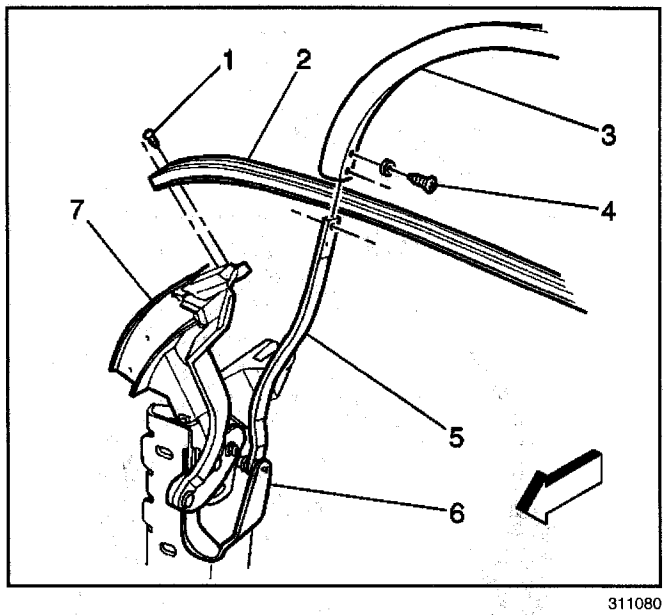
2. Disconnect the negative battery cable.
3. Remove the outer arm weatherstrip. Refer to Weatherstrip Replacement - Folding Top.
4. Remove the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side.*
5. Remove the quarter window filler bolts (4).
6. Remove the quarter window fillers (2).
7. Remove the cover from the outer arm (1) by removing the bolts.
8. Peel the cover away from the adhesive in order to remove the cover from the outer arm (1).
9. Remove the cover retainer cable.

10. Remove the staples connecting the number 1, 2, 3, and 4 bow position pad (10) to the number three bow (9).
    Mark the location of the pad and staples.



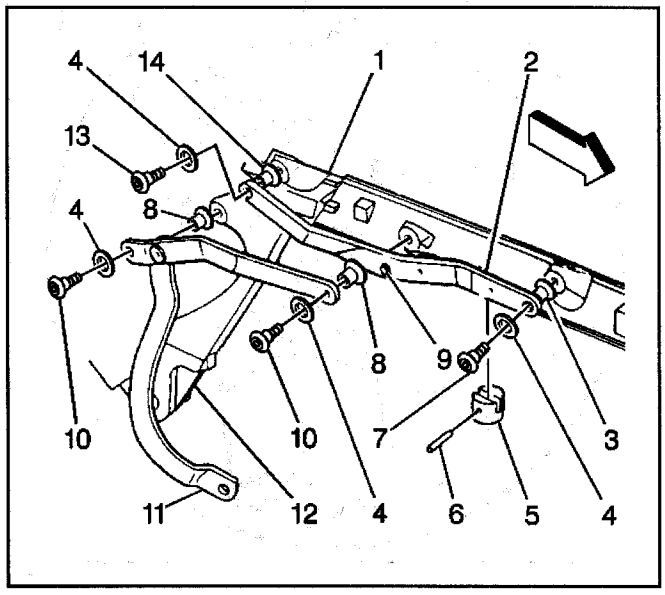
311079

11. Remove the bolts (1) from the number 3 bow (2).
    Slide the plastic tackstrip along the channel in the number 3 bow in order to reveal the bolts.

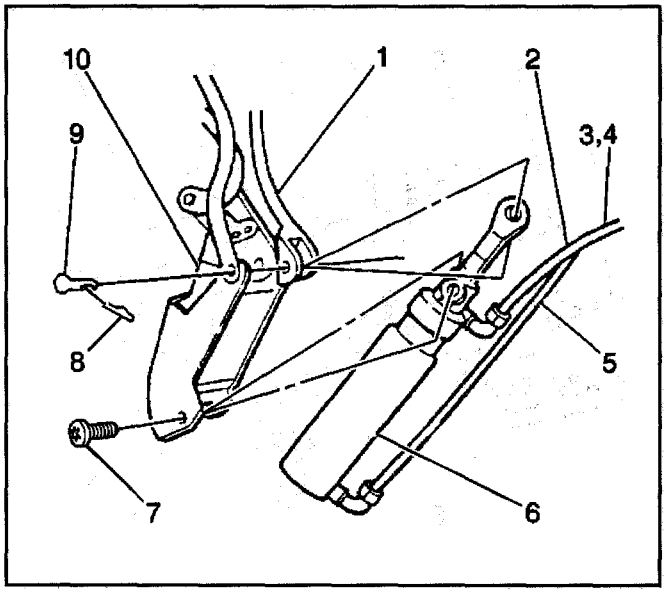


311080

12. Remove the front side rail link rear bolt (13) and washer (4).
13. Remove the front side rail link (2) and bushing (14) from the outer arm (12).
14. Remove the side rail link pivot bolt (10) and washer (4).
15. Remove the side rail link (11) from the outer arm (12).

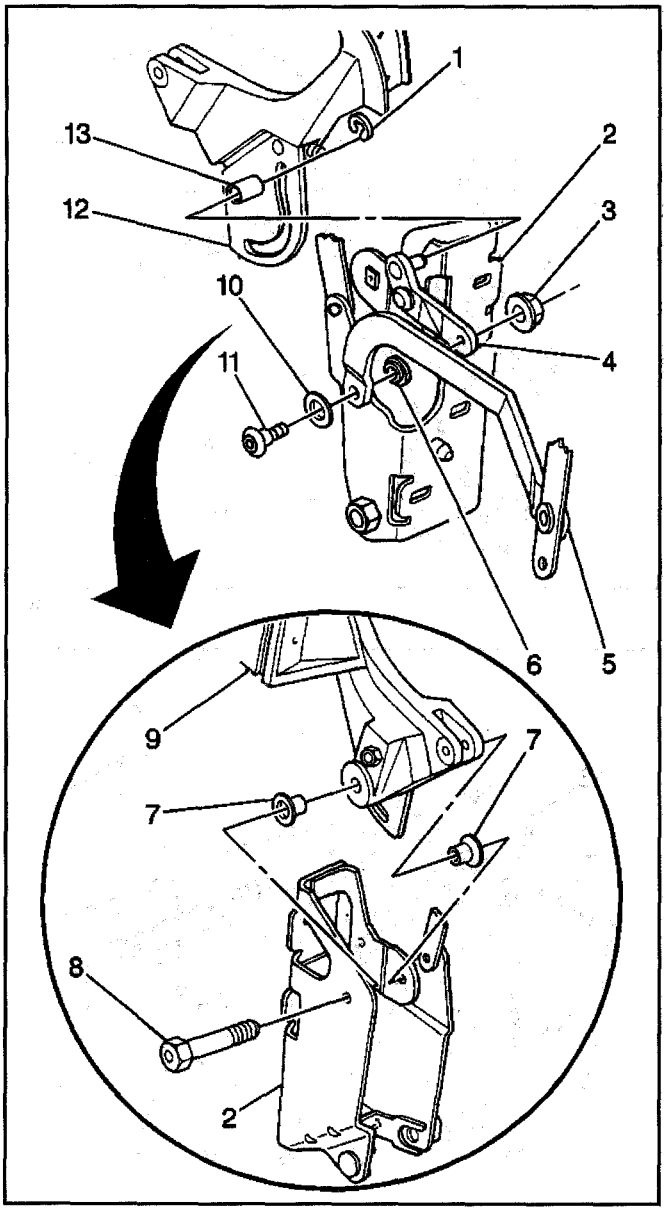


311083



311084

16. Remove the pivot bracket locking pin (8) and the cylinder pivot pin (9).
17. Remove the cylinder (6) from the outer arm (1).
18. Remove the bolt (7).



311086

19. Remove the outer arm pivot pin retainer (1).
20. Remove the outer arm (9) with the inner arm link cam (12) attached.
21. Clean the adhesive from the outer arm (9).

Installation Procedure (On-Vehicle Service)

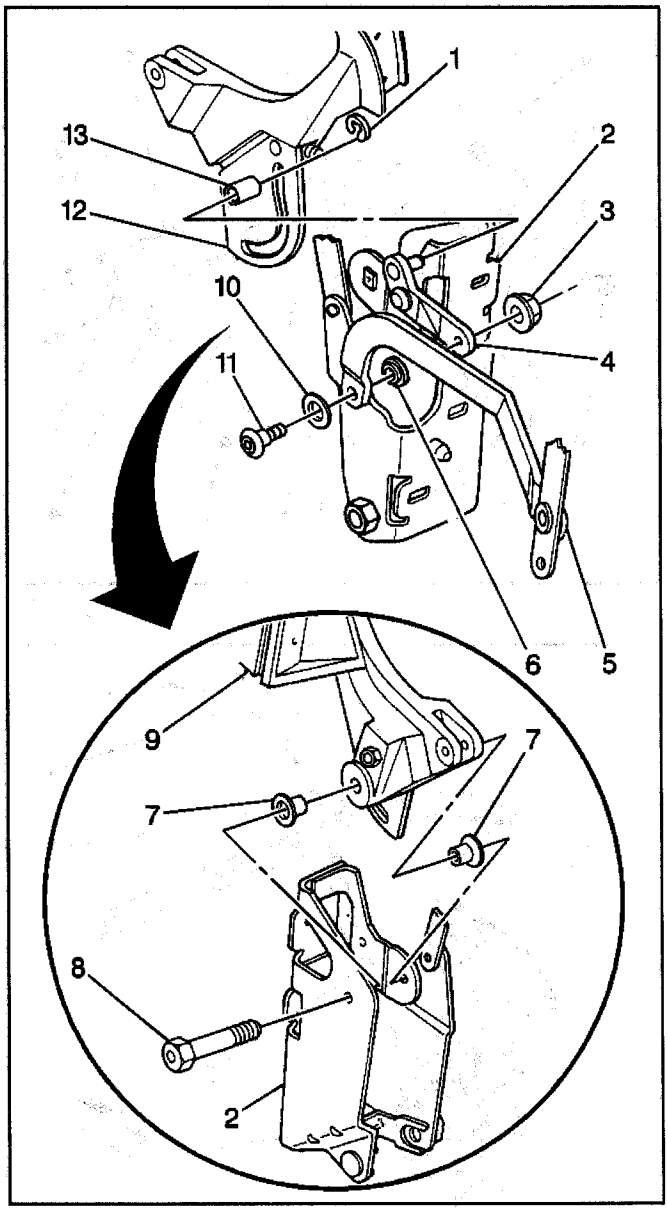
1. Use Hughes P/N HC-4183, 3M P/N 8046, or equivalent adhesive on the headliner or top cover attaching surfaces.
2. Install the outer arm (9) with the inner arm link cam (12) attached.
3. Install the outer arm pivot pin retainer (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the cylinder bolt (7).

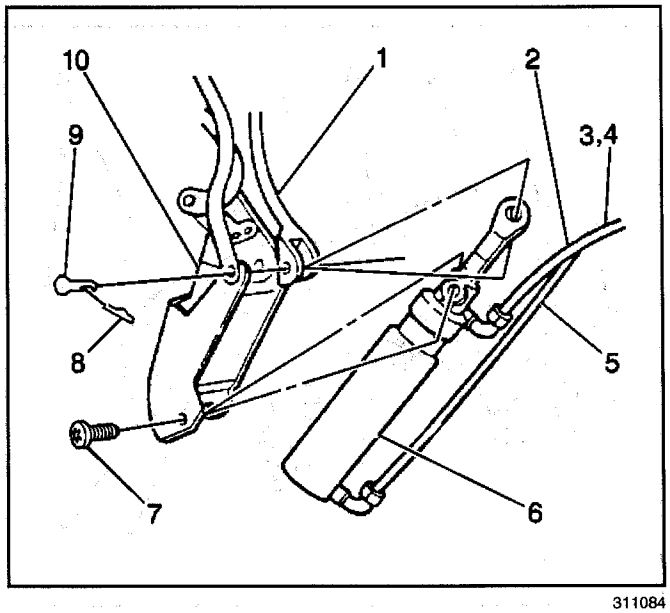
   Tighten

   Tighten the bolt (7) to 5 N·m (44 lb in).

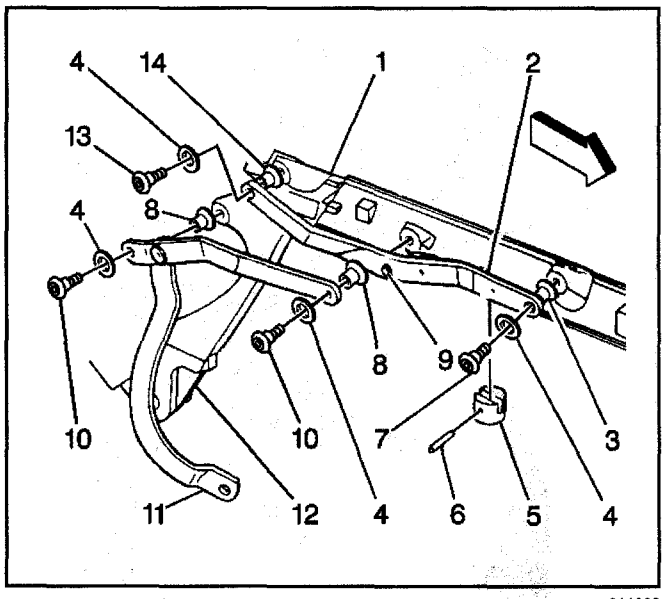


311086

5. Install the cylinder (6) to the outer arm (1).
6. Install the cylinder pivot pin (9) and pivot bracket locking pin (8).



311084



311083

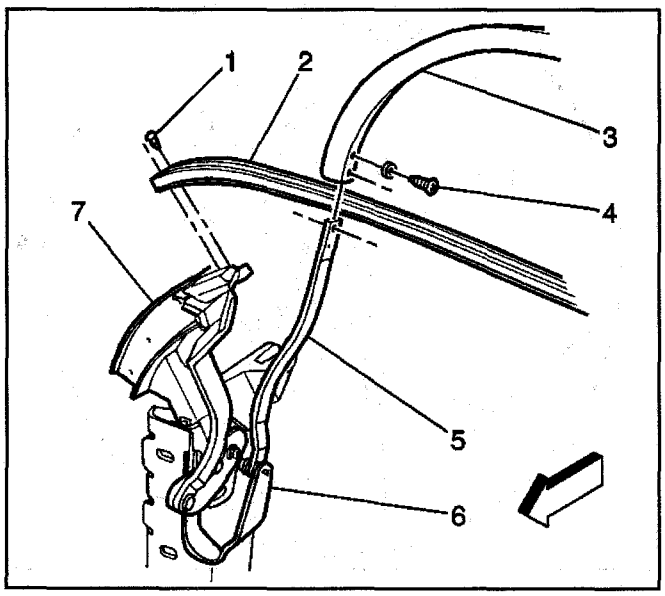
7. Install the side rail link (11) to the outer arm (12).
8. Install the front side rail link (2) and bushing (14) to the outer arm (12).
9. Install the side rail link pivot bolt (10) and washer (4).

   Tighten

   Tighten the bolt (10) to 17 N·m (13 lb ft).
10. Install the bolt (13)

    Tighten

    Tighten the bolt (13) to 17 N·m (13 lb ft).

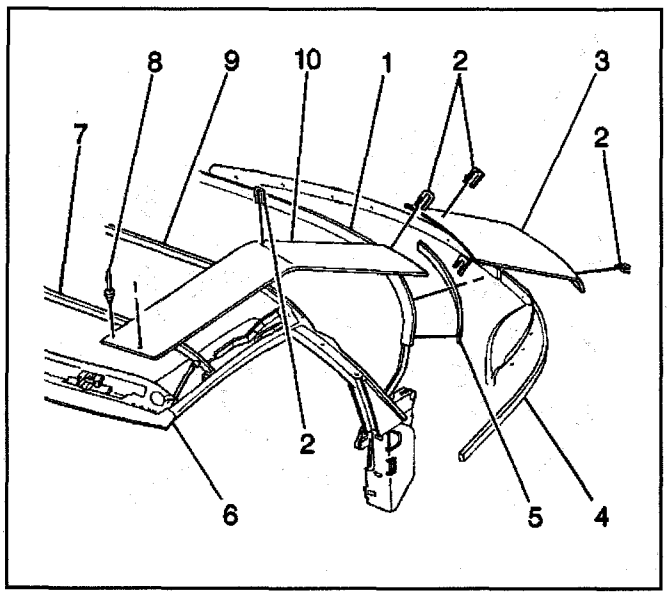


311080

11. Install the bolt (1) attaching the number 3 bow (2) to the outer arm (7).

    Tighten

    Tighten the bolts (1) to 10 N·m (89 lb in).
12. Return the plastic tackstrip to the original position.



311079

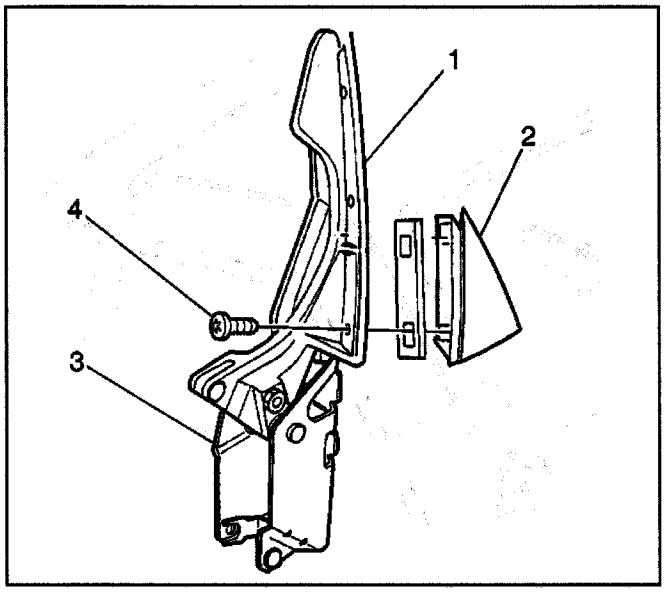
13. Install the number 1, 2, 3, and 4 bow position pad (10) to the original position on the number 3 bow (9).

    Install the staples to their original location.
14. Install the cover retainer cable.

15. Install the cover to the outer arm (1).
    15.1. Apply adhesive to the outer arm and to a portion of the cover being attached.
    15.2. Press the cover into place.
    15.3. Install the bolts.
16. Install the quarter window filler (2).
17. Install the quarter window filler bolts (4).

    Tighten

    Tighten the bolt (4) to 10 N·m (89 lb in).
18. Install the outer arm weatherstrip retainer. Refer to *Weatherstrip Retainer Protector and Seal - Side*.



311089

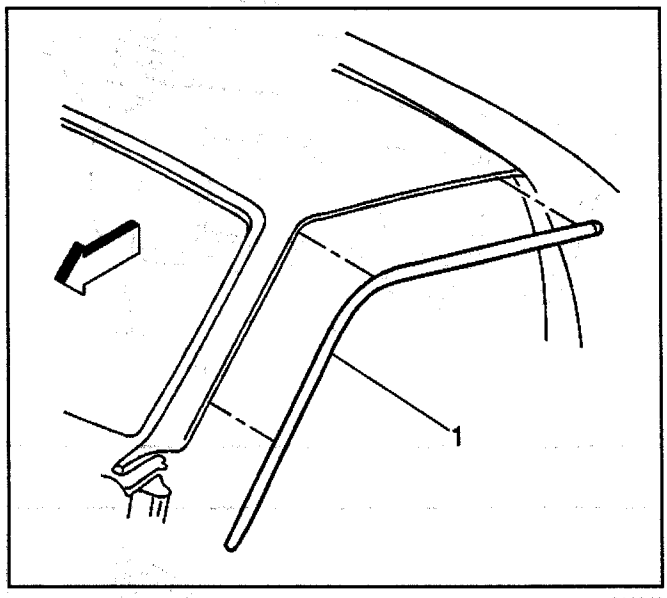
Important: The outer arm service part is not pre-drilled for the weatherstrip retainer screws. Use the weatherstrip retainer as a template in order to drill holes at the appropriate locations on the new outer arm.

19. Install the outer arm weatherstrip. Refer to Weatherstrip Replacement - Folding Top.
20. Reconnect the negative battery cable.
21. Remove the support prop and raise the folding top.

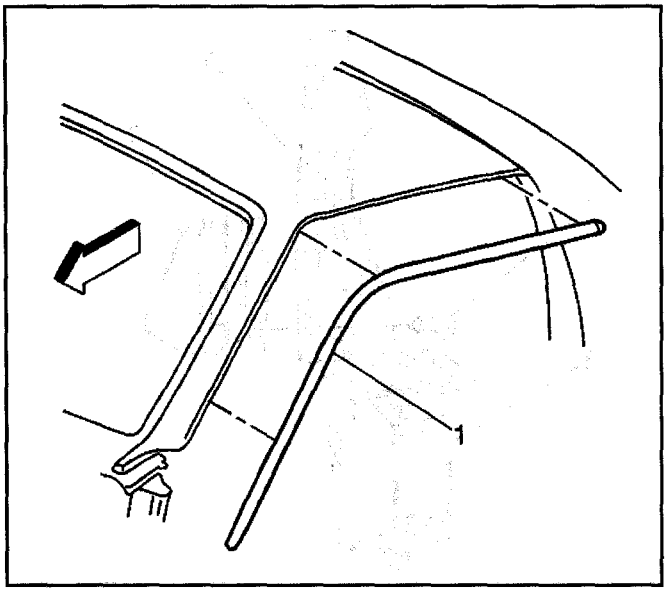
Drain Channel Replacement

Removal Procedure

Pull the roof drip scalp molding away from the door opening in order to remove the roof drip scalp molding (1).



311049



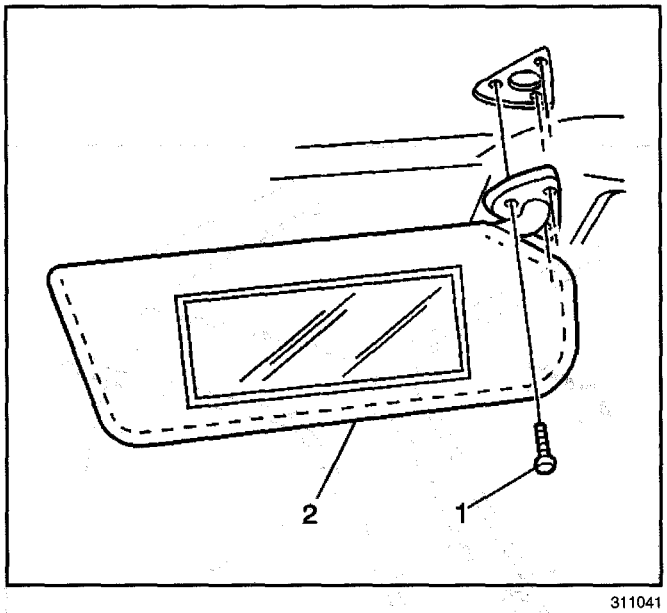
311049

Installation Procedure

Install the roof drip scalp molding (1) using the following method:

1. Begin installing the roof drip scalp molding (1) at the rear of the door opening.
2. Press the entire length of the roof drip scalp molding (1) in order to secure the molding.

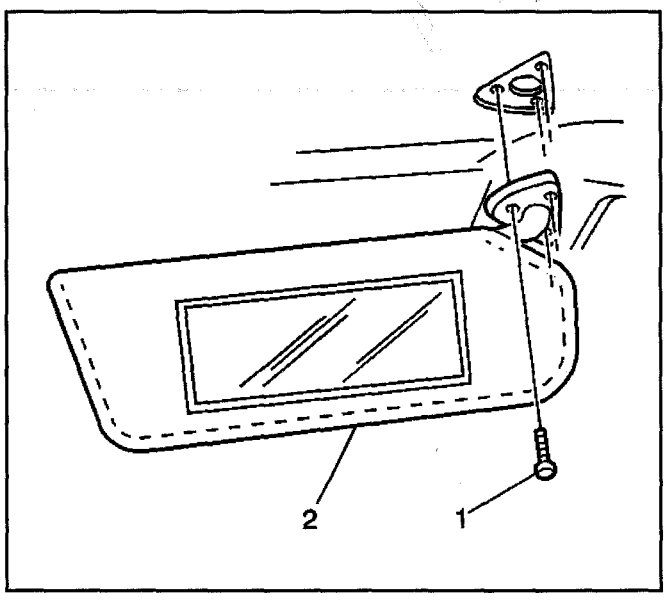
Sunshade Panel Replacement



311041

Removal Procedure

1. Remove the bolts (1).
2. Remove the sunshade (2).



311041

Installation Procedure

1. Install the sunshade (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt (1).

   Tighten

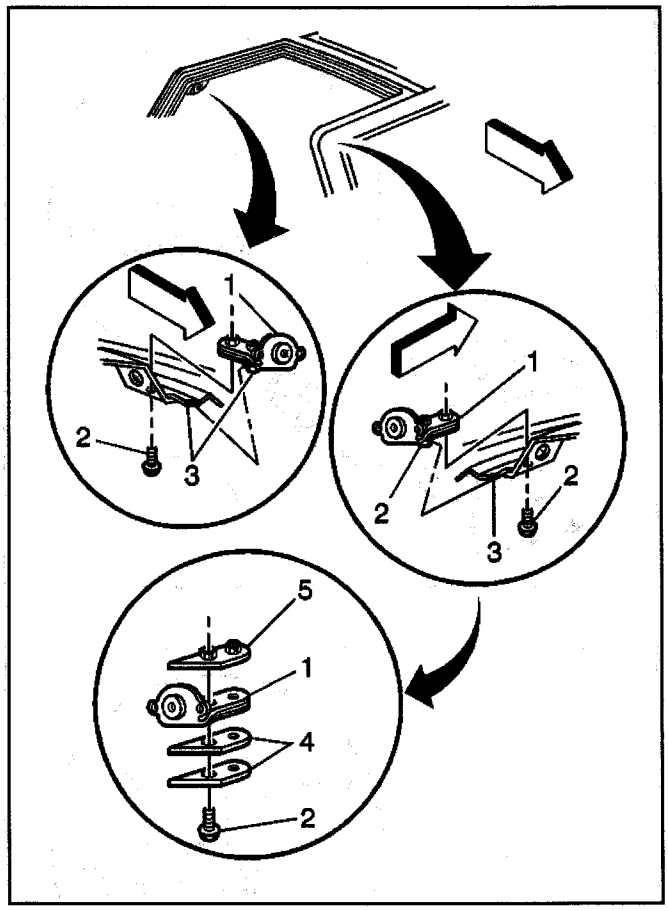
   Tighten the bolt (1) to 1.7 N·m (15 lb in).

Lift Off Panel Replacement

Removal Procedure

The roof lift-off window is adjustable within the lift-off window opening. The roof lift-off windows are adjusted up and down by adding or removing backing plates (4). Inboard/outboard and fore-and-aft travel is adjusted by loosening bolts/screws (2) and repositioning the front and rear strikers (1 & 3) as necessary. Adjustments should be made to get a flush fit of the roof lift-off window to the roof.

1. Remove roof lift-off window. Refer to *Lift-Out Panel Replacement*.
2. Remove windshield side upper garnish molding.
3. Remove quarter trim finish panel bolts/screws.
4. Remove quarter inner trim finish panel extension to access rear striker (3).
5. Loosen bolts/screws (2).



386084

Installation Procedure

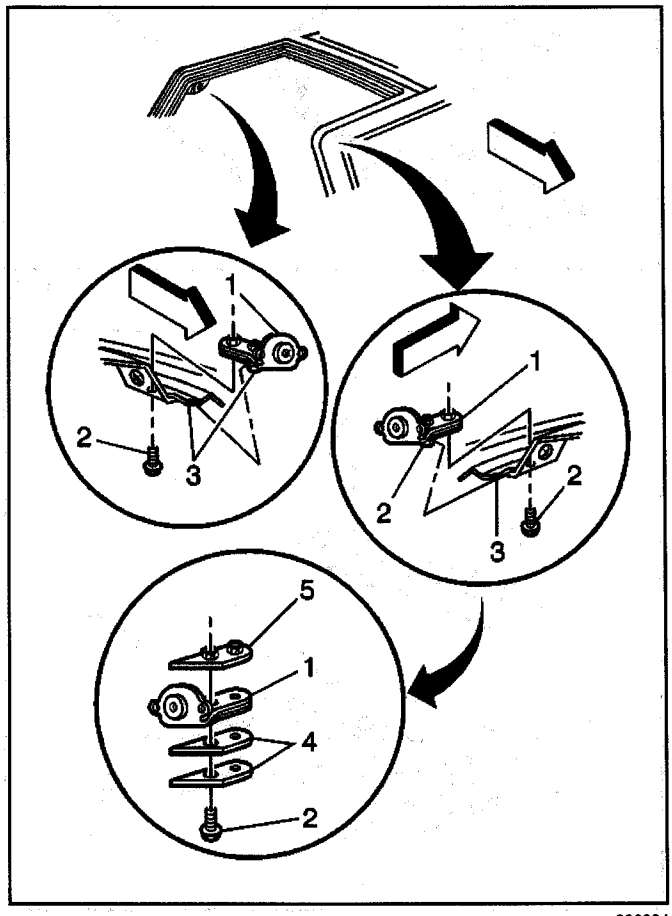
1. Install quarter inner trim finish panel extension.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

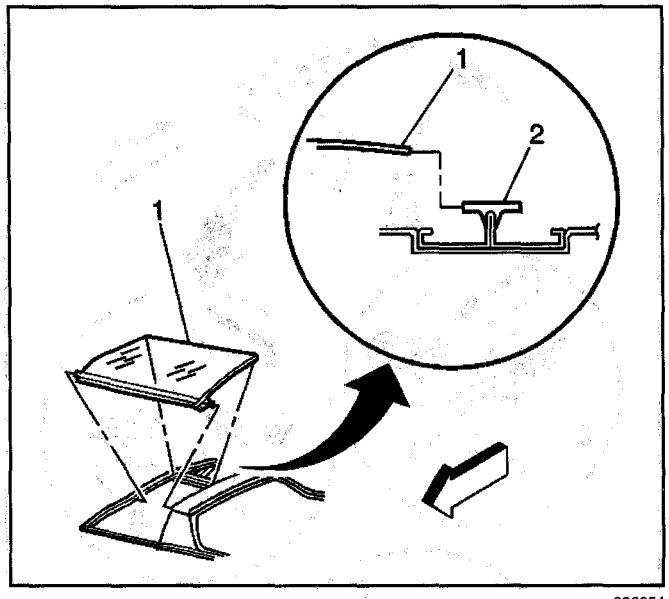
2. Install quarter trim finish panel bolts/screws.

   Tighten

   Tighten the quarter trim finish panel bolts/screws to 1.7 N·m (15 lb in).
3. Install windshield side upper garnish molding.
4. Install roof lift-off window. Refer to *Lift-Out Panel Replacement*.



386084



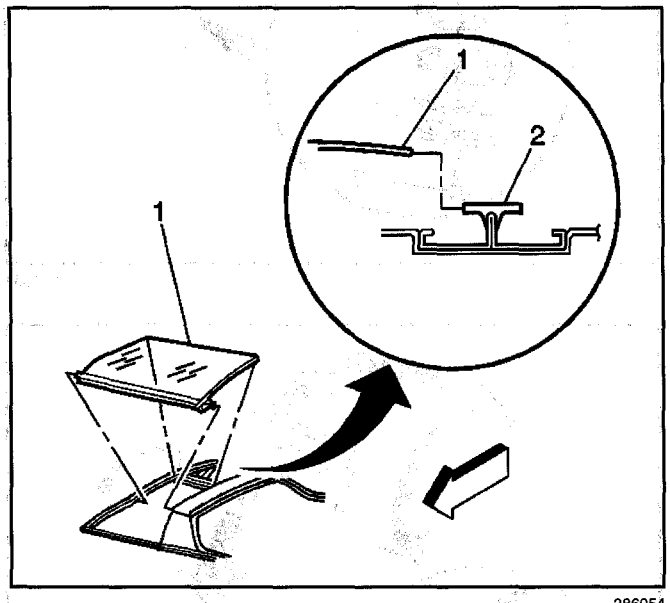
386054

Lift-Out Panel Replacement

Removal Procedure

The roof lift off windows are manually operated. The windows are curved to match the contour of the roof and are made of tinted, tempered glass. The front side door weatherstrip are one piece units and are molded the shape of the roof opening. The weatherstrips are held in place by retainers.

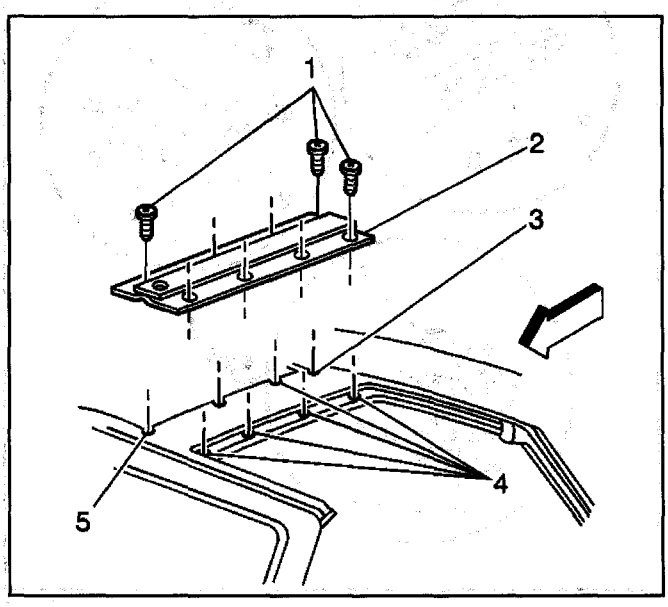
1. Turn window latch handle.
2. Lift outer edge of lift window (1) slightly and pull outwards to release window (1) from longitudinal bow finish molding (2).
3. Repeat steps 1 and 2 for the other lift window removal.



386054

Installation Procedure

1. Carefully insert inside edge of lift window (1) into channel or cavity of longitudinal bow finish molding (2).
2. Once seated in cavity, lower outer edge of lift window and latch into place.
3. Repeat steps 1 and 2 for the other lift window installation.



386050

Lift-Out Panel Mounting Hardware Replacement

Removal Procedure

1. Remove roof lift window panels. Refer to *Lift-Out Panel Replacement.*
2. Remove roof panel longitudinal bow finish molding bolts/screws (1) from molding (2).
3. Remove longitudinal bow finish molding (2) from vehicle roof (3).

Installation Procedure

1. Install longitudinal bow finish molding (2) to vehicle roof (3).

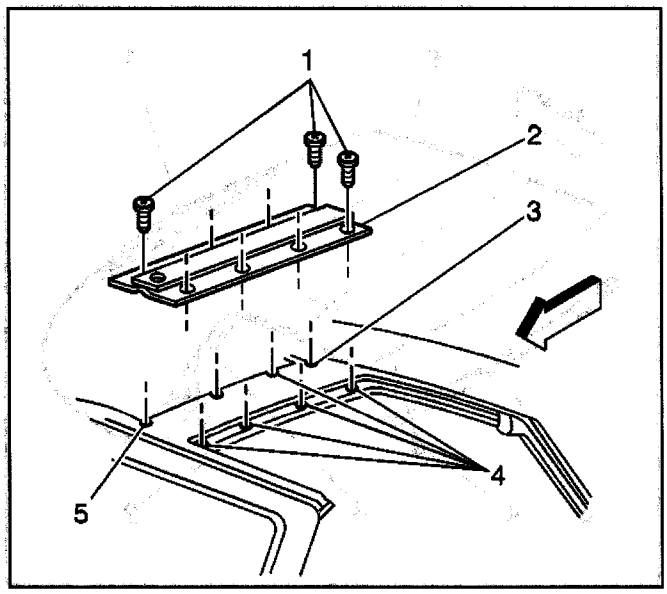
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install roof panel longitudinal bow finish molding bolts/screws (1) to molding (2).

   Tighten

   Tighten the bolts/screws as they are installed in positions 5, 3, and 4 to 1.7 N·m (15 lb in).

3. Install roof lift window panels. Refer to *Lift-Out Panel Replacement.*

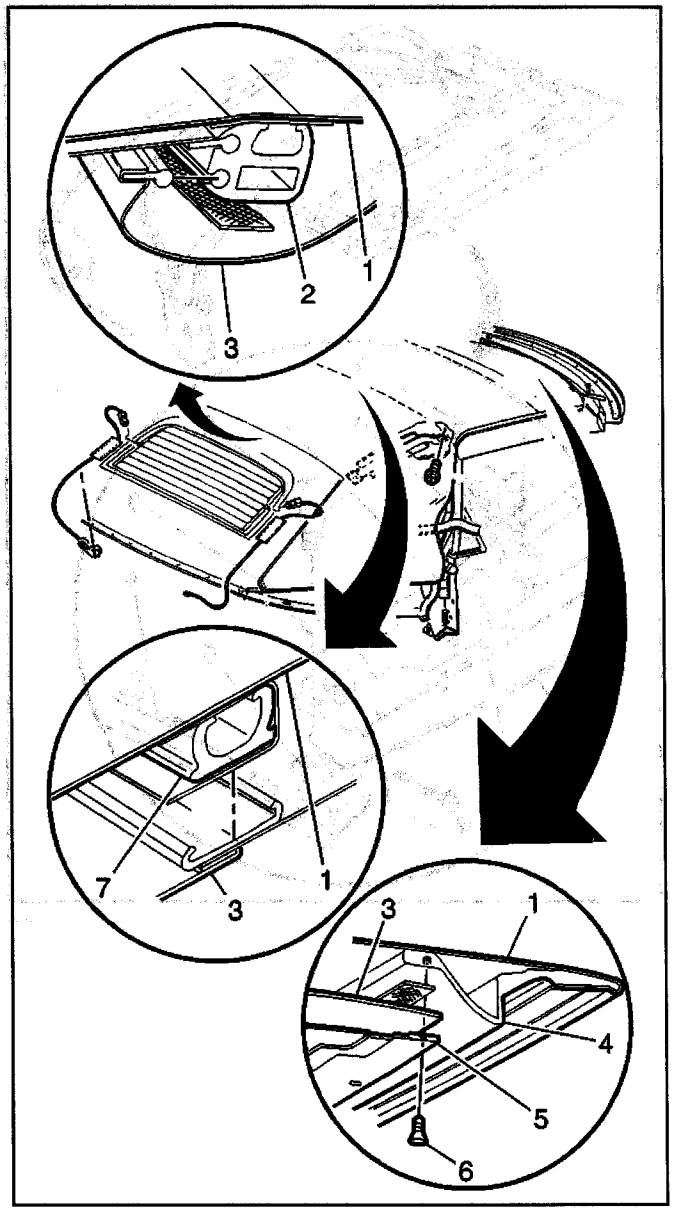


386050

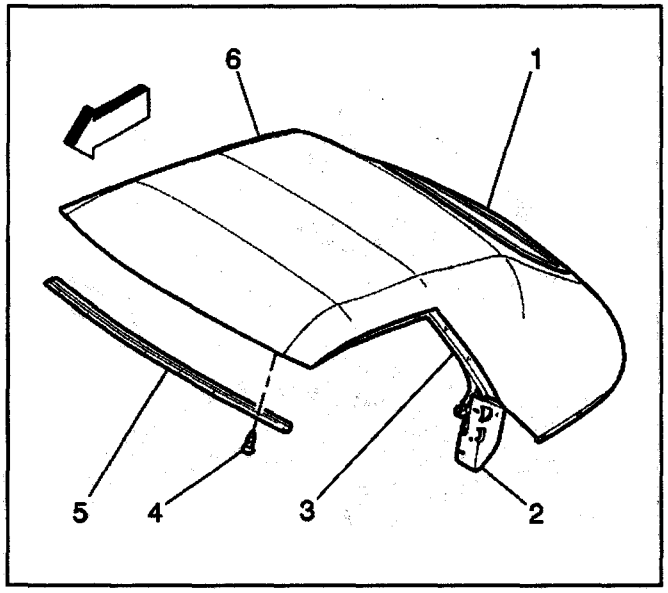
Folding Top Stowage Compartment Lid Latch Replace

Removal Procedure

1. Lower the folding top.
2. Mark the folding top to the fabric along the front edge of the number 1 bow (4) for reference.

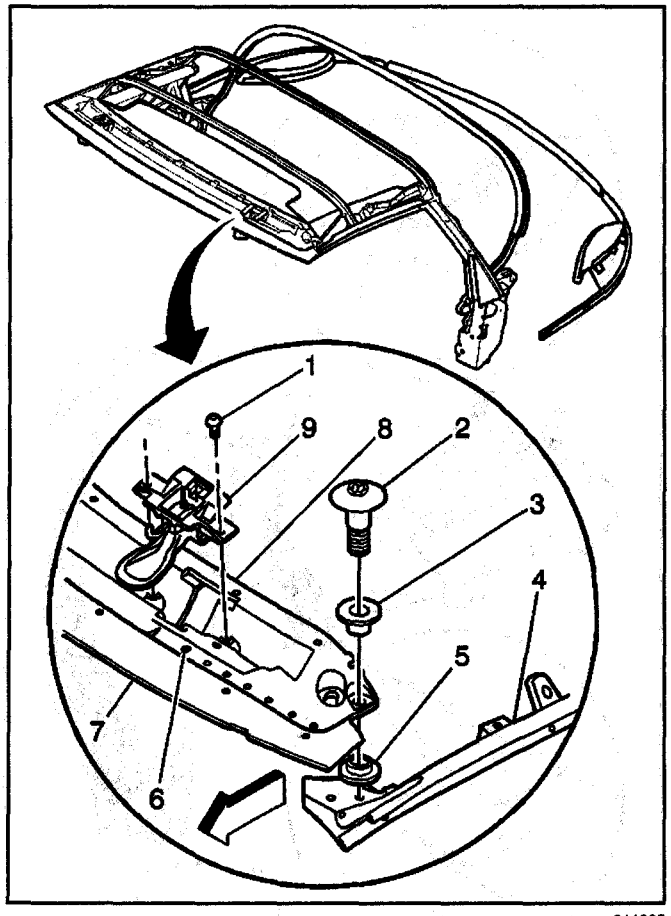


311068



311071

3. Remove the front cover number 1 bow retainer bolts (4).
4. Remove the front cover number 1 bow retainer (5).
   Peel back the top cover in order to reveal the latch bolts.

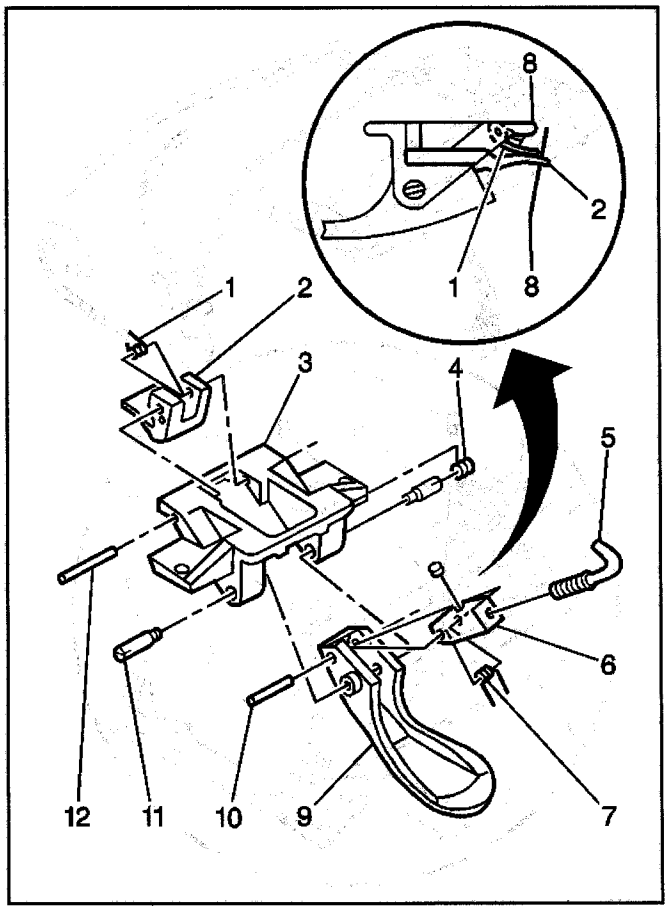


311065

5. Remove the latch bolts (1).
6. Remove the latch (9).

Disassembly Procedure

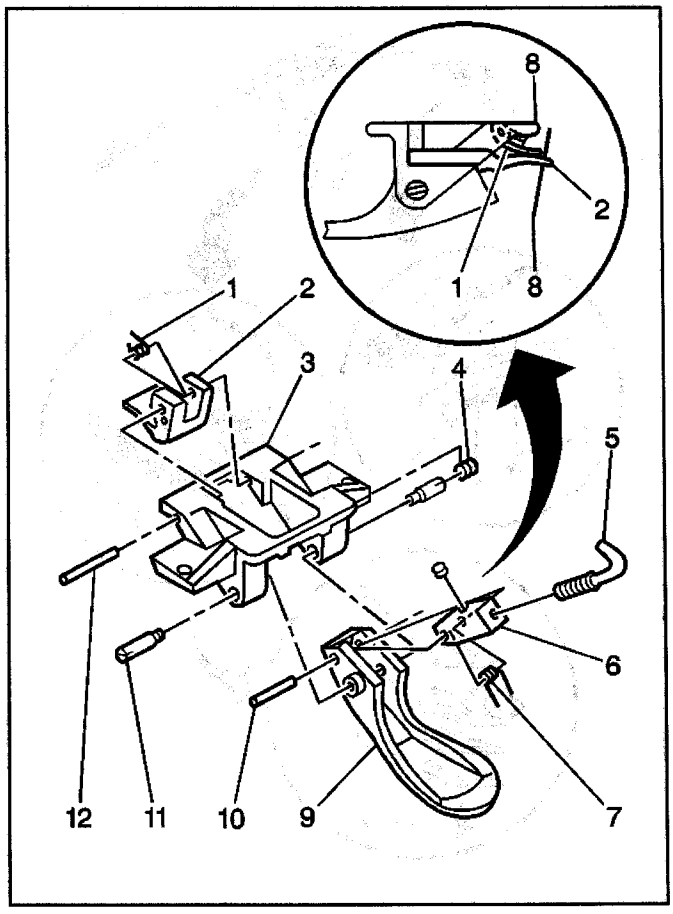
1. Note the position of the front latch spring (4).
2. Remove the latch spring from the latch handle pin.
3. Note the position of the front latch hook spring (7).
4. Drive out the pin (10) in order to remove the clamp from the body.
5. Note the position of the front release button spring (1).
6. Drive out the pin order to remove the latch release button.



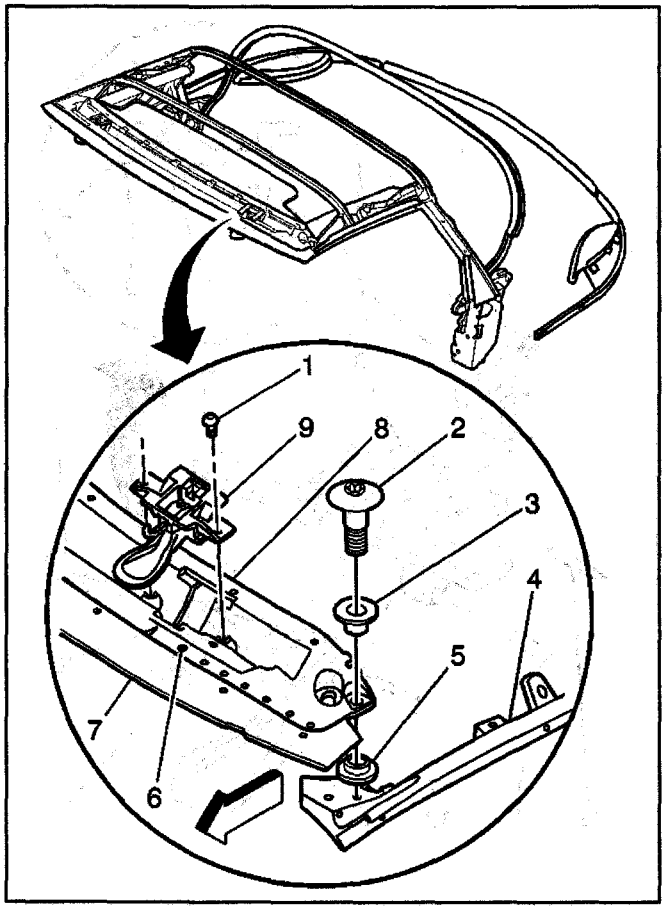
311082

Assembly Procedure

1. Assemble the latch release button to the latch mounting bracket and the front latch release button spring (1).
2. Drive in the release button pin.
3. Trim the ends of the front latch release button spring (1).
4. Assemble the clamp body and the front latch hook spring (7).
5. Drive in the pin (10).
6. Assemble the front latch spring (4) to the latch handle pin.



311082



311065

Installation Procedure

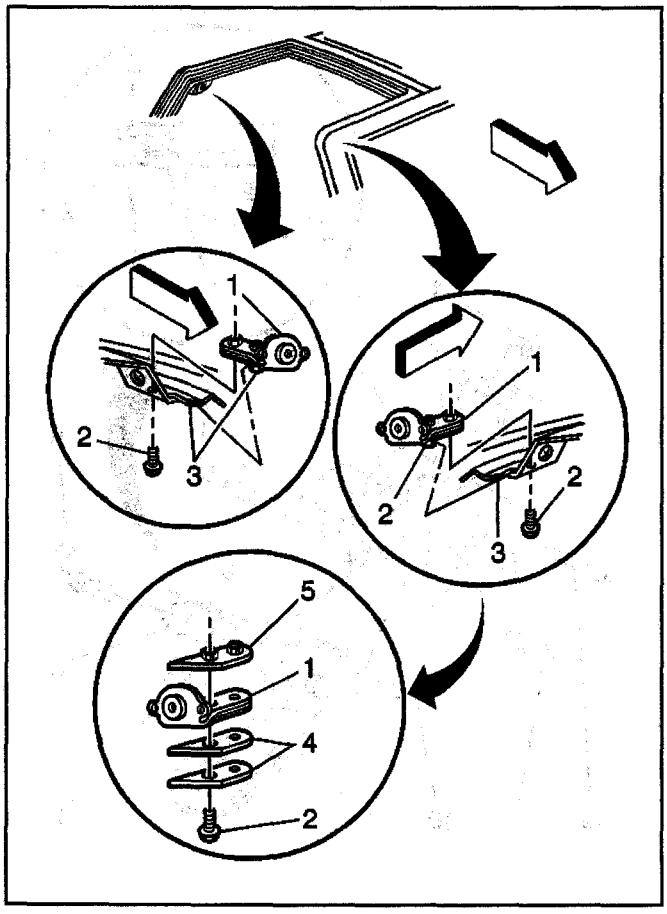
1. Install the latch (9).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the latch bolts (1).

   Tighten

   Tighten the bolts (1) to 10 N·m (89 lb in).
3. Install the cover.
4. Install the front cover number 1 bow retainer (7).
5. Install the front cover number one bow retainer bolts.
6. Raise the folding top.



386084

Roof Lift Off Panel Adjustment

Removal Procedure

The roof lift-off window is adjustable within the lift-off window opening. The roof lift-off windows are adjusted up and down by adding or removing backing plates (4). Inboard/outboard and fore-and-aft travel is adjusted by loosening bolts/screws (2) and repositioning the front and rear strikers (1 & 3) as necessary. Adjustments should be made to get a flush fit of the roof lift-off window to the roof.

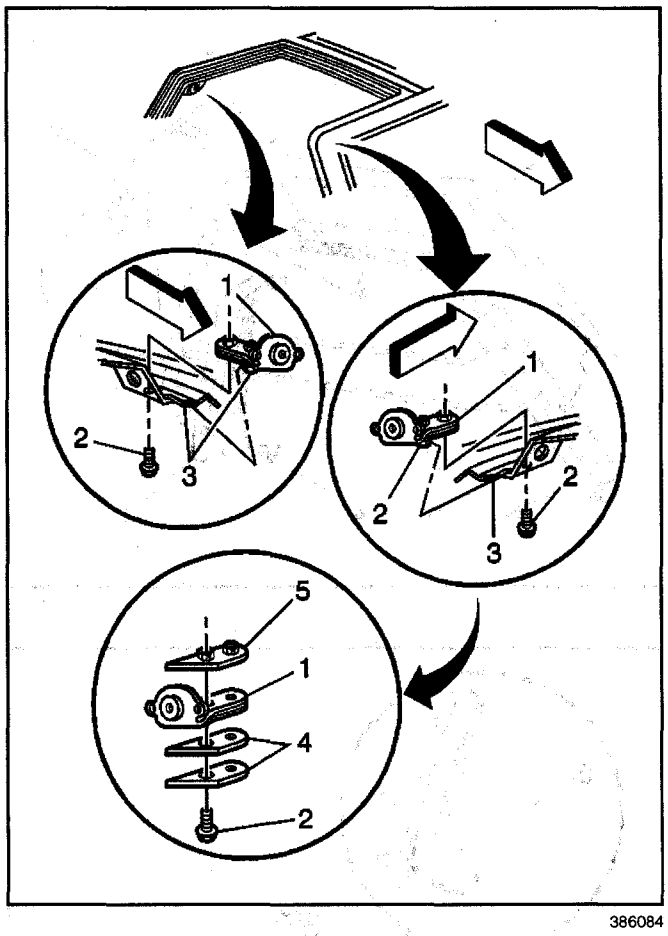
1. Remove roof lift-off window. Refer to *Lift-Out Panel Replacement.*
2. Remove windshield side upper garnish molding.
3. Remove quarter trim finish panel bolts/screws.
4. Remove quarter inner trim finish panel extension to access rear striker (3).
5. Loosen bolts/screws (2).

Installation Procedure

1. Install quarter inner trim finish panel extension.
2. Install quarter trim finish panel bolts/screws.

   Tighten

   Tighten the quarter trim finish panel bolts/screws to 1.7 N·m (15 lb in).
3. Install windshield side upper garnish molding.
4. Install roof lift-off window. Refer to *Lift-Out Panel Replacement.*



386084

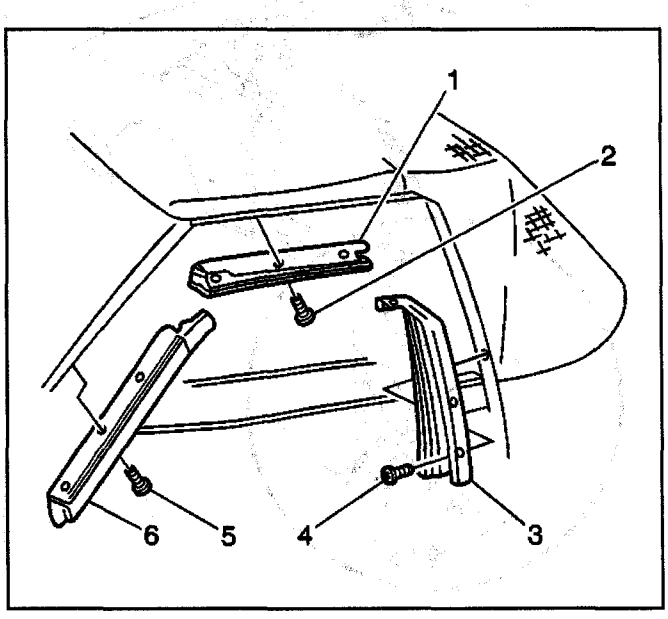
Weatherstrip Retainer Replacement - Folding Top

Removal Procedure

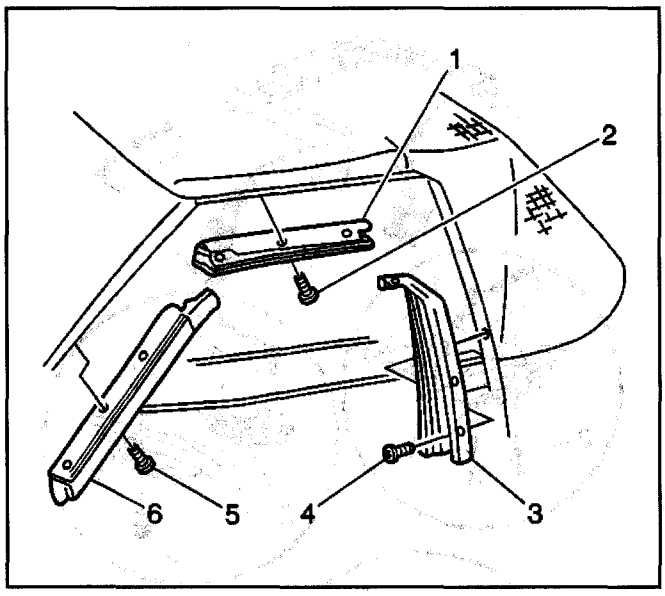
1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the folding top front weatherstrip. Refer to *Weatherstrip Replacement - Front.*
4. Remove the folding top front weatherstrip retainer bolts (5).
5. Remove the folding top front weatherstrip retainer (6).



311146



311146

Installation Procedure

1. Install the folding top front weatherstrip retainer (6).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the folding top front weatherstrip retainer bolts (5).

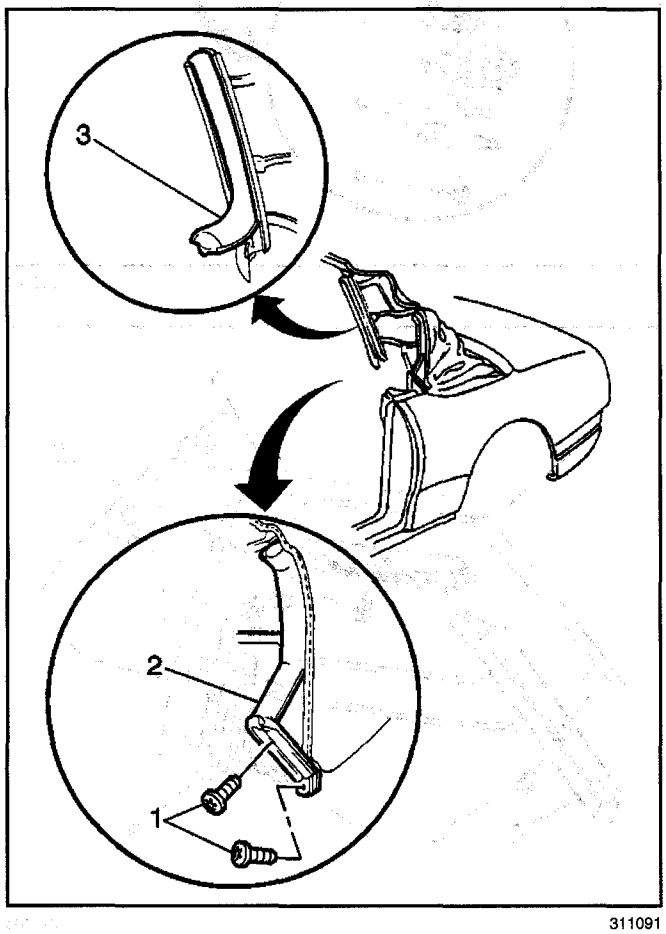
   Tighten

   Tighten the bolts (5) to 10 N·m (89 lb in).

3. Install the folding top front weatherstrip. Refer to *Weatherstrip Replacement - Front.*

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

4. Reconnect the negative battery cable.
5. Raise the folding top.



311091

Weatherstrip Replacement - Folding Top Side Front

Removal Procedure

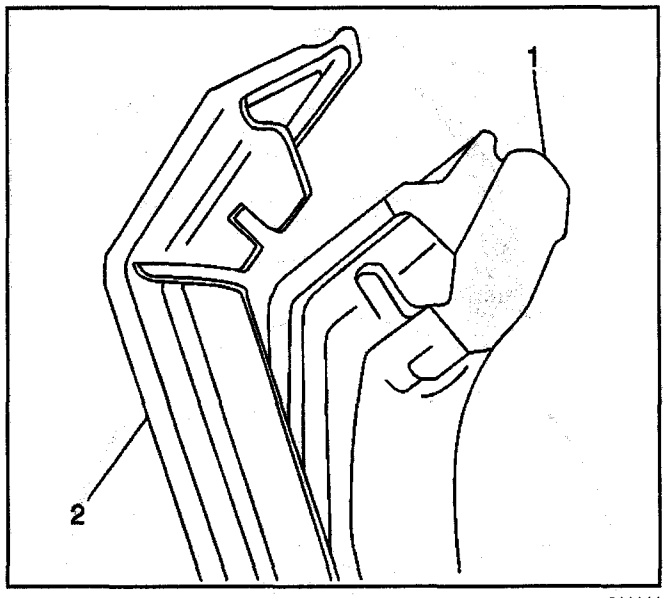
1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the front side door window upper rear weatherstrip bolts (1).
4. Remove the front side door window upper rear weatherstrip (2).

Installation Procedure

1. Line up the top tab of the weatherstrip (1) to the notch in the weatherstrip retainer (2).
2. Insert the weatherstrip (1) into the retainer (2).
3. Roll the weatherstrip into place.



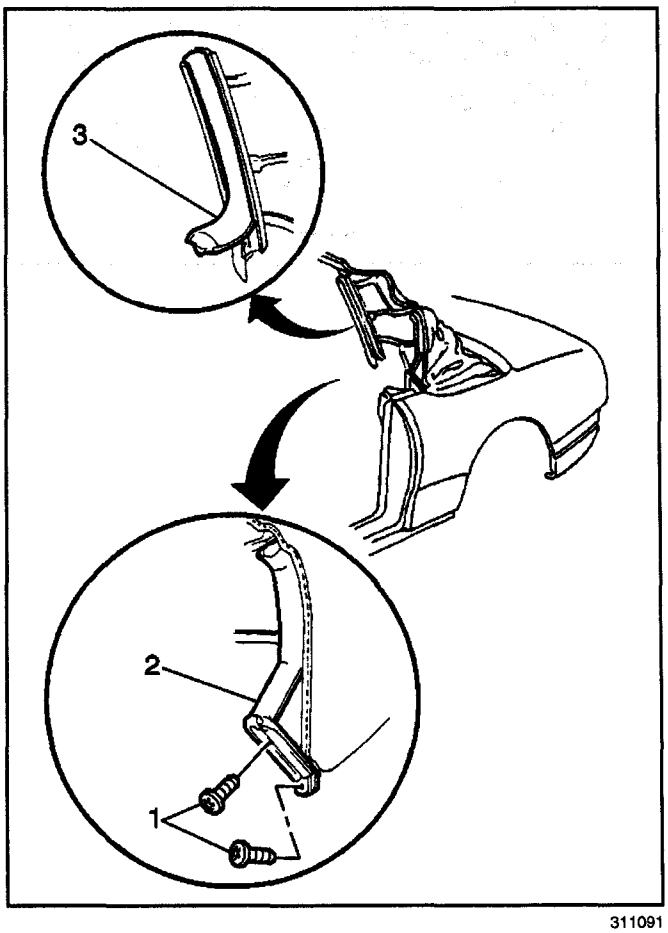
311144

Notice: Refer to *Fastener Notice* in Cautions and Notices.

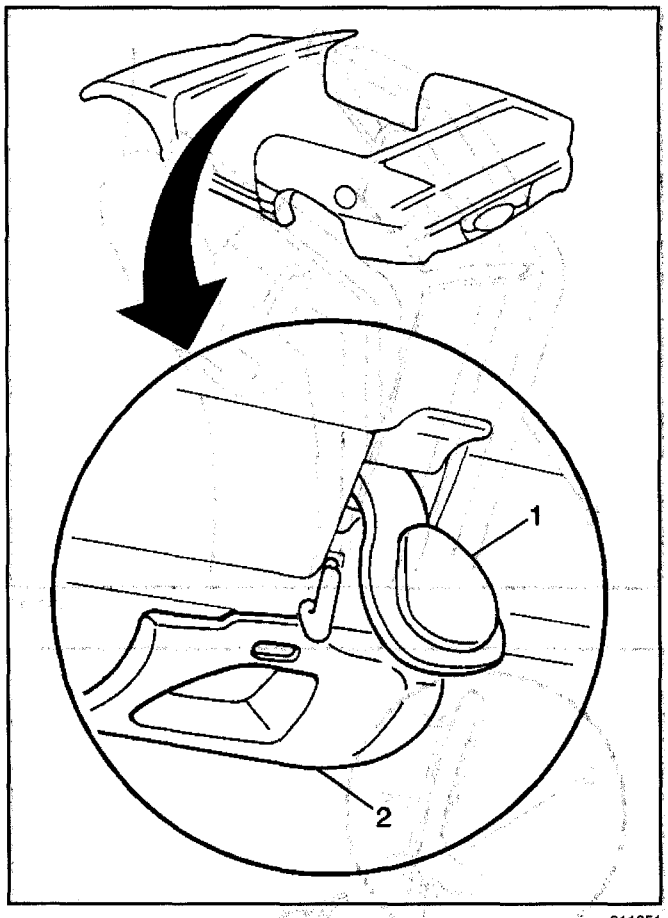
4. Install the front side door window upper rear weatherstrip bolts (1).

   Tighten

   Tighten the bolts (1) to 1.3 N·m (12 lb in).
5. Connect the negative battery cable.
6. Raise the folding top.



311091



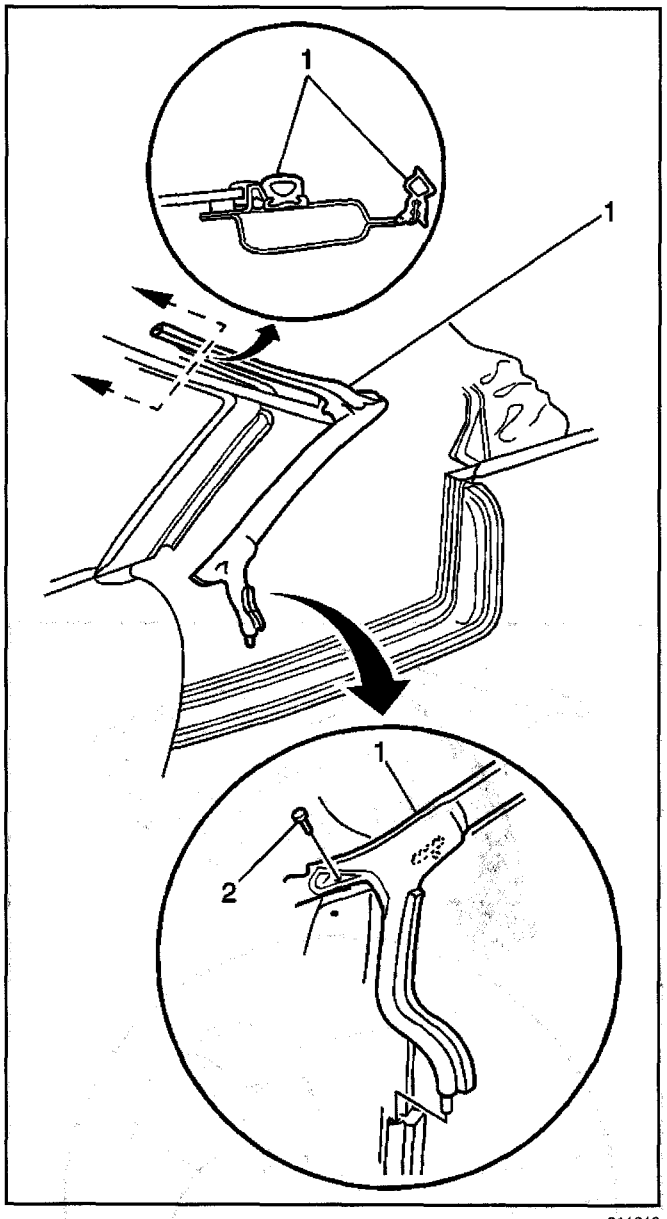
311051

Weatherstrip Replacement - Front

Removal Procedure

1. Lower the folding top.
2. Remove the right and left windshield side upper garnish moldings. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
3. Remove the right and left body hinge pillar trim panels.
4. Remove the right and left front latch striker bolts.
5. Remove the right and left front latch striker (2).

6. Remove the front weatherstrip (1).



311219

Installation Procedure

1. Remove the paper backing from the adhesive on the molded details of the weatherstrip at the top of the A-pillar.
2. Position the molded details of the weatherstrip to the top of the A-pillar.

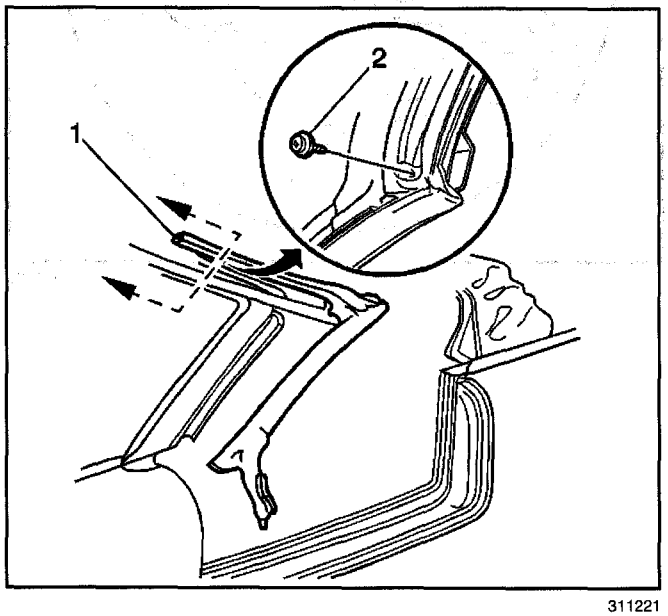
   Align the hole in the weatherstrip to the previously drilled hole in the body.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

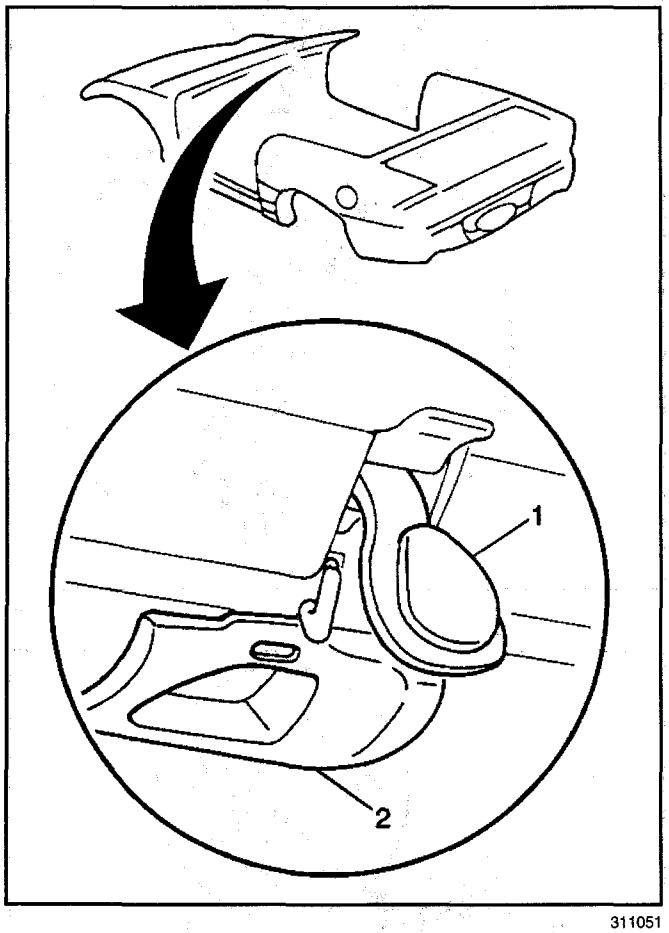
3. Drive the front weatherstrip bolt (2) into the previously drilled hole in the body.

   Tighten

   Tighten the bolt (2) to 1.3 N·m (12 lb in).
4. Insert the front top section of the weatherstrip into the retainer on the windshield header.



311221



311051

5. Roll the entire length onto the channel.
6. Insert the rear top section of the weatherstrip into the retainer on the windshield header.
7. Roll the entire length of the flange.
8. Remove the paper backing from the adhesive on the molded details of the weatherstrip at the top of the hinge pillar.
9. Position the weatherstrip to the hinge pillar.
10. Insert a plastic nail through the hole in the weatherstrip into the hole in the body at the top of the hinge pillar.
11. Insert the weatherstrip into the A-pillar retainer.
12. Roll the entire length into the channel.
13. Insert the tapered end of the weatherstrip into the hole in the front side door lower weatherstrip.
14. Insert the remaining length of weatherstrip onto the flange
15. Roll the weatherstip into place.
16. Install the right and left front latch striker (2).
17. Install the right and left latch striker bolts.
18. Install the right and left body hinge pillar trim panels.
19. Install the right and left windshield side upper garnish moldings. Refer to *Garnish Molding Replacement - Windshield Pillar* in Interior Trim.
20. Raise the folding top.

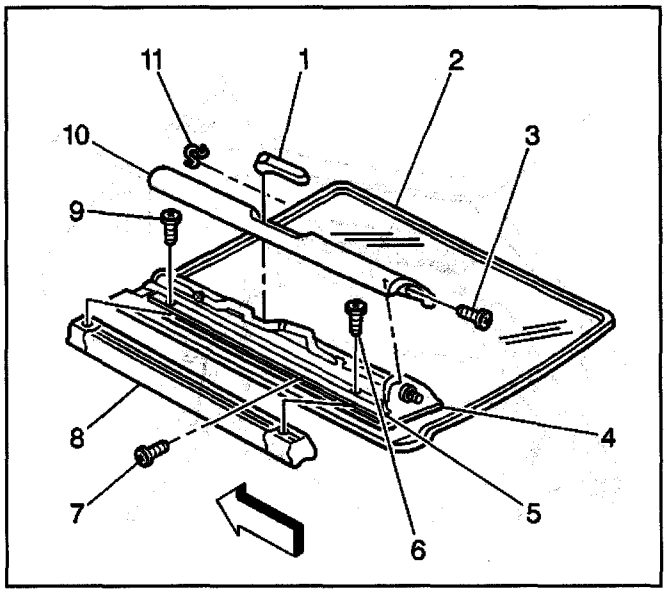
Weatherstrip Replacement - Lift Off Panel

Removal Procedure

1. Remove roof lift-off window. Refer to *Lift-Out Panel Replacement.*
2. Move window to bench for disassembly.

Important: Ensure that glass is not scratched by placing window on a clean cloth.

3. Remove handle (1) by removing handle spring (11) with small flat-blade screwdriver.
4. Remove trim cover bolts/screws (3).
5. Remove trim cover (10).
6. Remove weatherstrip bolts/screws (6 & 9).
7. Remove weatherstrip (8) by pulling from weatherstrip retainer (5).
8. Remove weatherstrip retainer bolts/screws (7).
9. Remove weatherstrip retainer (5).



386082

Installation Procedure

1. Install weatherstrip retainer (5).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install weatherstrip retainer bolts/screws (7).

   Tighten

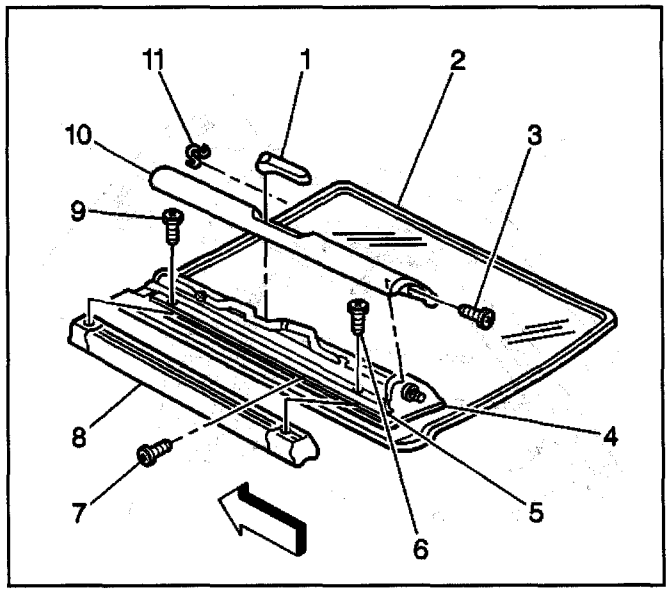
   Tighten the bolts/screws to 1.7 N·m (15 lb in).
3. Install weatherstrip (8) by pulling from weatherstrip retainer (5).
4. Install weatherstrip bolts/screws (6 & 9).

   Tighten

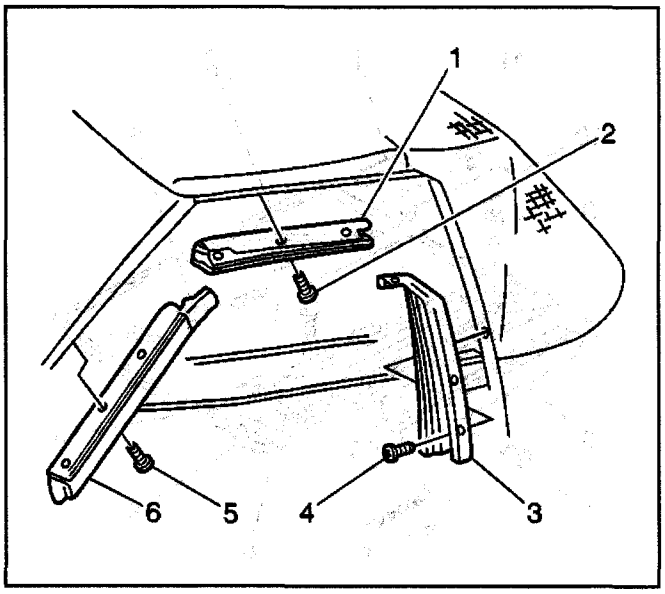
   Tighten the bolts/screws to 1.3 N·m (12 lb in).
5. Install trim cover (10).
6. Install trim cover bolts/screws (3).

   Tighten

   Tighten the bolts/screws to 1.7 N·m (15 lb in).
7. Install handle (1) on shaft (in the open position) and secure with handle spring (11).
8. Install roof lift-off window. Refer to *Lift-Out Panel Replacement.*



386082



311146

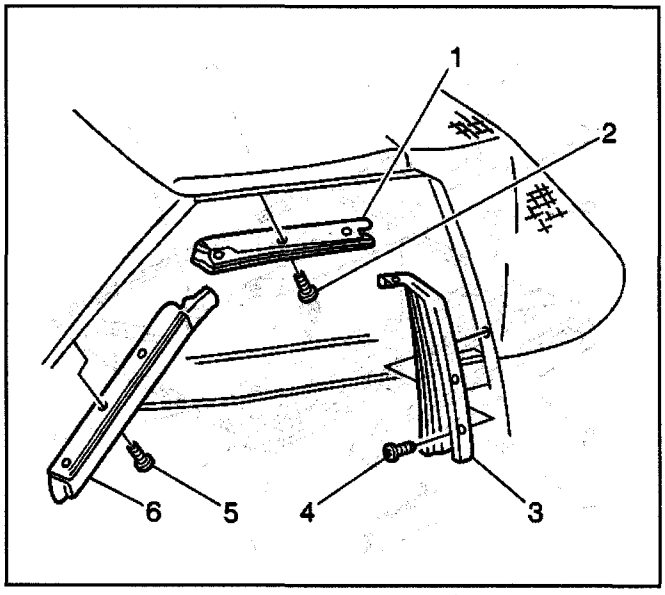
Weatherstrip Retainer Replacement - Lift Off Panel

Removal Procedure

1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the front side door window upper rear weatherstrip. Refer to *Weatherstrip Replacement - Folding Top Side Front.*
4. Remove the front side door window upper rear weatherstrip retainer bolts (4).
5. Remove the front side door window upper rear weatherstrip retainer (3).



311146

Installation Procedure

1. Install the front side door window upper rear weatherstrip retainer (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

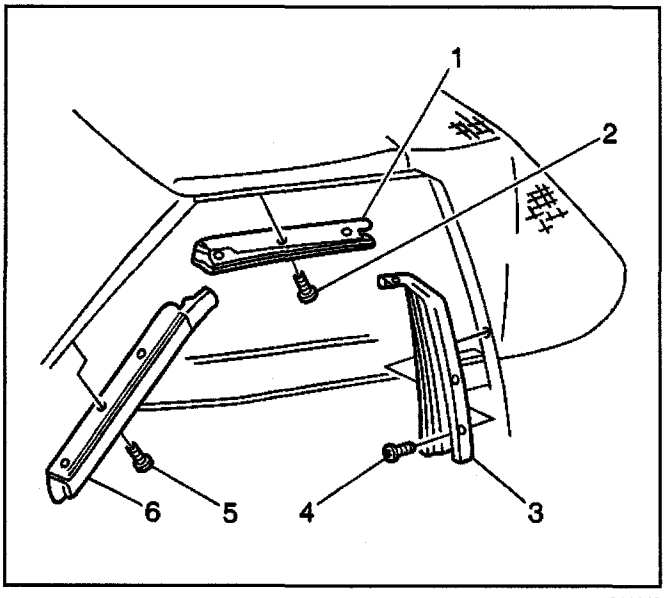
2. Install the front side door window upper rear weatherstrip retainer bolt (4).

   Tighten

   Tighten the bolts to 1.3 N·m (12 lb in).
3. Install the front side door window upper rear weatherstrip. Refer to *Weatherstrip Replacement - Folding Top Side Front.*

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

4. Connect the negative battery cable.
5. Raise the folding top.



311146

Weatherstrip Retainer Protector and Seal - Side

Removal Procedure

1. Lower the folding top to a suitable working position.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

2. Disconnect the negative battery cable.
3. Remove the front side door window upper rear weatherstrip. Refer to *Weatherstrip Replacement - Folding Top Side Front.*
4. Remove the front side door window upper rear weatherstrip retainer bolts (4).
5. Remove the front side door window upper rear weatherstrip retainer (3).

Installation Procedure

1. Install the front side door window upper rear weatherstrip retainer (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the front side door window upper rear weatherstrip retainer bolt (4).

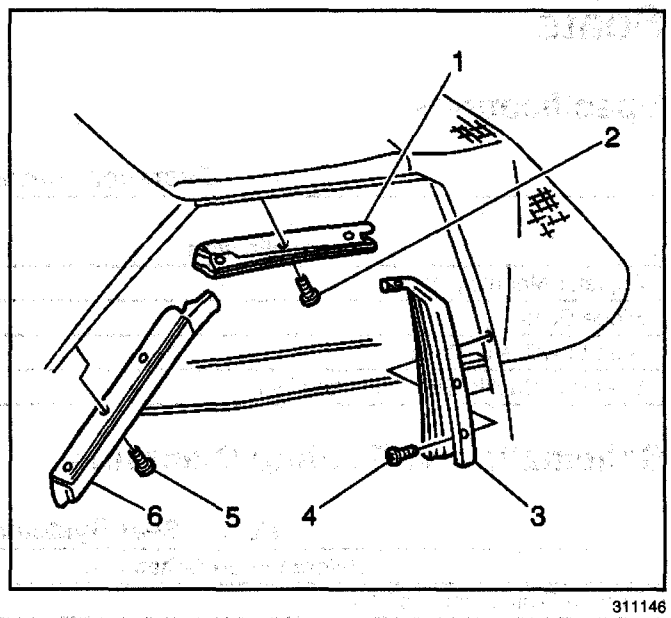
   Tighten

   Tighten the bolts (104) to 1.3 N·m (12 lb in).

3. Install the front side door window upper rear weatherstrip. Refer to *Weatherstrip Replacement - Folding Top Side Front.*

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

4. Connect the negative battery cable.
5. Raise the folding top.



311146

Description and Operation

Power Folding Top Circuit Description

Important:

- The folding top pump assembly has voltage applied from the WINDOWS CKT BRKR 30A. The WINDOWS CKT BRKR 30A is controlled by the retained accessory power (RAP) module.
- For a complete understanding of the RAP operation, refer to *Retained Accessory Power Circuit Description.*
- Do not attempt to operate the power folding top unless the vehicle is parked.
- Release all of the latches before lowering the power folding top.
- Re-engage all latches after raising the power folding top.

Voltage is applied from WINDOWS CKT BRKR 30A to the folding top switch through circuit 341 when the ignition switch is in one of the following positions:

- RUN
- ACCY
- RAP

The folding top pump assembly receives the ground through the folding top switch assembly, which is grounded at G201. The folding top pump is driven by a reversible permanent-magnet motor. The motor is controlled by the folding top switch, which is normally closed to the ground. When the folding top switch is moved to the UP position, battery voltage is provided to the folding top (circuit 163) pump assembly through the GRY wire (circuit 162). The folding top pump assembly will receive ground through the PPL wire of the folding top switch. This action will drive the power folding top pump top up. When the switch is released, the switch contacts will return to their normal grounded position.

Seats

Specifications

Fastener Tightening Specifications

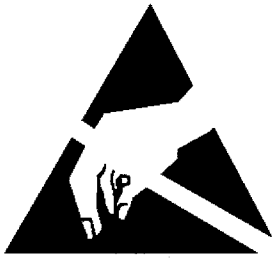
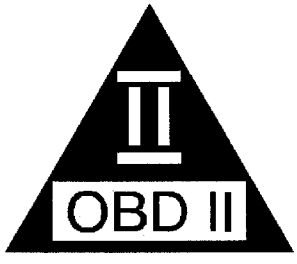
Application	Specification	
	Metric	English
Adjuster Mounting Nuts	50 N·m	37 lb ft
Hinge Bolts	24 N·m	18 lb ft
Seat to Adjuster Bolts	24 N·m	18 lb ft
Seat Belt Buckle Side Mounting Nut	50 N·m	37 lb ft

Schematic and Routing Diagrams

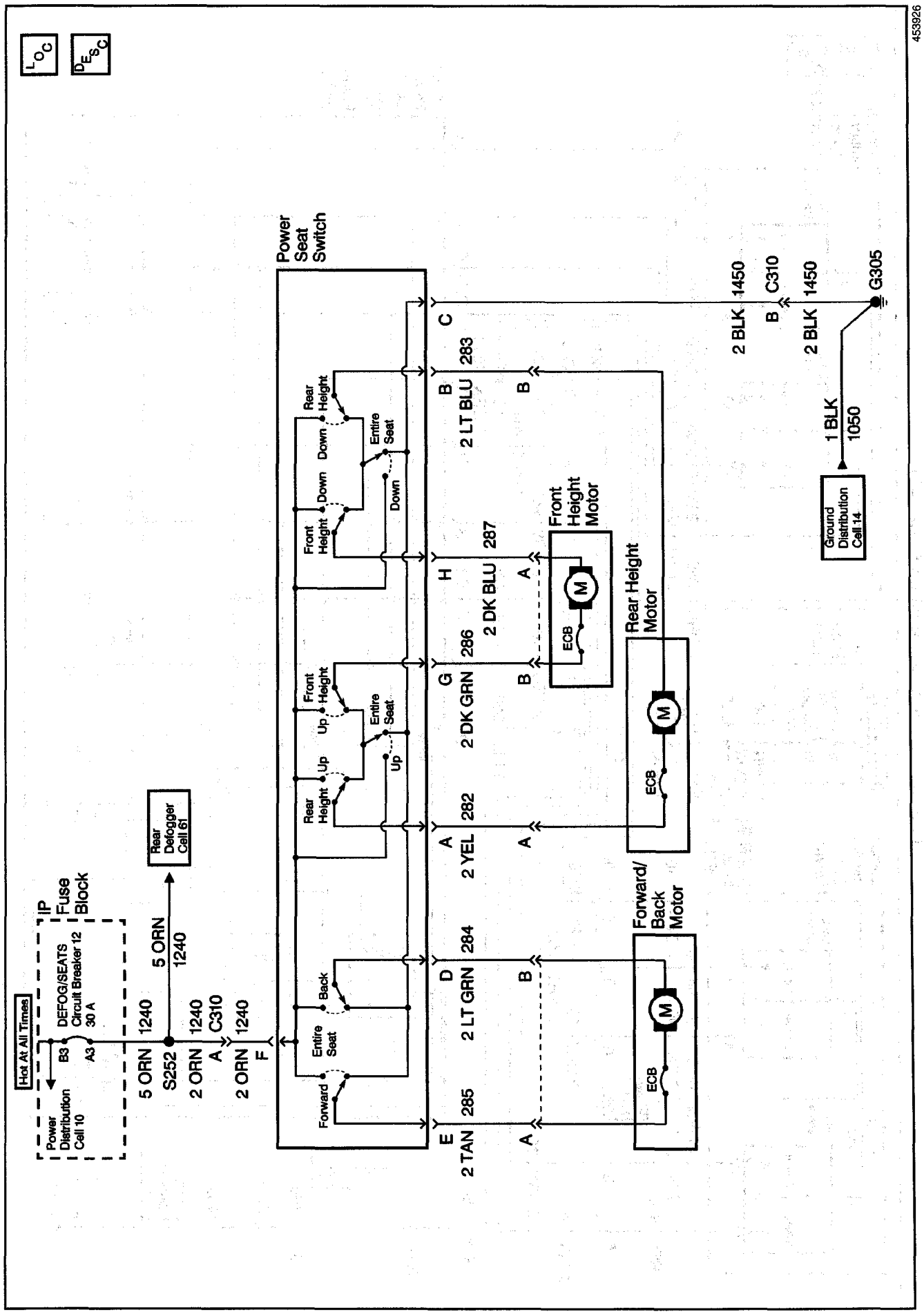
Power Seat Systems Schematic References

Reference on Schematic	Section Number - Subsection Name
Ground Distribution Cell 14	8 — Wiring Systems
Power Distribution Cell 10	8 — Wiring Systems
Rear Defogger Cell 61	8 — Stationary Windows

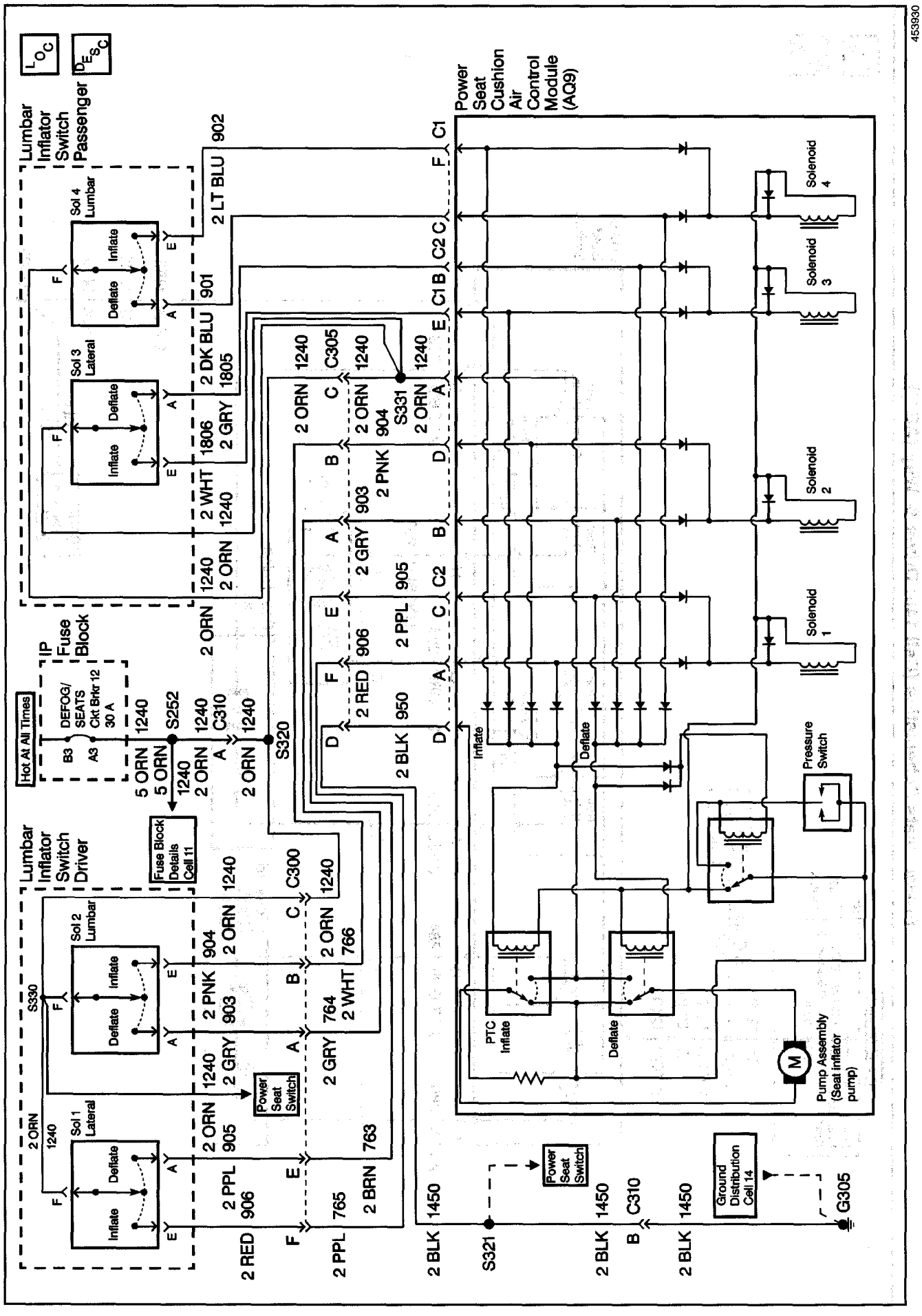
Power Seat Systems Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Caution and Notices.
 19386	Refer to *SIR Service Precautions Caution* in Caution and Notices.
 19385	Refer to *OBD II Symbol Description Notice* in Caution and Notices.

Power Seats Schematics (Cell 140: Driver 6–Way (AG1))



Lumbar Support Schematics (Cell 142)



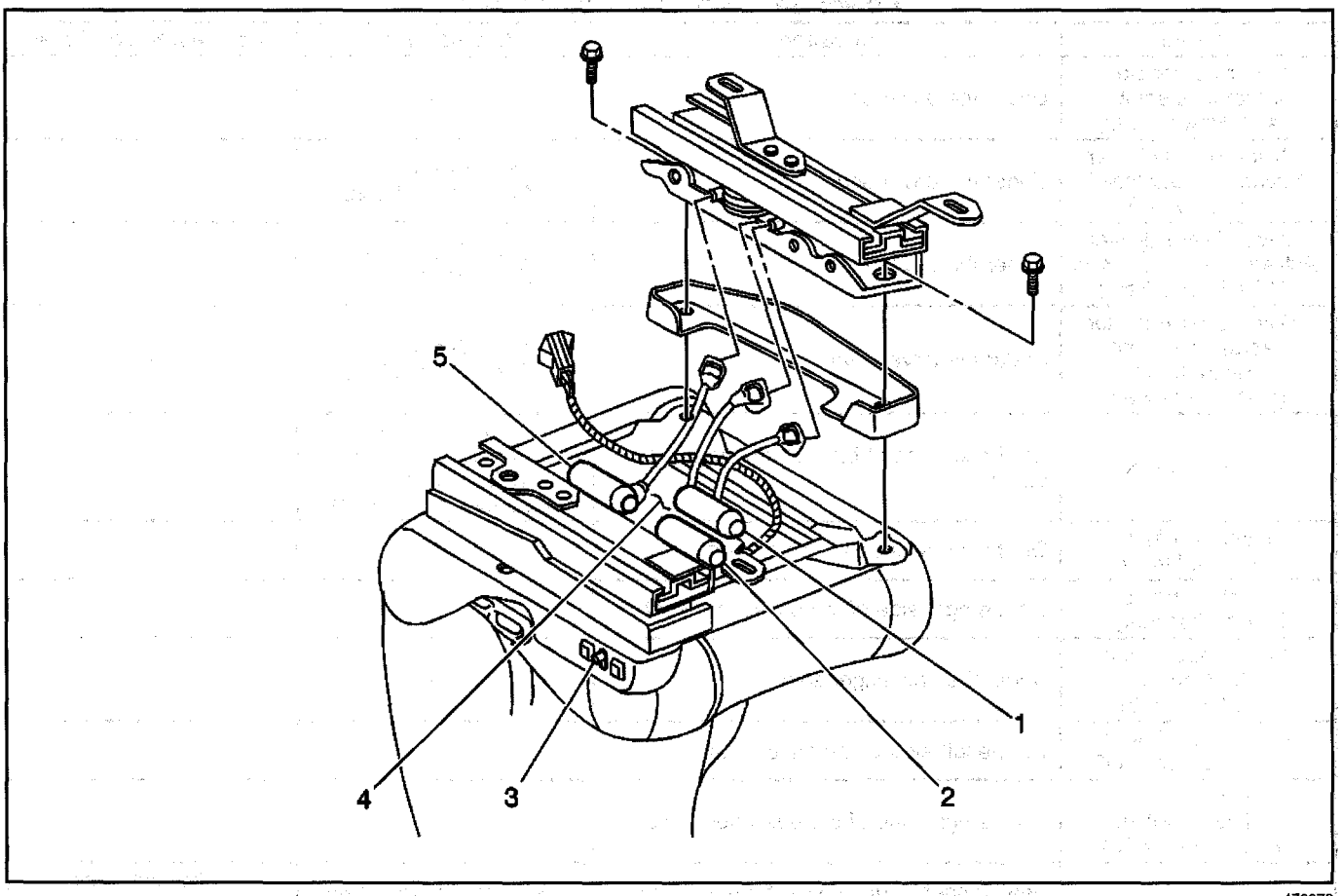
Component Locator

Power Seat Systems Components

Name	Location	Locator View	Connector End View
Driver Power Seat Actuator Assembly (AG1 Power Seat)	Under the driver seat	—	—
Driver Seat Adjuster Actuator - Rear Height Motor (AG1)	Under the driver seat	*Power Seat Systems Component Views*	—
Driver Seat Adjuster Actuator - Forward/Back (AG1 Power Seat)	Under the driver seat	*Power Seat Systems Component Views*	—
Driver Seat Adjuster Actuator - Front Height Motor (AG1 Power Seat)	Under the driver seat	*Power Seat Systems Component Views*	—
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Lumbar Inflator Switch, Driver	On the left side of the driver seat	—	—
Lumbar Inflator Switch, Passenger	On the right side of the passenger seat	—	—
Power Seat Cushion Air Control Module (AQ9)	Under the passenger seat	—	—
Power Seat Inflator Switch, Driver (AQ9)	On the left side of the driver seat	—	—
Power Seat Inflator Switch, Passenger (AQ9)	On the right side of the passenger seat	—	—
C300 (6 cavities) (AQ9)	Seat jumper to driver seat harness, under the driver seat assembly	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C305 (6 cavities) (AQ9)	Seat jumper to passenger seat harness, under the passenger seat assembly	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C310 (2 cavities) (w/AG1)	Instrument panel to driver seat harness, rear mounting bolt of the driver seat	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
C310 (2 cavities) (w/AQ9)	Instrument panel to seat jumper harness, between the rear mounting bolts of the driver seat	*Harness Routing Views* in Wiring Systems	—
G305	Bolted to the left rocker panel at the floor pan bar 3	*Harness Routing Views* in Wiring Systems	—
S252 (Coupe)	In the instrument panel harness, main branch, approximately 33 cm (13 in) from G305 breakout	—	—
S252 (Convertible)	In the instrument panel harness, main branch, approximately 48 cm (19 in) from G200 breakout	—	—
S320 (AQ9)	In the seat jumper harness, main branch, approximately 7 cm (3 in) from C310 breakout	—	—
S321 (AQ9)	In the seat jumper harness, main branch, approximately 13 cm (5 in) from C310 breakout	—	—
S331 (AQ9)	In the passenger seat harness, approximately 30 cm (12 in) from C305 breakout	—	—

Power Seat Systems Component Views

Bottom of Driver's Seat (AG1)

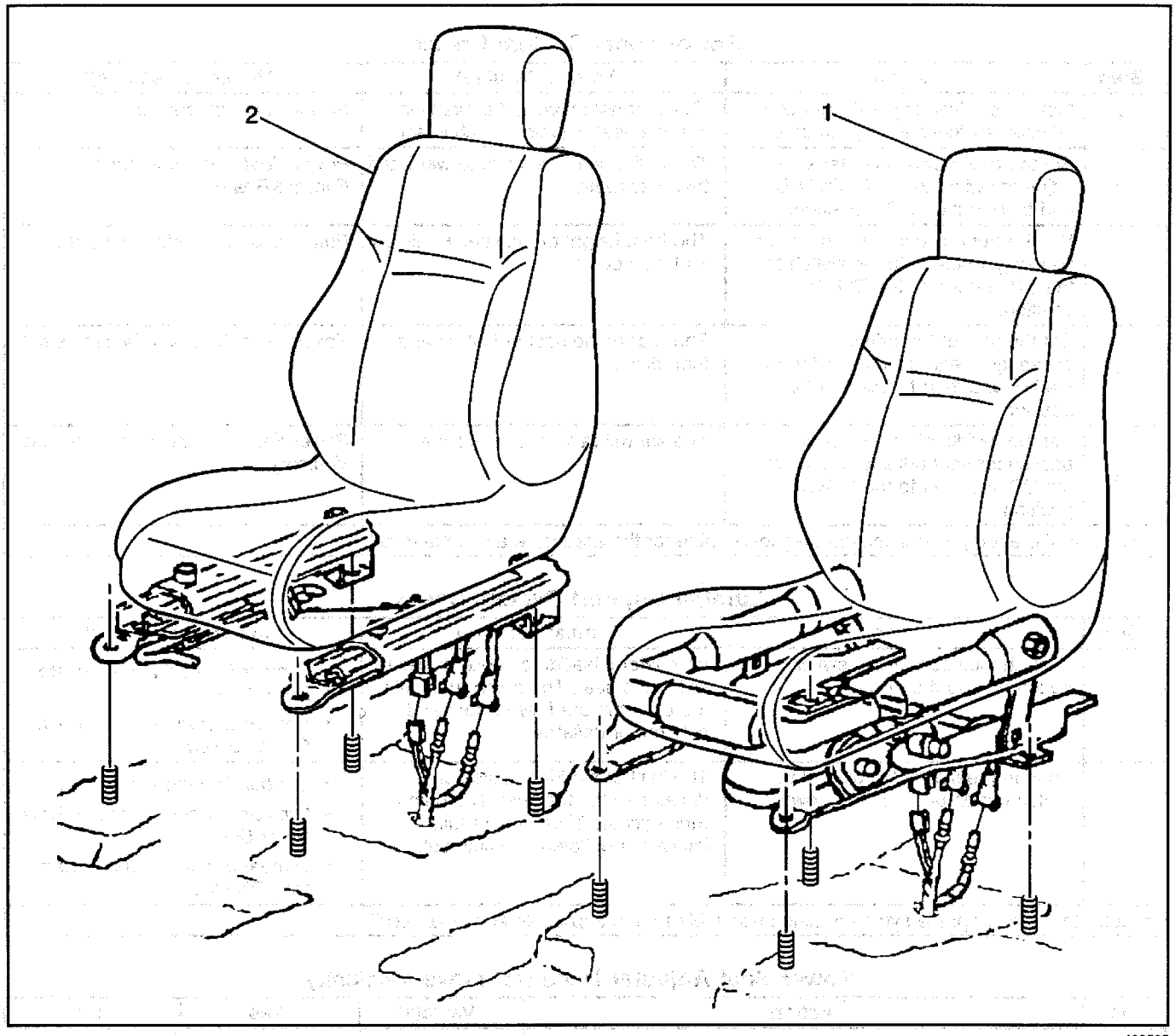


479972

Legend

(1) Rear Height Motor
(2) Front Height Motor
(3) Power Seat Switch
(4) Power Seat Actuator Assembly
(5) Forward/Back Motor

Seats



483595

Legend

(1) Driver Seat

(2) Passenger Seat

Diagnostic Information and Procedures

Power Seats System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Move the driver or passenger seat adjuster switches in any direction.	The seat will move in the direction that the seat adjuster switch is set.	*Power Seat Inoperative*
2	Set the driver or passenger seat adjuster switch to the FORWARD and then to the BACK position.	The entire seat will move forward and then backward.	*Power Seat Does Not Move Forward/Rearward*
3	Set the front height of the driver or passenger seat adjuster switch to the UP and the to the DOWN position.	The front height of the seat will tilt up and then down.	*Power Seat Does Not Tilt Forward*
4	Set the rear of the driver or passenger seat adjuster switch to the UP and then to the DOWN position.	The rear of the seat will tilt up and then down.	*Power Seat Does Not Tilt Rearward*
5	Set the middle of the driver or passenger seat adjuster switch to the UP and then to the DOWN position.	The set will raise and then lower.	*Power Seat Adjuster Does Not Move Vertically*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Lumbar Support System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	Push the lumbar inflator switch button up and then down.	Both lateral bladders inflate or deflate within the seat. The pump runs until the bladders are fully inflated and cuts out or deflates.	• *Lumbar Support Does Not Move Up or Down* • *Lumbar Support Inoperative in One Direction*
2	Push the rearward lumbar inflator switch button up and then down.	The lumbar bladder inflates or deflates within the seat. The pump runs until the bladders are fully inflated or deflated and cuts out.	• *Lumbar Support Inoperative* • *Lumbar Support Does Not Move Up or Down* • *Lumbar Support Inoperative in One Direction*
* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.			

Power Seat Adjuster Does Not Move Vertically

Step	Action	Value(s)	Yes	No
1	Was the entire Power Seats System Check performed?	—	Go to *Step 2*	Go to *Power Seats System Check*
2	Inspect for a poor connection at the power seat switch. Does the poor connection exist?	—	Go to *Step 3*	Go to *Step 4*
3	Repair the poor connection. Is the repair complete?	—	Go to *Step 5*	—
4	Replace the power seat switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 5*	—
5	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all repairs been made?	—	Go to *Power Seats System Check*	—

Power Seat Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Power Seats System Check performed?	—	Go to *Step 2*	Go to *Power Seats System Check*
2	Using a test light, backprobe between C310 terminal A and ground. Does the test light illuminate?	—	Go to *Step 3*	Go to *Step 4*
3	Using a test light, backprobe between C310 terminals A and B. Does the test light illuminate?	—	Go to *Step 5*	Go to *Step 6*
4	Repair the poor connection or open in circuit 1240. Is the repair complete?	—	Go to *Step 7*	—
5	Replace the power seat switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 7*	—
6	Repair the poor connection or the open in circuit 1450. Is the repair complete?	—	Go to *Step 7*	—
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all components/connectors removed? Have the repairs been made?	—	Go to *Power Seats System Check*	—

Power Seat Does Not Move Forward/Rearward

Step	Action	Value(s)	Yes	No
1	Was the entire Power Seats System Check performed?	—	Go to *Step 2*	Go to *Power Seats System Check*
2	1. Using a test light, backprobe between the forward/back motor connector terminals A and B. 2. Press and hold the driver seat adjuster switch to the FORWARD position and then the BACK position. Does the test light illuminate in both cases?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the forward/back motor. Refer to *Seat Back Hinge/Recliner Mechanism Replace - Front.* Is the repair complete?	—	Go to *Step 14*	—
4	Did the test light illuminate when the driver seat adjuster switch was in the FORWARD position?	—	Go to *Step 5*	Go to *Step 6*
5	1. Using a test light, backprobe between the power seat switch connector terminal D and ground. 2. Press and hold the driver seat adjuster switch to the BACK position. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	1. Using a test light, backprobe between the power seat switch connector terminals E and ground. 2. Press and hold the driver seat adjuster switch in the FORWARD position. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 8*
7	Check for a short to ground in circuit 284. Is there a short to ground present?	—	Go to *Step 12*	Go to *Step 13*
8	Replace the power seat switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 14*	—

Power Seat Does Not Move Forward/Rearward (cont'd)

Step	Action	Value(s)	Yes	No
9	Check for a short to ground in circuit 285. Is there a short to ground present?	—	Go to *Step 10*	Go to *Step 11*
10	Repair a short to ground in circuit 285. Is the repair complete?	—	Go to *Step 14*	—
11	Repair the poor connection or open in circuit 285. Is the repair complete?	—	Go to *Step 14*	—
12	Repair a short to ground in circuit 284. Is there a short to ground present?	—	Go to *Step 14*	—
13	Repair the poor connection or open in circuit 284. Is the repair complete?	—	Go to *Step 14*	—
14	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Seats System Check*	—

Power Seat Does Not Tilt Forward

Step	Action	Value(s)	Yes	No
1	Was the entire Power Seats System Check performed?	—	Go to *Step 2*	Go to *Power Seats System Check*
2	1. Using a test light backprobe between the front height motor connector terminals A and B. 2. Press and hold the rear end of the driver/passenger seat adjuster switch in the UP and then DOWN positions. Does the test light illuminate in both cases?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the front height motor. Refer to *Power Recliner Replacement - Front Seat.* Is the repair complete?	—	Go to *Step 14*	—
4	Did the test light illuminate when the driver/passenger seat adjuster switch was in the UP position?	—	Go to *Step 5*	Go to *Step 6*
5	1. Using a test light, backprobe between the power seat switch connector terminal H and ground. 2. Set and hold the front end of the driver/passenger seat adjuster switch in the DOWN position. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	1. Using a test light, backprobe between the power seat switch connector terminal G and ground. 2. Press and hold the front end of the driver/passenger seat adjuster switch in the UP position. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 8*
7	Check for a short to ground in circuit 287. Is there a short to ground present?	—	Go to *Step 10*	Go to *Step 11*
8	Replace the power seat switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 14*	—
9	Check for a short to ground in circuit 286. Is there a short to ground present?	—	Go to *Step 12*	Go to *Step 13*
10	Repair a short to ground in circuit 287. Is the repair complete?	—	Go to *Step 14*	—
11	Repair the poor connection or open in circuit 287. Is the repair complete?	—	Go to *Step 14*	—

Power Seat Does Not Tilt Forward (cont'd)

Step	Action	Value(s)	Yes	No
12	Repair a short to ground in circuit 286. Is the repair complete?	—	Go to *Step 14*	—
13	Repair the poor connection or open in circuit 286. Is the repair complete?	—	Go to *Step 14*	—
14	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Seats System Check*	—

Power Seat Does Not Tilt Rearward

Step	Action	Value(s)	Yes	No
1	Was the entire Power Seats System Check performed?	—	Go to *Step 2*	Go to *Power Seats System Check*
2	1. Using a test light backprobe between the rear height motor connector terminals A and B. 2. Press and hold the rear end of the driver/passenger seat adjuster switch in the UP and then DOWN positions. Does the test light illuminate in both directions?	—	Go to *Step 3*	Go to *Step 4*
3	Replace the rear height motor. Refer to *Power Recliner Replacement - Front Seat.* Is the repair complete?	—	Go to *Step 14*	—
4	Did the test light illuminate when the driver/passenger seat adjuster switch was in the UP position?	—	Go to *Step 5*	Go to *Step 6*
5	1. Using a test light, backprobe between the power seat switch connector terminal B and ground. 2. Press and hold the back end of the driver/passenger seat adjuster switch in the DOWN position. Does the test light illuminate?	—	Go to *Step 7*	Go to *Step 8*
6	1. Using a test light, backprobe between the power seat switch connector terminal A and ground. 2. Press and hold the back end of the driver/passenger seat adjuster switch in the UP position. Does the test light illuminate?	—	Go to *Step 9*	Go to *Step 8*
7	Check for a short to ground in circuit 283. Is there a short to ground present?	—	Go to *Step 10*	Go to *Step 11*
8	Replace the power seat switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 14*	—
9	Check for a short to ground in circuit 282. Is there a short to ground present?	—	Go to *Step 12*	Go to *Step 13*
10	Repair a short to ground in circuit 283. Is the repair complete?	—	Go to *Step 14*	—
11	Repair the poor connection or open in circuit 283. Is the repair complete?	—	Go to *Step 14*	—
12	Repair a short to ground in circuit 282. Is the repair complete?	—	Go to *Step 14*	—
13	Repair the poor connection or open in circuit 282. Is the repair complete?	—	Go to *Step 14*	—
14	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all the repairs been made?	—	Go to *Power Seats System Check*	—

Lumbar Support Inoperative

Step	Action	Value(s)	Yes	No
1	Was the entire Lumbar Support System Check performed?	—	Go to *Step 2*	Go to *Lumbar Support System Check*
2	With a test light to ground, backprobe C310 terminal A. Is the test light on?	—	Go to *Step 3*	Go to *Step 4*
3	Connect a test light between terminals A and B of C310. Is the test light on?	—	Go to *Step 5*	Go to *Step 6*
4	Repair a poor connection or open in circuit 1240. Is the repair complete?	—	Go to *Step 11*	—
5	With a test light to ground, backprobe the power seat cushion air control module connector C1 terminal A. Is the test light on?	—	Go to *Step 7*	Go to *Step 8*
6	Repair a poor connection or open in circuit 1450. Is the repair complete?	—	Go to *Step 11*	—
7	1. Disconnect the power seat cushion air control module connectors. 2. Connect a test light between connector C1 terminal A and connector C2 terminal D at the power seat cushion air control module connector. Is the test light on?	—	Go to *Step 9*	Go to *Step 10*
8	Repair the poor connector or open in circuit 1240. Is the repair complete?	—	Go to *Step 11*	—
9	Replace the power seat cushion air control module. Refer to *Lumbar Motor Replacement.* Is the repair complete?	—	Go to *Step 11*	—
10	Repair a poor connection or open in ground circuit 1450. Is the repair complete?	—	Go to *Step 11*	—
11	1. Turn the ignition switch to the OFF position. 2. Reconnect all the connectors/components removed. Have all the repairs been made?	—	Go to *Lumbar Support System Check*	—

Lumbar Support Does Not Move Up or Down

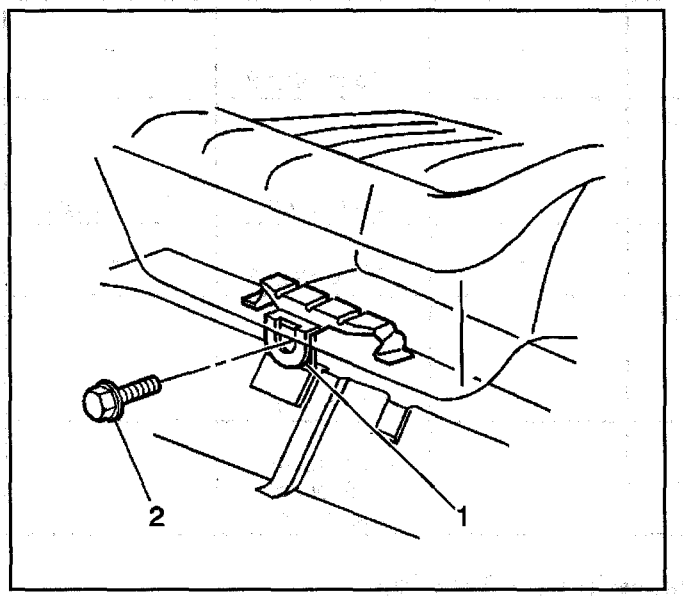
Step	Action	Value(s)	Yes	No
1	Was the entire Lumbar Support System Check performed?	—	Go to *Step 2*	Go to *Lumbar Support System Check*
2	1. Connect a test light to ground. 2. Backprobe the lumbar inflator switch connector terminal of the suspect seat. 3. Operate the lateral bladder using the lumbar inflator switch to the INFLATE or DEFLATE positions while observing the test light. Does the test light illuminate while operating the switch?	—	Go to *Step 3*	Go to *Step 4*
3	1. Connect a test light to ground. 2. Backprobe the power seat cushion air control module inflate terminal of the suspect seat. 3. Operate the lateral bladder using the lumbar inflator switch to the INFLATE or DEFLATE positions while observing the test light. Does the test light illuminate while operating the switch?	—	Go to *Step 5*	Go to *Step 6*
4	Replace the lumbar inflator switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 9*	—

Lumbar Support Does Not Move Up or Down (cont'd)

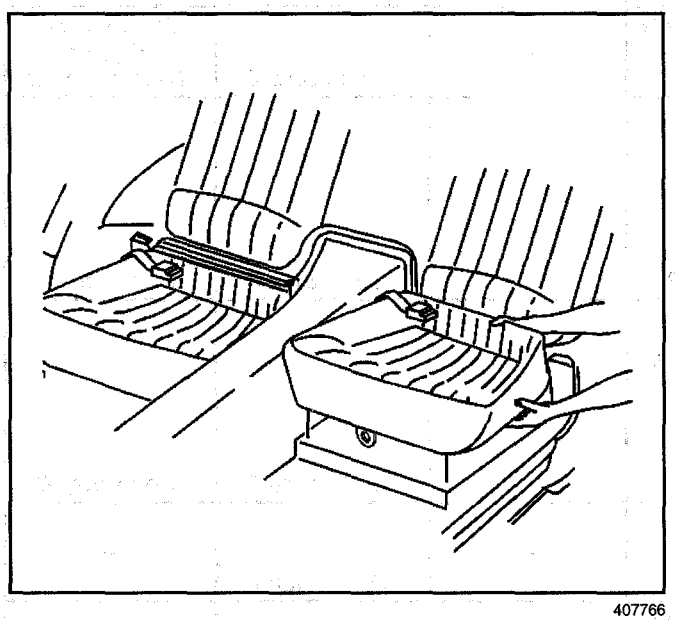
Step	Action	Value(s)	Yes	No
5	Replace the power seat cushion air control module. Refer to *Lumbar Motor Replacement.* Is the repair complete?	—	Go to *Step 9*	—
6	Inspect for a short to ground in the inflate circuits between the lumbar inflator switch connector and the power seat control module connector. Is a short to ground present?	—	Go to *Step 7*	Go to *Step 8*
7	Repair the short to ground. Is the repair complete?	—	Go to *Step 9*	—
8	Repair the open in the inflate circuits between the lumbar inflator switch connector and the power seat cushion air control module connector. Is the repair complete?	—	Go to *Step 9*	—
9	1. Turn the ignition switch to the OFF position. 2. Reconnect all the connectors/components removed. Have all the repairs been made?	—	Go to *Lumbar Support System Check*	—

Lumbar Support Inoperative in One Direction

Step	Action	Value(s)	Yes	No
1	Was the entire Lumbar Support System Check performed?	—	Go to *Step 2*	Go to *Lumbar Support System Check*
2	1. Connect the test light. 2. Backprobe the lumbar inflator switch circuit inoperative of the suspect seat. 3. Operate the lumbar inflator switch to the inoperative position while observing the test light. Does the test light illuminate while operating the switch?	—	Go to *Step 3*	Go to *Step 4*
3	1. Connect the test light to ground. 2. Backprobe the power seat cushion air control module inoperative circuit. 3. Operate the lumbar inflator switch to the inoperative position while observing the test light. Does the test light illuminate while operating the switch?	—	Go to *Step 5*	Go to *Step 6*
4	Replace the lumbar inflator switch. Refer to *Seat Adjuster Mechanism Replacement - Power.* Is the repair complete?	—	Go to *Step 7*	—
5	Replace the power seat cushion air control module. Refer to *Lumbar Motor Replacement.* Is the repair complete?	—	Go to *Step 7*	—
6	Check for a short to ground in the inoperative circuit. Is a short to ground present?	—	Go to *Step 8*	Go to *Step 9*
7	1. Turn the ignition switch to the OFF position. 2. Reconnect all connectors/components removed. Have all of the repairs been made?	—	Go to *Lumbar Support System Check*	—
8	Repair a short to ground in the inoperative circuit. Is the repair complete?	—	Go to *Step 7*	—
9	Repair the poor connection or open in the inoperative circuit. Is the repair complete?	—	Go to *Step 7*	—



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Repair Instructions

Seat Replacement - Bucket (Cushion Bottom)

Removal Procedure

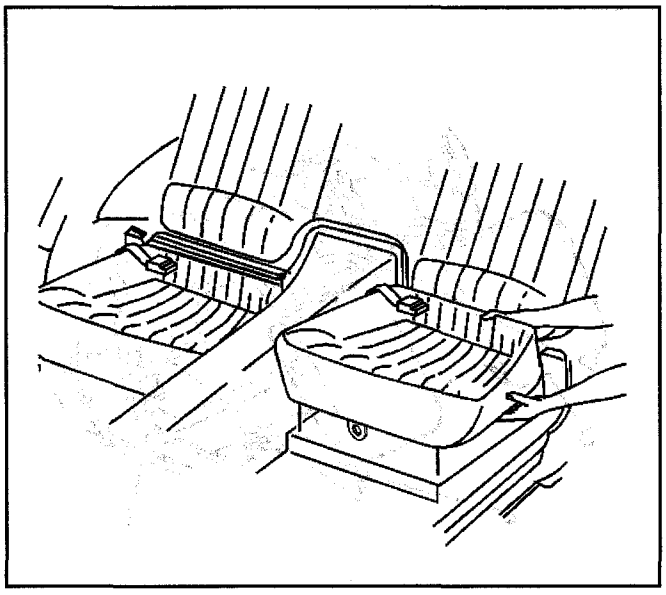
1. Place the front seats to the full-forward position.
2. Remove bolt/screw (2) from the base of the bucket seat cushion(s) (2).
3. Remove seat cushion by pulling upwards and forwards.

Important: Failure to use a protective barrier over nearby trim and paint may cause damage to the vehicle.

4. Remove seat cushion from the vehicle.

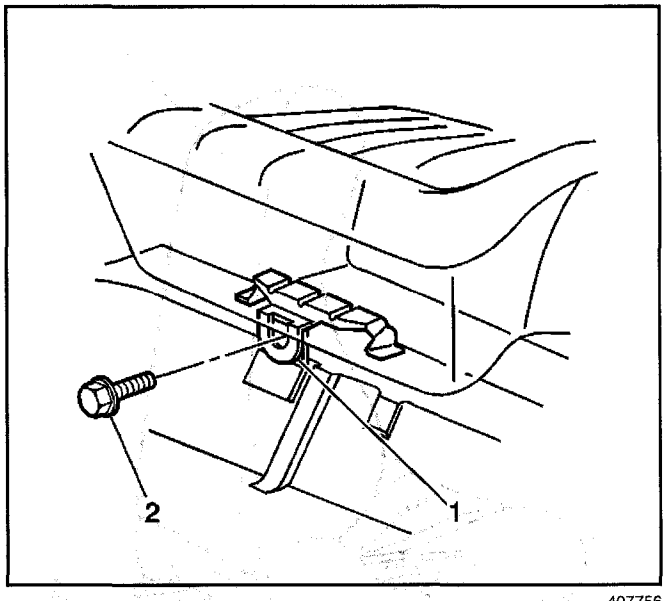
Installation Procedure

1. Install the seat cushions into the vehicle by inserting rear edge of seat into cavity and pushing in and down.



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2. Install the seat cushion bolt/screw (2).
   Tighten
   Tighten the bolts to 25 N·m (18 lb ft).
3. Return the front seats to their previous position.

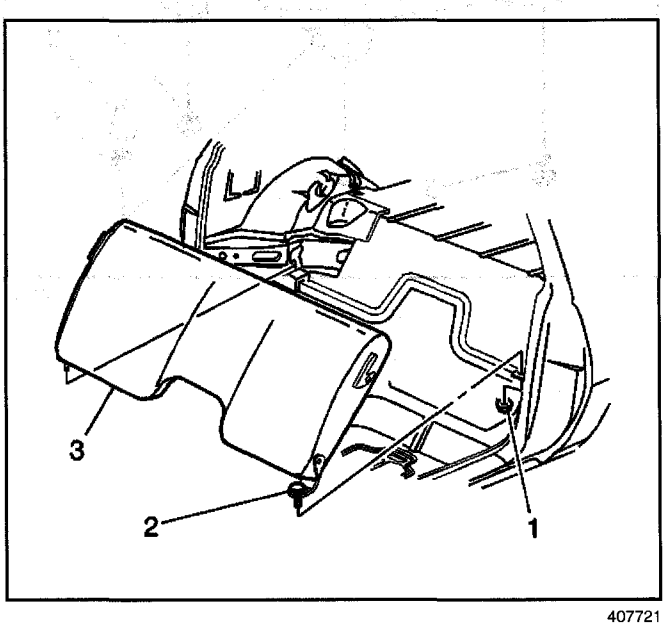


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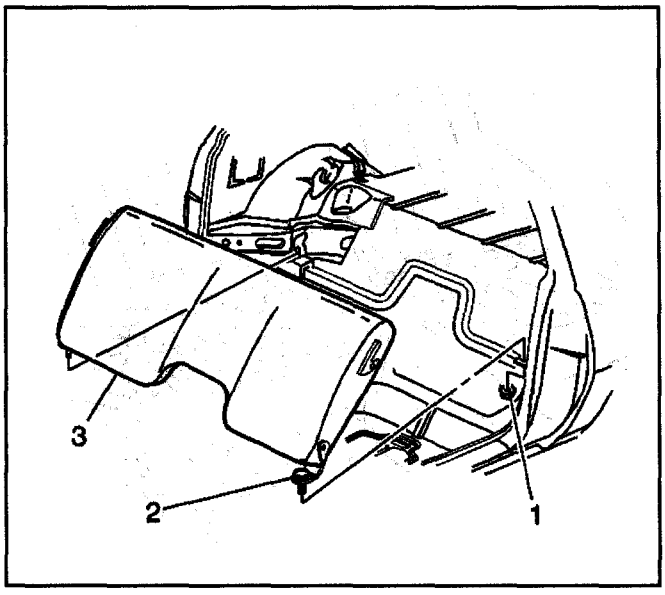
Seat Replacement - Bucket (Seatback Cushion)

Removal Procedure

1. Remove rear seat bottom cushions. Refer to *Seat Replacement - Bucket (Cushion Bottom)* in Seats.
2. Remove shoulder restraint guide bolt/screw and restraint if replacing seatback.
3. Unlatch seatback latch from striker.
4. Remove nuts (1) from rear seatback cushion studs.
5. Remove seat studs from outer pivot supports by lifting upward on outboard side of cushion (3).
6. Place protective shield over nearby trim and paint.
7. Remove cushion from vehicle by removing through rear liftgate using care not to damage cushion.



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Installation Procedure

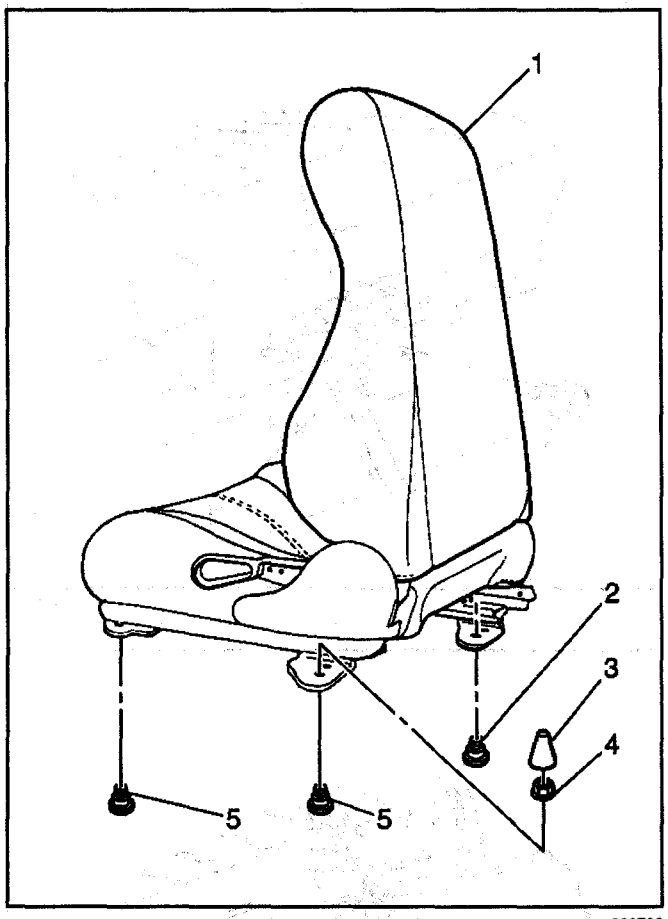
1. Place protective shield over nearby trim and paint.
2. Install cushion into vehicle.
3. Remove protective shield.
4. Install seat studs into outer pivot supports.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install nuts (1) to rear seat studs loosely.

   Tighten

   Tighten the nuts (1) to 24 N·m (18 lb ft.).
6. Install shoulder restraint guide and screw hand tight.
7. Install rear seat bottom cushions. Refer to *Seat Replacement - Bucket (Cushion Bottom)* in Seats.



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Seat Replacement - Front Bucket (Chevrolet)

Removal Procedure

1. Remove the caps (3) that cover the nuts (4).
2. Remove the caps (3) that cover the studs (5).
3. Remove the nuts (4) from the studs (5).
4. Remove the body wiring harness electrical connector, as needed.
5. Place a protective shield over the nearby trim and paint.
6. Remove the seat (1) from the floor pan.
7. Remove the seat (1) from the vehicle.

Installation Procedure

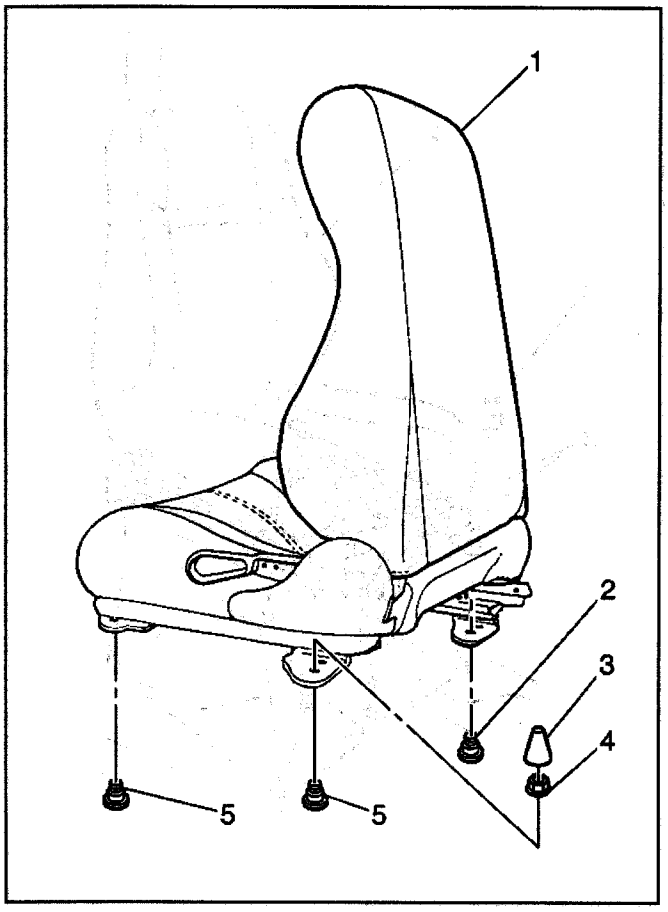
1. Install the seat (1) to the vehicle.
2. Install the seat (1) over the studs (5) to the floor pan.
3. Remove the protective shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the nuts (4) to the studs (5).

   Tighten

   Tighten the nuts (4) to 24 N·m (18 lb ft).
5. Install the body wiring harness electrical connector, if previously disconnected.
6. Install the caps (3) that cover the nuts (4).
7. Install the caps (3) that cover the studs (5).

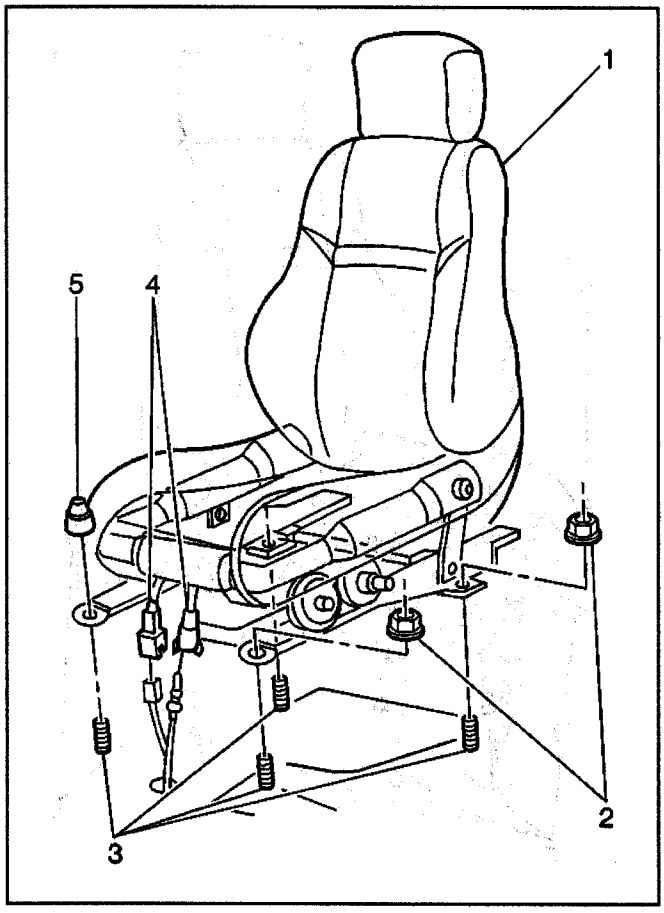


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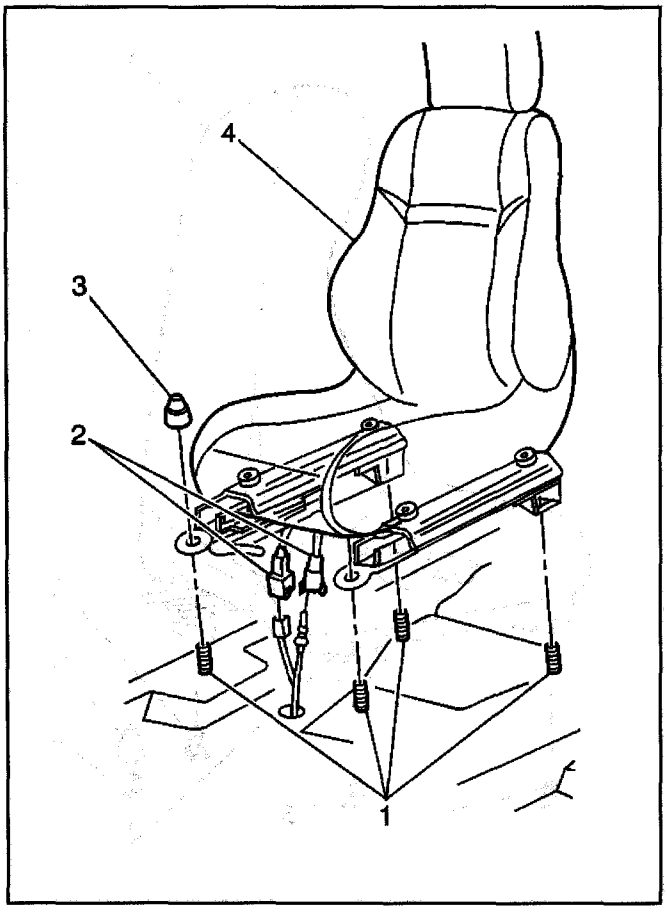
Seat Replacement - Front Bucket (Pontiac)

Removal Procedure

1. Remove the caps (5) that cover the nuts (2).
2. Remove the caps (5) that cover the studs (3).
3. Remove the nuts (2) from the studs (3).
4. Remove the body wiring harness electrical connector (4), if needed.
5. Remove the seat air supply hose, if needed.
6. Place a protective shield over the nearby trim and paint.
7. Remove the driver seat (1) from the floor pan.
8. Remove the driver seat (1) from the vehicle.

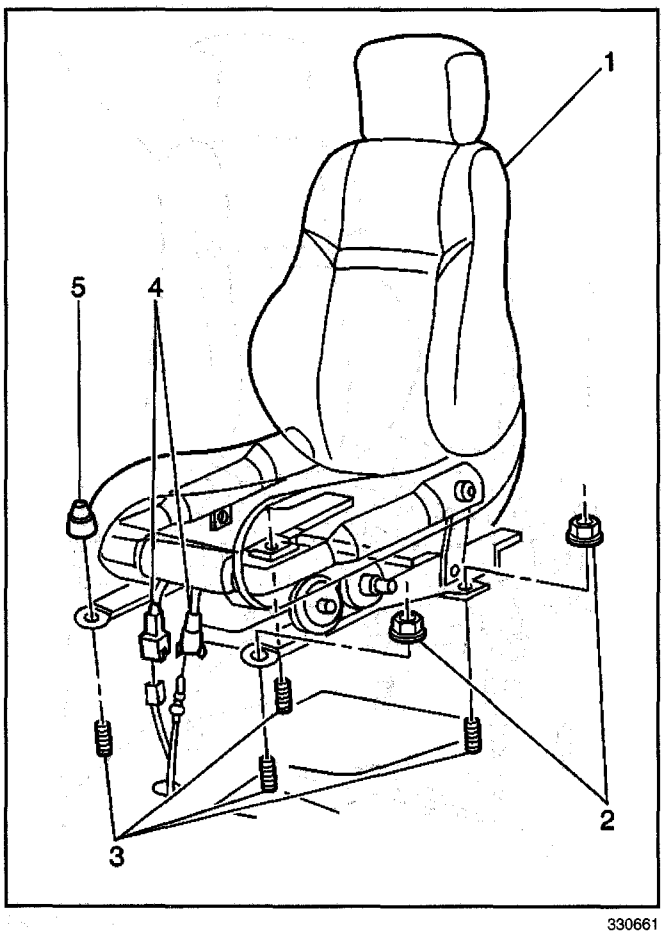


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9. Remove the passenger seat (4) from the floor pan.
10. Remove the passenger seat (4) from the vehicle.



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Installation Procedure

1. Install the driver seat (1) to the vehicle.
2. Install the seat over the studs (3) to the floor pan.
3. Remove the protective shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the nuts (2) to the studs (3).

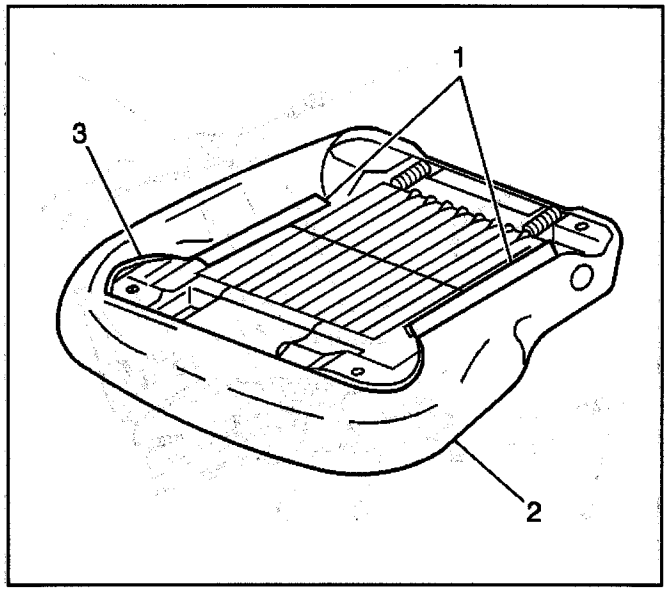
   Tighten

   Tighten the nuts (2) to 24 N·m (18 lb ft).
5. Install the body wiring harness electrical connector (4), if previously disconnected.
6. Install the seat air supply hose if previously removed.
7. Install the caps (5) that cover the nuts (2).
8. Install the caps (5) that cover the studs (3).

Seat Cushion Cover Replacement - Front

Removal Procedure

1. Remove the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.
2. Remove the J-retainers (1) from the seat cushion (2) frame.
3. Remove the cover (3).

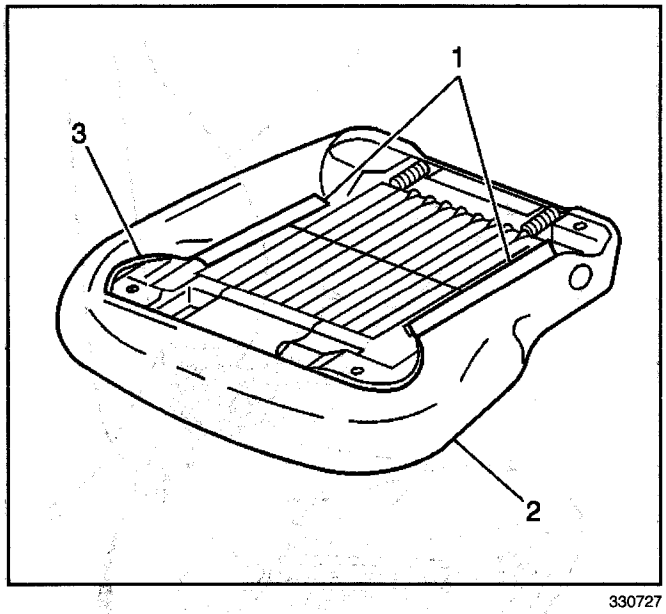


330727

Installation Procedure

1. Install the cover (3) over the seat cushion (2) frame.

   Cap the front and rear corners of the cover over the cushion (2) and regulate to a desired appearance.
2. Install the J-retainers (1) to the seat cushion (2) frame.
3. Install the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.

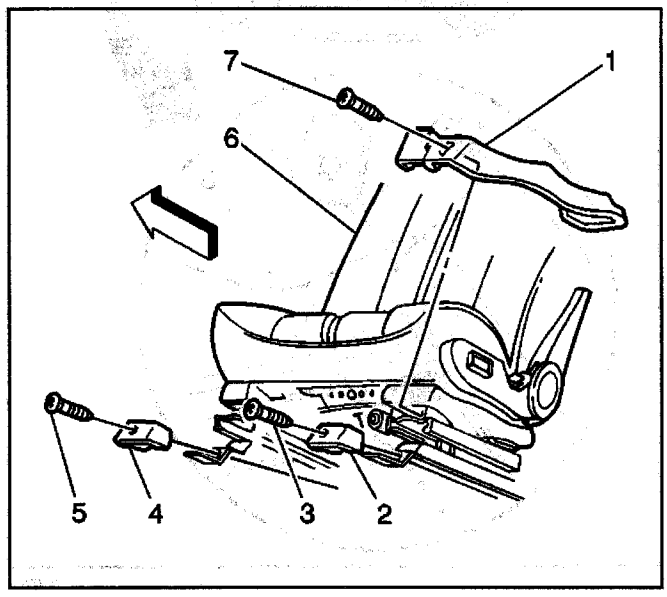


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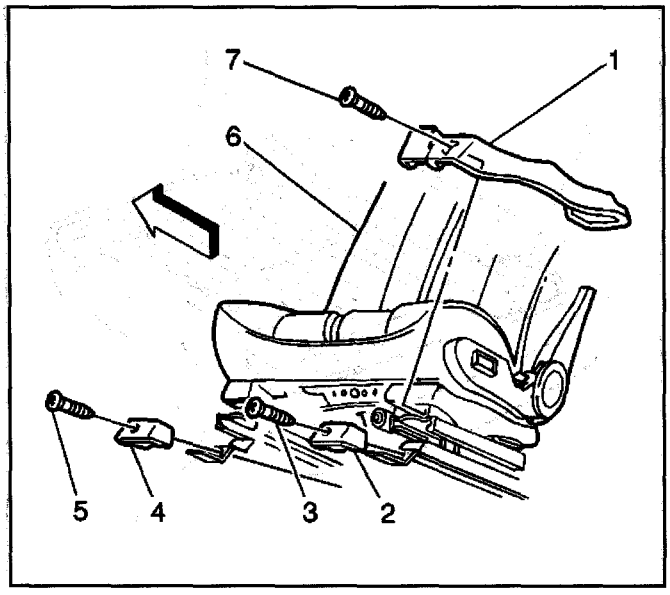
Seat Cushion Trim Cover and Pad Replacement

Removal Procedure

1. Remove the bolts (3, 5) that attach the covers (2, 4) to the driver seat adjuster track.
2. Remove the covers (2, 4) from the driver seat adjuster track.



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Installation Procedure

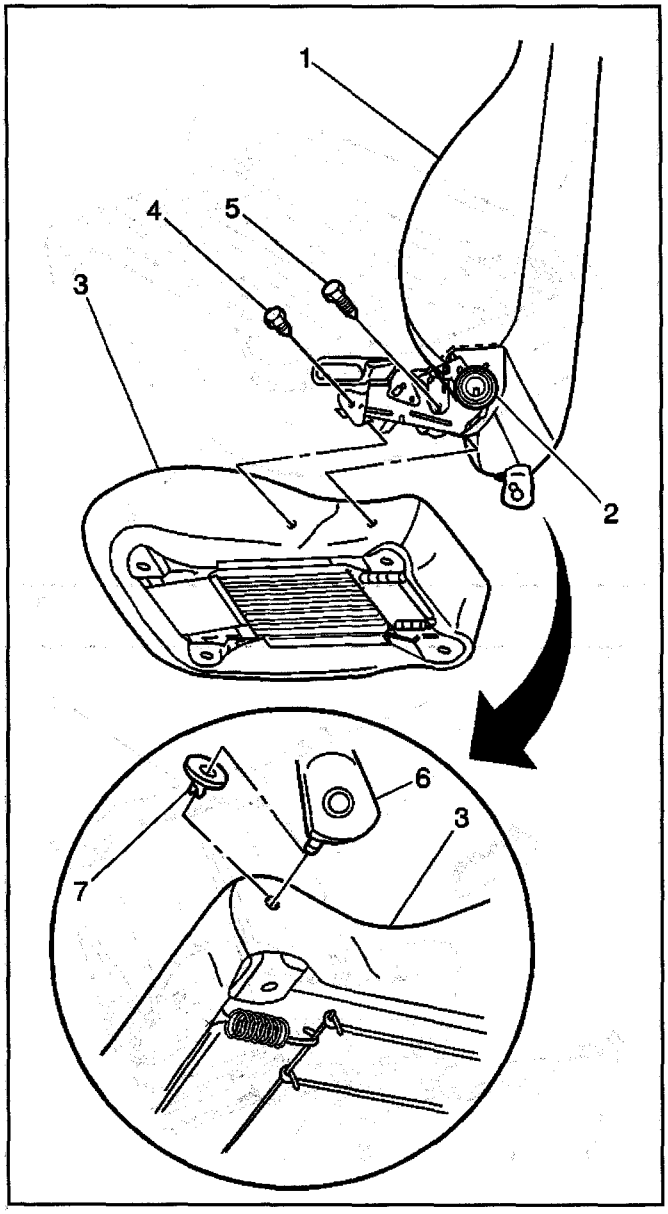
1. Install the covers (2, 4) to the driver seat adjuster track.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts (3, 5) to the covers (2, 4).

   Tighten

   Tighten the bolts (3, 5) to 1.7 N·m (15 lb in)



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Seat Back Replacement - Front

Removal Procedure

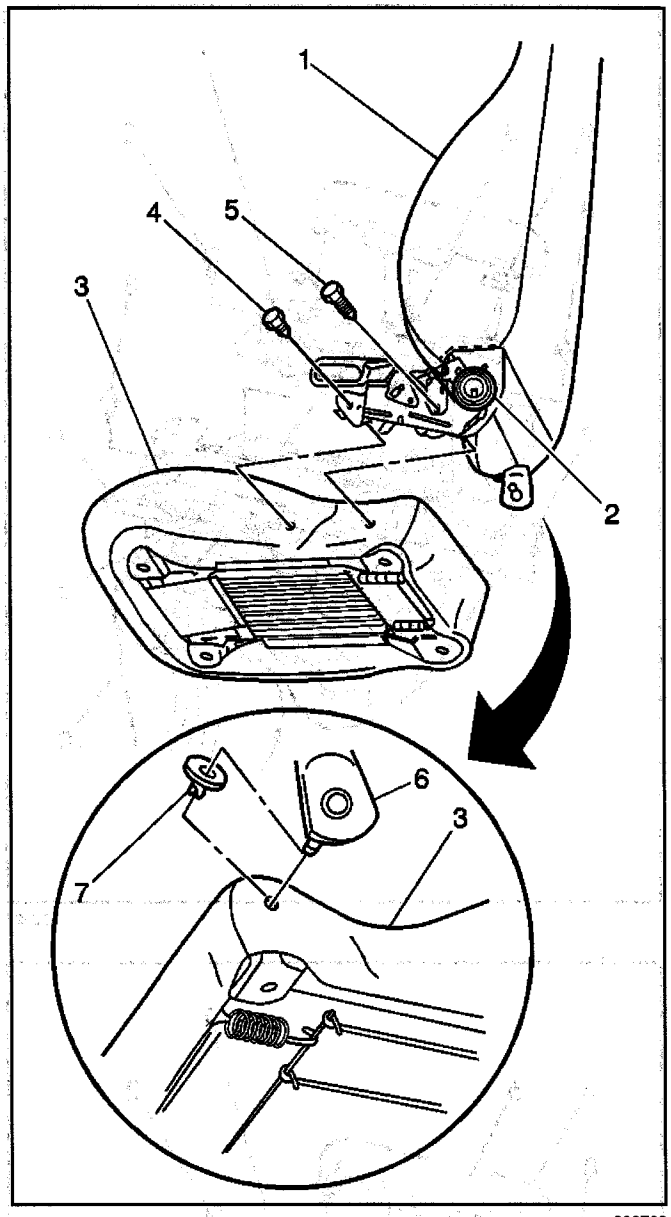
1. Remove the front seat (1). Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac).*
2. Remove the hinge arm trim covers. Refer to *Seat Cushion Trim Cover and Pad Replacement.*
3. Remove the bolts (4,5) attaching the hinge arms to the seat cushion (3).
4. Unsnap the seatback (1) from the seatback pivot bushing (7) in order to remove the seatback (1) from the seat cushion (3).

Installation Procedure

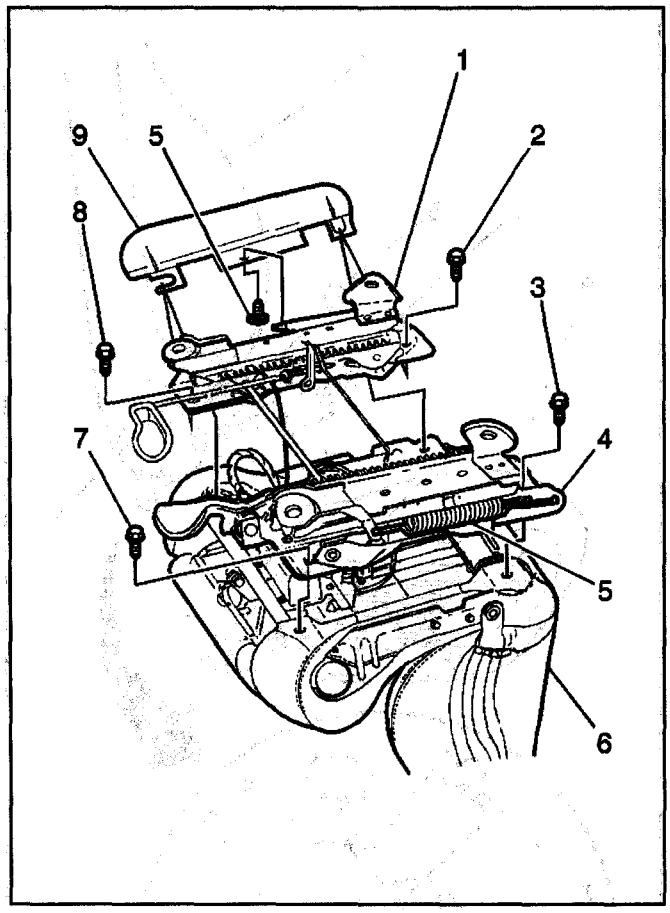
1. Install the front seatback pivot bushing (7).
2. Install the seatback (1) to the seat cushion (3).
   Align the pivot shaft on the seatback (1) with the hole in the seat cushion (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the bolts (4, 5).
   Tighten
   Tighten the bolts (4, 5) to 24 N·m(18 lb ft).
4. Install the hinge arm trim covers. Refer to *Seat Cushion Trim Cover and Pad Replacement.*
5. Install the front seat (1). Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac).*



330708

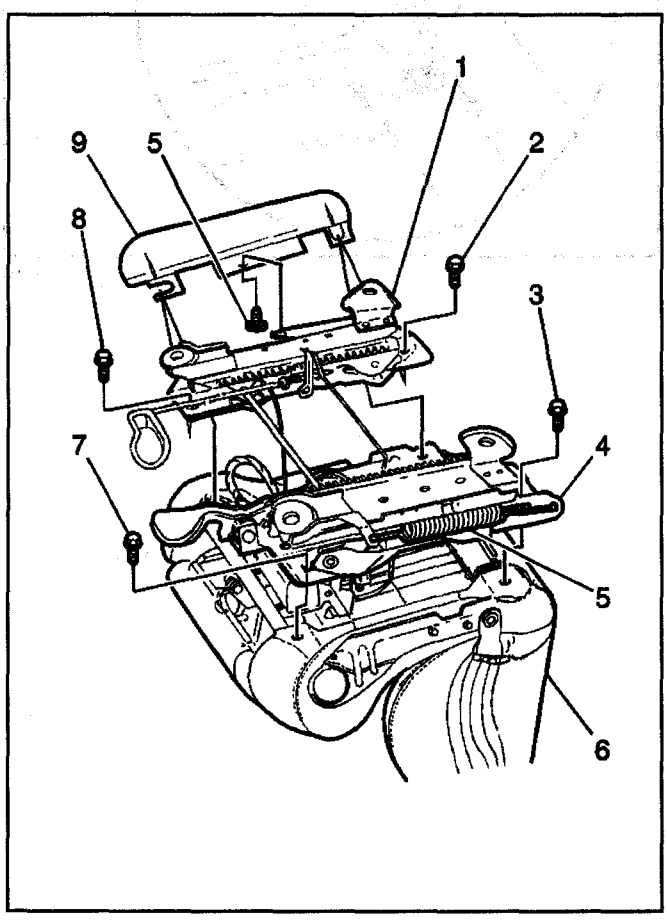


330827

Seat Back Hinge/Recliner Mechanism Replace - Front

Removal Procedure

1. Remove the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.
2. Remove the bolts (2, 8) that attach the adjuster (1) to the front seat.
3. Remove the adjuster (1).
4. Remove the bolts (3, 7) that attach the adjuster (4) to the front seat.
5. Remove the adjuster (4).



330827

Installation Procedure

1. Install the adjuster (4) to the front seat.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts (3, 7).

   Tighten

   Tighten the bolts (3, 7) to 24 N·m (18 lb ft).
3. Install the adjuster (1) to the front seat.
4. Install the bolts (2, 8).

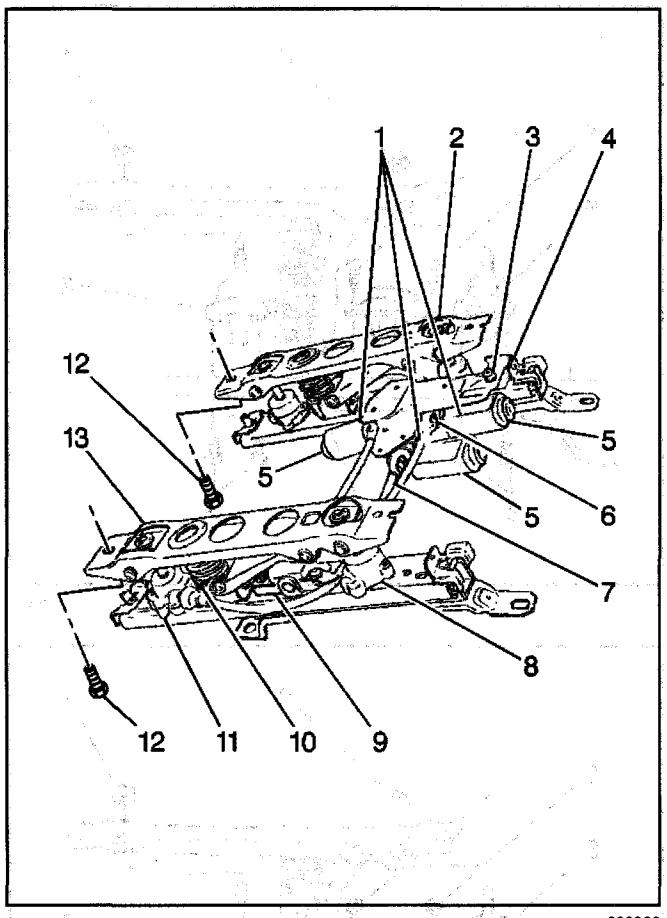
   Tighten

   Tighten the bolts (2, 8) to 24 N·m (18 lb ft).
5. Install the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.

Power Recliner Replacement - Front Seat

Removal Procedure

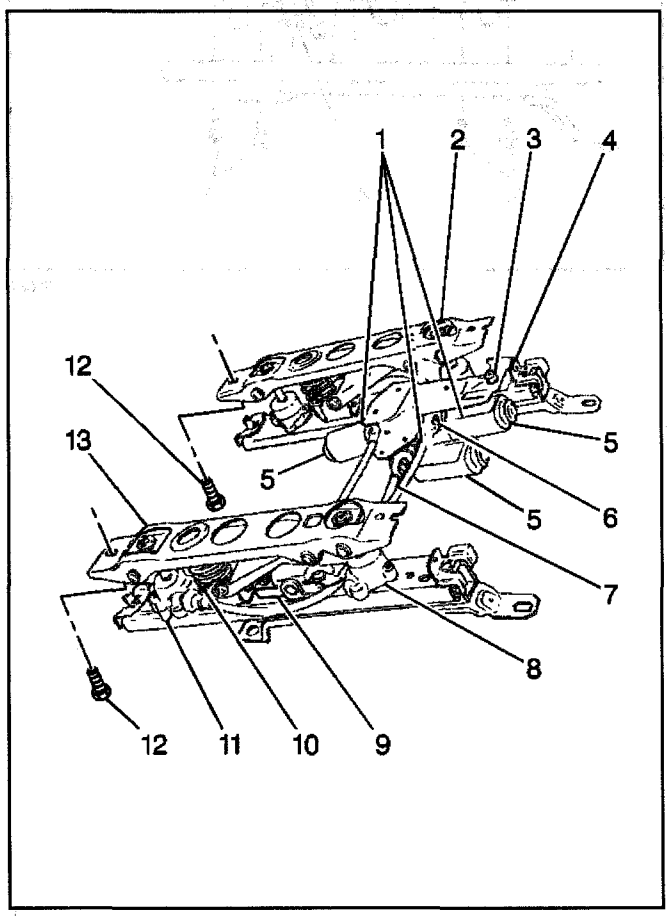
1. Remove the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.
2. Remove the drive cables (7).
3. Remove the nut (3) that secures the driver seat adjuster motor support (4) with the driver seat adjuster motor (5) attached.
4. Remove the driver seat adjuster motor support (4) with the driver seat adjuster motor (5) attached.
5. Remove the bolts (12).
6. Remove the adjuster (13).
7. Remove the adjuster cover bolts, as needed.
8. Remove the adjuster covers, as needed.



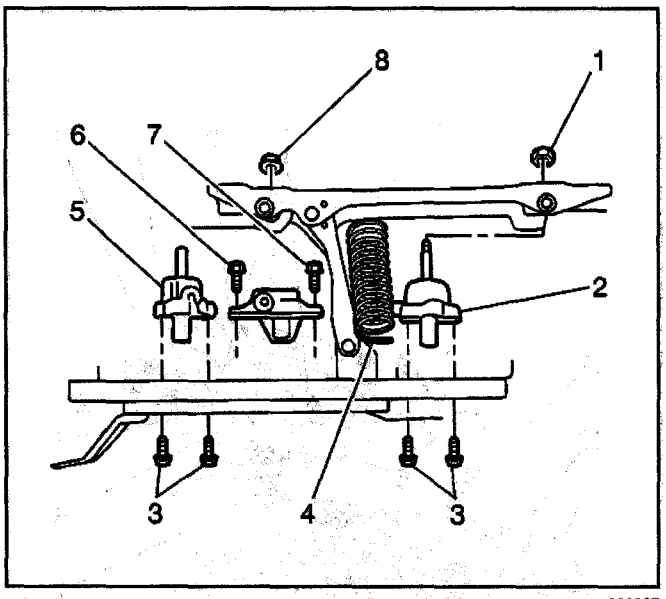
330829

Disassembly Procedure

1. Place the adjuster (13) in a bench vise.
2. Remove the rear adjuster (2) nut.
3. Open the vise slowly in order to relieve the assist spring compression.
4. Remove the adjuster (13) from the vise.
5. Disassemble the vertical assist spring (10).

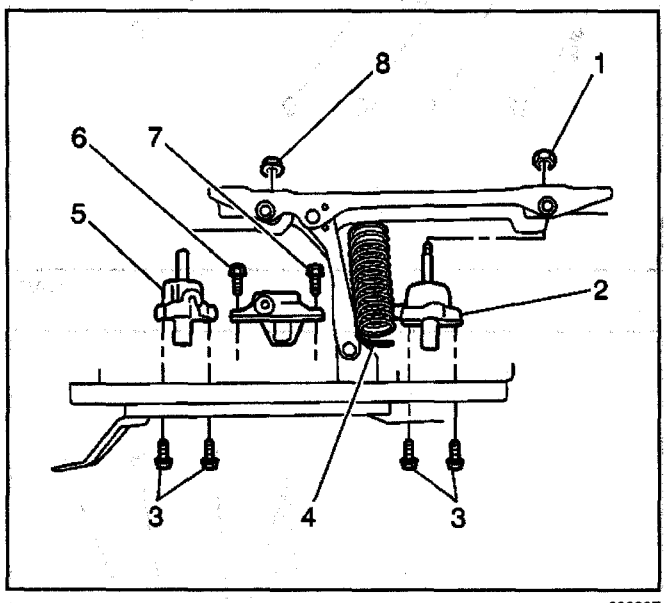


330829



330837

6. Remove the front adjuster nut (8).
7. Remove the bolts (6) from the adjuster horizontal actuator (7).
8. Disassemble the adjuster horizontal actuator (7).
9. Remove the adjuster bolts (3).
10. Disassemble the rear vertical actuator (2).
11. Disassemble the front vertical actuator (5).

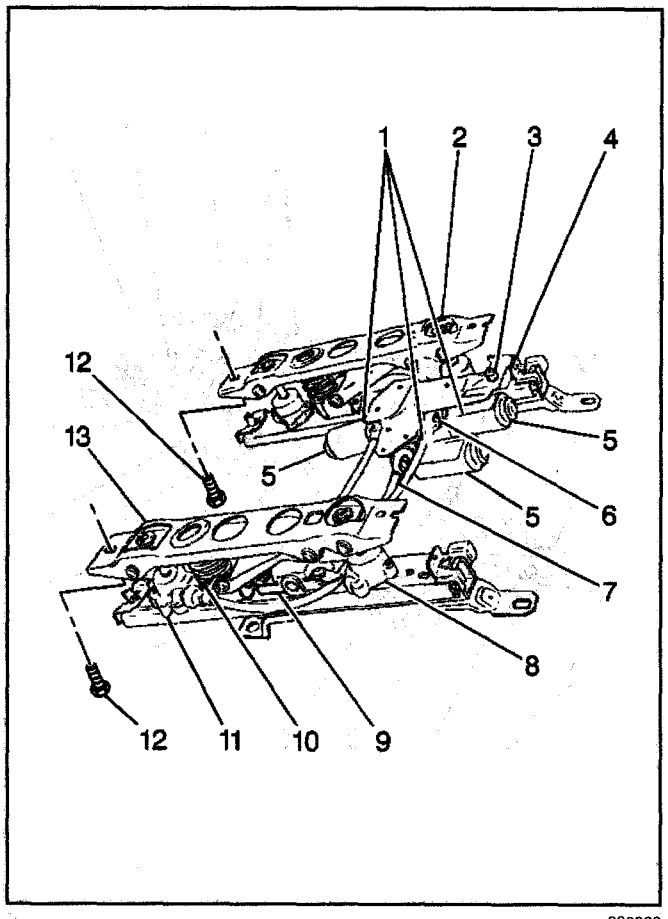


330837

Assembly Procedure

1. Assemble the front vertical actuator (5).
2. Assemble the rear vertical actuator (2).
3. Install the adjuster bolts (3).
4. Assemble the adjuster horizontal actuator (7).
5. Install the bolts (6) to the adjuster horizontal actuator (7).
6. Install the front adjuster nut (8).
7. Assemble the vertical assist spring (4).

8. Place the adjuster (13) into a bench vise.
9. Carefully compress the vertical assist spring (10).
10. Install the rear adjuster nut (2).
11. Remove the adjuster from the bench vise.



330829

Installation Procedure

1. Install the adjuster covers, if previously removed.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

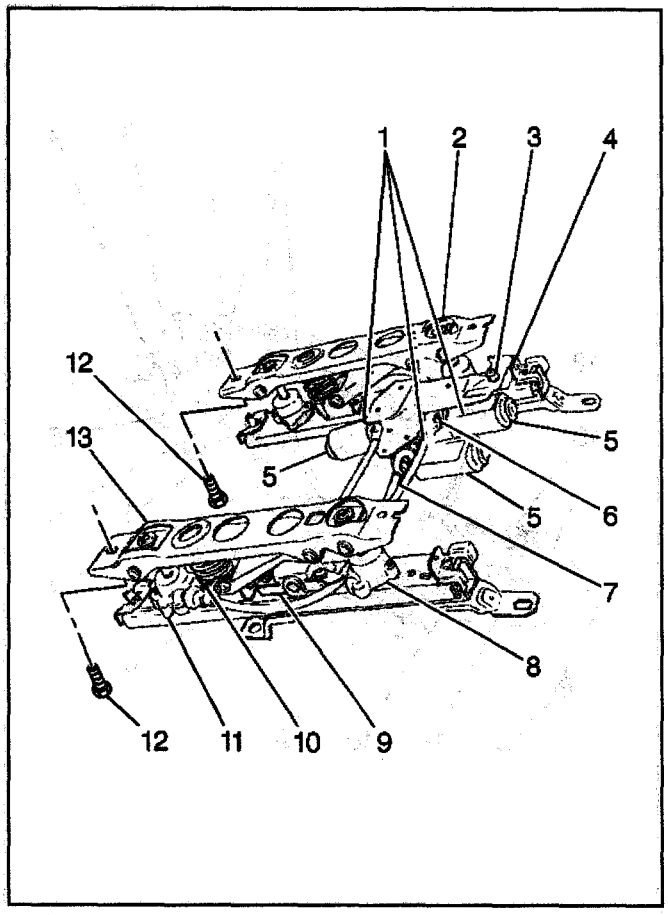
2. Install the adjuster cover bolts, if previously removed.

   Tighten

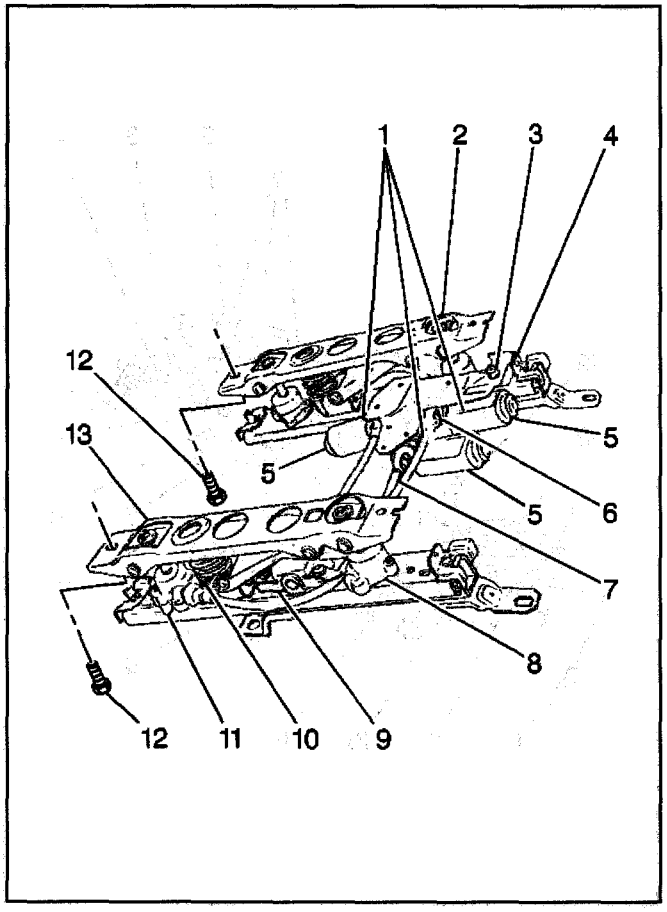
   Tighten the adjuster cover bolts to 1.7 N·m (15 lb in).
3. Install the adjuster (13).
4. Install the bolts (12).

   Tighten

   Tighten the bolts to 24 N·m (18 lb ft).
5. Install the driver seat adjuster motor support (4) with the driver seat adjuster motor (5) attached.
6. Install the nut (3) that secures the driver seat adjuster motor (4) support.
7. Install the drive cables (7).
8. Install the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac).*



330829

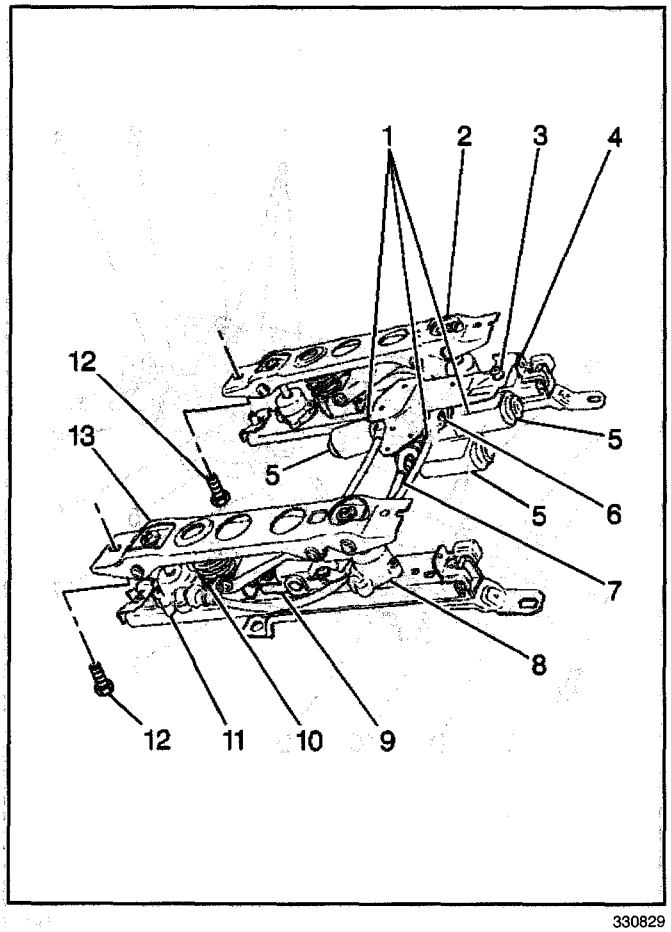


330829

Motor Removal Procedure

1. Remove the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.
2. Remove the drive cables (7).
3. Remove the nuts (3).
4. Remove the driver seat adjuster motor support (4) with the driver seat adjuster motor (5) attached.
5. Disconnect the electrical connectors from the driver seat adjuster motor (5).
6. Remove the driver seat adjuster motor (5) from the driver seat adjuster motor (4) support.

   Grind off the ends of the grommet in order to separate the driver seat adjuster motor (5) from the driver seat adjuster motor support (4).



330829

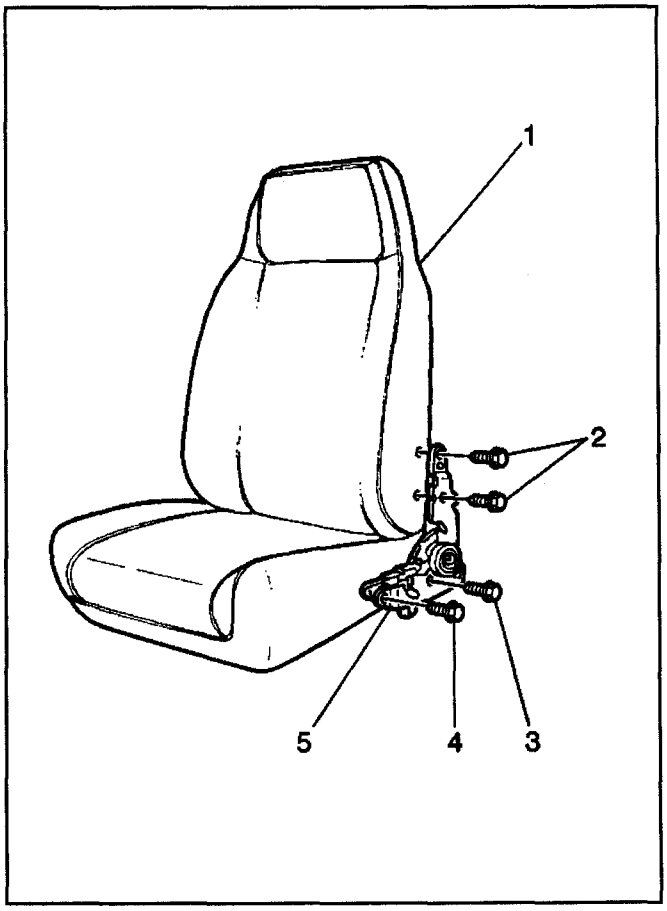
Motor Installation Procedure

1. Install the driver seat adjuster motor (5) to the driver seat adjuster motor support (4).
   1.1. Use a 3/16 inch drill bit in order to drill out the top end of the grommet.
   1.2. Secure the driver seat adjuster motor (5) to the driver seat adjuster motor support (4) with 3/16 inch rivets.
2. Connect the electrical connectors to the driver seat adjuster motor (5).
3. Install the driver seat adjuster motor support (4) with the driver seat adjuster motor (5) attached.
4. Install the nut (3).
5. Install the drive cables (7).
6. Install the front seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.

Seat Back Recliner Mechanism Replacement - Front

Removal Procedure

1. Remove the seat cushion trim. Refer to *Seat Cushion Trim Cover and Pad Replacement.*
2. Pull the seatback cover sufficiently forward in order to access the bolts (2).
3. Remove the bolts (2) that attach the recliner to the front seat.
4. Remove the front seatback. Refer to *Seat Back Replacement - Front.*
5. Remove the recliner (5).



330805

Installation Procedure

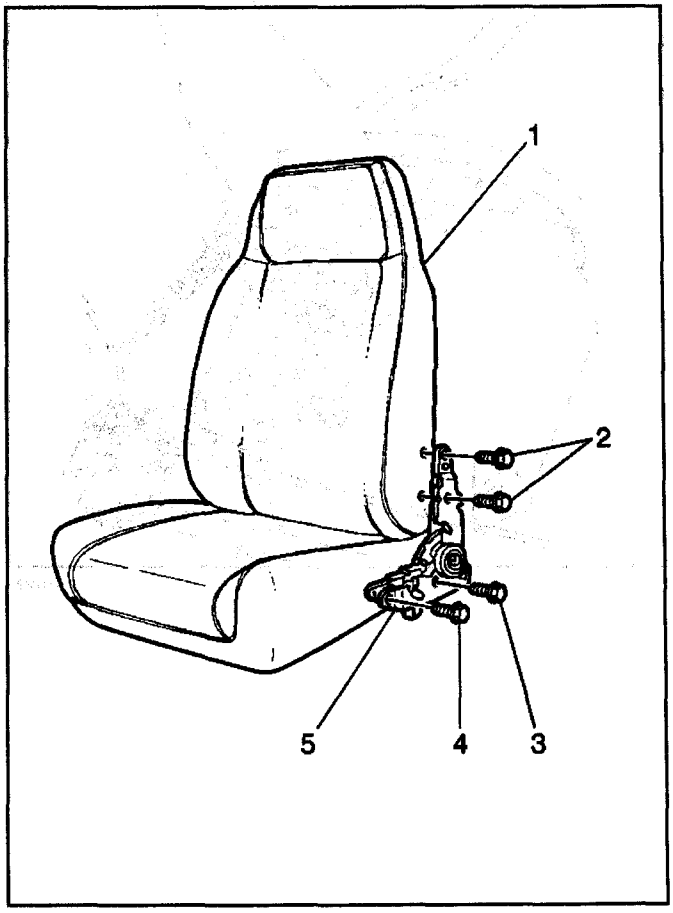
1. Install the recliner (5) to the front seat.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts (2) that attach the recliner (5) to the front seat.

   Tighten

   Tighten the bolts (2) to 24 N·m (18 lb ft).
3. Install the front seatback. Refer to *Seat Back Replacement - Front.*
4. Install the seatback cover to the original position.
5. Install the seat cushion trim. Refer to *Seat Cushion Trim Cover and Pad Replacement.*



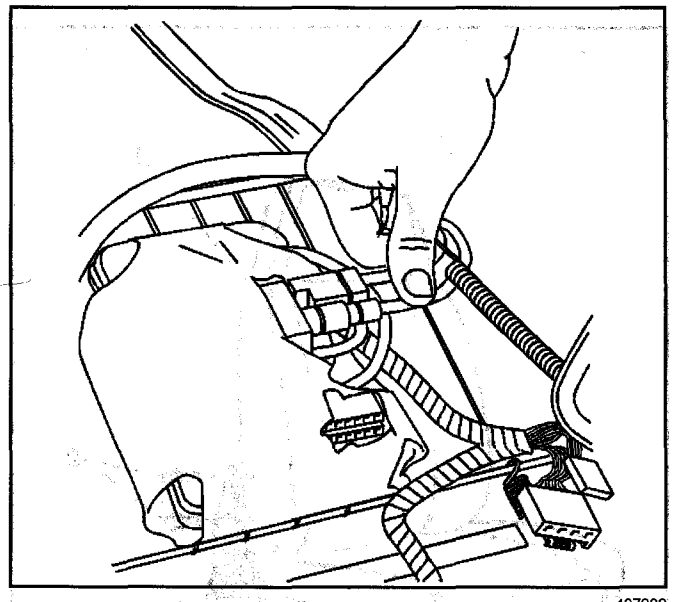
330805

Recliner Control Check

1. Lift the recliner control handle.
2. Press the seatback rearward into a fully reclined position (21 degrees from the intermediate position).
3. Inspect the ease of the recliner control handle operation and the seatback movement.
4. Release the recliner control handle.

   Ensure that the handle returns to its original position and that the seatback remains fully reclined.
5. Lift the recliner control handle.
6. Pull the seatback forward to an intermediate reclined position.
7. Release the recliner control handle.
8. Press the seatback rearward in order to ensure that the seatback is locked and stays in position.
9. Lift the recliner control handle and move the seatback to the normal position.

   Verify the ease of the recliner control handle operation and the seatback return.
10. Release the recliner control handle.
11. Press the seatback rearward in order to ensure that the seatback is locked and stays in position.
12. If the recliner control does not operate correctly, remove and replace the recliner control. Refer to Front Seat Recliner.



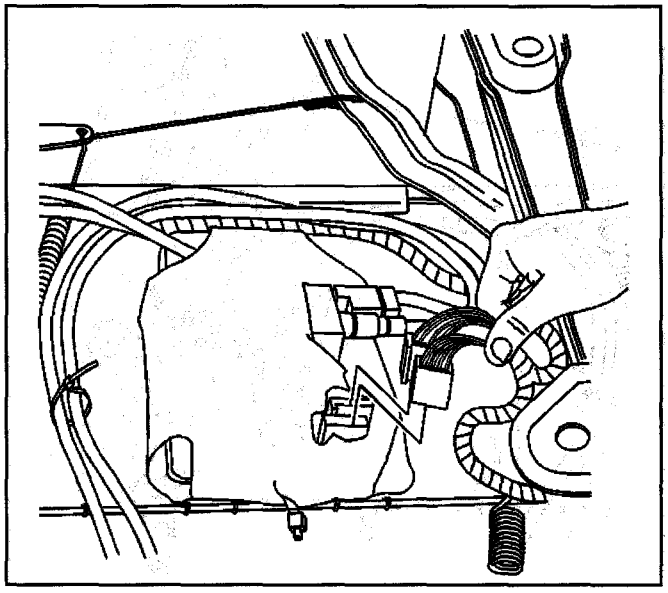
407293

Lumbar Motor Replacement

Removal Procedure

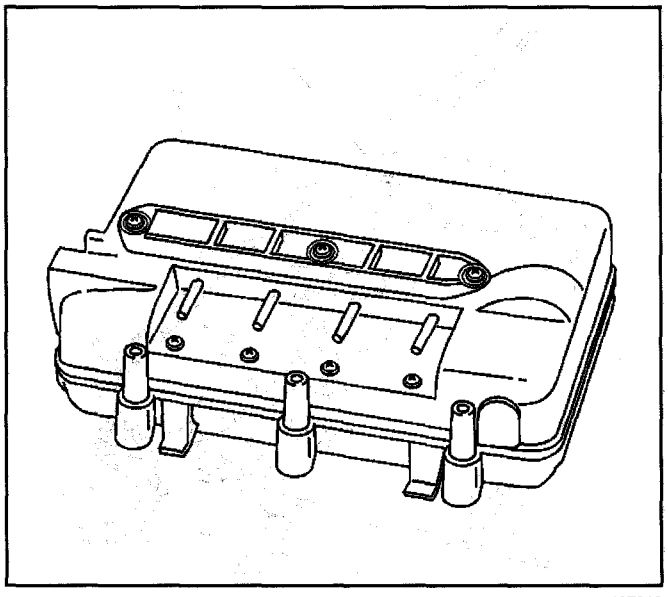
1. Remove the front passenger seat. Refer to *Seat Replacement - Front Bucket (Pontiac)* for Pontiac or *Seat Replacement - Front Bucket (Chevrolet)* for Chevrolet.
2. Remove the adjuster. Refer to *Power Recliner Replacement - Front Seat* in seats.
3. Disconnect the air supply hoses from the lumbar module.

4. Disconnect the electrical connectors.



407308

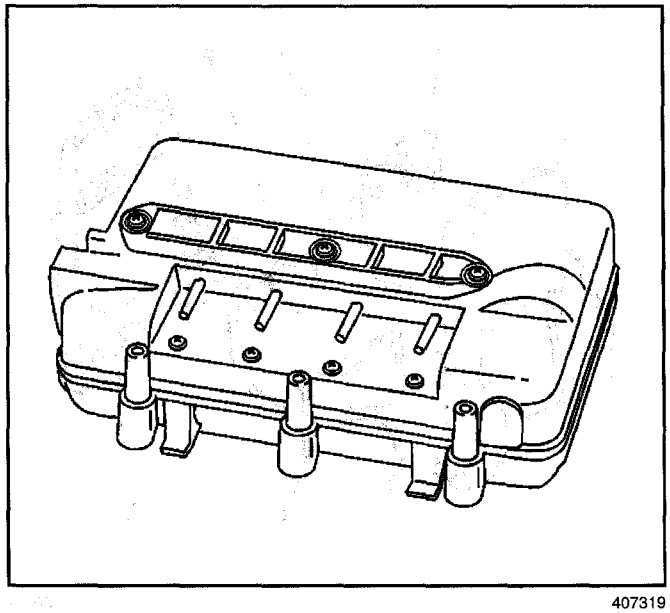
5. Open leather module pouch and slide module out of installed location.



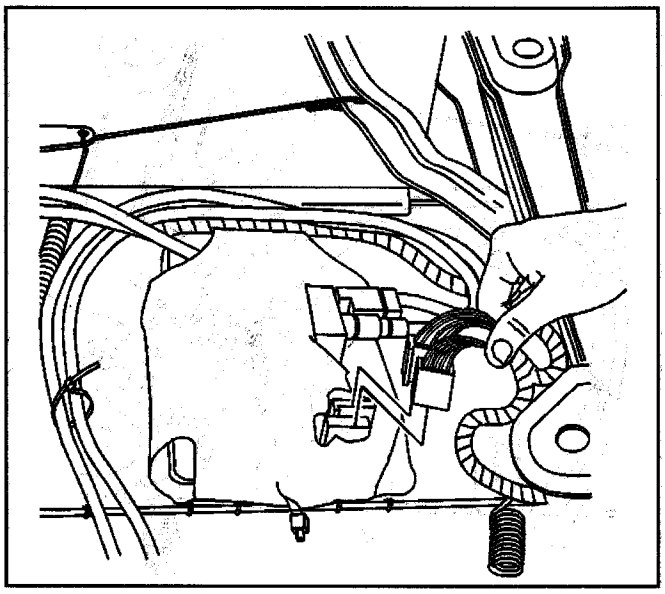
407319

Installation Procedure

1. Install the lumbar module into leather pouch and secure pouch.

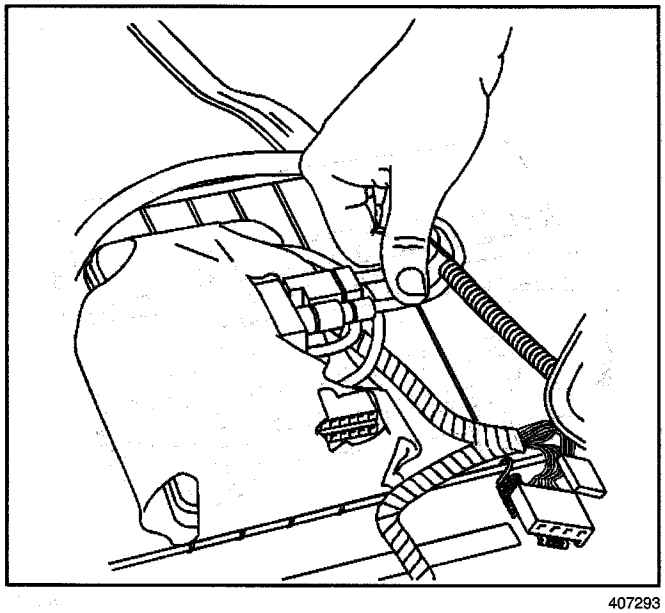


407319



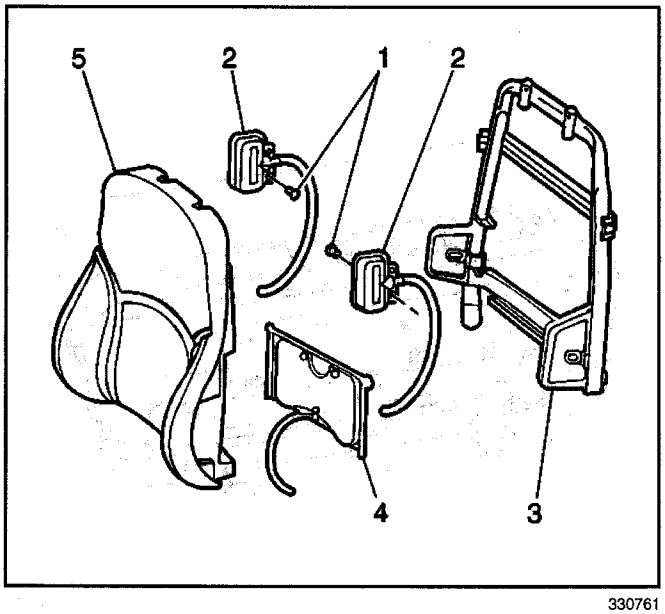
407308

2. Connect the electrical connectors.



407293

3. Connect the air supply hoses to the lumbar module.
4. Install the adjuster. Refer to *Power Recliner Replacement - Front Seat* in seats.
5. Install the front passenger seat. Refer to *Seat Replacement - Front Bucket (Pontiac)* for Pontiac or *Seat Replacement - Front Bucket (Chevrolet)* for Chevrolet.



330761

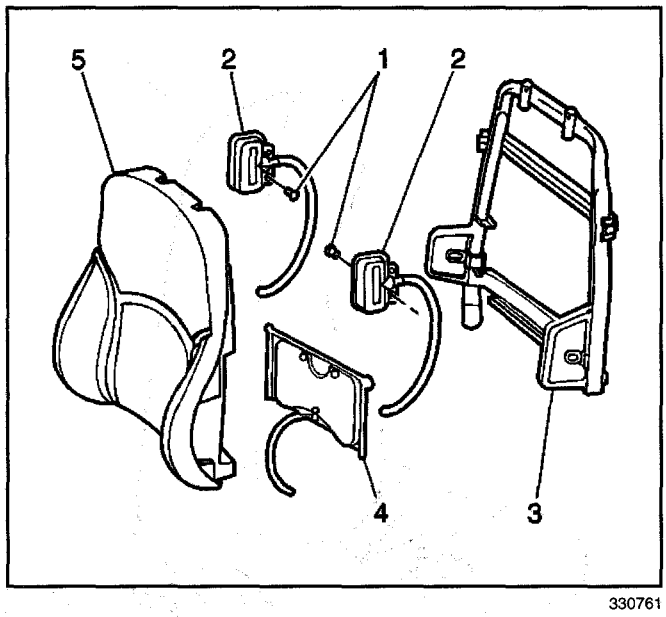
Lumbar Bladder Replacement

Removal Procedure

1. Remove the seatback cover. Refer to Seatback Cover Uplevel.
2. Remove the seatback pad (5) from the frame (3).
3. Remove the seatback lumbar bladder (4) and the hose.
4. Remove the seat lateral support bladder retainer (1).
5. Remove the seat lateral support bladders (2) and the hose.

Installation Procedure

1. Install the seat lateral support bladders (2) and the hose.
2. Install the seat lateral support bladder retainer (1).
3. Install the seatback lumbar bladder (4) and the hose.
4. Install the seatback pad (5) to the frame (3).
5. Install the seatback cover. Refer to Seatback Cover Uplevel.

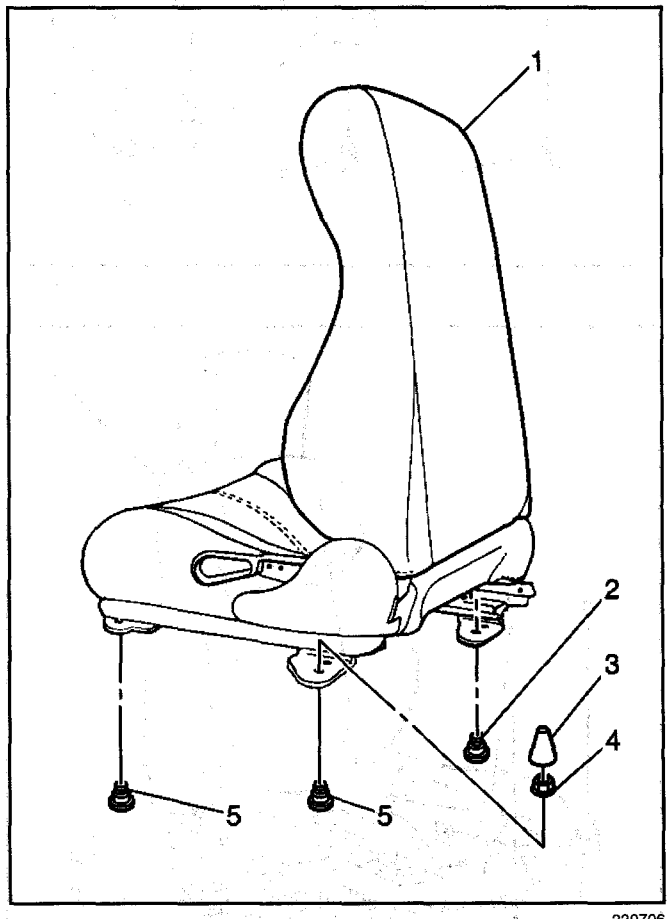


330761

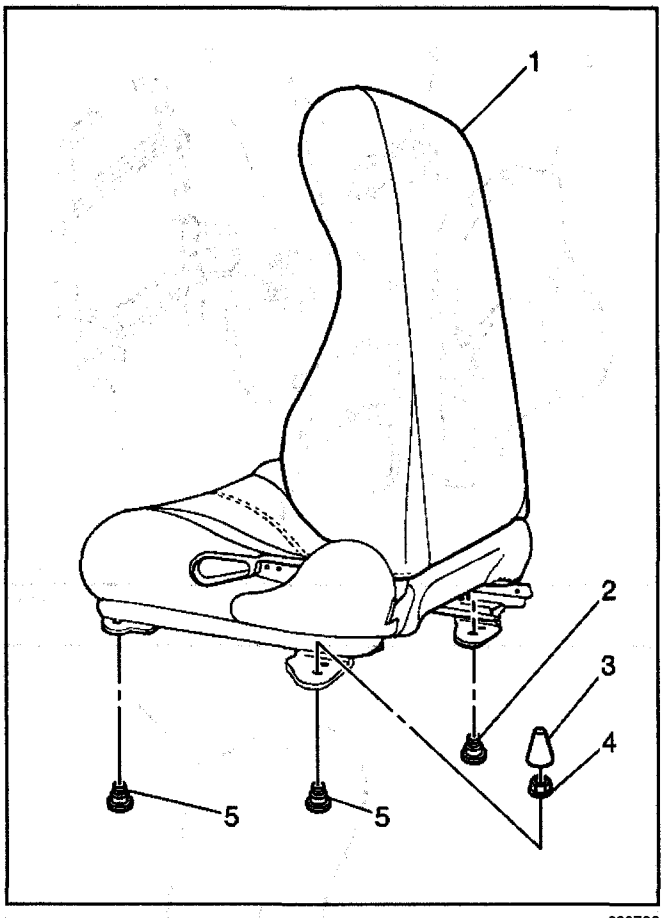
Seat Replacement - Power with Adjuster (Chevrolet)

Removal Procedure

1. Remove the caps (3) that cover the nuts (4).
2. Remove the caps (3) that cover the studs (5).
3. Remove the nuts (4) from the studs (5).
4. Remove the body wiring harness electrical connector, as needed.
5. Place a protective shield over the nearby trim and paint.
6. Remove the seat (1) from the floor pan.
7. Remove the seat (1) from the vehicle.



330706



330706

Installation Procedure

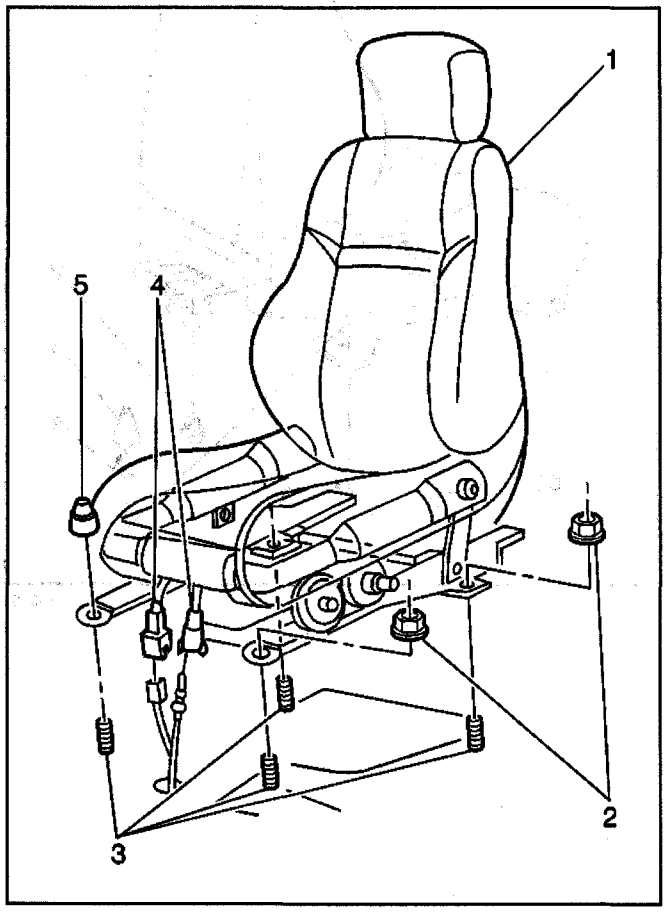
1. Install the seat (1) to the vehicle.
2. Install the seat (1) over the studs (5) to the floor pan.
3. Remove the protective shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the nuts (4) to the studs (5).

   Tighten

   Tighten the nuts (4) to 24 N·m (18 lb. ft).
5. Install the body wiring harness electrical connector, if previously disconnected.
6. Install the caps (3) that cover the nuts (4).
7. Install the caps (3) that cover the studs (5).



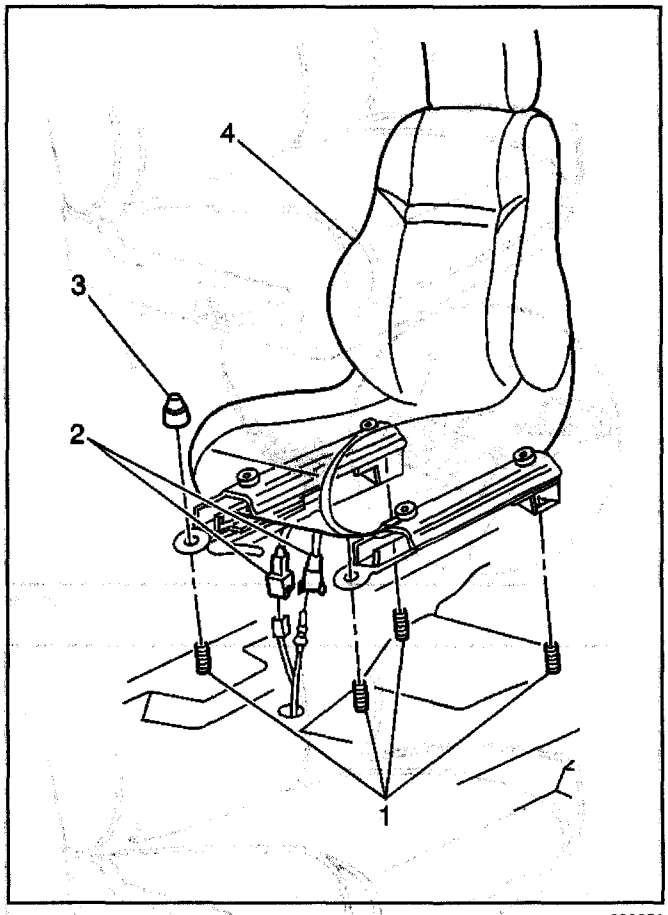
330661

Seat Replacement - Power with Adjuster (Pontiac)

Removal Procedure

1. Remove the caps (5) that cover the nuts (2).
2. Remove the caps (5) that cover the studs (3).
3. Remove the nuts (2) from the studs (3).
4. Remove the body wiring harness electrical connector (4), if needed.
5. Remove the seat air supply hose, if needed.
6. Place a protective shield over the nearby trim and paint.
7. Remove the driver seat (1) from the floor pan.
8. Remove the driver seat (1) from the vehicle.

9. Remove the passenger seat (4) from the floor pan.
10. Remove the passenger seat (4) from the vehicle.



330659

Installation Procedure

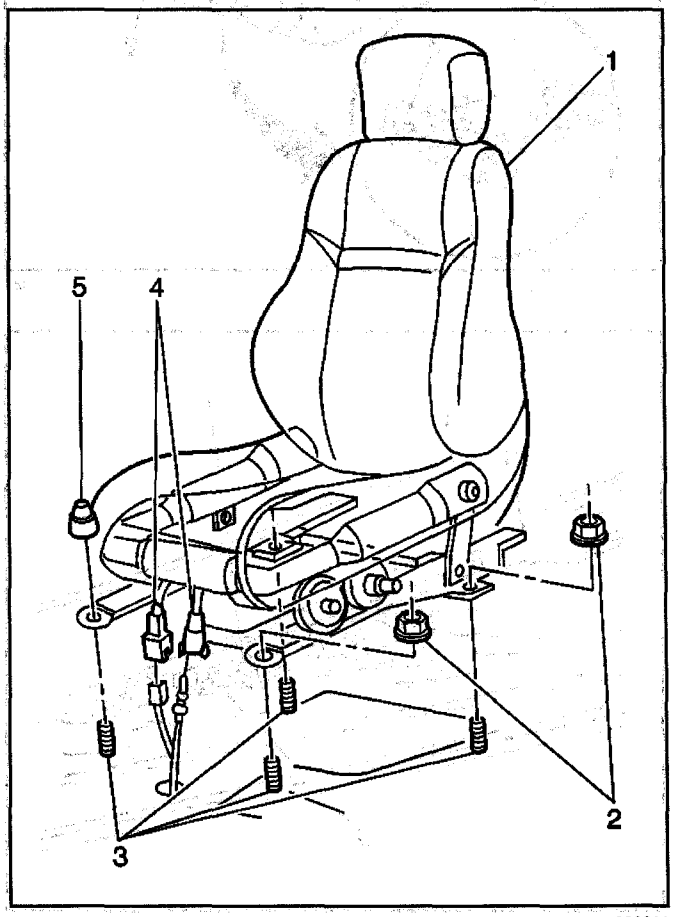
1. Install the driver seat (1) to the vehicle.
2. Install the seat over the studs (3) to the floor pan.
3. Remove the protective shield.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

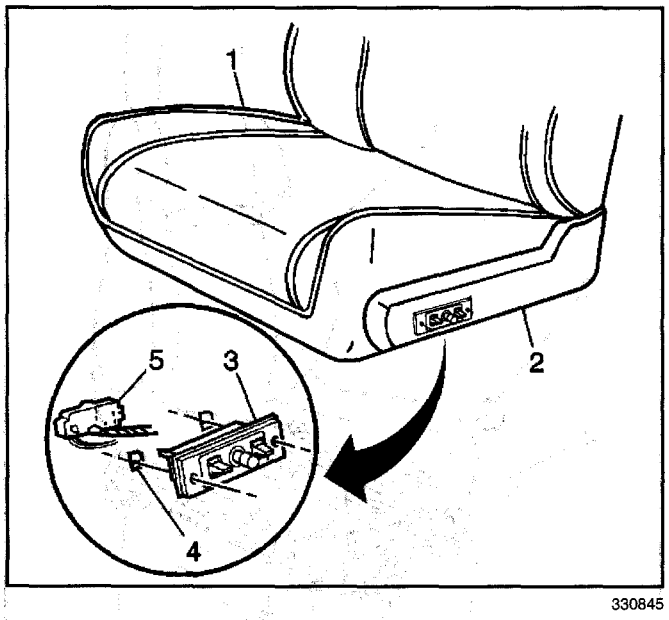
4. Install the nuts (2) to the studs (3).

   Tighten

   Tighten the nuts (2) to 24 N·m (18 lb. ft).
5. Install the body wiring harness electrical connector (4), if previously disconnected.
6. Install the seat air supply hose if previously removed.
7. Install the caps (5) that cover the nuts (2).
8. Install the caps (5) that cover the studs (3).



330661

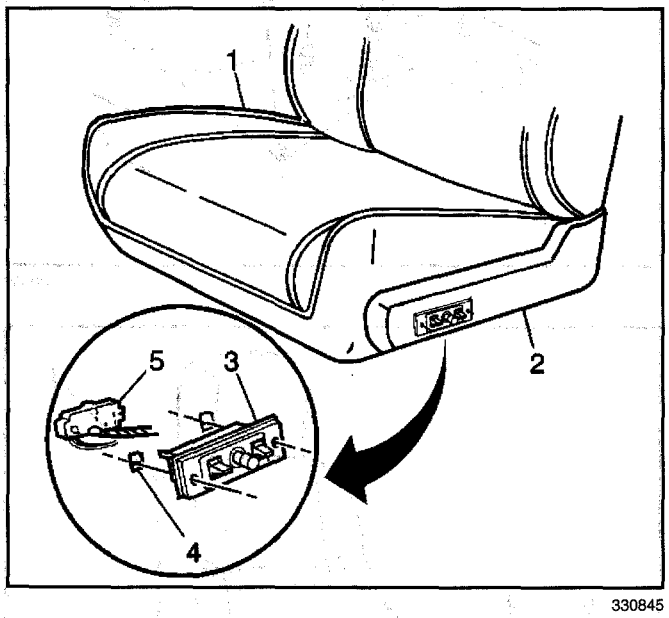


330845

Seat Adjuster Mechanism Replacement - Power

Removal Procedure

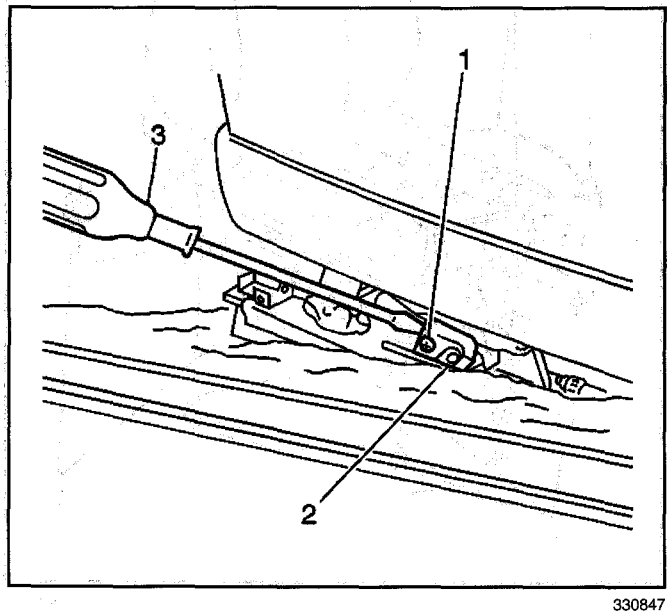
1. Remove the driver seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.
2. Remove the hinge arm trim cover. Refer to Hinge Arm Trim Cover.
3. Remove the connector (5) from the adjuster (3) by releasing the retainers (4).



330845

Installation Procedure

1. Connect the connector (5) to the adjuster (3) by engaging the retainers (4).
2. Install the hinge arm trim cover. Refer to Hinge Arm Trim Cover.
3. Install the driver seat. Refer to *Seat Replacement - Power with Adjuster (Chevrolet)* or *Seat Replacement - Power with Adjuster (Pontiac)*.



330847

Adjustment Procedure

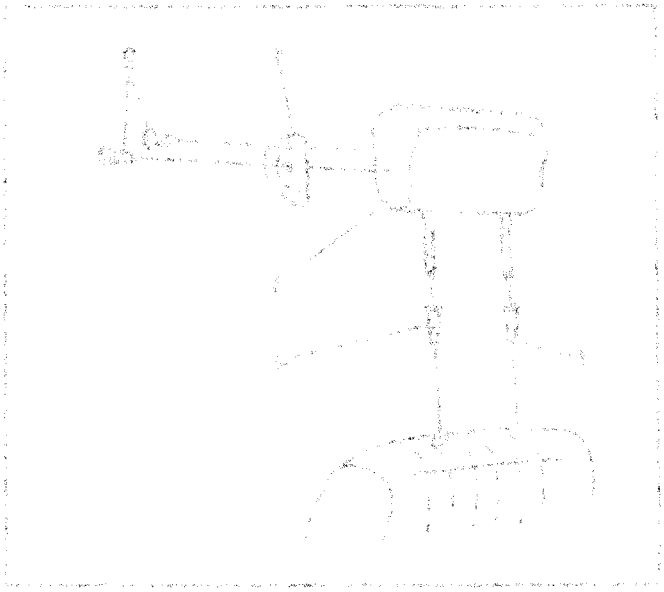
With the seat adjuster installed, chucking or jerking can be corrected by tightening or loosening the horizontal actuator and pinion gear to the adjuster lower track rack gear.

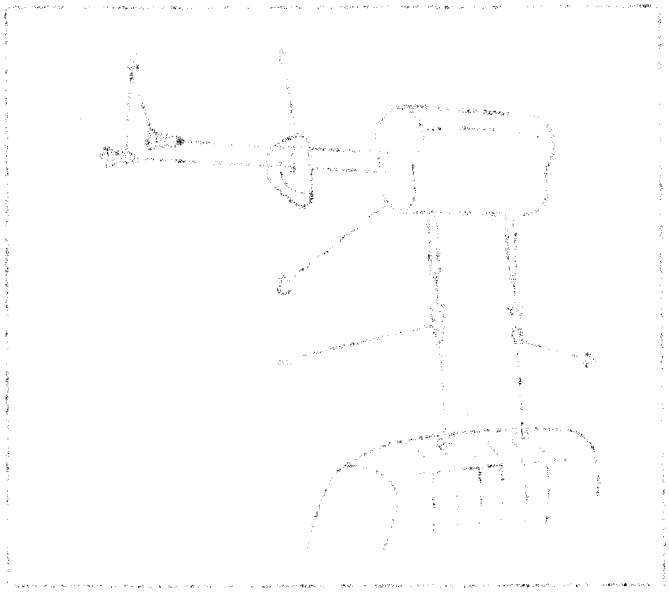
1. Operate the seat to a 3/4-forward position.
2. Loosen the bolt (1).

3. Perform the following steps at the same time.
   3.1. Use a large screwdriver in order to apply 67 to 111 N·m (15 to 25 lb) of outward pressure on the actuator (2).
   3.2. Use the horizontal adjuster switch to move the seat forward and backward.
   This will help position and secure the horizontal actuator pinion gear teeth to the lower track rack gear teeth, eliminating any free play.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

   3.3. While keeping pressure on the actuator (2), tighten the bolt (1).
   Tighten
   Tighten the bolt to 28 N·m (20 lb ft).

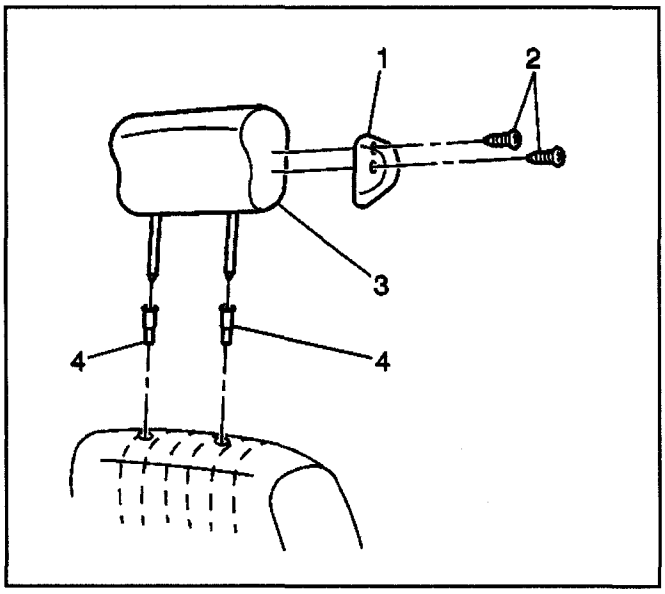




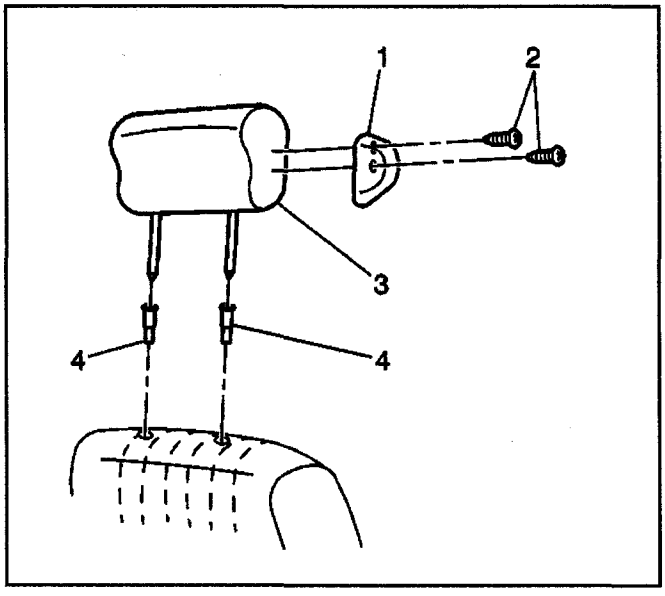
Phase Adjustment Procedure

The adjuster is out of phase when one adjuster reaches either the maximum horizontal or the maximum vertical travel before the other adjuster. An out-of-phase adjuster can occur over time or when the seat is serviced.

1. Operate the horizontal adjuster switch until one adjuster reaches a full-forward position.
2. Detach the horizontal drive cable from the full-forward adjuster.
3. Operate the horizontal adjuster switch until the other adjuster reaches a full-forward position.
4. Connect the horizontal drive cable.
5. Inspect the horizontal travel.
6. Operate the vertical adjuster switch until one adjuster reaches the full-up position at both the front and rear.
7. Disconnect both of the front and the rear vertical drive cable from the full-up adjuster.
8. Operate the vertical adjuster switch until the other adjuster reaches the full-up position at both the front and the rear.
9. Connect the vertical drive cable.
10. Inspect the vertical drive cable.



330781



330781

Headrest Replacement - Front Seat

Base Level

Tools Required

J 39641 Headrest Removal Tool (2)

Removal Procedure

1. Remove the seatback release knob.
2. Separate the J-retainers at the bottom of the seat.
3. Pull the seat cover past the head restraint posts.
4. Slide the *J 39641* up the head restraint posts with the tool tabs fitting into the open slots between the head restraint guide tabs.
5. With the headrest removal tools in place, rotate each tool so the head restraint guide tabs expand outward.
6. Remove the head restraint (3).

Installation Procedure

1. Install the head restraint (3).
2. Firmly pull down on the seat cover in order to enable the J-retainers at the bottom of the seat to lock together.
3. Install the seatback release knob.

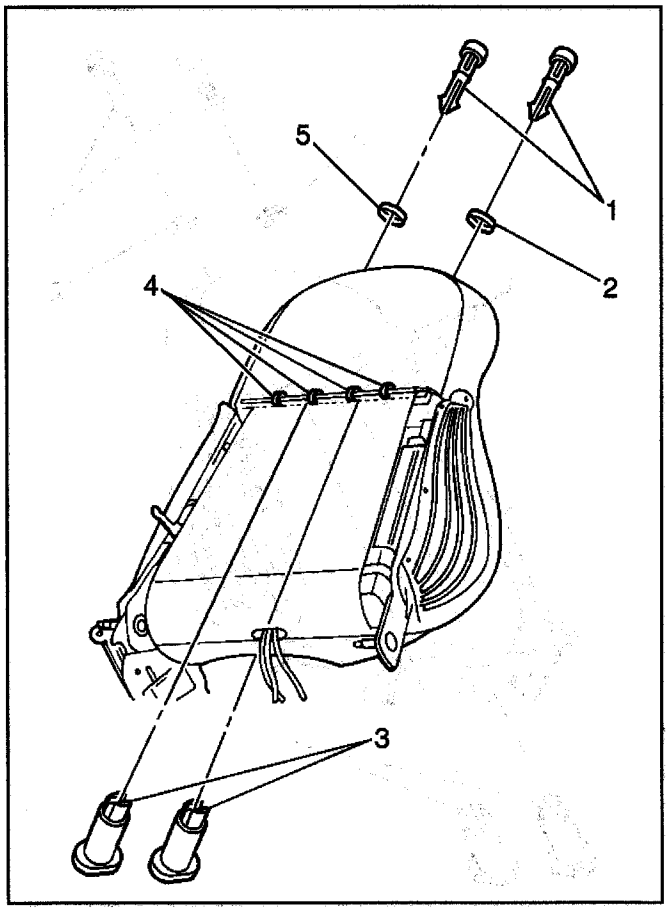
Uplevel

Tools Required

J 39641 Headrest Removal Tool.

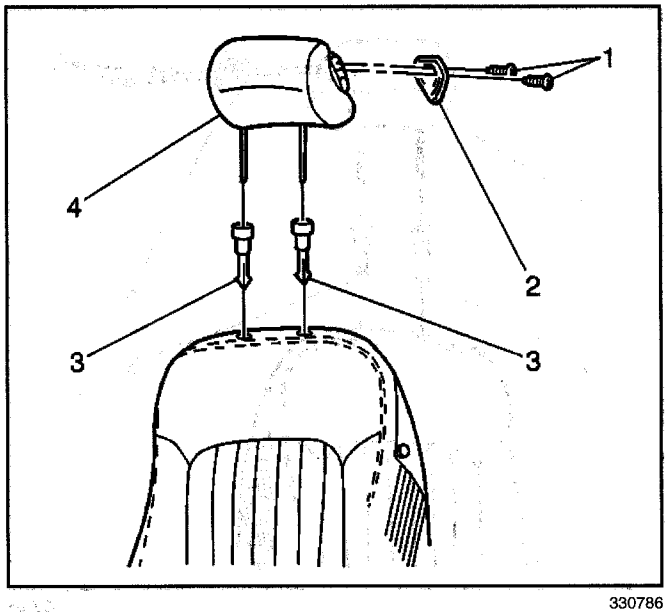
Removal Procedure

1. Remove the seatback trim. Refer to Uplevel Seat Trim.
2. Remove the cover retainer rings (4).
3. Raise the cover in order to access the guides.
4. Remove the head restraint post retaining rings (5) from the bottom of the posts.
5. Slide the *J 39641* up the head restraint posts with the tool tabs fitting into the open slots between the head restaint guide tabs.
6. With the headrest removal tools in place, rotate each tool in order for the head restaint guide tabs to expand outward.

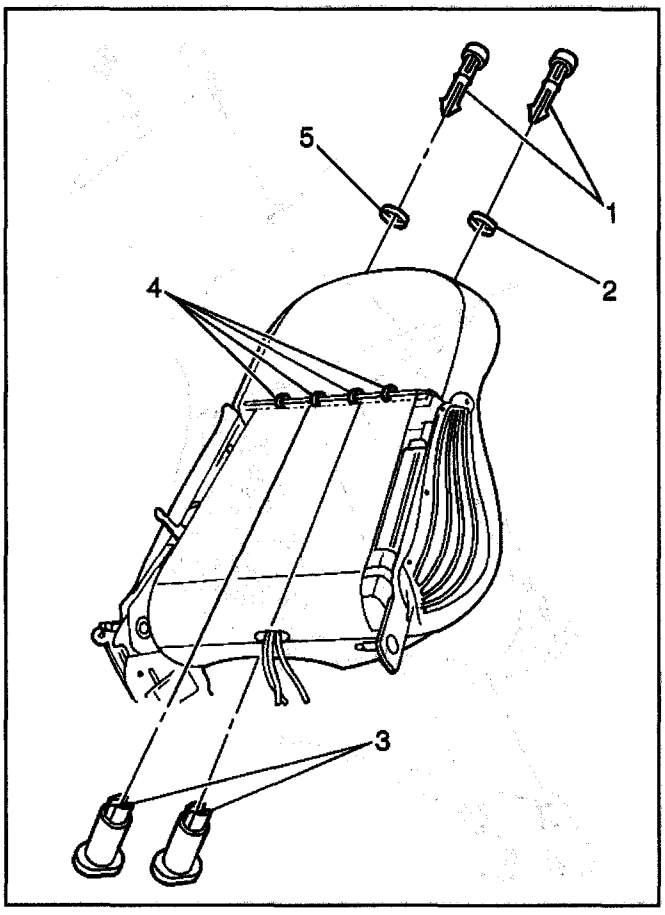


330790

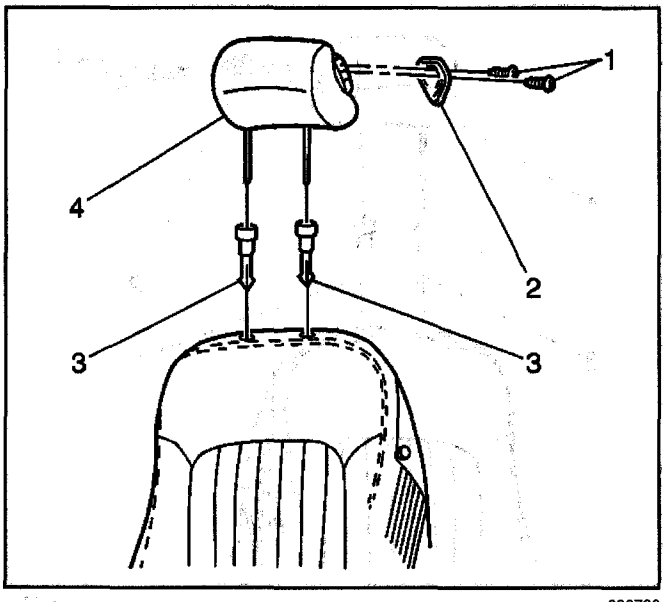
7. Remove the head restraint (4).
8. Remove the bolts (1) and the seat shoulder belt guide (2), as needed.



330786



330790

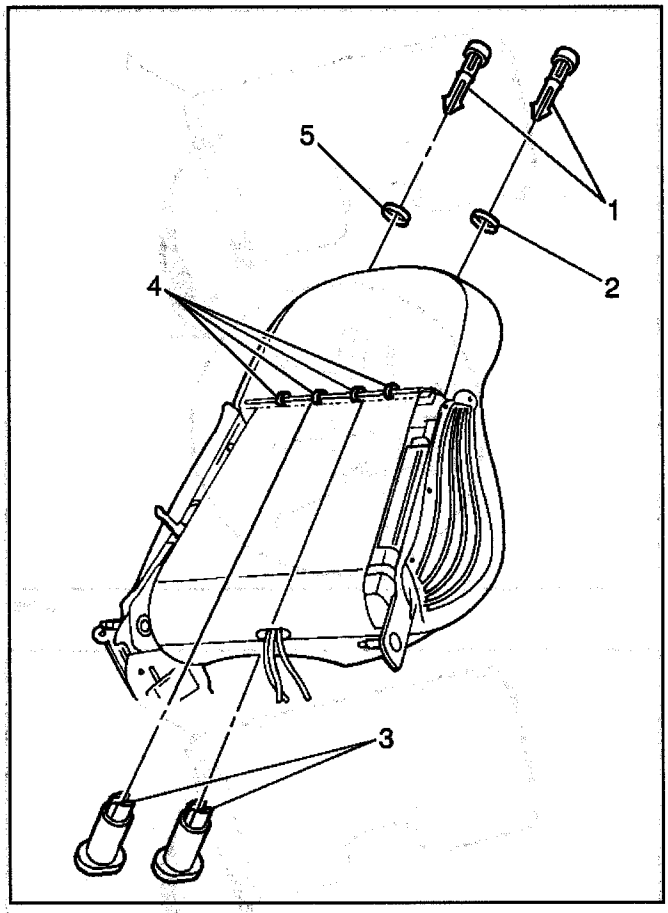


330786

Installation Procedure

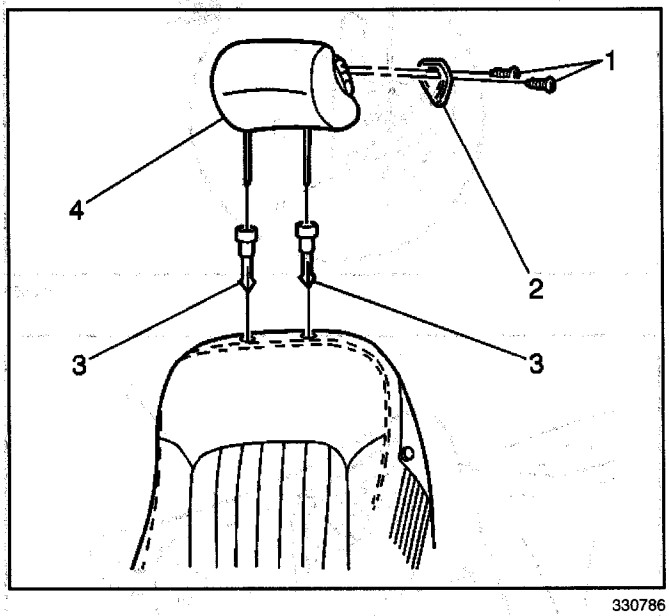
1. Install the head restraint post retaining rings (2, 5) to the bottom of the posts.
2. Install the head restraint (4).

3. Install the cover retainer rings (4).
4. Install the seatback trim. Refer to Uplevel Seat Trim.

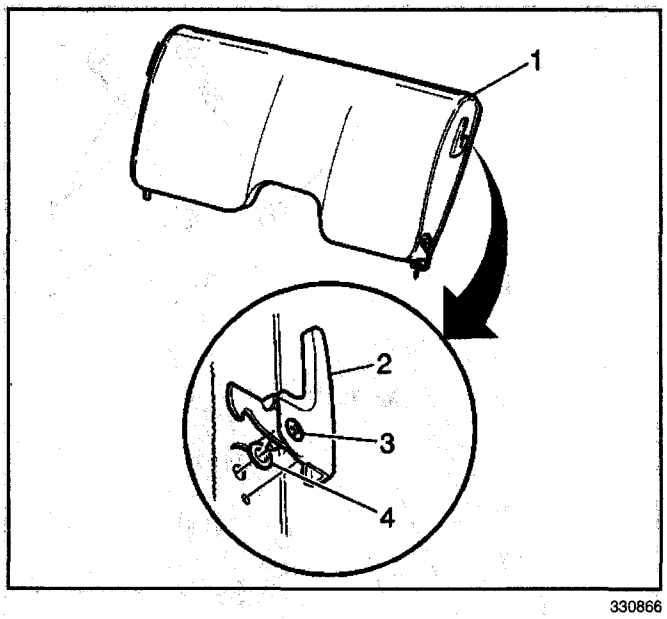


330790

5. Install the seat shoulder belt guide (2).
6. Install the bolts (1) as needed.
7. Secure the bolts (1).



330786



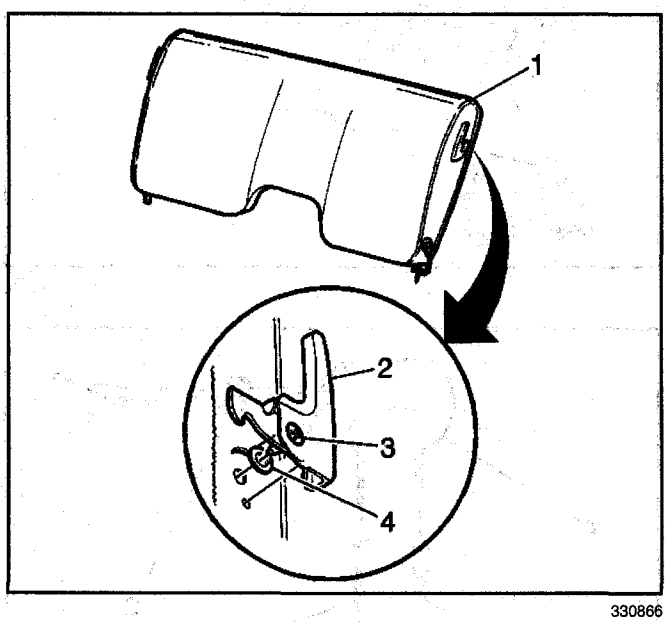
330866

Seat Back Replacement - Rear Split Folding

Removal Procedure

The rear seat folds down in order to provide additional storage space in the rear of the vehicle. The seatback locks are located on the outboard sides of the seat. The strikers are located on the wheelhouse panel.

1. Remove the rear seat cushion. Refer to Rear Seat Cushion.
2. Remove the rear seatback cushion (1). Refer to Rear Seatback Cushion.
3. Remove the bolt (3).
4. Remove the lock (2) and the washer (4).



330866

Installation Procedure

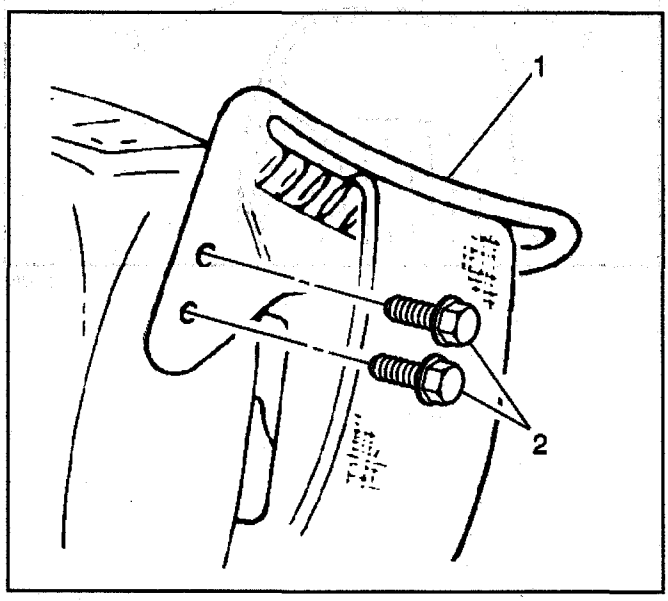
1. Install the washer (4) and the lock (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt (3).

   Tighten

   Tighten the bolt (3) to 27 N·m (20 lb ft).
3. Install the rear seatback cushion (1). Refer to Rear Seatback Cushion.
4. Install the rear seat cushion. Refer to Rear Seat Cushion.



330855

Shoulder Restraint Guide Replacement - Rear Seat (Standard)

Removal Procedure

1. Remove the bolts (2) that attach the guide (1) to the rear seatback cushion.
2. Remove the guide (1).

Installation Procedure

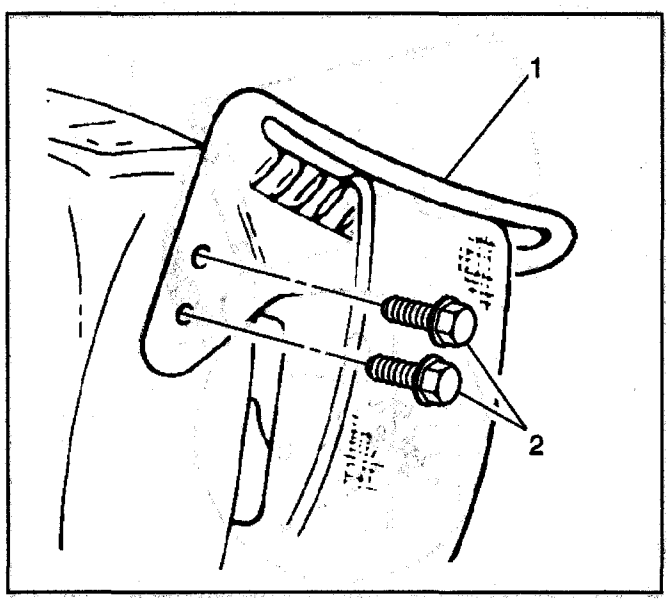
1. Install the guide (1) to the rear seatback cushion.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts (2).

Tighten

Tighten the bolts to 10 N·m (89 lb in).

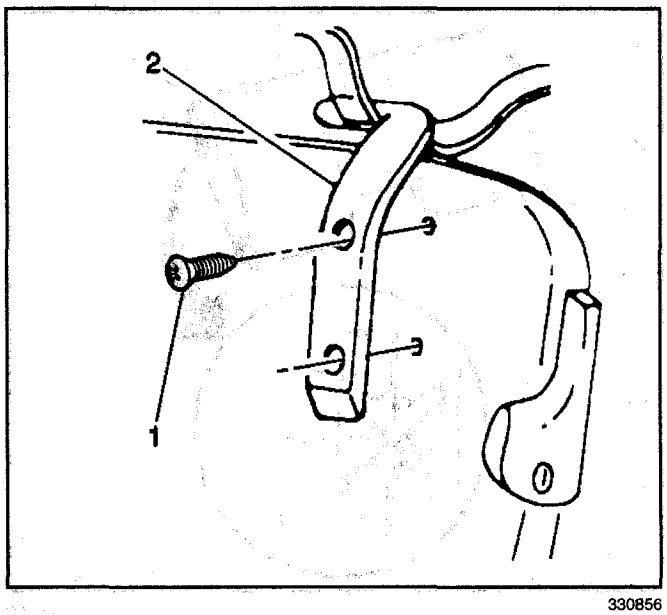


330855

Shoulder Restraint Guide Replacement - Rear Seat (Convertible)

Removal Procedure

1. Remove the bolts (1) that attach the guide (2) to the rear seatback cushion.
2. Remove the guide (2).



330856

Installation Procedure

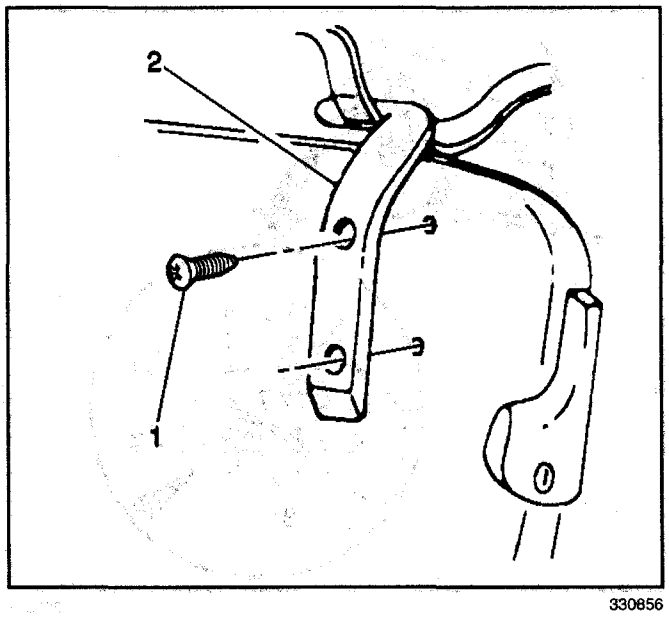
1. Install the guide (2) to the rear seatback cushion.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

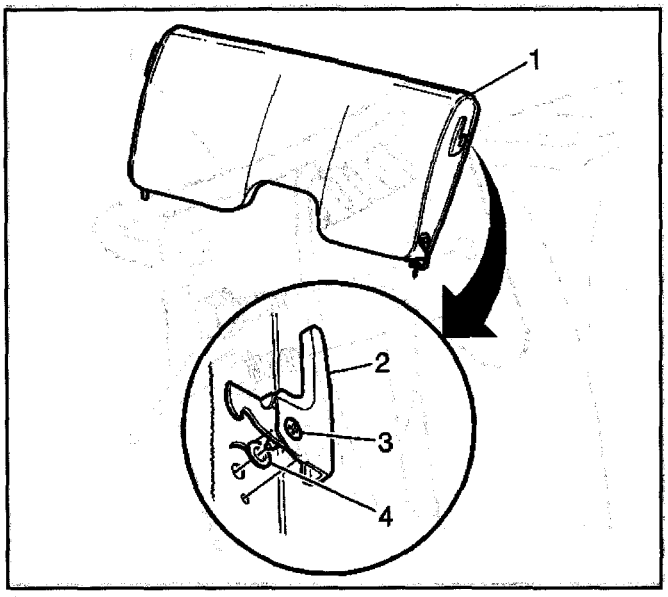
2. Install the bolts (1).

Tighten

Tighten the bolts (1) to 10 N·m (89 lb in).



330856



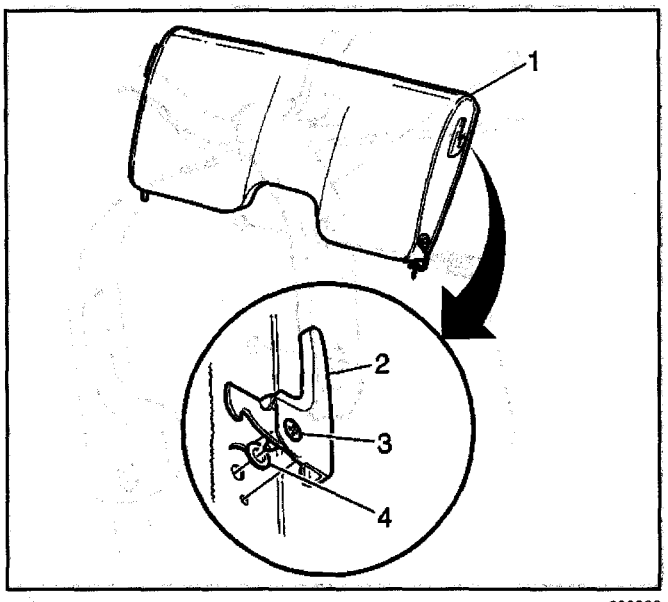
330866

Seat Back Latch Replacement - Rear Folding

Removal Procedure

The rear seat folds down in order to provide additional storage space in the rear of the vehicle. The seatback locks are located on the outboard sides of the seat. The strikers are located on the wheelhouse panel.

1. Remove the rear seat cushion. Refer to Rear Seat Cushion.
2. Remove the rear seatback cushion (1). Refer to Rear Seatback Cushion.
3. Remove the bolt (3).
4. Remove the lock (2) and the washer (4).



330866

Installation Procedure

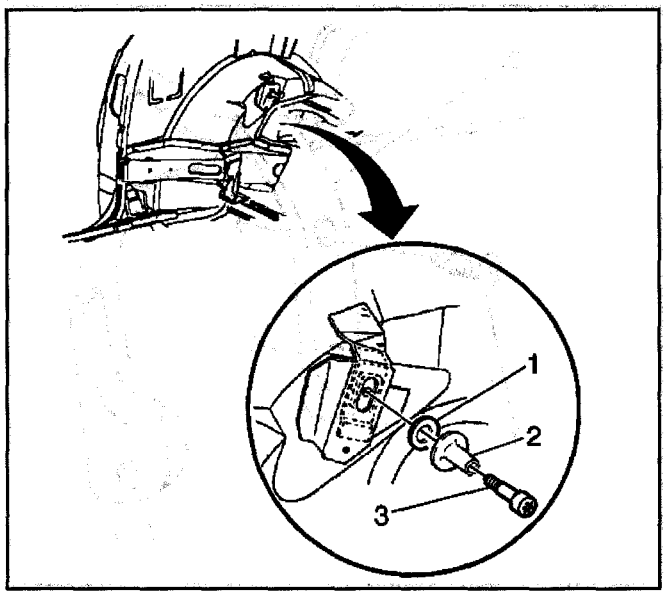
1. Install the washer (4) and the lock (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt (3).

   Tighten

   Tighten the bolt (3) to 27 N·m (20 lb ft).
3. Install the rear seatback cushion (1). Refer to Rear Seatback Cushion.
4. Install the rear seat cushion. Refer to Rear Seat Cushion.



330869

Seat Back Latch Striker Replacement - Rear Folding

Removal Procedure

The rear seat folds down in order to provide additional storage space in the rear of the vehicle. The seatback locks are located on the outboard sides of the seat. The strikers are located on the wheelhouse panel.

1. Remove the bolt (3).
2. Remove the sleeve (2).
3. Remove the washer (1).

Installation Procedure

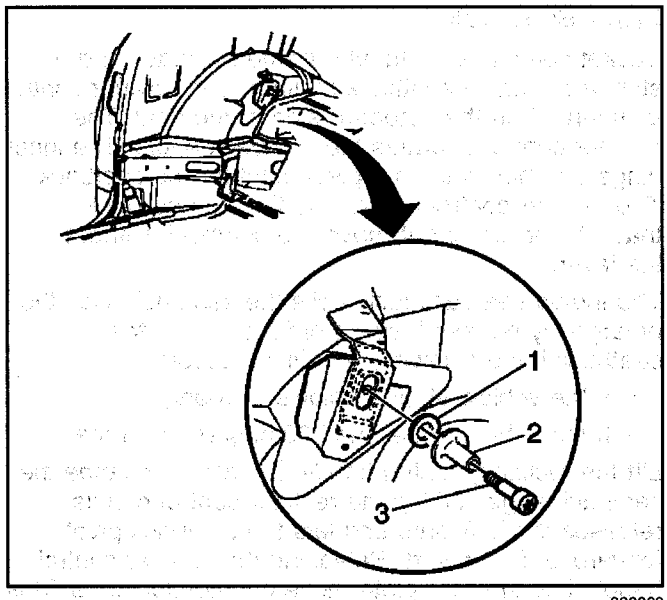
1. Install the sleeve (2) over the bolt (3).
2. Install the washer (1) over the bolt (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the bolt (3).

   Tighten

   Tighten the bolt (3) to 35 N·m (26 lb ft).



330869

Description and Operation

Front Seats Description

Front Seat

The front seats are bucket seats.

The driver and the front passenger seats have the following features:

- Inertia seatback locks
- Manual seatback recliners
- Manual seatback adjuster

For the driver's seat only, the following features can be ordered:

- A 4-way manual seat adjuster
- A 6-way power seat adjuster

Also, both driver and front passenger seats can be ordered as pneumatic seats. Pneumatic seats have an adjustable thigh support. For Pontiac only, inflatable lumbar and lateral support bladders can be ordered.

The seatback and the cushion have formed foam pads that fit the contours of the seatback and the seat cushion frames.

Front Seatback

Bucket seats have a tubular frame seatback and a standard manual seatback recliner. The recliner control is mounted on the outboard side of the seat. The recliner control operates the seatback angle. The inner hinge arm bolt acts as a pivot point for the seatback. The recliner control has an inertia seatback lock that lets the occupant move the seatback without the lever.

The inertia seatback lock locks the seatback. Use the emergency release lever in order to move the seatback if the following conditions occur:

- If the vehicle stops or slows suddenly
- If the vehicle is declined 20 degrees or more

Lift the reclining control handle in order to change the seatback angle. Lifting the recliner control handle releases the lock bars and lets the seatback pivot forward and rearward. Releasing the recliner control handle lets the cam plate move counterclockwise. This causes the lock bar teeth to lock the seatback in a new position. The recliner control handle should return automatically to its original position.

Rear Seats Description

The rear seat construction in the Camaro and Firebird vehicles consists of a solid bench type seatback with individual seat bottom cushions separated by the driveline tunnel. Both the rear seat back and the individual seat bottom cushions are fastened to the vehicle with steel loop-type fasteners and bolts. Each of the cushions and the seatback can be serviced individually.

Power Seats Circuit Description

There are 3 reversible motors operating the Power Seats:

- The front height motor
- The rear height motor

  The front and back height raises and lowers individually of each other. When the Entire Seat Switch is operated both motors work at the same time.
- The Forward/Back Motor

  The forward/back motor is operated by the Entire Seat Switch.

Forward/Back Motor Operation

- The forward operation of the Entire Seat Switch utilizes the following circuits:
  - The circuit 285 and switch contacts applies battery voltage.
  - The circuit 284 and the contact of the Entire Seat Switch ground G305.
- The back operation of the Entire Seat Switch utilizes the following circuits:
  - The circuit 284 and switch contacts applies battery voltage.
  - The circuit 285 and the contact of the Entire Seat Switch ground G305.
- Reversed polarity cause the motor to run in the opposite direction and drive.

Front and Rear Motors Operation

- The up operation of the Entire Seat Switch utilizes the following circuits:
  - The circuit 282 and circuit 286 applies battery voltage for the rear and front seat motors.
  - The circuit 287, circuit 283 and the Power Seat Switch to G305.
- In order to move the entire seat down a similar action occurs.

Electronic Circuit Breaker (ECB)

- Each motor contains an Electronic Circuit Breaker (ECB).
- When the motor is overloaded the ECB resistance increases until opening.
- When the overload is removed the ECB closes and resistance returns to normal.

Power Lumbar Circuit Description

Each seat incorporates a power inflate/power deflate pneumatic system. The system alters the contour of the seat with air bladders inflate and deflate within each seat.

Both of the power seats operation utilize the same power seat cushion air control module and pump assembly. The power seat cushion air control module and pump assembly are mounted under the passenger seat. A seat jumper harness from the passenger seat connects the circuitry and the bladder tubing to the driver's seat.

Voltage is supplied at all times to both of the lumbar inflator switches through CKT 1240 from the DEFOG/SEATS circuit breaker 12. The lumbar inflator switch applies voltage to the selected solenoid at the solenoid valve assembly for lateral/lumbar support.

The solenoid valve assembly is grounded through the power seat cushion air control module. Simultaneously the lumbar inflator switch applies battery voltage to the selected inflate or deflate relay within the power seat cushion air control module. The power seat cushion air control module applies power to the pump assembly in either the forward direction (inflate) or the reverse direction (deflate). The ground to the solenoid valve is electrically opened when a pressure switch inside the power seat cushion air control module senses a bladder full/empty condition. In response, the power seat cushion air control module shuts off the pump by opening the ground to the inflate or deflate relay until the lumbar inflator switch is released.

Interior Trim

Specifications

Fastener Tightening Specifications

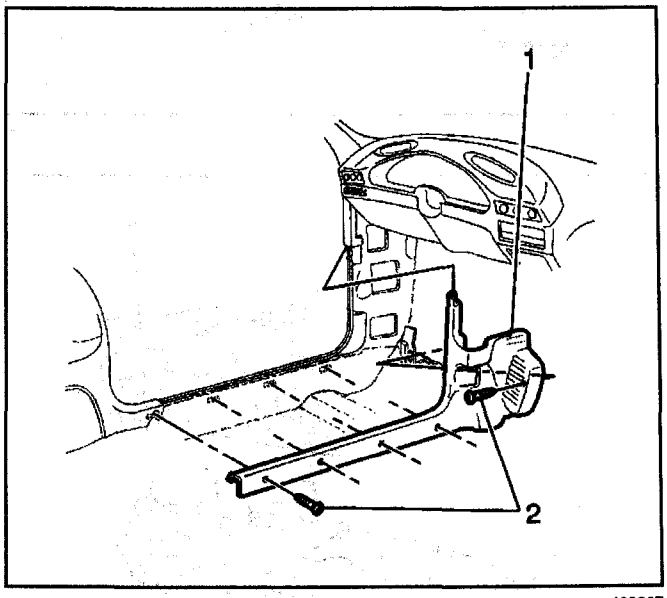
Application	Specification	
	Metric	English
Hinge Pillar Trim Panel Bolt/Screw (w/t-tops)	1.7 N·m	15 lb in
Lower Windshield Pillar Garnish Molding Bolt/Screw	1.7 N·m	15 lb in
Luggage Screen Support Bolt/Screw	6.0 N·m	53 lb in

Repair Instructions

Trim Replacement - Hinge Pillar

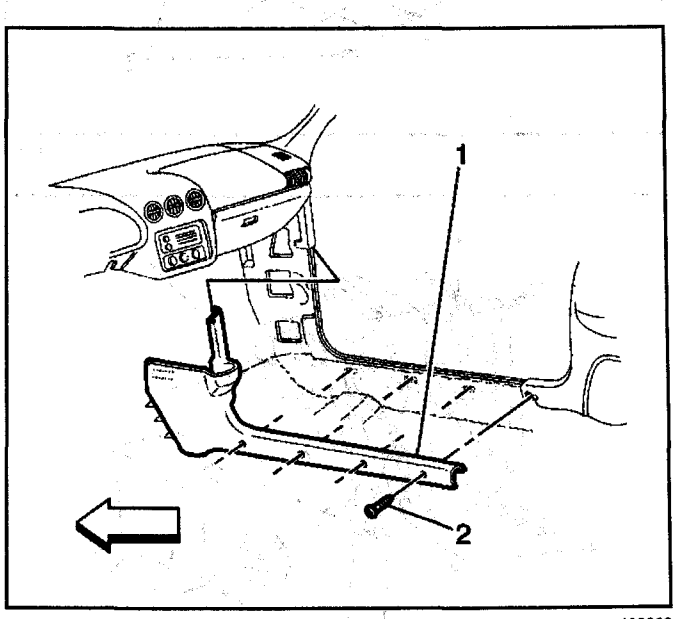
Removal Procedure

1. Remove the driver-side hinge pillar trim panel bolts/screws (2) from the panel (1).
2. Slide the driver-side hinge pillar trim panel (1) upward and rearward in order to remove.

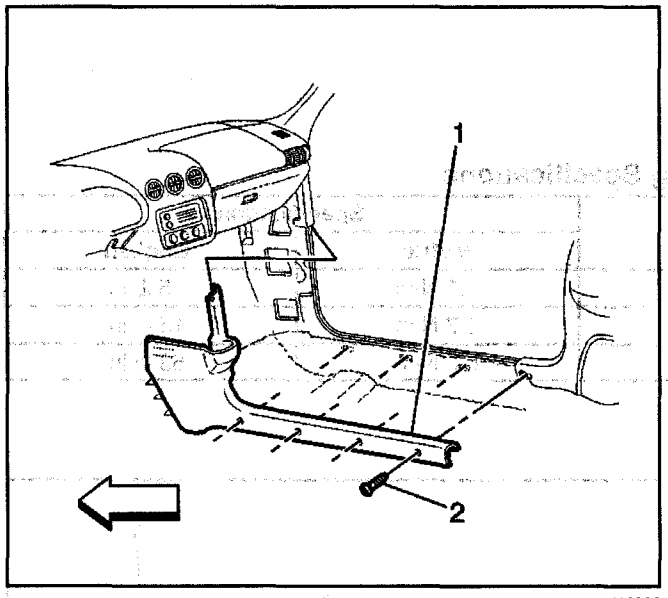


403307

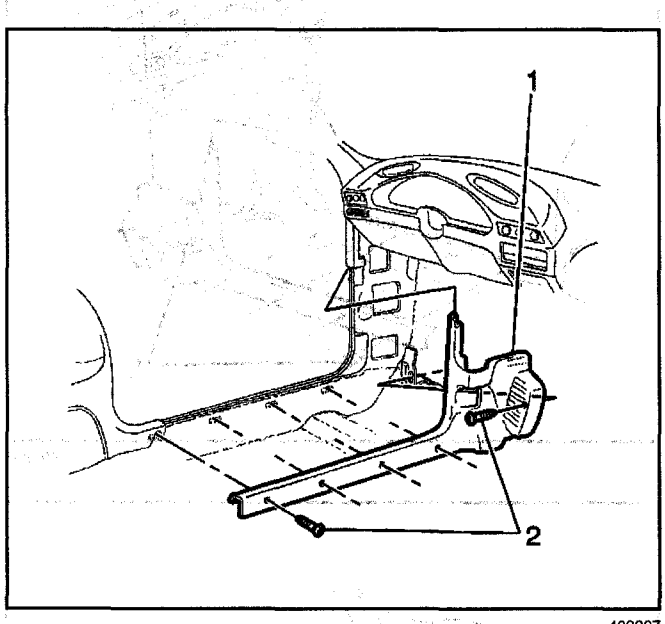
3. Remove the passenger-side hinge pillar trim panel bolts/screws (2) from the panel (1).
4. Slide the passenger-side hinge pillar trim panel (1) upward and rearward in order to remove.



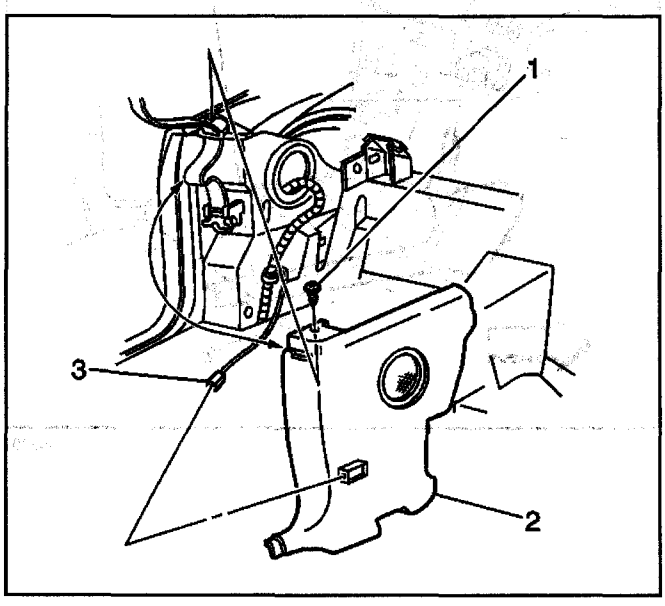
403309



403309



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Installation Procedure

1. Slide the passenger-side hinge pillar trim panel (1) forward and downward in order to install.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the hinge pillar trim panel bolts/screws (2).

Tighten

Tighten the hinge pillar trim panel bolts/screws (2) to 1.3 N·m (12 lb in).

3. Slide the driver-side hinge pillar trim panel (1) forward and downward in order to install.
4. Install the hinge pillar trim panel bolts/screws (2).

Tighten

Tighten the hinge pillar trim panel bolts/screws (2) to 1.3 N·m (12 lb in).

Trim Panel Replacement - Cargo Area Front (Convertible)

Removal Procedure

1. Lower the seatback.
2. Remove the left or right shroud side trim finishing panel.
3. Remove the coat hook (coupe only).

Important: Release retainer with a screwdriver and pull out if necessary.

4. Remove the rear seat striker bolt/screw and washer.
5. Remove quarter inner trim finish panel extension bolt/screw (1) (convertible only).
6. Remove quarter inner trim finish panel extension (2) (convertible only).

7. Remove quarter inner trim finishing panel.

Important: Push lap belt through slot in quarter inner trim finishing panel.

8. Remove speaker grille, if replacing panel.
9. Disconnect and remove quarter courtesy lamp (convertible only) if replacing panel.

Installation Procedure

1. Install and connect quarter courtesy lamp (convertible only) if removed.
2. Install speaker grille, if removed.
3. Install quarter inner trim finishing panel

Important: Thread lap belt through slot in quarter inner trim finishing panel.

4. Install quarter inner trim finish panel extension (convertible only) (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install quarter inner trim finish panel extension bolt/screw (1) (convertible only).

   Tighten

   Tighten the screws to 1.9 N·m (17 lb in).

6. Install the rear seat striker bolt/screw and washer.

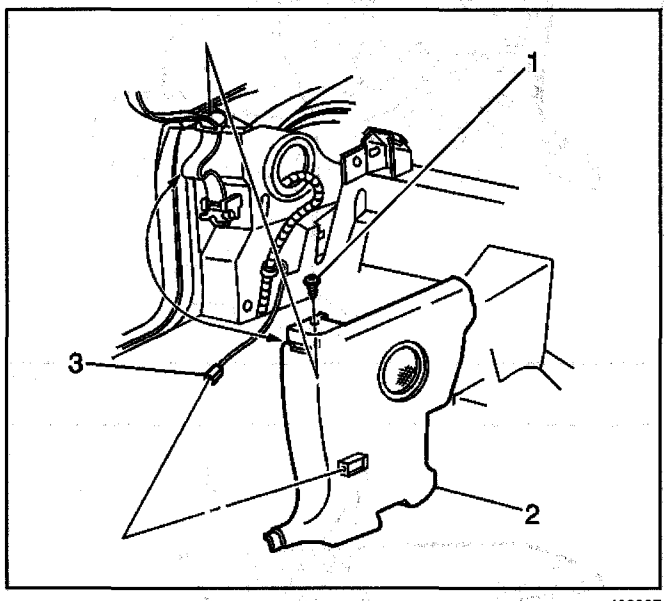
   Tighten

   Tighten the bolt to 35 N·m (26 lb in).

7. Install the coat hook (coupe only).

Important: Slide into position and press retainer to lock.

8. Install the left or right shroud side trim finishing panel.
9. Raise the seatback.



403297

Trim Panel Replacement - Cargo Area Front (Coupe)

Removal Procedure

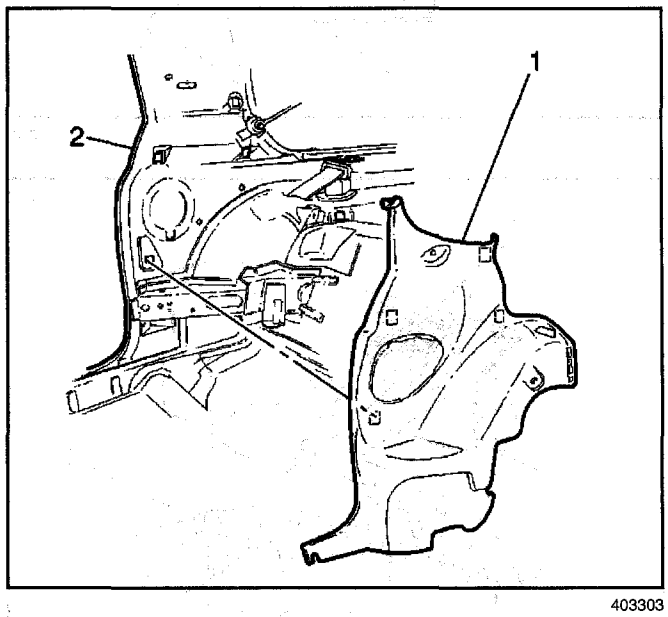
1. Lower the seatback.
2. Remove the left or right shroud side trim finishing panel.
3. Remove the coat hook (coupe only).

Important: Release retainer with a screwdriver and pull out if necessary.

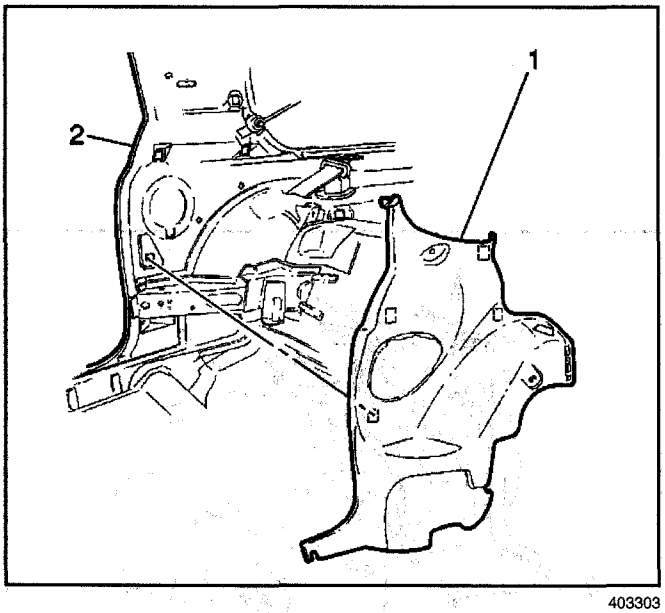
4. Remove the rear seat striker bolt/screw and washer.
5. Remove quarter inner trim finishing panel (1) from vehicle body (2).

Important: Push lap belt through slot in quarter inner trim finishing panel.

6. Remove speaker grille, if replacing panel.



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403303

Installation Procedure

Important: Thread lap belt through slot in quarter inner trim finishing panel.

1. Install speaker grille, if removed.
2. Install quarter inner trim finishing panel (1) to vehicle body (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the rear seat striker bolt/screw and washer.

   Tighten

   Tighten the bolt to 35 N·m (26 lb in).
4. Install the coat hook (coupe only).

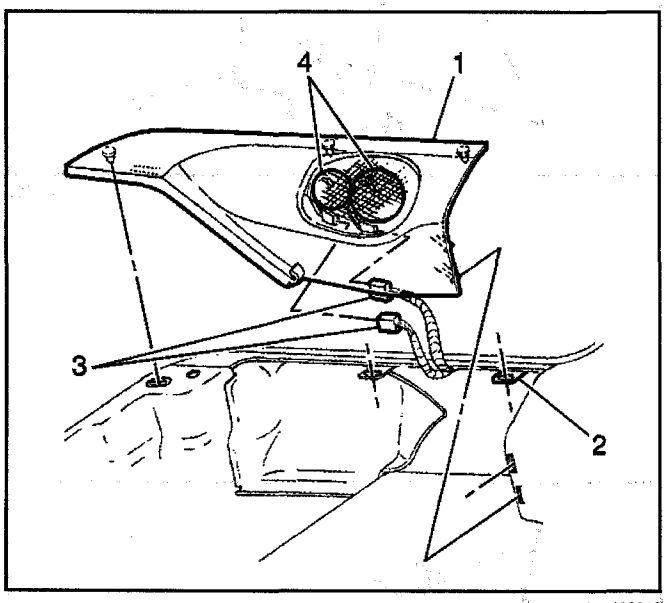
Important: Slide into position and press retainer to lock.

5. Install the left or right shroud side trim finishing panel.
6. Raise the seatback.

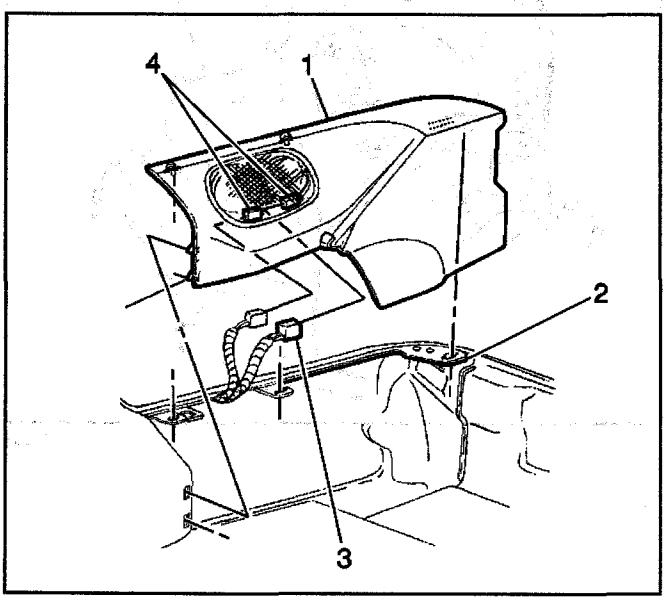
Trim Panel Replacement - Cargo Area Side

Removal Procedure

1. Raise rear compartment lift window.
2. Remove sunshade by unsnapping from installed position.
3. Remove three retainers by rotating retainers a quarter turn using a key or coin if removing right quarter inner rear trim finishing panels.
4. Begin removing quarter inner rear trim finishing panels (1) by first lifting from front corner.
5. Completely remove quarter inner rear trim panels (1) by lifting the front of the panels, gently unseating the remaining retainers (left side removal only).



403319

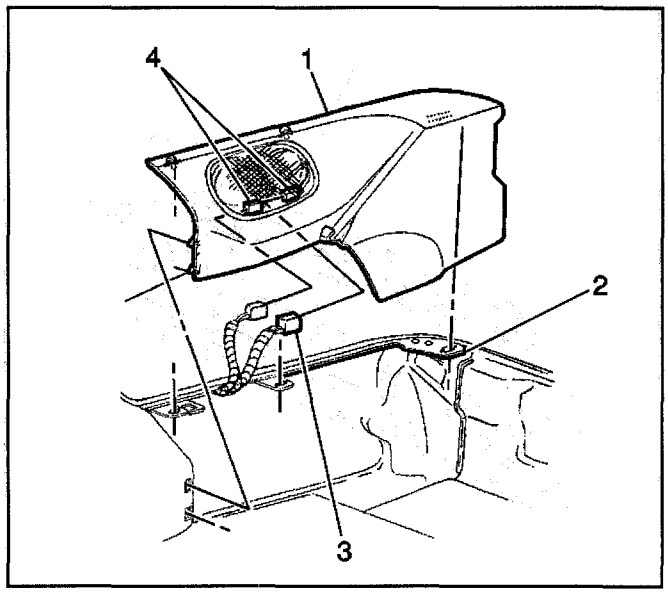


403315

6. Remove speaker electrical connections (3) from speakers (4).
7. Remove speaker grille if replacing panel.
8. Remove rear speakers from panels.
9. Remove and save retainers on left panel for reuse if replacing panel.

Installation Procedure

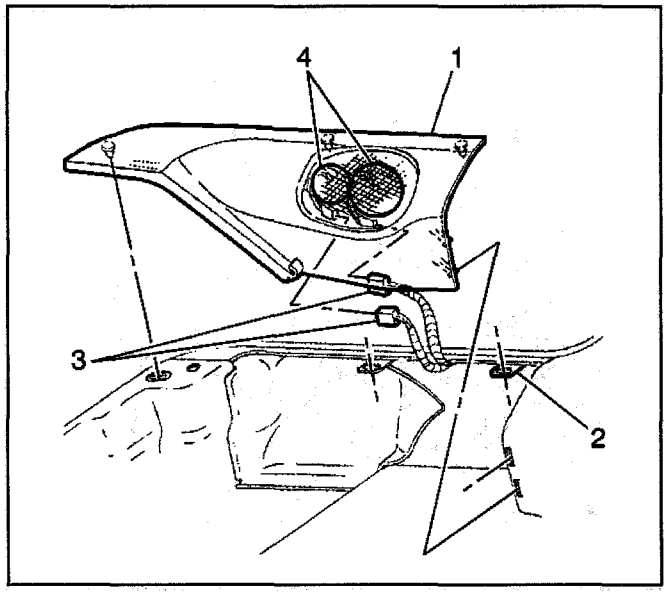
1. Install three retainers to new panels if replaced.
2. Install rear speakers to panels if panels were removed.
3. Install speaker grille if removed.
4. Install speaker electrical connections (3) to speakers (4).



403315

Important: On left panel, align the three retainers with the holes in the body and press down firmly to engage clips. Ensure that clips "click" into place.

5. Install quarter inner rear trim finishing panel.
6. Seat the three retainers by rotating retainers a quarter turn using a key or a coin if installing left panel.
7. Install sunshade by snapping into position.
8. Lower rear rear compartment lift window.

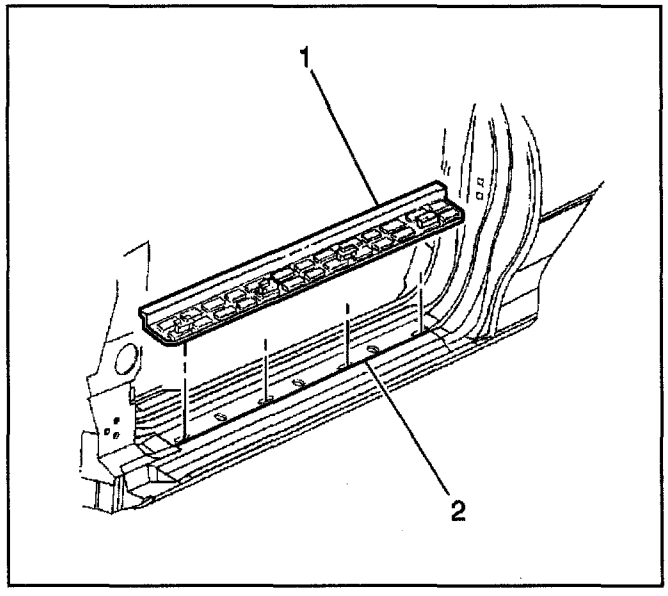


403319

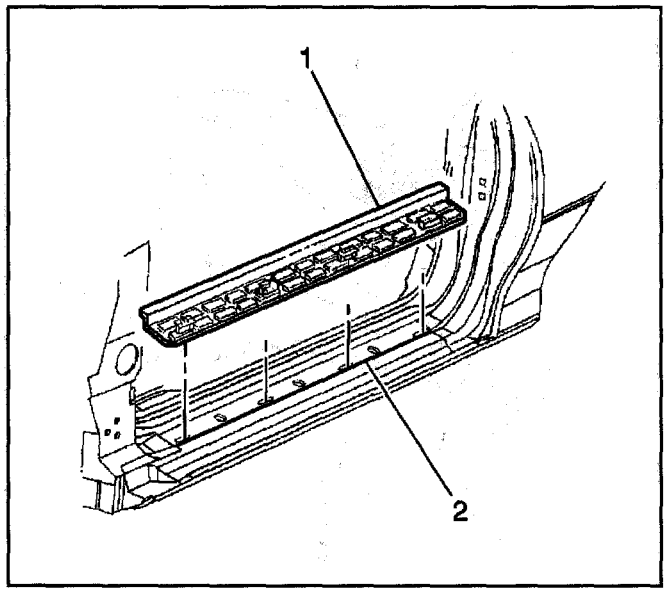
Door Sill Plate Replacement

Removal Procedure

1. Open vehicle's door (1).
2. Remove sill plate by gently prying under sill plate to dislodge sill plate trim retainers (2).



403365



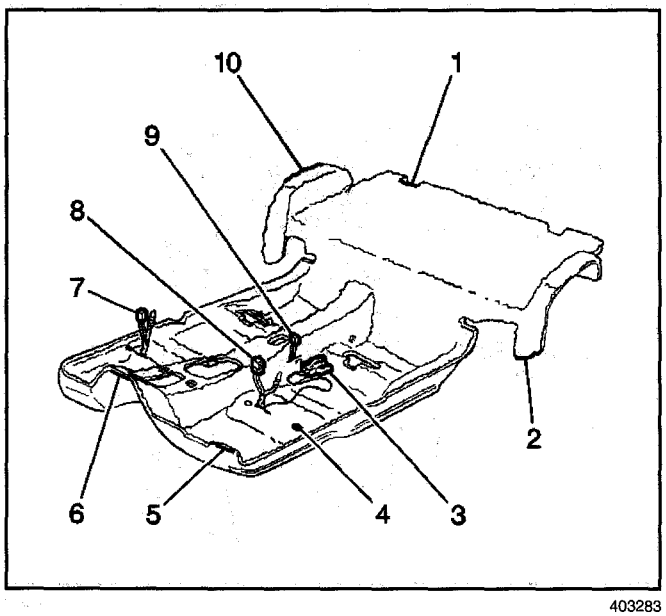
403365

Installation Procedure

1. Install sill plate (1) to vehicle body by pressing firmly.

Important: Ensure that all retainers "snap" into place in body.

2. Close vehicle's door.



403283

Carpet Replacement

Removal Procedure

Floor carpet is specially designed for the high floor pan temperatures caused by the catalytic converter in the exhaust system. When servicing a vehicle in the field, it is essential that any floor pan carpet that has been disturbed or dislodged be reinstalled in the original location. It is important that any carpet service repair or replacement be the same thickness, size and location as the original installation in the vehicle or vehicle damage and/or personal injury could result. When servicing or replacing interior carpets the following instructions must be observed:

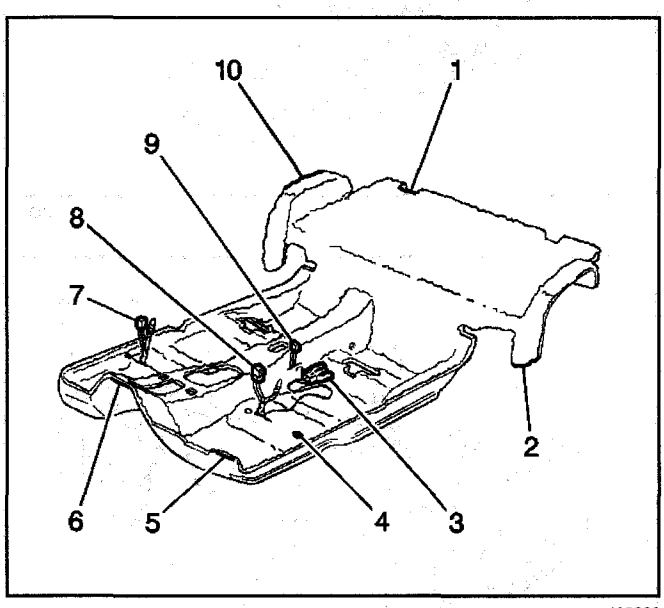
- Carpets must be installed in the original position and sequence. Pieces should be butted together to avoid gapping or overlapping.
- If it is necessary to replace a carpet, specified material must be used.
- Use original part to determine the amount of replacement material and as a template for cutting and fitting a new piece to the floor pan.
- When installing a carpet, do not enlarge cutouts or holes used for attachment of interior components such as a seat or seat belt.
- Spray-on deadeners and trim adhesives should not be applied to the top of the floor pan at the area directly over the catalytic converter or muffler.

1. Remove front seats. Refer to *Seat Replacement - Front Bucket (Pontiac)* or *Seat Replacement - Front Bucket (Chevrolet)* in Seats.
2. Remove rear bucket seats. Refer to *Seat Replacement - Bucket (Cushion Bottom)* in Seats.
3. Remove front seat belt buckles. Refer to *Seat Belt Buckle Replacement - Left Front* removal or *Seat Belt Buckle Replacement - Right Front* in Seats

4. Remove rear seat belt buckles. Refer to *Seat Belt Side Buckle Replacement - Rear* in Restraints.
5. Remove body hinge pillar trim panels. Refer to *Trim Replacement - Hinge Pillar.*
6. Remove rear cargo area front side trim panels. Refer to *Trim Panel Replacement - Cargo Area Front (Convertible)* or *Trim Panel Replacement - Cargo Area Front (Coupe).*
7. Remove front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.
8. Remove floor carpet from vehicle.

Installation Procedure

1. Install the floor carpet to the vehicle.
2. Install front floor console. Refer to *Console Replacement - Front Floor* in Instrument panel, Gauges and Console.
3. Install rear cargo area front side trim panels. Refer to *Trim Panel Replacement - Cargo Area Front (Convertible)* or *Trim Panel Replacement - Cargo Area Front (Coupe).*
4. Install body hinge pillar trim panels. Refer to *Trim Replacement - Hinge Pillar.*
5. Install rear seat belt buckles. Refer to *Seat Belt Side Buckle Replacement - Rear* in Restraints.
6. Install front seat belt buckles. Refer to *Seat Belt Buckle Replacement - Left Front* or *Seat Belt Buckle Replacement - Right Front* in Restraints.
7. Install front seats. Refer to *Seat Replacement - Front Bucket (Pontiac)* or *Seat Replacement - Front Bucket (Chevrolet)* in Seats.

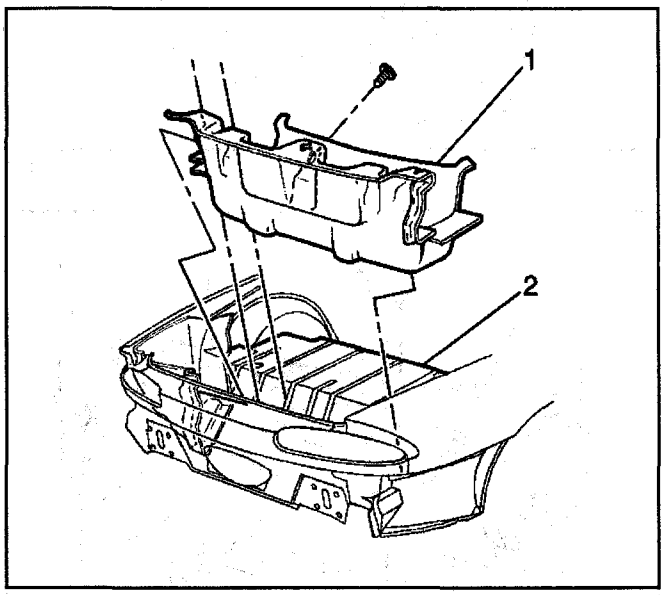


403283

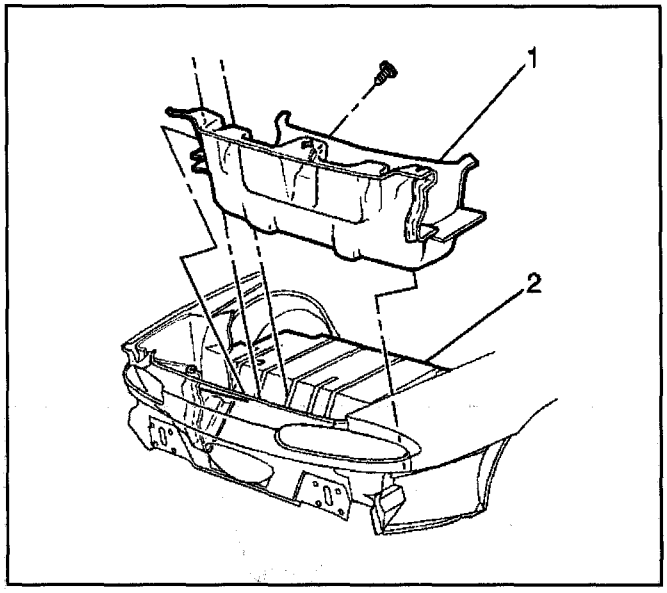
Trim Panel Carpet - Rear Compartment Rear Center (Coupe)

Removal Procedure

1. Remove rear compartment side trim panels. Refer to *Trim Panel Replacement - Cargo Area Side.*
2. Remove rear compartment trim panel carpet retainer (push clip).
3. Remove rear compartment trim panel carpet (1) from vehicle body (2).



403363

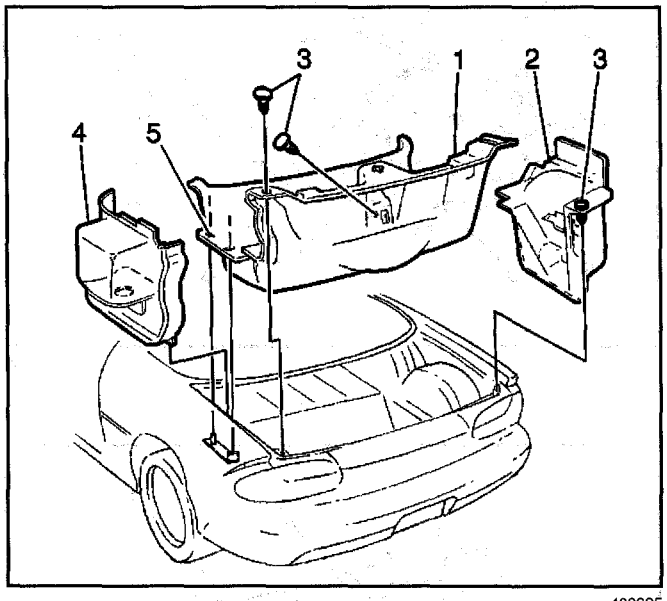


403363

Installation Procedure

Important: If retainer (push clip) is damaged, replace retainer.

1. Install rear compartment trim panel carpet (1) into vehicle body (2).
2. Insert rear compartment trim panel carpet retainer (push clip).
3. Install rear compartment side trim panels. Refer to *Trim Panel Replacement - Cargo Area Side*.

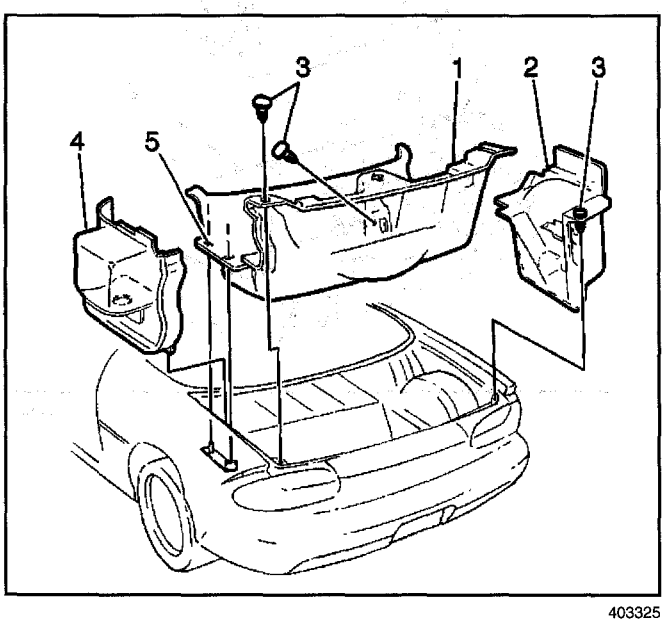


403325

Trim Panel Carpet - Rear Compartment Rear Center (Convertible)

Removal Procedure

1. Remove rear compartment trim panel carpet retainer (push clips) (3).
2. Remove rear compartment trim panel carpet (1) and side trim (2 & 4) from vehicle body (2).



403325

Installation Procedure

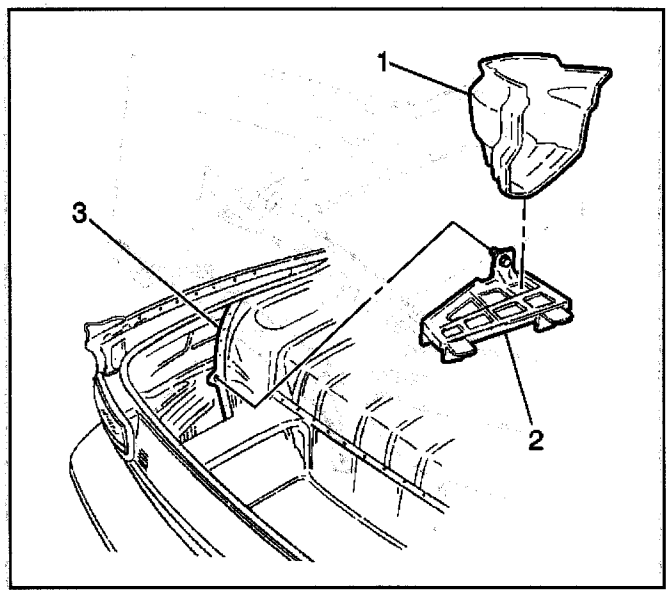
1. Install rear compartment trim panel carpet (1) and side trim (2 & 4) into vehicle body (2).
2. Insert rear compartment trim panel carpet retainers (push clips) (3).

Important: If retainers (push clips) are damaged, replace as necessary.

Luggage Screen Support Replacement

Removal Procedure

1. Remove cargo compartment side trim panel (drivers-side only). Refer to *Trim Panel Replacement - Cargo Area Side.*
2. Remove left section (1) of rear compartment trim panel carpet. (felt liner at rear).
3. Remove luggage screen support bolt/screw from support (2).
4. Remove support (2) from vehicle body (3).



403354

Installation Procedure

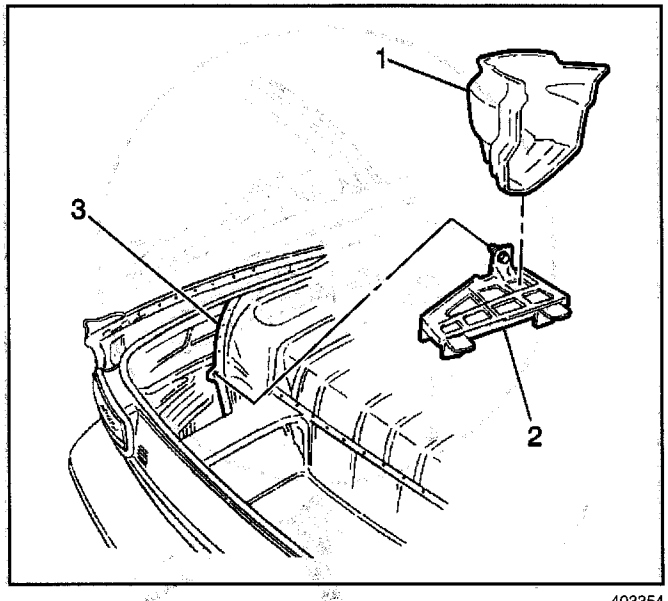
1. Install support (2) to vehicle body (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install luggage screen support bolt/screw to support (2).

   Tighten

   Tighten the bolt/screw to 6 N·m (53 lb in).
3. Install left section (1) of rear compartment trim panel carpet into original position (felt liner at rear).
4. Install cargo compartment side trim panel (drivers-side only). Refer to *Trim Panel Replacement - Cargo Area Side.*



403354

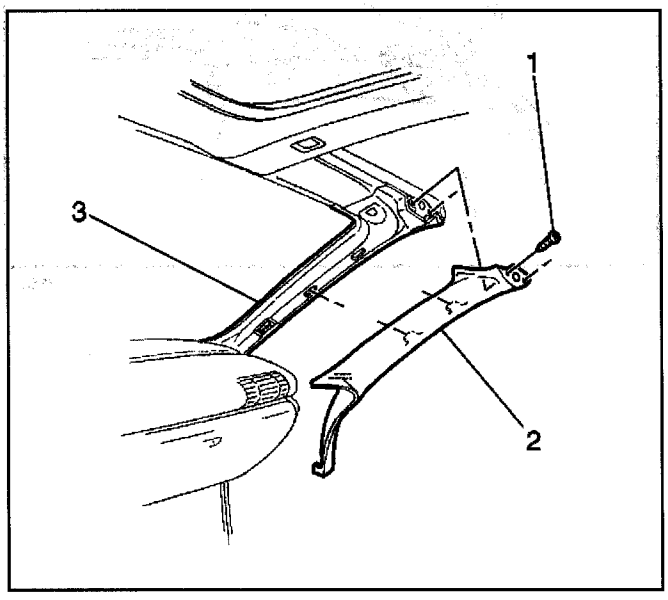
Garnish Molding Replacement - Windshield Pillar

Removal Procedure

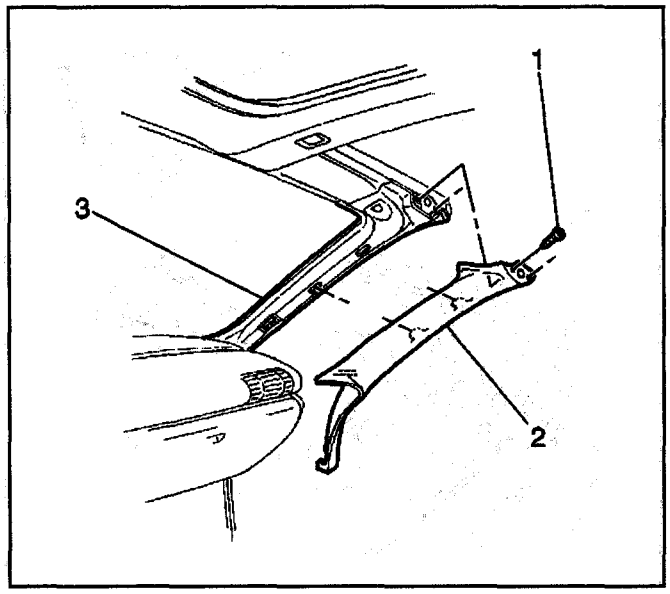
1. Remove screws (1) from garnish molding (2) (w/T-Tops only).

Important: Without T-Tops, garnish molding is retained by "S" clips and not screws. Molding can be gently pulled from its installed location

2. Remove garnish molding from windshield pillar.



403341



403341

Installation Procedure

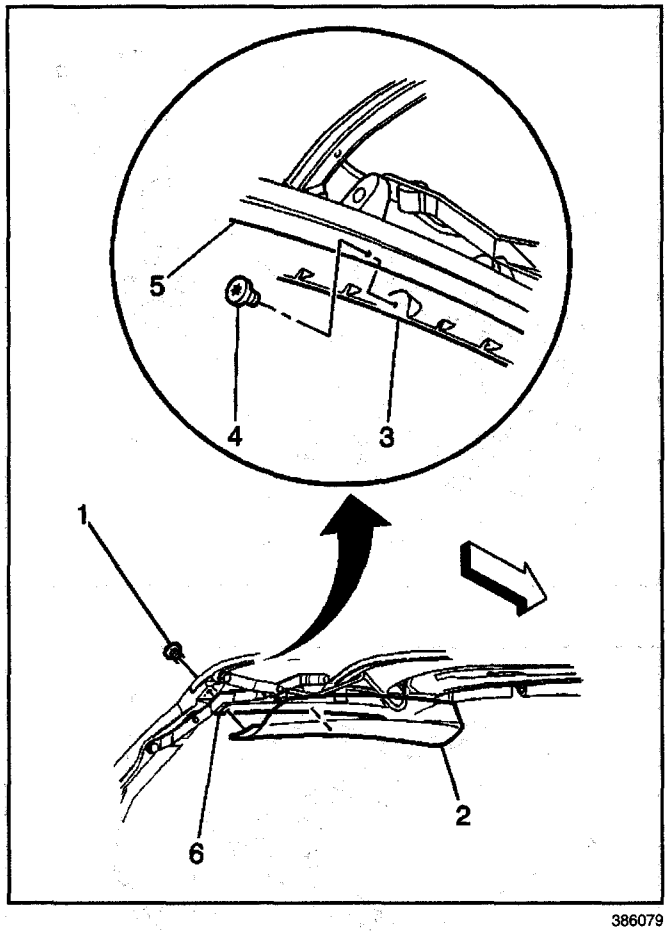
1. Install garnish molding to windshield pillar.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install screws (1) from garnish molding (2).

   Tighten

   Tighten the screws to 1.7 N·m (15 lb in).



386079

Garnish Molding Replacement - Upper

Removal Procedure

1. Lower folding top to suitable working position.
2. Remove side rail weatherstrip.
3. Remove side rail weatherstrip retainer.
4. Remove side rail garnish molding bolts/screws (4) from garnish molding (3).
5. Remove side rail garnish molding (2).

Installation Procedure

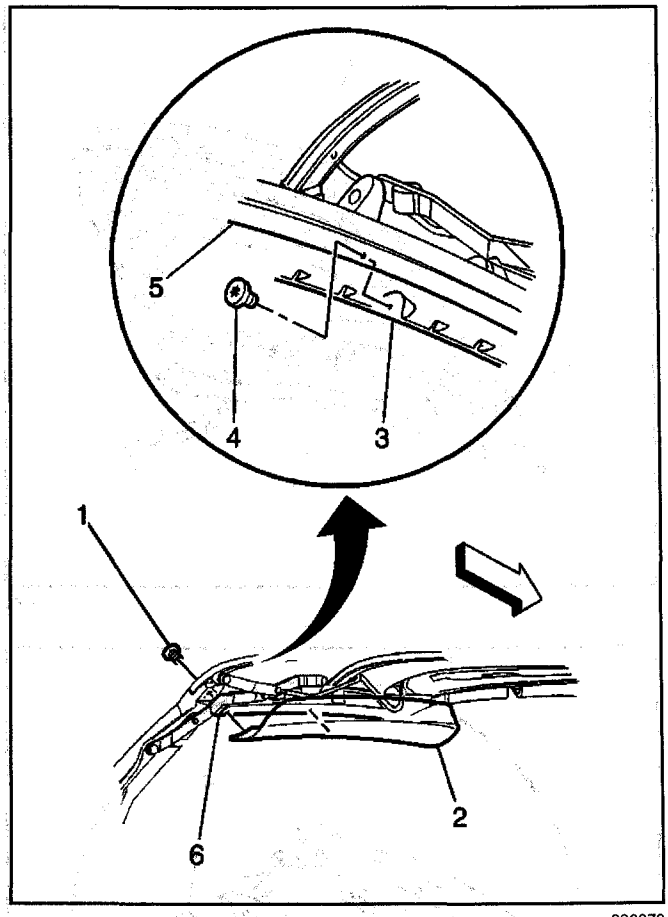
1. Install side rail garnish molding (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install side rail garnish molding bolts/screws (4) to molding (3).

   Tighten

   Tighten the bolts/screws to 5 N·m (44 lb in).
3. Install side rail weatherstrip retainer.
4. Install side rail weatherstrip.
5. Raise folding top.

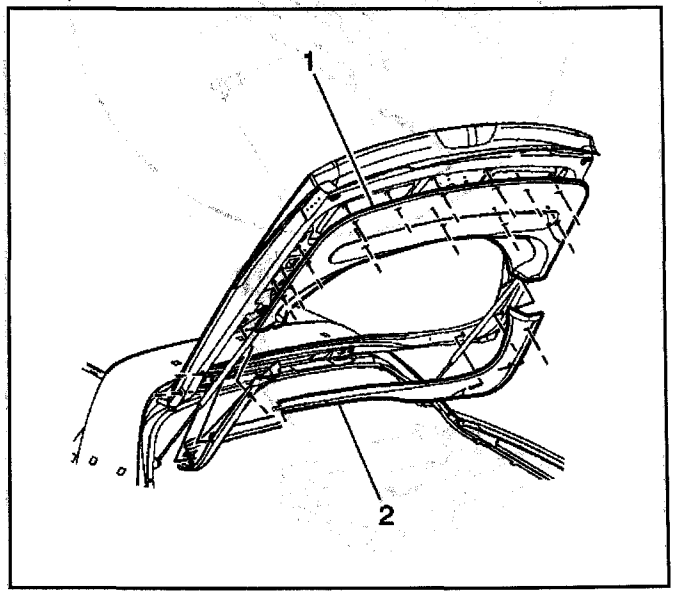


386079

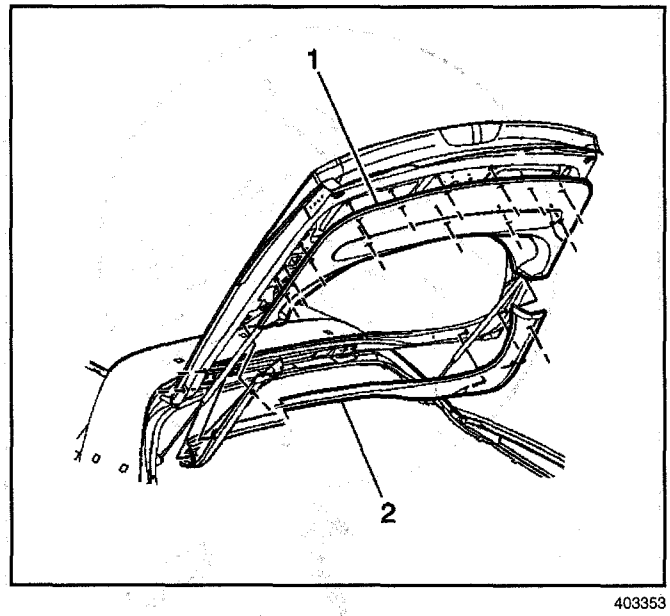
Finish Panel Replacement - Upper Rear Trim

Removal Procedure

1. Raise rear compartment liftgate (coupe only).
2. Remove forward (front liftgate) trim panel by pulling or gently prying panel retainers from the liftgate.
3. Remove rear (rear liftgate) trim panel (1) by pulling or gently prying panel retainers from the liftgate (2).



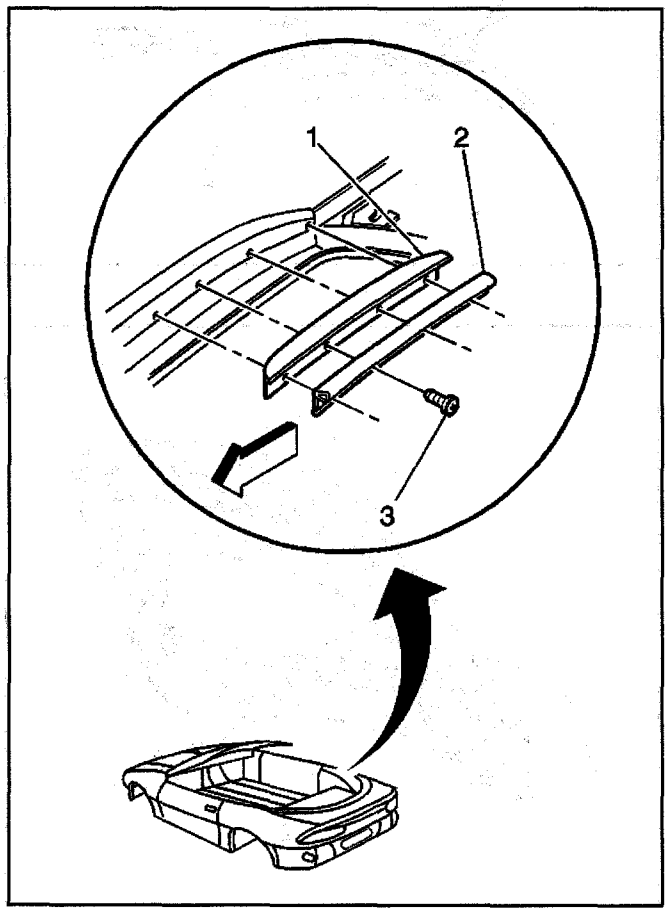
403353



403353

Installation Procedure

1. Remove rear (rear liftgate) trim panel (1) by pulling or gently prying panel retainers from the liftgate (2).
2. Remove forward (front liftgate) trim panel by pulling or gently prying panel retainers from the liftgate.
3. Close rear compartment liftgate.



386061

Belt Reveal Molding Replacement (Chevrolet)

Removal Procedure

1. Lower folding top.
2. Remove quarter belt reveal molding bolts/screws (3).
3. Remove quarter belt reveal molding (1) with seal (2).
4. Remove quarter belt reveal molding seal (2) from quarter belt reveal molding (1).
5. Remove any old adhesive from molding (1).

Installation Procedure

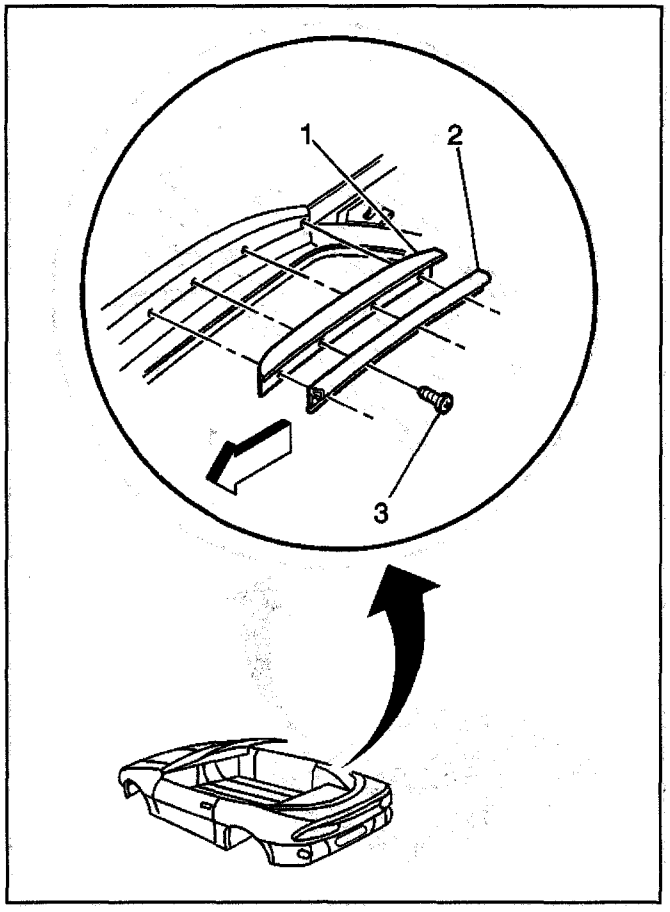
1. Remove paper backing from adhesive on quarter belt reveal molding seal (2).
2. Install quarter belt reveal molding seal (2) to quarter belt reveal molding (1)
3. Install quarter belt reveal molding (1) with seal (2) to rear quarter.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install quarter belt reveal molding bolts/screws (3).

   Tighten

   Tighten the bolts/screws (3) to 5 N·m (44 lb in).
5. Raise folding top.

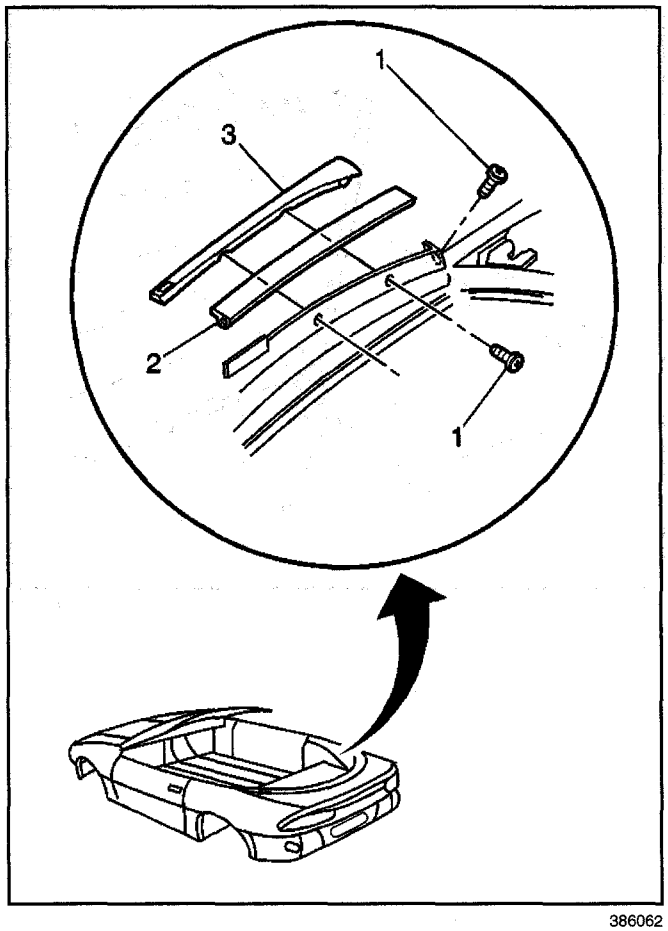


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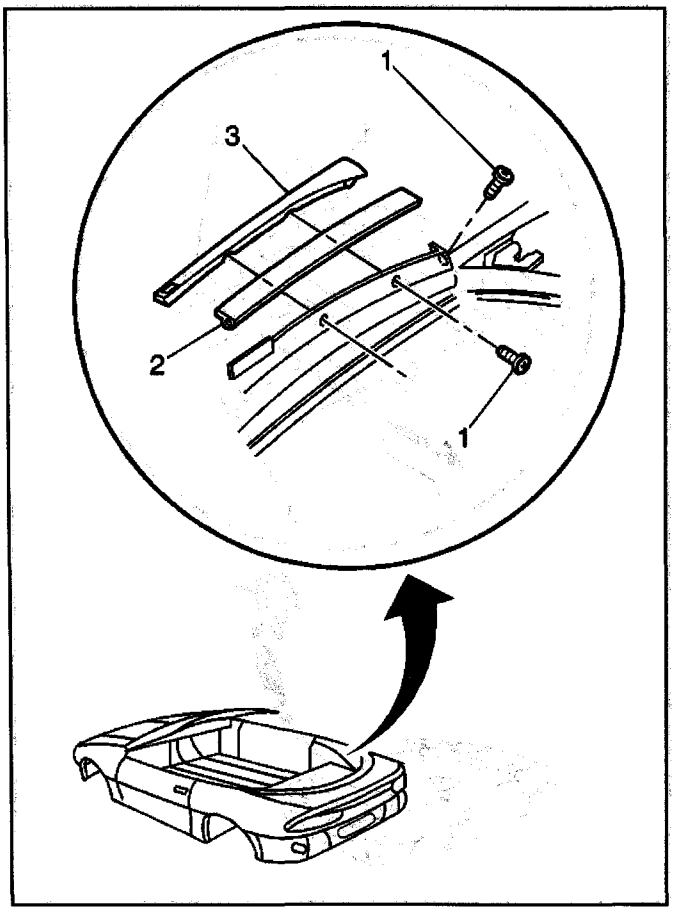
Belt Reveal Molding Replacement (Pontiac)

Removal Procedure

1. Lower folding top.
2. Remove quarter belt reveal molding bolts/screws (3).
3. Remove quarter belt reveal molding (1) with seal (2).
4. Remove quarter belt reveal molding seal (2) from quarter belt reveal molding (1).
5. Remove any old adhesive from molding (1).



386062



386062

Installation Procedure

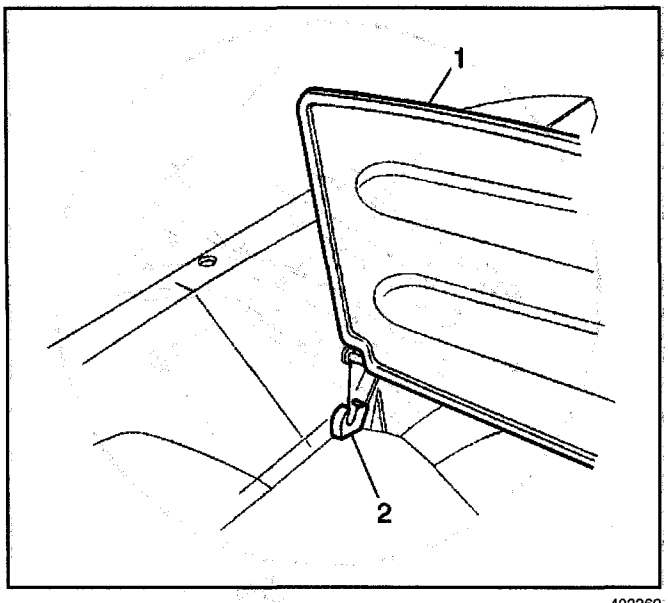
1. Remove paper backing from adhesive on quarter belt reveal molding seal (2).
2. Install quarter belt reveal molding seal (2) to quarter belt reveal molding (1)
3. Install quarter belt reveal molding (1) with seal (2) to rear quarter.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install quarter belt reveal molding bolts/screws (3).

   Tighten

   Tighten the bolts/screws (3) to 1.7 N·m (15 lb in).
5. Raise folding top.



403362

Trim Panel Replacement - Rear Shelf

Removal Procedure

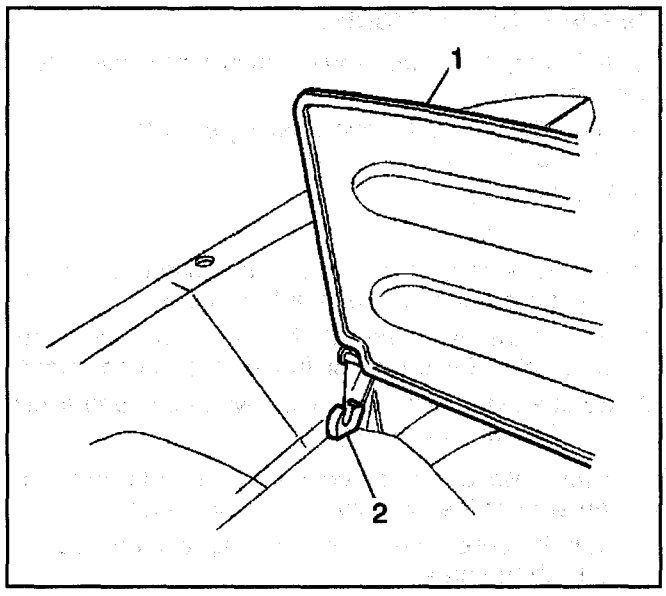
1. Open liftgate and lift rear shelf trim panel (1).

Important: Panel (1) must be resting on rear quarter trim panel to be removed.

2. Disengage panel (1) by gently pushing panel from mounting brackets (2).

Installation Procedure

1. Engage panel (1) by gently pushing panel into mounting brackets (2) until it seats (snaps).
2. Lower rear shelf trim panel (1) and close liftgate.



403362

Cleaning Vinyl Trim

Use warm water and a clean cloth.

1. Rub with a clean, damp cloth in order to remove dirt. You may have to do this more than once.
2. Things like tar, asphalt, and shoe polish will stain if you do not remove them quickly. Use a clean cloth and a vinyl/leather cleaner. See dealer for this product.

Cleaning Leather Trim

Use a soft cloth with lukewarm water and a mild soap or saddle soap and wipe dry with a soft cloth. Then, let the leather dry naturally. Do not use heat of any kind to dry.

- For stubborn stains, use a leather cleaner. See dealer for this product.
- Never use oils, varnishes, solvent-based or abrasive cleaners, furniture polish or shoe polish on leather.
- Soiled or stained leather should be cleaned immediately. If dirt is allowed to work into the finish, it can harm and permanently discolor the leather surface.

Cleaning the Headliner

The following items are required in order to clean the headliner panel:

- GM P/N 1051398 fabric cleaning solvent for coated fabrics or equivalent
- Hand gloves
- Clean cloths
- A knife, scrapper, or equivalent in order to remove any loose soil from the headliner panel.

1. Scrape the heavy soil off the headliner panel. Use care not to force the soil further into the headliner.
2. Soak a clean cloth in solvent, wring out, and allow the cloth to partially dry.

Important: Move the pad periodically in order to keep a clean area of the cloth over the coiled spot.

3. Dab the soiled area with the damp cloth pad. Do not rub the area.

Cleaning Agents

The following cleaning products can be hazardous. Some are toxic. Others can burst into flame if you strike a match or get them on a hot part of the vehicle. Some are dangerous if you breathe their fumes in a closed space. When you use anything from a container to clean a vehicle, be sure to follow the manufacturers warnings and instructions.

1. Gasoline
2. Benzene
3. Naptha
4. Carbon Tetrachloride
5. Acetone
6. Paint Thinner
7. Turpentine
8. Lacquer Thinner
9. Nail Polish Remover

Cleaning of Fabric Trim

For cleaning fabric trim, Multi-Purpose Interior Cleaner and Capture Non-Solvent Dry Spot and Soil Remover is recommended. They will clean normal spots and stains very well. You can get GM-approved cleaning products from your dealer parts supply. Here are some cleaning tips:

- Always read the instructions on the cleaner label.
- Clean up stains as soon as possible, before they set.
- Carefully scrape off any excess staining liquid.
- Use a clean cloth or sponge, and change to a clean area often. A soft brush may be used if stains are stubborn.
- If a ring forms on fabric after spot cleaning, clean the entire area immediately or it will set.

Cleaning Glass Surfaces

Glass should be cleaned often. GM Glass Cleaner or a liquid household glass cleaner will remove normal tobacco smoke and dust films on interior glass. Do not use abrasive cleaners on glass because they may cause scratches. Avoid placing decals on the inside of the rear window, since they may have to be scraped off later. If abrasive cleaners are used on the inside of the rear window, an electronic defogger element may be damaged. Any temporary license should not be attached across the defogger grid.

Removal of Specific Stains

Special Fabric Cleaning Problems

Stains caused by such things as catsup, coffee (black), egg, fruit, milk, soft drinks, vomit, urine, and blood can be removed as follows:

1. Carefully scrape off excess stain, then sponge the soiled area with cool water.
2. If a stain remains, follow the multi-purpose interior cleaner instructions.
3. If an odor lingers after cleaning vomit or urine, treat the area with a water/baking soda solution: 1 teaspoon (5 ml) of baking soda to 1 cup (250 ml) of lukewarm water.
4. Let dry.

Stains caused by candy, ice cream, mayonnaise, chili sauce and unknown stains can be removed as follows:

1. Vacuum and brush the area to remove any dirt..
2. Always clean a whole trim panel or section. Mask surrounding trim along stich or welt lines.
3. Mix powdered cleaner following the directions on the container label to form thick suds.
4. Use suds only and apply with a clean sponge. Don't saturate the material and don't rub it roughly.
5. As soon as you've cleaned the section, use a sponge to remove the suds.
6. Wipe cleaned area with a clean, damp towel or cloth.
7. Wipe with a clean cloth and let dry.

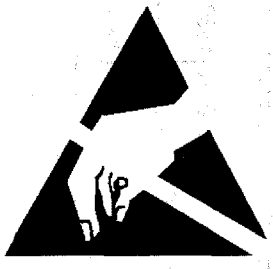
Body Rear End

Schematic and Routing Diagrams

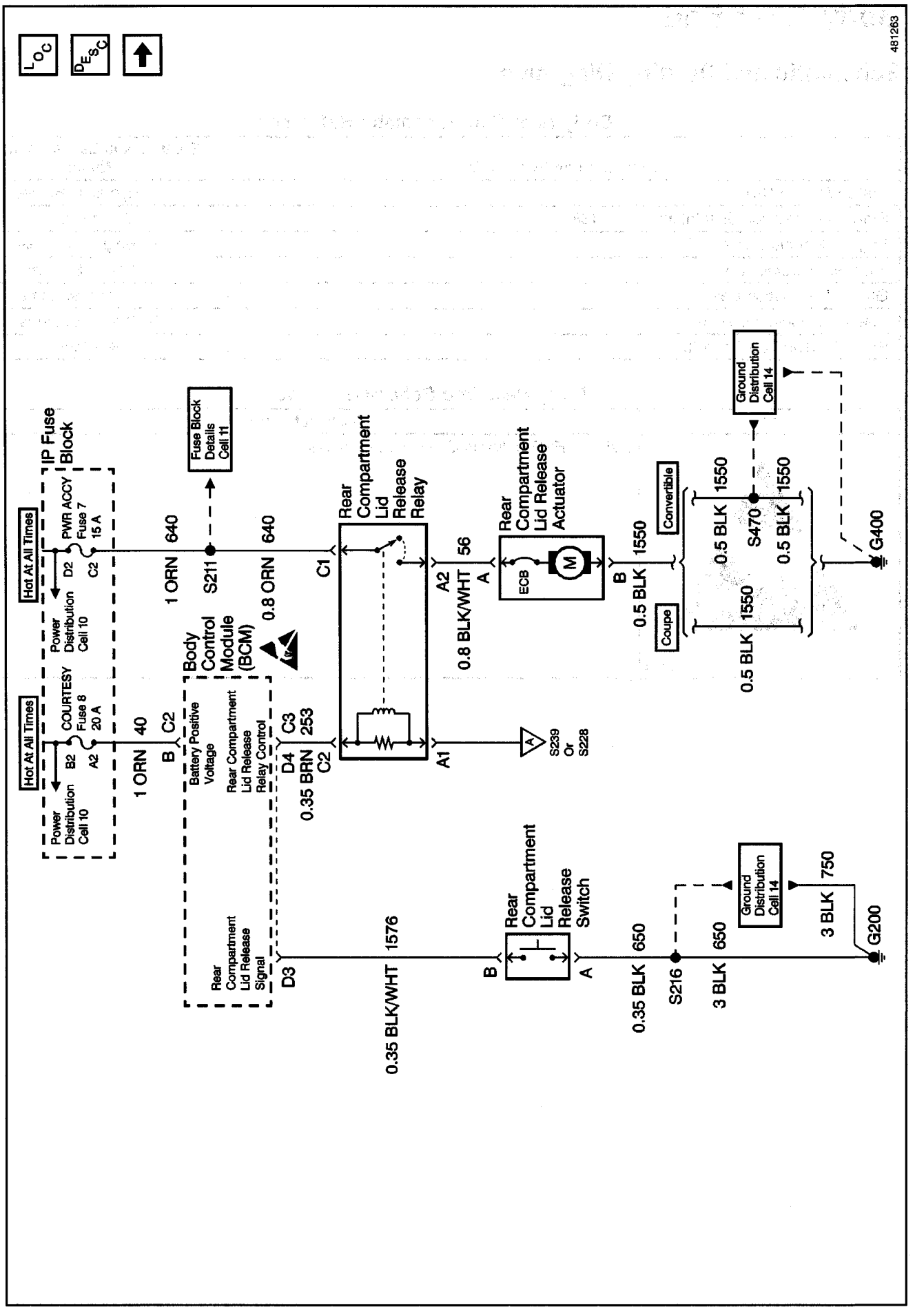
Body Rear End Schematic References

Reference on Schematic	Section Number Subsection Name
Brake Warning Cell 41	5—Hydraulic Brakes
Brake Transmission Shift Interlock Cell 138	2—Steering
Engine Controls Cell 20, 21	6—Engine Controls
Fuse Block Details Cell 11	8—Wiring Systems
Ground Distribution Cell 14	8—Wiring Systems
Power Distribution Cell 10	8—Wiring Systems
Power Folding Top Cell 120	8—Roof

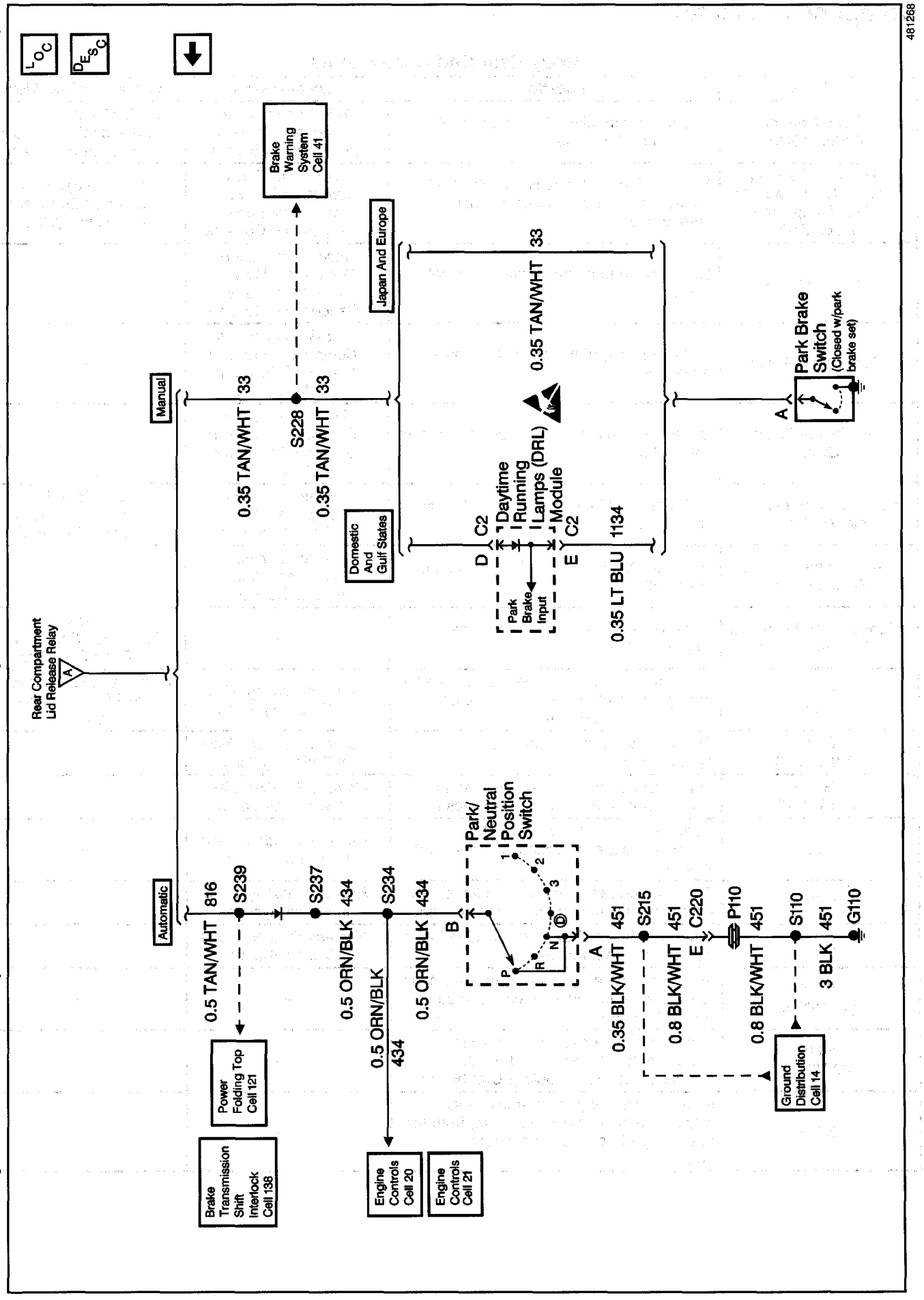
Body Rear End Schematic Icons

Icon	Icon Definition
 19384	Refer to *ESD Notice* in Caution and Notices.

Release Systems Schematics (Cell 134: Rear Compartment Lid Release Relay, Rear Compartment Lid Release Actuator, Rear Compartment Lid Release Switch)



Release Systems Schematics (Cell 134: Park Brake Switch, Daytime Running Lamps (DRL) Module, Park/Neutral Position Switch)



Component Locator

Body Rear End Components

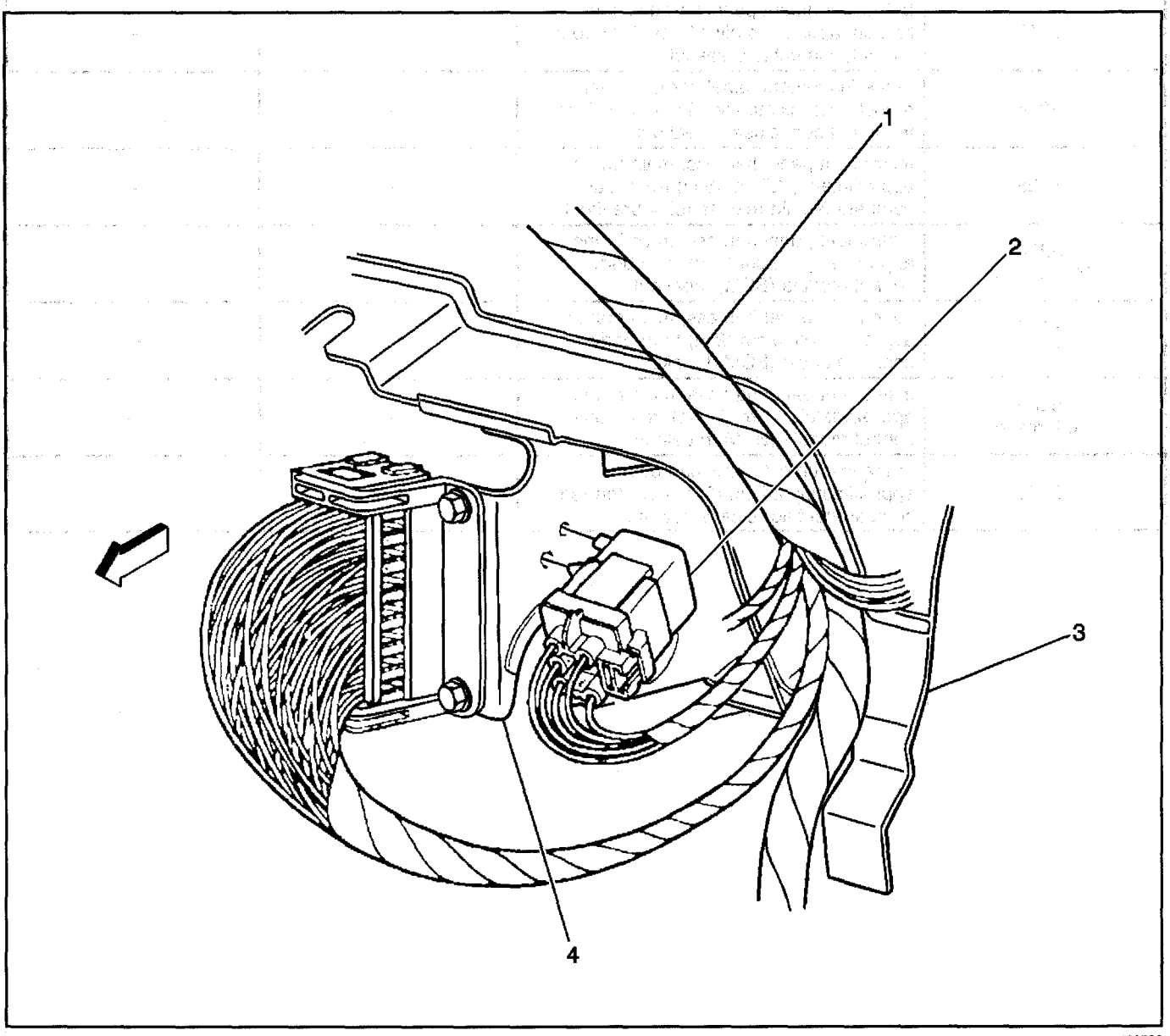
Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Daytime Running Lamps (DRL) Module (Headlamp Auto Control Module)	Mounted behind the radio and the HVAC control, left of the instrument panel compartment	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Lighting Systems Connector End Views* in Lighting Systems
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Park Brake Switch	In the console, at the base of the park brake lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Park Neutral Position Switch	Under the console, on the base of the shift control lever	*Tilt Wheel/Column Component Views* in Steering Wheel and Column - Tilt	—
Rear Compartment Lid Release Actuator	In the center of the end panel, in the cargo compartment	*Body Rear End Component Views* in Body Rear End	*Body Rear End Connector End Views* in Body Rear End
Rear Compartment Lid Release Relay	Under the left side of the instrument panel, near C200	*Body Rear End Component Views* in Body Rear End	—
Rear Compartment Lid Release Switch	In the driver knee bolster, left of the steering column	—	*Body Rear End Connector End Views* in Body Rear End
C220 (10 cavities)	Instrument panel to engine harness, under the right side of the instrument panel, behind the knee bolster	*Harness Routing Views* in Wiring Systems	*Inline Harness Connector End Views* in Wiring Systems
G110 (V8 VIN G)	Attached to the rear of the left cylinder head	*Harness Routing Views* in Wiring Systems	—
G110 (V6 VIN K)	In the front of the engine, bolted to the pulley above the A/C clutch connector	*Harness Routing Views* in Wiring Systems	—
G200	Near the left A-pillar, bolted to the instrument panel mounting stud behind the kick panel	*Harness Routing Views* in Wiring Systems	—
G400	Bolted to the rear compartment lid release actuator bracket in the rear compartment	*Harness Routing Views* in Wiring Systems	—
P110	Right side in the dash panel, engine to the passenger compartment	*Harness Routing Views* in Wiring Systems	—
S110 (V6 VIN K)	In the engine harness, approximately 4 cm (2 in) from the powertrain control module (PCM) breakout	—	—
S110 (V8 VIN G)	In the engine harness, main branch, approximately 19 cm (7 in) from the powertrain control module (PCM) breakout	—	—
S211	In the instrument panel harness, main branch, approximately 7 cm (3 in) from the rear compartment lid release relay breakout	—	—

Body Rear End Components (cont'd)

Name	Location	Locator View	Connector End View
S215	In the instrument panel harness, main branch, approximately 11 cm (4 in) from the antenna cable breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S228	Instrument panel harness, main branch, approximately 20 cm (8 in) from rear compartment lid release relay breakout	—	—
S234 (Automatic)	Instrument panel harness, main branch, approximately 5 cm (2 in) from body control module (BCM) breakout	—	—
S237 (Automatic)	Instrument panel harness, main branch, approximately 6 cm (2 in) from body control module (BCM) breakout	—	—
S239 (Automatic)	Instrument panel harness, main branch, approximately 1 cm (0.5 in) from body control module (BCM) breakout	—	—
S470	In the instrument panel harness, approximately 24 cm (9 in) from the rear compartment lid release actuator	—	—

Body Rear End Component Views

Lower Left Side of the Instrument Panel

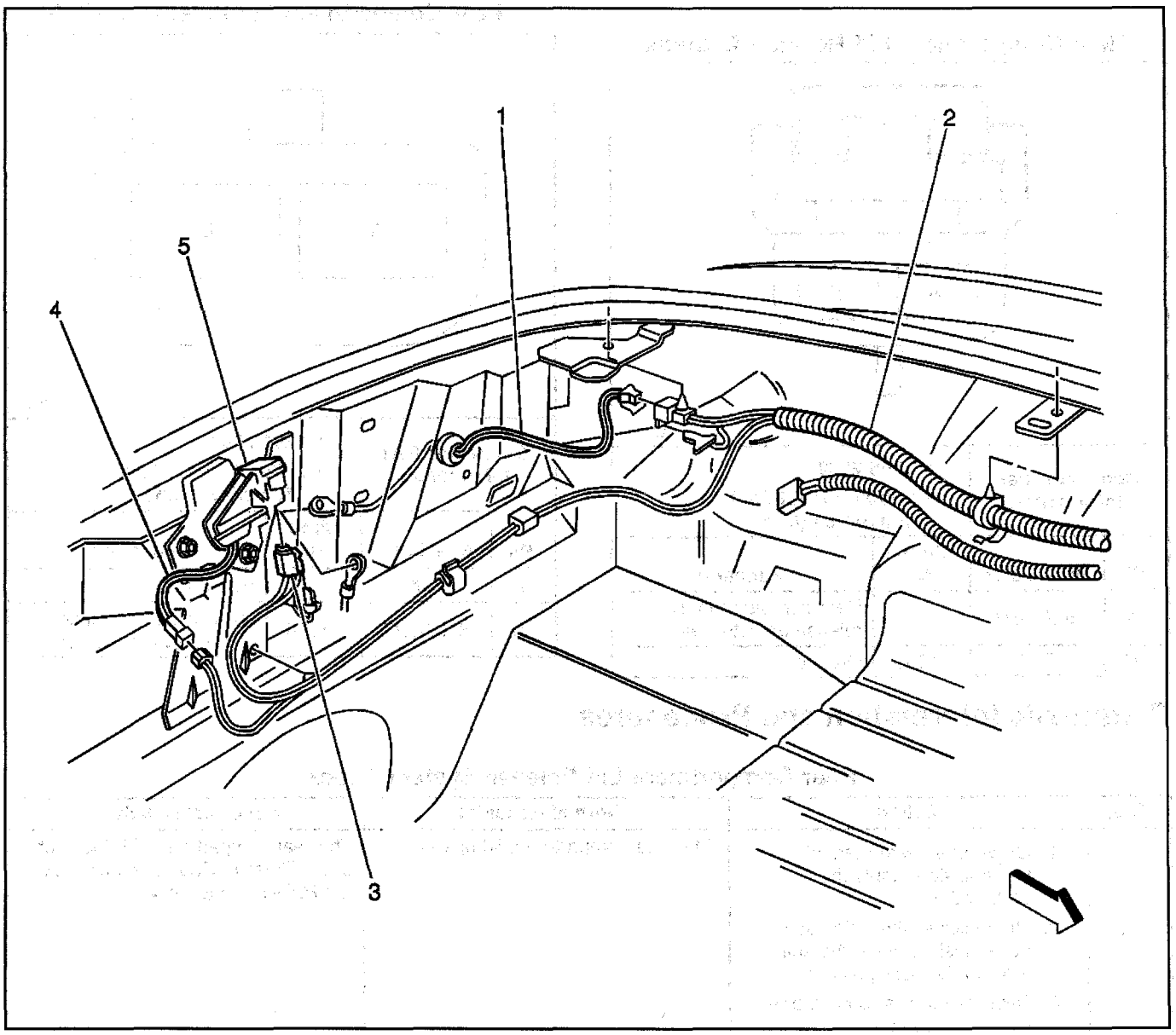


483596

Legend

(1) IP Wiring Harness
(2) Rear Compartment Lid Release Relay
(3) Instrument Panel
(4) Bracket

Left Side of Rear Compartment (Coupe)



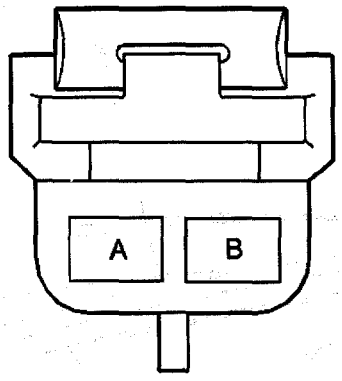
483597

Legend

(1) RR Body Harness
(2) IP Wiring Harness
(3) Rear Compartment Lid Release Actuator Connector
(4) Rear Compartment Lid Ajar Indication Switch
(5) Rear Compartment Lid Release Actuator

Body Rear End Connector End Views

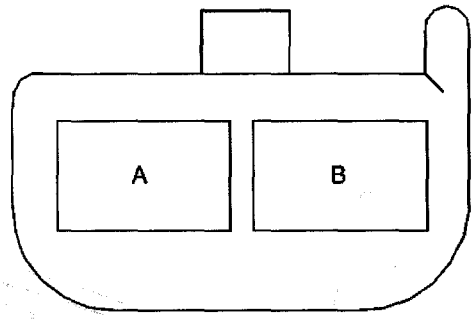
Rear Compartment Lid Release Actuator



280768

Connector Part Information	• 1205-2832 • 2 Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK/WHT	56	Rear compartment lid release actuator feed
B	BLK	1550	Ground

Rear Compartment Lid Release Switch



82383

Connector Part Information	• 1204-7662 • 2 Way F Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	650	Ground
B	BLK/WHT	1576	Rear compartment lid release switch output

Diagnostic Information and Procedures

Rear Compartment Lid Release System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. On vehicles with manual transmission, apply the park brake. 2. On vehicles with automatic transmission, place the shift lever in the park position. 3. Depress the rear compartment lid release switch.	The rear compartment lid opens.	The rear compartment lid does not open. Refer to *Rear Compartment Lid Release Inoperative*
2	1. Close the rear compartment lid. 2. Press the rear compartment lid release button on the remote control door lock transmitter.	The rear compartment lid opens.	The rear compartment lid does not open. Refer to *Remote Keyless Entry System Check*

* Refer to the appropriate symptom diagnostic table for the applicable abnormal result.

Rear Compartment Lid Release Inoperative

Step	Action	Value(s)	Yes	No
1	1. Connect a test lamp to ground. 2. Backprobe the rear compartment lid release actuator terminal A. Does the test lamp light?	—	Go to *Step 3*	Go to *Step 2*
2	1. Connect a test lamp to ground. 2. Backprobe the rear compartment lid release relay terminal C1 to ground. Does the test lamp light?	—	Go to *Step 4*	Go to *Step 5*

Rear Compartment Lid Release Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
3	1. Inspect for a short to B+ in circuit 56 between the rear compartment lid release actuator and the rear compartment lid release relay. 2. If the circuit is OK replace the rear compartment lid release relay. Is the repair complete?	—	System OK	—
4	1. Disconnect the rear compartment lid release relay connector. 2. Momentarily connect a fused jumper from terminal C1 to terminal A2 of the rear compartment lid release connector. Does the rear compartment lid release actuator operate?	—	Go to *Step 6*	Go to *Step 7*
5	Repair the open in circuit 540 from the rear compartment lid release relay. Is the repair complete?	—	System OK	—
6	1. Connect a test lamp to ground. 2. Backprobe the rear compartment lid release relay terminal C2. 3. Operate the rear compartment lid release switch. Does the test lamp light?	—	Go to *Step 8*	Go to *Step 9*
7	1. Reconnect the fused jumper from terminal C1 to terminal A2 of the rear compartment lid release relay connector. 2. Connect a test lamp to ground. 3. Backprobe the rear compartment lid release actuator connector terminal A. Does the test lamp light?	—	Go to *Step 10*	Go to *Step 11*
8	1. Connect a multimeter between the rear compartment lid release relay connector terminals C1(+) and terminal A1(-). 2. Set the parking brake on vehicles equipped with a manual transmission. Place vehicles equipped with an automatic transmission in PARK or NEUTRAL. 3. Test for 9 to 15 VDC between the test points listed. Is 9 to 15 VDC present?	9–15 Volts	Go to *Step 12*	Go to *Step 13*
9	1. Disconnect the body control module (BCM) connector C3 and connector C2. 2. Connect a test lamp between the connector C2 terminal B and the connector C3 terminal D3. 3. Press the rear compartment lid release switch. Does the test lamp light?	—	Go to *Step 16*	Go to *Step 17*
10	1. Disconnect the rear compartment lid release actuator. 2. Connect a test lamp to the rear compartment lid release actuator connector from terminal A to terminal B. Does the test lamp light?	—	Go to *Step 14*	Go to *Step 15*
11	Repair the open in circuit 56 between the rear compartment lid release relay and the rear compartment lid release actuator. Is the repair complete?	—	System OK	—
12	1. Inspect for faulty connections at the rear compartment lid release relay. 2. If the connections are OK, replace the rear compartment lid release relay. Is the repair complete?	—	System OK	—

Rear Compartment Lid Release Inoperative (cont'd)

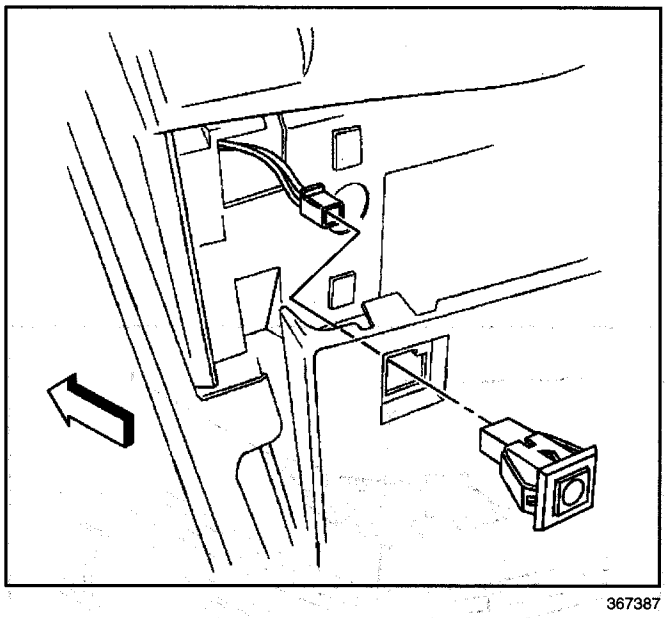
Step	Action	Value(s)	Yes	No
13	Is the vehicle equipped with a manual transmission?	—	Go to *Step 21*	Go to *Step 20*
14	1. Inspect for faulty connections at the rear compartment lid release actuator. 2. If the connections are OK, replace the rear compartment lid release actuator. Refer to *Lock Actuator Replacement - Liftgate.* Is the repair complete?	—	System OK	—
15	Repair an open in circuit 1550 between the rear compartment lid release actuator and splice S470. Is the repair complete?	—	System OK	—
16	Connect a fused jumper between the body control module (BCM) connector C2 terminal B and connector C3 terminal D4 momentarily. Did the rear compartment lid release operate?	—	Go to *Step 18*	Go to *Step 19*
17	1. Inspect for an open in circuit 1576 between the body control module (BCM) and the rear compartment lid release switch. 2. Inspect for an open in circuit 650 between the rear compartment lid release switch and splice S216. 3. If the circuits are OK, replace the rear compartment lid release switch Refer to *Rear Compartment Lid Switch Replacement.* 4. Inspect the system. Is the repair complete?	—	System OK	—
18	Replace the body control module (BCM). Is the repair complete?	—	System OK	—
19	Repair the open in circuit 253 between the body control module (BCM) and the rear compartment lid release relay. Is the repair complete?	—	System OK	—
20	**Automatic Transmission** 1. Inspect for an open in circuit 816/434 between the rear compartment lid release relay and the park/neutral position switch. 2. Inspect for an open in circuit 451 between the park neutral position switch and splice S215. 3. Inspect for a faulty connection at the park/neutral switch. 4. If the connections are OK, replace the park/neutral switch. Refer to *Park/Neutral Position Switch Replacement.* Is the repair complete?	—	System OK	—
21	**Manual Transmission** 1. Inspect for an open circuit 33. 2. Inspect for faulty connections at the daytime running lamps module connector C2 terminal D and terminal E. 3. Inspect Domestic and Gulf States vehicles for an open in circuit 1134 between the daytime running lamps (DRL) module and the park brake switch. 4. If the circuits and connections are OK, replace the park brake switch. Refer to Park Brake Switch Replacement in Manual Transmission. Is the repair complete?	—	System OK	—

Repair Instructions

Rear Compartment Lid Switch Replacement

Removal Procedure

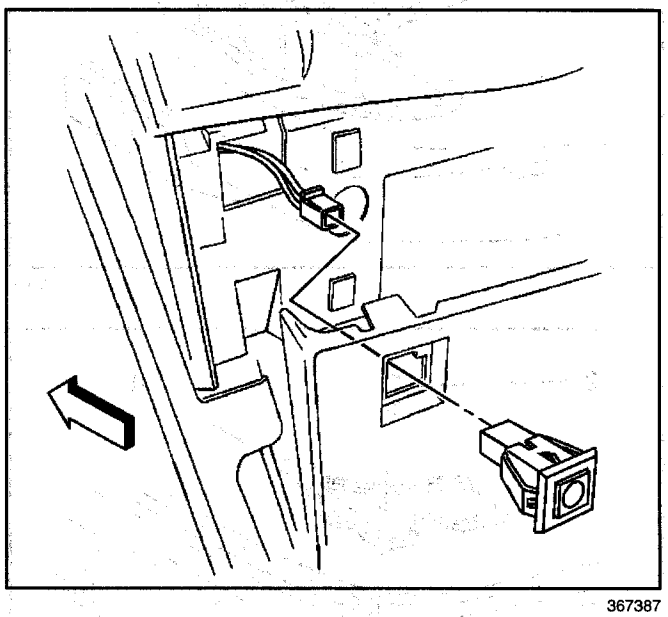
1. Remove instrument panel knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges, and Console.
2. Remove the instrument panel wiring harness connector from rear compartment lid release switch.
3. Remove the switch from knee bolster.



367387

Installation Procedure

1. Install the switch to knee bolster.
2. Install the instrument panel wiring harness connector to rear compartment lid release switch.
3. Install instrument panel knee bolster. Refer to *Knee Bolster Replacement* in Instrument Panel, Gauges, and Console.



367387

Trim Panel Replacement - Liftgate

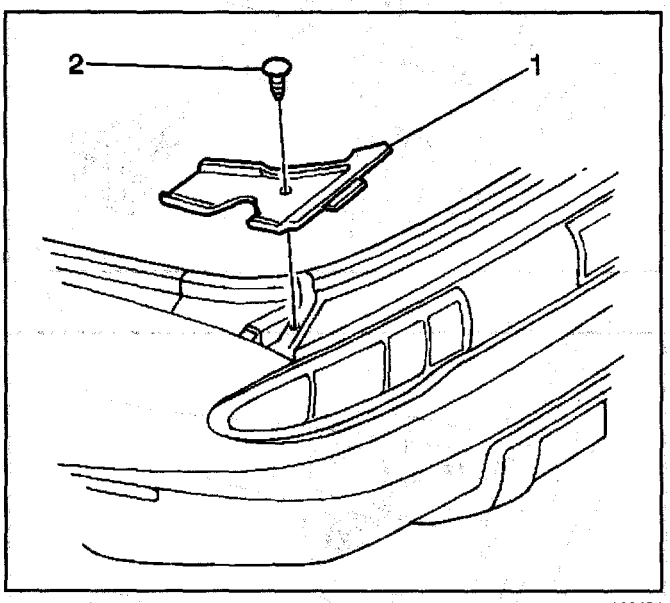
Removal Procedure

1. Open rear compartment lift window.
2. Unsnap and remove the (11) fasteners holding the inner cover from the rear compartment lift window.

Installation Procedure

1. Open rear compartment lift window.
2. Line up inner cover trim panel with cutouts over struts.
3. Position and snap (11) fasteners to install the inner cover to the rear compartment lift window.
4. Install the quarter inner rear trim finishing panel. Refer to *Trim Panel Replacement - Cargo Area Side*.
5. Install the sunshade, if equipped. Refer to *Sunshade Panel Replacement*.

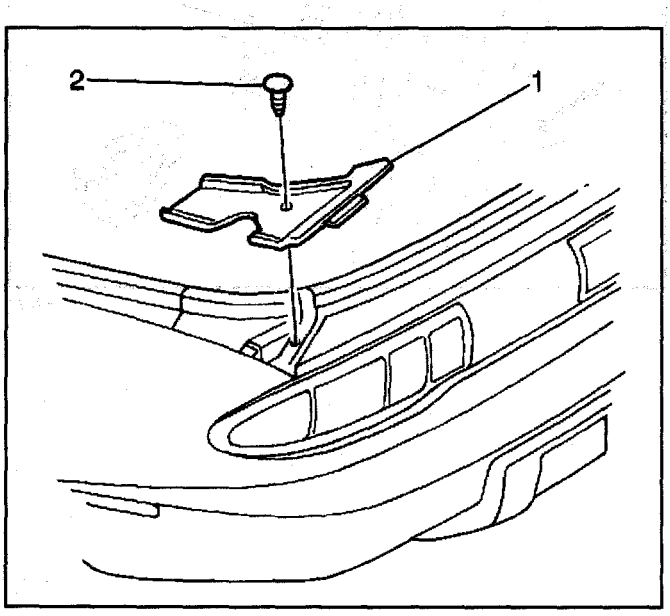
Trim Panel Opening Cover Replacement



330434

Removal Procedure

1. Remove the retainer (2).
2. Remove the filler (1).



330434

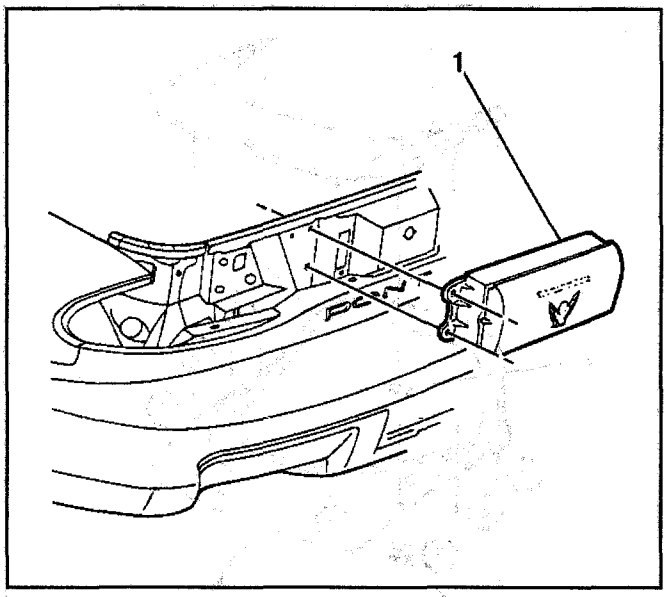
Installation Procedure

1. Install the filler (1).
   The tab on the filler is fitted under the flange on the taillamp housing.
2. Install the retainer (2).

Compartment Lid Applique Replacement - Rear (Pontiac)

Removal Procedure

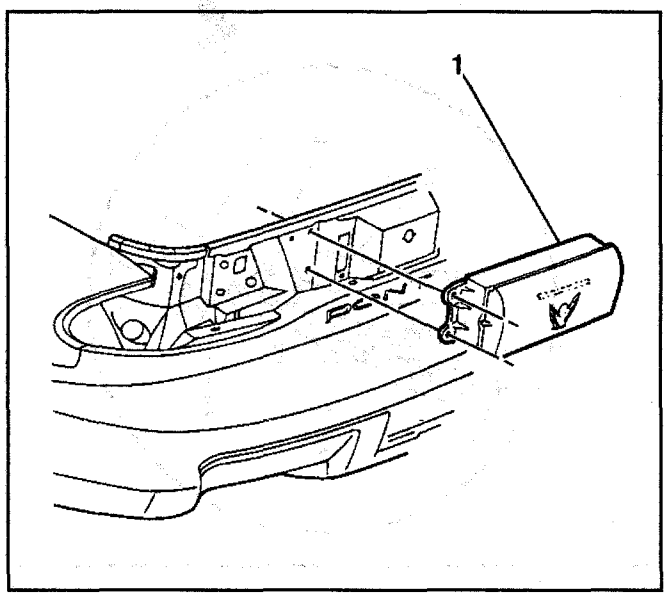
1. Remove the taillamps. Refer to *Tail Lamp Replacement (Pontiac)* in Lighting Systems.
2. Remove the filler (1).



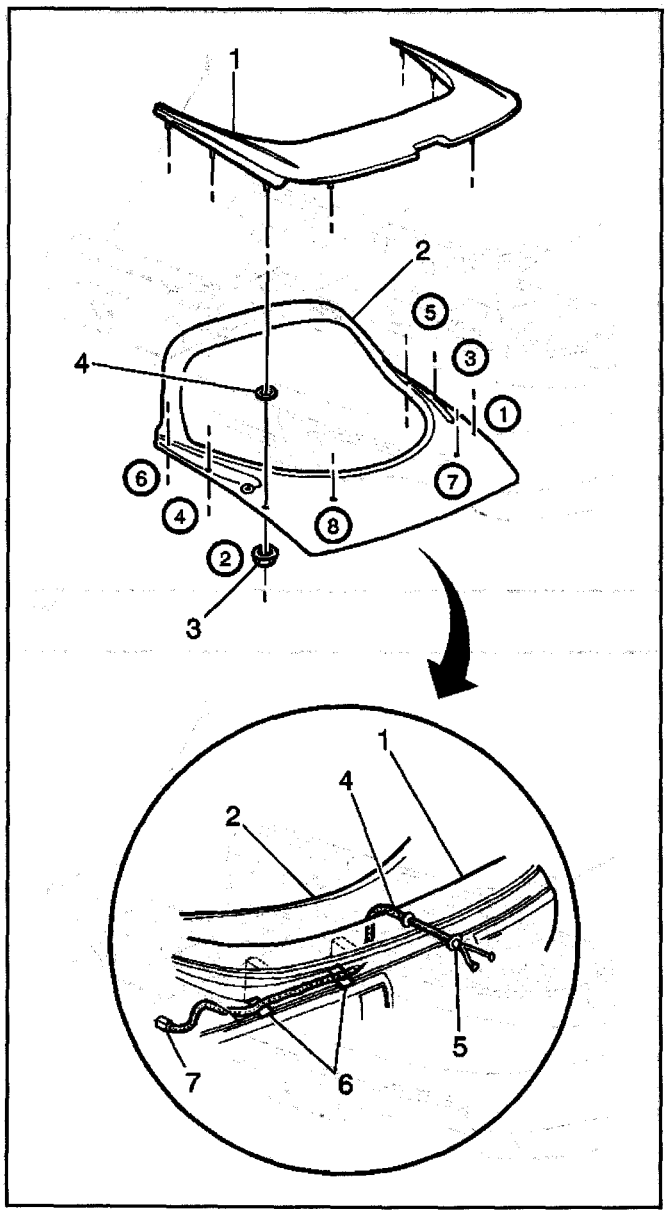
330458

Installation Procedure

1. Install the filler (1).
2. Install the taillamps. Refer to *Tail Lamp Replacement (Pontiac)* in Lighting Systems.



330458



330586

Spoiler Replacement - Rear (Camaro-RS)

Removal Procedure

1. Remove the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim* in Interior Trim.
2. Remove the rear compartment lift window side finish moldings. Refer to Lift Window Side Finish Moldings.
3. Remove the high-mounted stoplamp. Refer to *High Mounted Stoplamp Replacement (Chevrolet)* in Lighting Systems.
4. Perform the following steps to remove the wiring extension from the spoiler:
   - 4.1. Disconnect the electrical connector.
   - 4.2. Remove the tape.
   - 4.3. From outside of the vehicle, pull the wiring extension from the spoiler.
5. Remove the nuts.
6. Remove the spoiler.
7. Remove the washers.

Installation Procedure

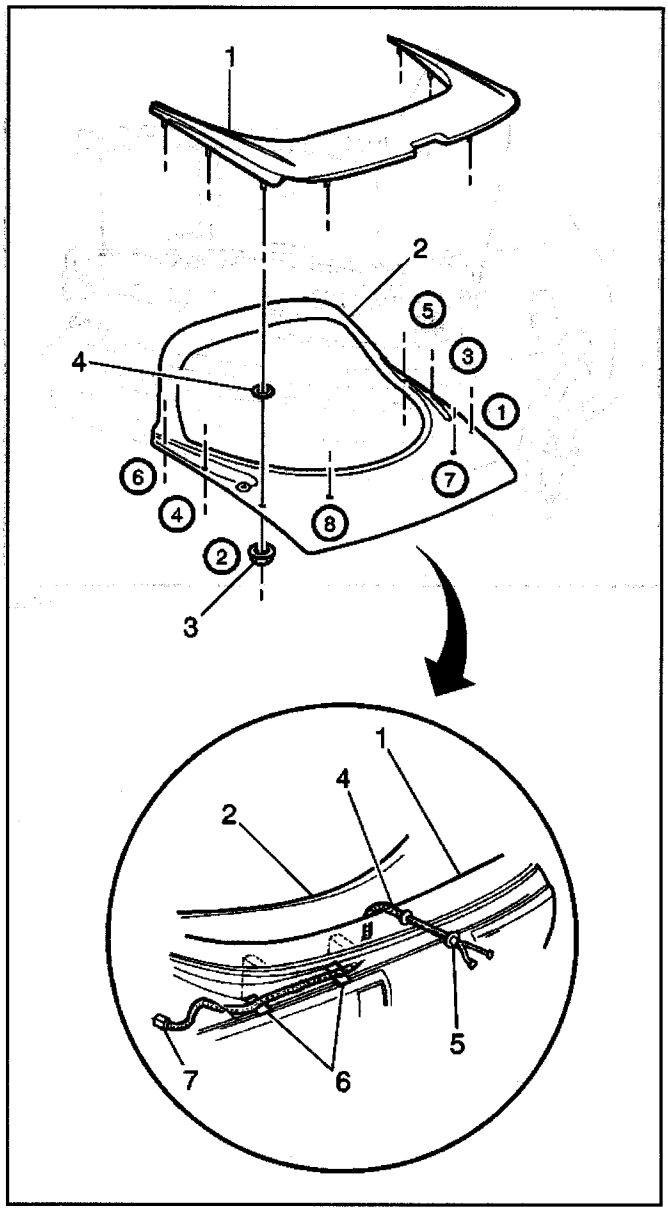
1. Install the washers to the studs on the spoiler.
2. Install the spoiler.
3. Push the spoiler forward.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the nuts.

   Tighten

   Tighten the nuts in sequence to 6 N·m (53 lb in).
5. Perform the following steps in order to install the harness into the spoiler:
   5.1. Route the wiring extension through the spoiler.
   5.2. Pull on the wiring extension in order to seat the grommet.
   5.3. Connect the electrical connector.
   5.4. Tape the wiring extension to the window panel.
6. Install the high-mounted stoplamp. Refer to *High Mounted Stoplamp Replacement (Chevrolet)* in Lighting Systems.
7. Install the rear compartment lift window side finish moldings. Refer to Lift Window Side Finish Moldings.
8. Install the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim* in Interior Trim.

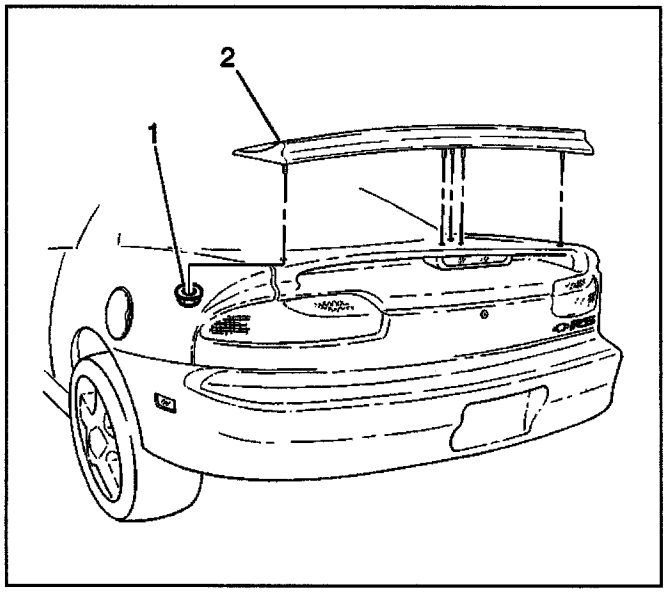


330586

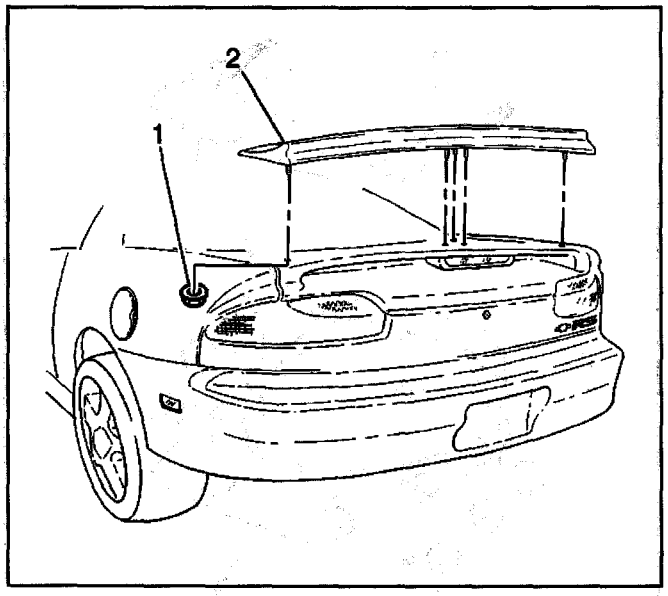
Spoiler Replacement - Rear (Coupe)

Removal Procedure

1. Remove the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim* in Interior Trim.
2. Remove the high mount stoplamp from the rear end spoiler. Refer to *High Mounted Stoplamp Replacement (Chevrolet)* in Lighting Systems.
3. Remove the rear end spoiler from the rear compartment lift window panel.
4. Place the rear end spoiler upside down on a clean, smooth, soft surface.
5. Remove the nuts attaching the rear deck spoiler to the rear end spoiler.
6. Remove the rear deck spoiler (2).



330627



330627

Installation Procedure

1. Install the rear deck spoiler (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the nuts attaching the rear deck spoiler to the rear end spoiler.

   Tighten

   Tighten the nuts to 8.5 N·m (75 lb in).

3. Install the rear end spoiler to the rear compartment lift window panel.
4. Place the rear end spoiler onto the rear compartment lift window panel.

   Do not scratch the paint surface.

5. Install the high mount stoplamp to the rear compartment lift window panel. Refer to *High Mounted Stoplamp Replacement (Chevrolet)* in Lighting Systems.
6. Install the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim* in Interior Trim.

Fuel Filler Door Replacement

Removal Procedure

1. Remove the fuel tank filler pocket. Refer to *Fuel Filler Pocket Replacement.*
2. Install the fuel tank filler cap.
3. Drill out the 4 rivets.
4. Remove the fuel tank filler door.

   Pry back the sound insulating material around the filler door hinge, as needed.

Installation Procedure

1. Install the fuel tank filler door.
2. Alternately install the 4 rivets from top to bottom.
3. Remove the fuel tank filler cap.
4. Install the fuel tank filler pocket. Refer to *Fuel Filler Pocket Replacement.*

Fuel Filler Pocket Replacement

Removal Procedure

1. Open the fuel tank filler door.
2. Remove the fuel tank cap.
3. Remove the fuel tank filler pocket bolts.
4. Remove the fuel tank filler pocket.

Installation Procedure

1. Install the fuel tank filler pocket.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the fuel tank filler pocket bolts.

   Tighten

   Tighten the bolts to 1.9 N·m (17 lb in).

3. Install the fuel tank cap.
4. Close the fuel tank filler door.

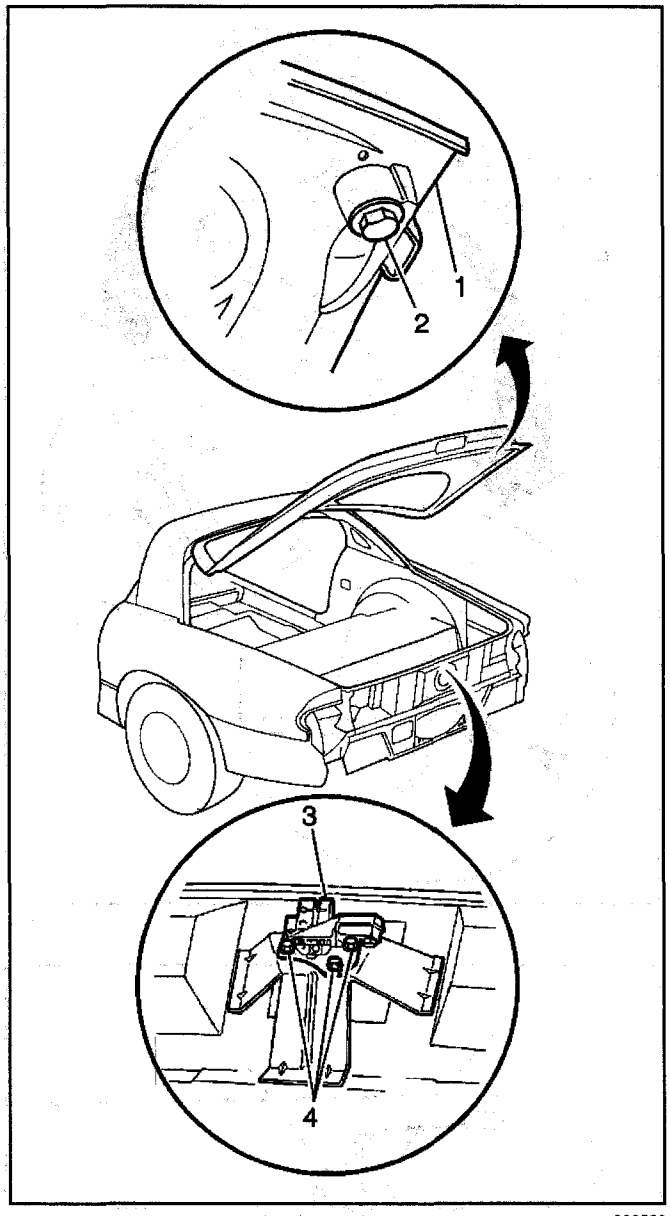
Lift Window Panel Adjustment - Rear

Notice: Refer to *Fastener Notice* in Cautions and Notices.

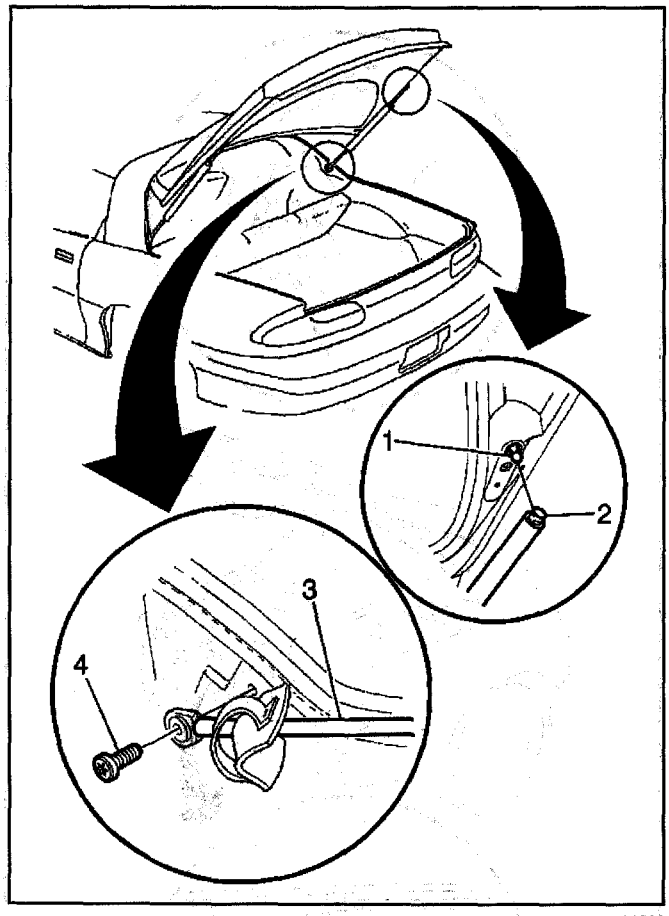
1. Perform the following steps in order to adjust the window panel flush to the quarter outer panel:
   1.1. Center the window in the opening.
   1.2. Open the window panel.
   1.3. Move the rear compartment trim as needed. Refer to *Trim Panel Replacement - Liftgate.*
   1.4. Loosen the bolts.
   1.5. Close the window panel.
   1.6. Move the window panel as needed.
   1.7. Tighten the bolts.

   Tighten

   Tighten the bolts to 10 N·m (89 lb in).
2. Adjust the window panel flush to the quarter trim finish panel.
3. Loosen or tighten the bumpers as needed.



330529

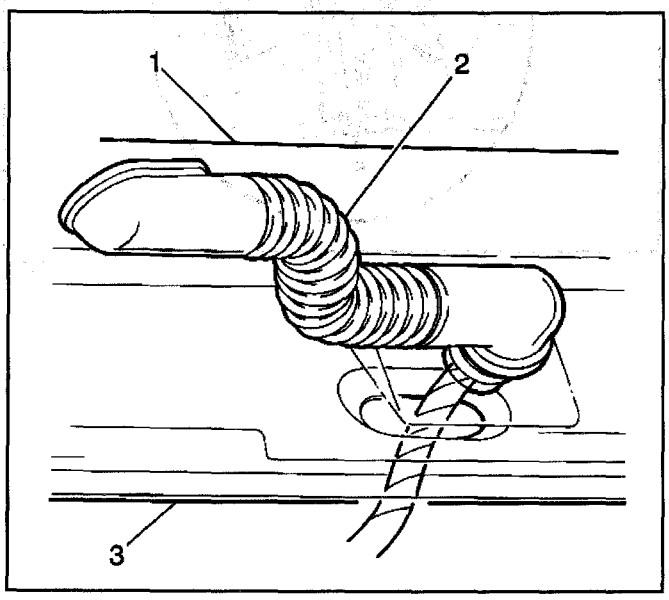


392580

Lift Window Panel Replacement - Rear

Removal Procedure

1. Raise and support the liftgate window panel.
2. Remove the headliner trim finishing panel. Refer to *Hard Top Headliner Replacement* in Roof.
3. Remove the liftgate strut ends (2) from the liftgate mounts (1) and allow the struts to rest in the rear compartment.



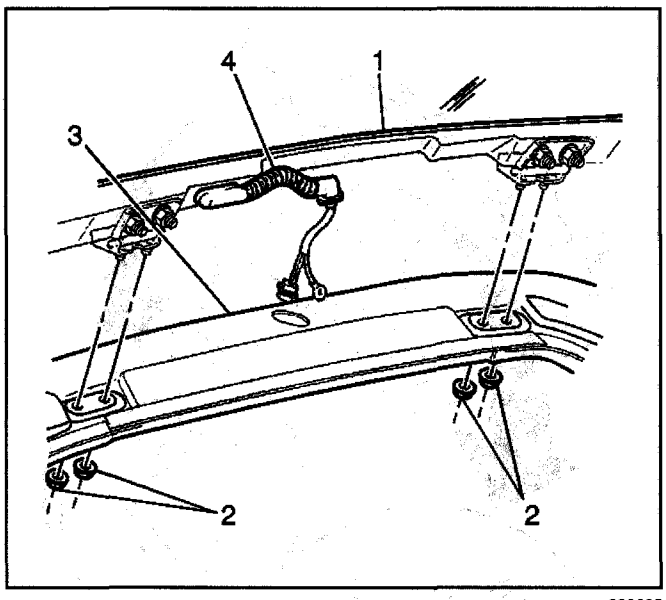
330518

4. Remove the harness conduit (2) from the vehicle body (3).

5. Disconnect the liftgate electrical connectors (4) from the body harness.
6. Remove the nuts (2) from the liftgate studs (1).

Important: When replacing the liftgate panel, remove the hinges and the spoiler and transfer to the new assembly.

7. Remove the gaskets from the hinges and remove the liftgate from the vehicle.



392605

Installation Procedure

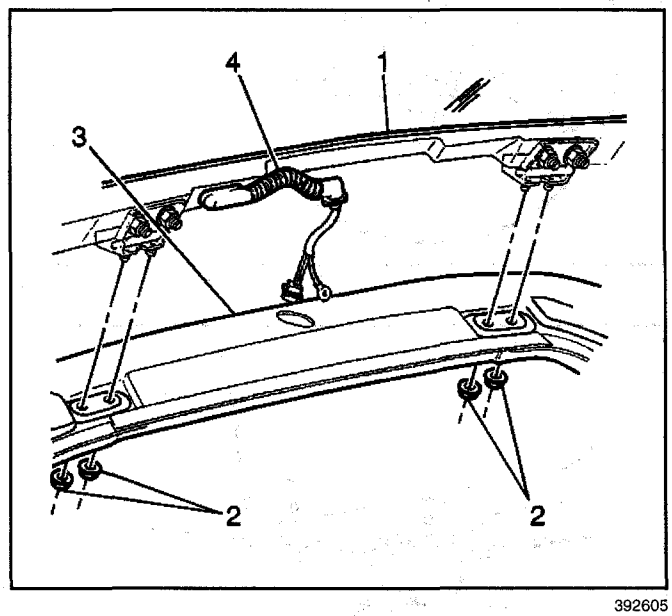
1. Install the gaskets to the hinges.
2. Align the studs on the hinges with the holes and install the liftgate to the vehicle. Support the front of the liftgate until the struts are reattached.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the nuts.

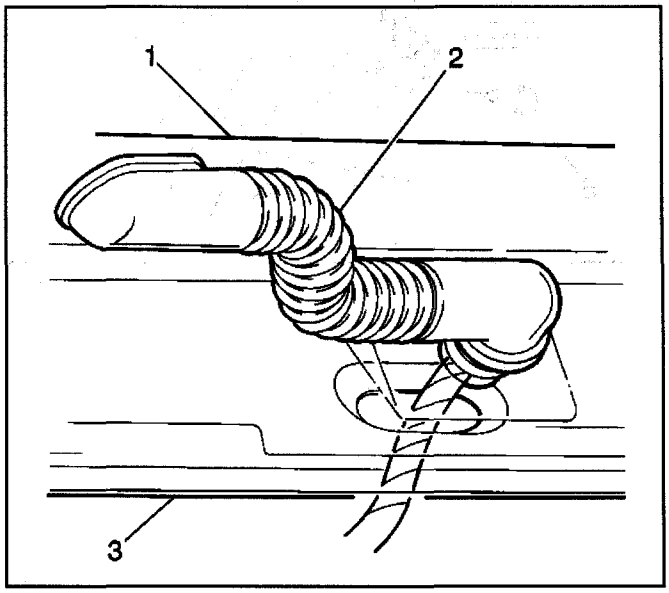
   Tighten

   Tighten the nuts to 25 N·m (18 lb·ft).
4. Connect the liftgate electrical connectors (4) to the body harness.

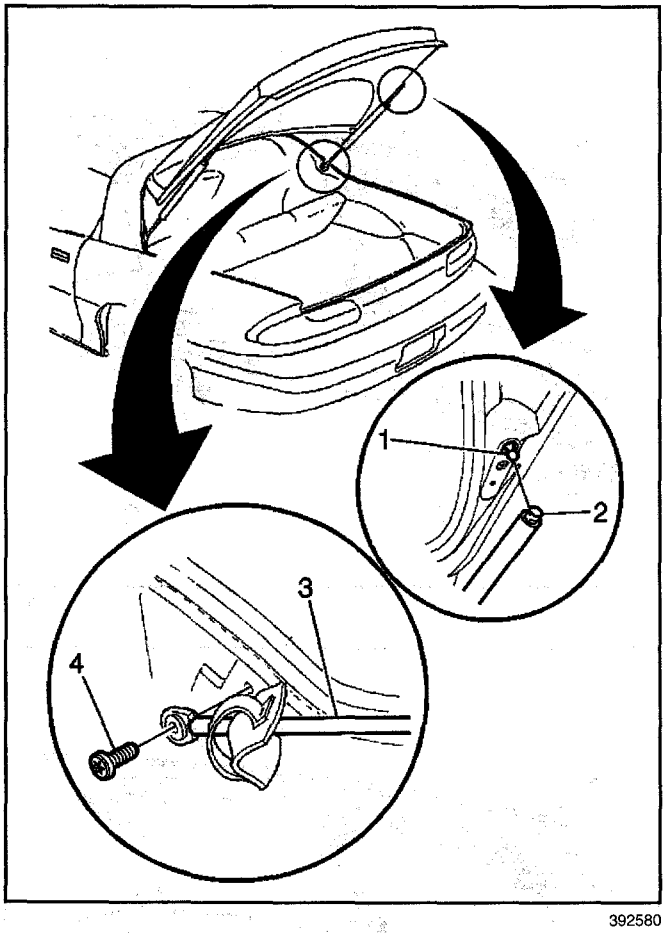


392605

5. Reinstall the harness conduit by performing the following steps:
   5.1. Route the harness.
   5.2. Apply a soap solution to the grommet.
   5.3. Seat the conduit at the window panel and roof frame.



330518

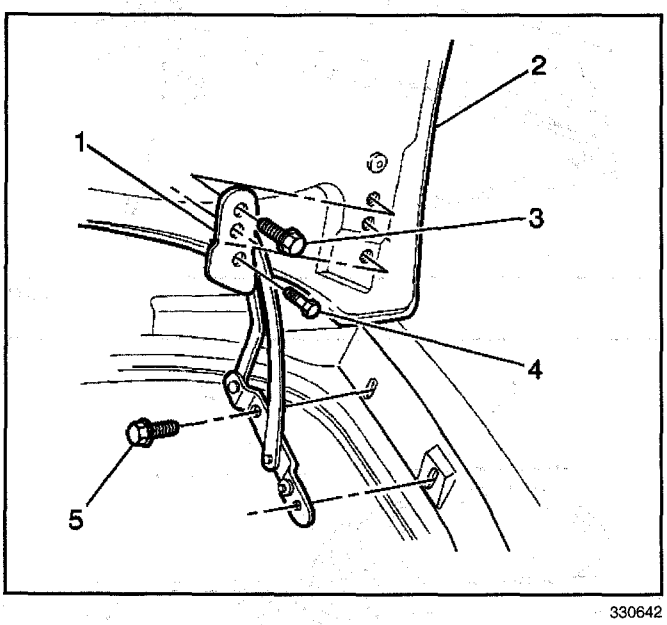


392580

6. Install the liftgate strut ends (2) to the liftgate mounts (1).

Important: A snap should be heard when the strut ends are fully seated. Verify that the strut ends are securely installed by tugging firmly on the strut ends.

7. Install the headliner trim finishing panel. Refer to *Hard Top Headliner Replacement* in Roof.



330642

Compartment Lid Replacement - Rear (Chevrolet)

Removal Procedure

1. Raise and support the lid panel.
   Remove the plastic cap.
2. Disconnect the electrical connectors.
3. Remove the struts at the rear compartment lid panel. Refer to Strut Replacement - Rear Lift Window Panel.
4. Remove the adjustment bumper bolt.
5. Remove the bolts.

Important: If you are replacing the rear compartment lid panel, remove the spoiler and harness. Refer to *Spoiler Replacement - Rear (Coupe).*

6. Remove the lid panel.

Installation Procedure

1. Install the lid panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts.

   Tighten

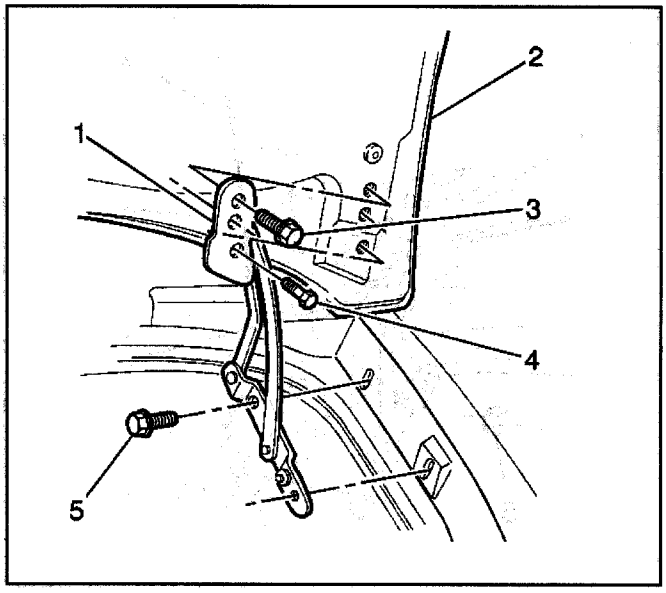
   Tighten the bolts to 25 N·m (18 lb ft).

3. Install the adjustment bumper bolt.

   Tighten

   Tighten the adjustment bumper bolt to 25 N·m (18 lb ft).

4. Install the struts at the rear compartment lid panel. Refer to Strut Replacement - Rear Lift Window Panel.
5. Connect the electrical connector.
6. Install the plastic cap.
7. Perform the following adjustments as needed on the rear compartment lid:
   - Fore or aft
   - Side to side
   - Front height
8. Loosen or tighten the bumpers as needed.



330642

Compartment Lid Replacement - Rear (Pontiac)

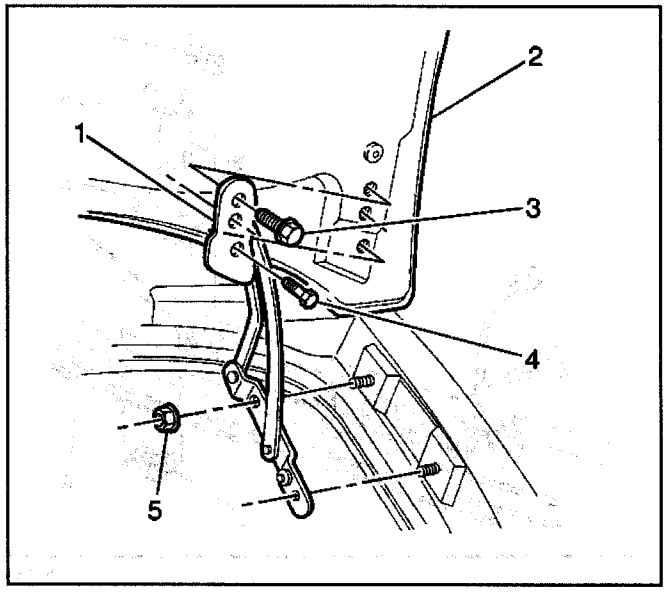
Removal Procedure

1. Raise and support the lid panel.

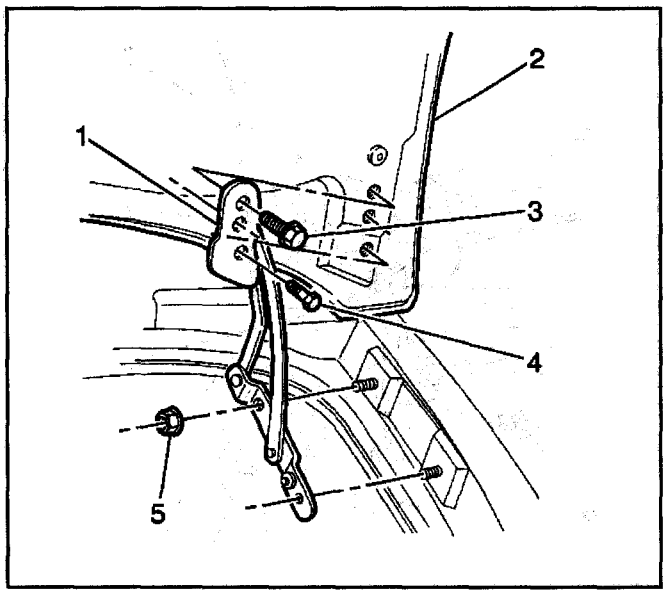
   Remove the plastic cap.
2. Disconnect the electrical connectors.
3. Remove the struts at the rear compartment lid panel. Refer to Rear Compartment Lid Strut in Body Rear End.
4. Remove the adjustment bumper bolt.
5. Remove the bolts.

Important: If you are replacing the rear compartment lid panel, remove the spoiler and harness. Refer to *Spoiler Replacement - Rear (Coupe).*

6. Remove the lid panel.



330643



330643

Installation Procedure

1. Install the lid panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts.

   Tighten

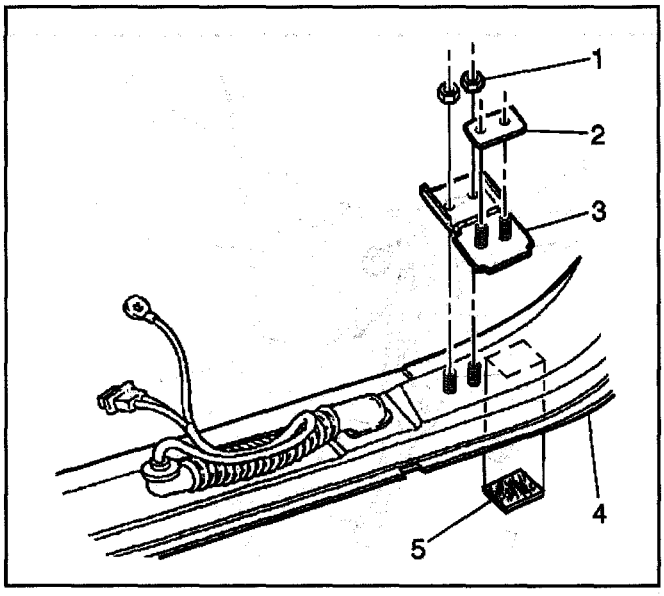
   Tighten the bolts to 25 N·m (18 lb ft).

3. Install the adjustment bumper bolt.

   Tighten

   Tighten the adjustment bumper bolt to 25 N·m (18 lb ft).

4. Install the struts at the rear compartment lid panel. Refer to Rear Compartment Lid Strut.
5. Connect the electrical connector.
6. Install the plastic cap.
7. Perform the following adjustments as needed on the rear compartment lid:
   - Fore or aft
   - Side to side
   - Front height
8. Loosen or tighten the bumpers as needed.



392584

Hinge Replacement - Rear Lift Window Panel

Removal Procedure

1. Remove the rear compartment lift window panel. Refer to *Lift Window Panel Replacement - Rear.*
2. Remove the nuts (1).
3. Remove the hinges (3) and gaskets (2).

Installation Procedure

1. Install the hinges (3) and gaskets (2).

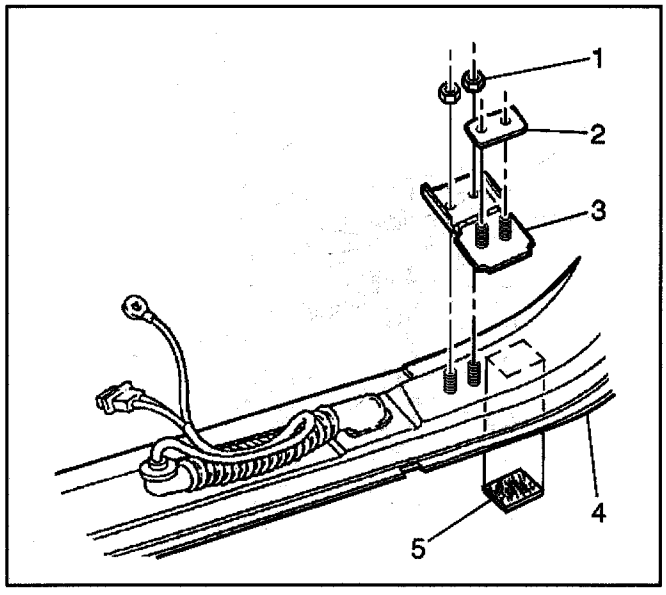
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the nuts.

   Tighten

   Tighten the nuts to 42 N·m (31 lb ft).

3. Install the rear compartment lift window panel. Refer to *Lift Window Panel Replacement - Rear.*

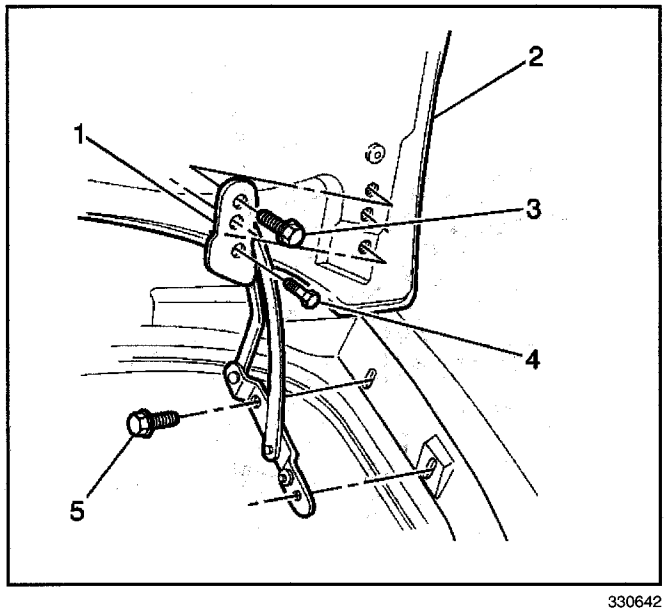


392584

Hinge Replacement - Rear Compartment Lid (Chevrolet)

Removal Procedure

1. Remove the rear compartment lid panel. Refer to *Compartment Lid Replacement - Rear (Chevrolet).*
2. Remove the bolts.
3. Remove the adjustment bumper bolt.
4. Remove the bolts.
5. Remove the hinges.



330642

Installation Procedure

1. Install the hinges.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts.

   Tighten

   Tighten the bolts to 25 N·m (18 lb ft).

3. Install the adjustment bumper bolt.

   Tighten

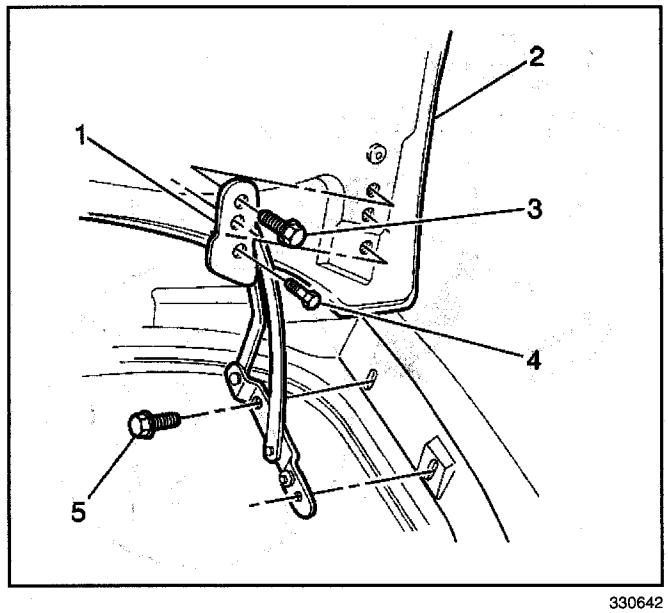
   Tighten the bumper bolt to 25 N·m (18 lb ft).

4. Install the bolts.

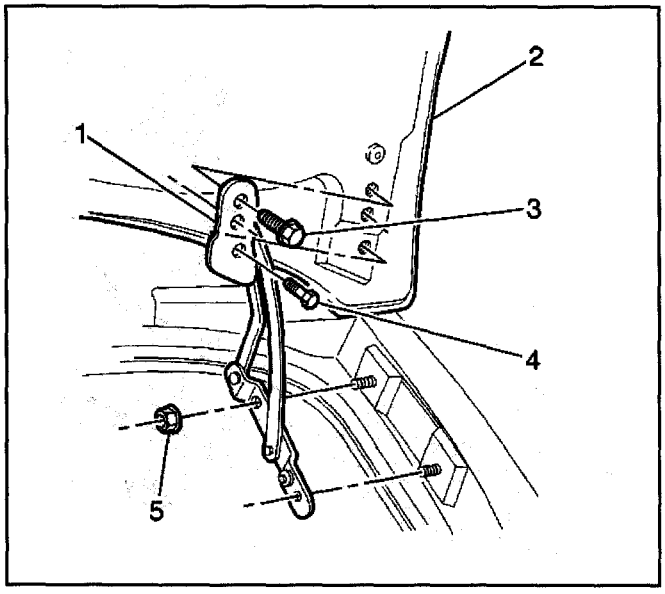
   Tighten

   Tighten the bumper bolt to 50 N·m (37 lb ft).

5. Install the rear compartment lid panel. Refer to *Compartment Lid Replacement - Rear (Chevrolet).*



330642

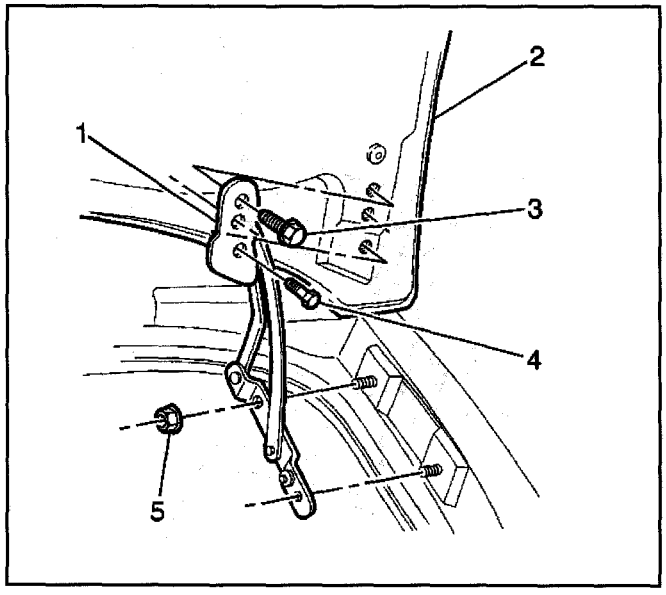


330643

Hinge Replacement - Rear Compartment Lid (Pontiac)

Removal Procedure

1. Remove the rear compartment lid panel. Refer to Rear Compartment Lid Panel.
2. Remove the nuts.
3. Remove the adjustment bumper bolt.
4. Remove the bolts.
5. Remove the hinges.



330643

Installation Procedure

1. Install the hinges.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts.

   Tighten

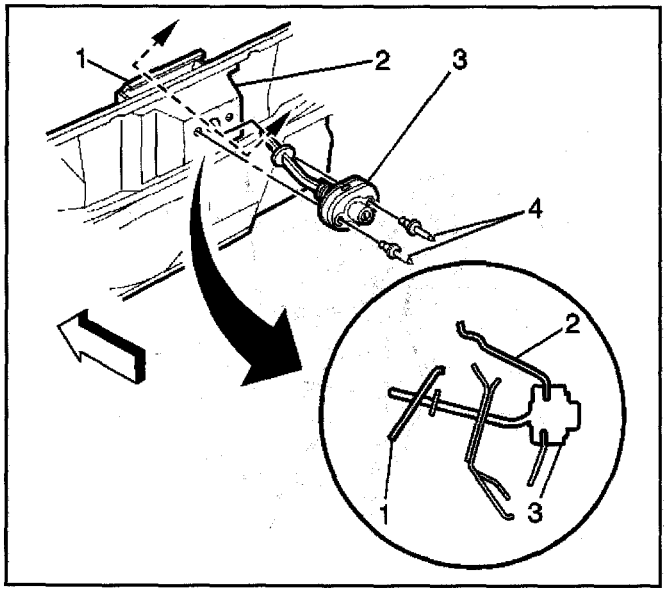
   Tighten the bolts to 25 N·m (18 lb ft).
3. Install the adjustment bumper bolt.

   Tighten

   Tighten the bumper bolt to 25 N·m (18 lb ft).
4. Install the nuts.

   Tighten

   Tighten the bumper bolt to 50 N·m (37 lb ft).
5. Install the rear compartment lid panel. Refer to Rear Compartment Lid Panel.



330412

Lock Cylinder Replacement - Liftgate

Removal Procedure

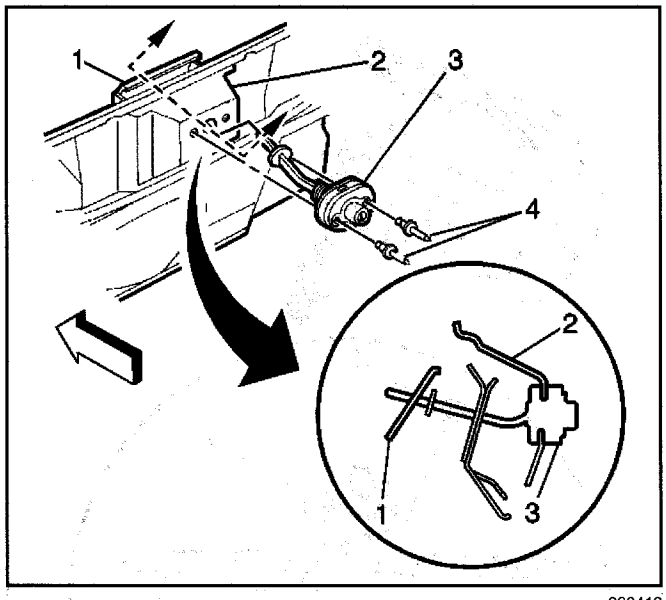
1. Open the window panel.
2. For Chevrolet only, remove the rear end finish panel. Refer to *Panel Replacement - Rear End (Chevrolet).*
3. For Pontiac only, remove the taillamp filler. Refer to *Panel Replacement - Rear End (Pontiac).*
4. Remove the rivets.
5. Remove the lock cylinder.

Installation Procedure

Important: Position the tan dot on the lock cylinder upward when installing the lock cylinder.

1. Install the lock cylinder.

   Guide the lock cylinder shaft through the hole in the rear end panel into the hole in the lock support.
2. Align the lock cylinder.
3. Install the right rivet.
4. Install the left rivet.
5. For Pontiac only, install the taillamp filler. Refer to *Panel Replacement - Rear End (Pontiac).*
6. For Chevrolet only, install the rear end finish panel. Refer to *Panel Replacement - Rear End (Chevrolet).*

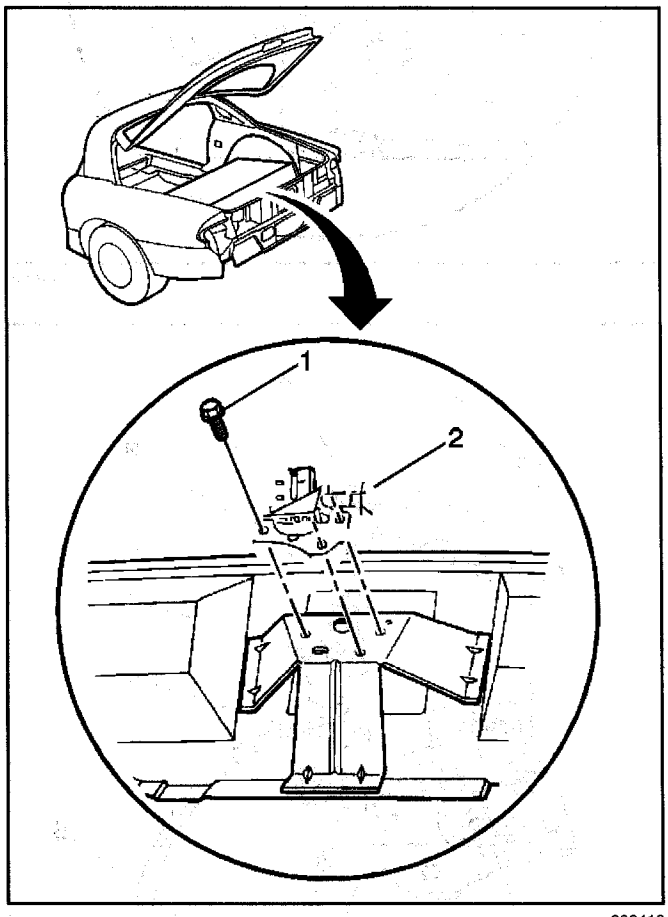


330412

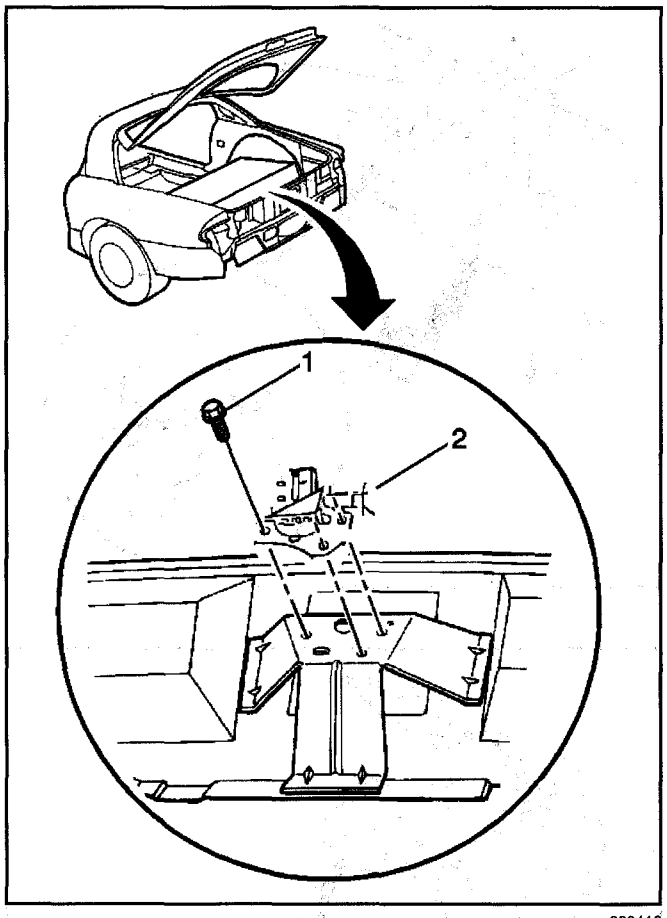
Latch Replacement - Endgate

Removal Procedure

1. Open the window panel.
2. Remove the rear compartment trim as needed. Refer to *Trim Panel Replacement - Liftgate.*
3. Disconnect the rear compartment lid release switch electrical connector. Refer to *Rear Compartment Lid Switch Replacement.*
4. Disconnect the rear compartment lid lock release actuator secondary lock retainer and electrical connector. Refer to *Lock Actuator Replacement - Liftgate.*
5. Remove the endgate latch bolts (1).
6. Remove the latch (2).



330416



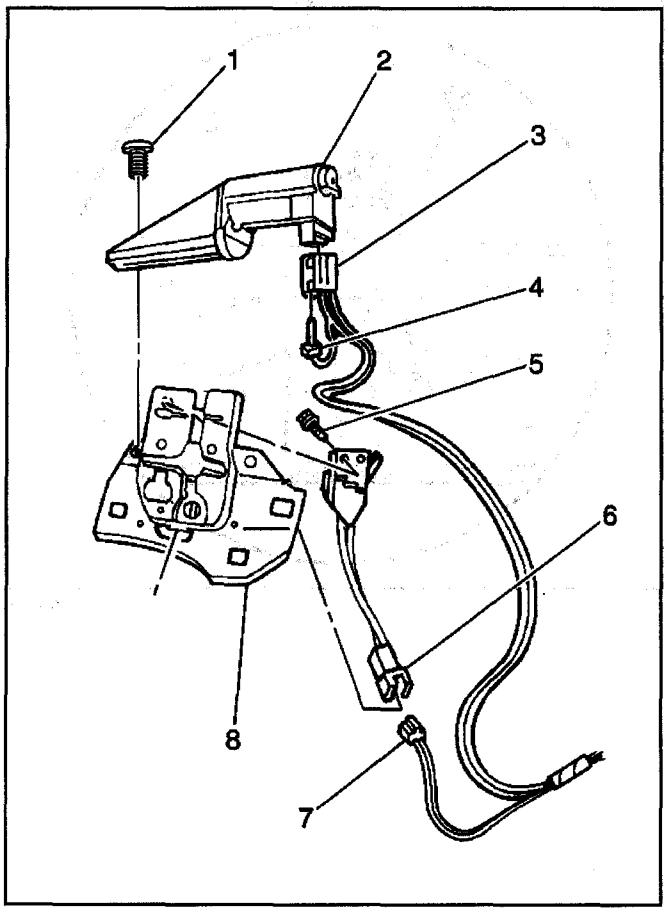
330416

Installation Procedure

1. Install the latch (2).
   Align the holes in the latch with the holes in support.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the endgate latch bolts (1).
   Tighten
   Tighten the bolt to 10 N·m (89 lb in).
3. Connect the rear compartment lid lock release actuator electrical connector and secondary lock retainer. Refer to *Lock Actuator Replacement - Liftgate*.
4. Install the rear compartment trim. Refer to *Trim Panel Replacement - Liftgate*.



330424

Lock Actuator Replacement - Liftgate

Removal Procedure

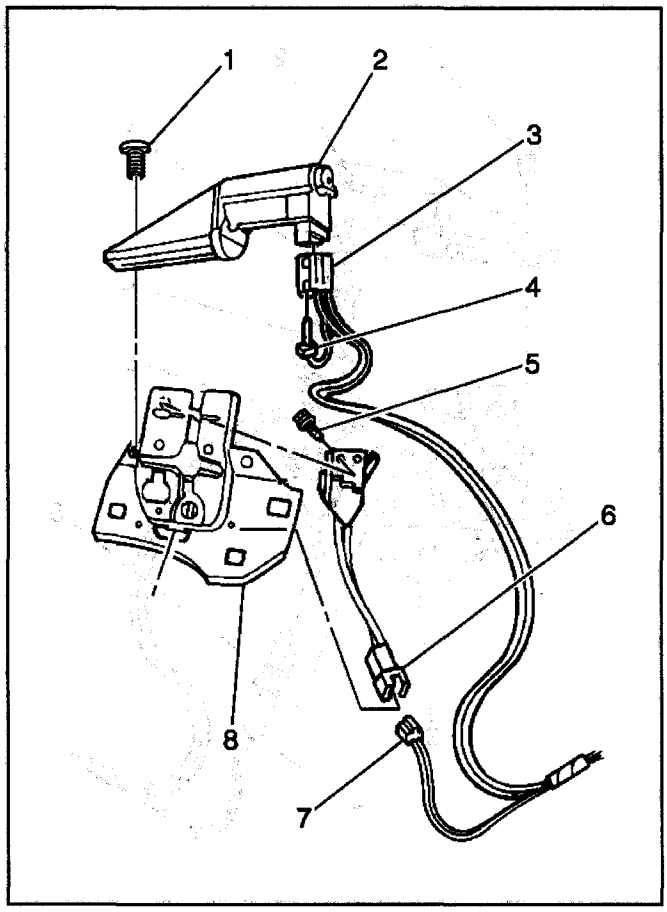
1. Open the window panel.
2. Remove the rear compartment trim, as needed. Refer to Rear Compartment Trim.
3. Remove the secondary lock retainer from the actuator.
4. Disconnect the electrical connector from the actuator.
5. Remove the bolt.
6. Remove the actuator from the latch.

Installation Procedure

1. Install the actuator.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts.
3. Connect the electrical connector to the actuator.
4. Install the secondary lock retainer.
5. Install the rear compartment trim. Refer to Rear Compartment Trim.

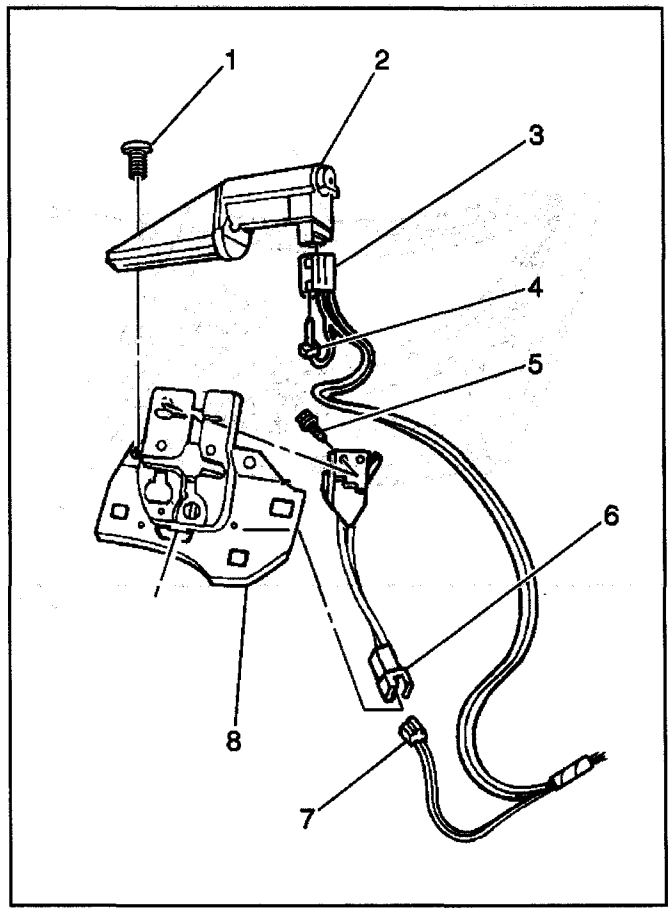


330424

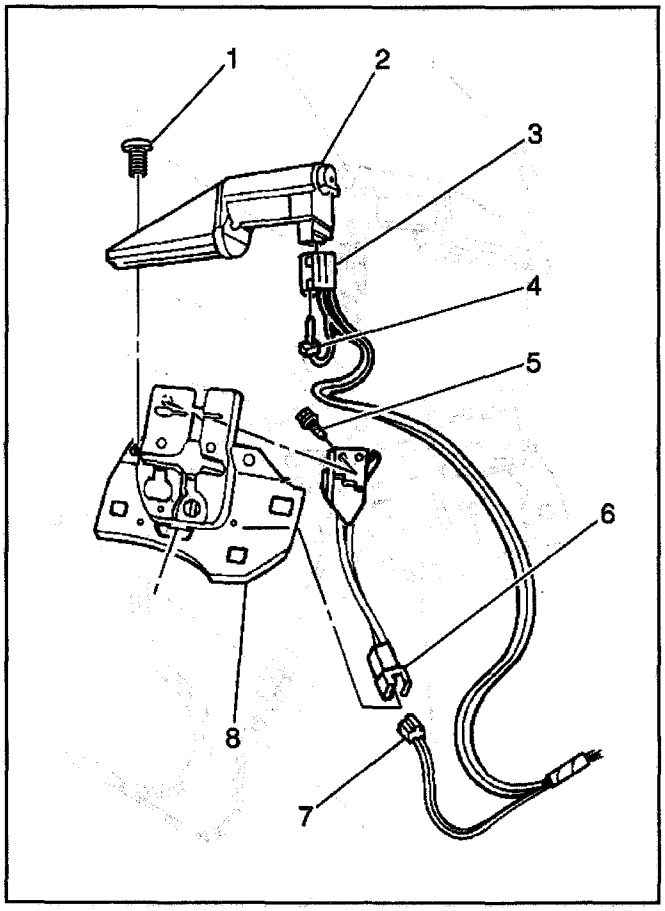
Release Actuator Replacement

Removal Procedure

1. Open the window panel.
2. Open the rear compartment trim, as needed. Refer to Rear Compartment Trim.
3. Disconnect the electrical connector from the switch.
4. Remove/disconnect the following components from the actuator:
   - The secondary lock retainer
   - The electrical connector
5. Remove the endgate latch. Refer to *Latch Replacement - Endgate*.
6. Remove the bolts.
7. Remove the switch from the latch.



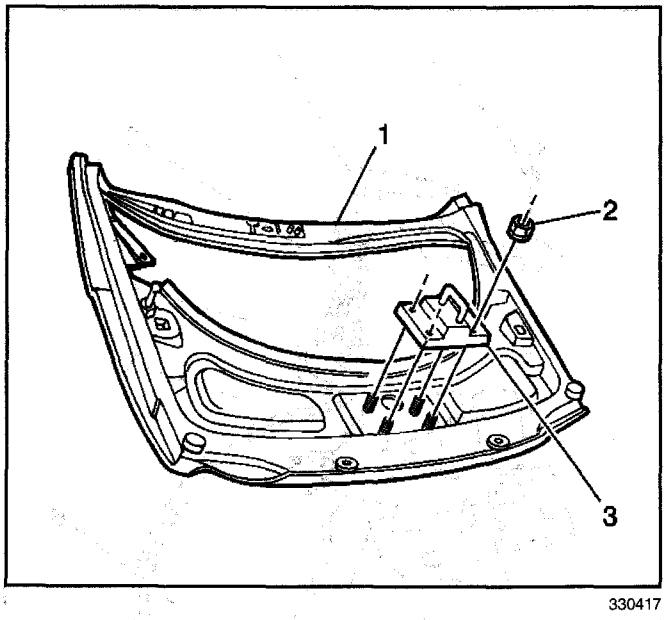
330424



330424

Installation Procedure

1. Insert the switch to the latch.
2. Install the bolts.
3. Install the endgate latch. Refer to *Latch Replacement - Endgate*.
4. Install/connect the following components to the actuator:
   - The secondary lock retainer
   - The electrical connector
5. Connect the electrical connector to the switch.
6. Install the rear compartment trim. Refer to Rear Compartment Trim.



330417

Lock Striker Replacement - Rear Compartment Lid

Removal Procedure

1. Open the window panel.
2. Remove the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim*.
3. Remove the nuts (2).
4. Remove the striker (3).

Installation Procedure

1. Install the striker (3).

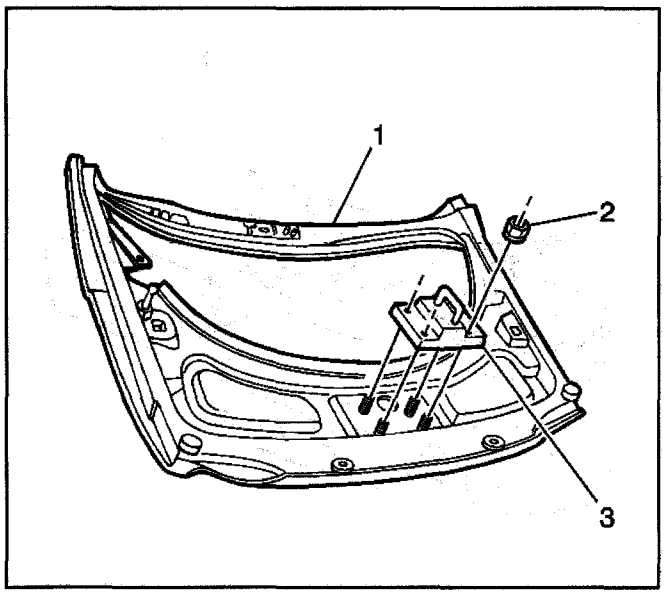
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the nuts (2).

   Tighten

   Tighten the nuts to 10 N·m (89 lb in).

3. Install the rear compartment lift window inner panel cover. Refer to *Finish Panel Replacement - Upper Rear Trim.*
4. Inspect the window panel operation. Adjust as needed. Refer to *Lift Window Panel Adjustment - Rear.*

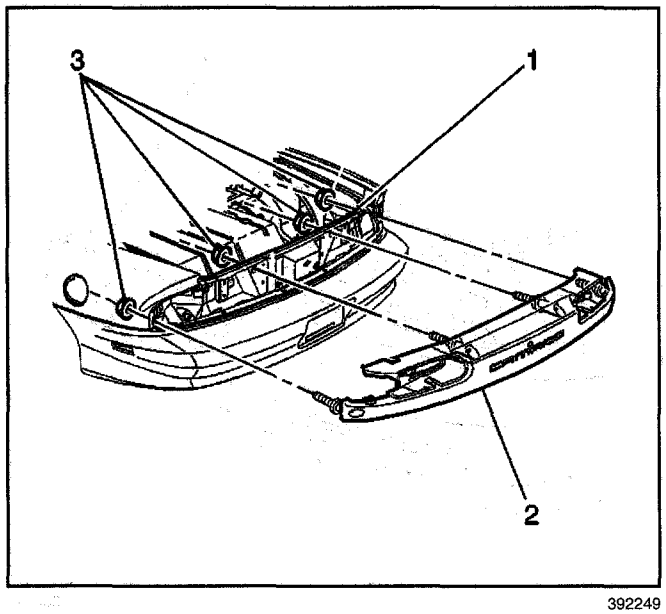


330417

Panel Replacement - Rear End (Chevrolet)

Removal Procedure

1. Remove taillamp assemblies. Refer to *Tail Lamp Replacement (Chevrolet)* in Lighting Systems.
2. Remove rear end panel retainers (3) (plastic nuts) from the cargo compartment interior.
3. Remove rear end panel (2) from body support (1).



392249

Installation Procedure

1. Install rear end panel (2) to body support (1).

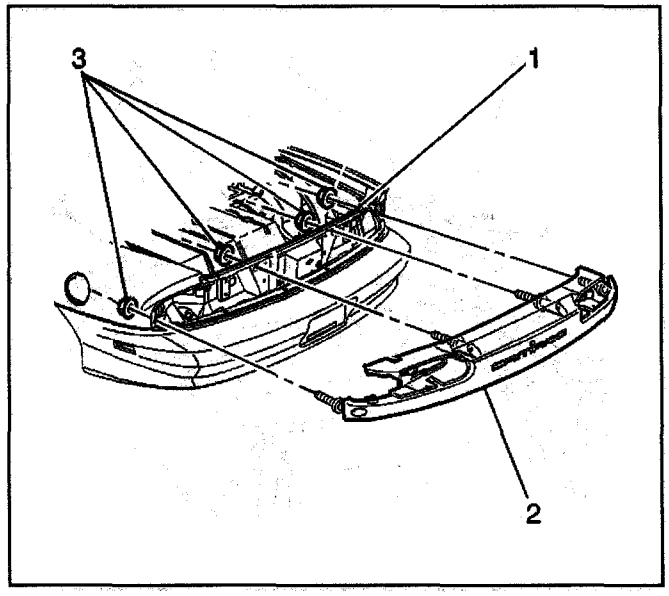
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install rear end panel retainers (3) (plastic nuts) to the cargo compartment interior.

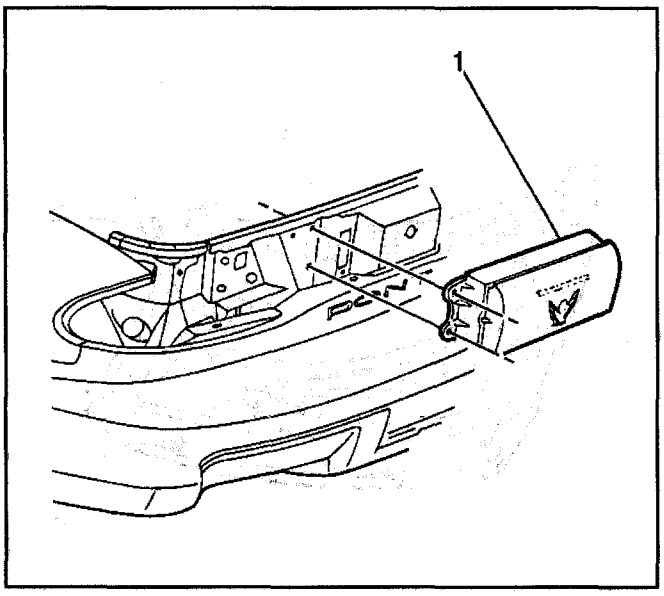
   Tighten

   Tighten the retainers (3) until seated but not stripped.

3. Install taillamp assemblies. Refer to *Tail Lamp Replacement (Chevrolet)* in Lighting Systems.



392249

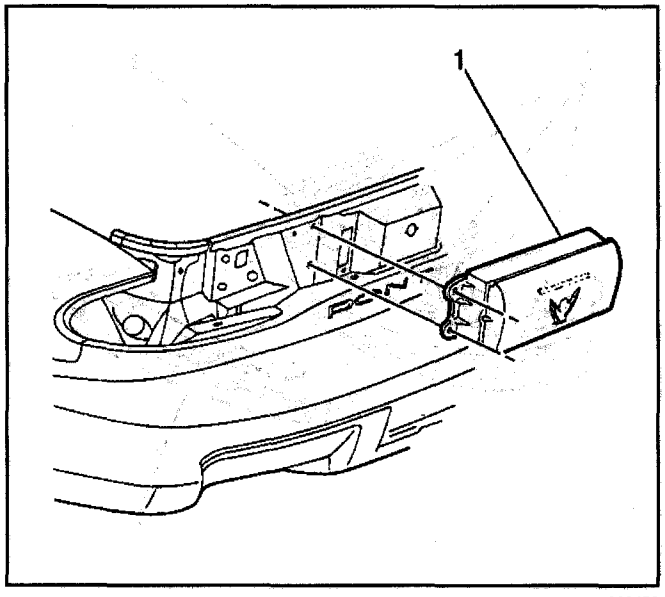


330458

Panel Replacement - Rear End (Pontiac)

Removal Procedure

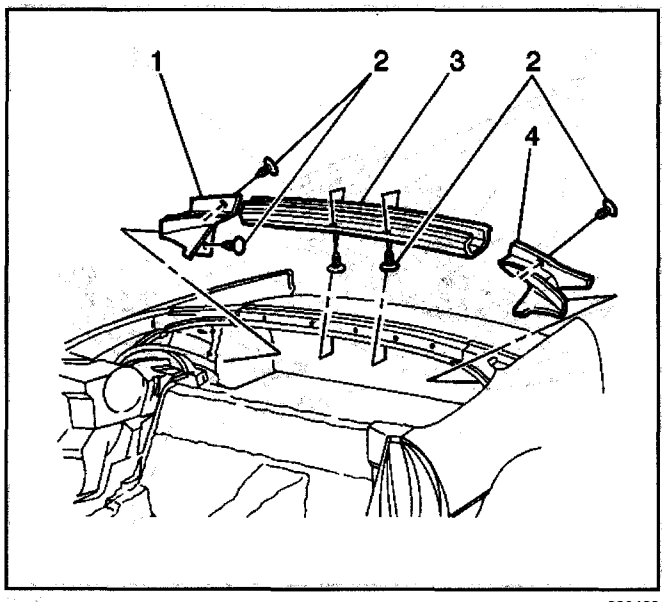
1. Remove the taillamps. Refer to *Tail Lamp Replacement (Pontiac)* in Lighting Systems.
2. Remove the filler.



330458

Installation Procedure

1. Install the filler.
2. Install the taillamps. Refer to *Tail Lamp Replacement (Pontiac)* in Lighting Systems.



330468

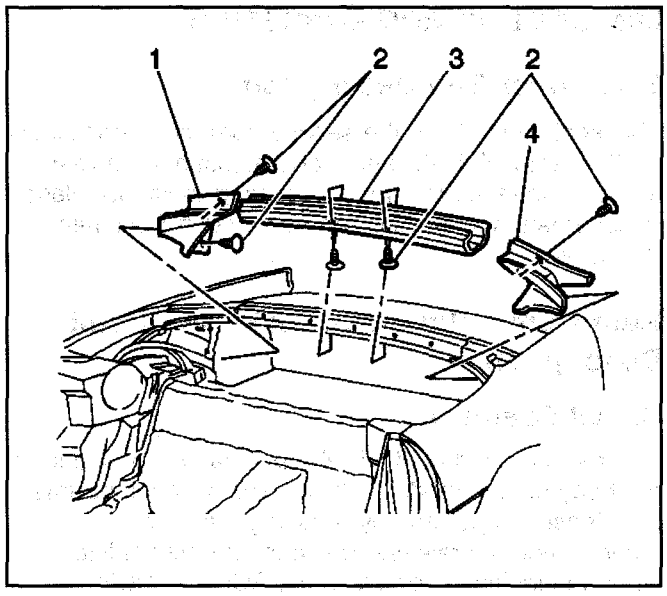
Garnish Molding Replacement - Liftgate

Removal Procedure

1. Remove the retainers.
2. Remove the right molding from the rear window drain panel garnish.
3. Remove the left molding from the rear window drain panel garnish.
4. Remove the rear window drain panel garnish molding.

Installation Procedure

1. Install the rear window drain panel garnish molding.
2. Install the left molding to the rear window drain panel garnish.
3. Install the right molding to the rear window drain panel garnish.
4. Install the retainers.

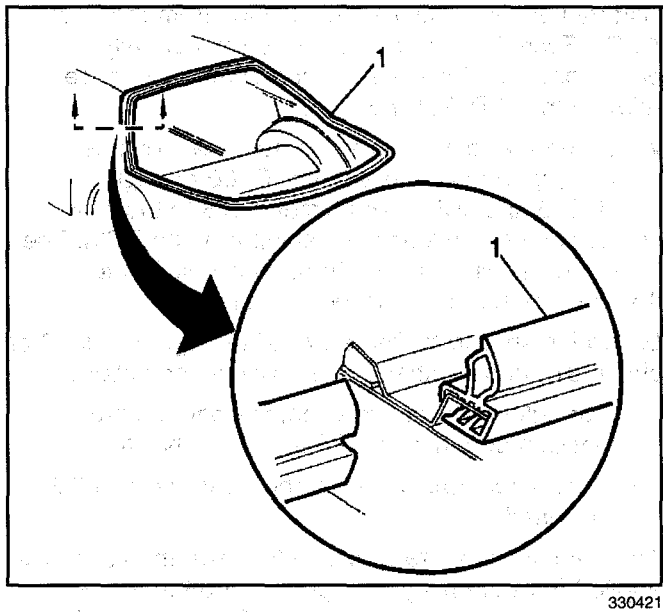


330468

Weatherstrip Replace - Rear Lift Window Opening

Removal Procedure

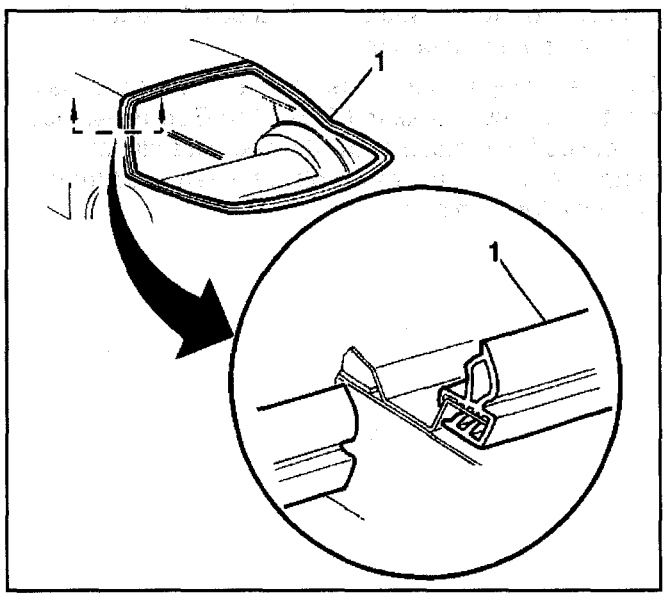
1. Peel the weather-strip from the flange in order to remove the weather-strip.
2. Clean the weather-strip sealer from the flange.
3. Support the window panel.
4. Remove the struts at the quarter inner roof panel. Refer to Strut Replacement - Rear Lift Panel.
5. Remove the weather-strip from the opening.



330421

Installation Procedure

1. Install the weather-strip into the opening.
2. Install the struts at the quarter inner roof panel. Refer to Strut Replacement - Rear Lift Panel.
3. Position the weather-strip to the top center of the flange.
4. Attach the upper corners. Attach from the corners to the center, across the top.
5. Attach the elbow areas. Attach from the elbow areas to the upper corners.
6. Attach the rear corners. Attach from the rear corners to the elbow areas.
7. Attach from the rear corners to the center, across the rear.
8. Roll the entire weather-strip to the seat.



330421

Description and Operation

Body Rear End Description

This section contains the service operations necessary for the removal, installation, and adjustment of rear end components. Information relating to liftgate glass replacement and sealing can be found in Stationary Windows.

Rear Compartment Lid Release Circuit Description

Circuit Operation

The rear compartment lid release relay is controlled by the body control module (BCM). The rear compartment lid release is operated by pressing the rear compartment lid release switch inside the vehicle when the ignition switch is in the ACCY or RUN position.

Battery voltage is applied at all times from the PWR ACCY Fuse through circuit 640 to the normally open contacts of the rear compartment lid release relay from PWR ACCY Fuse 7.

When the rear compartment lid release switch is pressed, ground is applied from G200 through circuit 650, the switch and circuit 1576 to the rear compartment lid release signal input of the BCM. The BCM then applies voltage through circuit 253 to the rear compartment lid release relay coil.

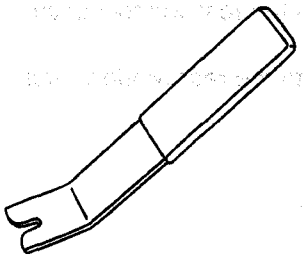
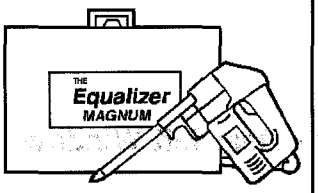
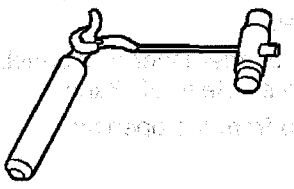
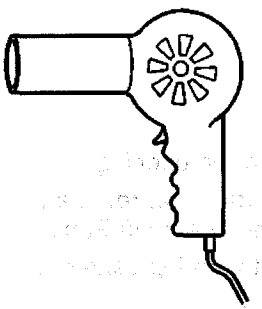
Ground is applied to the relay coil through circuit 33 or circuit 816 under either of the following conditions:

- For automatic transmission, the park neutral position switch is in (P) Park or (N) Neutral
- For manual transmission, the park brake switch is closed

The normally open relay contacts close and voltage is applied from the relay through circuit 56 to the rear compartment lid release actuator. Ground is applied to the actuator from G400 through circuit 1550 and the rear compartment opens.

The rear compartment lid release actuator contains an electronic circuit breaker (ECB). The ECB resistance increases if the motor is overloaded. Resistance returns to normal after the voltage is removed from the actuator terminals.

Special Tools and Equipment

Illustration	Tool Number/ Description
 178589	J 38778 Trim Pad Remover
 3905	J 39032 Stationary Glass Removal Tool
 3898	J 24402-A Glass Sealant Remover (Cold Knife)
 78337	J 25070 Heat Gun

Plastic Panel Information and Repair

Specifications

Repair Materials - Flexible Plastic Part

Thermoset Plastic Type	Type of Repair	Recommended Repair Material	Availability
Most flexible and semi flexible plastic*	Most repairs*	GM Goodwrench Compoxy Repair Material (GM P/N 12377980* or equivalent)	GM Dealer/ Retailer
		CMR-8 Composite Repair Material, P/N 82091 or equivalent	Refer to local paint supplier
* TPO, TEO, (Polyolefin Plastics) require the application of GM P/N 1052364 polyolefin adhesive primer before the GM P/N 12377980 repair compound is applied.			

Repair Materials - Rigid Plastic Part

Thermoset Plastic Type	Type of Repair	Recommended Repair Material	Availability
Most rigid plastic parts	Cosmetic filling	GM Goodwrench Structural Bonding Epoxy (GM P/N 12345726 or equivalent)	GM Dealer/Retailer
		Sikkens Polystop LP or equivalent polyester repair putty	Refer to a local paint supplier
Most rigid plastic parts	Cosmetic repair; Adhesive bonding	GM Goodwrench Structural Bonding Epoxy (GM P/N 12345726 or equivalent)	GM Dealer/Retailer
		Lord Fusor SMC Body Panel Repair Adhesive or equivalent	Refer to local paint supplier
Most rigid plastic parts	Adhesive bonding	GM Goodwrench Structural Bonding Epoxy (GM P/N 12345726 or equivalent)	GM Dealer/Retailer
		Dynatron Dyna-Weld Plio Grip or equivalent (OE structural adhesive)	Refer to local paint supplier
Most rigid plastic parts	Adhesive structural* bonding	GM Goodwrench Structural Bonding Epoxy (GM P/N 12345726 or equivalent)	GM Dealer/Retailer
Most rigid plastic parts	Adhesive bonding Structural bonding	US Chemical and Plastic System 2000 Structural Adhesive P/N 82007B = 30 min P/N 82014B = 9 min	Refer to local paint supplier or US Chemicals customer service 1 800 321 0672
* Structural adhesive bonding may require the use of a pneumatic applicator, A8–37479–1A, or equivalent, to speed the application of the GM12345726 epoxy.			Kent-Moore 1-800-GM-TOOLS

Repair Instructions

Plastic Panels

Repair Procedure

Important: Follow these guidelines when performing SMC repairs:

- Clean, scuff, and solvent wipe all the areas to be repaired.
- For added strength and durability, V-groove and reinforce at least one side of SMC joints using a tacky mesh tape or equivalent.
- When partial panel replacement is performed, use 2 inch backing patches made from SMC or E-coated steel, as a reinforcement for all the butt joints.

1. Scuff the area where repair is to be performed.
2. Clean the bond area with a lint-free rag using a water-based cleaner.
3. Cracks in SMC should be grooved and reinforced on at least 1 side using a tacky mesh tape or equivalent
4. Sectioning joints require backing strips 50 mm (2 in) wide, which can be cut from leftover pieces of SMC.
5. Apply a thin coat of Goodwrench Structural Bonding Epoxy GM P/N 12345726, or equivalent, to the entire joint area extending across the cut lines and across the backing strip.
   - Use tacky mesh tape or an equivalent reinforcement matting.
   - Allow to cure according to the adhesive manufacturer's recommendations.
6. Shape and refinish the repair areas as necessary to resemble the original appearance.

Bonding Procedure

Important: Use the following procedure when bonding undamaged SMC to epoxy-coated steel.

1. Prime all the bare metal areas with an anti-corrosion material. Refer to GM 4901 Refinish Manual for approved materials
   - Some paint manufacturers recommend a pre-primer when bonding to epoxy.
   - Always refer to the paint manufacturer's recommendations.
   - Do not combine paint systems.
2. Clean the bond area with a lint-free rag using a water-based cleaner.
3. Scuff both surfaces to be bonded using a scuff pad such as 3M's Scotch-Brite Red scuff pad P/N 07447 or equivalent.
4. Ensure that the surface is clean and dry before applying the adhesive.
   - Use compressed air.
   - Do not wipe the surface with a hand or a rag.
5. Determine whether the adhesive is applied to the vehicle or the replacement panel.
6. Apply a consistent adhesive bond to the prepared surfaces.
7. Mechanically retain the panel in place in order to wet out the adhesive along the entire bonding surface.
8. Allow the area to cure according to the adhesive manufacturer's recommendations.

General Plastic Repair Instructions

The following procedures should be followed when repairing all types of thermoset plastic:

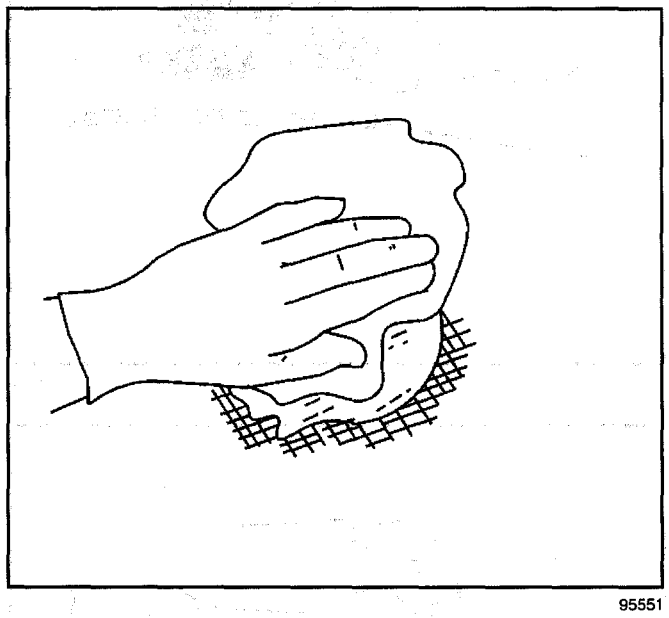
1. Use the supplies and the repair materials from the same manufacturer. Do not intermix systems. Mixing materials from different manufacturers can produce unsatisfactory results.
2. Clean the inner and outer surfaces of the repair area with a soap impregnated scouring pad in order to remove any dirt or mold release agent. A mold release agent is used during manufacturing in order to prevent the part from sticking to the mold. This release agent may be present in large enough concentrations to affect adhesion.
3. After washing, clean the area a second time with a wax and grease remover. Use only enough of the remover to dampen a cloth. Too much of the solvent will saturate the panel and may migrate out later, affecting the finish. Use a tack rag and air for finish cleanup. Allow the panel to dry thoroughly.
4. Apply force around the damaged area in order to look for hidden damage such as hairline cracks. Small cracks and faults in the bonds and the panels will eventually grow larger if left unattended. Drill a 3 mm (1/8 in) hole at each end of a crack in order to prevent any further cracking.
5. Remove the surface finish from the area to be repaired. Adhesives are designed to adhere to the plastic substrate, not the finish.
6. Prime a metal surface before applying the repair material.
7. Repair the inner surface of the panel first.
8. When using a mat reinforcement to repair the inner or outer surface of a panel, inspect that there are no strands of the mat left uncovered or unsaturated with the repair material. If exposed, the mat may act as a wick and draw moisture into the repair area, affecting the integrity and the finish.
9. Inspect the rear of the damaged panel for tool clearance. If accessing the repair with a saturation roller, a grinder, or a sander is impossible, do the repairs by hand.

10. Align the damaged or spliced area with a brace and clamps if the damage is severe. For a smaller repair, use a heavy tape on the outer surface in order to maintain the alignment until the inner repair material has cured.
11. If welding is necessary, do not allow the flame or the welding heat to come into direct contact with the plastic body panels. Protect the surrounding area with a fire retardant fabric. Several layers of aluminum foil make an excellent heat shield if not in direct contact with the flame.
12. Inspect the rear side of the work area before making repairs in order to avoid possible damage to wires, motors, etc.
13. Fiberglass parts will not yield or take a set as with steel parts, thus they cannot be straightened. If poor alignments are suspected, due to a collision or other damage inspect the steel reinforcements for damage and replace or repair them before repairing the plastic parts
14. Save any useful size pieces of repair material when cleaning up the work area. These pieces can be used for reinforcing smaller repair areas.
15. Force dry Structural Bonding Epoxy with heat. Heat speeds the cure time and increases the bond strength. Follow the manufacturer's curing recommendations.

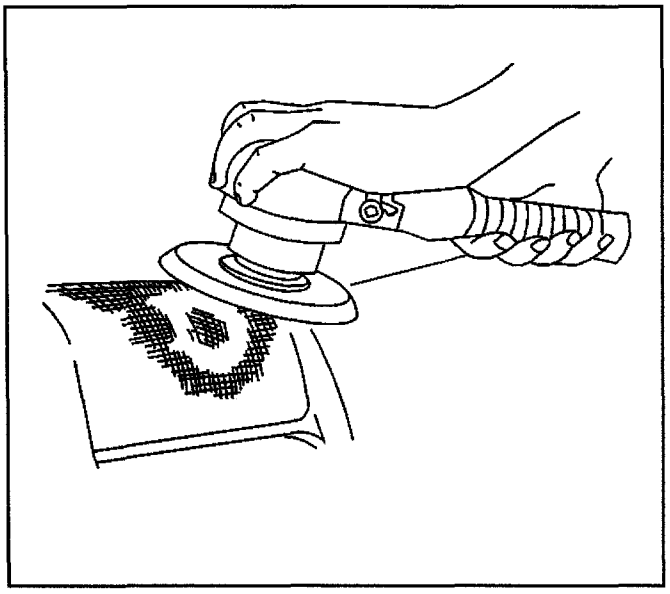
Gouge or Puncture Repair

When the fiberglass laminate is not pierced through or the damage extensive, the damaged area can be repaired using the following procedure:

1. Clean and inspect the damaged area. Refer to *General Plastic Repair Instructions.*
2. Finish the cleanup using a tack rag and air.



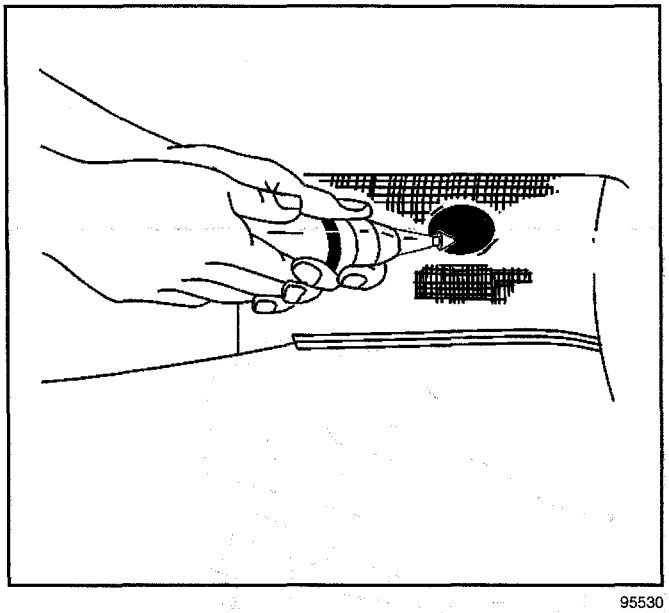
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95514

3. Sand the damaged area down to the fiberglass laminate.

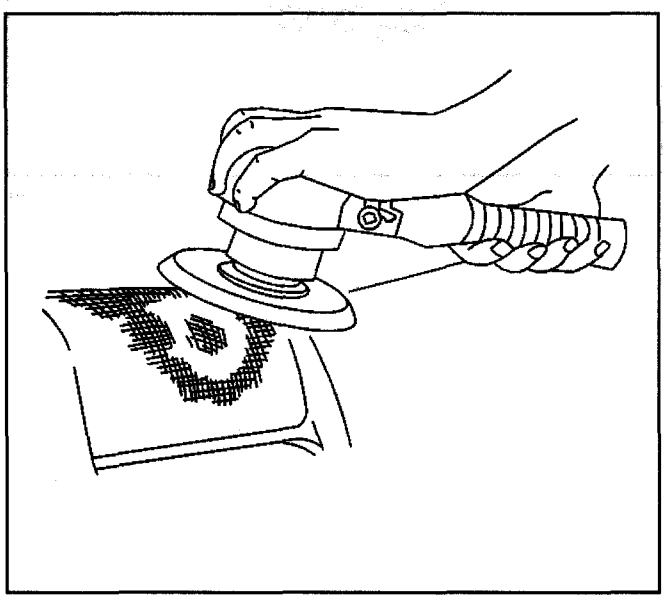
   Use a sander with a vacuum attachment in order to minimize dust.



95530

4. Grind or file the edges of the damaged area in order to form a dish.

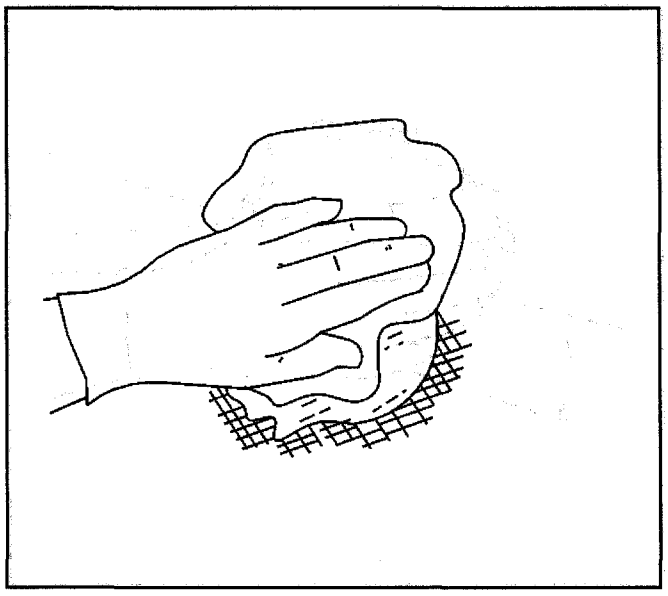
   The side of the dish should have a pitch for a maximum bonding surface.



95514

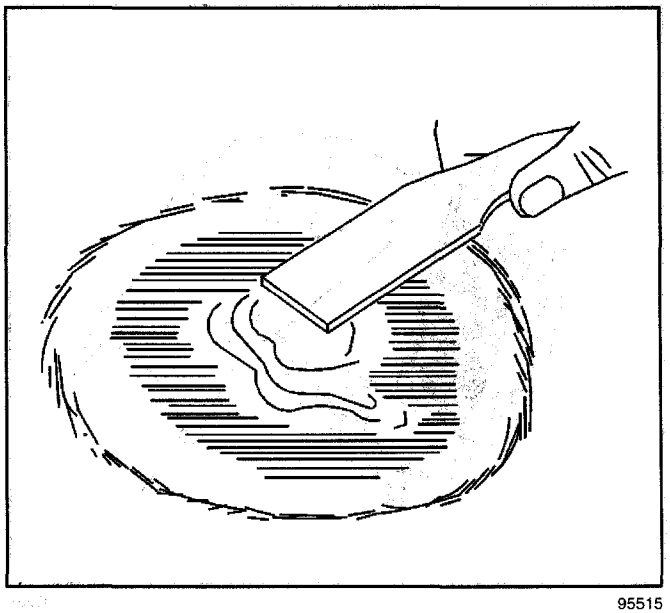
5. Scuff sand the area surrounding the damaged area in order to provide a good bonding surface.

6. Clean the repair area again using a water based wax and grease remover.
7. Finish the cleanup using a tack rag and air.



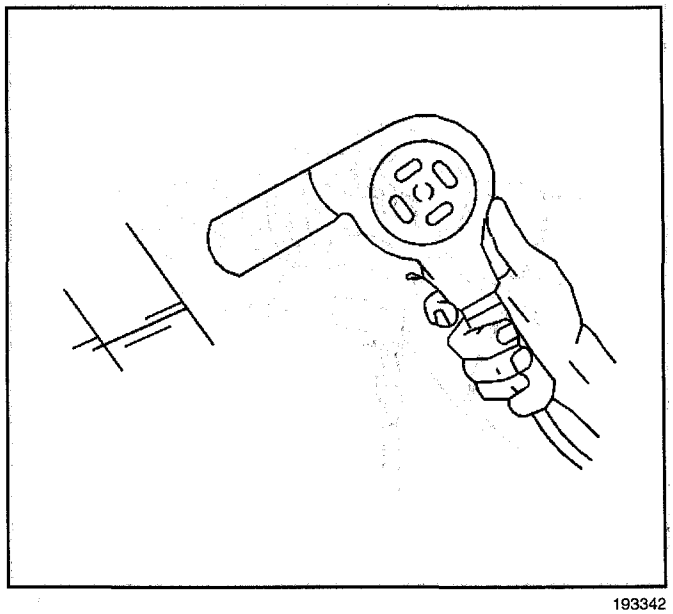
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8. Mix the recommended repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part*.
9. Apply the repair material to the damaged area until the repair is slightly higher than the surrounding area.

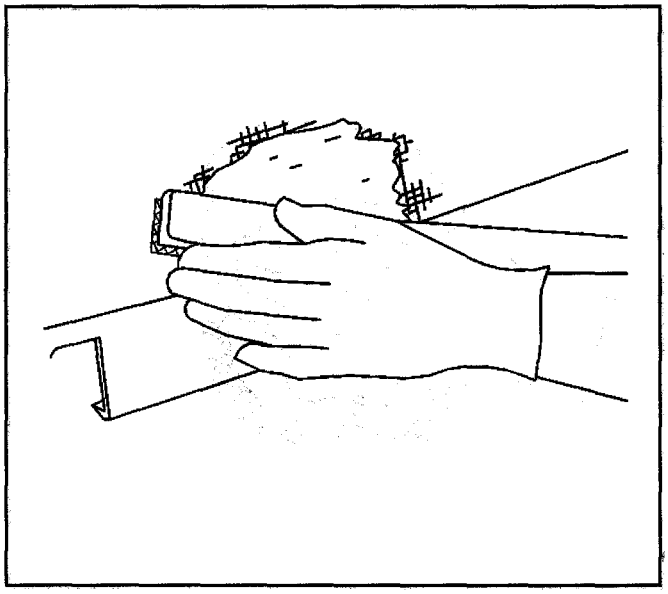


95515

10. Cure the repair material. Follow the manufacturer's recommendations.

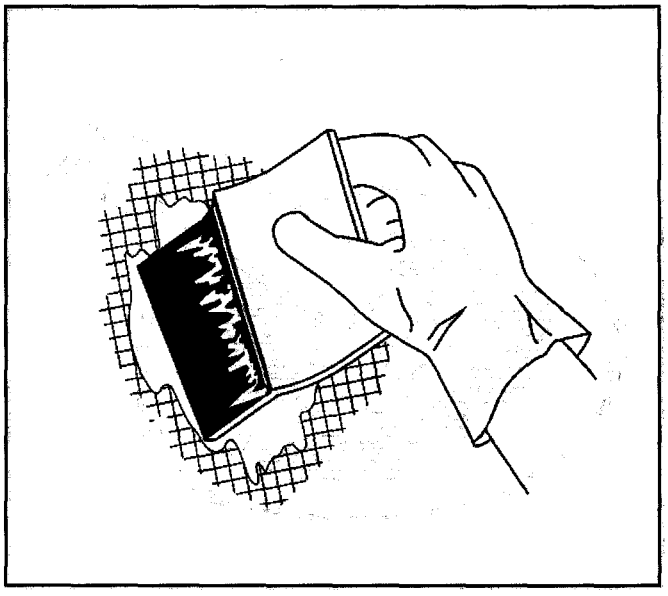


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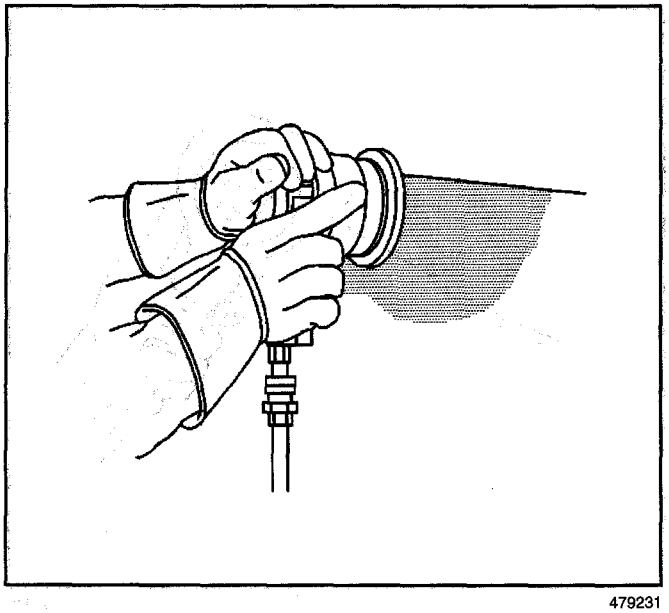
95541

11. Rough out the surface using a #80 grit disc on a D A sander or a curved-tooth body file.



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12. Apply a polyester type material, to provide a uniform surface for sanding, such as Silkens Polystop LP, or equivalent.



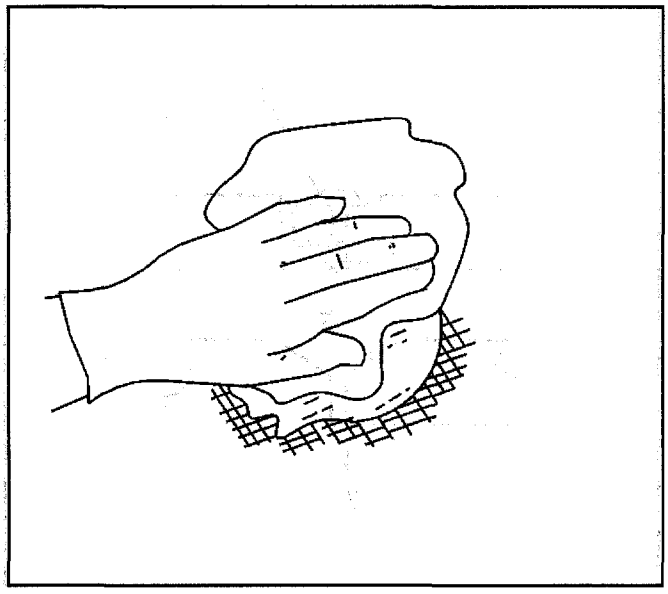
479231

13. Finish sand with a dual action random orbital sander.
14. Prime and refinish as necessary. Refer to GM 4901 M-D for a listing of approved materials. Follow the procedures recommended by the material manufacture.

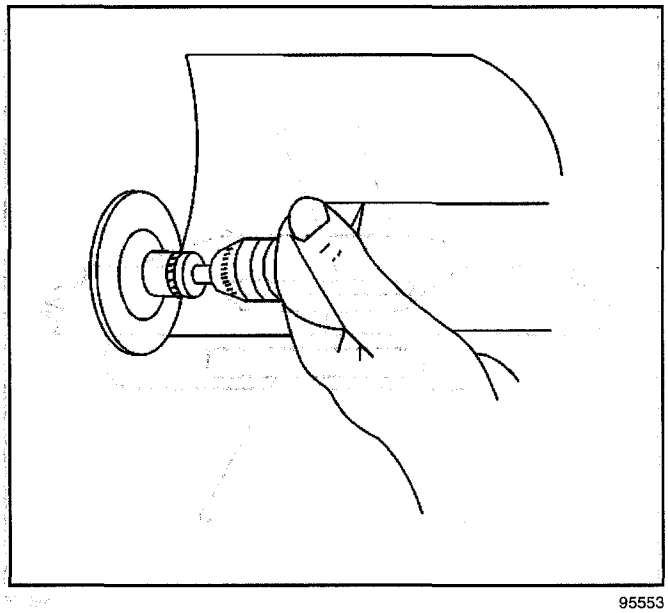
Panel Replacement - Partial

When you splice a replacement panel or a portion of a replacement panel to an existing panel, use the following procedure:

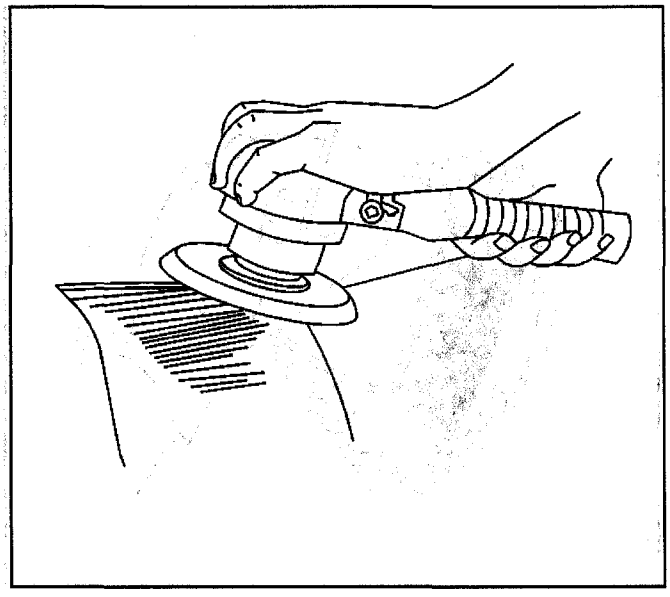
1. Clean and inspect the damaged area. Refer to *General Plastic Repair Instructions*.

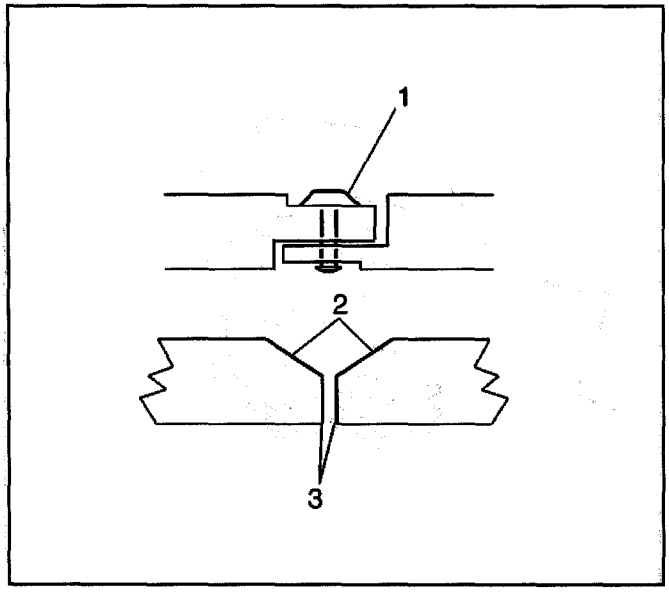

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2. Cut the damaged area and/or the replacement panel to the appropriate size so that the panel fills the opening.


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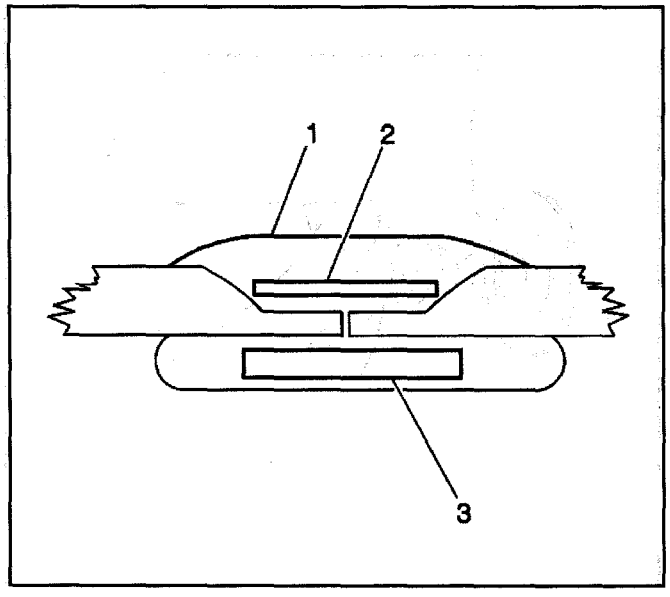
3. Scuff sand the damaged area and the replacement panel's mating surfaces.


95556



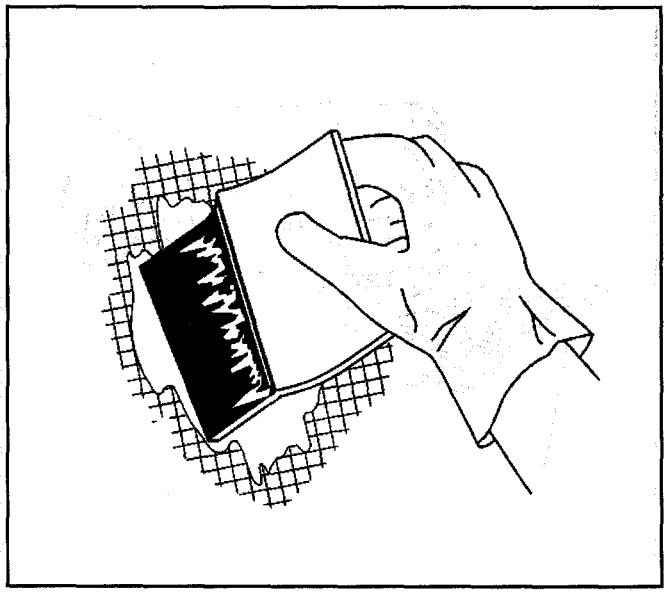
95567

4. Fit the panel to the opening:
   - If the bonding strips are exposed, mechanically attach (1) and bond the strips together.
   - If the bonding strips are not exposed, cut or grind the edge of the panels in order to form a good butt joint (3). Then bevel the edges (2) to about 30 degrees in order to form a dished butt joint.



366225

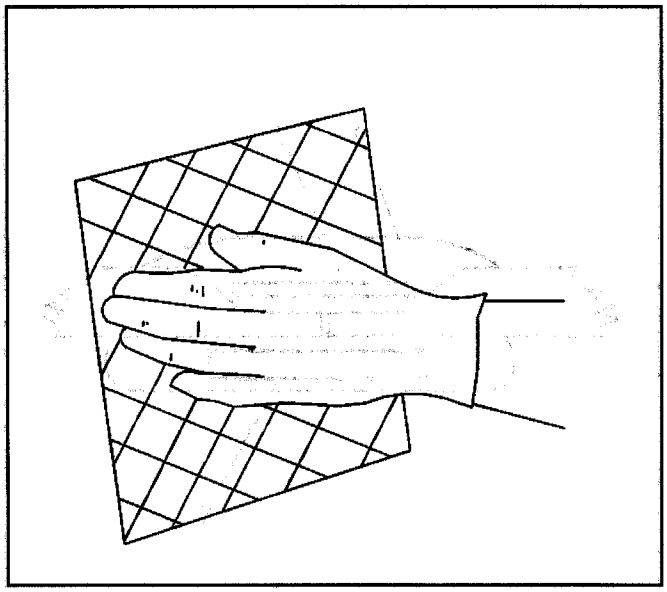
5. Install a backing patch (3). Refer to *Backing Patch Fabrication*.



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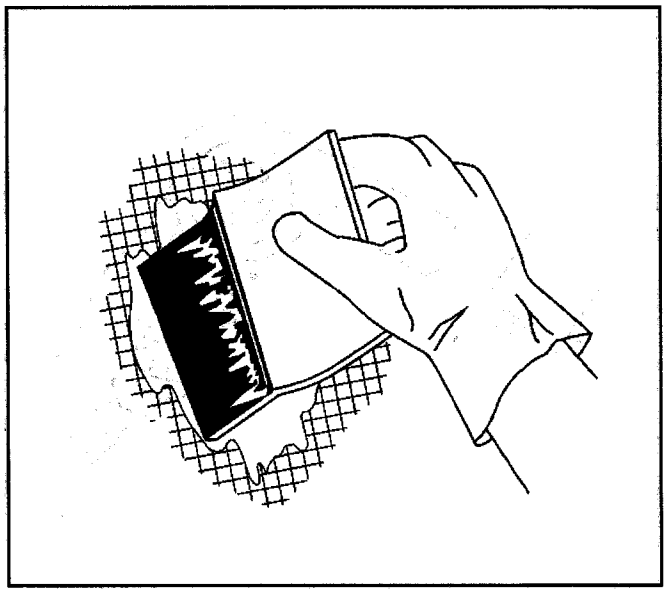
6. Mix and apply, follow the manufacture's instructions, a light coat of the repair material to the outside of the damaged area.

7. Lay a piece of reinforcement mat into the repair material.
   - The mat should extend 38–51 mm (1.5–2.0 in) beyond either side of the repair area.
   - All of the mat must be at a level below the final finished surface.
8. Using an applicator, saturate and remove any trapped air from the repair area.



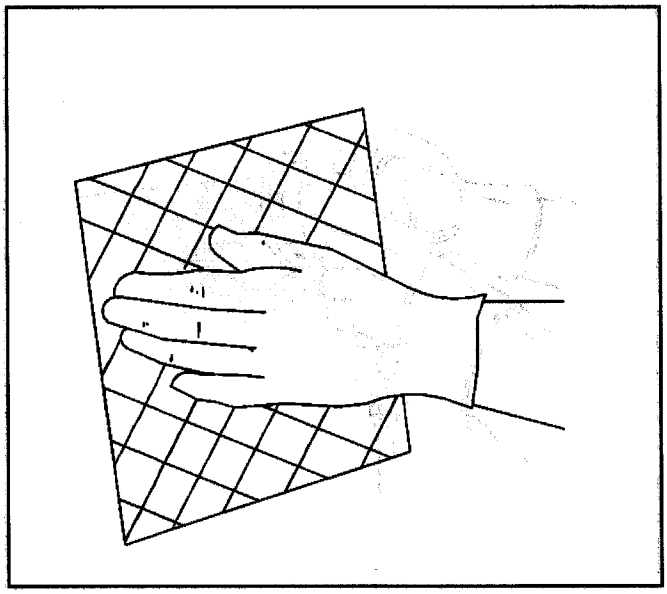
95561

9. Apply a second coat of the repair material in the same manner.

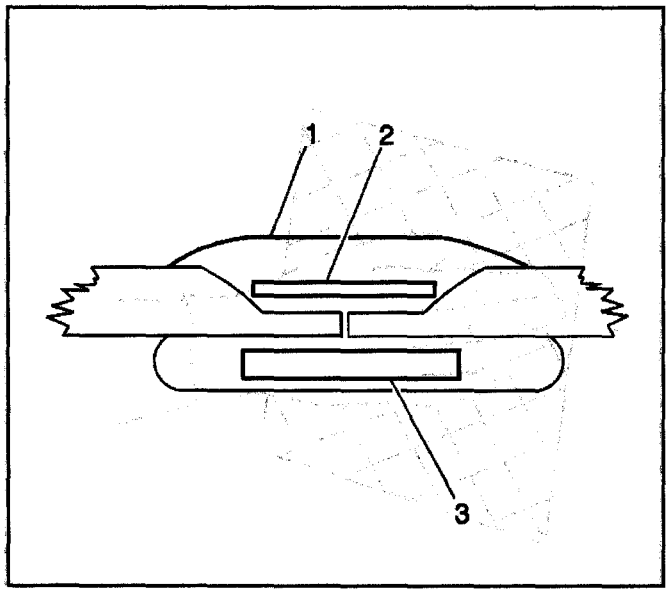


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10. Lay a second piece of mat into the repair area in the same manner.

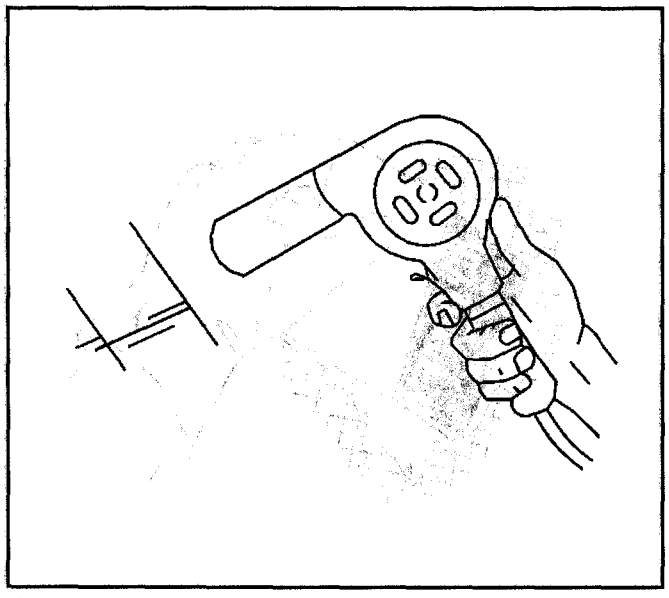


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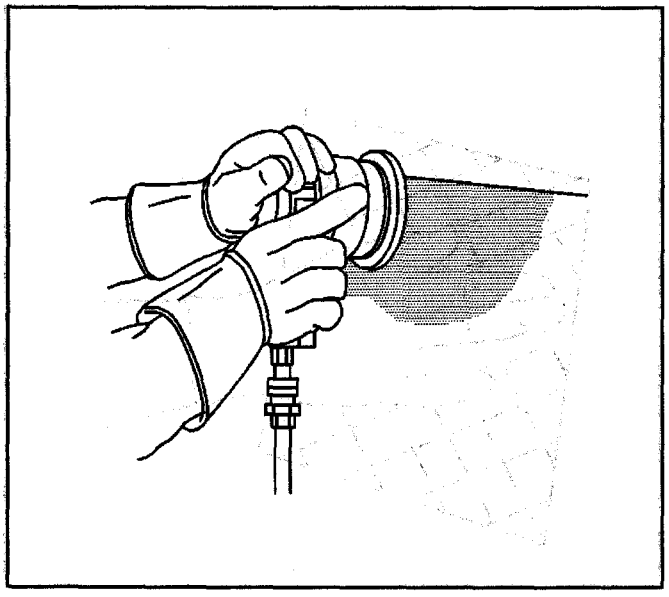
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11. Apply the final layer or repair material in the same manner until the repair material (1) is at a level slightly higher than the surrounding area.



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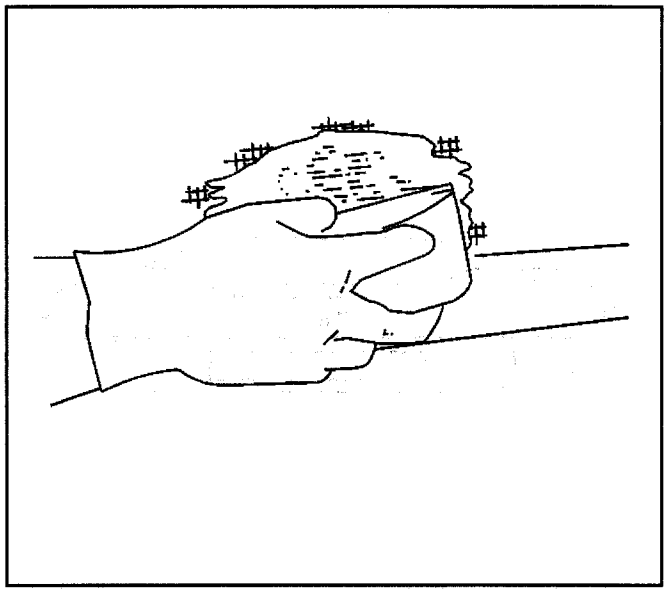
12. Cure the material according to the manufacturer's instructions.
13. Apply and cure additional layers as needed.



479231

14. Rough out the surface using a #80 grit disc on a D A sander.

15. Apply a polyester type material to provide a uniform surface for sanding, such as Silkens Polystop LP, or equivalent.
16. Prime and refinish as necessary. Refer to GM 4901 M-D for a listing of approved materials. Follow the procedures recommended by the material manufacture.



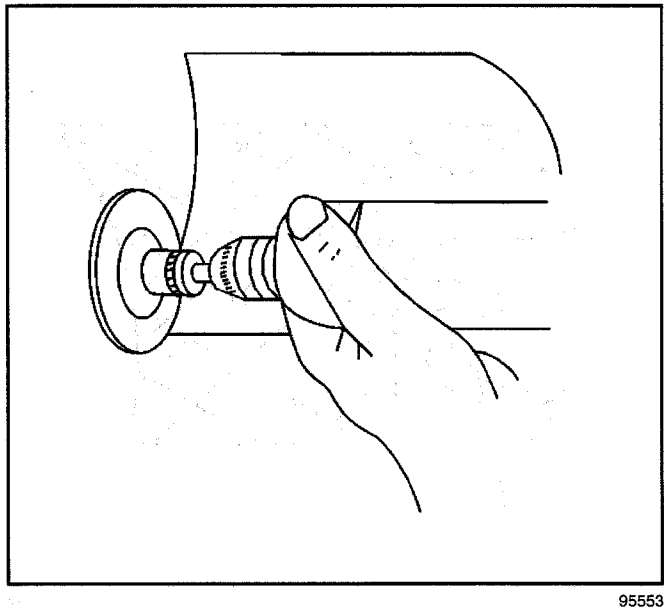
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Panel Replacement - Complete

Removal Procedure

Important: Wear safety equipment when you work with plastic.

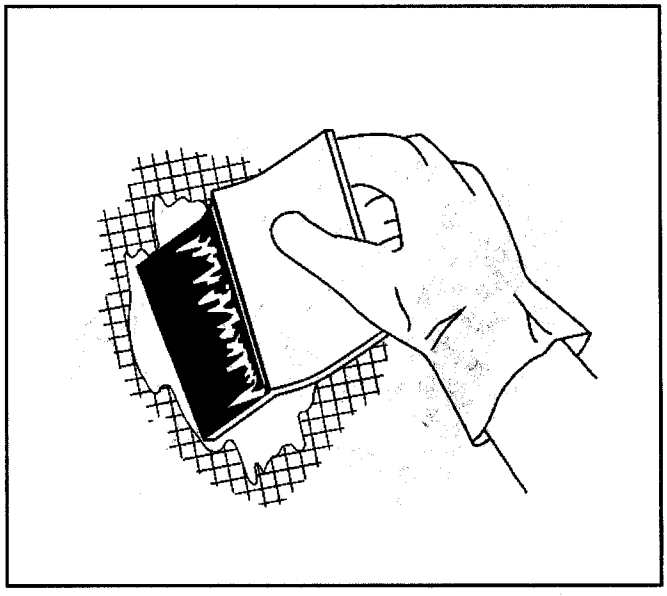
1. Cut a large window in the panel to be replaced to gain access to the bond adhesive.
   - Cut only deep enough to cut through the panel being replaced.
   - Most SMC plastic panels are 3 mm (0.125 in) thick.
2. Use a heat gun to soften the bonding adhesive.
   Heat to 400 degrees.
3. Cut through the adhesive bond with a putty knife.
4. Remove the damaged panel.



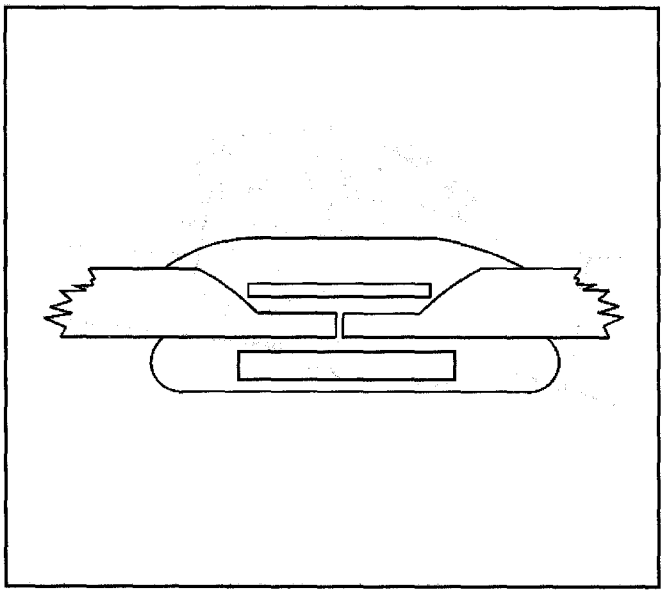
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Installation Procedure

1. Use a scraper in order to remove all the old adhesive.
2. Wash the bonding surfaces with soap and water. DO NOT use a solvent.
3. Install the proper bonding material to the bond surface. Refer to *Repair Materials - Rigid Plastic Part* or *Repair Materials - Flexible Plastic Part*
   Large panels require a pneumatic applicator to speed the application of the fast curing adhesive.
4. Position the panel.
5. Clamp the panel with vise grips, or equivalent.
6. Cure the repair. Follow the repair material manufacture's recommendations.



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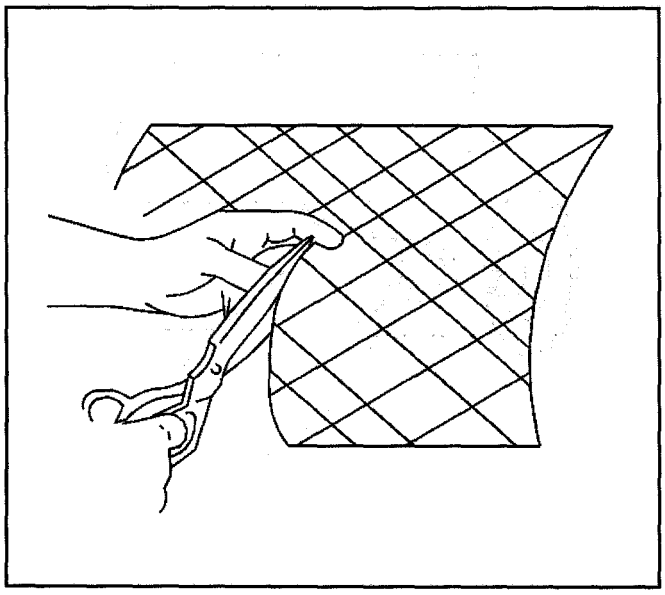
Backing Patch Fabrication

Before proceeding, refer to *General Plastic Repair Instructions* and *Plastic Repair Precautions*.

The following are three methods of fabricating a backing patch:

- Method 1: Fabricating a patch directly on the back of the damaged area. Layers of repair material and glass cloth mat are applied one at a time to a clean and sanded surface.
- Method 2: Cutting a patch from a scrap piece of a replaced panel.
- Method 3: Fabricating a patch on the outside of the damaged area to be reapplied to the inside of the damaged area.

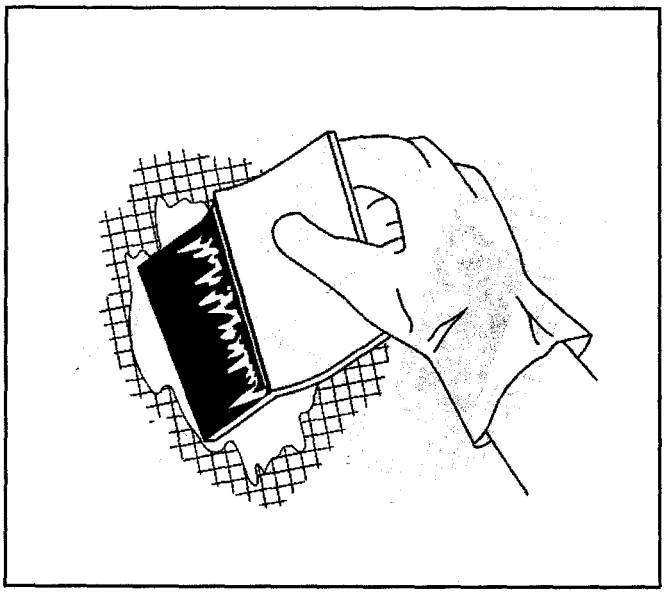
Any method can be used, but one method may be easier than another depending on the given situation. Read over each of the following methods in order to decide which will work best in a given situation.



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Method 1

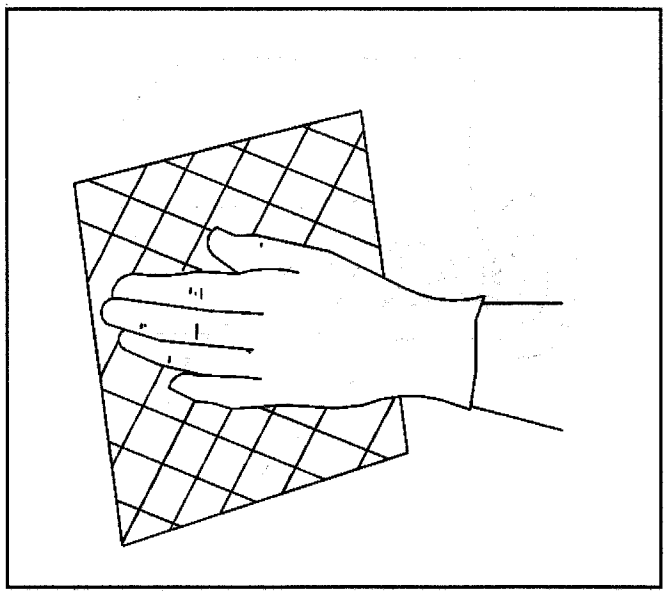
1. Cut a piece of the reinforcement mat, to the desired shape, so that the mat overlaps all sides of the back of the damage area by 38–51 mm (1.5–2.0 in).



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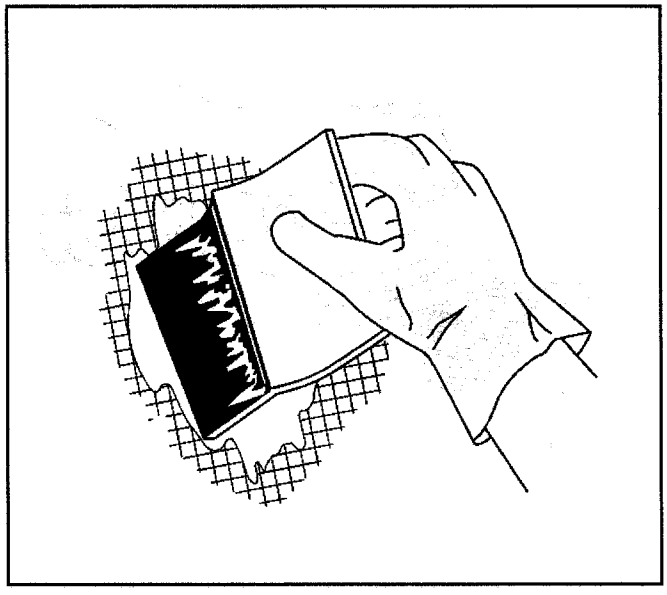
2. Determine the proper repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part*.
3. Mix the repair material according to the manufacturer's instructions.
4. Apply, follow the manufacturer's instructions, a skim coat of the repair material to the back of the damaged area.

5. Lay the pre-cut piece of reinforcement mat into the skim coat of the repair material.
   - Use the applicator in order to press the mat until saturated.
   - Inspect for exposed fibers or trapped air.



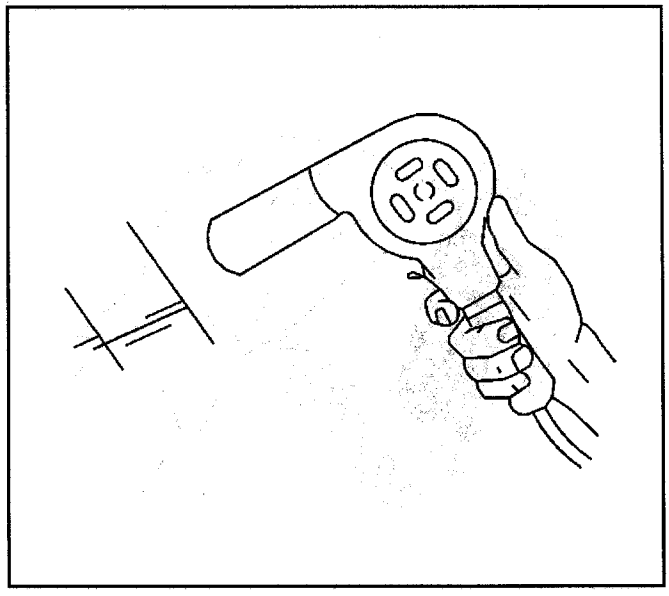
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6. Apply additional skim coats as needed to strengthen.

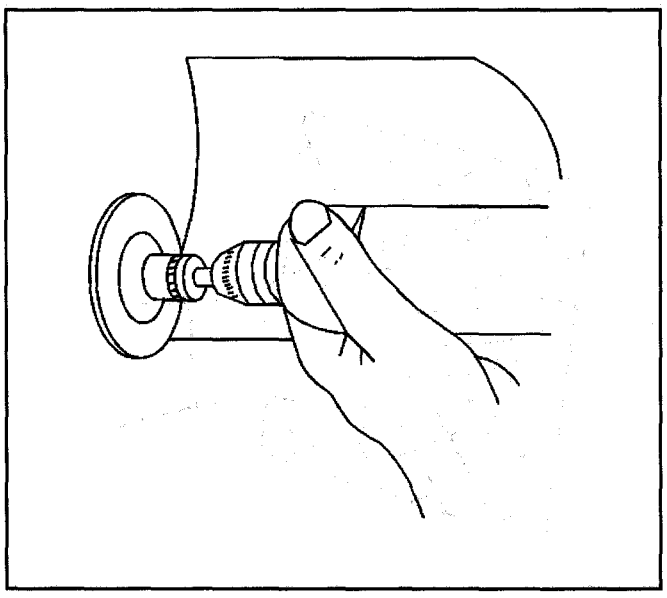


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7. Allow the material to cure according to the manufacturer's instructions.
8. Allow the repair area to return to room temperature.



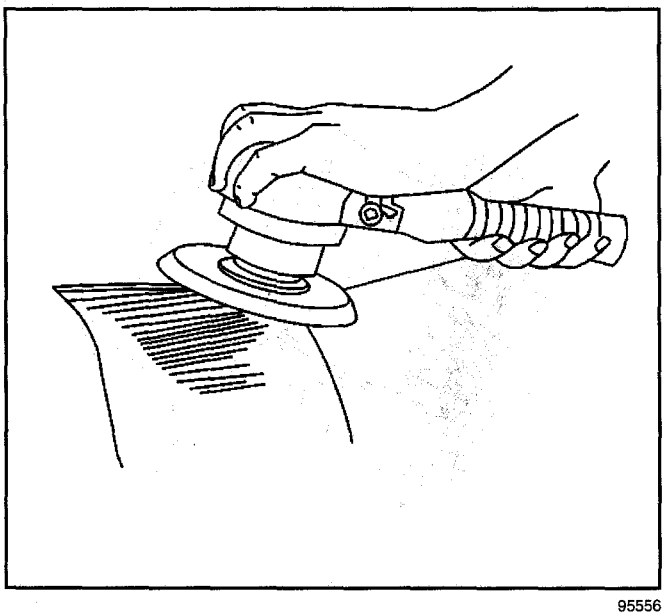
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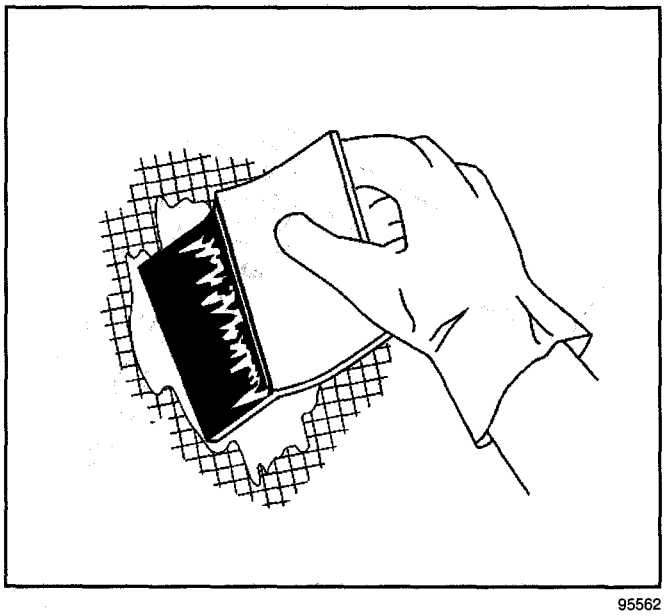
Method 2

1. Cut a patch from a scrap piece of a replaced panel so that the patch overlaps all sides of the damage area by 38–51 mm (1.5–2.0 in).



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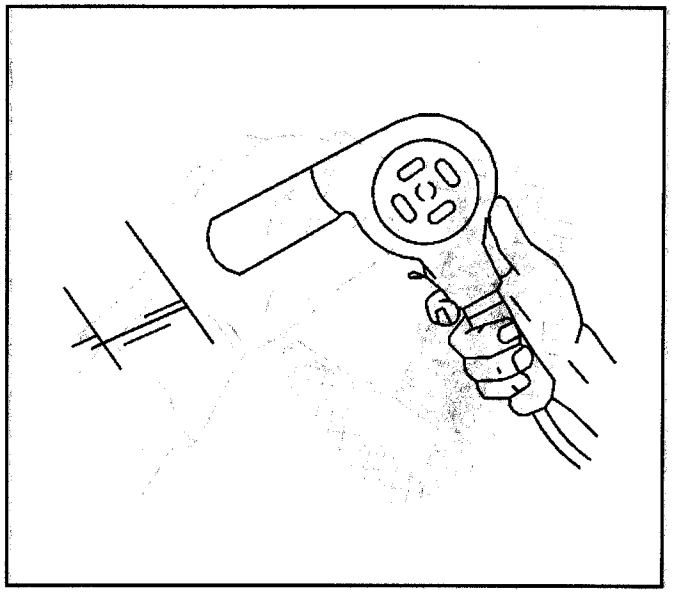
2. Sand and clean the surface of the patch in order to remove any paint or finish material which could prevent proper bonding.
3. Determine the proper repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part*.
4. Mix the repair material according to the manufacturer's instructions.



95562

5. Apply, follow the manufacturer's instructions, a skim coat of repair material to the back of the damaged area.
6. Install the patch:
   - 6.1. Align the patch over the damage on the back of the panel.
   - 6.2. Clamp or prop the patch onto the panel.
   - 6.3. Cover with repair material any voids or gaps a the edges of the patch that could allow entry of water or chemicals.

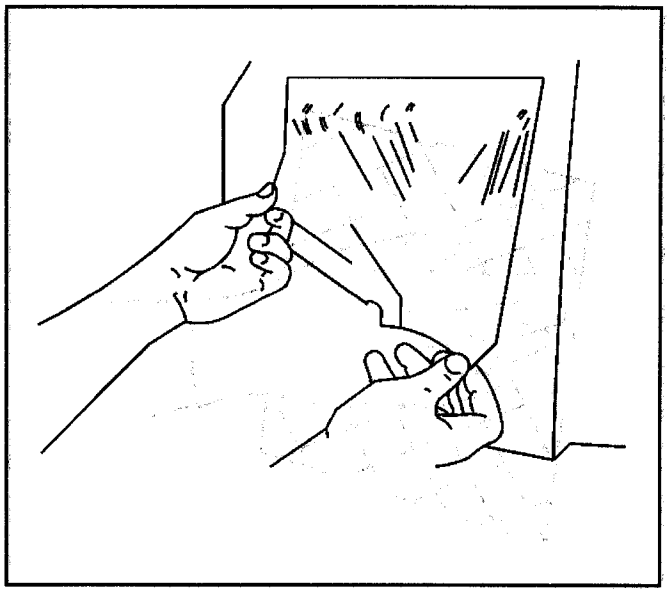
7. Cure according to the manufacturer's instructions.
8. Remove the clamp or the prop when curing is complete.



193342

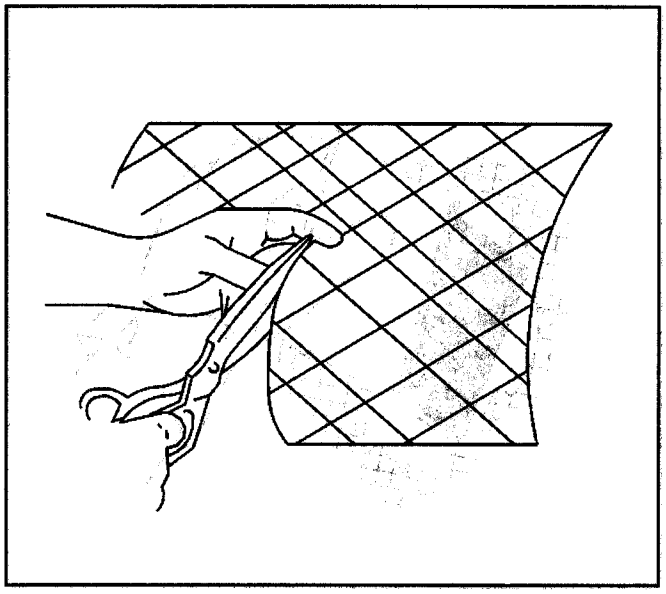
Method 3

1. Cut a piece of wax paper or polyethylene film material such as that used to wrap food:
   1.1. Cut the material to extend about 75 mm (3 in) beyond the repair area.
   1.2. Tape the material to the outside of the repair surface.

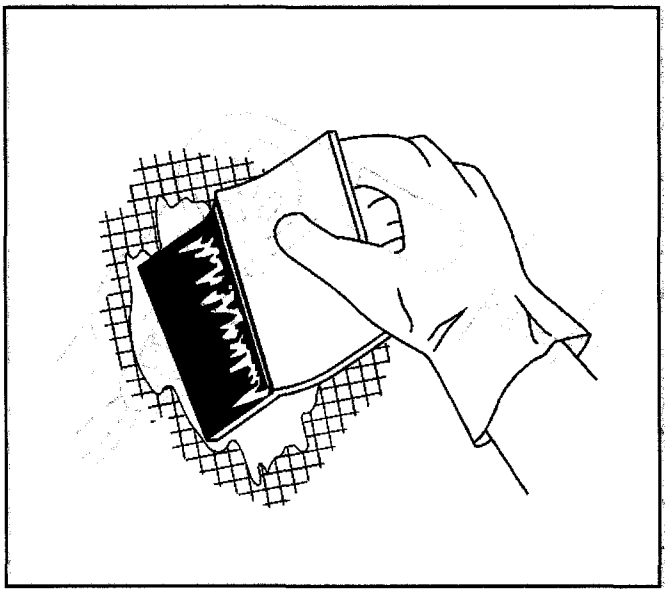


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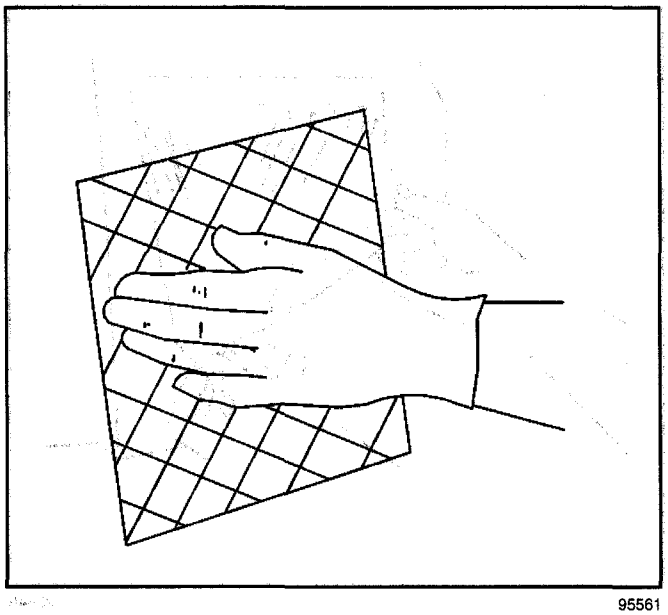
2. Cut a piece of the glass cloth mat to the desired shape, extending the mat 38–51 mm (1.5–2.0 in) beyond the repair area.



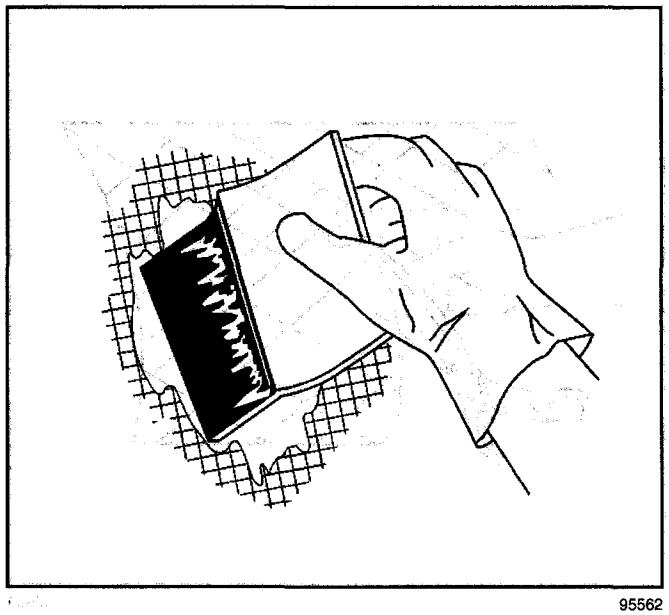
95559


95562

3. Determine the proper repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part*.
4. Mix the repair material according to the manufacturer's instructions.
5. Apply, follow the manufacturer's instructions, a layer of the repair material.

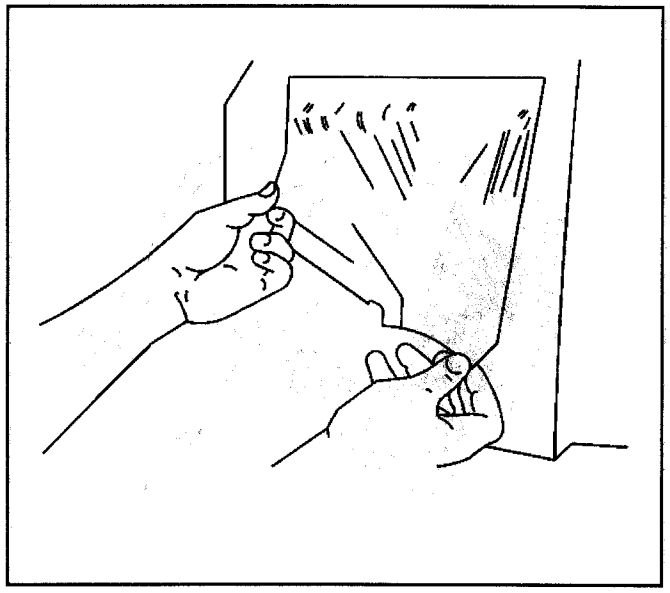

95561

6. Place a layer of the mat over the repair material.
7. Smooth out any wrinkles in the mat. Follow the contour of the panel.


95562

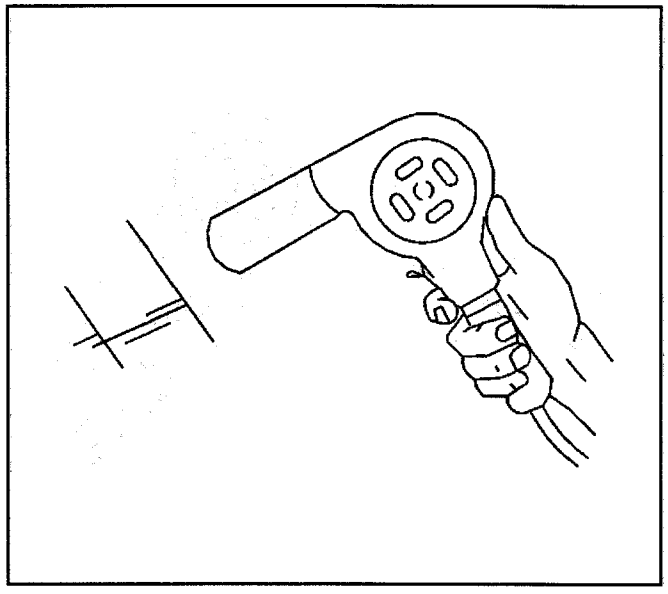
8. Apply a coat of repair material.

9. Cover the repair material with the wax paper or polyethylene.
10. Press against the wax paper with a saturation roller or squeegee in order to ensure saturation of the mat and to remove any air bubbles.
11. Continue applying layers as before as needed to strengthen.
12. Form the patch to match as close as possible the surface of the panel.



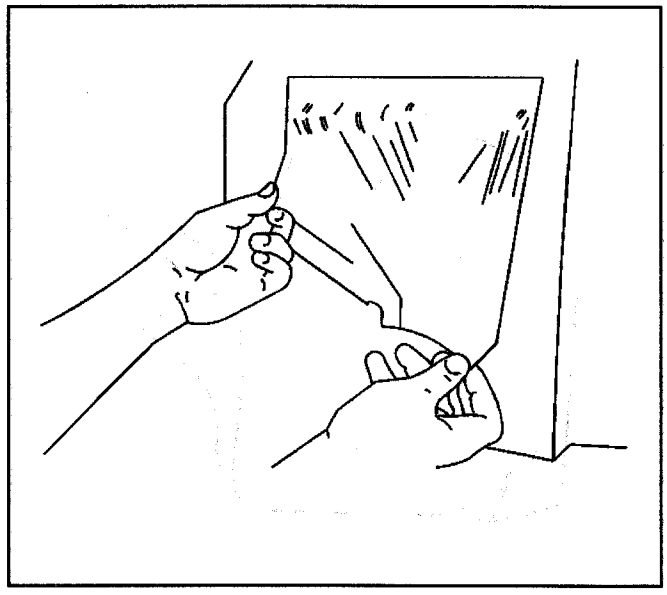
95548

13. Cure according to manufacturer's instructions.
14. Allow to return to room temperature.
15. Pop off the patch.

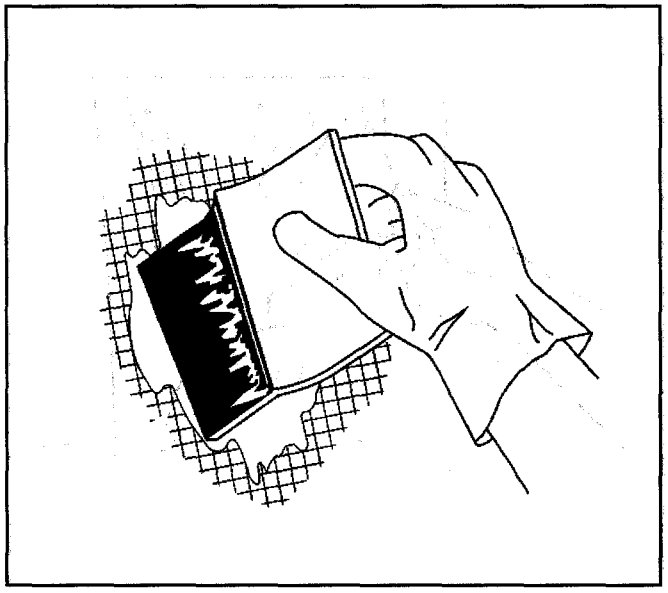


193342

16. Remove the wax paper or polyethylene.

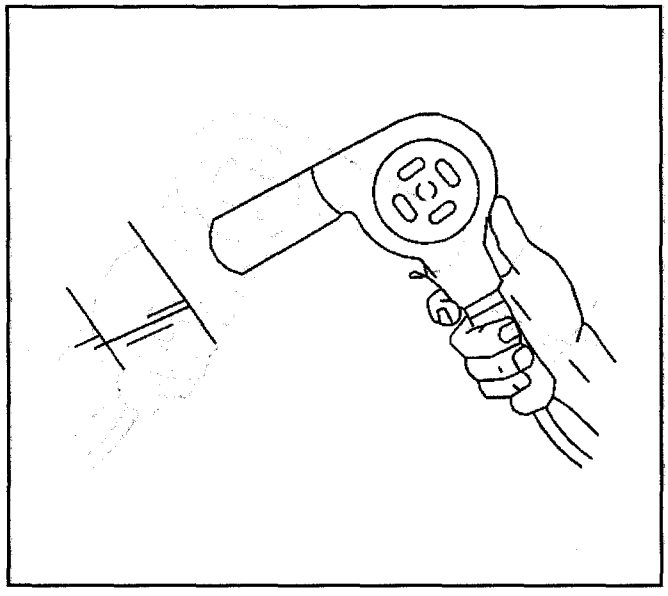


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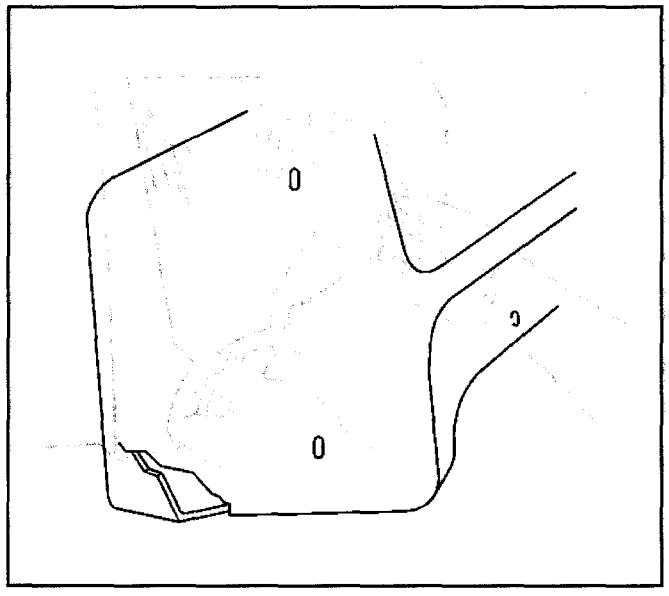
95562

17. Apply a skim coat of repair material.
18. Install the patch:
    - Align the patch over the damage on the back of the panel.
    - Clamp or prop the patch onto the panel.
    - Cover with repair material any voids or gaps at the edges of the patch that could allow entry of water or chemicals.



193342

19. Cure according to the manufacturer's instructions.
20. Remove the clamp or the prop when curing is complete.



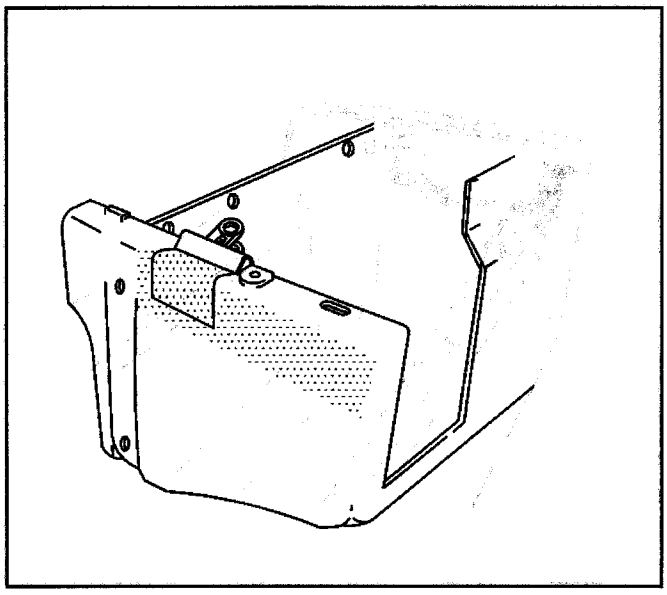
95517

Plastic Structure Repair

Before proceeding, refer to *General Plastic Repair Instructions* and *Plastic Repair Precautions*.

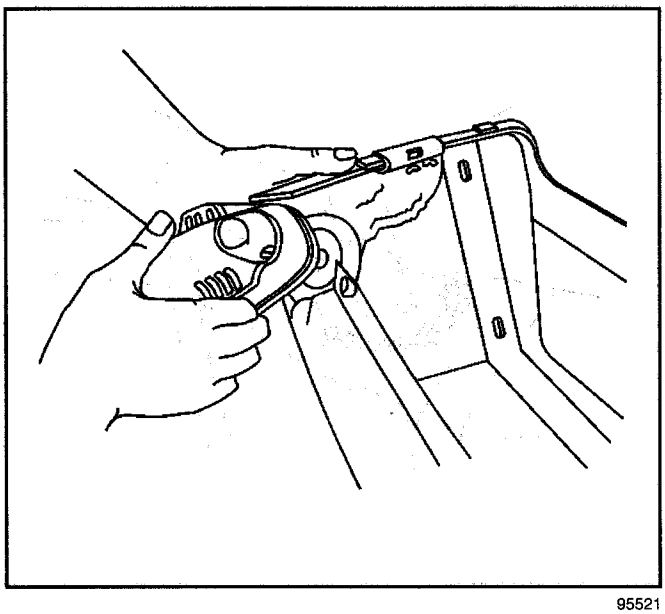
1. Clean and inspect the damaged area. Refer to *General Plastic Repair Instructions*.

2. Clamp or tape the damaged area in order to maintain alignment.
3. Prepare the damaged area for the installation of a backing patch. If the rear of the damage is accessible proceed with steps 4 through 6. If the rear of the damage is not accessible skip to step 7.



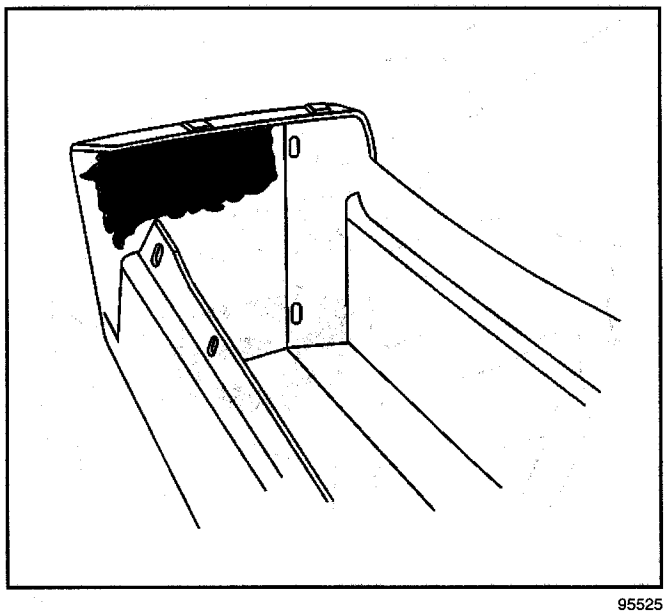
95519

4. Scuff the inner surface with a #80 grit disc on a D A sander or by hand if the access is limited.

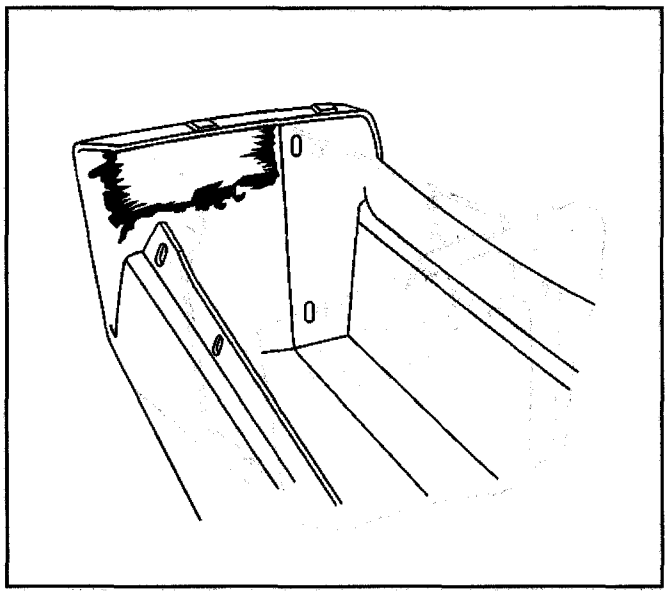


95521

5. Determine the proper repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part.*
6. Mix the repair material following the manufacturer's instructions.
7. Apply, follow the manufacturer's instructions, the repair material to the inner surface.

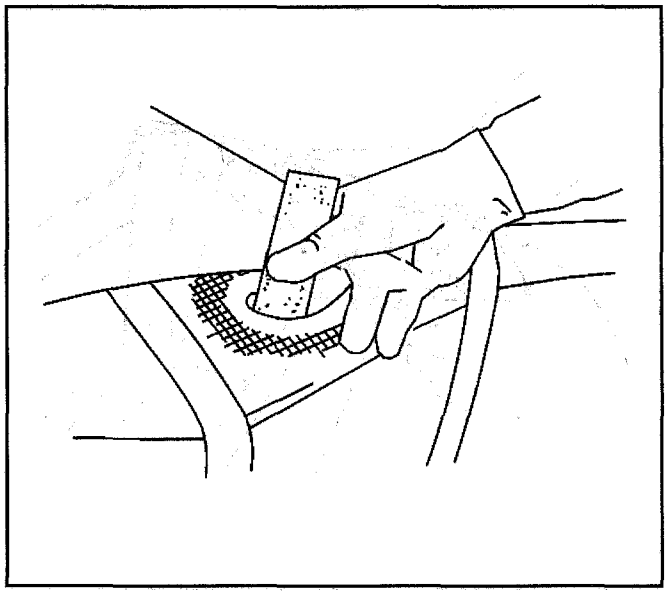


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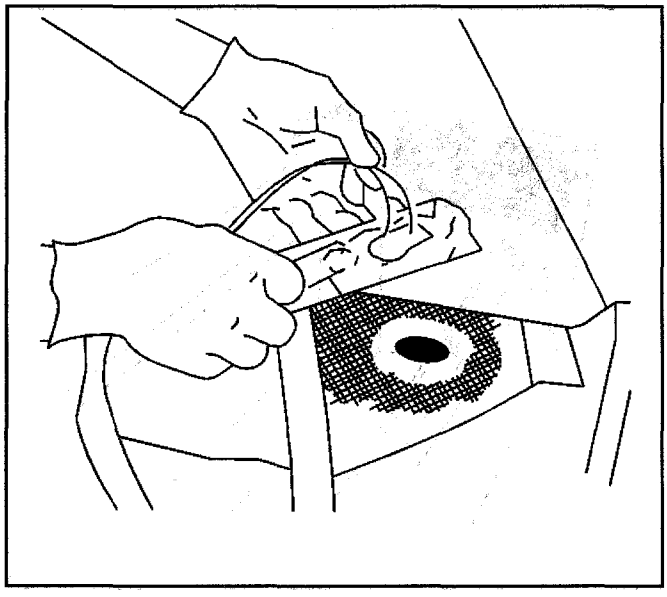
95527

8. Apply a backing patch and skip to step 21. Refer to *Backing Patch Fabrication.*



95531

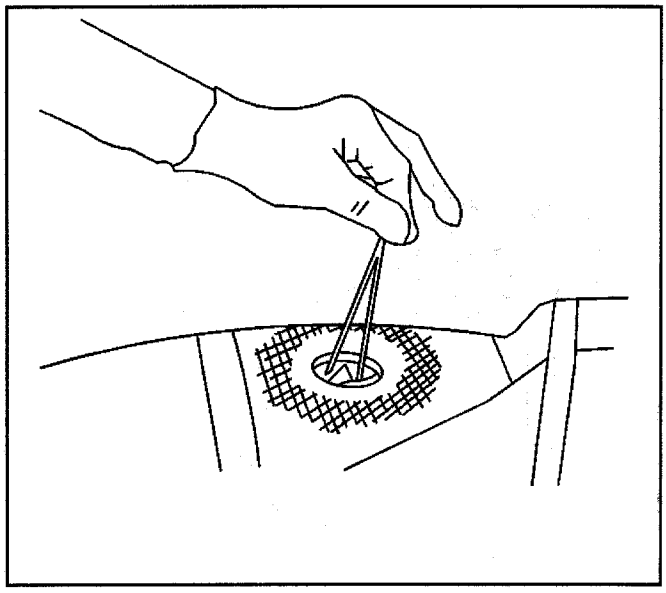
9. If the rear of the damaged area is not accessible remove some of the damaged material in order to form an access hole through which you can slip a backing patch.
10. Cut a backing patch from a scrap piece of panel. Refer to *Backing Patch Fabrication.*
11. Sand the mating surface of the patch.
12. Reach through the access hole and sand the underside of the repair area.



95534

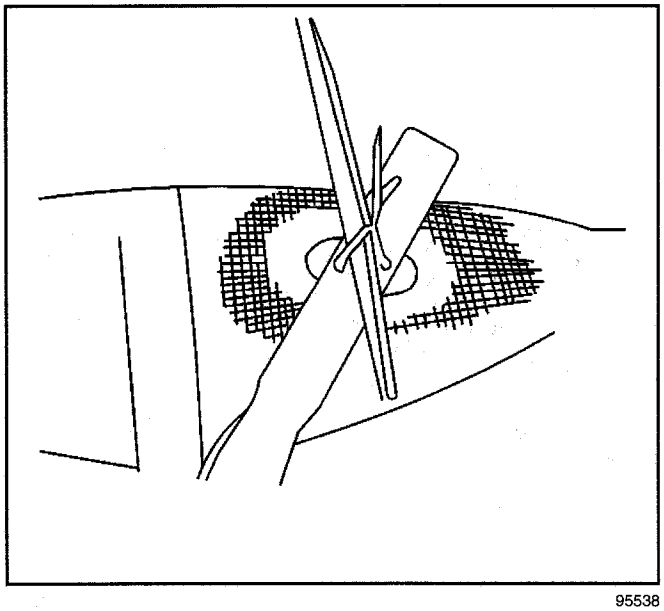
13. Drill 2 holes in the backing patch.
14. Thread a piece of waxed wire through the holes in order to assist in holding the patch in place after installation.
15. Determine the proper repair material. Refer to *Repair Materials - Flexible Plastic Part* or *Repair Materials - Rigid Plastic Part.*
16. Mix, follow the manufacturer's recommendations, the correct repair material.
17. Apply, follow the manufacturer's recommendation, the correct repair material to the mating surface of the patch.

18. Slip the patch through the access hole.
19. Pull up hard on the waxed wire until the repair material squeezes out on all sides.



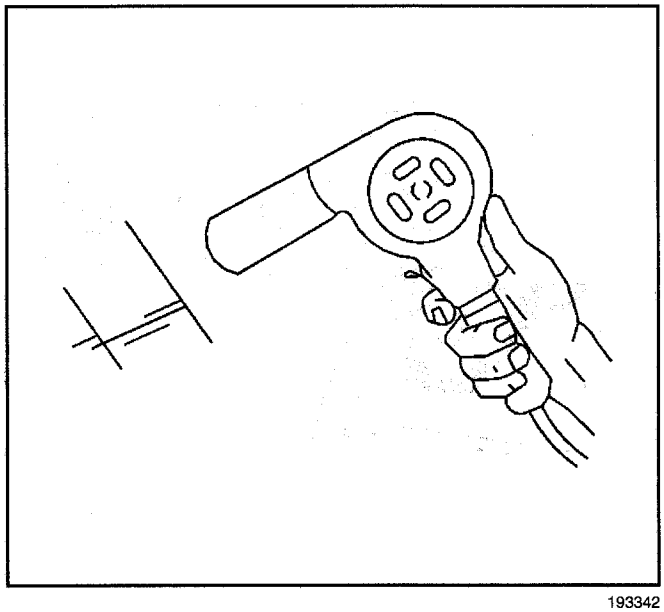
95536

20. Twist the wire around a piece of wood in order to hold the patch in position until the repair material cures.

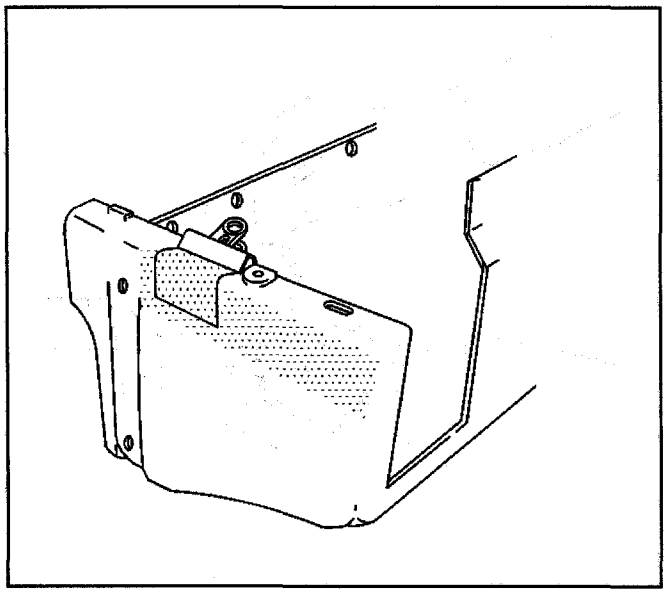


95538

21. Cure the repair material according to the manufacturer's instructions.

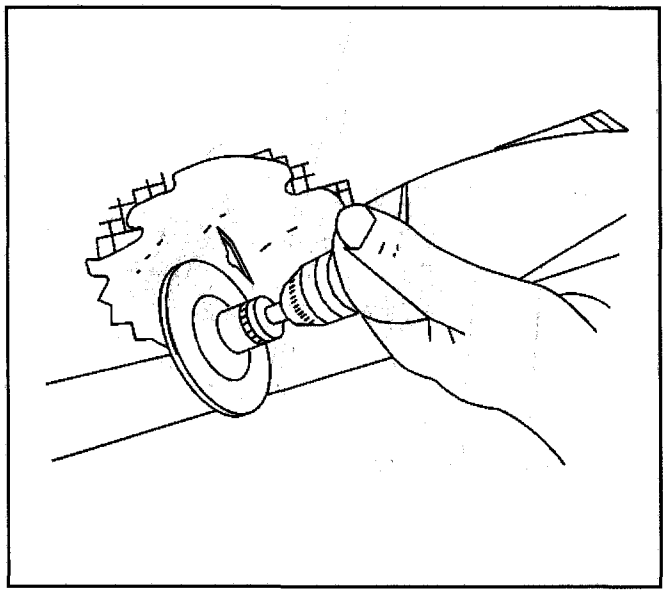


193342



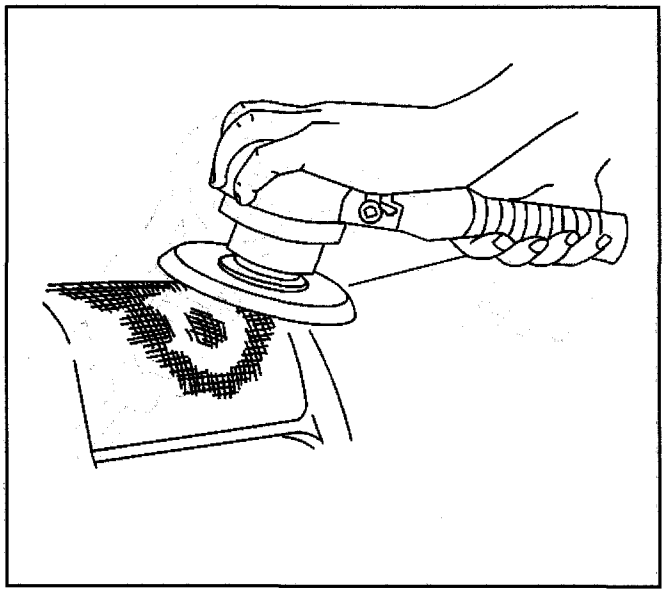
95519

22. Remove any tape, clamps, or waxed wire used to maintain alignment.



95528

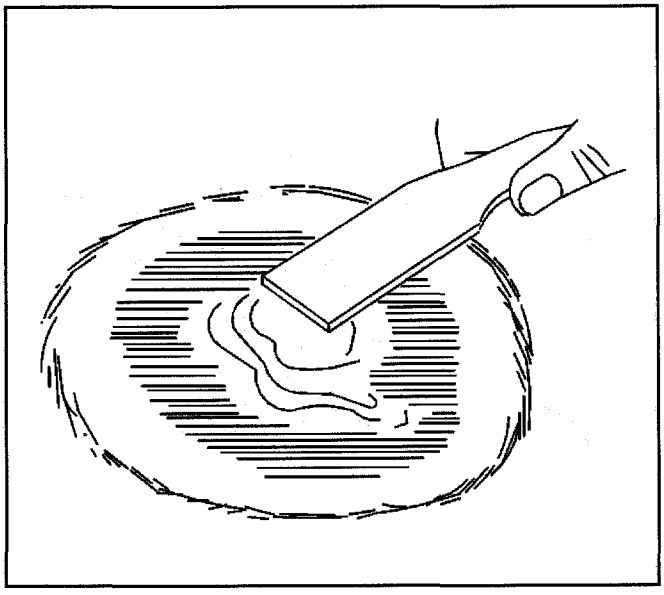
23. On the outer surface of the panel, bevel the damaged area with a #50 grit Roloc disc in order to extend the contact between the repair material and the substrate.



95514

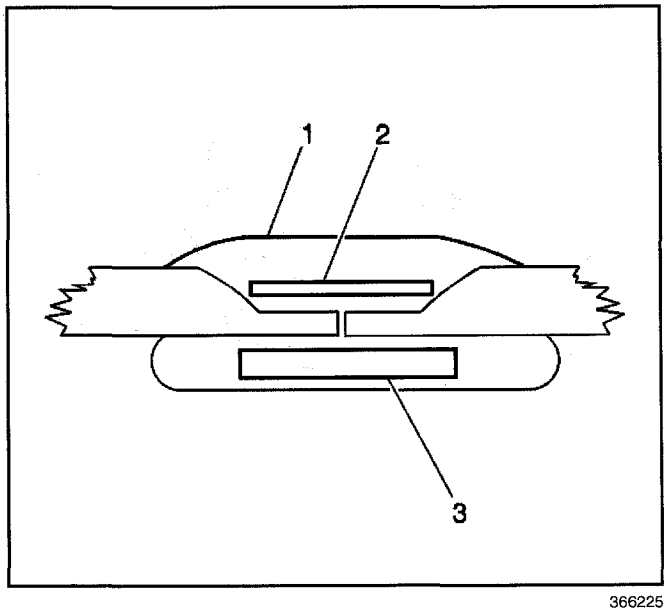
24. Using a D A sander, feather out several inches beyond the damaged area in order to remove any paint or primer from the substrate, and provide a proper adhesion surface.
    - Use a #80 grit disc on rigid panels.
    - Use a #180 grit disc on flexible panels.

25. Carefully and smoothly apply a light coat of repair material to the damaged area.



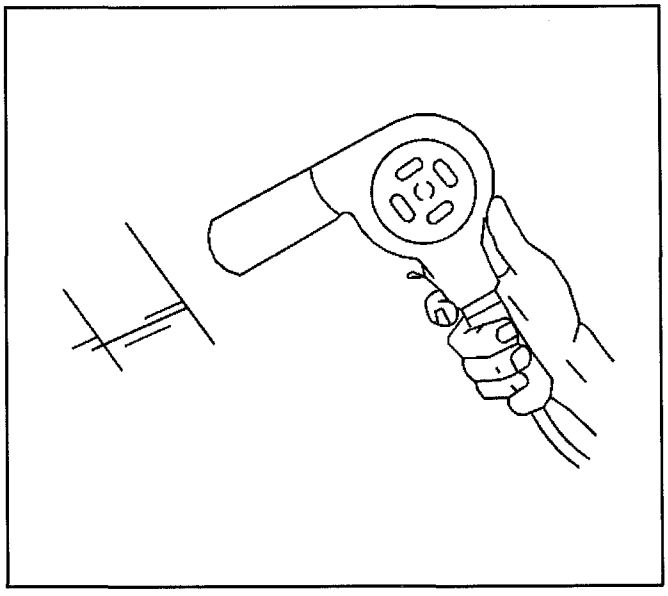
95515

26. Add mat material as needed to strengthen.
27. Apply a final layer of repair material (1) at a slightly higher level than the surrounding area.

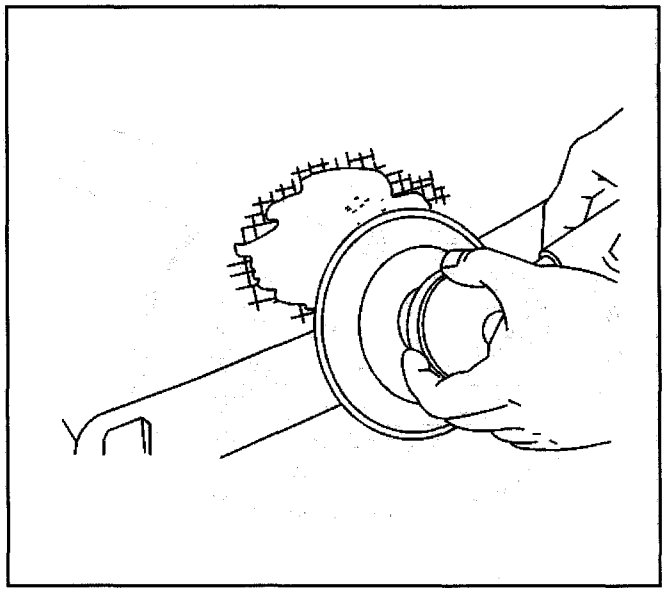


366225

28. Cure the repair material according to the manufacturer's instructions.

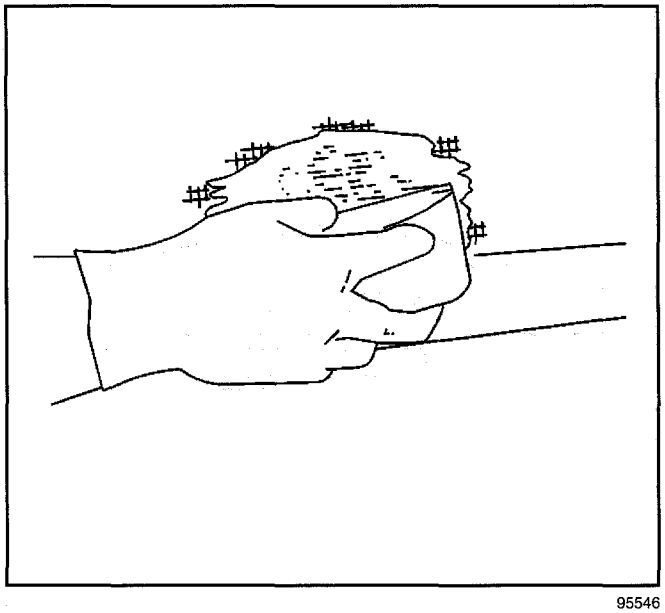


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95544

29. Rough out the surface using a #80 grit disc on a D A sander or a curved-tooth body file.

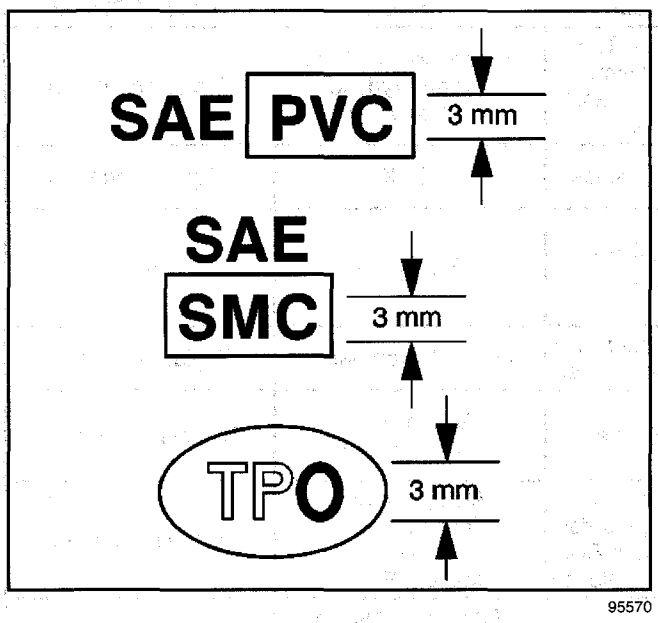


95546

30. Finish sanding using a #220–320 grit wet or dry sandpaper on a sanding block.
31. Prime and refinish as necessary. Refer to GM 4901 M-D for a listing of approved materials. Follow the procedures recommended by the material manufacturer.

Description and Operation

How to Identify Plastic Parts



95570

Plastic parts can be identified by the SAE the code, which is usually found on the rear of the part, and/or by the characteristics of the plastic. Knowing the type of plastic aids in selecting the proper repair materials and in selecting the proper repair procedure.

Look for the SAE code stamped into the part.

Code Found

1. Match the code to those in the plastic identification chart to determine whether the plastic is thermoplastic or thermoset plastic, and whether the plastic is rigid or flexible. Refer to *Plastic Identification and Refinishing Systems.*
2. Identify any special handling procedures. Refer to *Handling Precautions For Plastic.*

No Code Found

Important: Do not use a plastic burn test in order to distinguish the types of plastics. The burn test produces vapors that are harmful to you.

Perform one or both of the following tests to determine if the part is thermoplastic (polyolefin) or thermoset (non-polyolefin).

Float Test

1. Cut a shaving of plastic from the back of the part.

   The shaving should be free of mold release agents and paint.
2. Place the shaving in a container of water.
   - Thermoplastic (polyolefin) floats.
   - Thermoset (non-polyolefin) sinks.

Abrasion Test

- Sand a spot near the damaged with Grade 36 Roloc Disc.
- Thermoplastic (polyolefin) material melts or frays when sanded.
- Thermoset (non-polyolefin) material sands cleanly.

Thermoplastic and thermoset plastics can be either rigid or flexible. Thermoplastic plastic parts are best repaired with a hot iron plastic material-feed welder, but are usually replaced. Thermoset plastic can be repaired with epoxy or other more rigid two package repair material.

- For rigid thermoset repair materials refer to *Repair Materials - Rigid Plastic Part.*
- For flexible thermoset repair materials refer to *Repair Materials - Flexible Plastic Part.*
- For general repair instructions refer to *General Plastic Repair Instructions.*

Plastic Identification and Refinishing Systems

Identifying Symbol - Old Symbol in ( )'s	Chemical Composition or Plastic Family Name	Typical Area(s) Where Part is Used	Examples of Common/Trade Names	Type of Plastic
ABS	Acrylonitrile/ Butadiene- Styrene	Armrest Support, Console, IPC, Steering Column Bracket/Jacket, Trim Molding	ABS, Absafil, Abson, Cycolac, Dyel, Kralastic, Lustran	Thermoplastic
ABS + PC	Acrylonitrile/ Butadiene- Styrene + Polycarbonate	I/P, IPC	Baybland, Cycoloy, KHA, Proloy	Rigid
ABS/PVC	ABS/Vinyl (Soft)	Head Rest Cover, I/P Pad, Trim Molding/Panel	ABS Vinyl	Flexible, Vinyl
EPDM	Ethylene Propylene Diene Monomer	Body Panel, Bumper Impact Strip	EPDM, Nordel	Rigid
EVA (EVAC)	Ethylene/Vinyl Acetate	Head Rest Cover, Misc Soft Trim	Elvax, Microthane	Flexible
PA	Polyamide	Headlamp Bezels, Quarter Panel Extensions, Exterior Finish Trim Panels	Nylon, Capron, Zytel, Rilsan, minion, Vydyne, Welland	Rigid

Plastic Identification and Refinishing Systems (cont'd)

Identifying Symbol - Old Symbol in ( )'s	Chemical Composition or Plastic Family Name	Typical Area(s) Where Part is Used	Examples of Common/Trade Names	Type of Plastic
PA, PAG, PAGG	Polyamide	Exterior Finish Trim Panel, Headlamp Bezel, Quarter Panel Extension	Capron, Minlon, Nylon, Rilsan, Vydyne, Wellamid, Zytel	Rigid, Thermoset
PA + PPE	Polymide + Polypheneylene Ether	Exterior Trim, Fender	GTX	Rigid, Thermoset
PBT + TEEE (PBTP+ EEBC)	Polybutylene, Terephthalate + Ether, Ester Block Compound	Fascia, Rocker Panel Molding	Bexloy "M"	Rigid
PC	Polycarbonate	Interior Rigid/Hard Trim Panel, Valance Panel	Calibre, Lexan, Merlon	Rigid, Thermoset
PC + PETP	Polycarbonate + Polybutylene, Terephthalate	Bumper Fascia	Macroblend, Valox, Xenoy	Flexible, Thermoset
PE	Polyethylene	Fuel Tank Shield, Inner Fender Panel, Interior Trim Panel, Seat Belt Cover, Spoiler, Valance	Alathon, Dylan, Foriflex, Hi-fax, Hosalen, Marlex, Paxon	Rigid, Thermoplastic
PF	Phenol- Formaldehyde	Ashtray	Amberol, Bakelite, Durez, Genal, Phenolic, Plyophen, Resinox	Rigid, Thermoset
PP	Polypropylene	Bumper Fascia, Cowl Panel, Deflector Panel, Door Panel, Inner Fender, Interior Molding, Kick Panel, Load Floor, Radiator Shroud, Wheel Cover	Azdel, Daplen, Escorene, Marlex, Novolen, Oleflo, Profax, Tenite	Flexible, Thermoplastic
PPE (PPO)	Polyphenylene Ether	Bezels, Chromed Plastic, Headlamp Door, Ornaments	Noryl, Oleflo, Prevex	Rigid, Thermoset
PS	Polystyrene	Dash Panel, Door Panel	Durathon, Dylan, Lustrex, Polystyrol, Styron	Flexible, Soft
PUR	Polyurethane, Thermoset (Unsaturated)	Bumper Fascia, Filler Panel, Front/Rear Body Panel	Bayflex, Castethane, RIM, RRIM	Thermoset
PVC	Polyvinyl Chloride (Vinyl)	Interior Soft Trim, I/P Skins, Roof Cover	Geon, Pliovic, Unichem, Vinoflex, "Vinyl," Vinylite	Flexible, Vinyl
SAN (SA)	Styrene- Acrylonitrite	Center Console, Glove Box Door, Interior Trim Panel	Foracryl, Lustran, Tyril	Rigid
TEO (EP, EPM, TPO)	Ethylene/ Propylene (Rubber)	Air Dam, Bumper Fascia, Valance Panel	EPI, EPII, TPO, TPR (Thermoplastic Rubber)	Flexible, Thermoplastic
TPO	Thermal Plastic oletin	Bumper Covers	TPO	Flexible Thermoplastic
TPU (TPUR)	Polyurethane, Polyolefin	Bumper Fascia, Gravel Deflector, Soft Filler Panel, Window Molding	Estane, Pellethane, Roylar, Toxin	Flexible, Thermoplastic
UP	Polyester/ Thermoset	Air Scoop, Air Spoiler, Fascia Extension, Hood, Instrument Housing, Rear Compartment Lid, Roof, Ventilation Grid	"Fiberglass," Premi-glas, Selectron, SMC, Vibrinmat	Rigid, Thermoset

For symbols not listed in this table, contact the Society of Automotive Engineers, 400 Commonwealth Drive Warrendale, PA 15096-0001

Handling Precautions For Plastic

Abbreviation	Material Name	Heat Resisting Temperature C (F)	Resistance to Gasoline and Solvents	Other Cautions
AAS	Acrylonitrile acrylic rubber styrene	95 (203)	Avoid gasoline and solvents	Avoid brake fluid
ABS	Acrylonitrile butadiene-styrene resin	90 (194)	Avoid gasoline and solvents	Avoid brake fluid
AES	Acrylonitrile ethylene styrene	90 (194)	Avoid gasoline and solvents	Avoid brake fluid
FRP	Fiber reinforced plastics	170 (338)	Gasoline and most solvents are harmless	—
PA, PAG, PAGG	Polyamide (nylon)	150 (302)	Gasoline and most solvents are harmless	Avoid immersing in water
PBT	Polybutylene terephthalate	140 (284)	Gasoline and most solvents are harmless	—
PC	Polycarbonate	120 (248)	Avoid gasoline and solvents	—
PE	Polyethylene	80 (176)	Gasoline and most solvents are harmless	Flammable
PMMA	Polymethyl methacrylate	90 (194)	Avoid gasoline and solvents	Avoid brake fluid
POM	Polyacetal	120 (248)	Gasoline and most solvents are harmless	Avoid battery acid
PP	Polypropylene	90 (194)	Gasoline and most solvents are harmless	Flammable
PPC	Polypropylene composite	115 (239)	Gasoline and most solvents are harmless	Flammable
PPE	Polyphenylene ether	110 (230)	Avoid gasoline and solvents	—
PUR	Polyurethane	90 (194)	Gasoline and most solvents are harmless	Avoid brake fluid
PVC	Polyvinyl chloride	90 (194)	Gasoline and most solvents are harmless if wiped up quickly	Toxic when burned
TPE	Thermoplastic elastomer	80 (176)	Avoid gasoline and solvents	—
TPR	Thermoplastic rubber	80 (176)	Avoid gasoline and solvents	—

Plastic Repair Precautions

Adhere to the following precautions during thermoset plastic repair:

1. Apply protective cream to any exposed skin in order to prevent skin irritation.
2. Wear rubber gloves.
3. Wear safety glasses when using compressed air and when sanding.
4. Immediately remove any mixture that comes into contact with skin. The mixture hardens quickly.
5. Wear an air supplied respirator or dust mask when grinding or sanding.
6. Use a sander with a vacuum attachment whenever possible in order to control any dust.
7. Wash skin with cold water in order to alleviate minor skin irritation from glass and resin dust.
8. Do not get any of the repair material on clothing.
9. Use repair materials in a well-ventilated area. The repair materials may produce toxic fumes.
10. Follow the repair material manufacturer's instructions.
11. Close all containers after use. Dirt or moisture contamination of the repair material can result in an unsatisfactory repair.

Paint/Coatings

Specifications

Clearcoat Repair Specifications - 3M Products

Paint Condition	Wet Sanding	Compounding	Rotary Polisher	Dual Action Orbital Polisher	Hand Glazing/ Polishing
New vehicle prep or fine wheel marks	—	—	—	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit DA 6 inch Backup Pad P/N 05776	Premium Liquid/Paste Waxes P/N 0654/06055
Swirl marks, water spotting, or light oxidation	—	—	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit SBS/Perfect-It Backup Pad P/N 05717/18	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05725/35 • Hookit DA 6 inch Backup Pad P/N 05776	• Perfect-It Hand Glaze P/N 05997 or • Premium Liquid/Paste Waxes P/N 0654/06055
Overspray or medium oxidation	—	• Perfect-It 11 Rubbing Compound Pad P/N 059723 • Perfect-It 11 Foam Compound Pad P/N 05723/31	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit SBS/Perfect-It Backup Pad P/N 05717/18	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit DA 6 inch Backup Pad P/N 05776	• Perfect-It Hand Glaze P/N 05997 • Premium Liquid/Paste Waxes P/N 0654/06055
Heavy oxidation or minor acid rain pitting	Micro Fine 2000	• Perfect-It 11 Rubbing Compound Pad P/N 059723 • Perfect-It 11 Foam Compound Pad P/N 05723/31	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit SBS/Perfect-It Backup Pad P/N 05717/18	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit DA 6 inch Backup Pad P/N 05776	• Perfect-It Hand Glaze P/N 05997 • Premium Liquid/Paste Waxes P/N 0654/06055

Clearcoat Repair Specifications - 3M Products (cont'd)

Paint Condition	Wet Sanding	Compounding	Rotary Polisher	Dual Action Orbital Polisher	Hand Glazing/ Polishing
Dust nibs, minor scratches, or major acid rain pitting	Micro Fine 1500 or 2000	• Perfect-It 11 Rubbing Compound Pad P/N 059723 • Perfect-It 11 Foam Compound Pad P/N 05723/31	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit SBS/Perfect-It Backup Pad P/N 05717/18	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit DA 6 inch Backup Pad P/N 05776	• Perfect-It Hand Glaze P/N 05997 • Premium Liquid/Paste Waxes P/N 0654/06055
Orange peel, paint runs or sags	Micro fine 1200 or 1500	• Perfect-It 11 Rubbing Compound Pad P/N 059723 • Perfect-It 11 Foam Compound Pad P/N 05723/31	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit SBS/Perfect-It Backup Pad P/N 05717/18	• Perfect-It Polishing Pad Glaze P/N 05995/05996 • Perfect-It Foam Polishing Pad P/N 05776 • Hookit DA 6 inch Backup Pad P/N 05776	• Perfect-It Hand Glaze P/N 05997 or • Premium Liquid/Paste Waxes P/N 0654/06055

Clearcoat Repair Specifications - Meguiar Products

Paint Condition	Wet Sanding	Cleaning	Polishing
New car prep or fine wheel marks	—	—	Swirl Free Polish (M-82) W-6000 Pad for DA polishers
Swirl marks, chemical spotting or light oxidation	—	—	Swirl Free Polish (M-83) W-9000 Finishing Pad
Overspray or medium oxidation	—	Heavy-Cut Cleaner (M-85) W-7000 Cutting Pad	Swirl Remover (M-82) W-9000 Finishing Pad
Heavy oxidation or minor acid rain pitting	—	Compound Power Cleaner (M-84) W-4000 Cutting Pad	Swirl Free Polish (M-82) W-6000 Finishing Pad
Dust nibs	2000 Grade Unigrit Sanding Block	Compound Power Cleaner (M-84) W-7000 Cutting Pad	Swirl Free Polish (M-2) W-9000 Finishing Pad
Minor scratches or acid rain pitting	2000 Grade Unigrit Sanding Paper	Compound Power Cleaner (M-84) W-7000 Cutting Pad	Swirl Free Polish (M-2) W-9000 Finishing Pad
Major runs or sags	1500 Grade Unigrit Sanding Block	Compound Power Cleaner (M-84) W-7000 Cutting Pad	Swirl Free Polish (M-2) W-6000 Pad for DA Polishers
Major orange peel or acid rain pitting	1500 Grade Unigrit Sanding Paper	Compound Power Cleaner (M-84) W-7000 Cutting Pad	Swirl Free Polish (M-2) W-6000 Pad for DA Polishers
Need for protection	—	—	Quick Detailer (M-6601) will provide protection without streaking. Contains the mildest of cleaners which will insure even application of polish.

Introduction

Basecoat/Clearcoat Paint Systems

Caution: Exposure to isocyanates during paint preparation and application processes can cause severe breathing problems. Read and follow all of the instructions from the manufacturers of painting materials, equipment, and protective gear.

Caution: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

All paint finish repairs of rigid exterior surfaces must meet GM standards. The GM Approved Refinish Materials book GM P/N 4901M-D identifies the paint systems you may use. Always refer to the latest revision of the 4901M-D book. All approved products, including volatile organic compound (VOC) - compliant regulations are listed in the system approach recommended by the individual manufacturer. Refer to the manufacturer's instructions for the detailed procedures for materials used in the paint system in the painting repairs of rigid exterior surfaces. All components of an approved paint system have been engineered in order to ensure proper adhesion between layers.

If necessary, spot repairs or color blending in an open panel can be done. However, do not blend clearcoat in an open panel. Always apply clearcoat to the next break point (body side molding, feature line, or the next panel.)

Do not mix paint systems or substitute a product of 1 manufacturer for another manufacturer's product. If incompatible products are used together the following problems may occur:

- Lifting of primer coats caused by overly aggressive solvents in subsequent layers
- Loss of adhesion between layers due to incompatibility of resin systems
- Solvent popping or pinholing due to inappropriate solvent selection
- Poor through-curing due to incompatible hardener resins or insufficient reactivity
- Gloss reduction due to incompatible resins and/or solvents
- Poor color accuracy due to pigment interactions with incompatible resins and/or solvents
- Film defects (craters, blisters, orange peel loss of gloss) due to the use of inferior quality raw materials in incompatible products

Anti-Corrosion Treatment and Repair

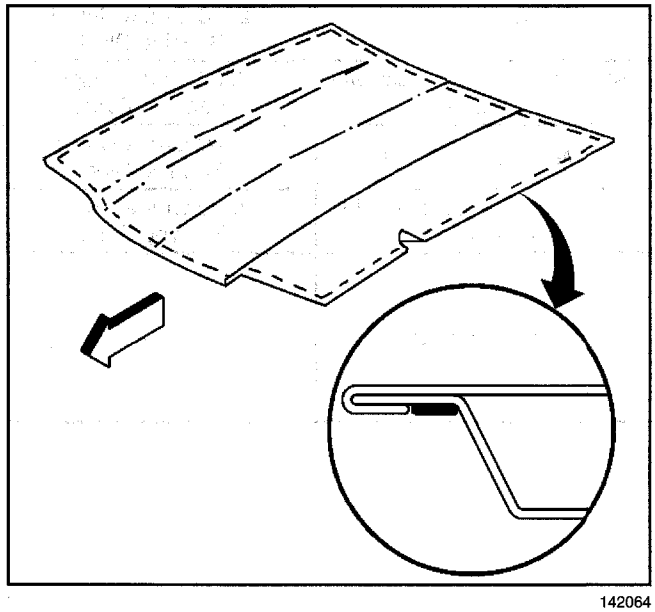
Caution: When applying sound deadeners, or anti-corrosion materials due care and preventative measures must be exercised to prevent any material from being sprayed into door and quarter panel mechanisms such as door locks, window run channels, window regulators and seat belt retractors, as well as any moving or rotating mechanical or suspension parts on the underbody, particularly the parking brake cable. After material application, be sure that all body drain holes are open. Improper application may increase chance of corrosion damage or limit the operation of moving parts, resulting in personal injury.

Caution: Foam sound deadeners must be removed from areas within 152.4 mm (6 in) of where flame is to be used for body repairs. When reinstalling foam sound deadeners, avoid inhaling fumes as bodily injury may result.

Caution: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

Notice: The anti-theft label found on some major body panels MUST be covered before performing any painting, rustproofing or undercoating procedures. The mask must also be removed following those procedures. Failure to follow these precautionary steps may result in liability for violation of the Federal Vehicle Theft Prevention Standard, and subject the vehicle owner to possible suspicion that the part was stolen.

Anti-corrosion materials providing rust resistance are used on the interior and the exterior surfaces of the metal panels. These materials include the following metals:



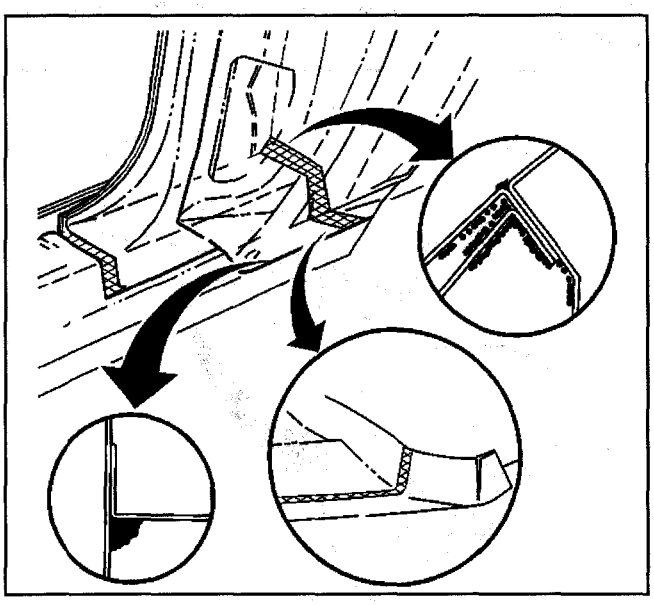
142064

- One-sided galvanized zinc
- Two-sided galvanized zinc
- Zinciron alloy steels

These treated metals are used on the following components:

- The fenders
- The doors
- The quarter panels
- The rocker panels
- The lids
- The floor pans
- The wheelhousings
- Other critical parts

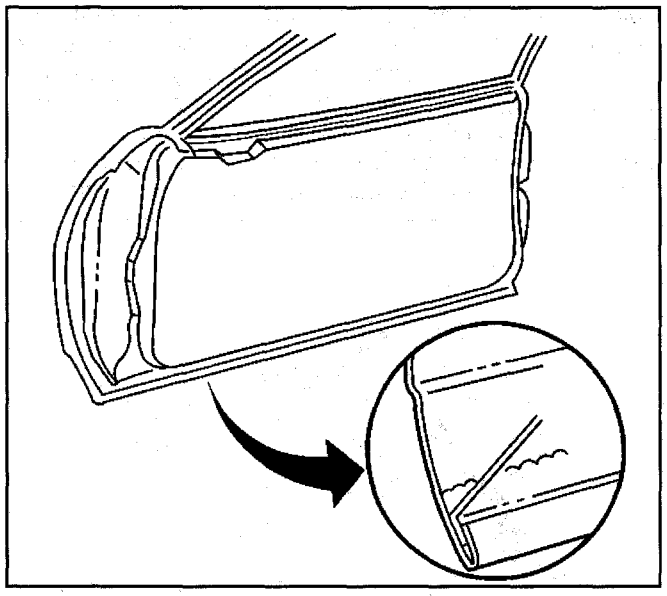
Metal conditioners and primers are used on the interior and the exterior surfaces along with protective waxes on the interior surfaces in the areas where moisture might accumulate. Sealers are applied along the exposed joints and the moisture-repelling asphaltic sound deadeners are applied inside the wheel wells, the doors, and on some underbody components.



142051

Any procedure that disturbs these special treatments, such as panel replacement or collision damage repair operations, may leave the metal unprotected and result in corrosion. Proper recoating of these surfaces with service-type anti-corrosion material is essential.

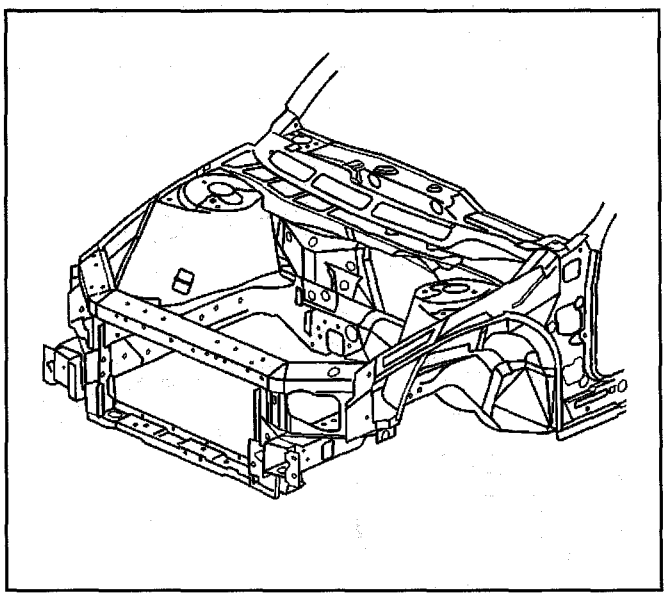
Metal conditioners and primer coatings are applied to all metal panels at the time of vehicle manufacture. After repair and/or replacement parts are installed, all accessible bare metal surfaces must be treated with metal conditioner and reprimed using a zinc chromate primer. This operation is to be performed prior to the application of sealers, waxes, deadeners, and antirust compounds. Refer to *Basecoat/Clearcoat Paint Systems*.



142049

These sealers are intended to prevent water and dust from entering the vehicle and also are anti-corrosion barriers. Sealers are applied to such areas as rear compartment lid hem flanges, wheelhouse, quarter outer, floor, cowl, roof, and various other panel to panel attaching points. The originally sealed joints are obvious and any damage to these sealed locations should be corrected by resealing. Attaching points of new replacement panels should be resealed. Replacement lids and doors will also require sealing in the hem flange areas.

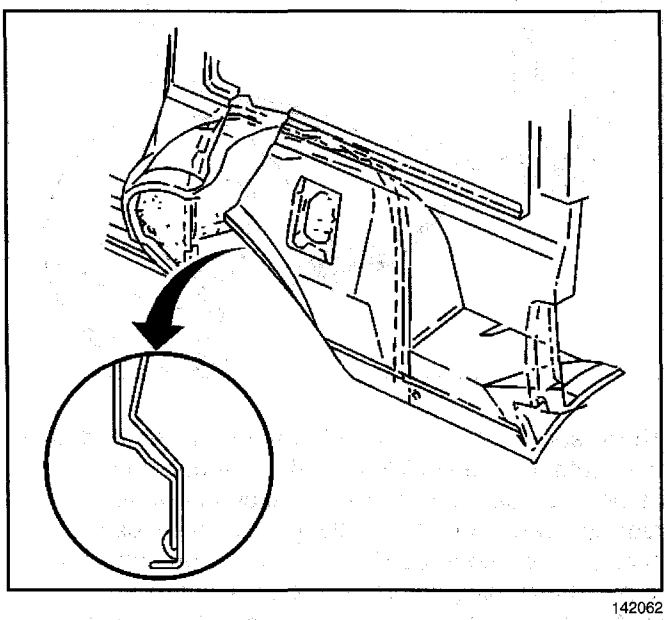
Flanged joints, overlap joints, and seams should be sealed using a quality sealer of medium-bodied consistency. The sealer used must retain its flexible characteristics after curing and be paintable.



142047

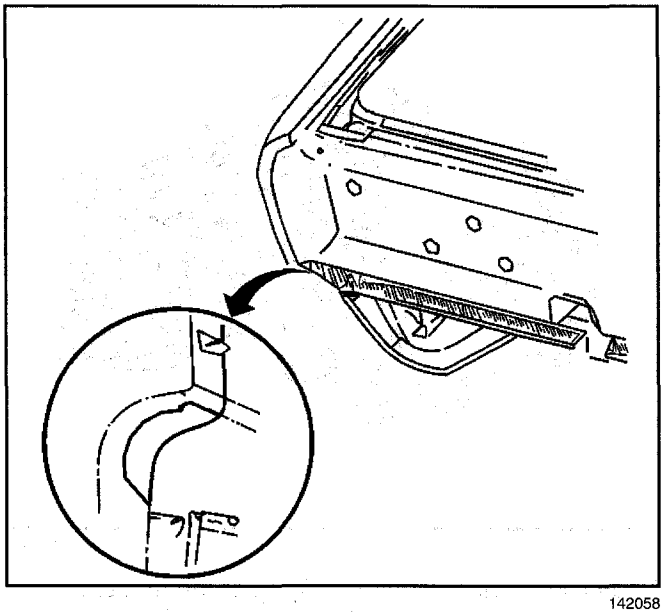
Open joints which require bridging of the sealer in order to close a gap should be sealed using a heavy-bodied caulking material. Follow the label directions for the material selected.

Color application may be required in order to restore repaired areas such as hood, fenders, doors, quarters, lid, roof, engine compartment, underbody, and inner panels to original appearance. When this is necessary, conventional refinishing preparation, undercoat buildup, and color application techniques should be followed. Refer to *Basecoat/Clearcoat Paint Systems*.



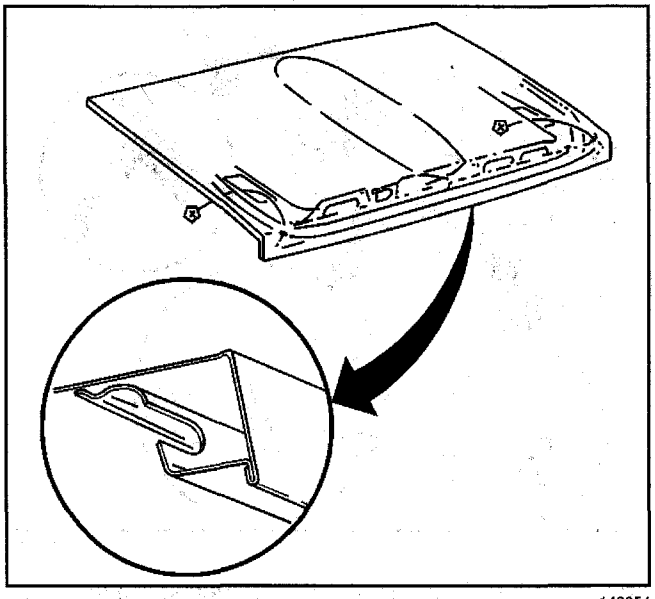
142062

Deadener materials (spray-on type) are used on various metal panels in order to provide corrosion resistance and joint sealing. They control the general noise level inside the passenger area of the vehicle. When deadeners are disturbed because of damage, are removed during repair operations, or a new replacement panel is installed, the deadener material must be replaced by a service equivalent material. The application pattern and location of deadener materials can be determined by observing the original production installation.



142058

Anti-corrosion compounds are light-bodied materials designed to penetrate between metal-to-metal surfaces, such as pinch weld joints, hem flanges, and integral panel attaching points where metal surfaces are difficult to coat with conventional undercoating materials, and are inaccessible for painting. Material suited for this type of application is GM P/N 12346225 Anti-Corrsion Compound Clear (Oil Base) or equivalent. Conventional undercoating is recommended in order to coat large areas such as replacement door and quarter outer panels, floor pan sections, lids, hoods, fenders, etc. During undercoating operations, care should be taken to prevent the material from being sprayed into door and quarter panel hardware mechanisms such as door locks, glass run channels, window regulators, and seat belt retractors. On the underbody, the material should not be applied to any moving or rotating part, energy absorbing bumper components, or shock absorbers. After undercoating, ensure that all body drain holes are open. Refer to *Basecoat/Clearcoat Paint Systems* for the sequence of application steps for anti-corrosion materials.



142054

Cleaning of the interior and underbody panel surfaces is necessary when original galvanized or other anti-corrosion materials have been burned off during welding or heating operations. Removal of the residue from burning will require additional care in such areas as interior surfaces of box-type construction and when configurations of the metal panels limit access to interior surfaces. One or more of the following methods will remove the residue.

- Sandblasting is an excellent method for cleanup and preparation of open joints, underbody components, and hem flange areas. Sandblasting is most effective and should be used.
- When access is possible, scraping with a putty knife or scraper can be used.
- A jet of compressed air will remove most residue and could be effective in a limited access areas.

Paint Identification

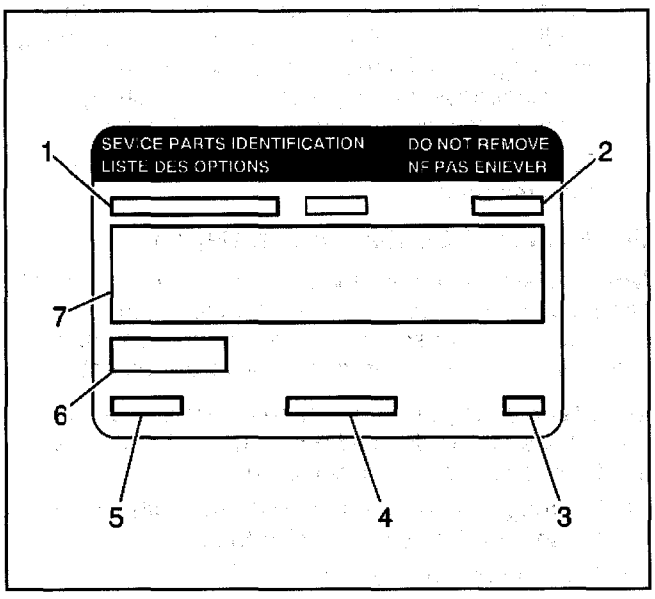
Introduction

Caution: Exposure to isocyanates during paint preparation and application processes can cause severe breathing problems. Read and follow all of the instructions from the manufacturers of painting materials, equipment, and protective gear.

Important: Always refer to the GM Approved Refinish Materials book GM P/N 4901M-D. This book identifies the paint systems you may use.

The basecoat/clearcoat paint is factory applied in the following 4 layers in order to give the finish a high gloss look:

1. A cathodic immersion primer
2. A primer/surfacer
3. A basecoat
4. A clear top coat (clearcoat)



65485

Legend

(1) Vehicle Identification Number
(2) Engineering Model Number (Vehicle Division, Vehicle Line and Body Style)
(3) Interior Trim and Decor Level
(4) Exterior (Paint Color) WA Number
(5) Paint Technology
(6) Special Order Paint Colors and Numbers
(7) Vehicle Option Content

Refer to Service Parts Identification in General Information in order to identify the type of top coat on the vehicle. This label contains all paint related information for the vehicle. This includes paint technology, paint codes, trim level, and any special order paint colors.

Repair Instructions

Clearcoat Repair w/o Repainting

Notice: Refer to *Clearcoat/Ultraviolet Screeners Notice* in Cautions and Notices.

Important:

- Avoid washing vehicles in direct sunlight.
- Avoid using strong soaps or chemical detergents.
- Use brushless type automatic car wash equipment.
- Avoid using products containing acids (unless specified in order to correct a condition such as rail dust).
- Do not use brushes or brooms in order to remove snow or ice from vehicles in storage or on lots.
- Cleaning agents and water should be dried promptly and not allowed to dry on the surface.

  Drying with a soft chamois is recommended.
- Standing rinse water should be dried promptly and not allowed to dry on the surface.

  Drying with a soft chamois is recommended.
- Do not polish vehicles unless a surface condition exists that can only be corrected by polishing. Refer to *Clearcoat Repair Specifications - Meguiar Products* or *Clearcoat Repair Specifications - 3M Products*.
- If a surface condition does exist, the repair approach should be one of less is best (the very least it takes to correct the condition).
- Avoid removing too much clear coat (whenever possible, use paint gauges before, during and after polishing). Refer to *Paint Gauges*.
- Use only the products recommended in this procedure (or their equivalent). Refer to *Clearcoat Repair Specifications - Meguiar Products* or *Clearcoat Repair Specifications - 3M Products*.
- Ensure that any power polishing equipment does not exceed the requirements in the polish manufacturers recommendations. The final process step typically uses an orbital type polisher with speeds of 1,500–2,000 RPM. Refer to *Clearcoat Repair Specifications - Meguiar Products* or *Clearcoat Repair Specifications - 3M Products*.
- Do not use wax or silicone type products in order to hide swirl marks (this damage will reappear later and cause customer dissatisfaction).
- Specific conditions on the paint (environmental damage, rail dust, etc.) may be corrected by:
  - Refer to *Environmental Fallout (Acid Rain)*.
  - Refer to *Rail Dust Damage Repair*.

1. Thoroughly wash the repair area with Liquid Wash and Wax GM P/N 1052870 or the equivalent.
2. Readings of the paint film build should be taken prior to the operation. Refer to *Paint Gauges*.

3. Apply a small amount of the appropriate material to repair area and smear evenly with the pad. Refer to *Clearcoat Repair Specifications - Meguiar Products* or *Clearcoat Repair Specifications - 3M Products.*
4. With the polisher running at approximately 1,500–2,000 RPM, polish the repair area. Keep the pad flat against the panel while applying heavier pressure for 4–6 seconds. Then, polish with lighter pressure for 6–8 seconds. Feature lines and panel edges should be hand-rubbed in order to avoid burn-through.
5. Inspect the repair area frequently. Add more of the appropriate material as needed.
6. Always blend or feather the outer edges of the repaired area.
7. After buffing, inspect the repaired area.
8. If swirls are still visible, repeat the buffing procedure.
9. Clean the repaired area using a clean soft, non-scratching cloth with a 50/50 mixture of Isopropyl Alcohol and water.
10. If sanding is required, refer to *Clearcoat Repair Specifications - Meguiar Products* or *Clearcoat Repair Specifications - 3M Products.*

Environmental Fallout (Acid Rain)

Since the severity of the condition varies from area to area, proper diagnosis of the damage extent is critical to the success of repairs. Perform diagnosis under high intensity fluorescent lighting, on horizontal surfaces (hood, roof panel, rear compartment lid) after the surfaces have been properly cleaned. There are 3 basic types of acid rain damage:

Surface Level Contamination: May be repaired by simply washing the vehicle, cleaning the surface with a silicone, wax and grease remover, neutralizing acidic residue and finesse polishing. Refer to Surface Level Contamination Repair in this procedure.

Clearcoat Etching: Slight etching still noticeable after the above washing and finesse polishing procedure. Refer to Slight Clearcoat Damage — Wet Sanding, Finesse Polishing in this procedure.

Basecoat Etching: Severe etching beyond the clearcoat into the basecoat. Refer to *Basecoat/Clearcoat Paint Systems.*

Slight Clearcoat Damage — Wet Sanding, Finesse Polishing

Notice: Removing more than 0.5 mils of the clearcoat can result in early paint failure. The clearcoat contains ultraviolet screeners. Do not finesse sand more than what is required to remove the defect.

Important: Always refer to manufacture's packaged instructions for the detailed procedures of materials used for compounding or polishing.

1. Select a small test area on the damaged panel.
2. Readings of the paint film build should be taken prior to the operation. Refer to *Paint Gauges.*
3. Wet sand the damaged area using an ultra-fine sandpaper and rubber sponge sanding block. Refer to the manufacturer's instructions for detailed procedures for the materials used in the repairs. During the wet sand process:
   3.1. Use ample amounts of water.
   3.2. Work slowly in order to prevent removing too much clearcoat.
4. Remove the excess water with a rubber squeegee and inspect the area. If wet sanding has repaired the damage, continue the sanding procedure on the entire panel.
5. Apply a finesse-type polish with a foam pad. Remove any swirl marks with a dual action orbital polisher and foam pad. Refer to *Clearcoat Repair Specifications - 3M Products* or *Clearcoat Repair Specifications - Meguiar Products.* If (during the repair) you suspect or observe that etching has penetrated into the basecoat, too much clearcoat has been removed during sanding or base color is transferred to pad during polishing, the affected areas may require clearcoat/basecoat application or refinishing. Refer to *Basecoat/Clearcoat Paint Systems.*
6. Polish the entire vehicle after all damage has been repaired.

Surface Level Contamination Repair

Notice: Removing more than 0.5 mils of the clearcoat can result in early paint failure. The clearcoat contains ultraviolet screeners. Do not finesse sand more than what is required to remove the defect.

Important: Always refer to manufacture's packaged instructions for the detailed procedures of materials used for compounding or polishing.

1. Thoroughly wash the repaired area with Liquid Wash and Wax GM P/N 1052870.
2. Dry the area thoroughly.
3. Clean the affected area with silicone, wax and grease remover.
4. Neutralize left over acidic residue by cleaning damaged areas with mixture of baking soda and water (1 tablespoon of baking soda per 1 quart of water). Rinse thoroughly and dry the panel completely.
5. Apply finesse-type polish with a foam panel. If damage has been repaired, remove any swirl marks with dual action orbital polisher and foam pad. Refer to *Clearcoat Repair Specifications - 3M Products* or *Clearcoat Repair Specifications - Meguiar Products.*
6. If some damage remains, refer to Slight Clearcoat Damage—Wet Sanding, Finesse Polishing in this procedure.

Paint Gauges

Use a paint gauge before, during and after the sanding process in order to accurately measure how much clearcoat has been removed. Paint gauges measure the total thickness of the finish and when used, determine how much clearcoat has been removed during the repair process. Paint gauges range from magnetic pull type to sophisticated electronic types and are available from a variety of sources. The older magnetic type gauges, at best have a 5 percent accuracy range and are not sensitive enough to detect removal of 0.020 mm 0.5 mil; (0.0005 in) clearcoat. The newer type magnetic gauges have improved accuracy ranges. Most gauges are confined to checking either ferrous metal (steel) or non ferrous metal (aluminum) panel. At this time, there are no viable gauges for reading film thickness on composite (SCM Doors, RIM Fenders) panels. The more sophisticated (ETG) electronic paint thickness gauges digital type gauges are able to read film thickness on both ferrous and non-ferrous metal panel. Digital (ETG) gauges may have an accuracy range of 1 percent and include thickness standards for recalibration. The following paint thickness gauges are available. Call 1-800-GM-TOOLS for information:

Paint Thickness Gauges

- 147–5437–ETG Standard Model
- 147–5437–ETG-P Standard model with print option.
- 147–5437–N-ETG-N Non-ferrous model for aluminum panels
- 147–5437–NP-ETG-NP Non ferrous model with print option
- 147–54437–SD-ETG Steel and aluminum gauge

Clearcoat Thickness

The clearcoat on the vehicle is typically 0.059– 0.078 mm (1.5– 2 mils; 0.0015–0.0020 in.) thick. The clearcoat contains ultraviolet screeners. Removing more than 0.5 mils (0.019 in.) of the clearcoat may result in early paint failure.

Rail Dust Damage Repair

Caution: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

Important: If rail dust has penetrated into the basecoat, the panel requires refinishing. Ensure all the rail dust has been removed prior to refinishing or the rust spots will return.

Rail dust damage comes from the tiny iron particles produced from the friction between the train wheels and the track. It can also be deposited on vehicles if stored near any operation producing iron dust (i.e., steel ore yards). This dust can either lay on top of, or embed into the paint surface. It is usually diagnosed as bumps in the paint surface or rust colored spots in the paint.

1. Move the vehicle to a cool shaded area and ensure the vehicle surfaces are cool during the removal process.
2. Thoroughly wash the repair area with Liquid Wash and Wax GM P/N 1052870 or the equivalent.
3. Wipe the area dry.
4. Clean the affected area with silicone, wax and grease remover.
5. Perform the removal process according to the manufacturer's directions of the type of repair material used (Gel Type Oxalic Acid or Clay Type Non-Acid Based). If, upon inspection, some particles are still present, the process may be repeated. If the damage has been repaired, complete the repair to the entire panel.
6. Polish the entire panel after the removal process. Refer to *Clearcoat Repair Specifications - 3M Products* or *Clearcoat Repair Specifications - Meguiar Products*. If small pits remain in the clearcoat after all of the damage has been repaired, refer to *Clearcoat Repair w/o Repainting*.

Frame and Underbody

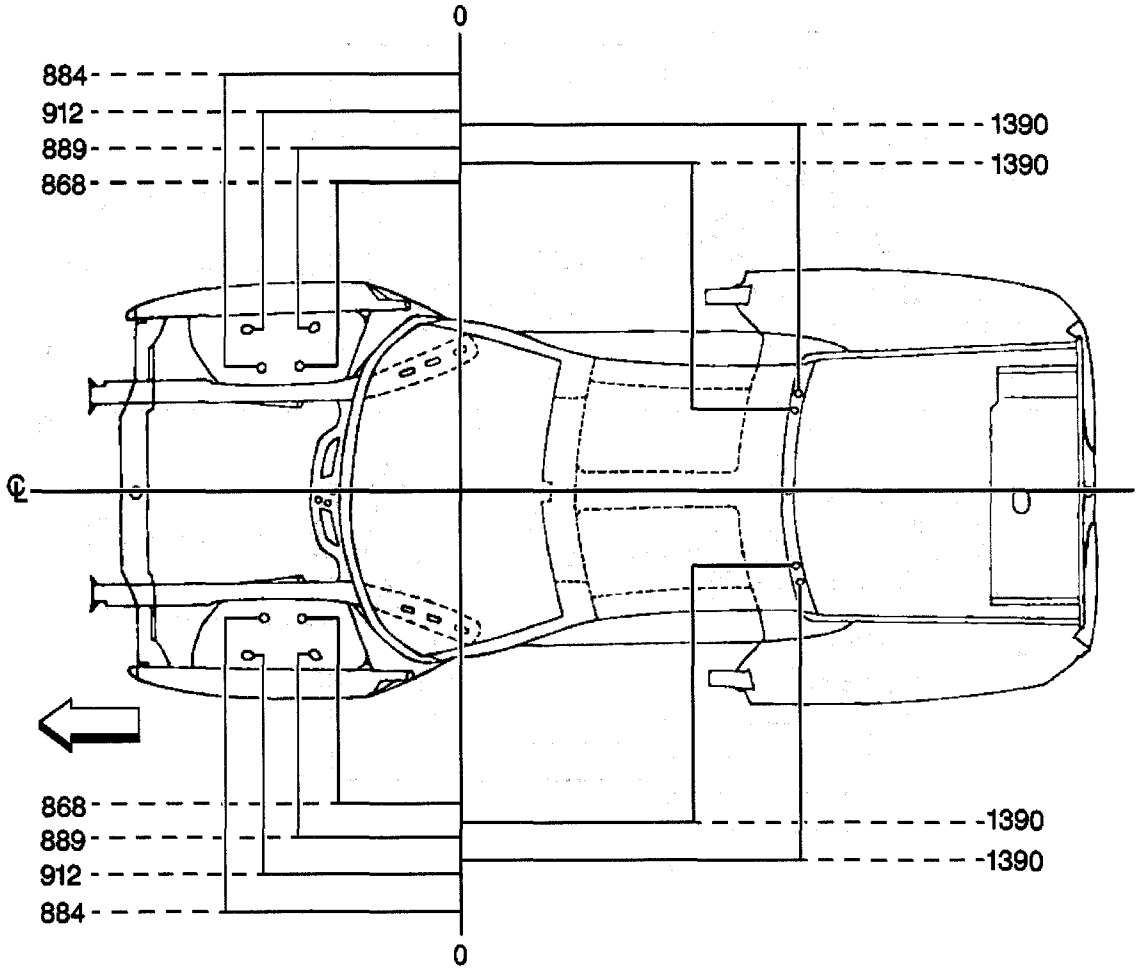
Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Brake Pipe Clip Bolt	13 N·m	115 lb in
Floor Panel Center Reinforcement Bolt	27 N·m	20 lb ft
Front Crossmember Bolt (Lower)	125 N·m	92 lb ft
Front Crossmember Bolt (Upper)	145 N·m	107 lb ft
Crossmember Brace Bolt	29 N·m	21 lb ft
Tow Hook Bolt	205 N·m	151 lb ft
Tow Hook Reinforcement Nut	70 N·m	52 lb ft
Transmission Support Bolt	90 N·m	66 lb ft
Transmission Mount Nut	57 N·m	42 lb ft

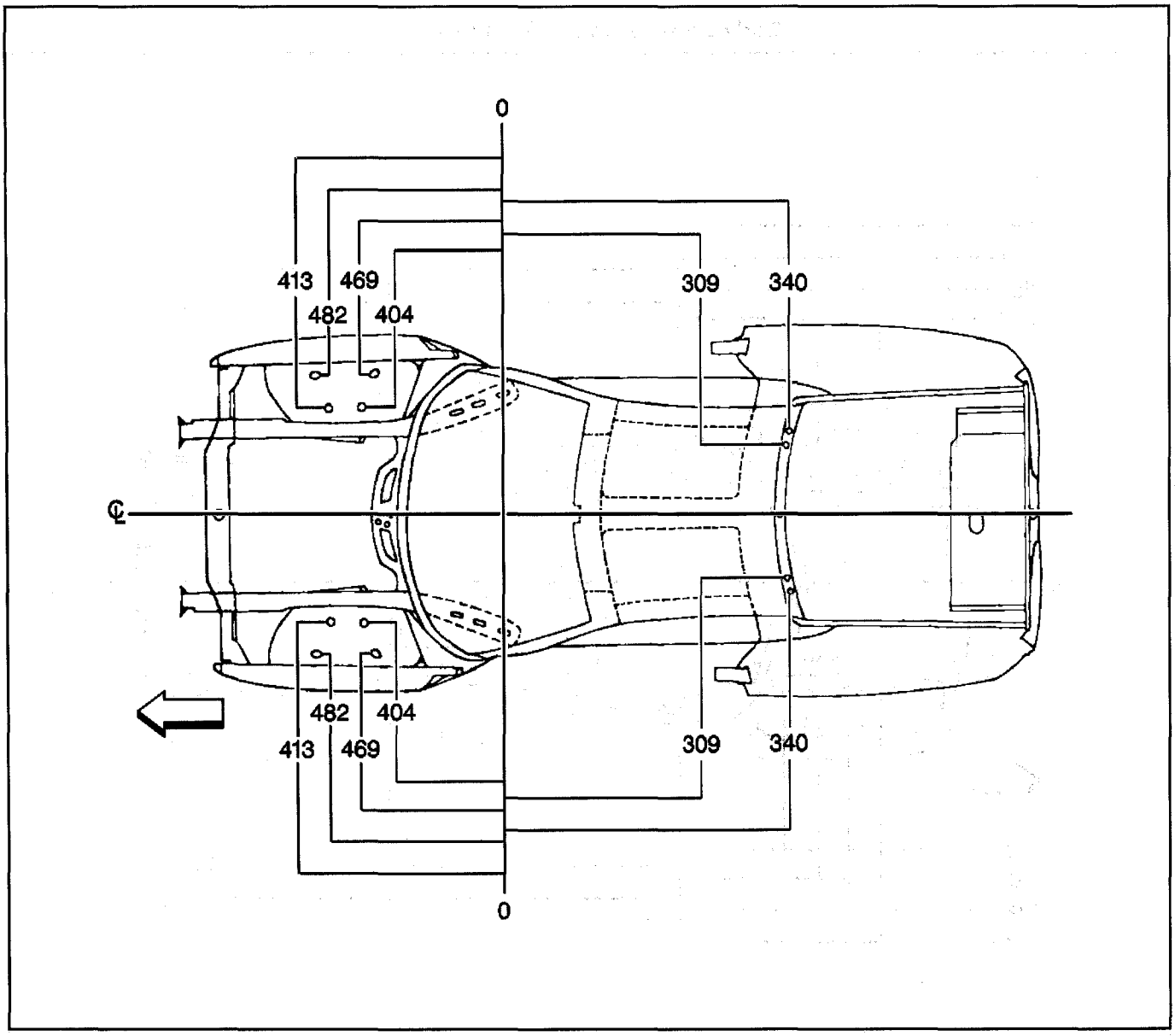
Dimensions - Body

Body Dimensions – Top (Height)



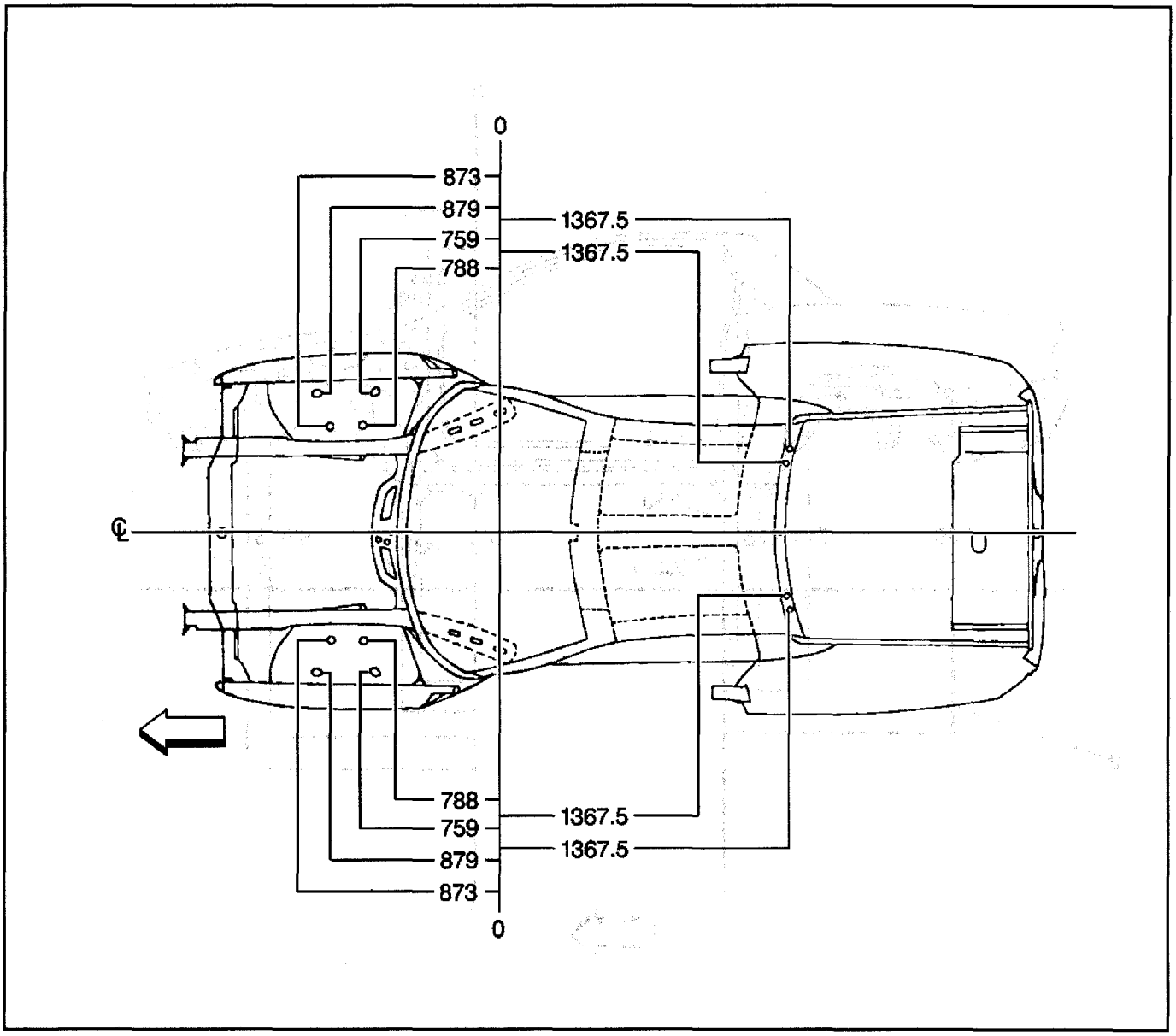
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Body Dimensions – Top (Width)



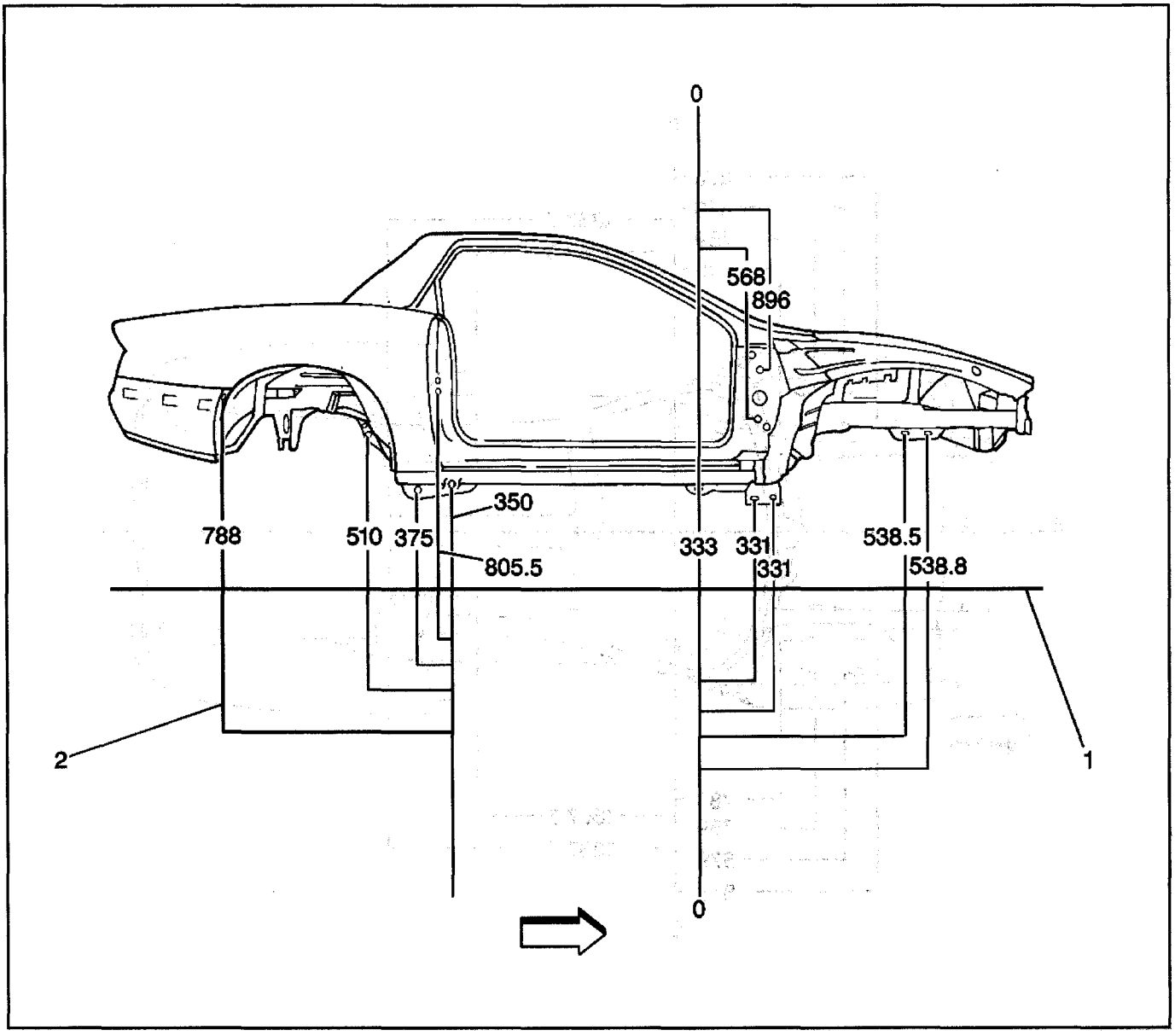
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Body Dimensions – Top (Length)



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Body Dimensions – Right Side (Height)



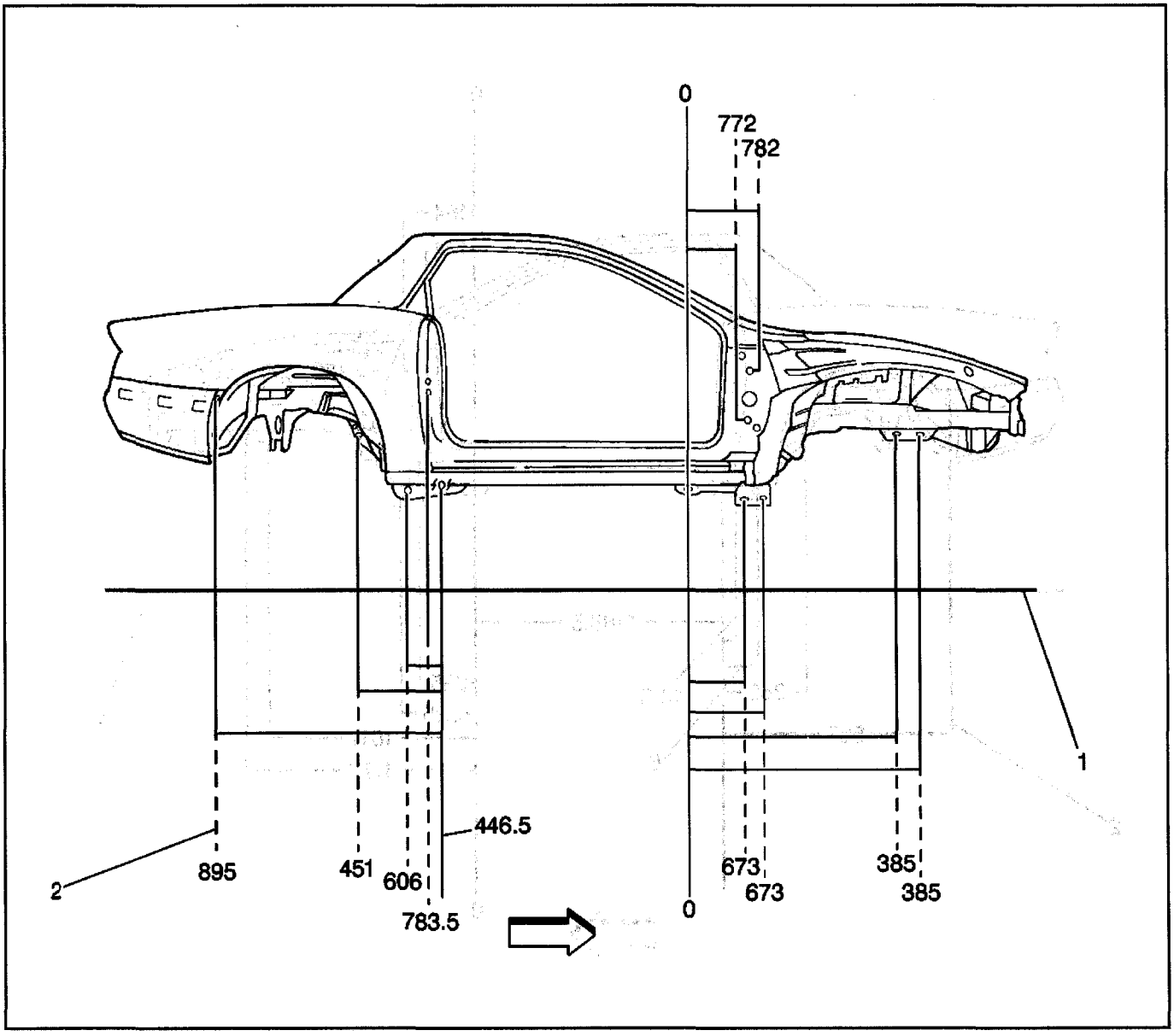
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Legend

(01) Datum Line

(02) Chevrolet

Body Dimensions – Right Side (Width)



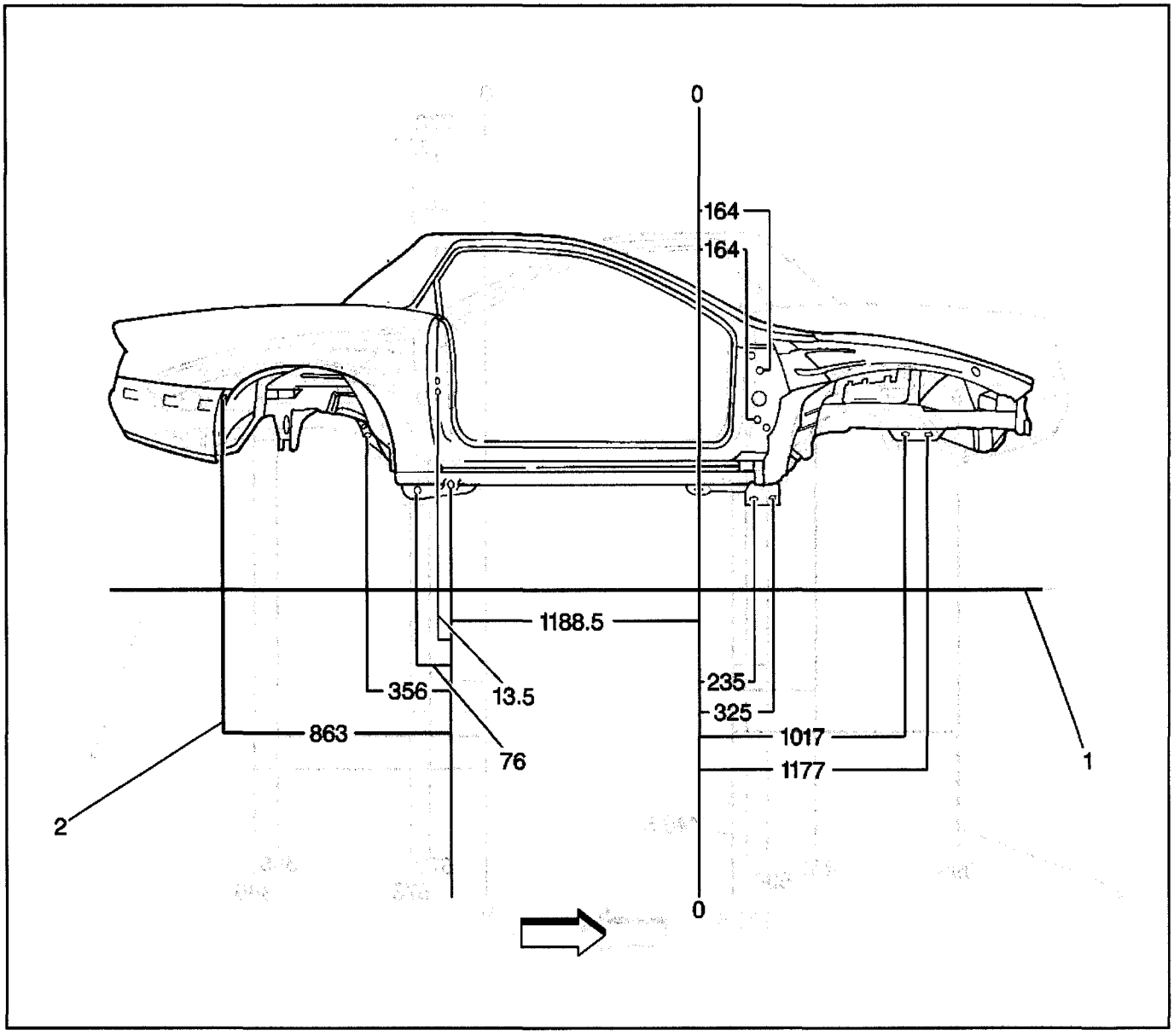
497763

Legend

(01) Datum Line

(02) Chevrolet

Body Dimensions – Right Side (Length)



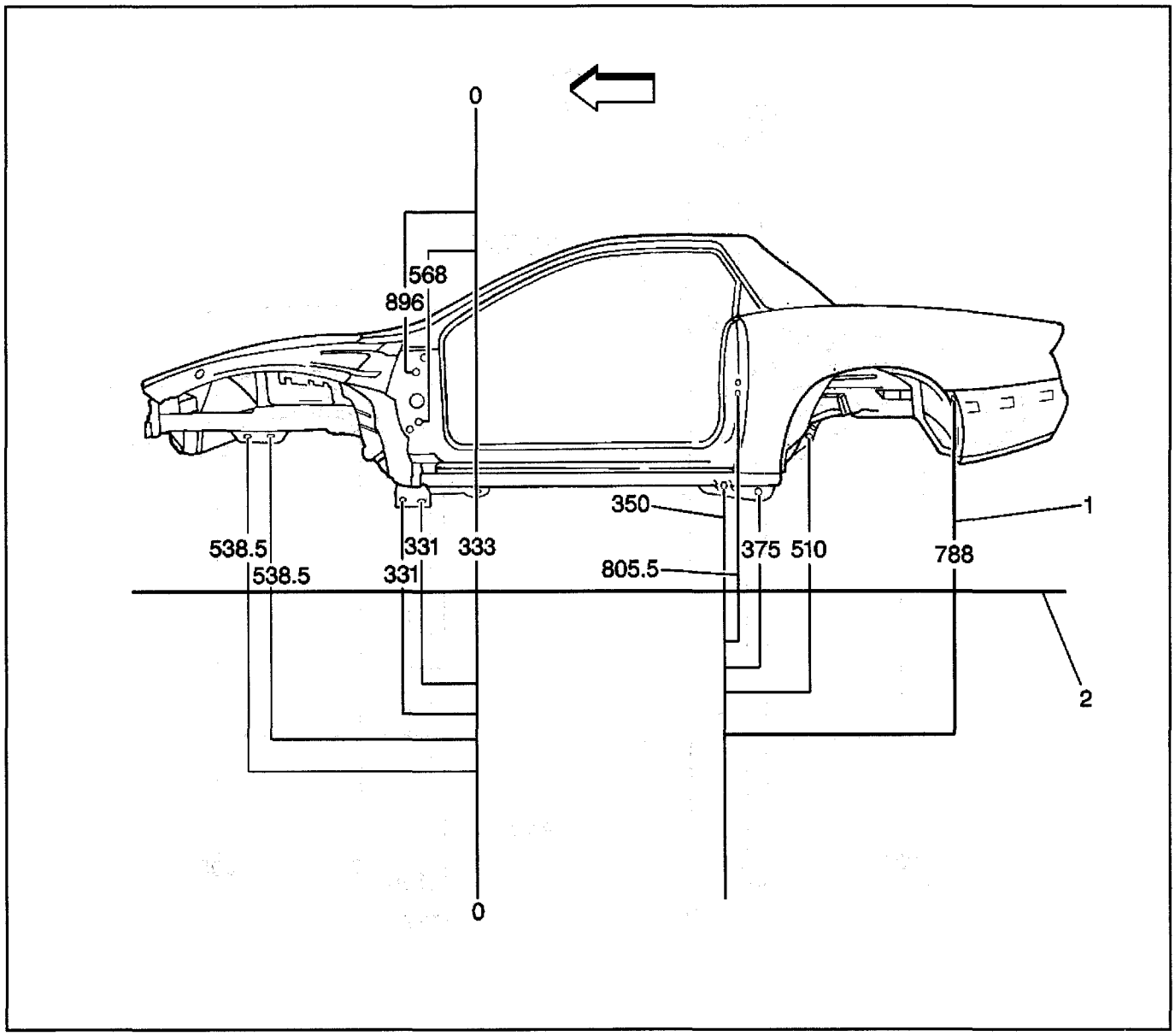
497764

Legend

(01) Datum Line

(02) Chevrolet

Body Dimensions – Left Side (Height)



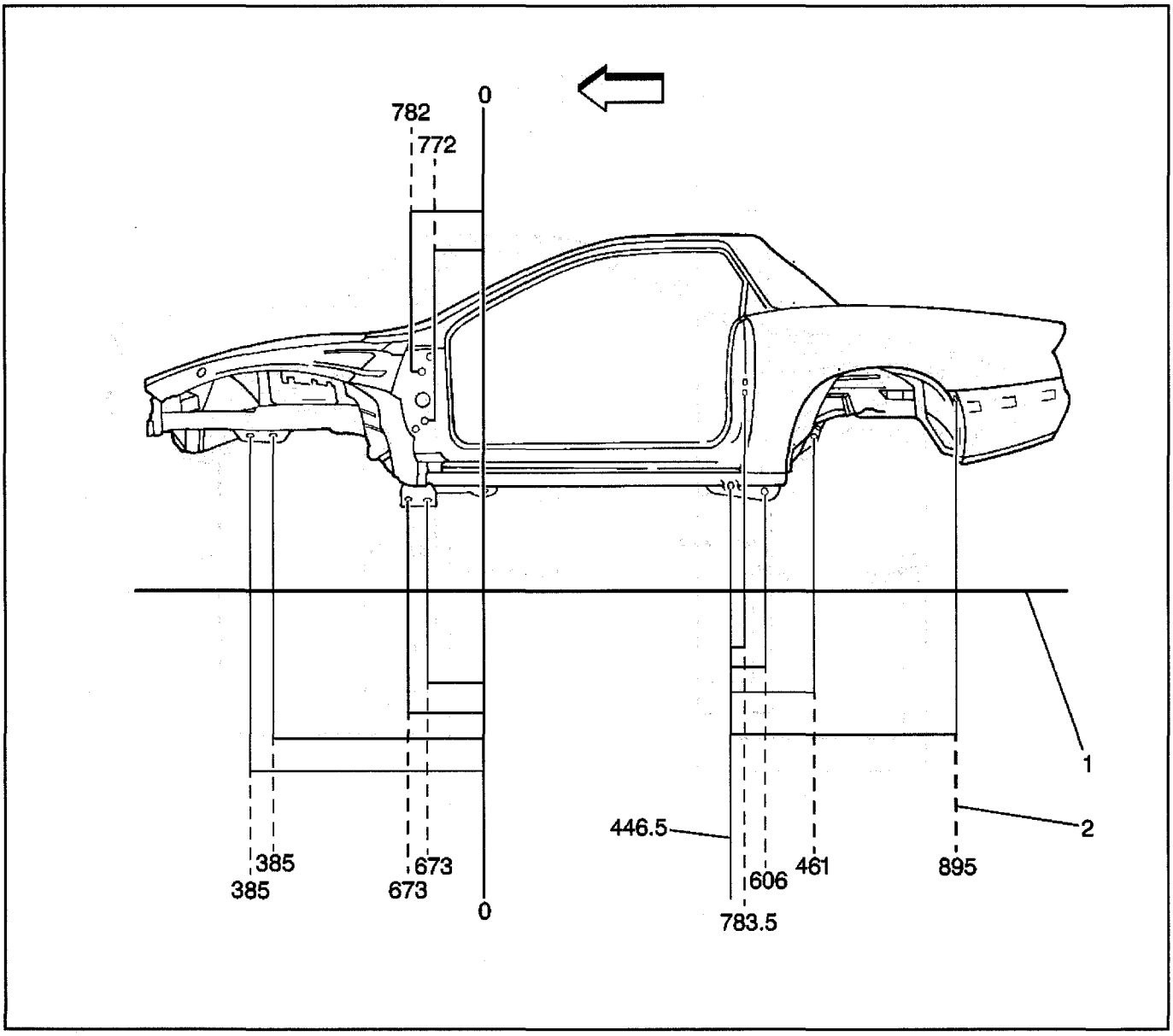
497766

Legend

(01) Chevrolet

(02) Datum Line

Body Dimensions – Left Side (Width)



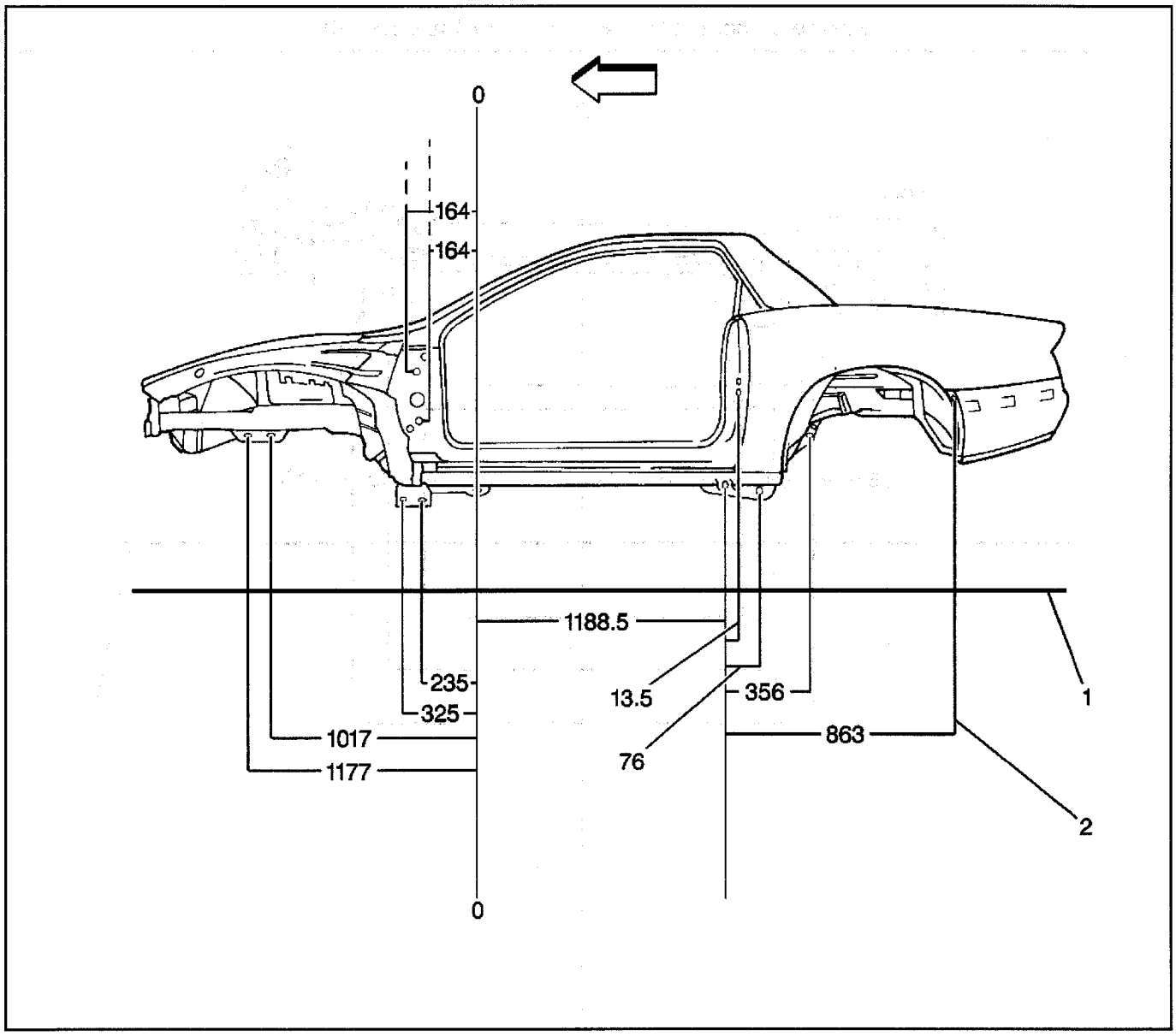
497767

Legend

(01) Datum Line

(02) Chevrolet

Body Dimensions – Left Side (Length)



497768

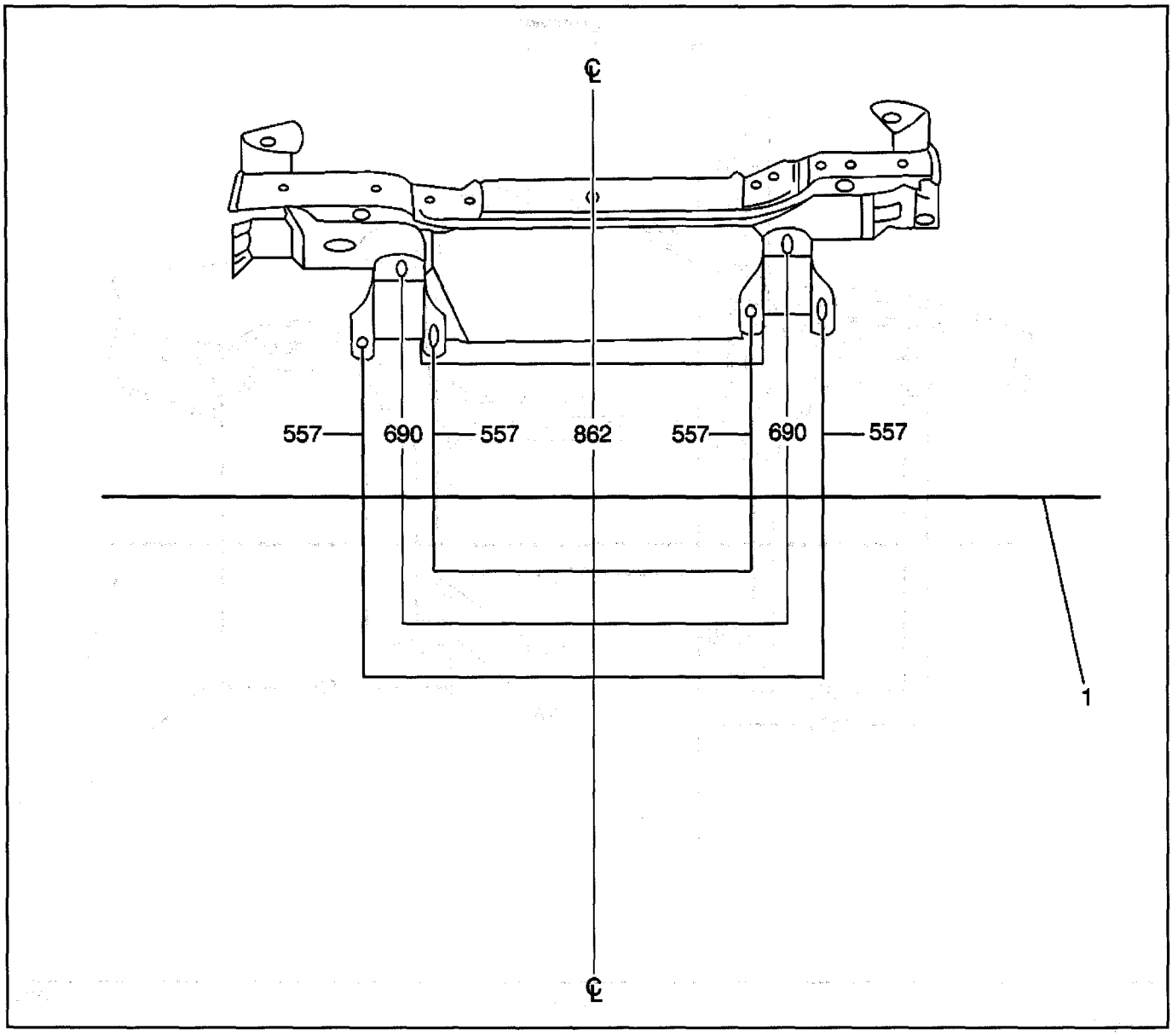
Legend

(01) Datum Line

(02) Chevrolet

Dimensions - Frame

Frame Dimensions – Front, Front View (Height)

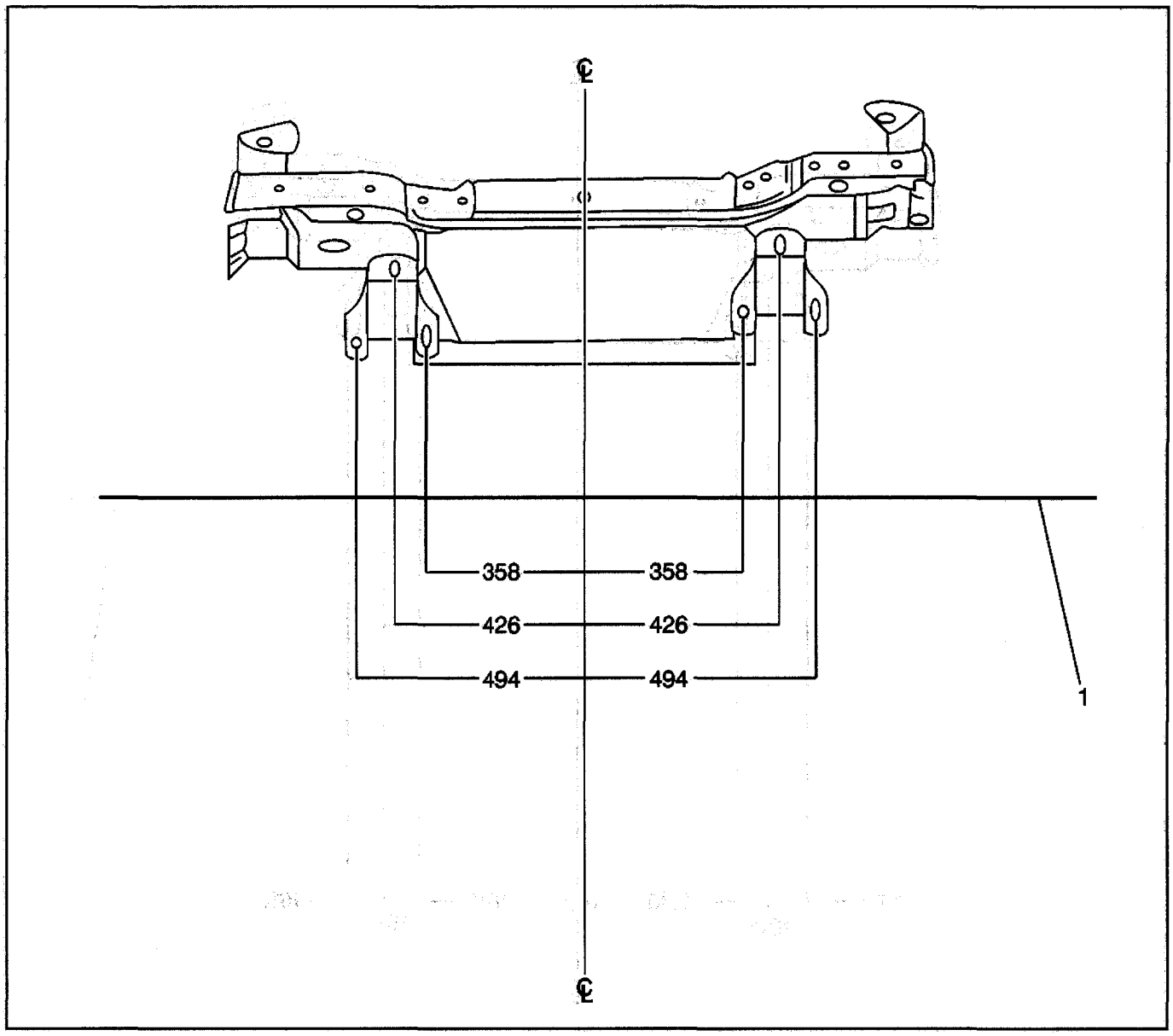


497769

Legend

(01) Datum Line

Frame Dimensions – Front, Front View (Width)

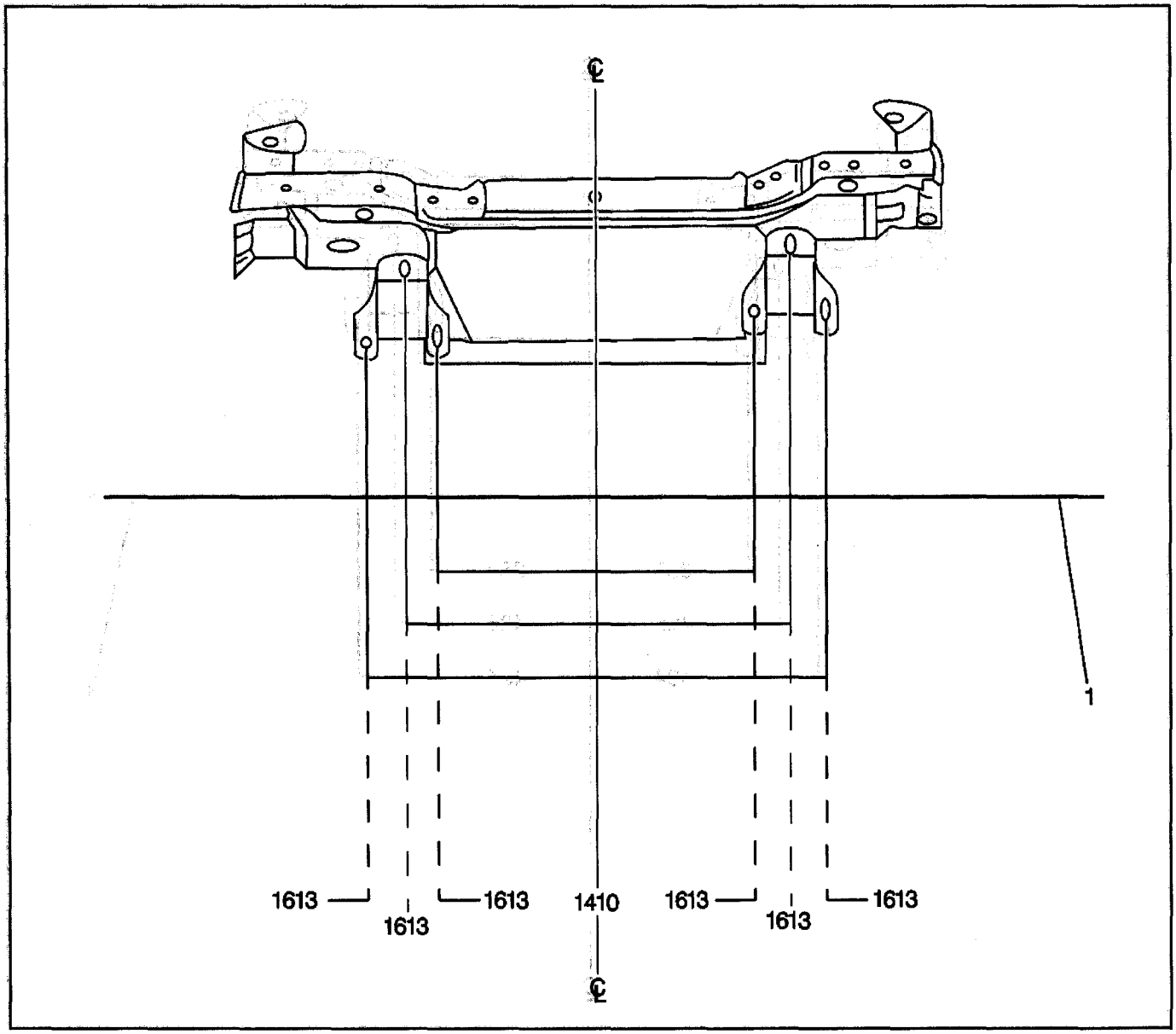


497770

Legend

(01) Datum Line

Frame Dimensions – Front, Front View (Length)

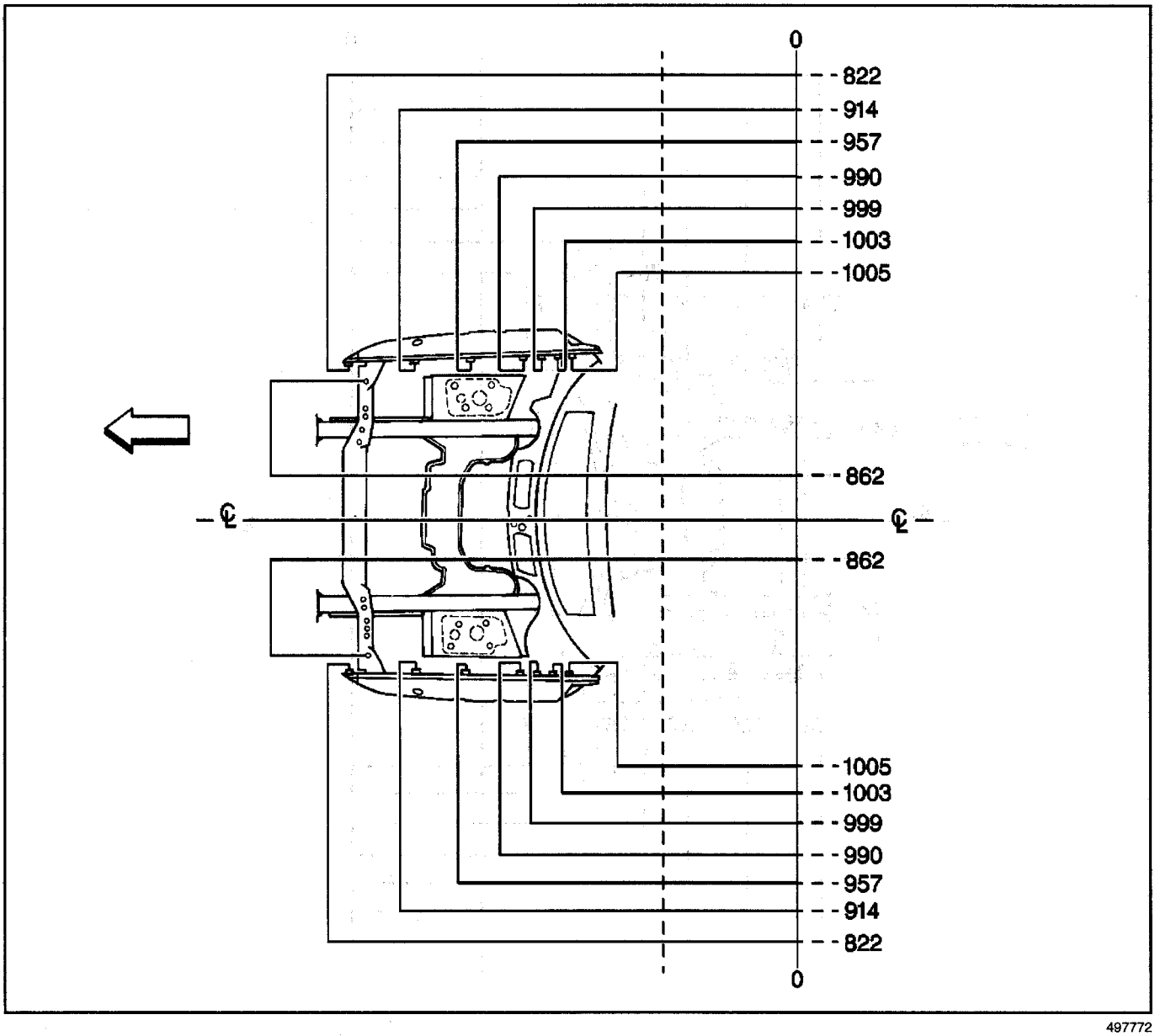


497771

Legend

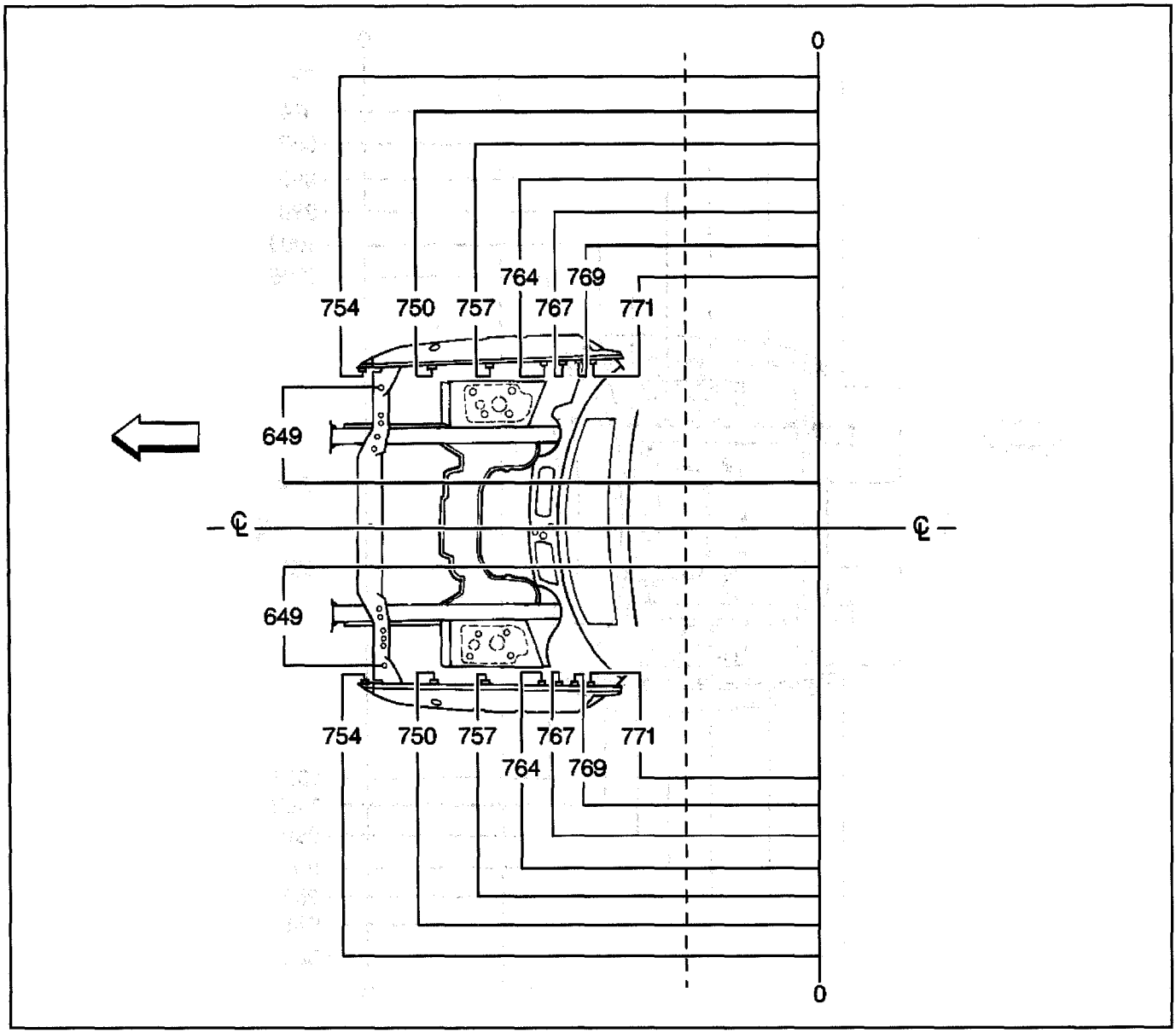
(01) Datum Line

Frame Dimensions – Front, Top View (Height)



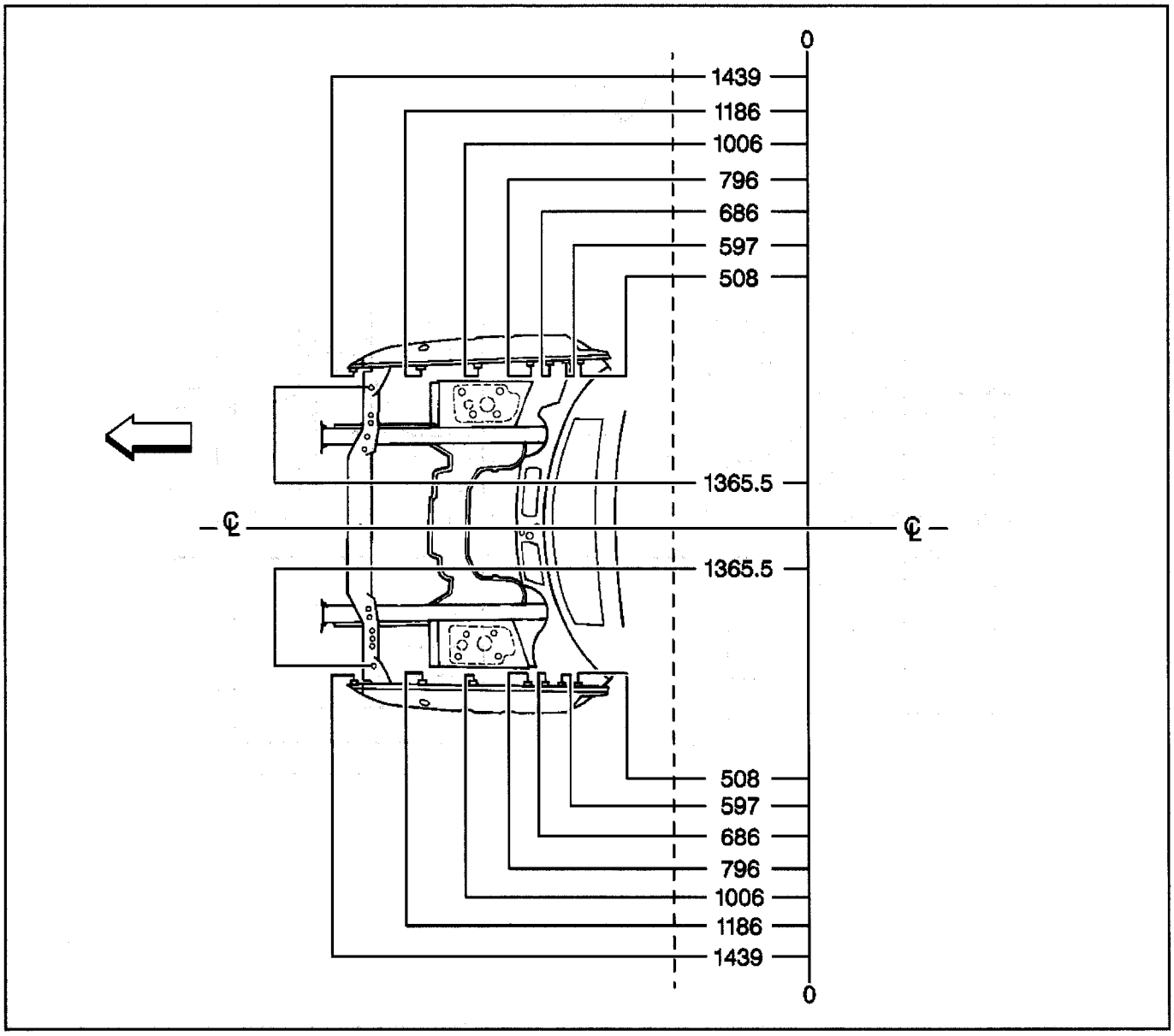
497772

Frame Dimensions – Front, Top View (Width)



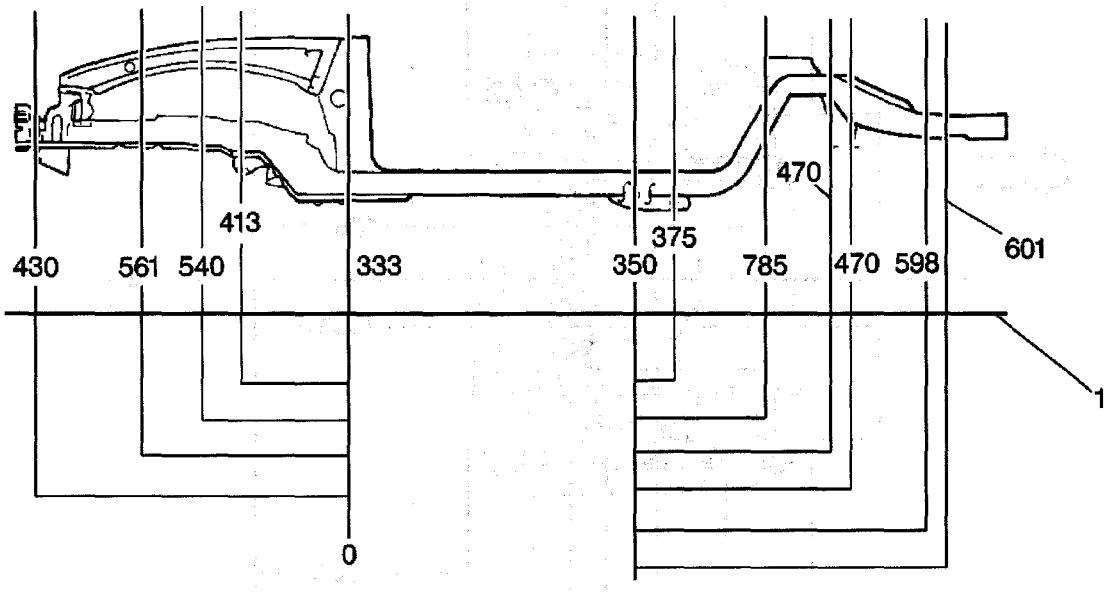
497777

Frame Dimensions – Front, Top View (Length)



497778

Frame Dimensions – Underbody (Height)

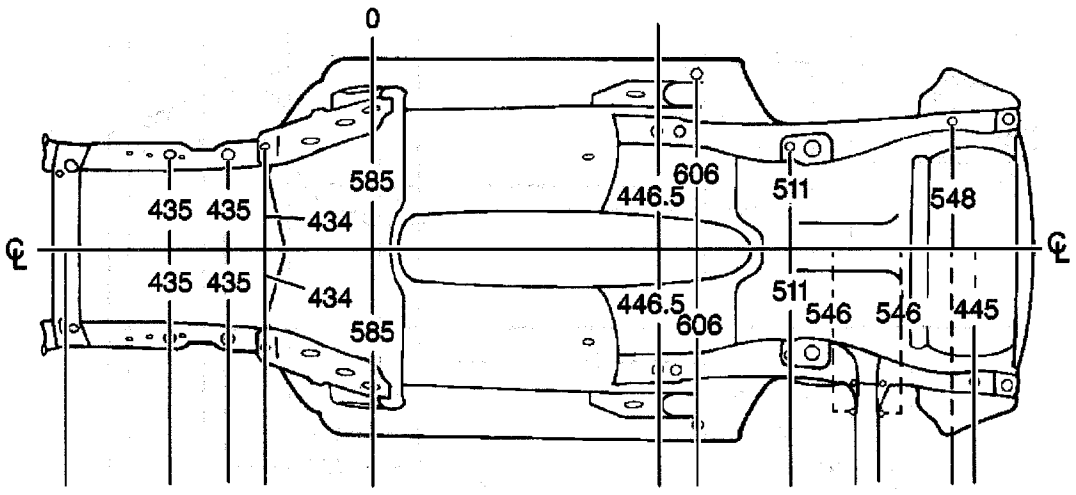


497779

Legend

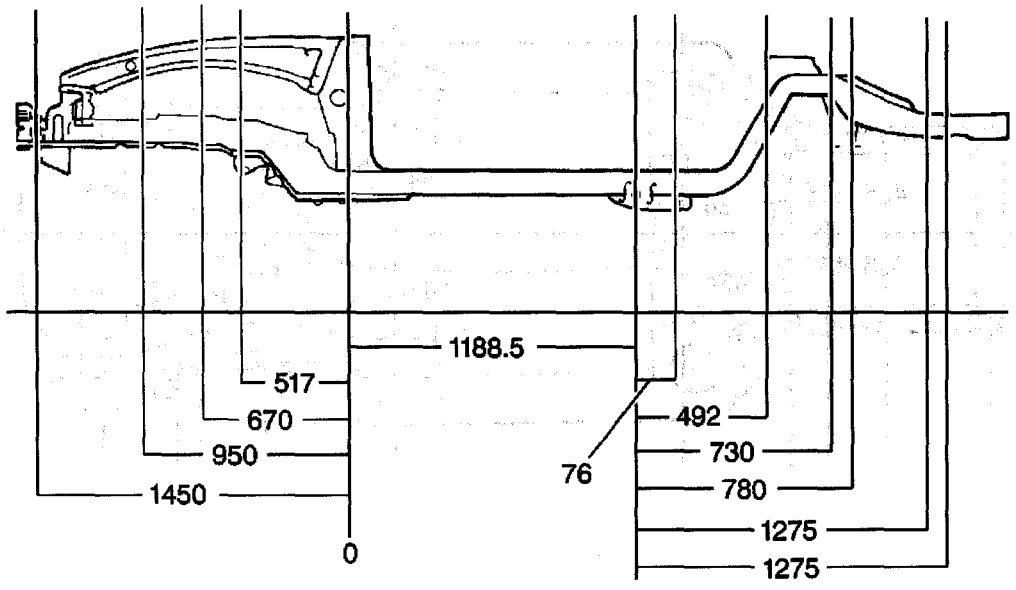
(01) Datum Line

Frame Dimensions – Underbody (Width)



497780

Frame Dimensions – Underbody (Length)



497782

Reference Points - Symmetrical

Symmetrical reference points are two corresponding points on opposite sides of the centerline that have equal specifications in length and height. Symmetrical reference points are used in order to make quick inspections in order to determine underbody structural damage. All measurements provided in the dimensions charts are symmetrical unless otherwise noted.

Reference Points - Asymmetrical

When two corresponding reference points have different measurements, the measurements are asymmetrical. If you perform a quick cross-check and the measurements are unequal, use the dimensions charts in order to verify it the measuring points are symmetrical or asymmetrical.

Diagnostic Information and Procedures

Alignment Checking

If a vehicle is involved in an accident that may result in a bent or sprung frame, inspect the vehicle for the following conditions:

- Proper frame alignment
- Steering geometry
- Wheel alignment

There are two different methods for determining vehicle measurements:

- The tram gauge method
- The three-dimensional method

Tram Gauge Method

A tram gauge is a quick reference for determining vehicle damage. The tram gauge set requires a vertical pointer that is capable of reaching 914 mm (36 in). Measure the engine compartment components from point to point using the vertical pointers equally set. Use the vertical pointers in order to make other measurements on the horizontal plane of the datum line, parallel to the underbody. Ensure that the pointers are set as specified for each point. When measuring dimensions to the gauge holes, measure to the center of the holes flush to the adjacent surface metal. Cross-check the diagonal dimensions in order to verify the dimensional accuracy of the vehicle underbody.

Three-Dimensional Method

If you are measuring the structural repair, ensure that the repair equipment is capable of simultaneously measuring the following multiple points:

- The height
- The length
- The width

Measure the vehicle body in order to obtain accurate comparisons to the vehicle structure. Universal measuring systems combine the use of equipment and techniques in order to make underbody and upperbody three dimensional measurements. The universal system provides accurate simultaneous measurements of the following items:

- Height
- Length
- Width

Checking Frame to Body Alignment

A misaligned frame may move up or down or to the side of where the rail should be. These possibilities must be checked.

The easiest way to check body alignment is with tramming gauges and universal measuring systems made for this purpose. Detailed instructions are normally supplied at the time of purchase. Instructions for equipment usage are not given in this manual.

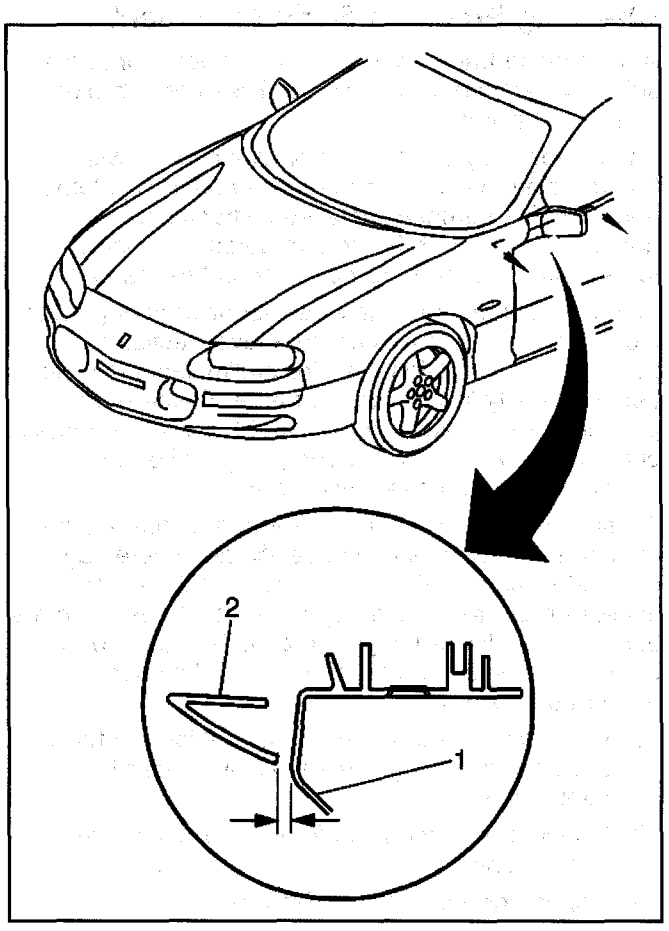
Whether alignment is checked with or without gauges, the vehicle must be parked on a level section of floor. Certain conditions call for preliminary inspections before actually inspecting the frame. Suspension problems may make it appear that the vehicle frame is out of alignment. A weak spring may make the vehicle appear to have a twisted frame.

A visual inspection of the top and the bottom flanges of each rail may reveal the specific are where sag or buckle exists. In the case of sag, wrinkles may appear on the top of the upper flange. Wrinkles on the bottom of the lower flange are definite evidence of buckle. To inspect the frame to body alignment perform the following:

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Inspect the suspension for worn or damaged components.
3. Inspect for floor pan for damage.
4. Inspect for frame damage.
5. If the frame can not be re-aligned, replacement may be necessary.

Inspect the frame to body alignment by inserting a 19 mm (0.75 in) diameter guide pin or drill bit into the frame to body bolt holes.

Repair Instructions



392196

Measurements - Body (Body Front End)

Below are the body front end fit requirements for Chevrolet and Pontiac, all specifications apply to both vehicles unless otherwise specified.

1. Measure the gap between the outside rearview mirror (1) and the front fender (2). (Chevrolet only)

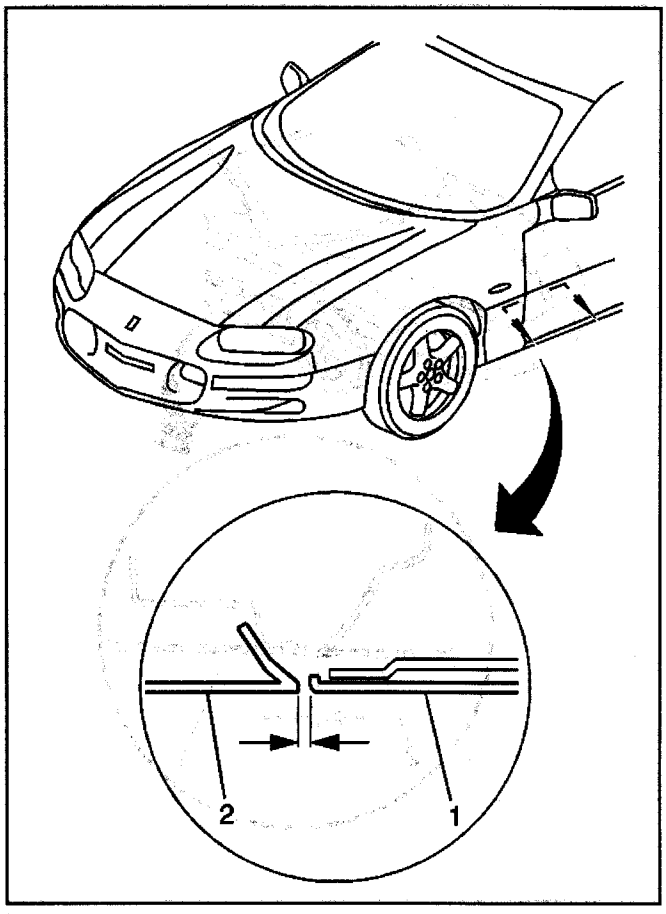
   Specification

   Gap specification is 10.7 mm (+/– 3.0 mm), 0.42 in (+/– 0.12 in).

2. Measure the gap between the door (1) and the front fender (2). (Chevrolet only)

Specification

Gap specification is 5.0 mm (+/- 1.5 mm), 0.197 in (+/- 0.06 in).

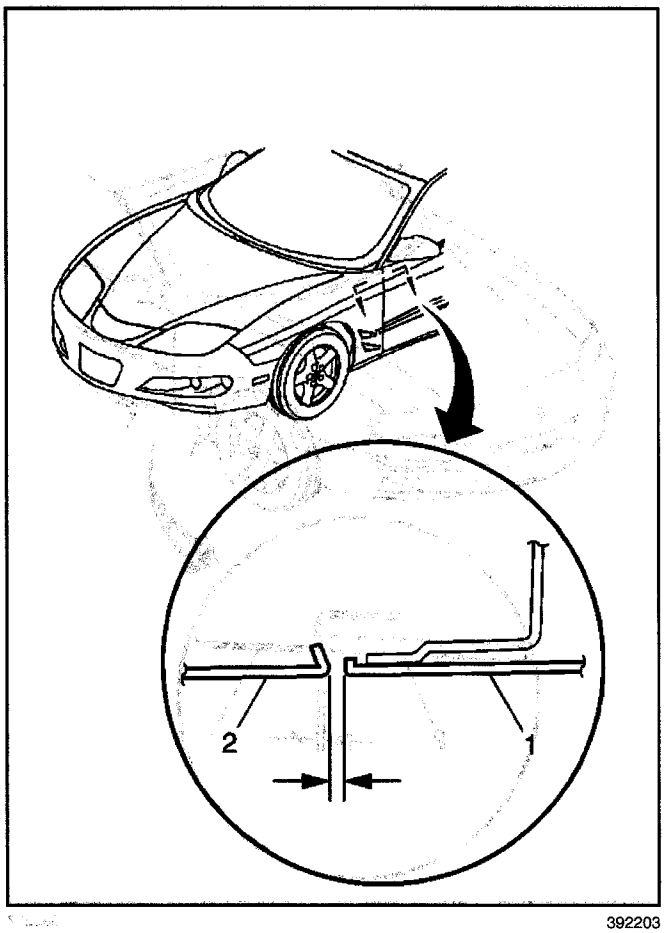


392200

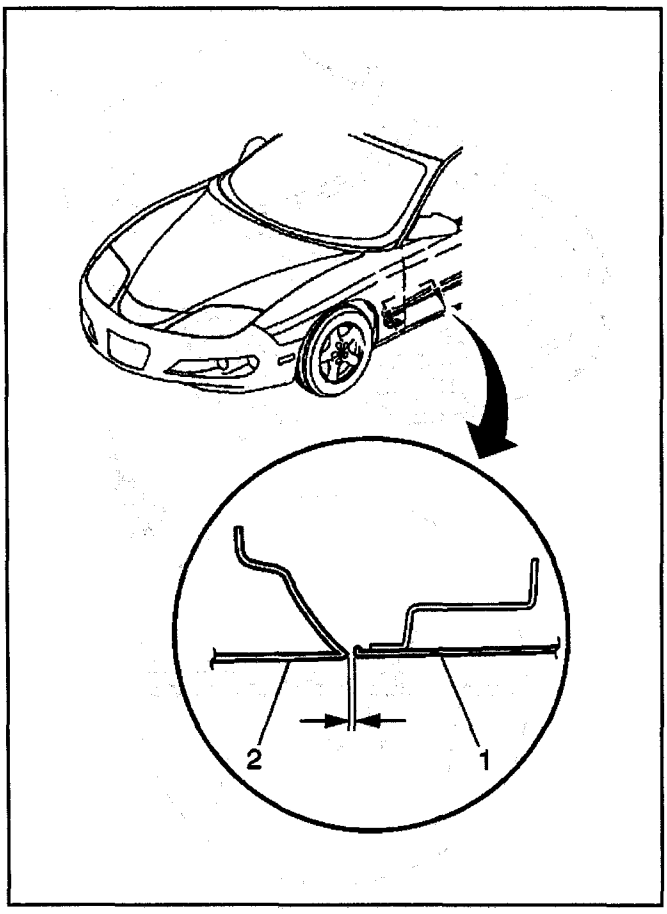
3. Measure the gap between the door (1) and the front fender (2). (Pontiac only)

Specification

Gap specification is 7.0 mm (+/- 5.0 mm), 0.276 in (+/- 0.197 in).



392203

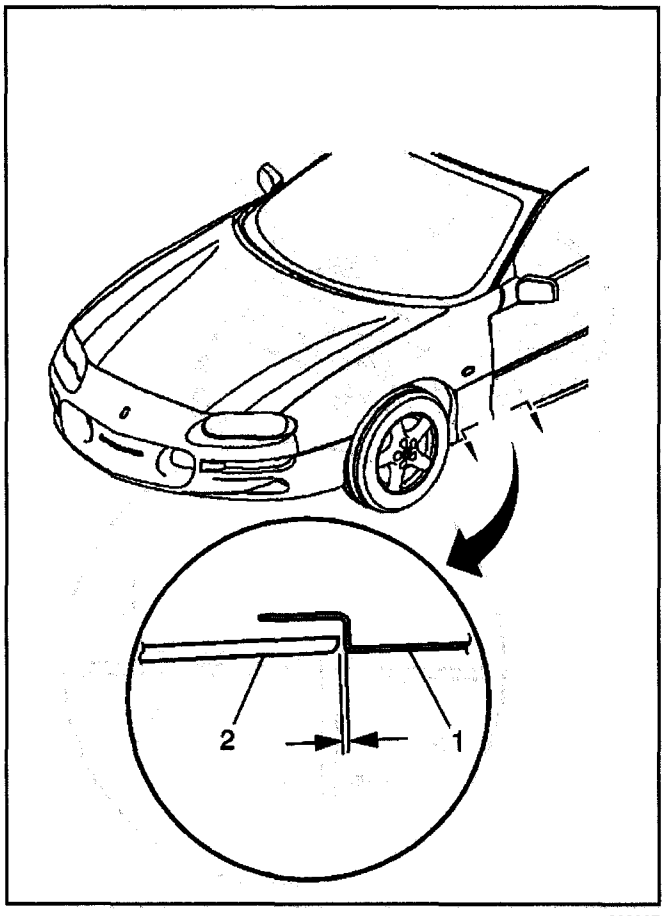


392204

4. Measure the gap specification between the door (1) and the front fender (2). (Pontiac only)

Specification

Gap specification is 5.0 mm (+/- 1.5 mm), 0.197 in (+/- 0.06 in).



392207

5. Measure the gap between the rocker panel (10 and the front fender (2).

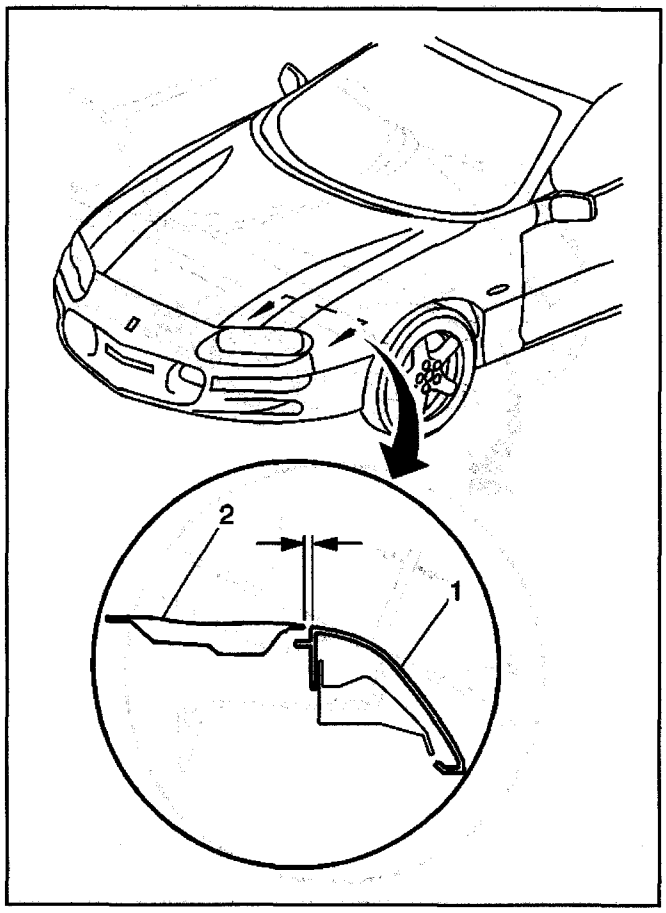
Specification

Gap specification is 2.5 mm (+/- 2.5 mm), 0.098 in (+/- 0.098 in).

6. Measure the gap between the front fender (1) and the hood (2).

Specification

Gap specification is 4.0 mm (+/- 1.5 mm), 0.158 in (+/- 0.06 in).

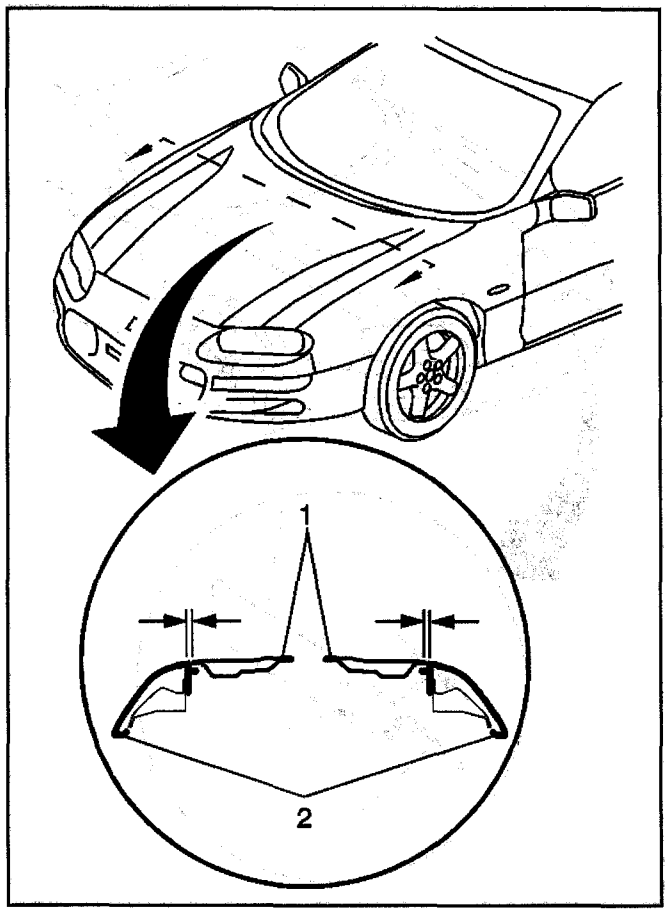


392210

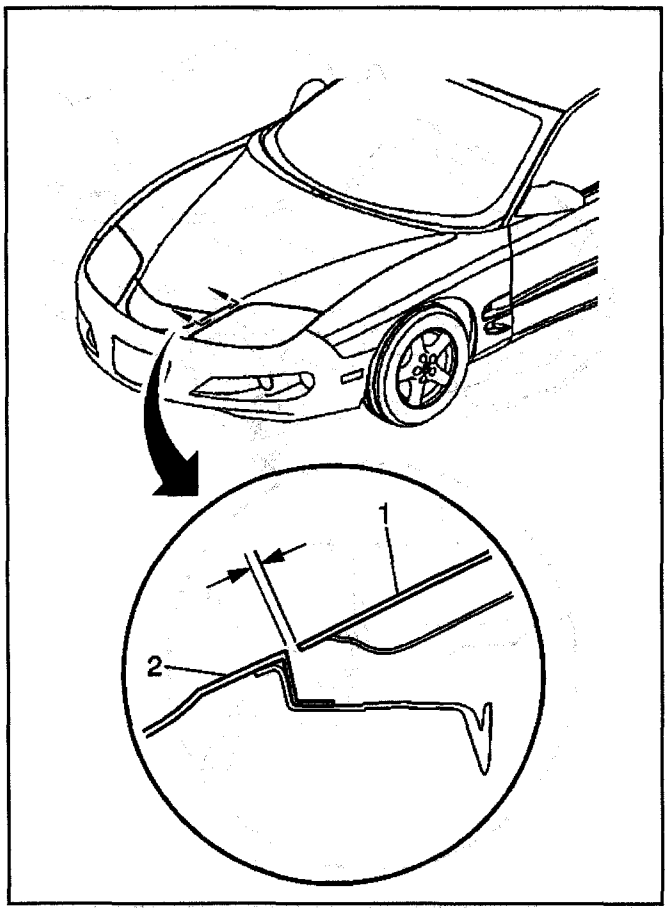
7. Measure the cross-car gap between the hood (1) and the front fenders (2).

Specification

Gap cross-car side to side specification within 1.5 mm (0.06 in).



392212

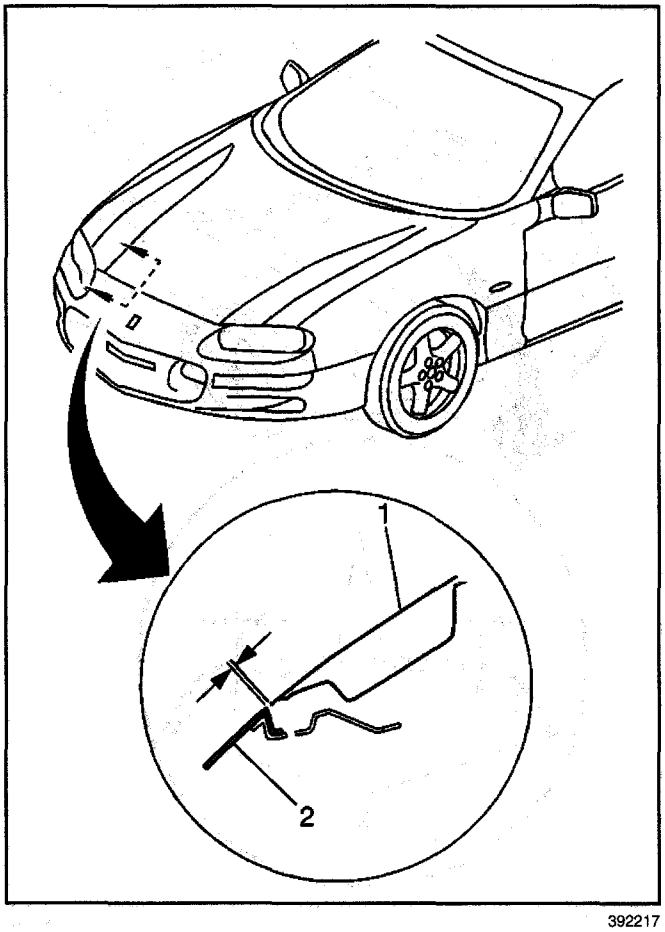


392216

8. Measure the gap between the hood (1) and the front fascia (2). (Pontiac only)

Specification

Gap specification is 4.6 mm (+/- 1.5), 0.18 in (+/- 0.06 in).



392217

9. Measure the gap between the hood (1) and the front fascia (2). (Chevrolet only)

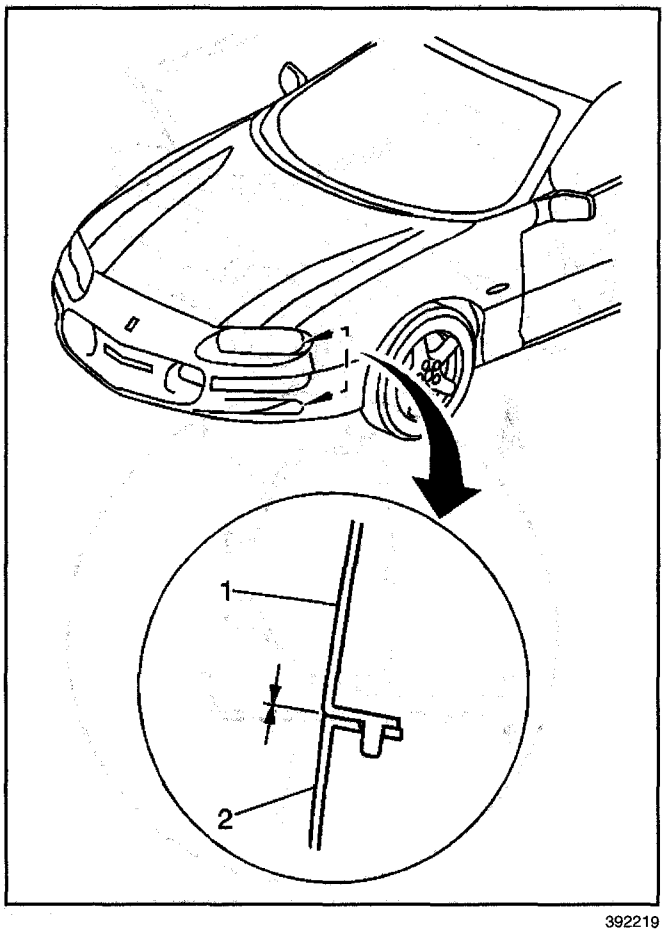
Specification

Gap specification is 4.0 mm (+/- 1.5 mm), 0.158 in (+/- 0.06 in).

10. Measure the gap between the front fender (1) and the front fascia (2).

Specification

Gap specification is 0.00 mm (+ 0.50 / - 0.00 mm).

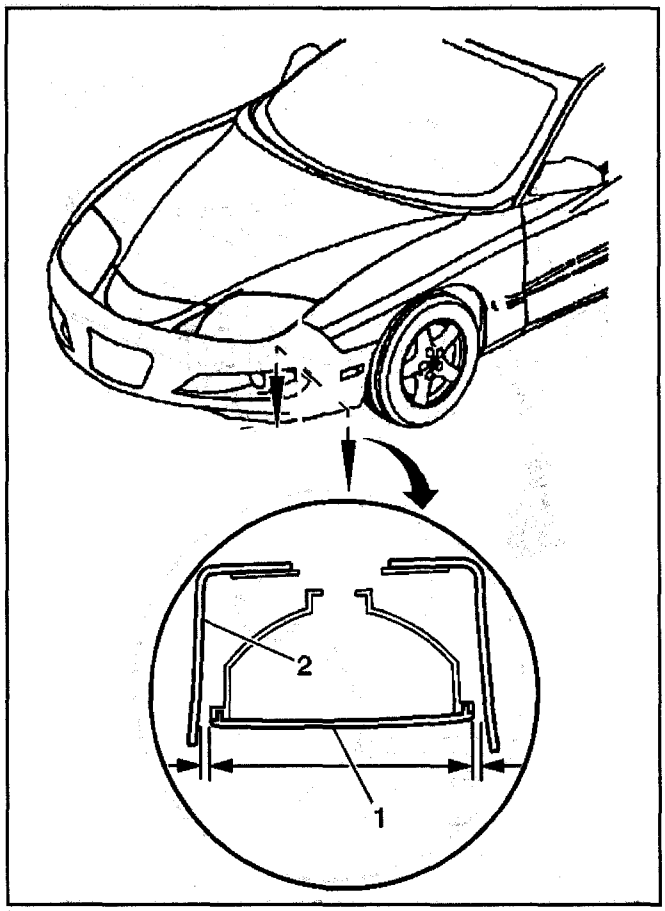


392219

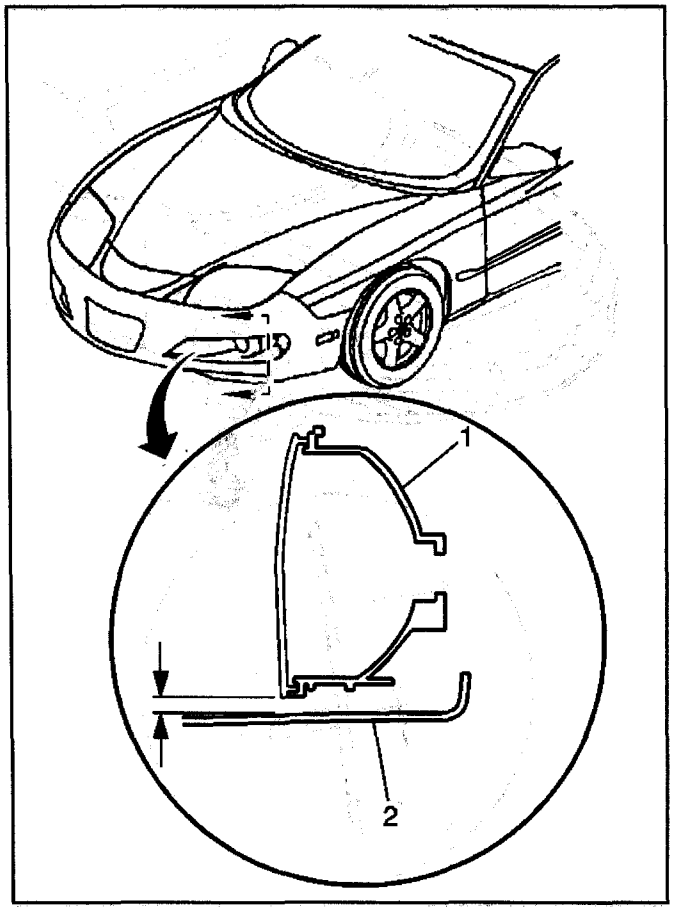
11. Measure the cross-car side to side gap between the fog lamp (1) and the front fascia (2). (Pontiac only)

Specification

Gap cross-car side to side specification within 2.0 mm (0.079 in).



392222

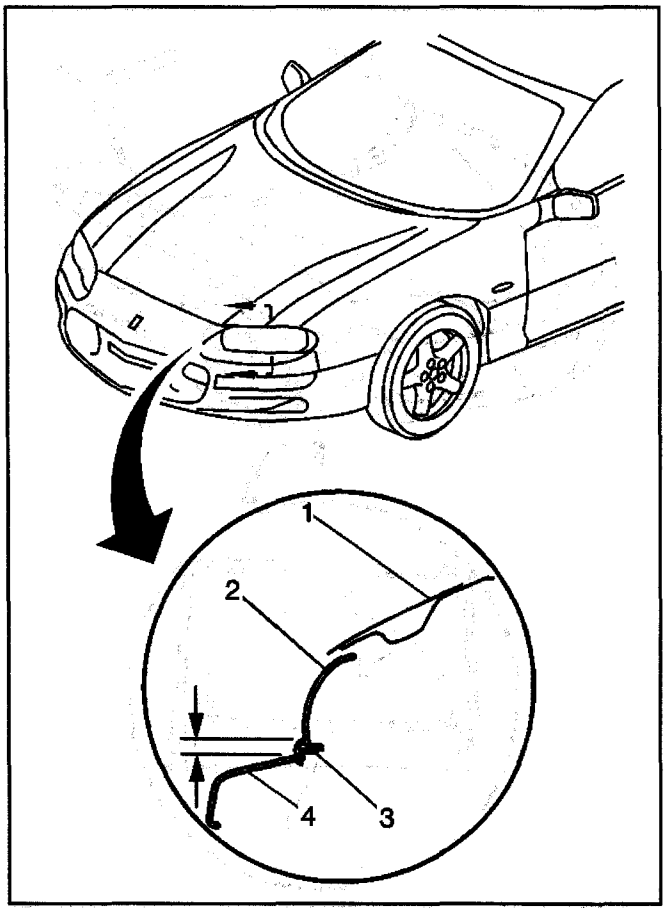


392227

12. Measure the gap between the fog lamp (1) and the front fascia (2). (Pontiac only)

Specification

Gap specification is 5.0 mm (+/- 2.0 mm), 0.197 in (+/- 0.79 in).



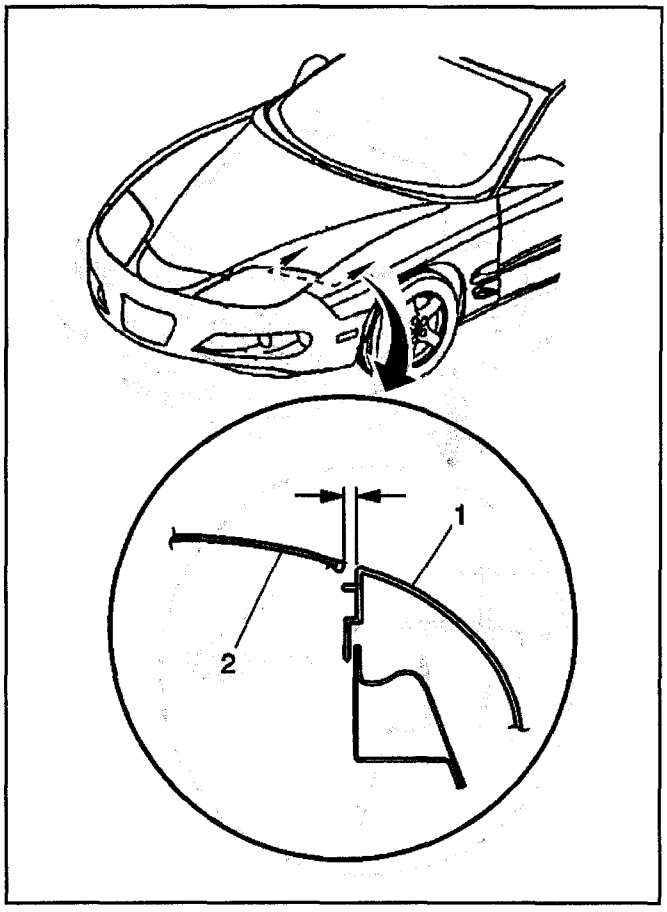
392230

13. There is no gap permissible between the headlamp seal (3) and the front fascia (4). (Chevrolet only)

14. Measure the gap between the headlamp door (1) and the front fender (2). (Pontiac only)

Specification

Gap specification is 4.0 mm (+/- 1.5 mm), 0.158 in (+/- 0.06 in).

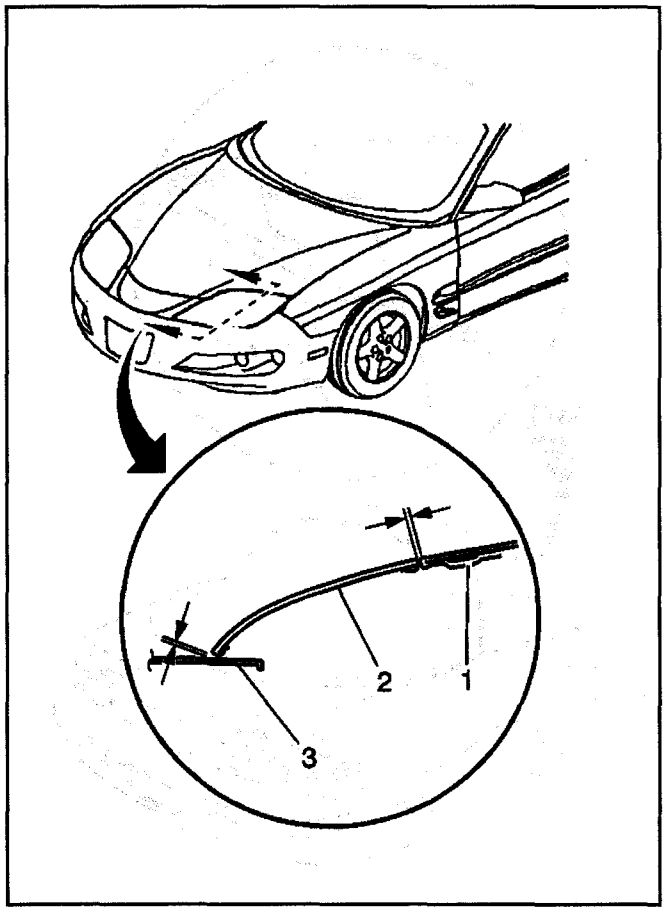


392231

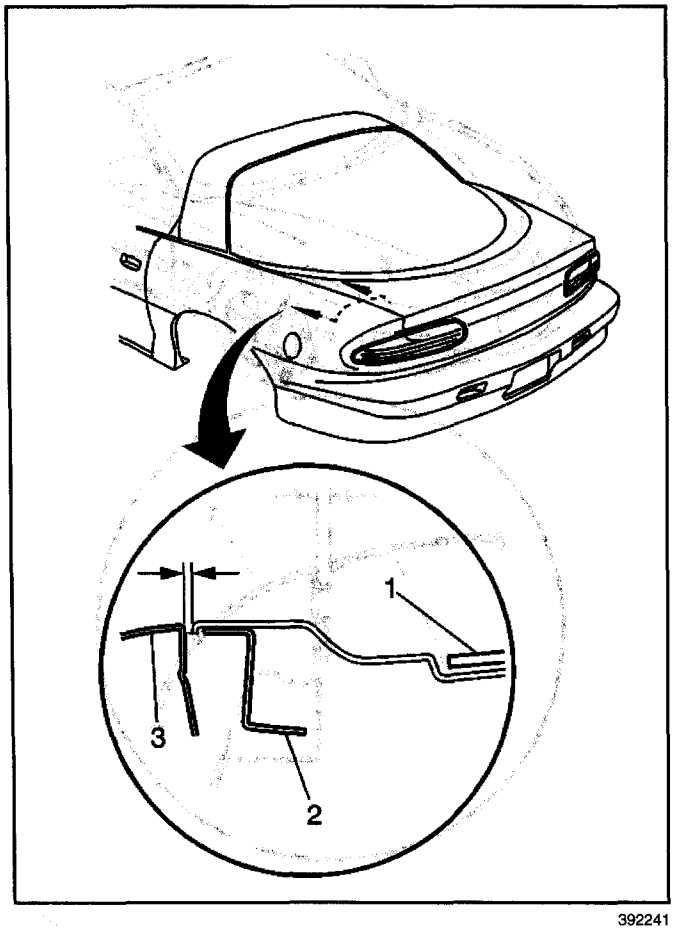
15. Measure the gap between the hood (1) and the headlamp door (2). (Pontiac only)

Specification

Gap specification is 4.0 mm (+/- 1.5 mm, 0.158 in (+/- 0.06 in).



392234



392241

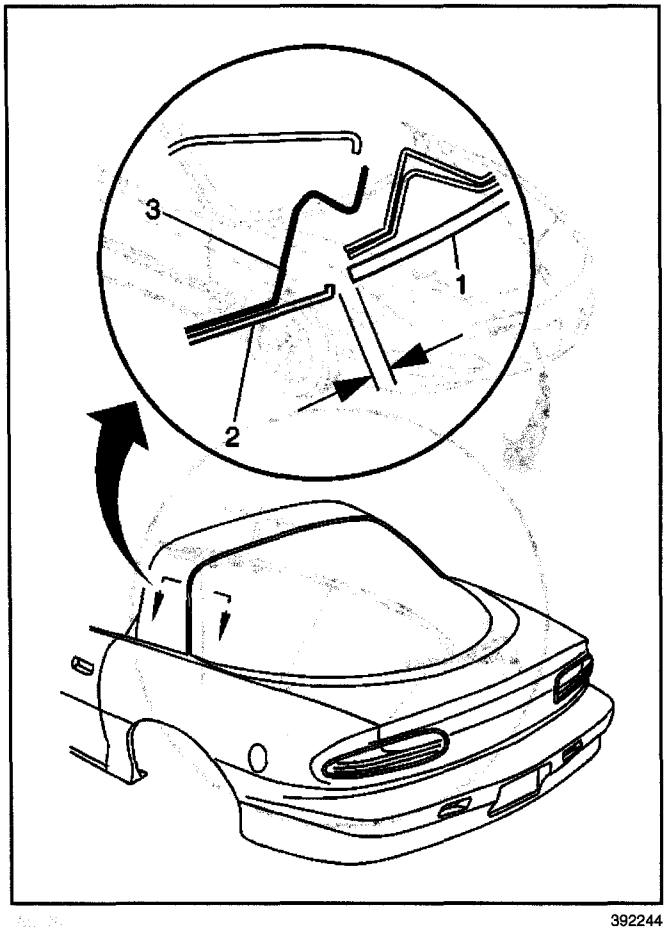
Measurements - Body (Body Rear End)

Below are the body rear end fit requirements for Chevrolet and Pontiac, all specifications apply to both vehicles unless otherwise specified.

1. Measure the gap between the rear compartment lift window (2) and the quarter panel (3).

   Specification

   Gap specification is 5.0 mm (+/- 1.5 mm), 0.197 in (+/- 0.06 in).



392244

2. Measure the rear compartment lift window (1) to roof outer sail panel (2).

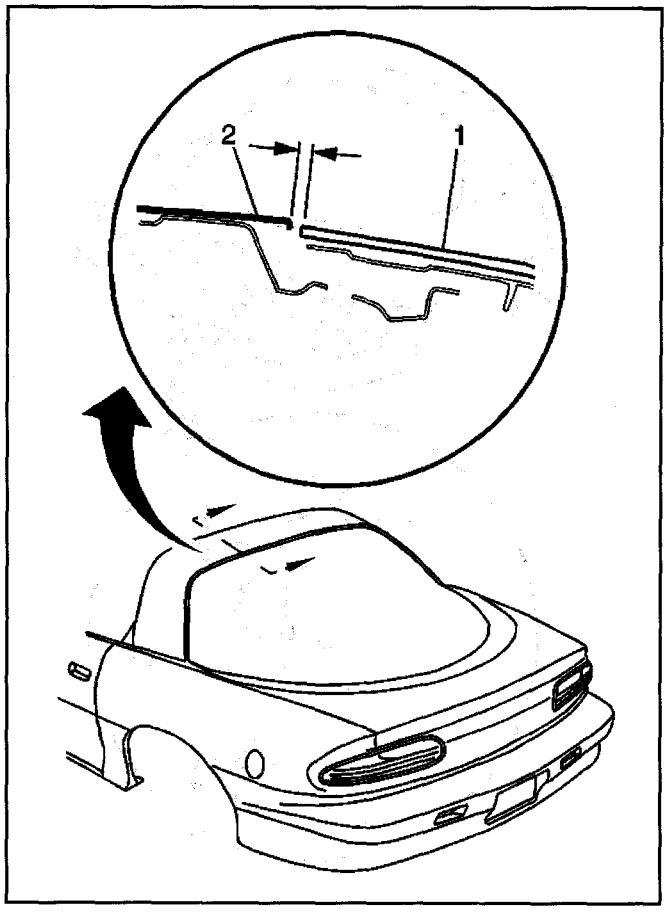
   Specification

   Gap specification is 8.0 mm (+/- 2.0 mm), 0.315 in (+/- 0.79 in).

3. Measure the gap between the rear compartment lift window (1) and the roof (2).

Specification

Gap specification is 8.0 mm (+/- 2.0 mm), 0.315 in (+/- 0.79 in).

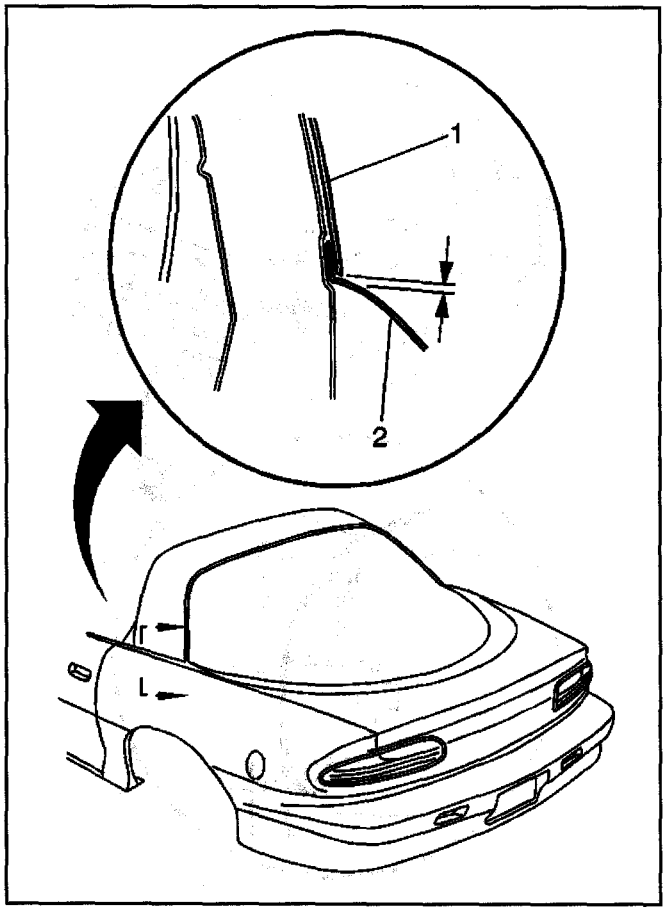


392246

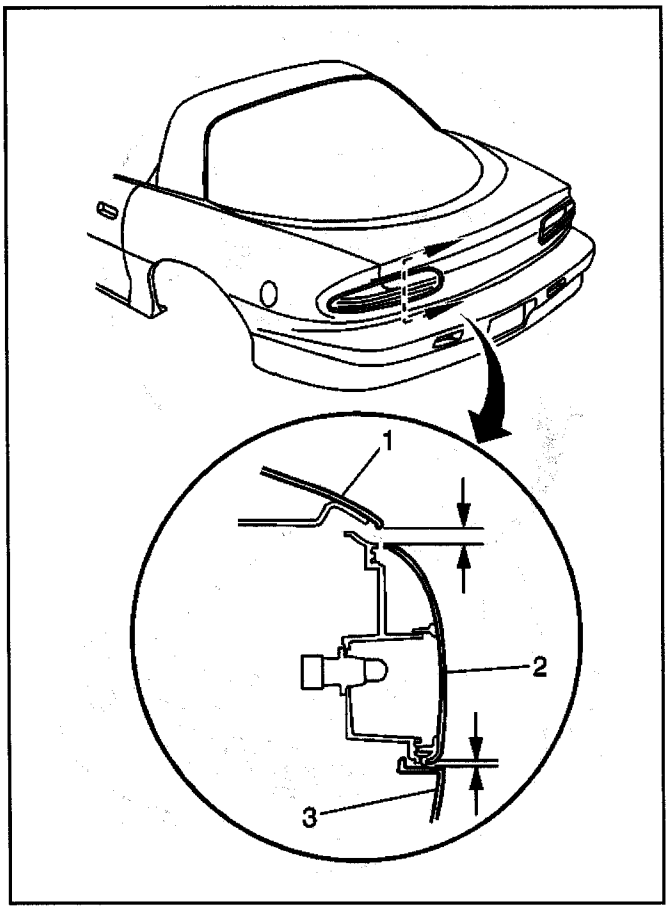
4. Measure the gap between the roof outer panel (1) and the quarter outer panel (2).

Specification

Gap specification is 4.0 mm (+/- 1.5 mm, 0.158 in (+/- 0.06 in).



392247

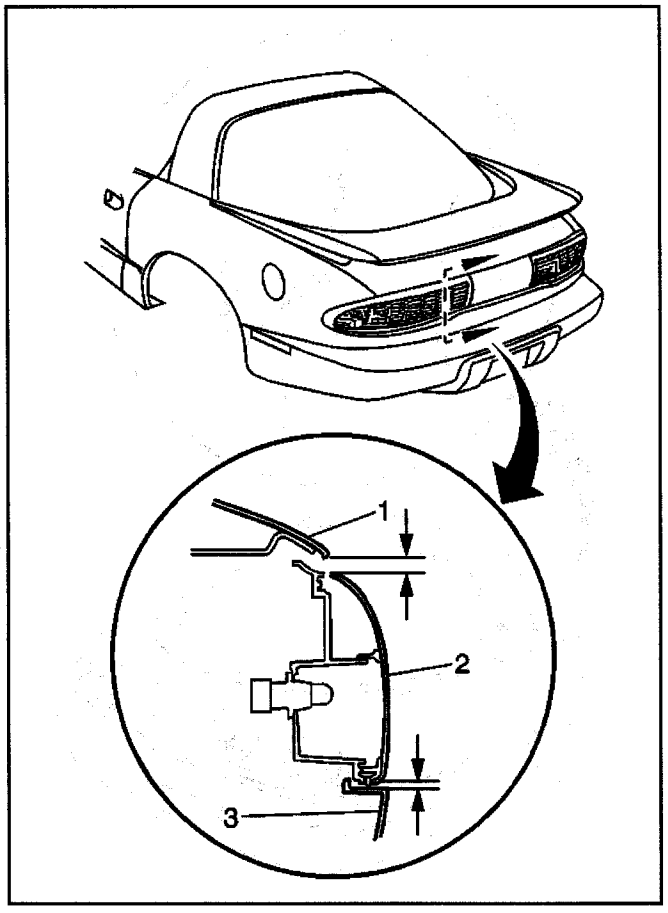


392248

5. Measure the gap between the rear compartment lift window panel (1) and the taillight lens (2). (Chevrolet only)
6. Measure the gap between the taillight lens (2) and the rear end finish panel (3). (Chevrolet only)

Specification

- Gap specification between the lift window panel (1) and the lens (2) is 10.5 mm (+/- 3.0 mm, 0.413 in (+/- 0.118 in).
- Gap specification between the lens (2) and the finish panel (3) is 2.0 mm (+/- 2.0 mm), 0.79 in (+/- 0.79 in).



392250

7. Measure the gap between the rear compartment lift window panel (1) and the taillight lens (2). (Pontiac only)
8. Measure the gap between the taillight lens (2) and the rear end finish panel (3). (Pontiac only)

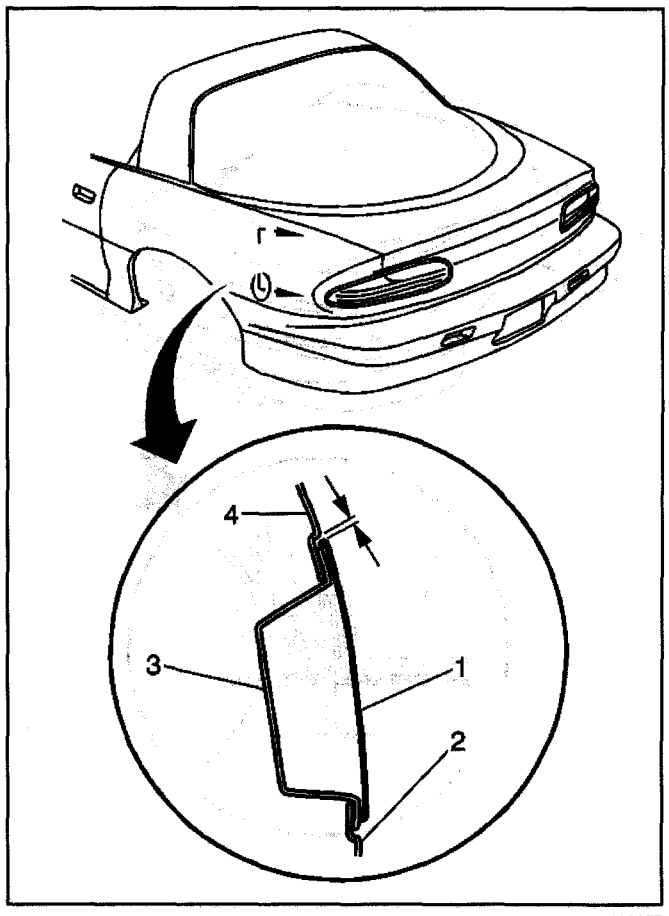
Specification

- Gap specification between the lift window panel (1) and the lens (2) is 5.0 mm (+/- 3.0 mm), 0.197 in (+/- 0.118 in).
- Gap specification between the lens (2) and the finish panel (3) is 4.0 mm (+/- 2.0 mm, 0.158 in (+/- 0.79 in).

9. Measure the gap between the fuel filler door (1) to the rear quarter panel (4).

Specification

Gap specification is 3.0 mm (+/- 1.0 mm), 0.118 in (+/- 0.349 in).

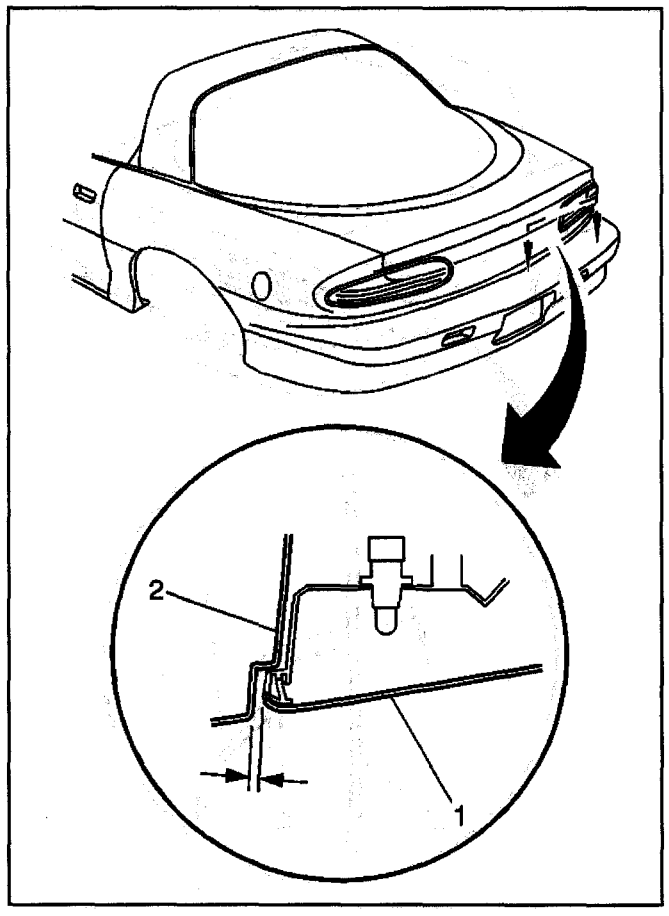


392257

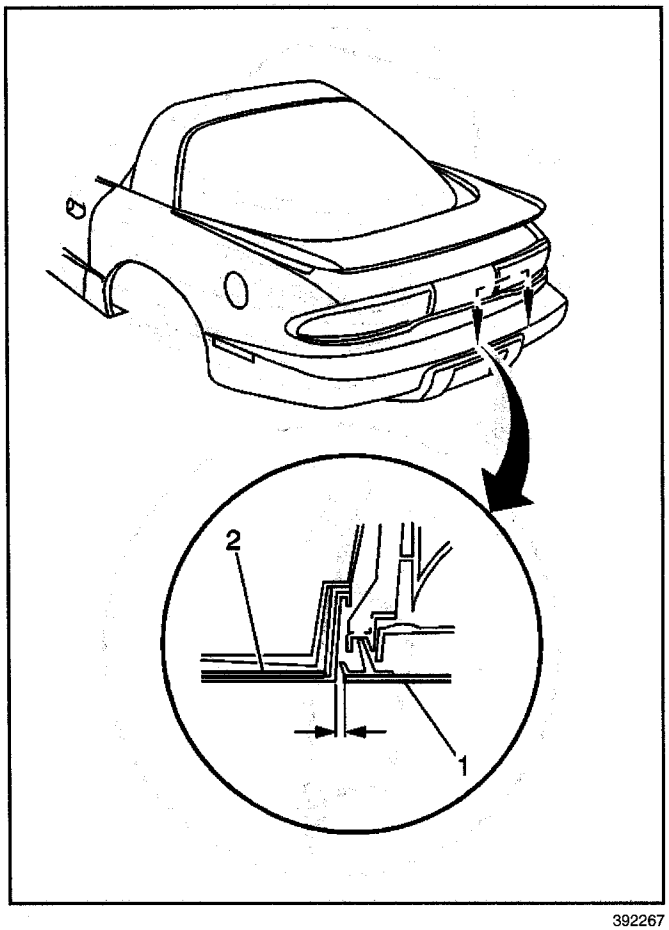
10. Measure the gap between the taillight lens (1) to the rear end finish panel (2). (Chevrolet only)

Specification

Gap specification is 2.0 mm (+/- 2.0 mm), .79 in (+/- 0.79 in).



392260

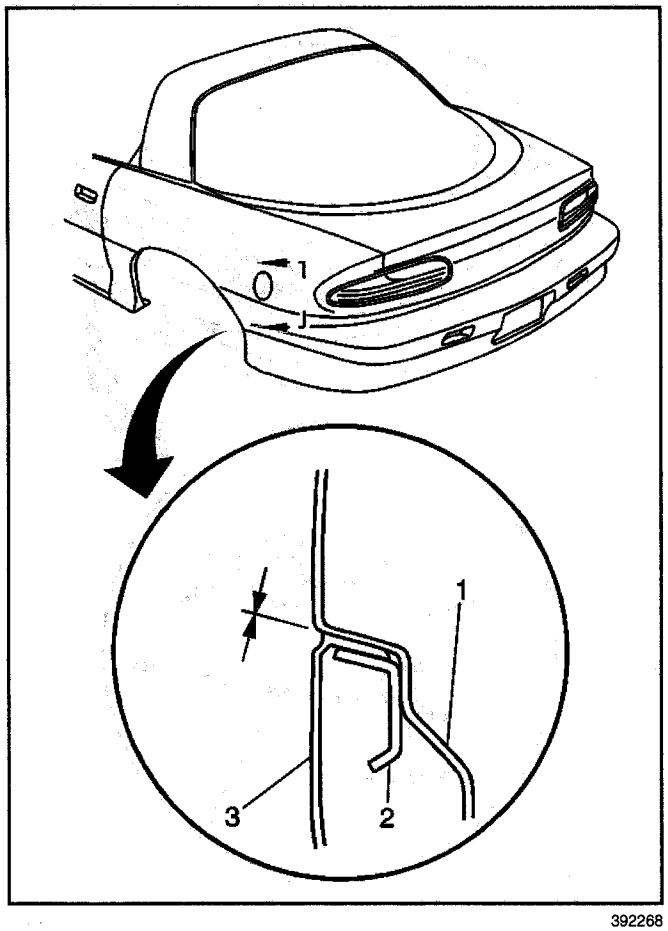


392267

11. Measure the gap between the taillight lens (1) and the rear end finish panel (2). (Pontiac only)

Specification

Gap specification is 4.0 mm (+/- 2.0 mm, 0.158 in (+/- 0.79 in).



392268

12. Measure the gap between the rear quarter panel (1) and the rear fascia (3).

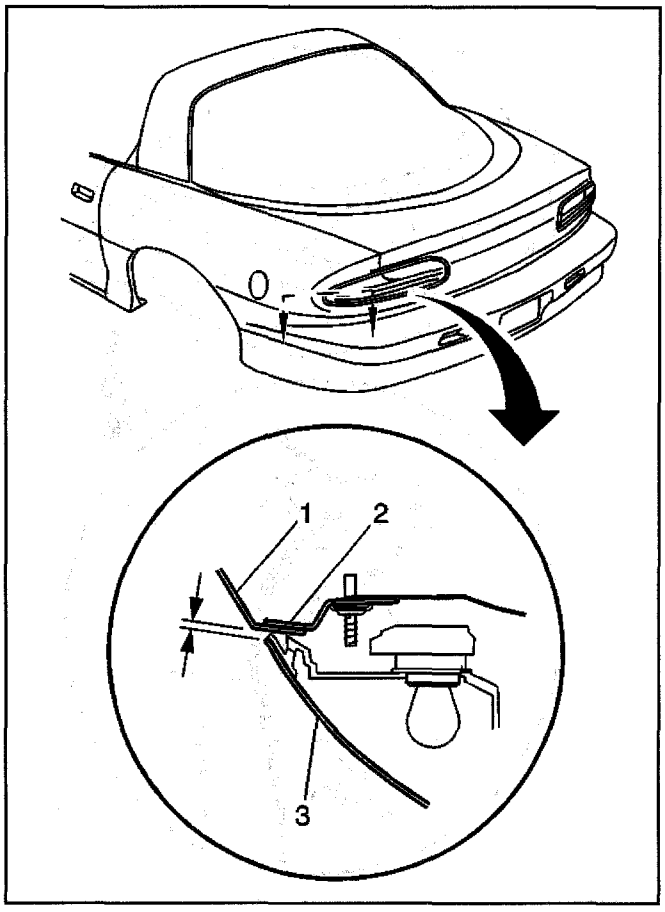
Specification

Gap specification is 0.00 mm (+ 0.50 / -0.00 mm).

13. Measure the gap between the rear quarter panel (1) and the taillight lens (3).

Specification

Gap specification is 2.0 mm (+/- 1.5 mm), 0.079 in (+/- 0.06 in).

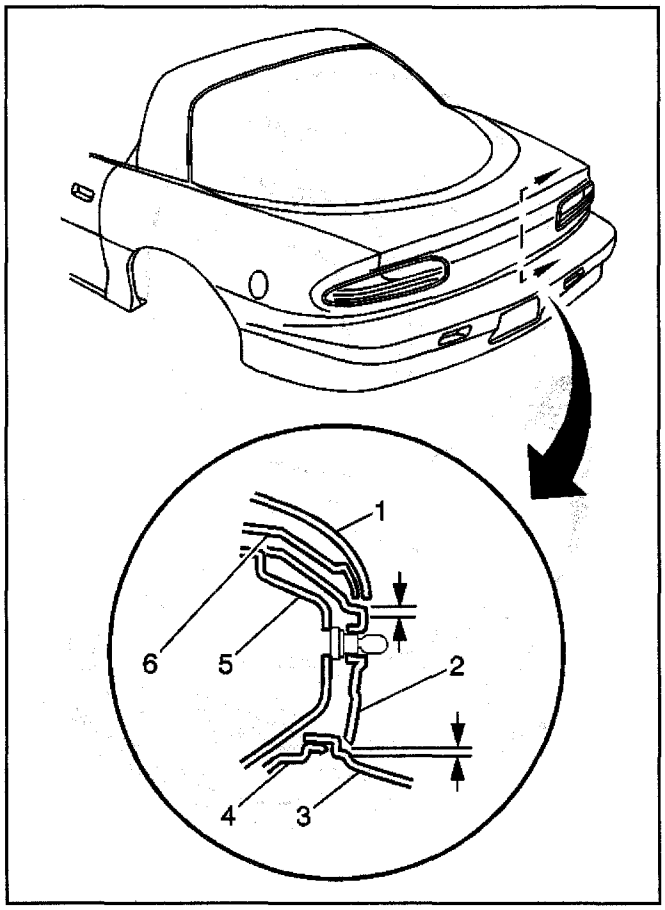


392271

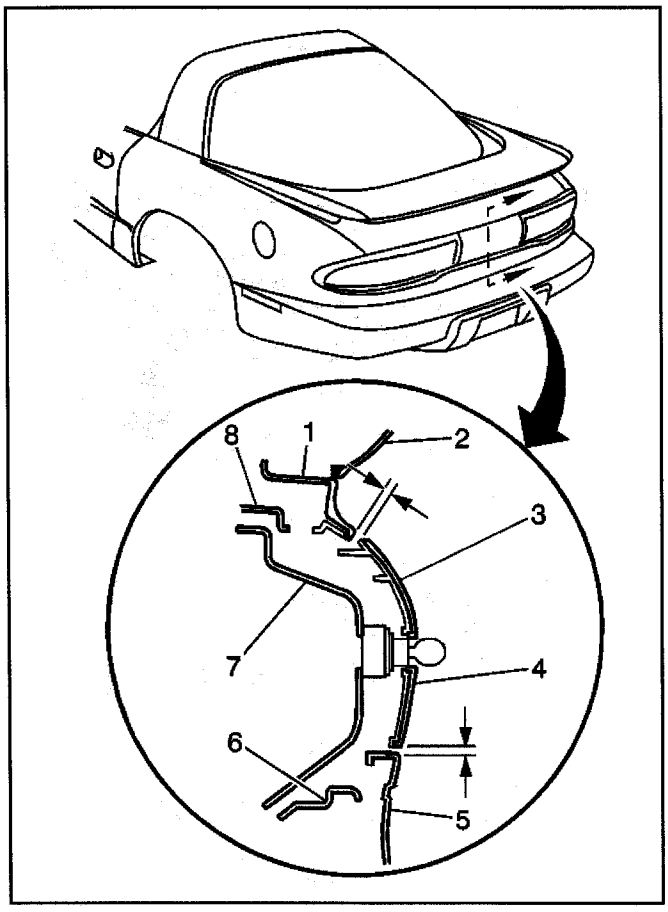
14. Measure the gap between the rear compartment deck lid (1) and the rear end finish panel (2). (Chevrolet only)
15. Measure the gap between the rear end finish panel (2) and the rear bumper fascia (3). (Chevrolet only)

Specification

- Gap specification between the deck lid (1) and the finish panel (2) is 8.5 mm (+/- 3.0 mm), 0.335 in (+/- 0.118 in).
- Gap specification between the finish panel (2) and the rear bumper fascia (3) is 6.0 mm (+/- 2.0 mm), 0.236 in (+/- 0.79 in).



392273

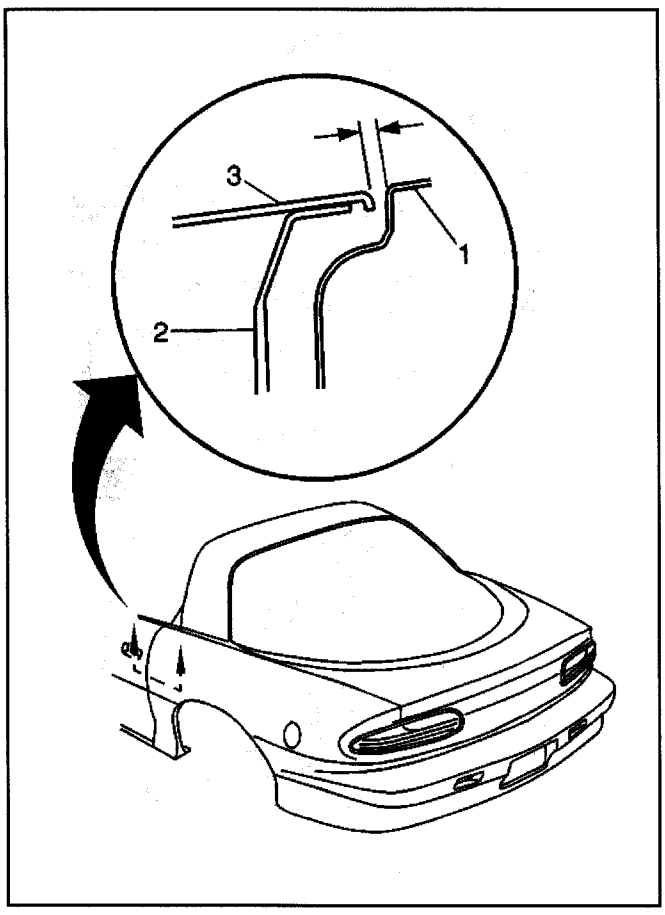


392277

16. Measure the gap between the deck lid spoiler (1) and the rear end filler (3). (Pontiac only)
17. Measure the gap between the rear end filler (3) and the rear bumper fascia (5). (Pontiac only)

Specification

- Gap specification between the deck lid spoiler (1) and the rear end filler (3) is 5.0 mm (+/- 3.0 mm), 0.197 in (+/- 0.118 in).
- Gap specification between the rear end filler (3) and the rear bumper fascia (5) is 4.0 mm (+/- 2.0 mm), 0.158 in (+/- 0.079 in).



392473

18. Measure the gap between the rear quarter panel (1) and the door (3).

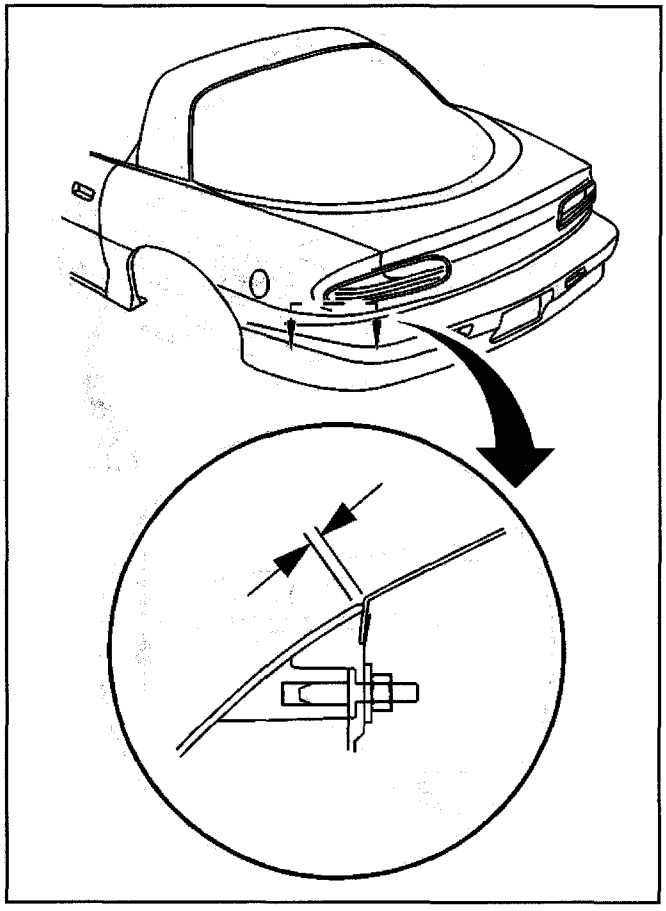
Specification

Gap specification is 5.0 mm (+/- 1.5 mm), 0.197 in (+/- 0.06 in).

19. Measure the gap between the rear end panel to the quarter panel. (Chevrolet only)

Specification

Gap specification is 2.0 mm (+/- 1.0 mm, 0.079 in (+/- 0.0394 in).

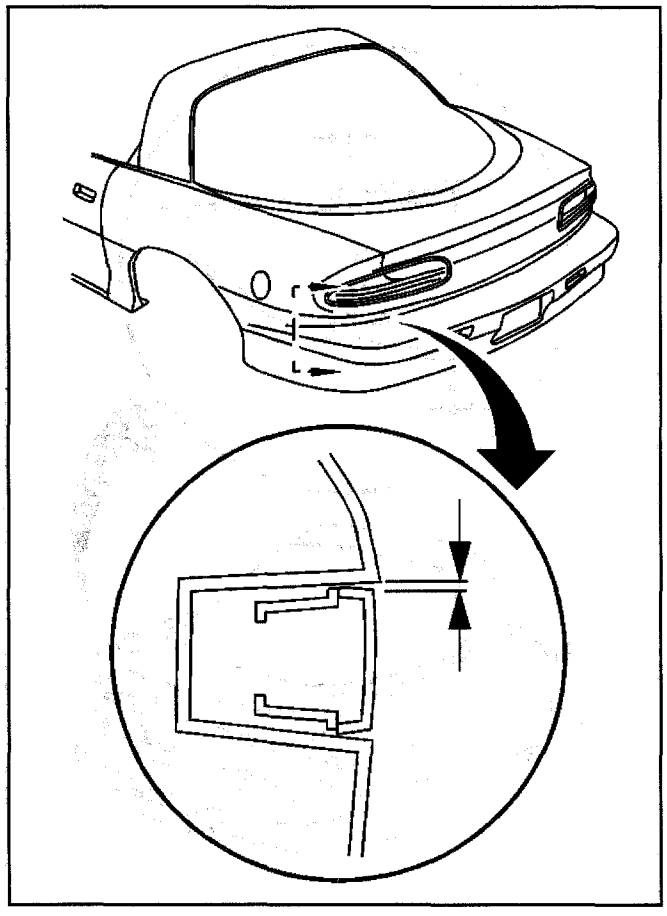


392474

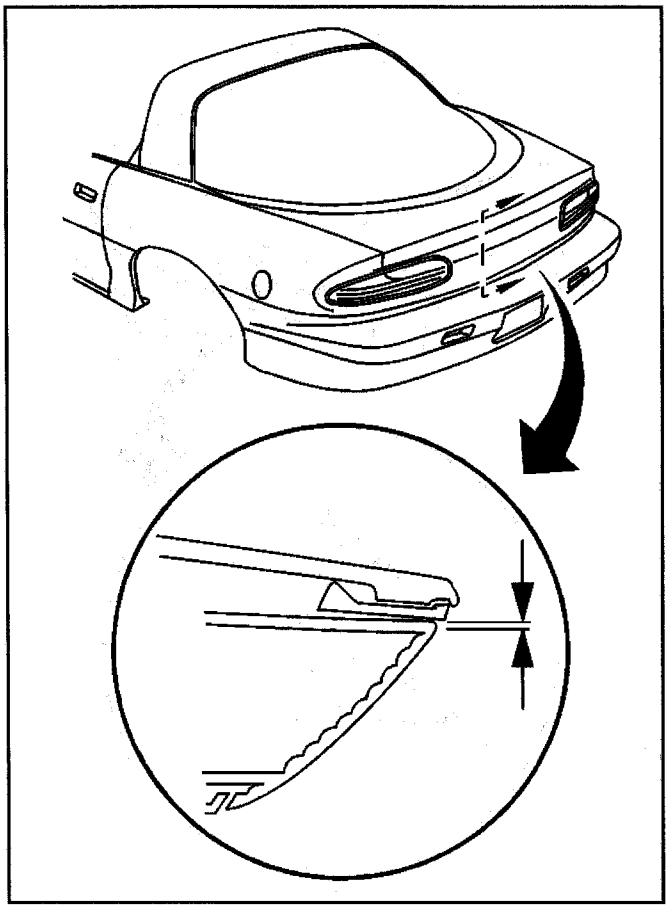
20. Measure the gap between the side marker lamp and the rear fascia.

Specification

Gap specification is 1.0 mm (+/- 0.5 mm), 0.0394 in (+/- 0.0197 in).



392477

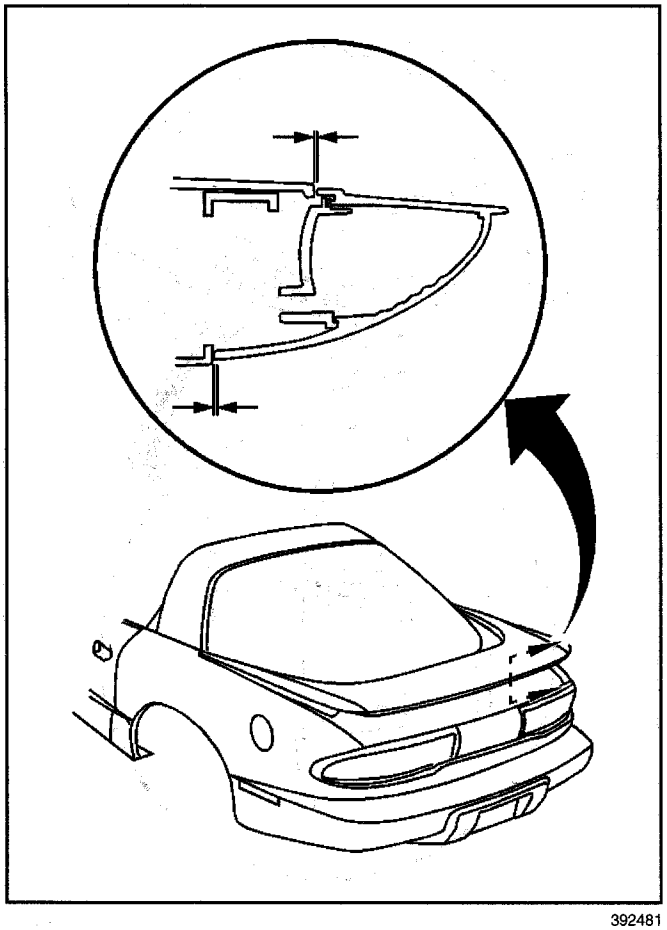


392478

21. Measure the horizontal and vertical (not shown) gap between the center high mount stoplamp and the spoiler. (Chevrolet only)

Specification

horizontal and vertical gap specification is 1.0 mm (+/- 1.0 mm), 0.0394 in (+/- 0.0394 in).



392481

22. Measure the top horizontal gap between the center high mount stoplamp and the spoiler. (Trans Am only)
23. Measure the vertical (not shown) gap between the center high mount stoplamp and the spoiler. (Trans Am only)
24. Measure the bottom horizontal gap between the center high mount stoplamp and the spoiler. (Trans Am only).

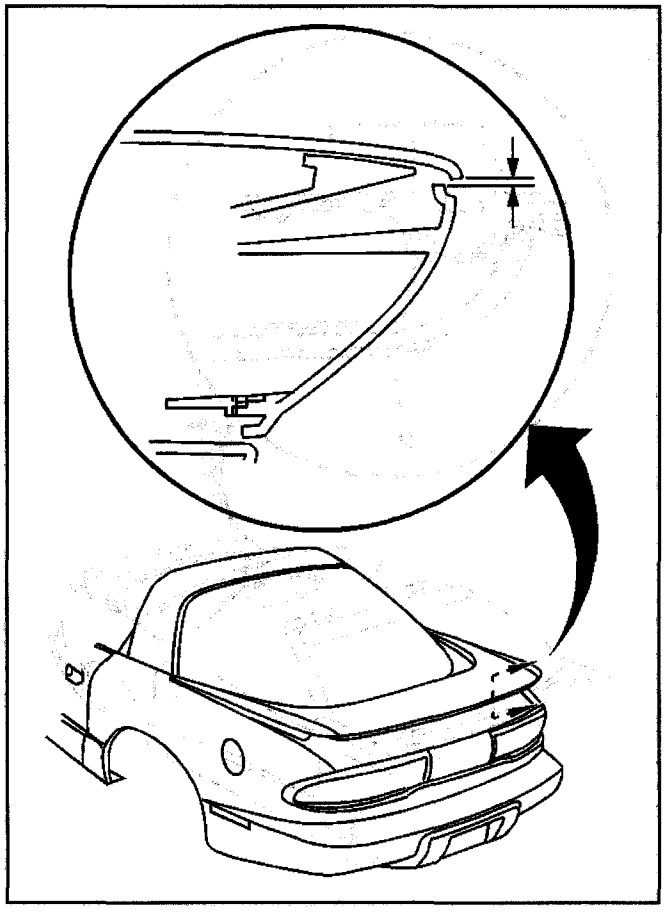
Specification

- Top horizontal gap specification is 0.5 mm (+/- 0.5 mm), 0.0197 in (+/- 0.0197 in).
- Vertical gap specification is 1.5 mm (+/- 1.0 mm), 0.059 in (+/- 0.0394 in).
- Bottom horizontal gap specification is 1.5 mm (+/- 1.0 mm), 0.059 in (+/- 0.0394 in).

25. Measure the horizontal gap between the center high mount stoplamp and the spoiler. (Firebird only)
26. Measure the vertical (not shown) gap between the center high mount stoplamp and the spoiler. (Firebird only)

Specification

- horizontal gap specification is 1.0 mm (+/- 1.0 mm), 0.0394 in (+/- 0.0394 in).
- Vertical gap specification is 1.5 mm (+/- 1.0 mm), 0.059 in (+/- 0.0394 in).



392485

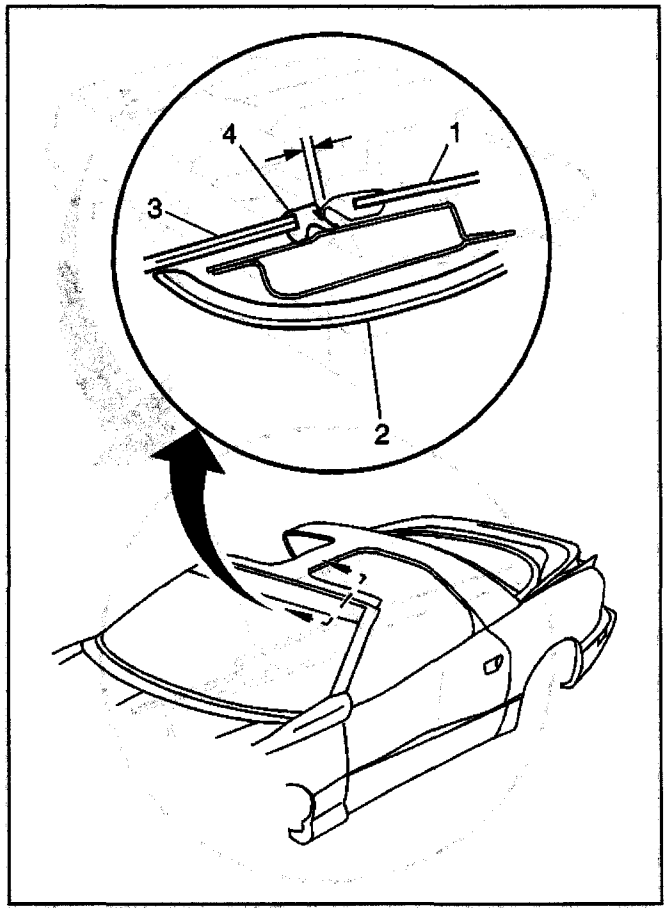
Measurements - Body (Roof and Upper Body)

Below are the roof and upper body fit requirements for Chevrolet and Pontiac, all specifications apply to both vehicles unless otherwise specified.

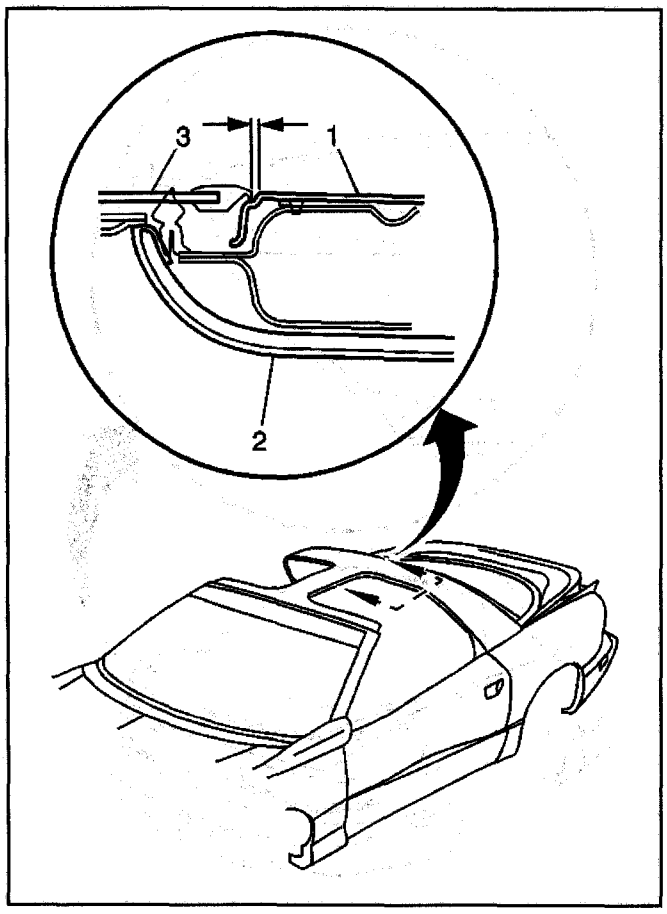
1. Measure the gap between the roof lift off window (1) and the windshield reveal molding (4).

Specification

Gap specification is 2.0 mm (+/- 1.0 mm), .079 in (+/- 0.0394 in).



392490

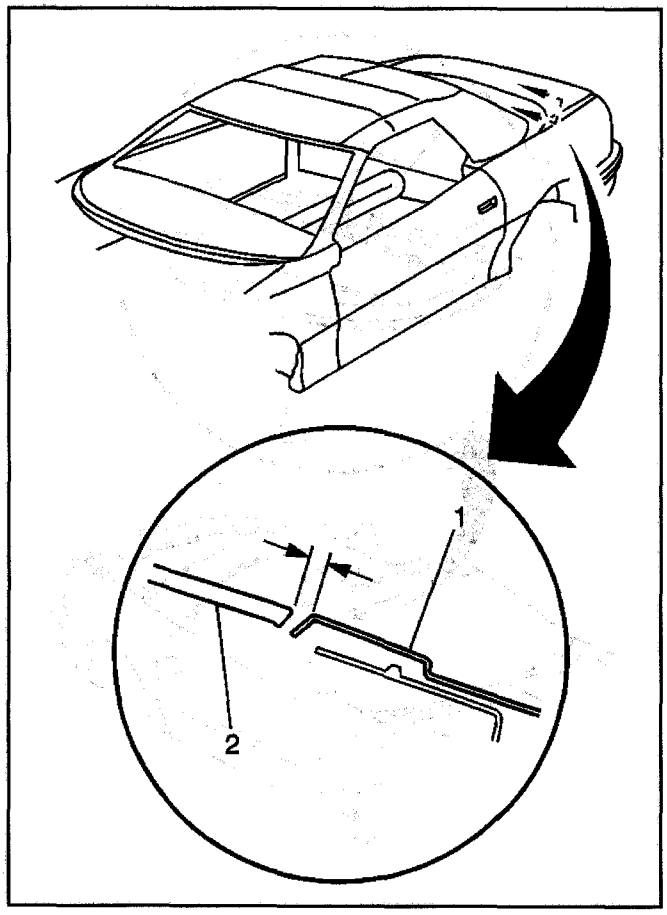


392495

2. Measure the gap between the roof (1) and the roof lift off window (3).

Specification

Gap specification is 2.0 mm (+/- 1.0 mm), (0.079 in (+/- 0.0394 in).



392497

3. Measure the gap between the deck lid (1) and the quarter belt reveal molding (2).

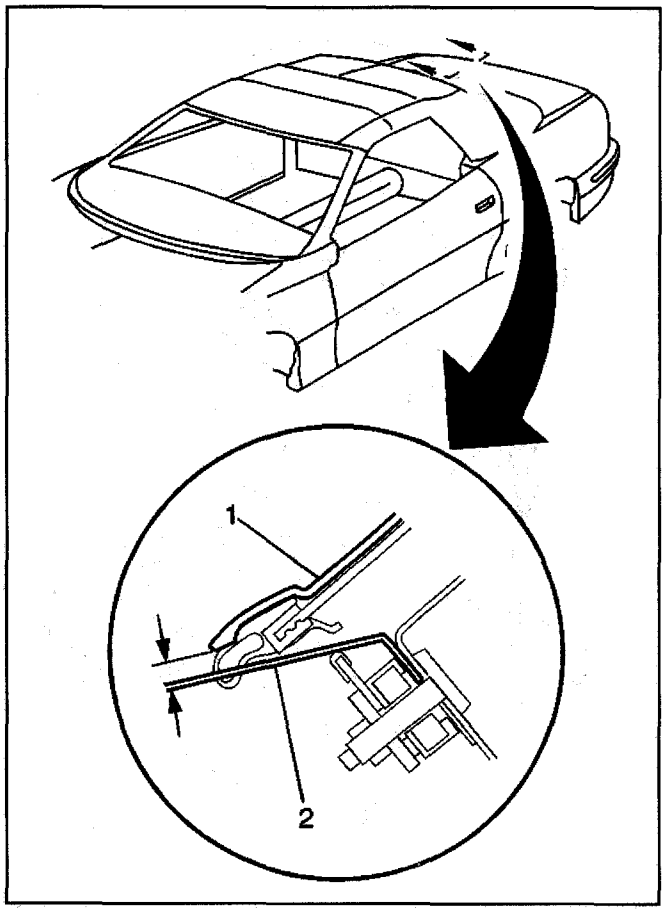
Specification

Gap specification is 5.0 mm (+/- 2.0 mm, 0.197 in (+/- 0.079 in).

4. Measure the gap between the deck lid back belt (1) and the folding top (2).

   Specification

   Gap specification is 15.0 mm (+/- 3.0 mm, 0.591 in (+/- 0.119 in).

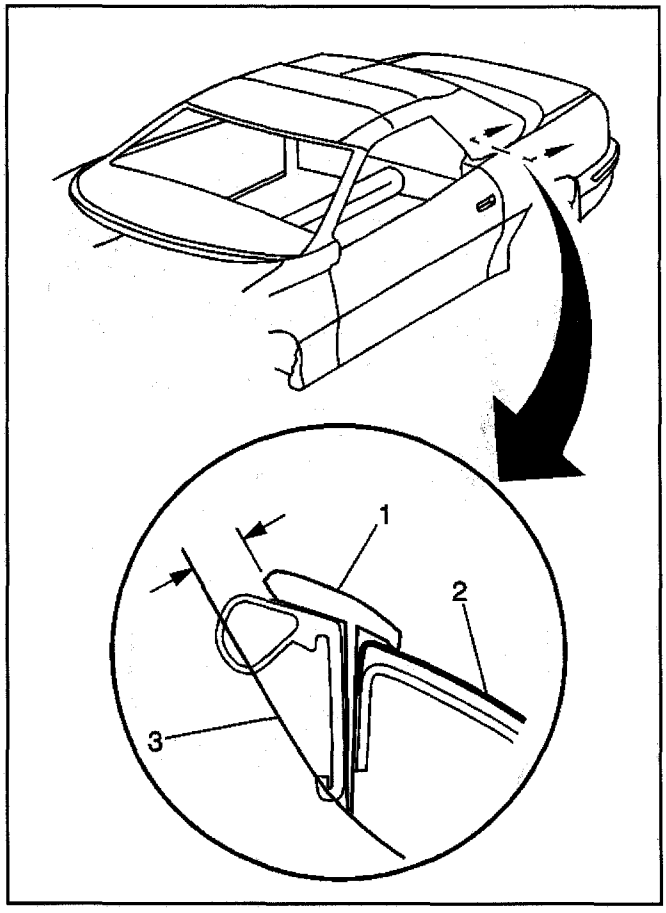


392498

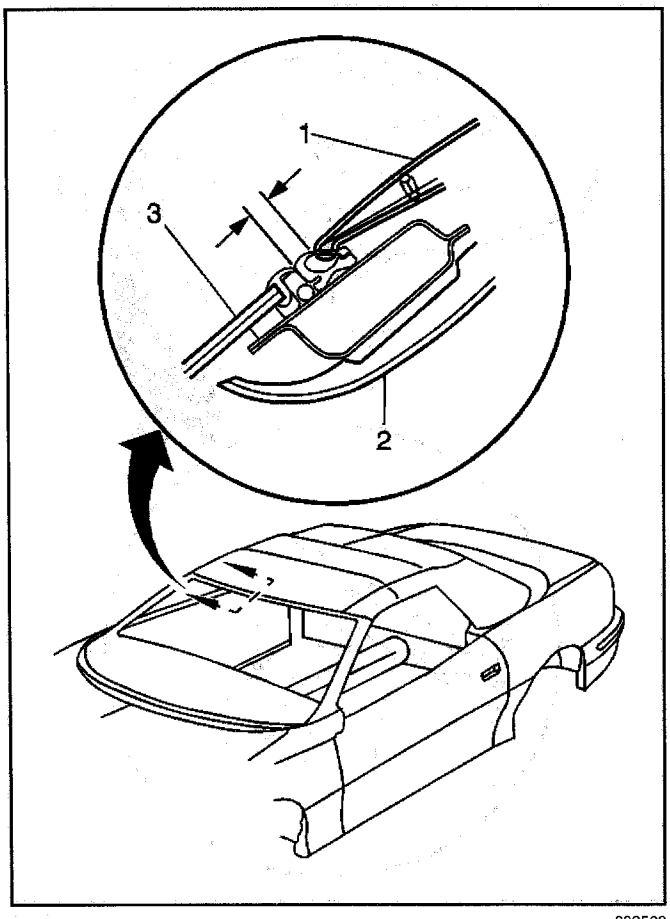
5. Measure the gap between the quarter belt molding (1) and the folding top (3).

   Specification

   Gap specification is 15.0 mm (+/- 3.0 mm, 0.591 in (+/- 0.119 in).



392499

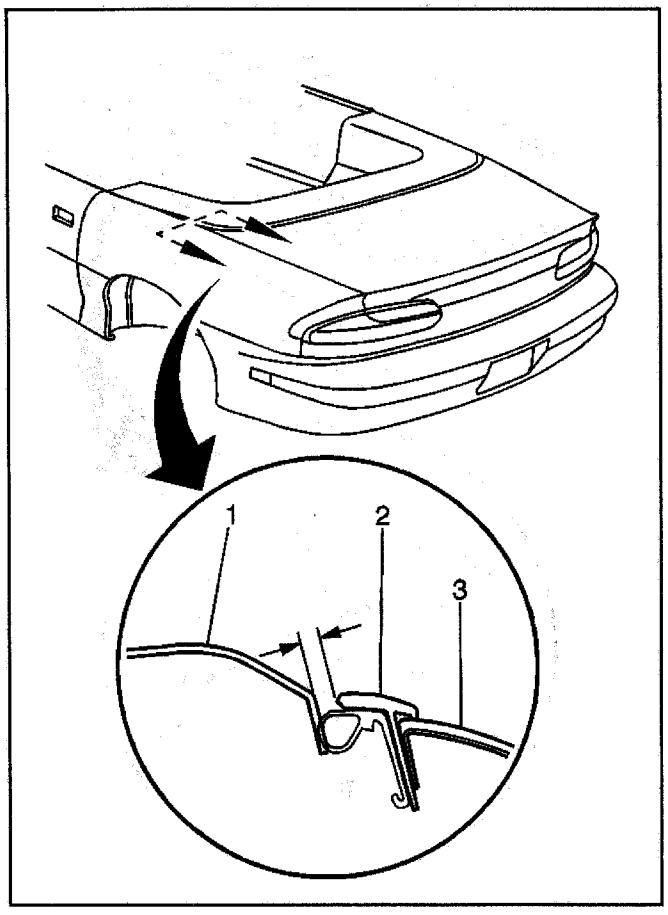


392502

6. Measure the gap between the folding top (1) and the windshield (3).

Specification

Gap specification is 8.0 mm (+/- 2.0 mm), 0.315 in (+/- 0.079 in).



392506

7. Measure the gap between the folding top stowage compartment extension (1) and the quarter belt molding (2).

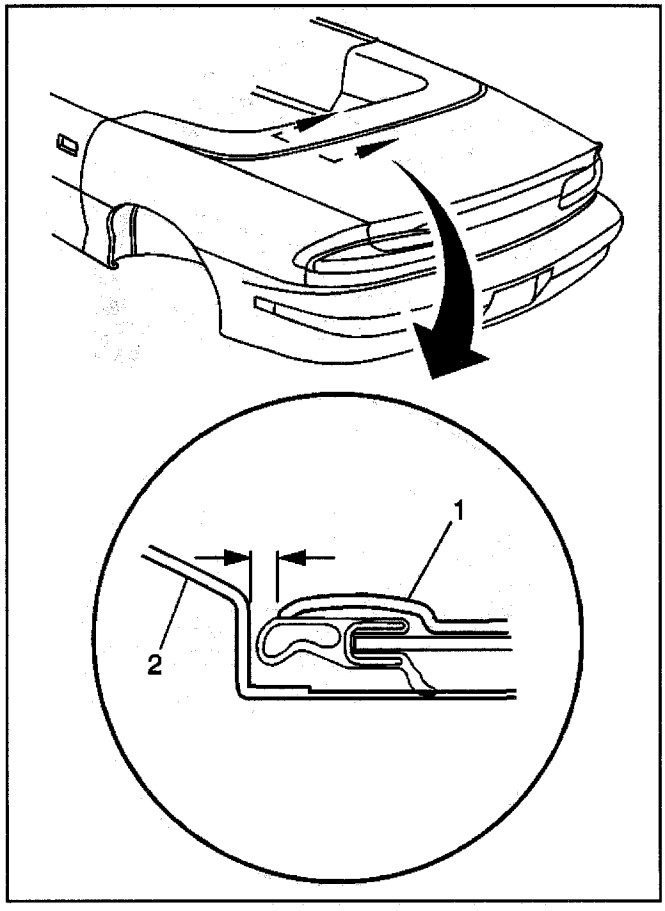
Specification

Gap specification is 6.0 mm (+/- 3.0 mm), 0.24 in (+/- 0.119 in).

8. Measure the gap between the deck lid (1) and the folding top stowage compartment extension (2).

Specification

Gap specification is 7.5 mm (+/- 3.0 mm), 0.295 in (+/- 0.119 in).

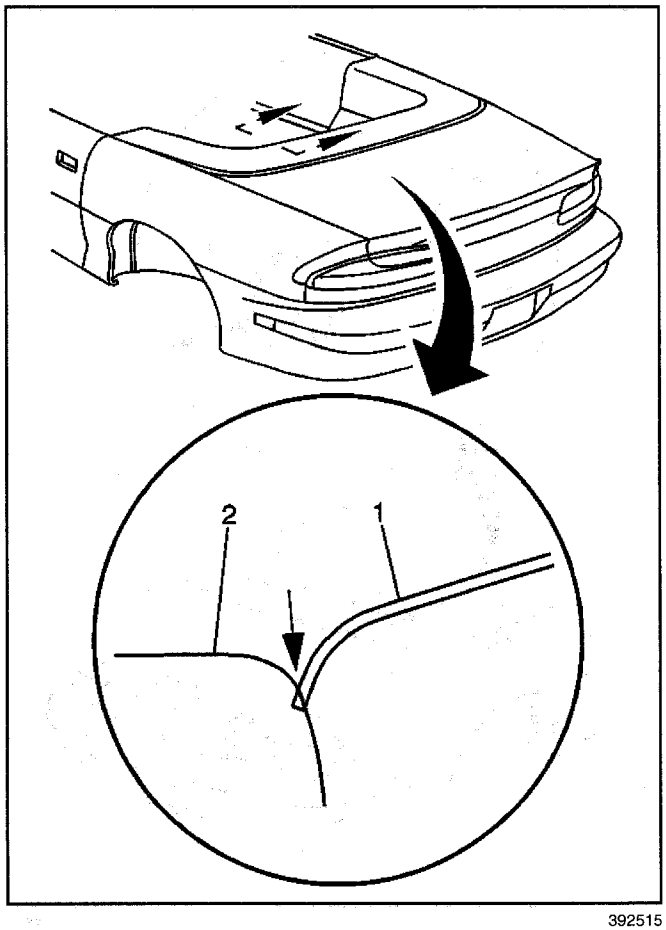


392509

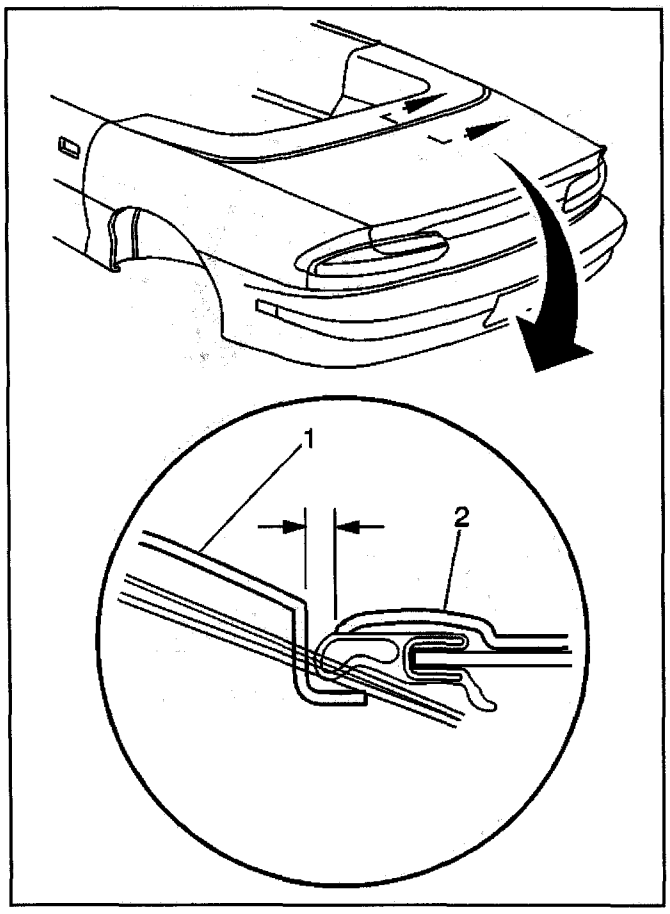
9. Measure the gap between the folding top stowage compartment cover (1) and the rear seat back (2).

Specification

Gap specification is 0.0 mm (+3.0 / -0.0)



392515

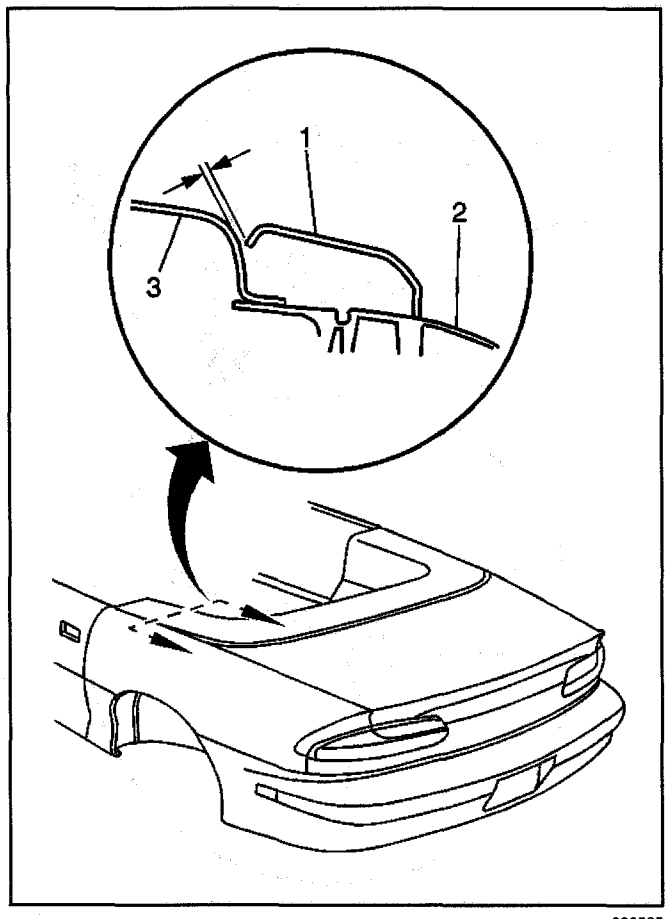


392519

10. Measure the gap between the folding top stowage compartment cover (1) and the deck lid (2).

Specification

Gap specification is 5.0 mm (+/- 3.0 mm), 0.197 in (+/- 0.119 in).



392525

11. Measure the gap between the quarter trim extension (1) and the folding top stowage compartment extension (3).

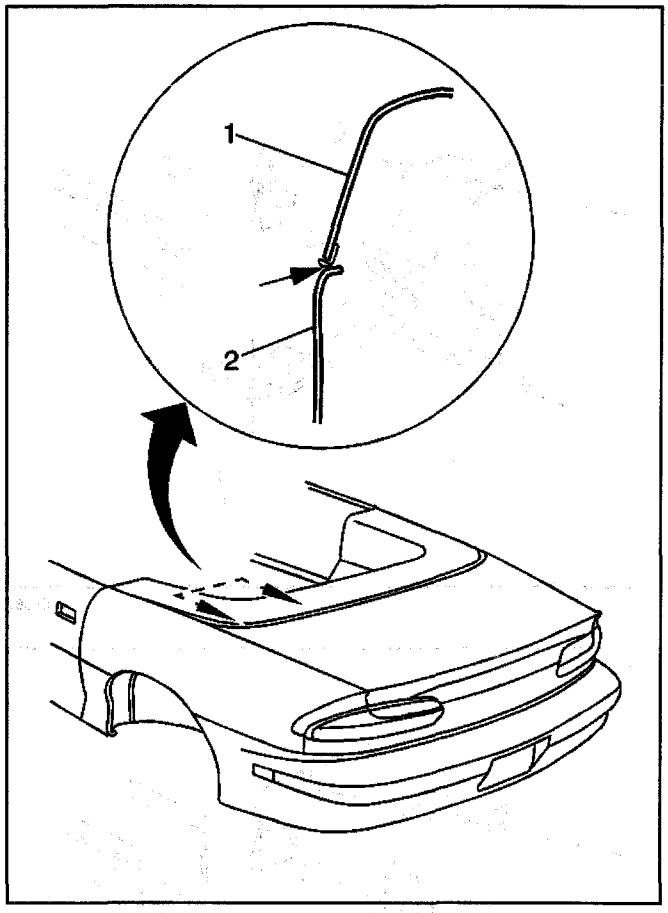
Specification

Gap specification is 3.0 mm (+/- 2.0 mm), 0.119 mm (+/- 0.079 in).

12. Measure the gap between the folding top stowage compartment extension (1) and the quarter trim panel (2).

    Specification

    Gap specification is 0.0 mm (+3.0 / -0.0)

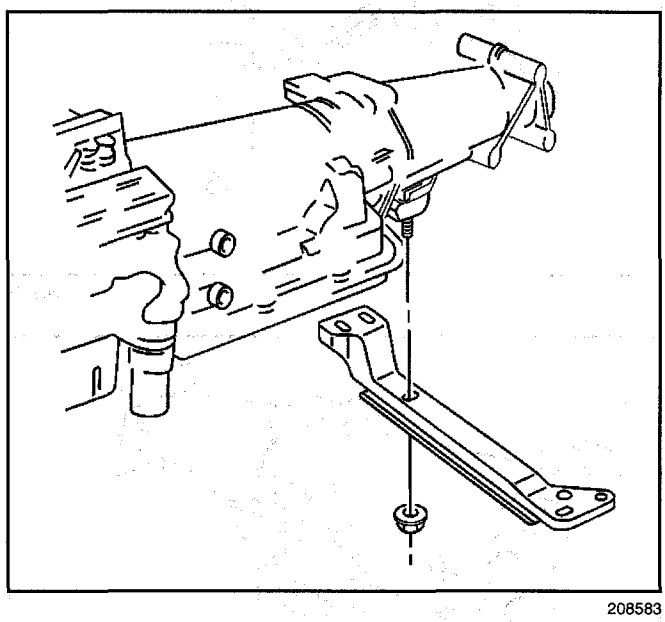


392529

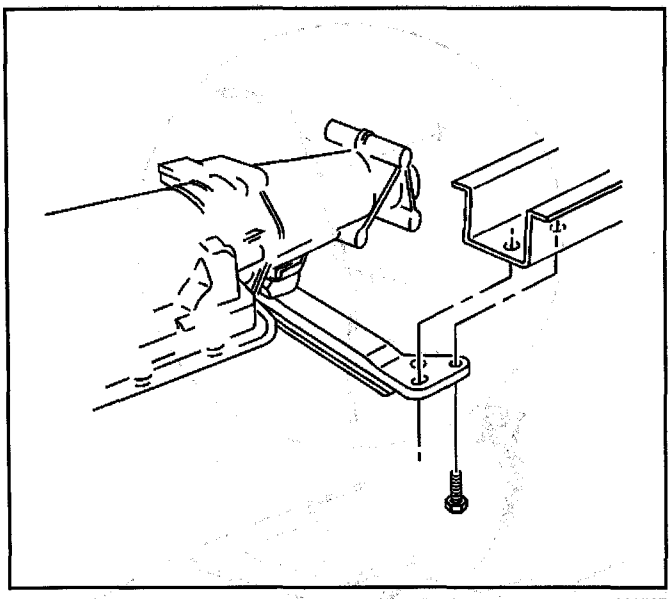
Transmission Support Replacement

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Support the transmission using a transmission jack.
3. Remove the transmission mount nut.

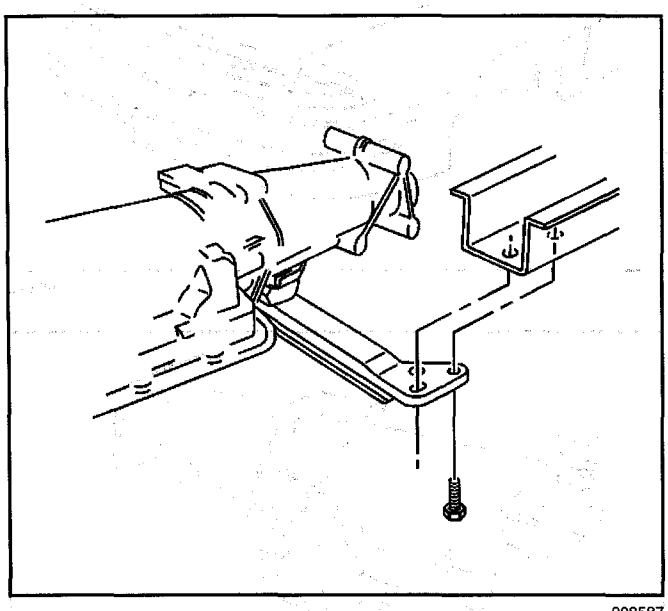


208583



208587

4. Remove the transmission support bolts.
5. Remove the transmission support.



208587

Installation Procedure

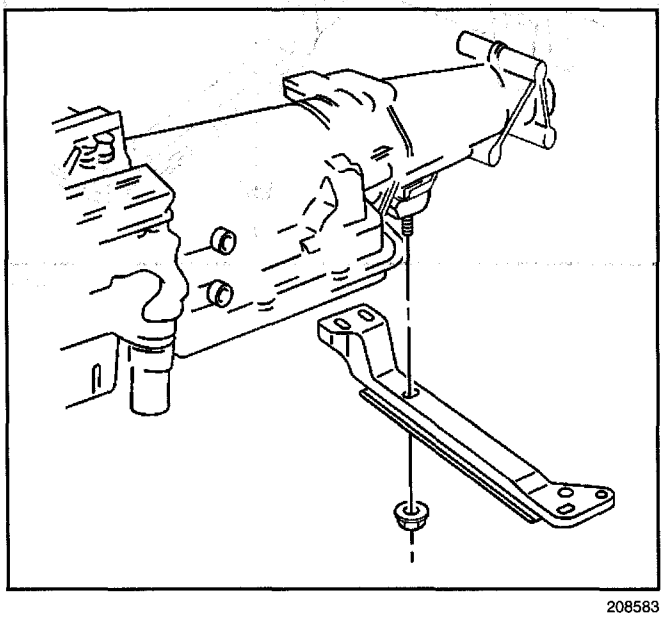
1. Install the transmission support.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the transmission support bolts.

   Tighten

   Tighten the transmission support bolts to 90 N·m (66 lb ft).



208583

3. Install the transmission mount nut.

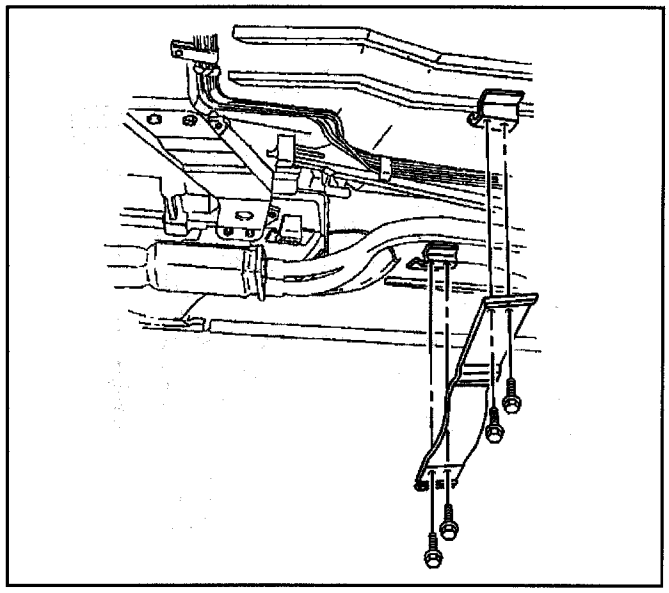
   Tighten

   Tighten the transmission mount nut to 57 N·m (42 lb ft).
4. Remove the transmission support jack.
5. Lower the vehicle.

Floor Panel Reinforcement Replacement (V6 and V8 w/6 SPD)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the floor panel center reinforcement bolts.
3. Remove the floor panel center reinforcement.



368319

Installation Procedure

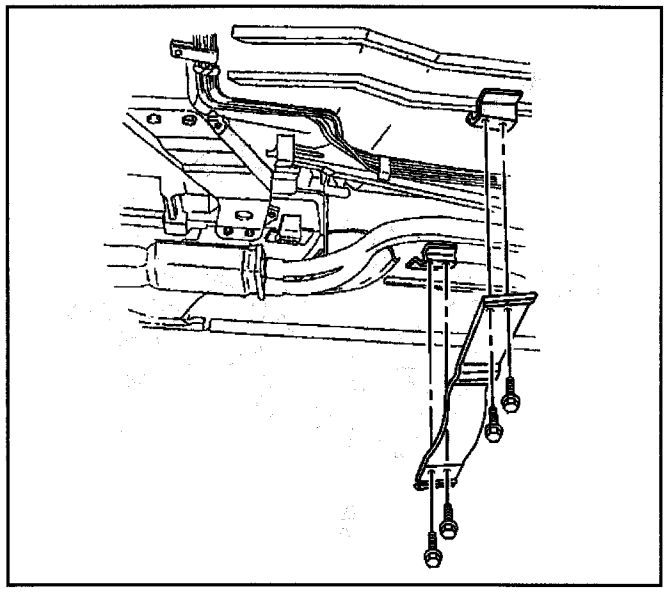
1. Install the floor panel center reinforcement.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the floor panel center reinforcement bolts.

   Tighten

   Tighten the floor panel center reinforcement bolts to 27 N·m (20 lb ft).
3. Lower the vehicle.

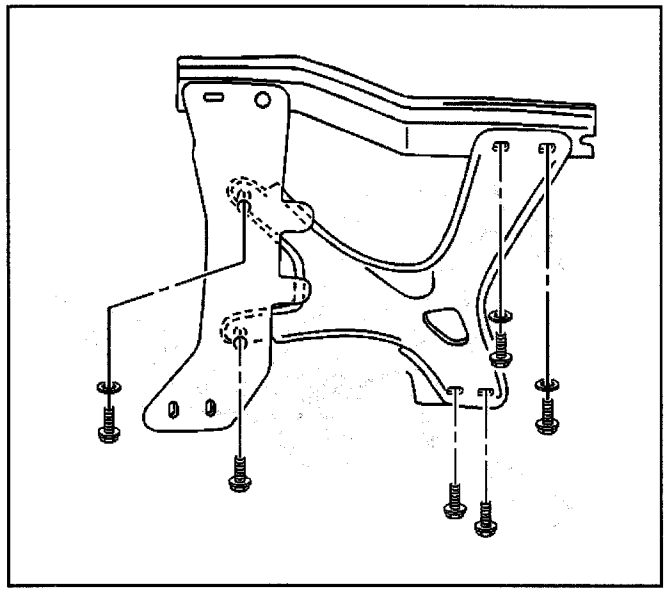


368319

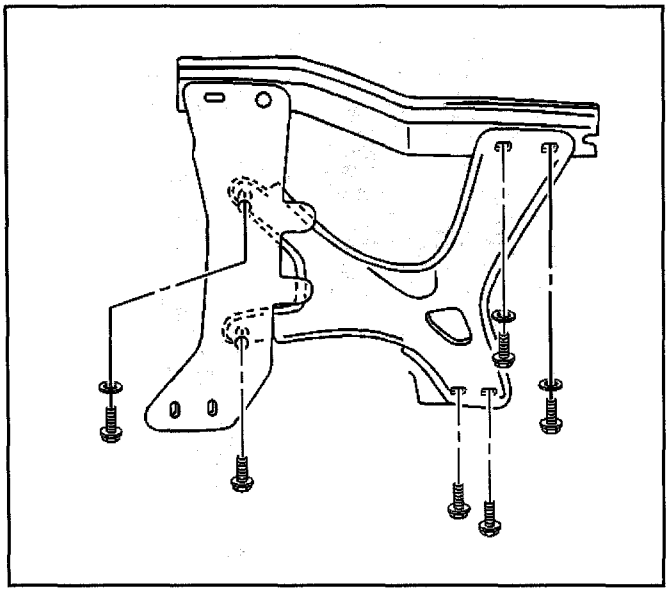
Floor Panel Reinforcement Replacement (V8)

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the floor panel center reinforcement bolts and washers from the transmission support.
3. Remove the floor panel center reinforcement bolts and washers at the underbody.
4. Remove the floor panel center reinforcement.



368321



368321

Installation Procedure

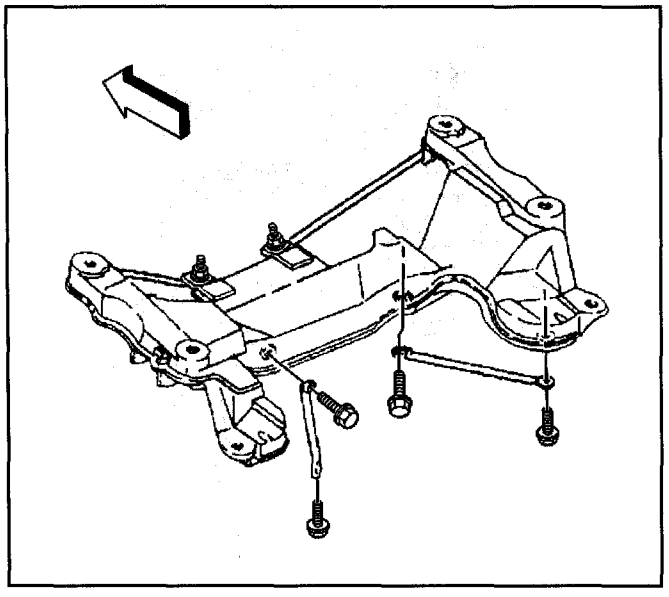
1. Install the floor panel center reinforcement.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the floor panel center reinforcement bolts and washers at the underbody.
3. Install the floor panel center reinforcement bolts and washers to the transmission support.

   Tighten

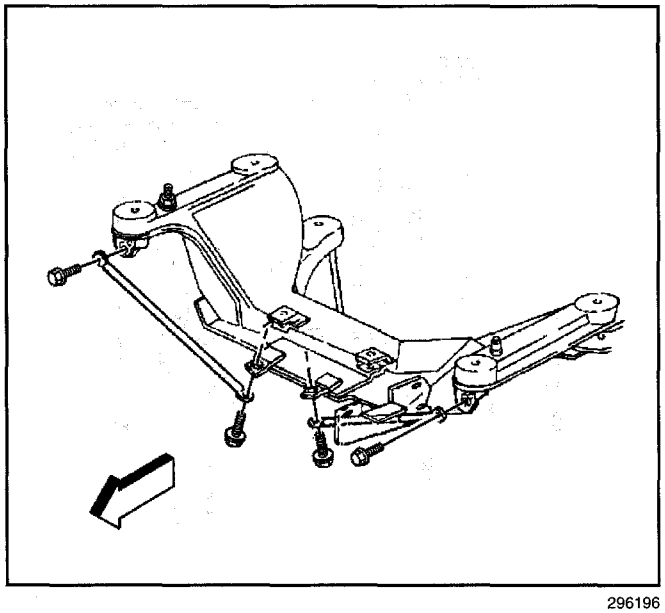
   Tighten the floor panel center reinforcement bolts to 27 N·m (20 lb ft).
4. Lower the vehicle.



296199

Crossmember Brace Replacement - Front

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the bolts that attach the braces to the front crossmember.

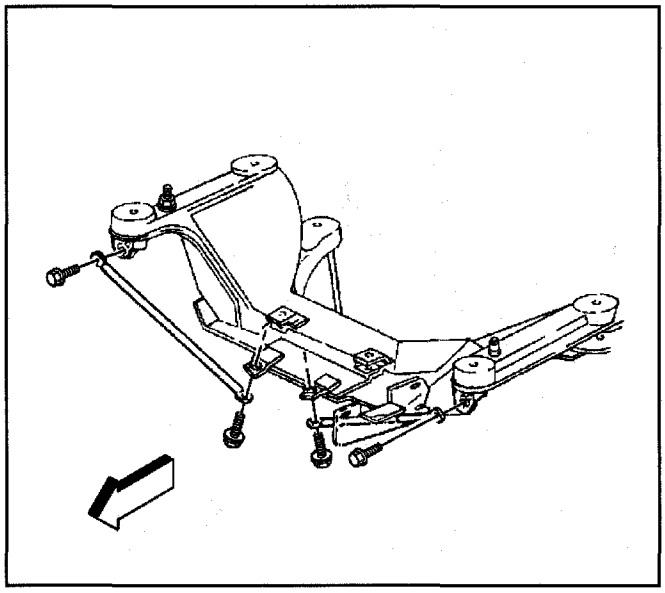


296196

3. Remove the braces from the front crossmember.

Installation Procedure

1. Connect the braces to the front crossmember.



296196

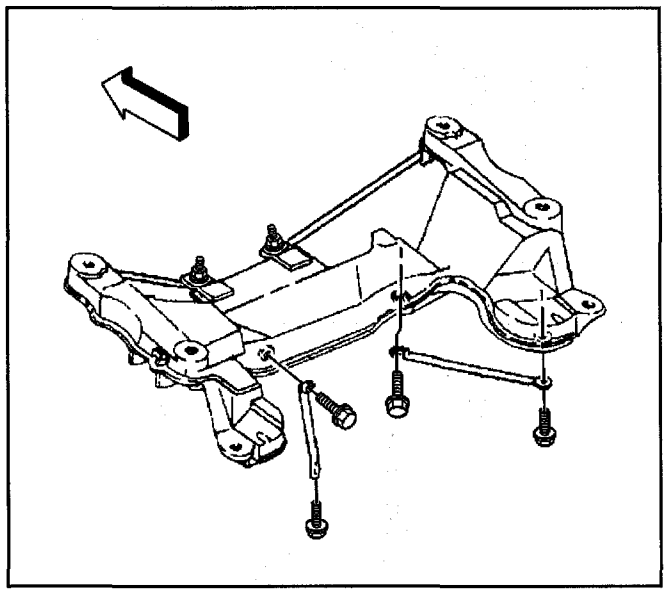
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts that attach the braces to the front crossmember.

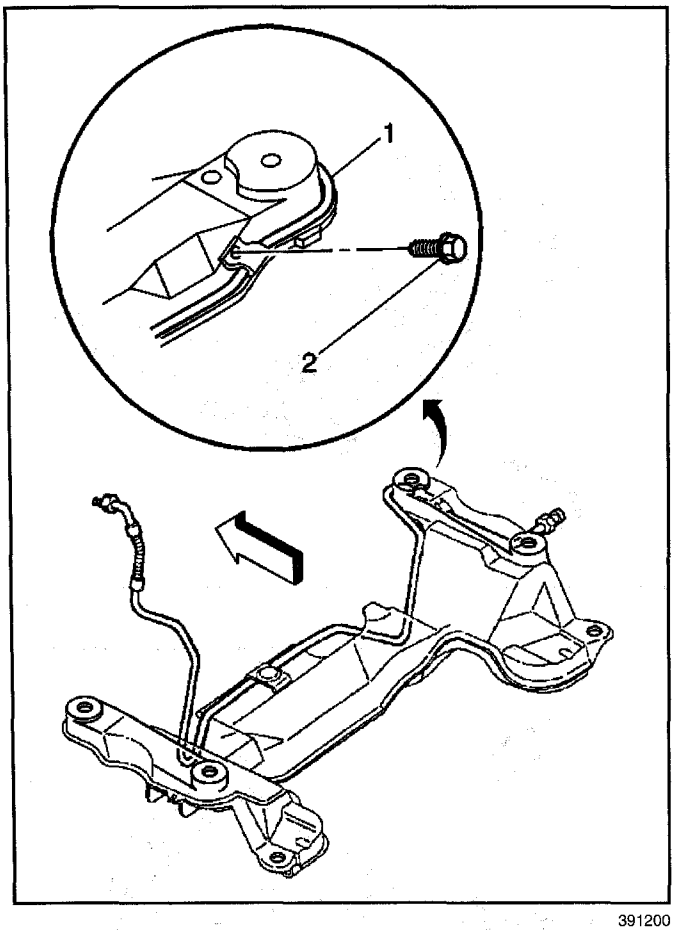
   Tighten

   Tighten the crossmember brace bolts to 29 N·m (21 lb ft).

3. Lower the vehicle.



296199



391200

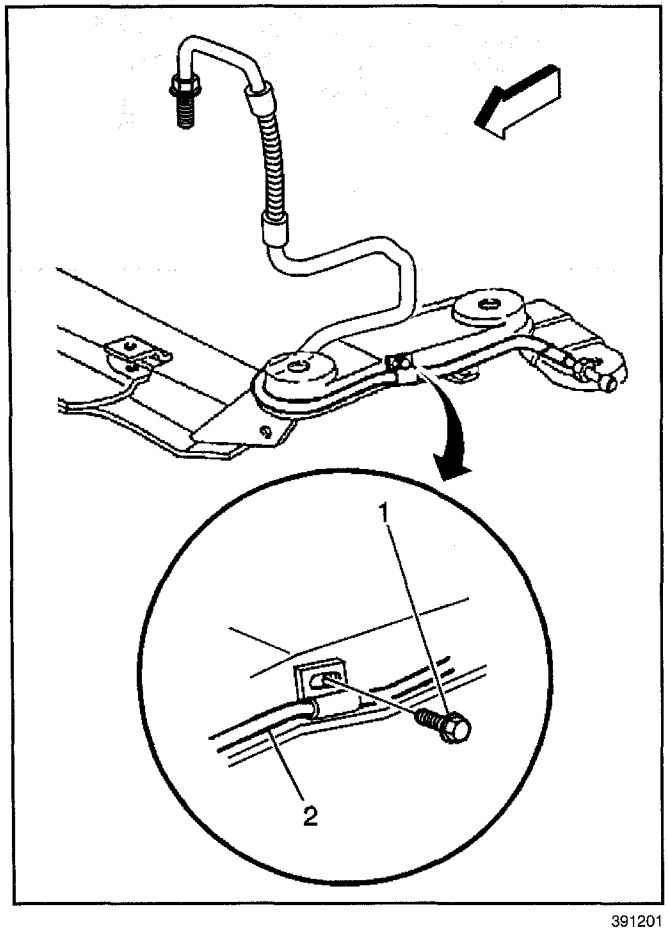
Crossmember Replacement

Removal Procedure

Tools Required

- *J 41044* Engine Support Adapters
- *J 42451* Engine Support Adapterr Kit
- *J 28467-B* Universal Support Fixture
- *J 36462-A* Engine Support Adapter

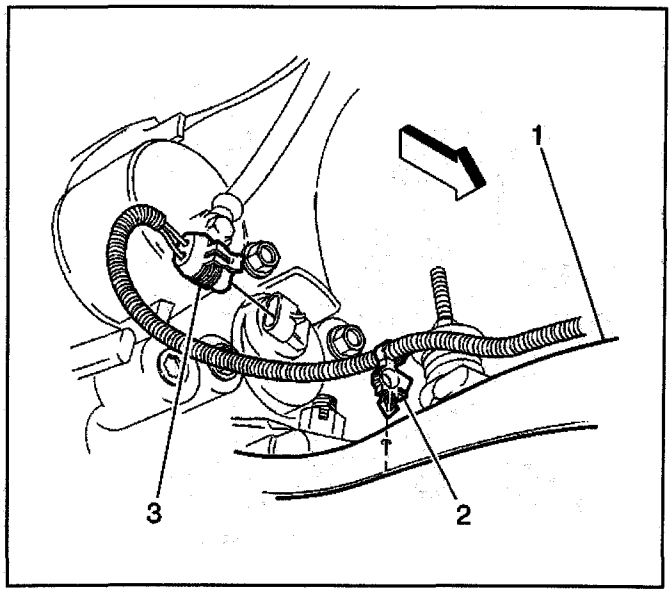
1. Remove the lower control arms. Refer to *Upper Control Arm Replacement* in Front Suspension.



391201

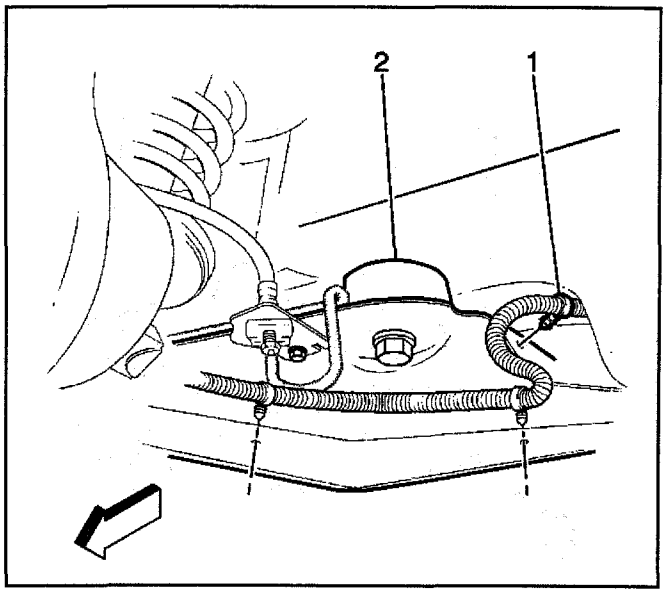
2. Using the *J 41044*, the *J 42451*, the *J 28467-B*, and the *J 36462-A* support and raise the engine.
3. Remove the steering gear. Refer to *Power Steering Gear Replacement (3.8L VIN G)* or *Power Steering Gear Replacement (5.7L VIN K)* in Power Steering.
4. Remove the engine mounts. Refer to *Engine Mount Replacement (Right Side)* and *Engine Mount Replacement (Left Side)* in Engine Mechanical.
5. Remove the brake pipe clip bolt (2) from the passenger side of the crossmember (1).
6. Remove the brake pipe clip bolt (1) from the driver side of the crossmember.

7. Disconnect the wheel speed sensor electrical connector (3).
8. Remove the harness clip (2) from the crossmember (1).



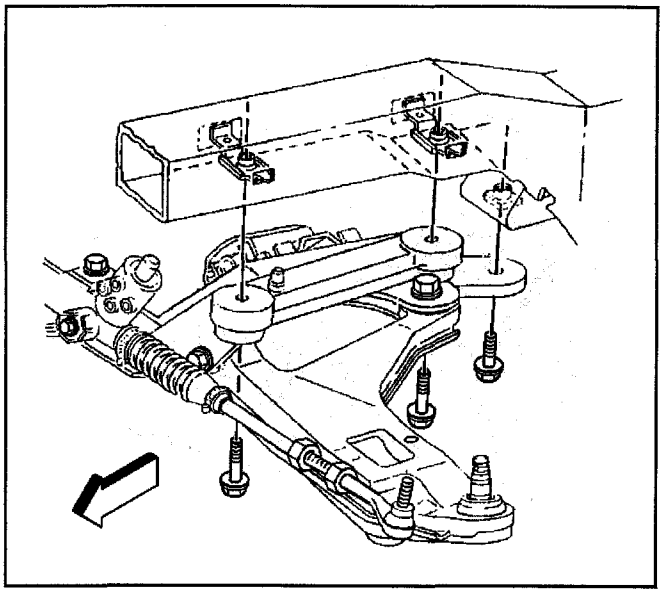
391199

9. Remove the harness clips (1) from the crossmember (2).

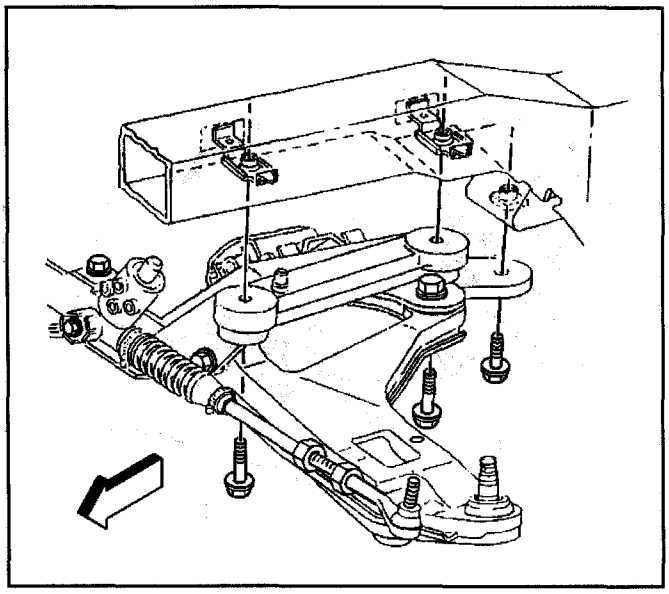


391198

10. Remove the crossmember bolts.
11. Slide the brake pipes from the crossmember.
12. Remove the crossmember from the vehicle.



296194



296194

Installation Procedure

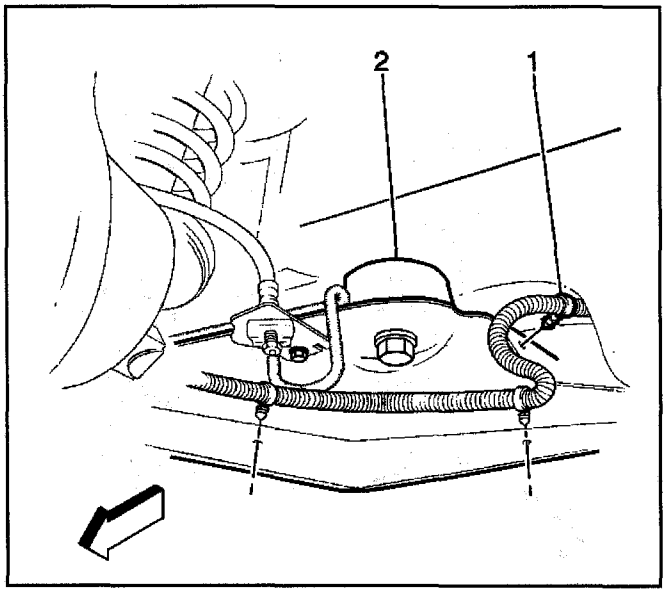
1. Install the crossmember to the vehicle.
2. Slide the brake pipes onto the crossmember.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the crossmember bolts.

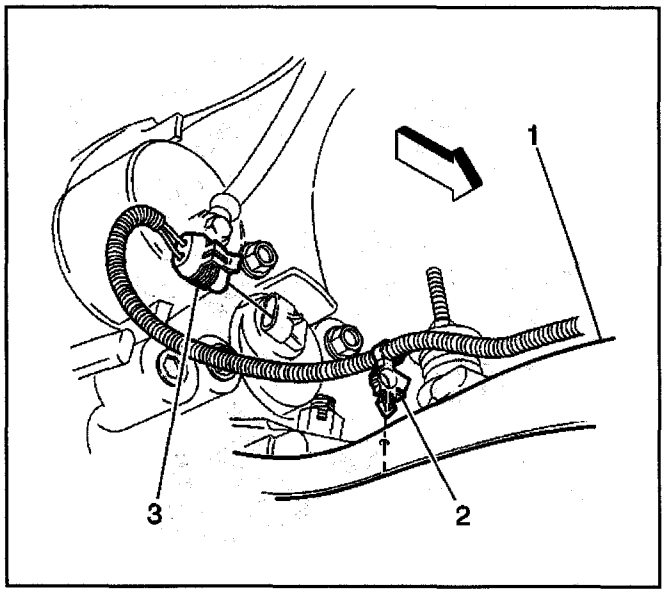
   Tighten

   - Tighten the lower crossmember bolts to 125 N·m 92 lb ft).
   - Tighten the upper crossmember bolts to 145 N·m 107 lb ft).



391198

4. Install the harness clips (1) to the crossmember (2).



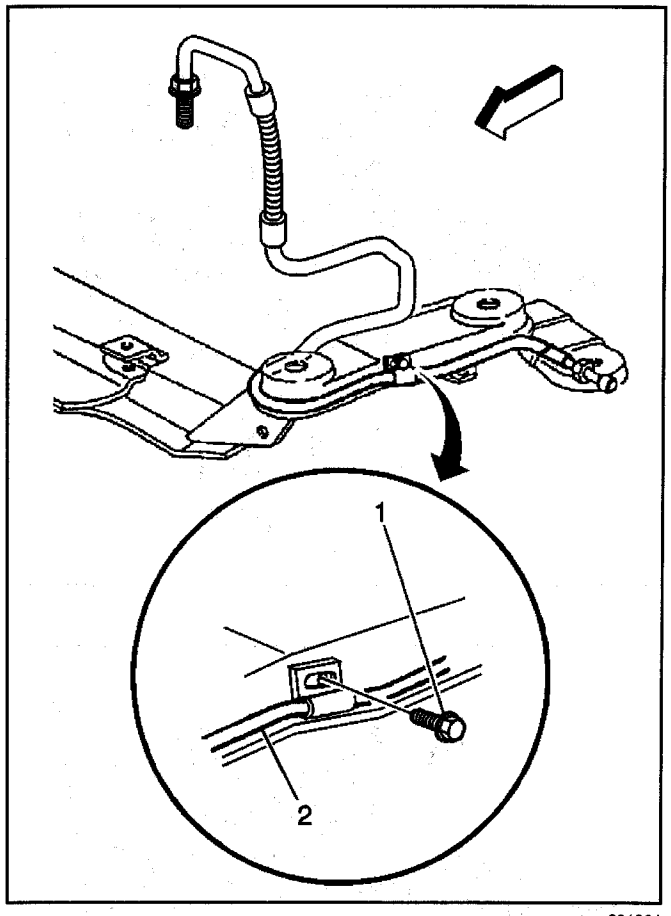
391199

5. Connect the wheel speed sensor electrical connector (3).
6. Install the harness clip (2) from the crossmember (1).

7. Install the brake pipe clip bolt (1) from the driver side of the crossmember.

   Tighten

   Tighten the brake pipe clip bolt (1) to 13 N·m (115 lb in).



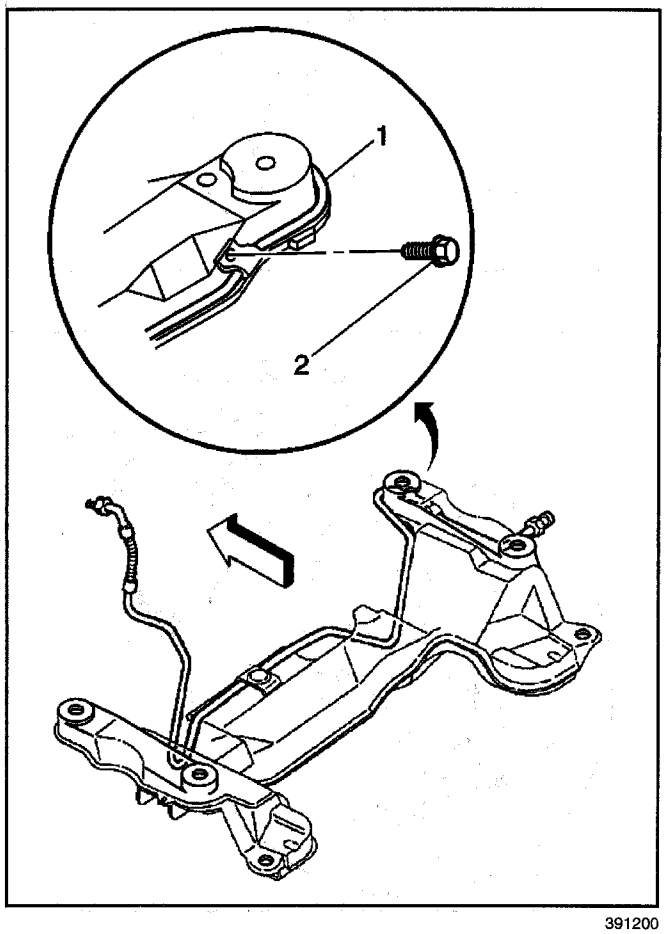
391201

8. Remove the brake pipe clip bolt (2) from the passenger side of the crossmember (1).

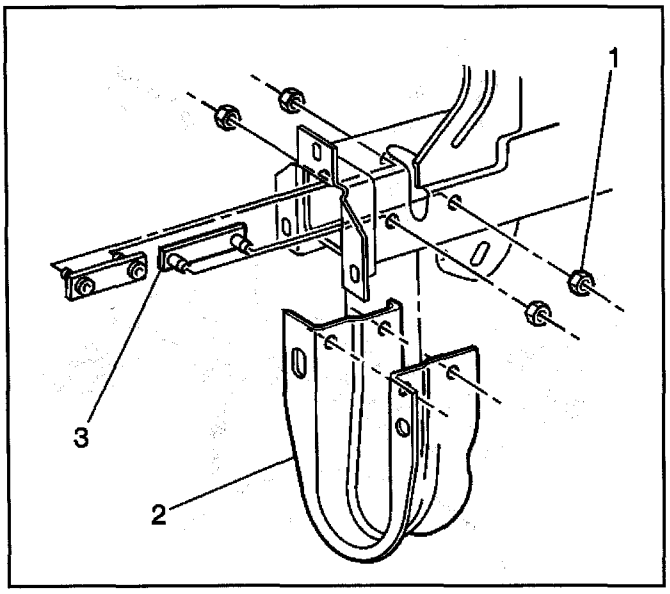
   Tighten

   Tighten the brake pipe clip bolt (2) to 13 N·m (115 lb in).

9. Install the steering gear. Refer to *Power Steering Gear Replacement (3.8L VIN G)* or *Power Steering Gear Replacement (5.7L VIN K)* in Power Steering.
10. Install the engine mounts. Refer to *Engine Mount Replacement (Left Side)* and *Engine Mount Replacement (Right Side)* in Engine Mechanical.
11. Remove the *J 41044*, the *J 42451*, the *J 28467-B* and the *J 36462-A*.
12. Install the lower control arms. Refer to *Upper Control Arm Replacement* in Front Suspension.



391200

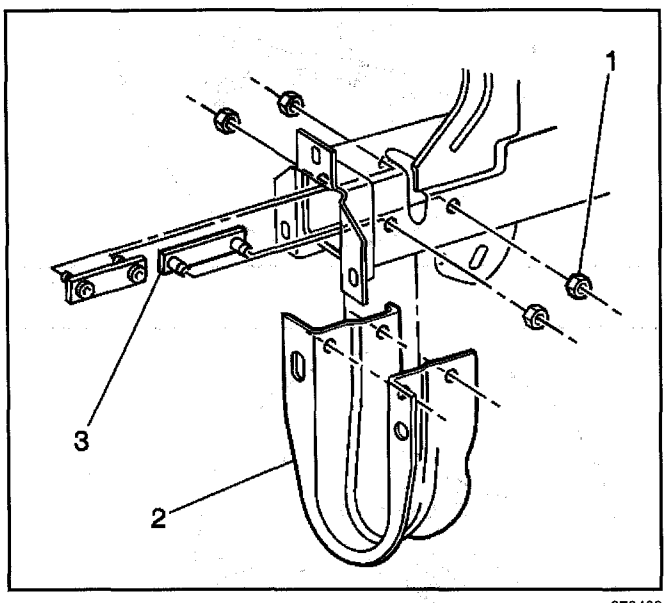


379409

Tow Hook Replacement (Front (Export))

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the front bumper fascia air deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
3. Remove the horn. Refer to *Horn Replacement* in Horns.
4. Remove the tow hook reinforcement nuts (1).
5. Remove the tow hook mounting plates (3).
6. Remove the tow hook (2) from rail.



379409

Installation Procedure

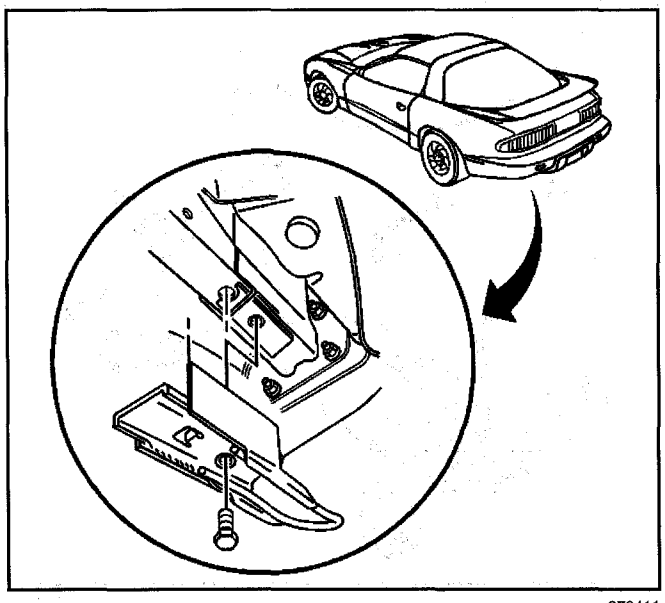
1. Install the tow hook (2) to the rail.
2. Install the tow hook mounting plates (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the tow hook reinforcement nuts (1).

   Tighten

   Tighten the tow hook reinforcement nuts (1) to 70 N·m (52 lb ft).
4. Install the horn. Refer to *Horn Replacement*
5. Install the front bumper fascia air deflector. Refer to *Air Deflector Replacement - Front Bumper Fascia* in Bumpers.
6. Lower the vehicle.

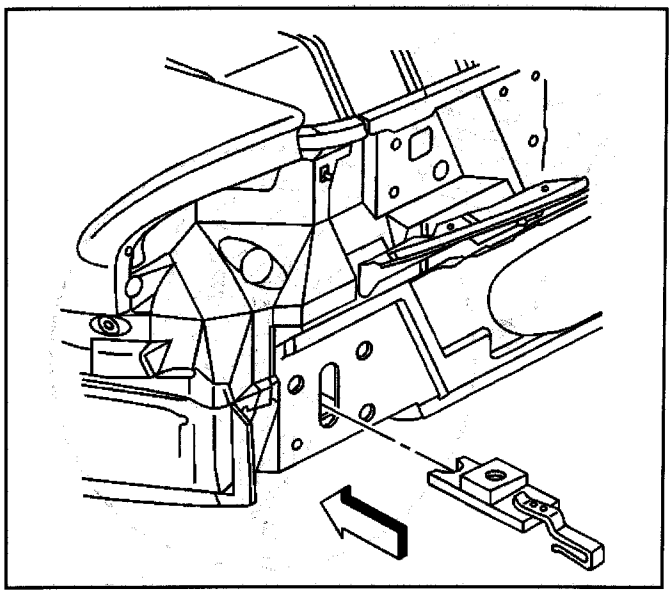

379411

Tow Hook Replacement (Rear Pontiac (Export))

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the rear tow hook bolt.
3. Remove the rear tow hook from the vehicle.

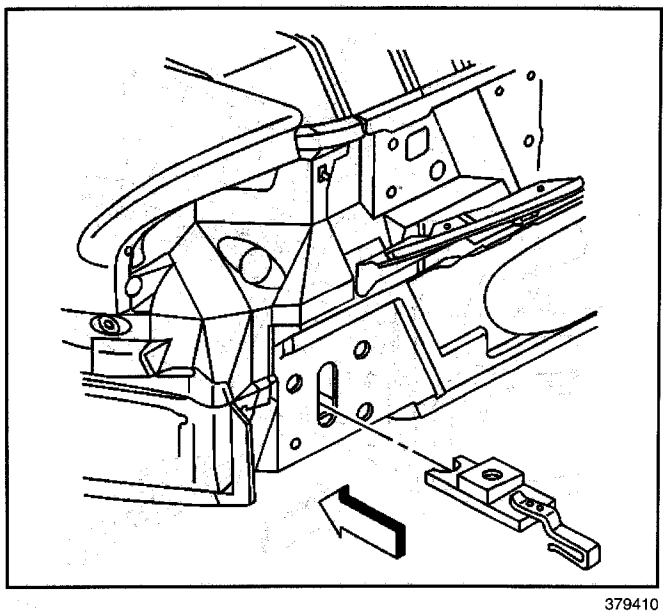
4. Remove the rear tow hook spacer, if necessary perform the following:
   4.1. Remove the rear bumper impact bar. Refer to *Impact Bar Replacement - Rear Bumper*
   4.2. Unclip the spacer from the lower flange of the longitudinal rail.
   4.3. Rotate the spacer 90 degrees.
   4.4. Remove the spacer through the access slot in the rear end panel.



379410

Installation Procedure

1. Install the rear tow hook spacer, if necessary perform the following:
   1.1. Install the spacer through the access slot in the rear end panel.
   1.2. Rotate the spacer 90 degrees.
   1.3. Clip the spacer to the lower flange of the longitudinal rail.
   1.4. Install the rear bumper impact bar. Refer to *Impact Bar Replacement - Rear Bumper*



379410

2. Install the rear tow hook to the vehicle.

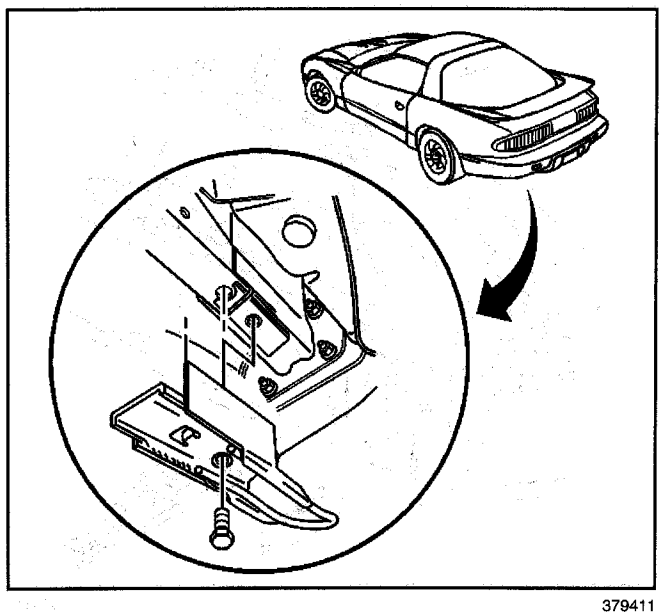
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Instal the rear tow hook bolt.

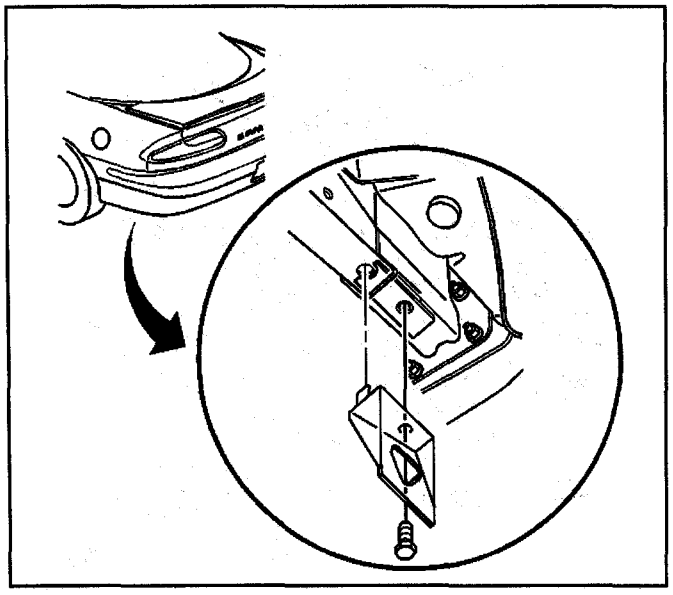
   Tighten

   Tighten the rear tow hook bolt to 205 N·m (151 lb ft).

4. Lower the vehicle.



379411

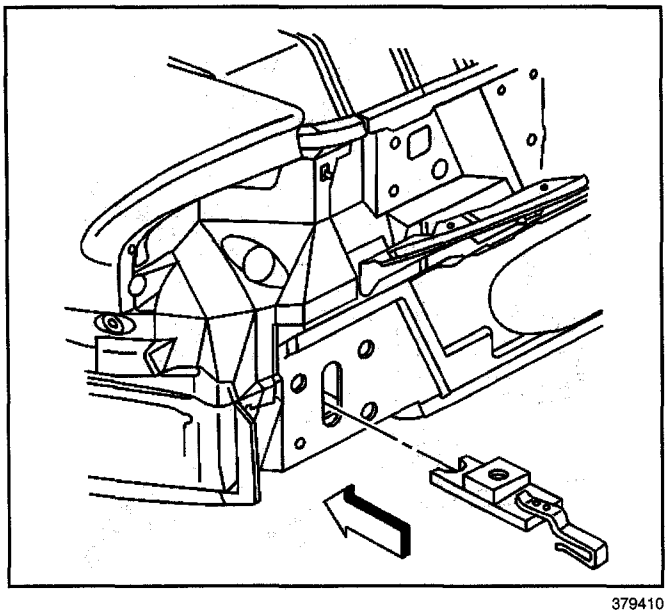


379413

Tow Hook Replacement (Rear Chevrolet (Export))

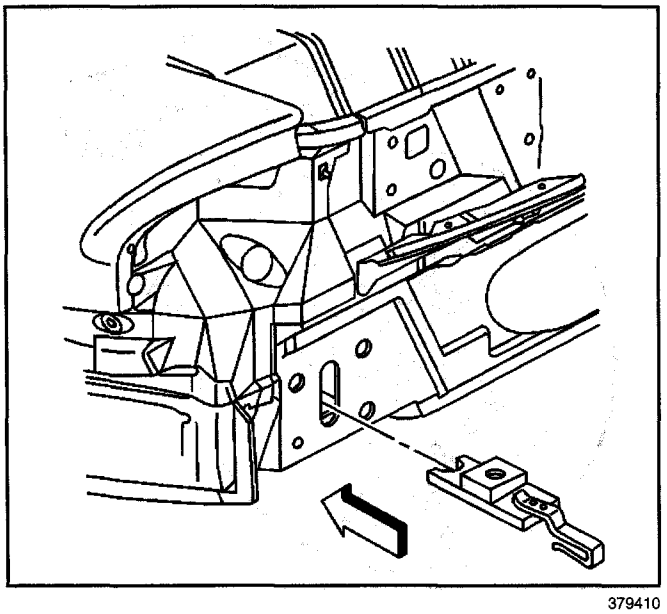
Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the rear tow hook bolt.
3. Remove the rear tow hook from the vehicle.



379410

4. Remove the rear tow hook spacer, if necessary perform the following:
   4.1. Remove the rear bumper impact bar. Refer to *Impact Bar Replacement - Rear Bumper* in Bumpers.
   4.2. Unclip the spacer from the lower flange of the longitudinal rail.
   4.3. Rotate the spacer 90 degrees.
   4.4. Remove the spacer through the access slot in the rear end panel.



379410

Installation Procedure

1. Install the rear tow hook spacer, if necessary perform the following:
   1.1. Install the spacer through the access slot in the rear end panel.
   1.2. Rotate the spacer 90 degrees.
   1.3. Clip the spacer to the lower flange of the longitudinal rail.
   1.4. Install the rear bumper impact bar. Refer to *Impact Bar Replacement - Rear Bumper* in Bumpers.

2. Install the rear tow hook from the vehicle.

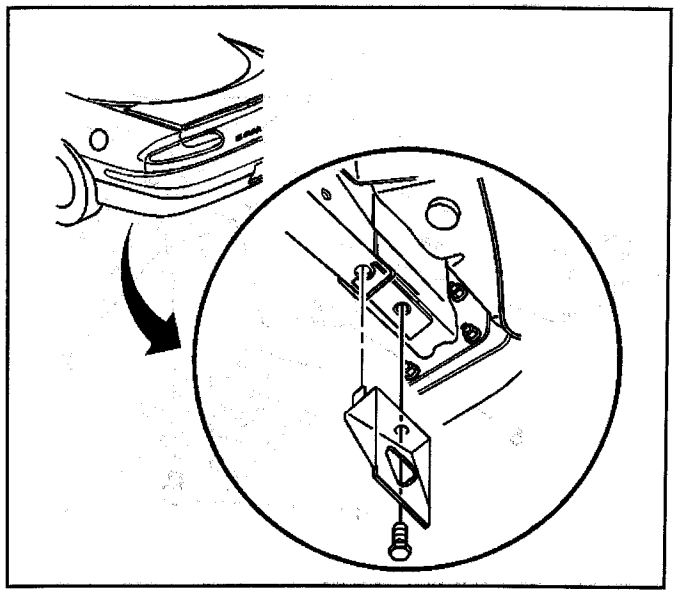
Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the rear tow hook bolt.

   Tighten

   Tighten the rear tow hook bolt to 205 N·m (151 lb ft).

4. Lower the vehicle.



379413

Underbody Inspection

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Check for obvious deterioration on the floor pan.
3. Check for loose dirt and corrosion around the inside of the floor pan reinforcement member access holes. This is the first indication that corrosion may exist in hidden areas.

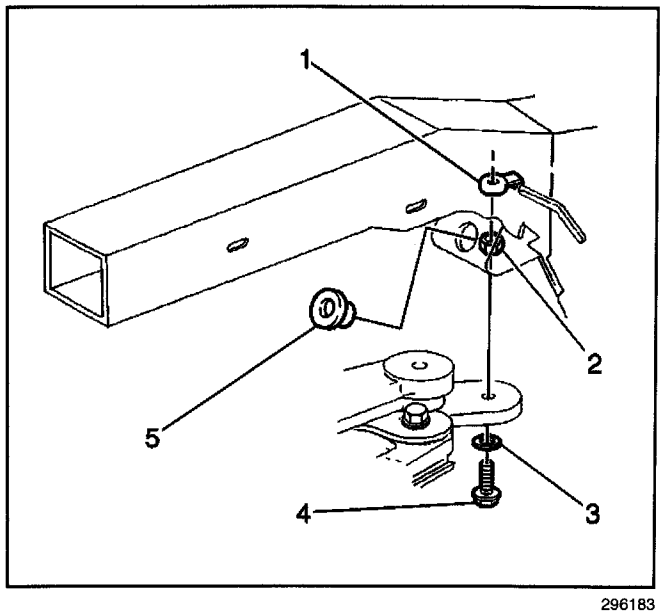
   Perform all repairs before the final cleaning and protective treatment is performed.
4. Using a chisel, ensure that the drain provisions in the floor pan reinforcement members are open.

   Open the drain holes in the body side panels using a punch and a drift.

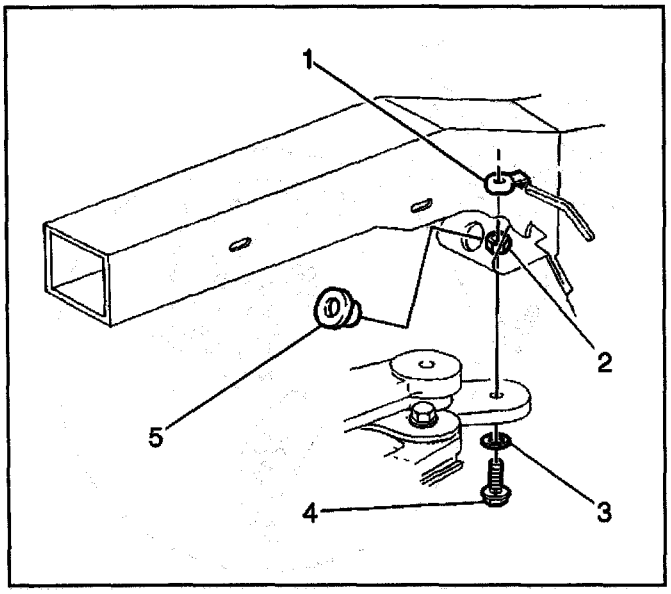
Damaged Cage Nut Service

Removal Procedure

1. Remove the plug (5) from the side rail.
2. Use a 13 mm drill bit in order to drill out the damaged nut (2).



296183



296183

Installation Procedure

1. Place an anti-rotation nut (1) on top of the drilled out nut (2).
2. Align the front crossmember to the side rail.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Finger tighten the crossmember bolt (3) and the washer (4).

   Tighten

   Tighten the lower crossmember bolt to 125 N·m (92 lb ft).
4. Install the plug (5) to the side rail.

Description and Operation

Datum Description

The datum line is a base line parallel to the plane of the underbody or the frame where all vertical measurements originate. A datum line is an imaginary horizontal plane that runs below and parallel to the vehicle. The height dimensions are calculated at right angles from the datum to a given control or reference point on the underbody.

The height dimensions determine the location of the datum based on the equipment being used. Therefore, different datum lines are established for the same vehicle. You can add an equal amount from all height dimensions and create a new datum line for your usage.

Centerline Description

A centerline is an imaginary vertical plane that is perpendicular to the length of the datum plane through the center of the vehicle. The centerline is any line drawn through the center of the vehicles datum plane.

Frame and Underbody Description

The following are supported by a front crossmember frame which is rigidly bolted to the body at six locations:

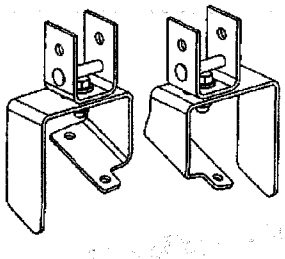
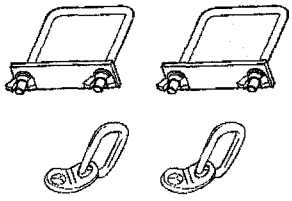
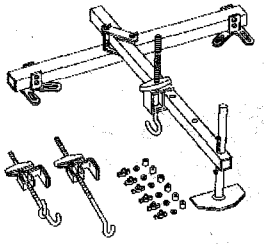
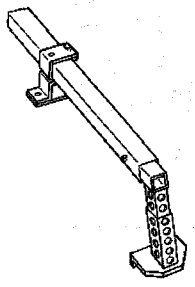
- The engine
- The front suspension lower control arms
- The steering linkage

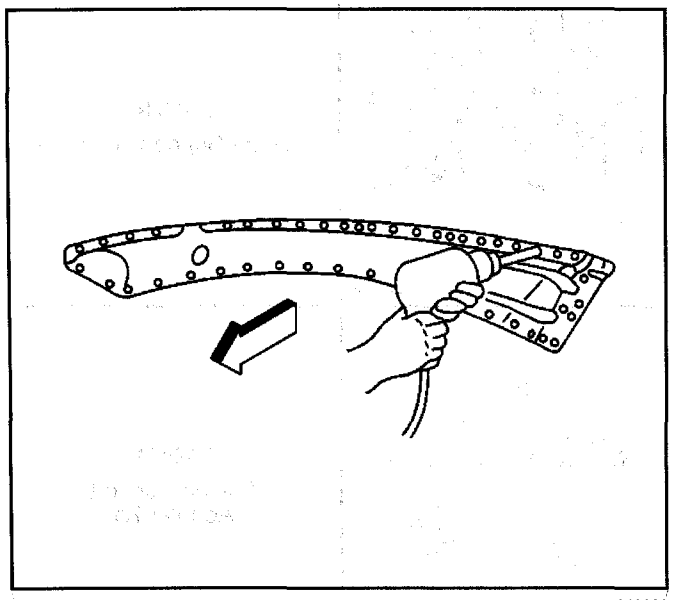
Two rubber mounts secure the engine to the front crossmember frame. The underbody frame (cradle) must be properly aligned to maintain the correct suspension and wheel alignment.

The individual underbody components contribute directly to the overall strength of the unibody. Use proper welding techniques during service operations. Refer to Collision Repair for welding information and for vehicle preparation.

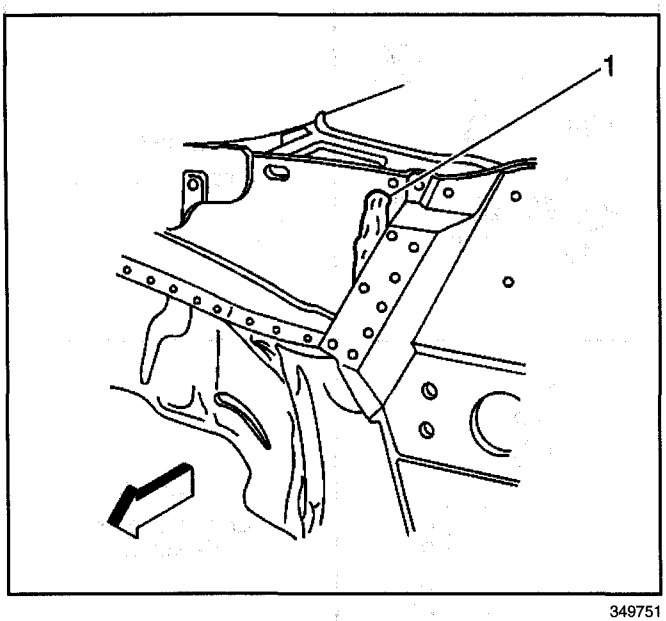
The components must be corrosion protected whenever body repair operations damage or destroy the original sealing surfaces. Use two part catalyzed primer such as PPG DP40 or equivalent when corrosion protection is needed on welded surfaces. Use GM Goodwrench Anti-Corrosion Compound P/N 12346225 or equivalent when needing a general corrosion protectant. Do not combine paint systems. refer to the paint manufacturer's recommendations.

Special Tools and Equipment

Illustration	Tool Number/ Description
 220634	J 41044 Engine Support Adapters
 220638	J 42451 Engine Support Adapter Kit
 220640	J 28467-B Universal Support Fixture
 220642	J 36462-A Engine Support Adapter Leg



349629



349751

Collision Repair

Repair Instructions

Rail Replacement - Upper

Engine Compartment Front Outer Side Rail

Before attempting to remove the engine compartment front outer side rail, visually inspect the damage and restore as much of the damage as possible to factory specifications. The engine compartment front outer side rail is attached to the front wheelhouse panel upper side rail assembly with spots welds. To remove the outer side rail, the spot welds must be drilled out. On the service part outer side rail, plug weld holes are not included. Plug weld holes must be drilled in the same location as the original spot welds.

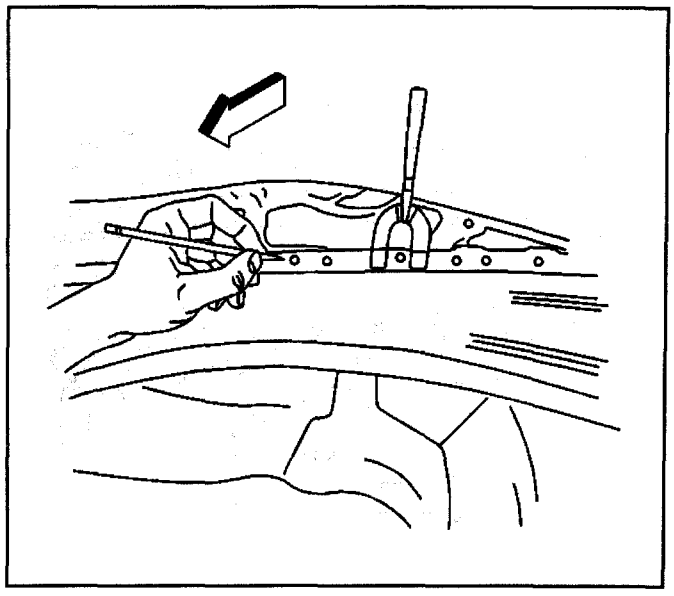
Removal Procedure

Important: Note the number and location of the welds for the installation of the new outer side rail.

1. Remove the front fender assembly, the hood assembly and the hood hinge assembly.
2. Drill out all related factory welds.
3. Remove the outer side rail.
4. Remove the air baffle material (1) from the side rail assembly.
5. Remove sealant from side rail assembly as necessary.

Installation Procedure

1. Position the new outer side rail to side rail assembly and clamp in place.
2. Mark seven formed and pierced locations from the side rail assembly to the new outer side rail.
3. Mark the hood hinge hole locations.

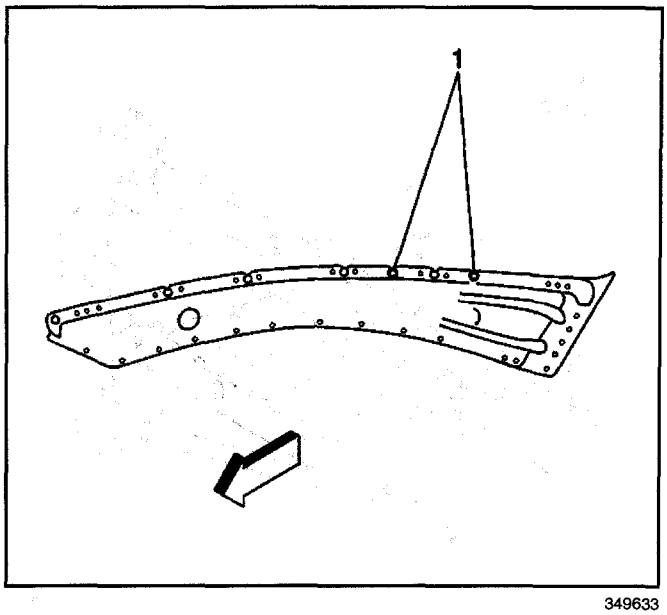


349631

4. Remove the clamps and the outer side rail.
5. Drill 1/8 in holes in marked locations on the new outer side rail at formed and pierced locations.
6. Drill two 10 mm (3/8 in) holes at hood hinge hole locations (1).
7. Drill 8 mm (5/16 in) 3/4 in fore and aft of seven formed and pierced locations.

Important: If the original outer side rail is damaged beyond recognition, place holes for welding 40 mm (1 1/2 in) apart.

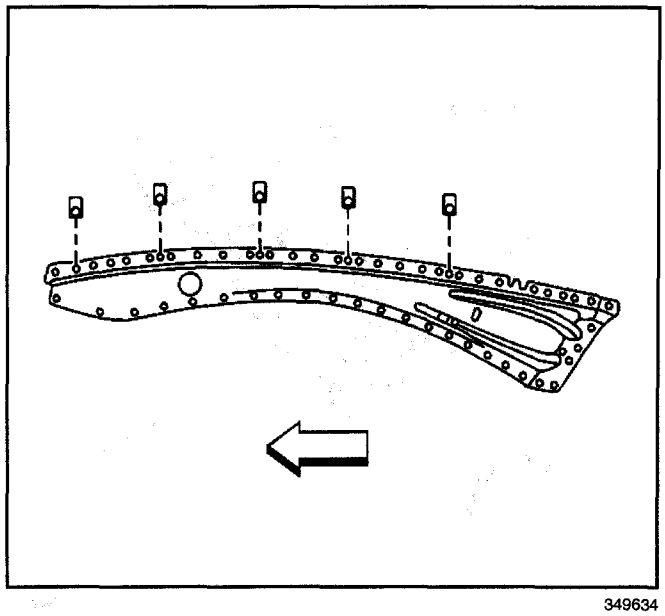
8. Drill 8 mm (5/16 in) holes on remaining locations as noted from old outer side rail.



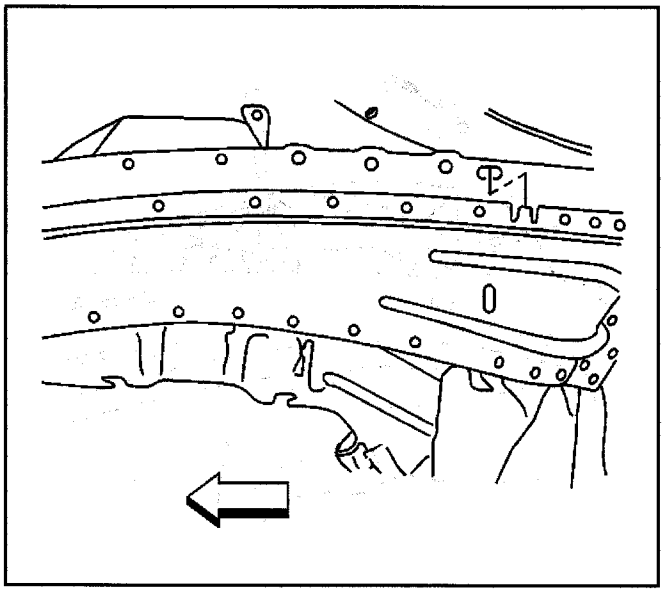
349633

Important: Two formed and pierced locations at hood hinge mounting panel do not require J-Clips.

9. Install J-Clips included with rail, GM P/N 10079170, at five formed and pierced locations.
10. Position the new outer side rail in place, insert locating tab through slot.



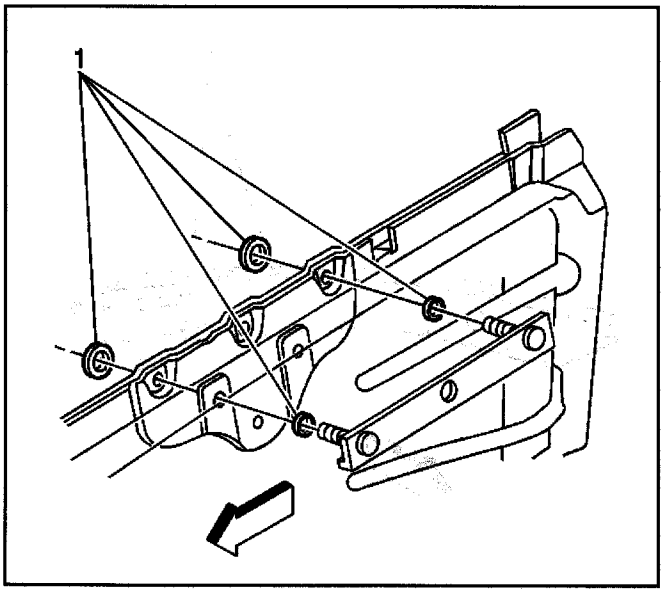
349634



349635

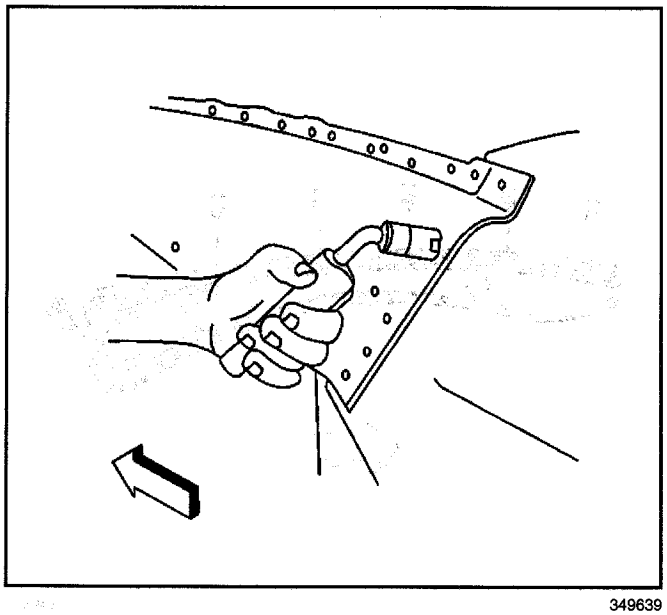
Important: The new outer rail may be manually positioned to accommodate the J-Clips at the five formed locations.

11. Install the fender mounting bolts/screws included with rail, GM P/N 11505023, at five J-Clips to secure outer side rail in place.



349636

12. Follow the next steps accordingly:
    - Outer Rail Replacement Only. Match the new outer rail to the contour of the two formed locations at the hood hinge. (Use hood hinge bracket with original spacers intact.)
    - Inner and Outer Rail Replacement. Replace original two spacers on hood hinge bracket bolt/screw with two washers provided (1). Install hood hinge bracket upside down, washers and bolts/screws to outer side rail assembly at hood hinge mounting panel.



349639

Important: Be sure to measure continually throughout welding process to maintain correct dimensions.

13. Using a MIG welder randomly plug weld new outer side rail in place.
14. Clean and prepare welded surfaces. Apply 3M Brushable Seam Sealer, part number 08361 or equivalent as necessary.

Important: Apply a small amount be applied into a disposable container to become familiar with the rate of discharge.

15. Apply HANDI FOAM to replace air baffle material. HANDI FOAM kit is available from FOMO Products Inc., 2775 Barber Rd., P.O. Box 1078, Norton, Ohio 44203 or call 1–800–321–5585 or 216–753–4585.

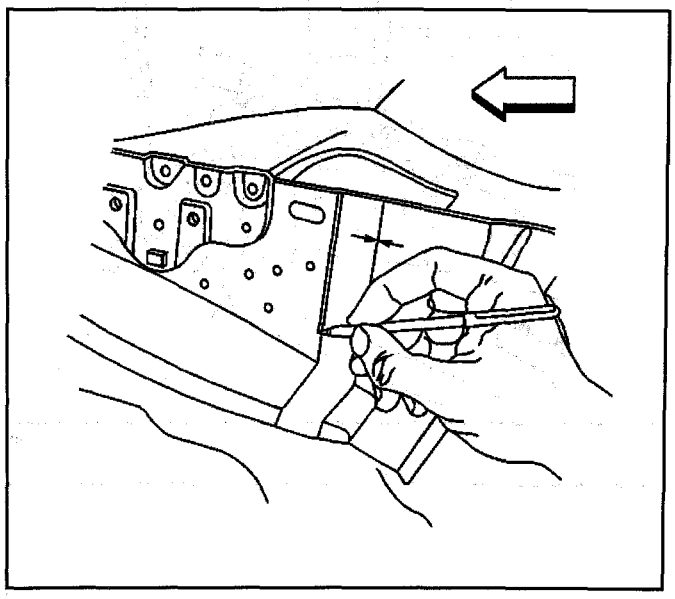
16. Prime with two-part catalyzed primer.
17. Apply anti-corrosion material as necessary.
18. Install the hood hinge assembly, the hood assembly and the front fender assembly.

Wheelhouse Replacement - Front (Panel Upper Side Rail)

When replacing the upper side rail assembly, cut a section of the damaged side rail assembly away and section a new side rail assembly in its place. Removal of the side rail assembly requires the use of a template to help in determining the location of the cut to be made.

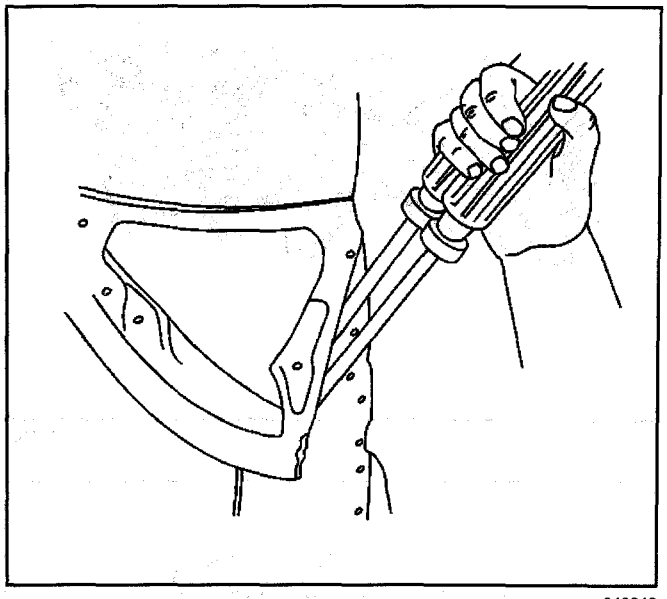
Removal Procedure

1. Remove the outer side rail.*Rail Replacement - Side*
2. Position template included with rail to side rail assembly at forward edge where indicated by arrows and scribe line onto side rail assembly.

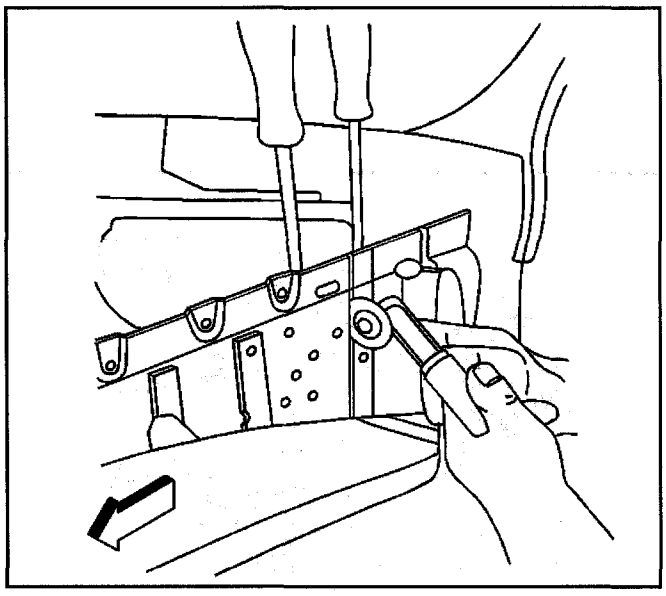


349641

3. Drill out the welds at cowl panel. The remaining welds will hold side rail assembly in place while cutting.
4. Separate side rail assembly away from cowl panel.



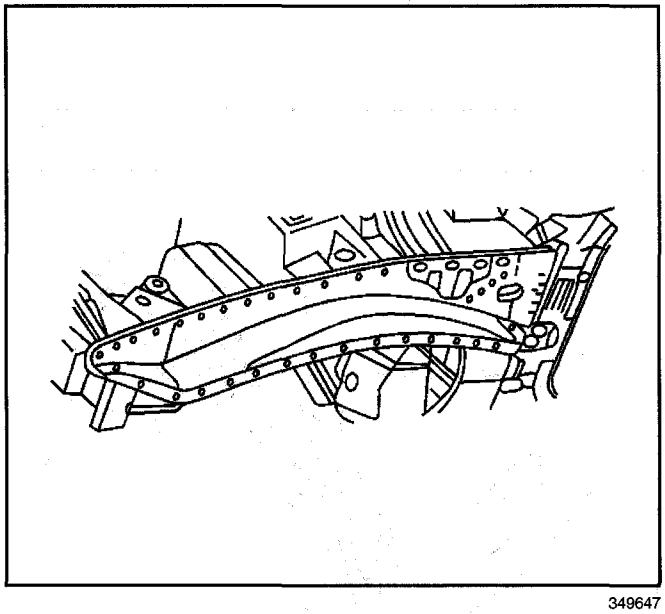
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349645

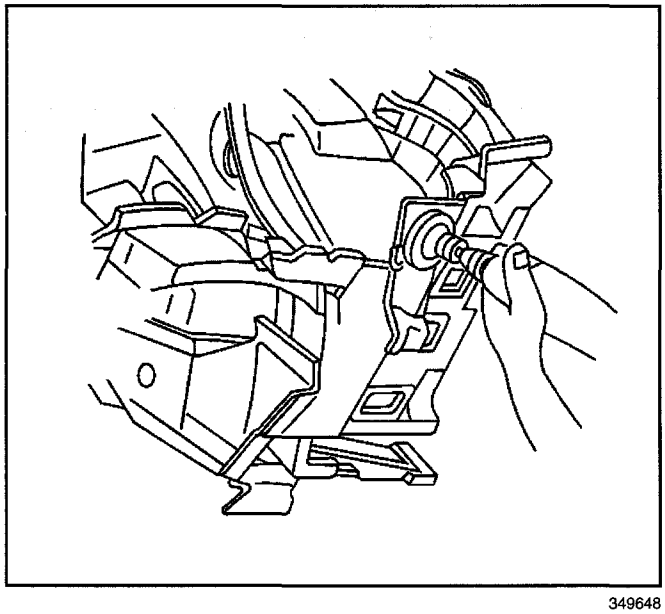
Important: Note the number and the location of remaining welds for installation of new side rail assembly.

5. Cut the side rail assembly at scribed lines, being careful not to cut adjacent panels.



349647

6. Drill out the remaining welds.
7. Remove the side rail assembly.



349648

Installation Procedure

1. Prepare mating surfaces for proper fit of new side rail assembly.
2. Clean sealer away from mating surfaces as necessary.

Important: If original side rail assembly is damaged beyond recognition, place holes for welding 1 1/2 in apart.

3. On new side assembly drill 5/16 in holes in remaining locations as noted from original side rail assembly.
4. Clean the surface of seven pierced locations on side rail assembly with mild soap and water.
5. Wipe dry.
6. Clean with wax and grease remover.

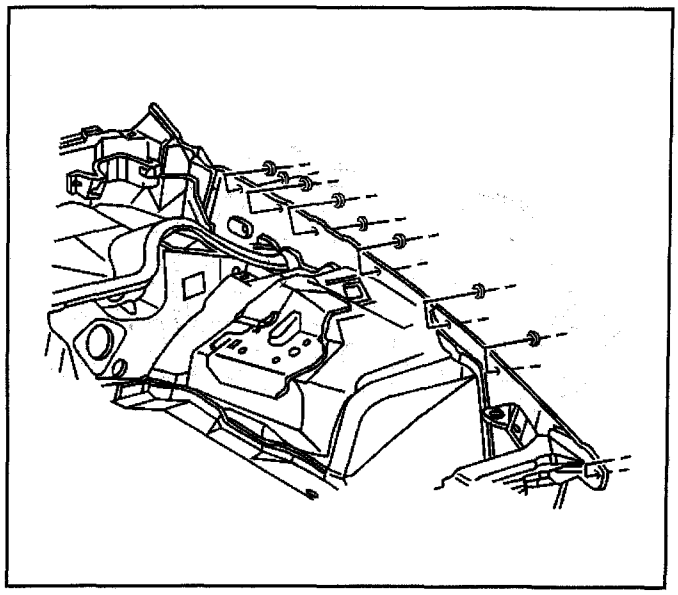
Important: Use only service kit washers provided with rail, GM P/N 12520407. Use of any other washer could cause improper positioning of side rail assembly.

Important: The forward pierced location may need to be manually positioned according to upper body dimensions, utilizing common tools and techniques.

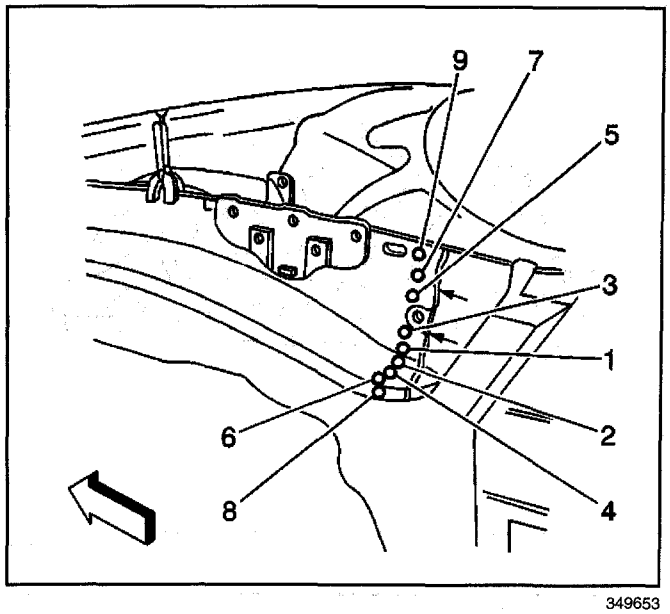
7. Remove backing from washers included with rail and carefully apply to motor compartment side of new side rail assembly at pierced locations.
8. Position new side rail assembly to overlap remainder of original side rail assembly by 35 mm. Align to arrows on remainder of original side rail assembly and clamp.
9. Using a MIG welder, at overlap, plug weld all 8 mm pre-drilled holes in new side rail assembly in sequence shown.

Important: Be sure to measure continually throughout welding process to maintain correct dimensions.

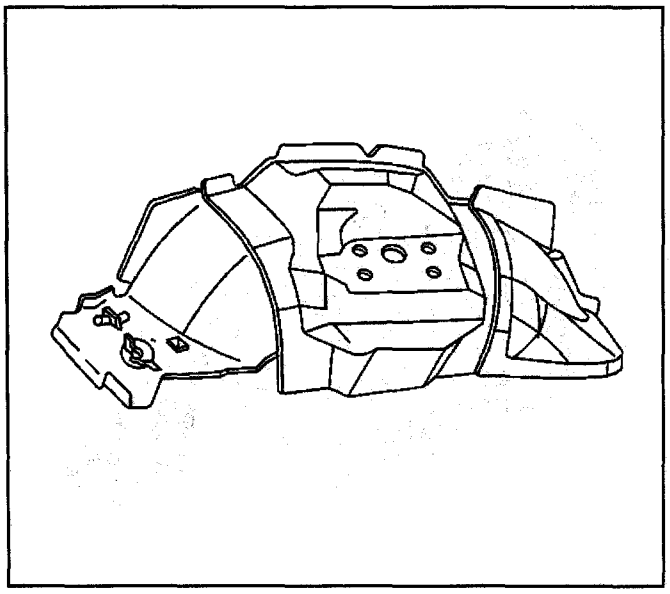
10. Using a MIG welder, randomly plug weld all remaining holes in new side rail assembly.
11. Complete stitch welding along seam.
12. Remove the clamps.
13. Clean and prepare welded surfaces. Prime with two-part catalyzed primer. Do not combine paint systems. Refer to paint manufacturer' s recommendations.
14. Install outer side rail. Refer to Engine Compartment Front Outer Side Rail.



349652



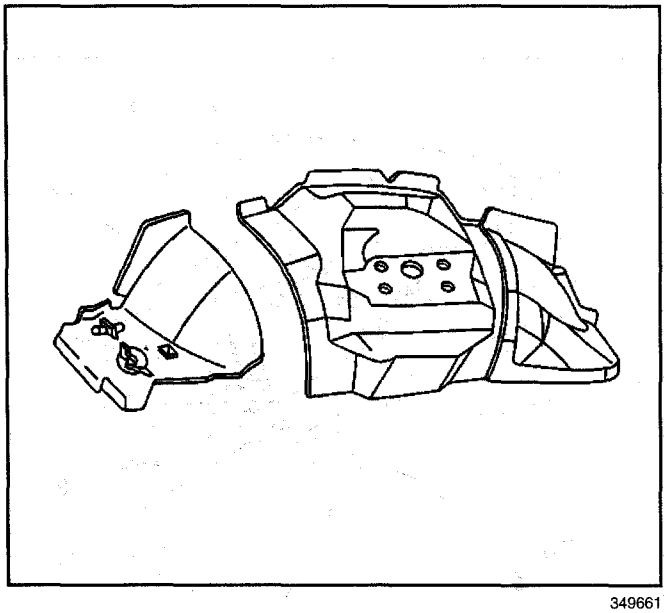
349653



349660

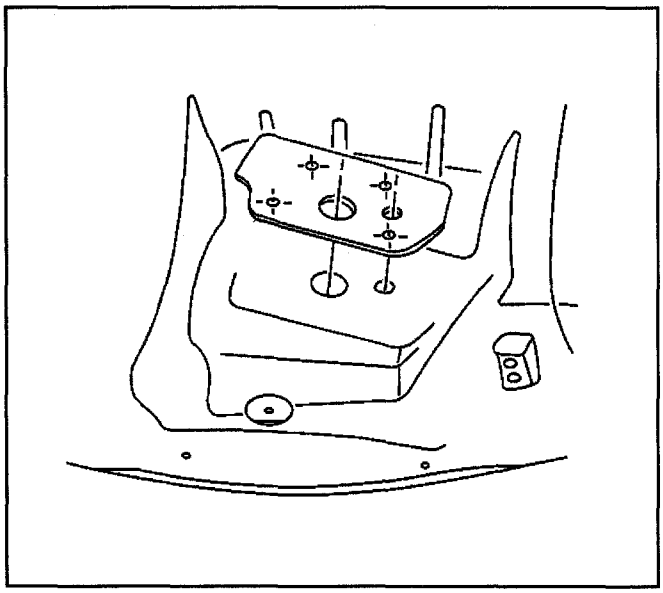
Wheelhouse Replacement - Front (Complete)

The Front Wheelhouse is available as an entire part including all brackets and reinforcements.



349661

The Front Wheelhouse Apron is also available separately.



349663

Removal Procedure

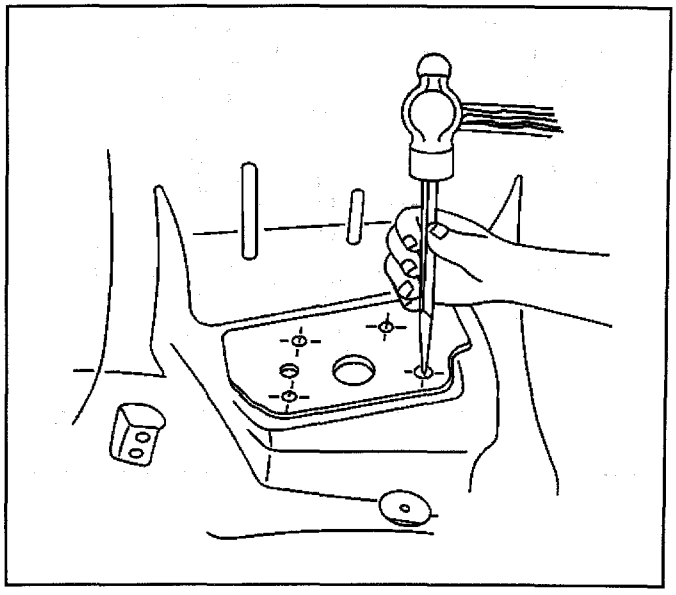
1. Remove all related panels and components.
2. Visually inspect the damaged area.
3. Restore as much of the damage as possible to factory specifications.
4. Remove sealers and anti-corrosion materials as necessary.

Important: Note the number and location of welds for installation of the front wheelhouse assembly.

5. Mark all factory welds.
6. Drill out all factory welds.
7. Remove the damaged wheelhouse.
8. Prepare mating surfaces for proper fit of new front wheelhouse assembly.

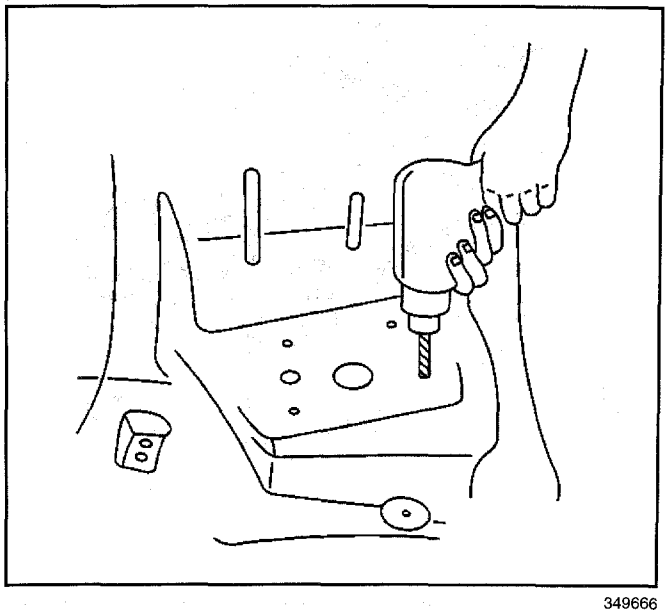
Installation Procedure

1. Set the new front wheelhouse assembly on a work surface with underside up.
2. Position the template (included in service kit) in the font wheelhouse assembly.
3. With a center punch locate four strut attaching holes.

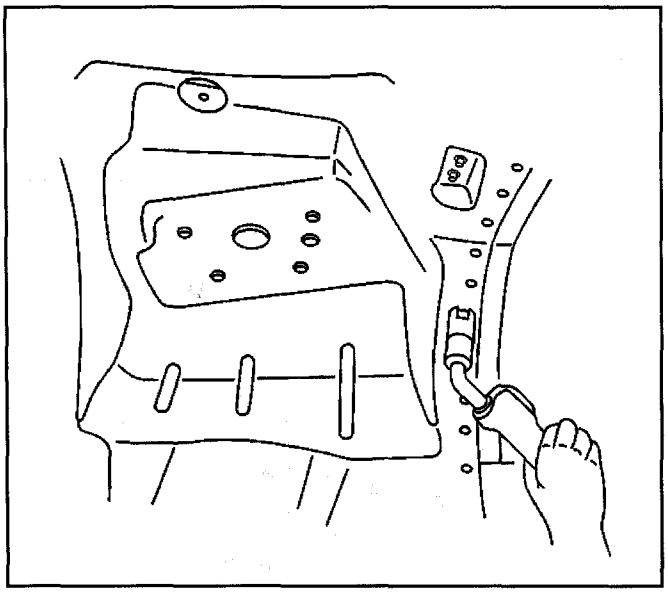


349665

4. Remove template.
5. Drill 12 mm (15/32 in) holes in marked locations on new front wheelhouse assembly.



349666

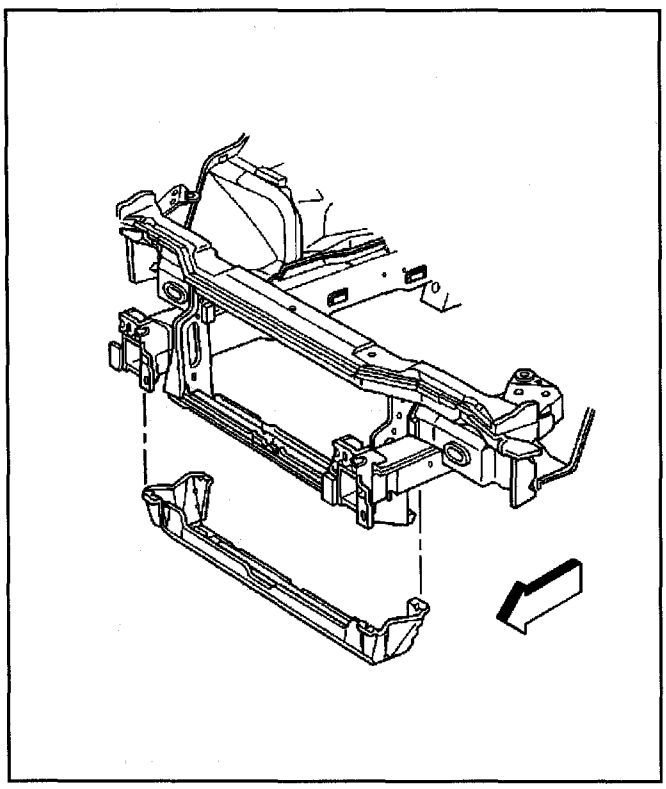


349667

6. Drill 8 mm (5/16 in) plug weld holes in the locations 1 1/2 in apart.
7. Position new front wheelhouse assembly in place, align and clamp.

Important: Be sure to measure continually throughout welding process to maintain correct dimensions.

8. Using a MIG welder, randomly plug weld the new front wheelhouse assembly in place.
9. Remove the clamps.
10. Clean and prepare the welded surfaces.
11. Apply 3M Brushable Seam Sealer part number 08361 or equivalent as necessary.
12. Refinish according to paint manufacturer's recommendations.
13. Apply anti-corrosion materials as necessary.



454111

Rail Sectioning - Lower

Removal Procedure

Important: Sectioning procedures have been developed to simplify repair to the lower LEFT rail, providing the majority of the damage can be returned to factory specifications. This allows the damaged front section to be replaced without performing full rail replacement. Bumper mounting brackets can be serviced separately.

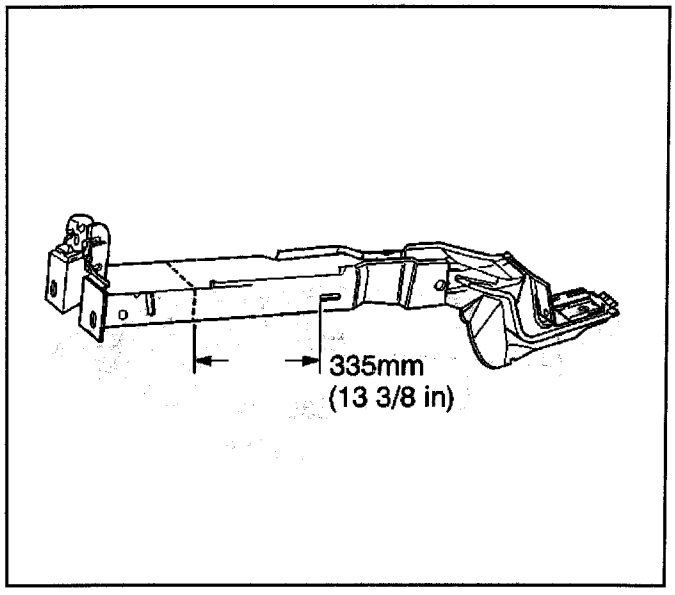
Important: If right rail cannot be straightened to factory specifications, full rail replacement is recommended.

1. Visually inspect and restore as much of the damage as possible to factory specifications.

2. Remove all related panels and components as necessary.

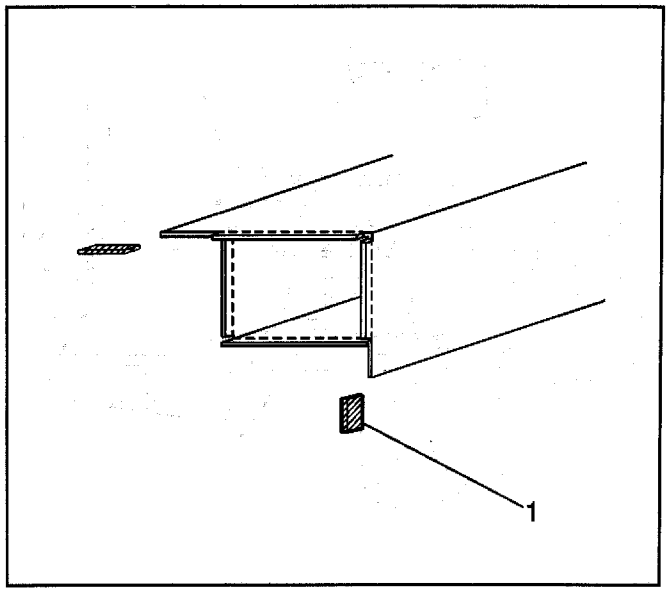
Important: Removal of the cradle and powertrain is not necessary when performing this procedure.

3. Locate the cut location on the left front rail. Use the left front cross-member cagenut slot for reference.
4. At the front edge of the slot, measure 335 mm (approximately 13-3/8 in) forward. This is the cut location on damaged part.
5. Use a straight edge to scribe a line around the rail.
6. Cut and discard the damaged portion of rail.



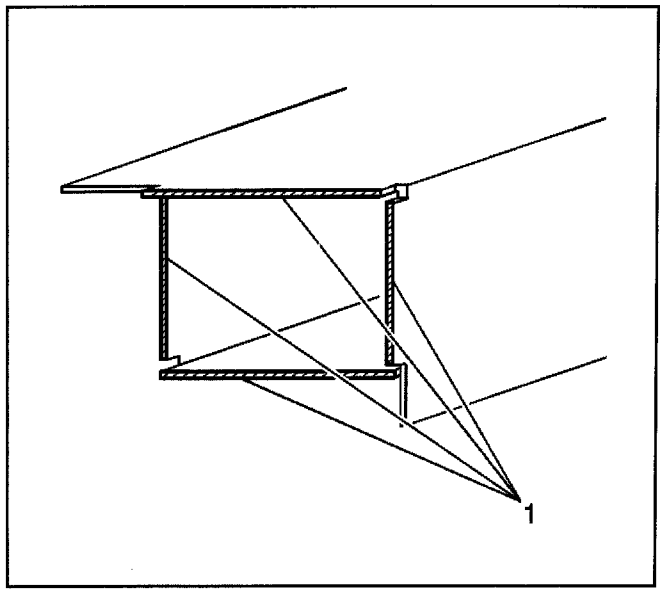
454115

7. Cut and remove approximately 5 mm (1/4 in) of the outboard and downward turned flanges from the end of the original rail (1).
8. Cut a 5 mm (1/4 in) gap approximately mm (1/4 in) along the corners of the orgianal rail to create a 5 mm (1/4 in) tab fo rthe service part to slide over.

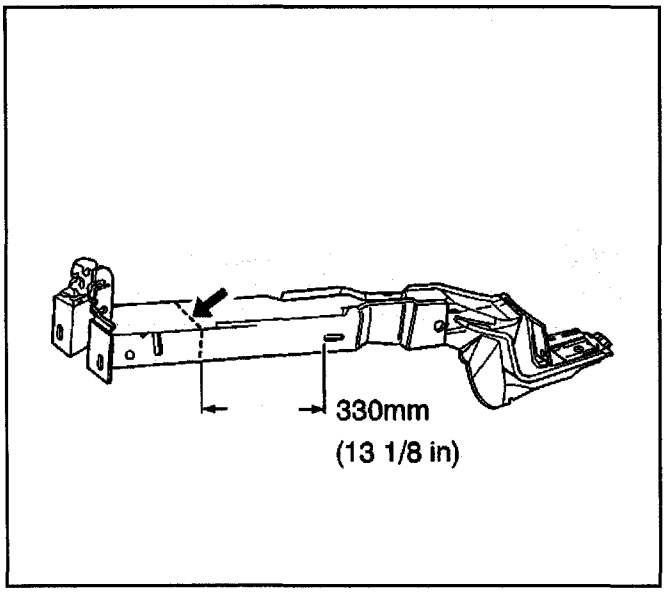


414315

9. Slightly bend the tabs inward to allow the replacement lower rail section to fit over the orignal rail (1).
10. Apply weld-thru coating to all bare metal areas as necessary befor fitting service part.



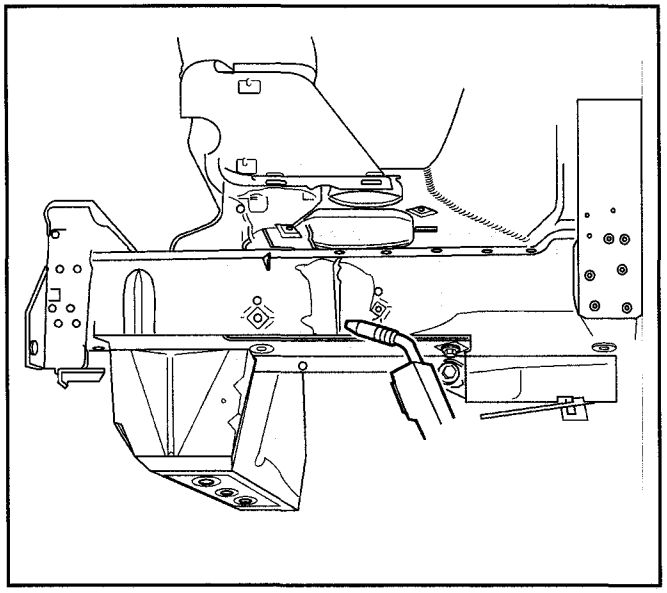
414320



454164

Preparation of Service Part

1. Locate the cut location on the service part. Use the front crossmember cage nut slot for reference.
2. Measure 330 mm (13-1/8 in) forward from front edge of slot. This will be the cut location for the service part.
3. Use a straight edge to scribe a line around the rail.
4. Cut and remove front peotion of the rail.
5. Discard unused rear portion of the service part.
6. Clean burrs on inside of the rail.
7. Apply weld-thru primer to bare metal surfaces as necessary.



454168

Installation Procedure

1. Position the modified service part over the tabs of the original rail and allow a 5 mm (1/4 in) of overlap.
2. Clamp in place.
3. Check fit using three-dimensional measuring equipment.
4. Stitch weld along the entire sectioning joint. Make 25 mm (1 in) welds along the seam with 25 mm (1 in) gaps between them.
5. Go back and complete the stitch weld. This will creat a solid joint with minimal heat distortion.
6. Clean and prepare welded surfaces.

Important: Prior to refinishing, refer to GM P/N 4901MD-99 Refinish Manual for recommended products. Do not combine paint systems. Refer to paint manufacturer's recommendations. For further information, or to order Manual, call 1-800-269-5100.

7. Apply the following:
   - two-part catalyzed primer
   - anti-corrosion protection materials
   - sealers
8. Install all related panels and components.

Rail Sub-Assembly Replacement - Front Lower

Removal Procedure

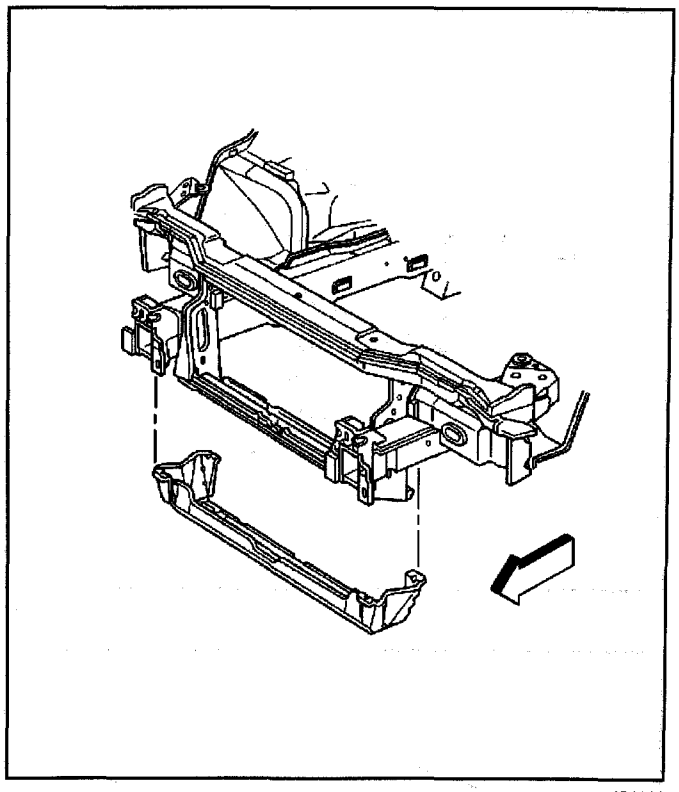
Sectioning procedures have been developed to simplify repair to the lower LEFT rail, providing the majority of the damage can be returned to factory specifications. This allows the damaged front section to be replaced without performing full rail replacement. Bumper mounting brackets can be serviced separately.

Important: If right rail cannot be straightened to factory specifications, full rail replacement is recommended.

1. Remove all related panels and components as necessary.
2. Visually inspect and restore as much of the damage as possible to factory specifications.

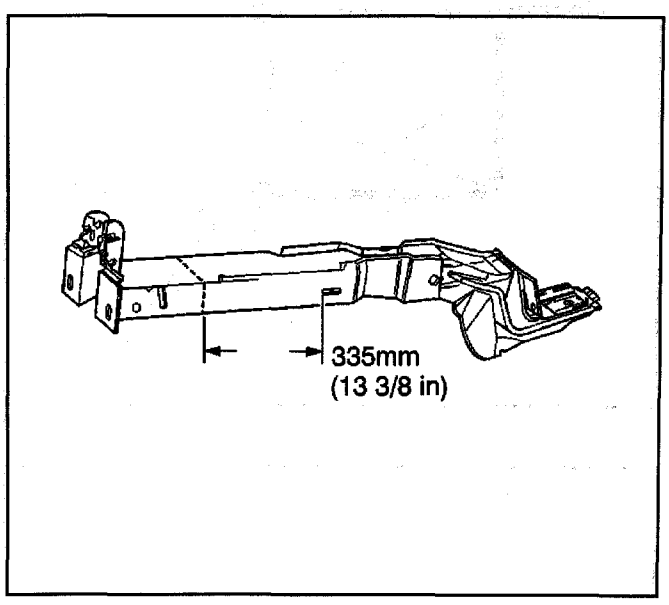
Important: Removal of the cradle and powertrain is not necessary when performing this procedure.

3. Locate the cut location on the left front rail, use the left front cross-member cagenut slot for reference.

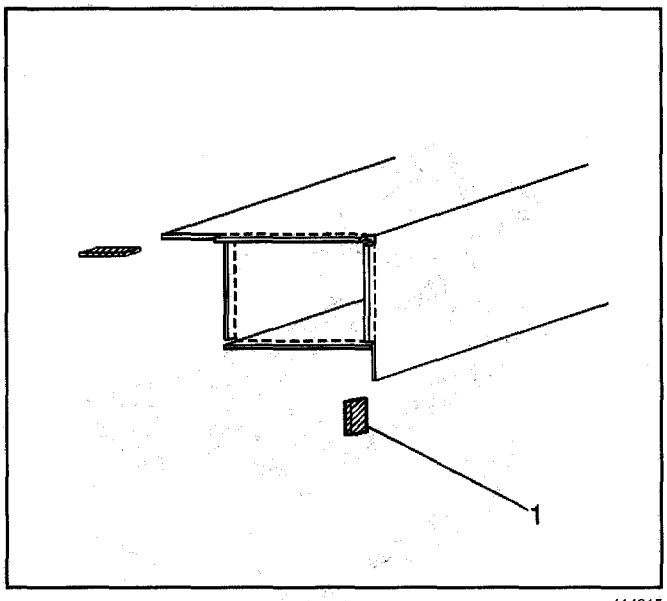


454111

4. Measure 335 mm (13 3/8 in) forward from the front edge of the slot. This is the cut location on the damaged part.
5. use a straight edge to scribe a line around the rail.
6. Cut and discard the damaged portion of the rail.
7. Cut and remove approximately 5 mm (¼ in) of the outboard and downward turned flanges of the original rail on the rail end.

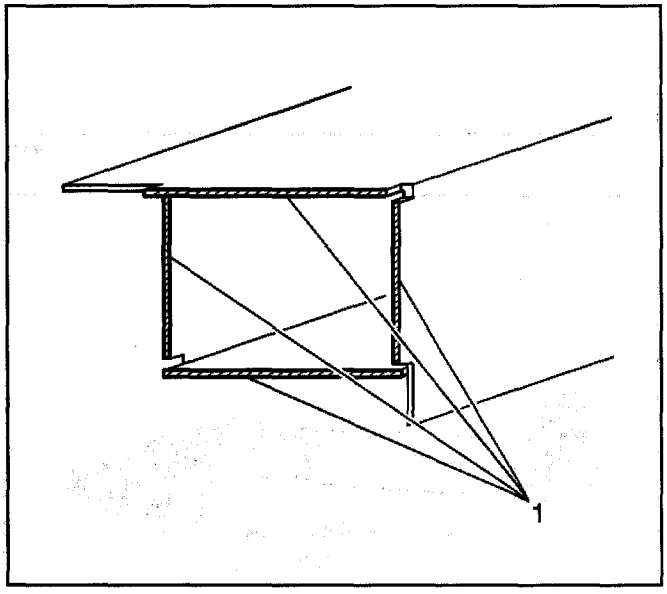


454115



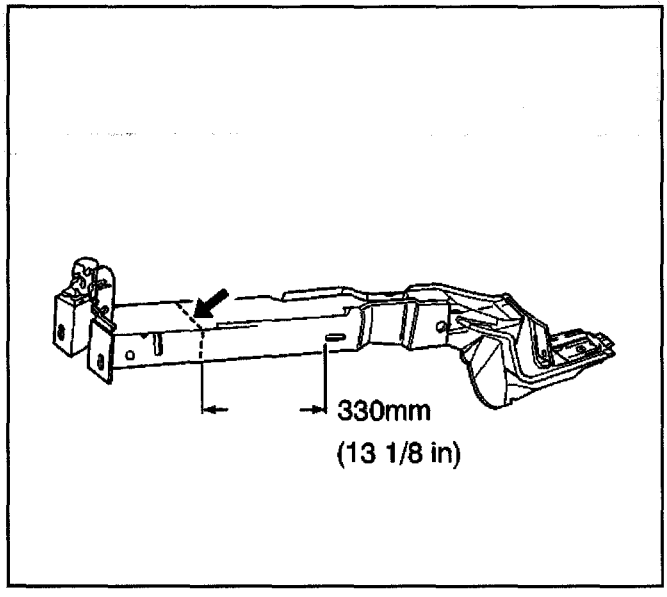
414315

8. Cut a 5 mm (¼ in) approximately 5 mm (¼ in) along the corners of the original rail to create a 5 mm (¼ in) tab for the service part to slide over.



414320

9. Slightly bend the tabs inward to allow the replacement lower rail section to fit over the original rail.
10. Apply weld-through coating to all bare metal areas as necessary before fitting service part.



454164

Preparation

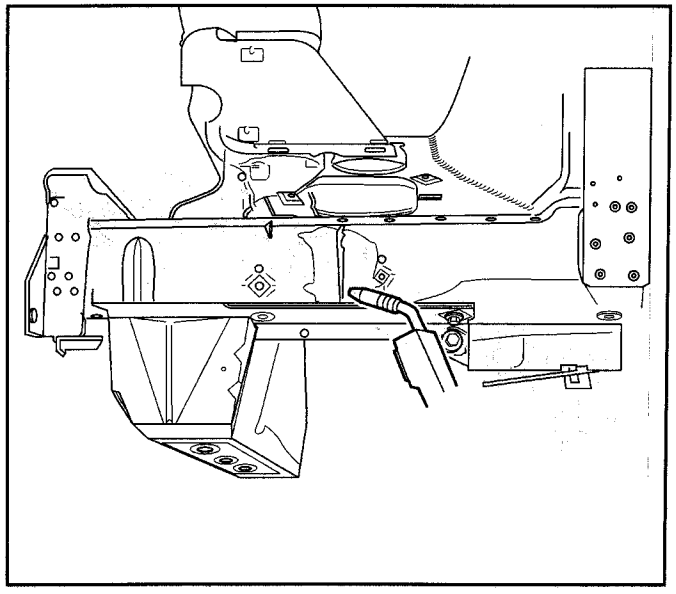
1. Locate the cut location on the service part, using the front crossmember cagenut slot for reference.
2. Measure 330 mm (13- 1/8 in) forward from the front edge of the slot. This will be the cut location for the service part.
3. Scribe a line around the rail with a straight edge.
4. Cut and remove the front portion of the rail.
5. Discard the unused rear portion of the service part.
6. Clean burrs on the inside of the rail.
7. Apply weld-thru primer to bare metal surfaces as necessary.

Installation Procedure

1. Position the modified service part over the tabs of the original rail, allow 5 mm (¼ in) of overlap.
2. Clamp in place.
3. Check fit using three-dimensional measuring equipment.
4. Stitch weld along the entire sectioning joint.
5. Make 25 mm (1 in) welds along the seam with 25 mm (1 in) gaps between them.
6. Complete the stitch weld to create a solid joint with minimal heat distortion.
7. Clean and prepare welded surfaces.

Important: Prior to refinishing, refer to GM P/N 4901MD-99 Refinish Manual for recommended products.

8. Apply two-part catalyzed primer.
9. Apply sealers and anti-corrosion protection materials as necessary. Do not combine paint systems. Refer to paint manufacturer's recommendations.
10. Install all related panels and components.

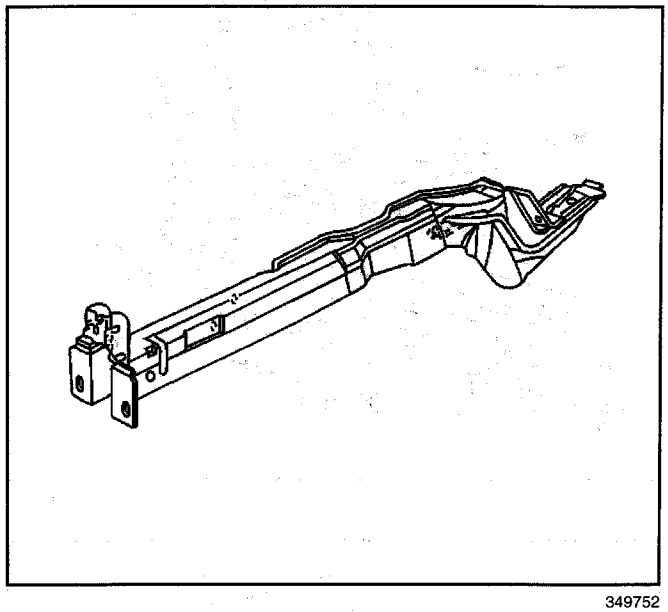


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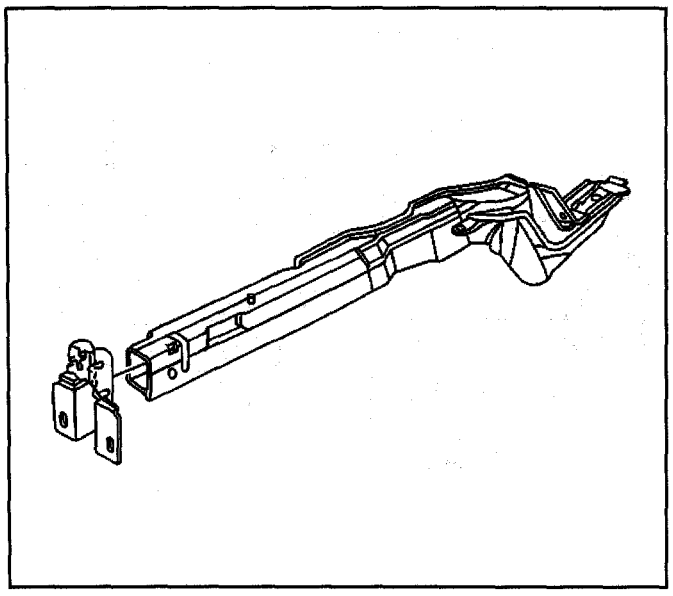
Rail Replacement - Side

Replacement of the engine compartment inner and outer side rail assemblies has been noticeably improved over past vehicle models. Virtually all attaching surfaces are easily accessible from underneath for service, which makes replacement much less complicated.

The service part comes as an entire unit including all brackets and reinforcements.



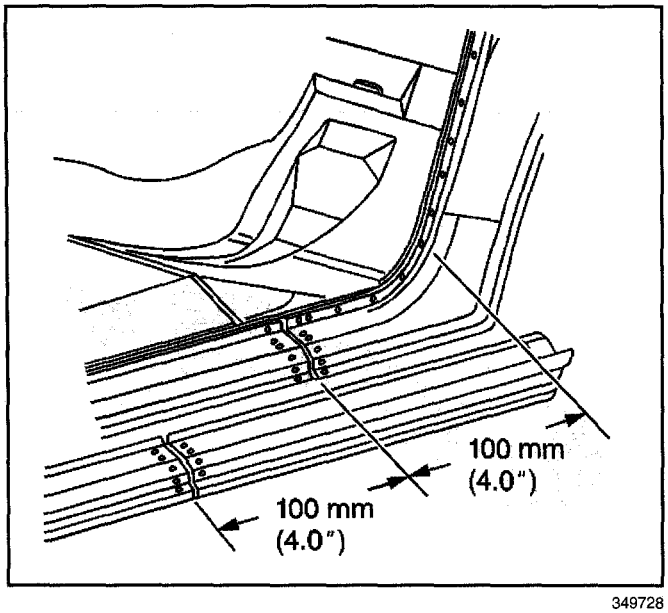
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The outer side rail extension is also available.

Sectioning of the engine compartment inner and outer side rail assemblies is not recommended as doing so could compromise the structural integrity of the vehicle

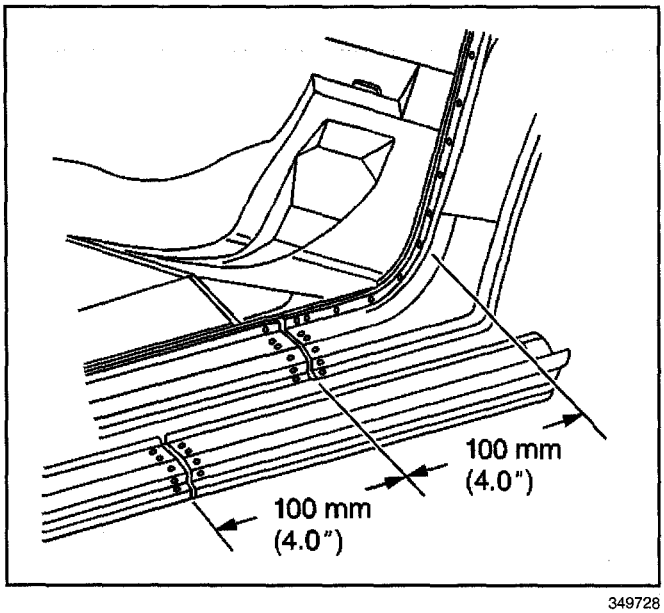


349728

Rocker Panel Replacement (Outer)

Important: When sectioning the outer rocker panel, do not section within 100 mm (4 in) of any other sectioning on adjacent components. Do not section the outer rocker panel within 100 mm (4 in) of either inner lower curve of the door opening frame. Sectioning in these area could jeopardize the structural integrity of the vehicle.

The outer rocker panel is attached to the rear quarter panel and the side door opening frame with factory welds. The outer rocker panel must be removed before servicing the side door frame. When sectioning in an area with no reinforcement, a backing plate or sleeve must be used.



349728

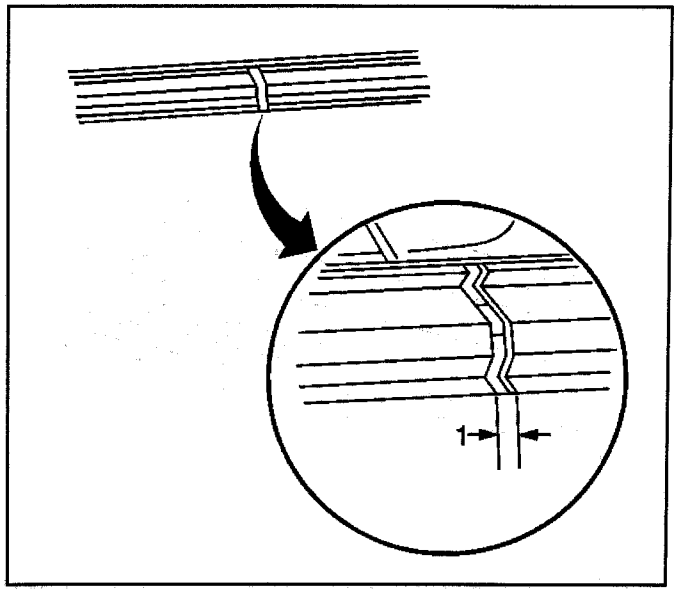
Removal Procedure

1. Remove all related panels and components.
2. Visually inspect the damaged areas.
3. Restore as much of the damage as possible to factory specifications.
4. Remove the sealers, the sound deadeners, and the anticorrosion materials as necessary.
5. Locate, mark and drill out factory welds as necessary. Note the number of welds for installation of the new assembly.
6. Measure, mark cut and remove the damaged section of the outer rocker panel, being careful in areas where there are multiple layers of steel.

Installation Procedure

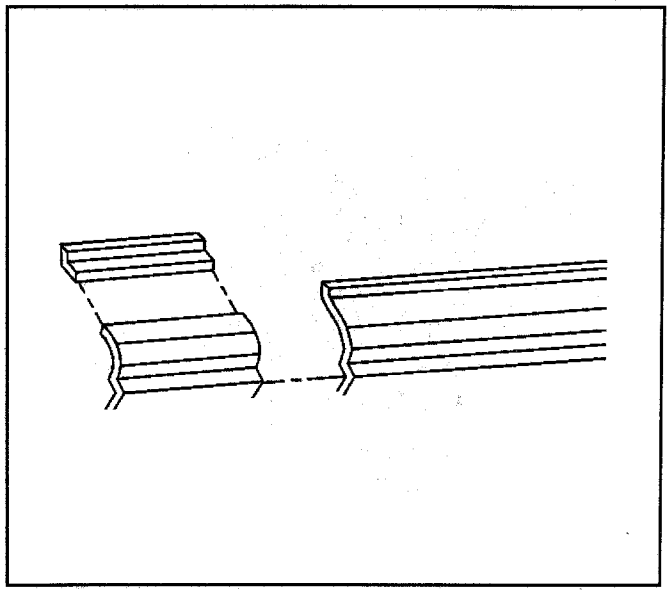
Important: A gap 1 1/2 time the thickness of the metal (1) must be maintained at the joint between the old frame and replacement frame. Trim the replacement frame as required to achieve this fit.

1. Prepare the new door opening frame by measuring and cutting to match the removed section. Check for proper fit.

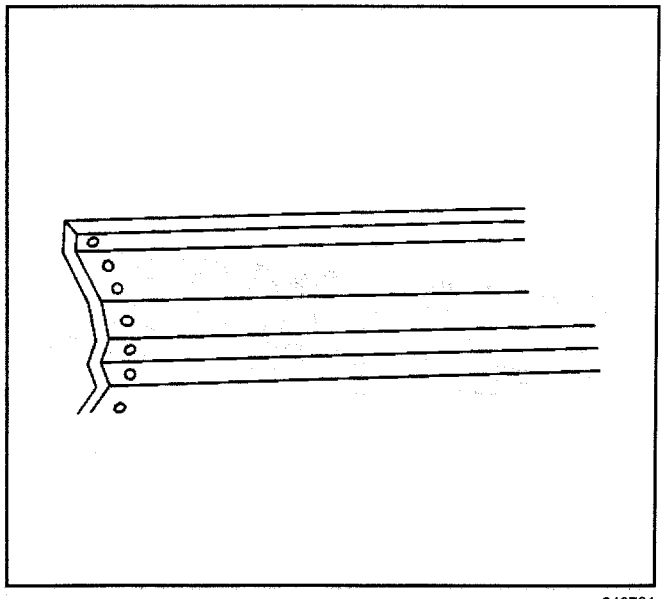


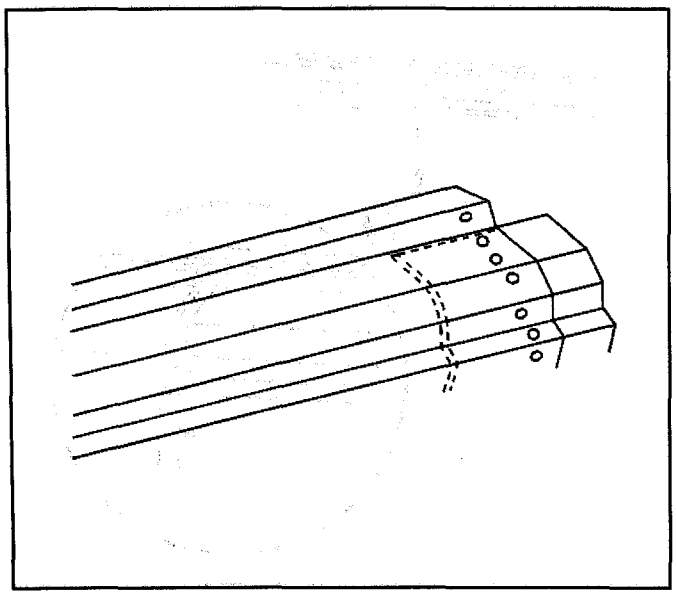
349729

2. In areas having no inner reinforcements, cut pieces to serve as backing plates of the same configuration from the areas where sectioning is to be done. These should be approximately 75 mm (3 in) in length. Use the damaged frame or the excess portions of the replacement frame.


349730

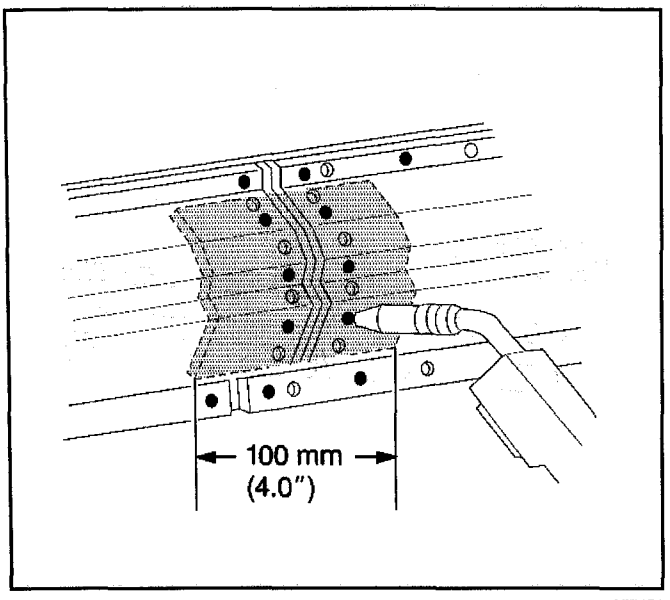
3. Modify the pieces so they fit snugly to the backside of the section joints.
4. Pre-drill 5/16 in plug weld holes for installation of the new frame.


349731



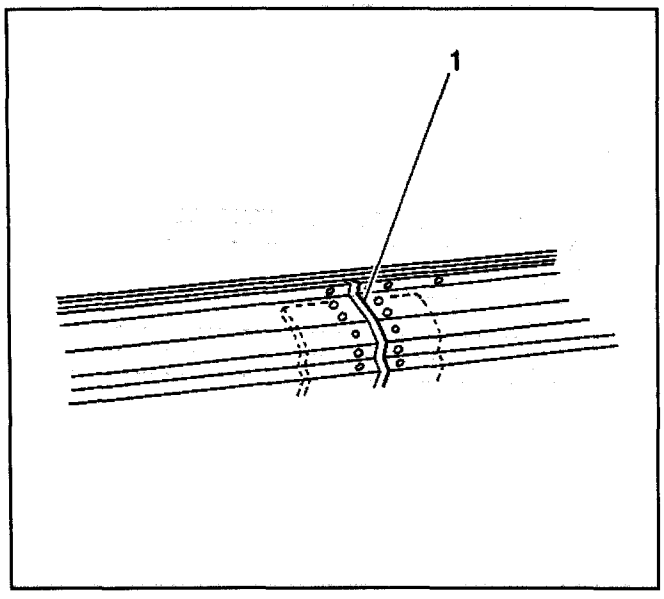
349733

5. Fit the backing plate halfway into the section joint on the vehicle. Clamp and MIG weld the backing plate to the vehicle.



277451

6. When all the backing plates are welded in place, reinstall the new part and check the fit using body dimensions.
7. When the replacement frame is properly fitted and aligned, clamp and MIG weld it to the backing plates. An alternating weld sequence is recommended to reduce heat and metal distortion.



349736

8. MIG weld the remaining (1) weld hole to attach the panel permanently.
9. Clean and prepare welded surfaces.
10. Prime with two-part catalyzed primer.
11. Apply sealers and anti-corrosion materials as necessary.

    Do not combine paint systems.
12. Install all the related panels and components.

Door Opening Frame Replacement - Side (Coupe)

The side door opening frame on the Camaro/Firebird can be either replaced as a unit or sectioned, following the proper techniques. The service part frame will come as a complete unit and will need to be trimmed to fit each application such as coup, T-Tops, etc. Templates are provided with the service part as a guide for trimming.

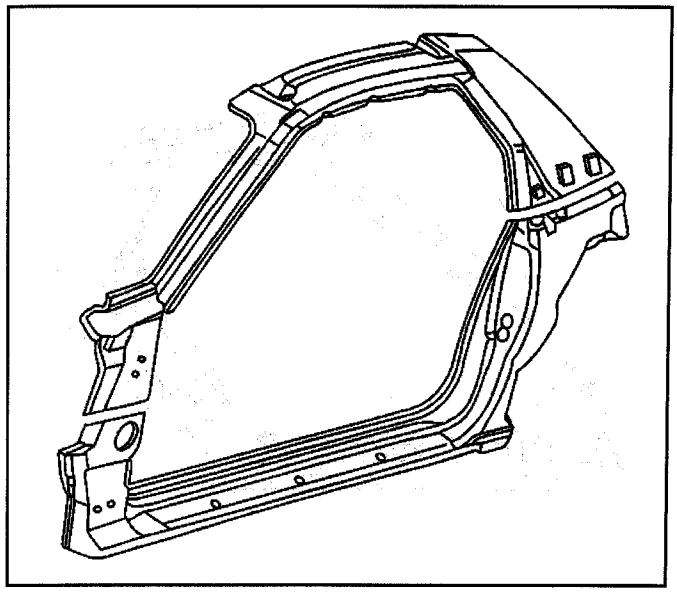
The following items may need to be removed or protected before replacing or sectioning the frame, the door hinges, outer rocker panel, upper outer side rail, windshield, weather-stripping, roof outer panel and T-Tops (if applicable), quarter panel assembly and rear end deck lid assembly.

Removal Procedure

1. Remove all related panels and components.
2. Remove appropriate sealer.

Important: When drilling out welds, use caution so that the inner panels are not damaged.

3. Drill out factory welds around the frame perimeter with a 8 mm (5/16 in) drill bit.
4. Remove the frame.
5. Prepare mating surfaces for installation of new frame.
6. The recommended locations for sectioning are shown. A sectioning procedure may be performed at these locations by overlapping the original panel by 20 mm.

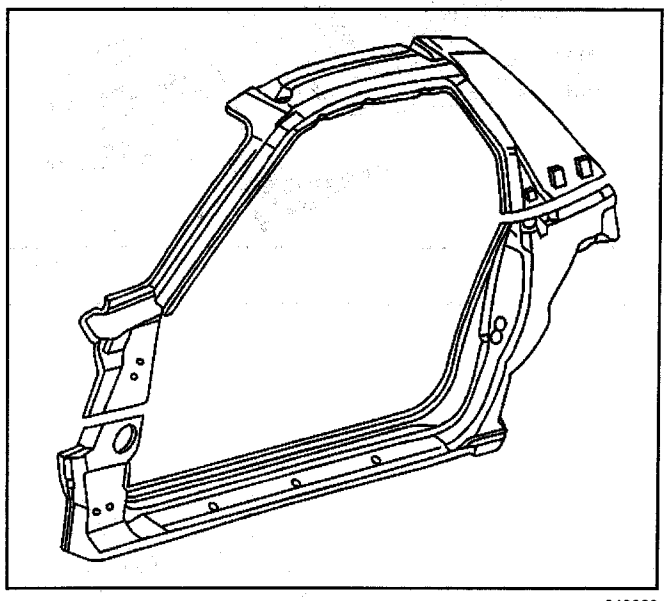


349669

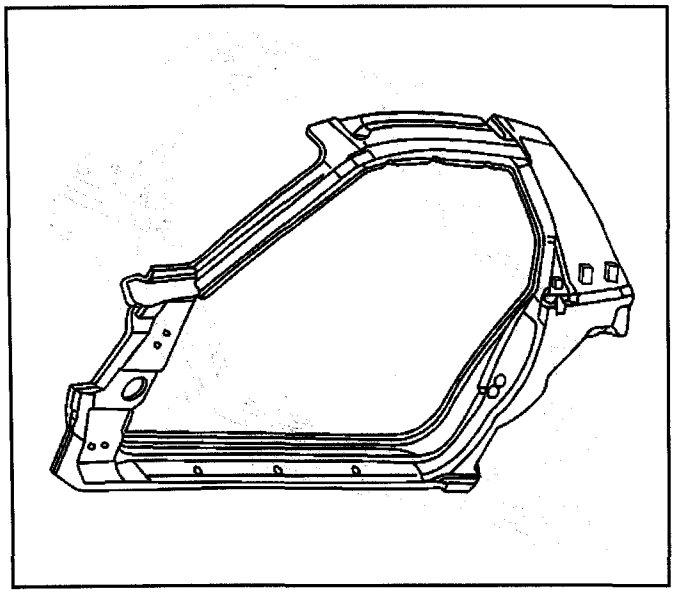
Installation Procedure

Important: If the original frame is damage beyond recognition, place the holes for welding 1 1/2 in apart.

1. On the new frame, drill 8 mm (5/16 in) holes in locations as noted from the original frame.
2. Align frame and clamp to hold in place.
3. Using a MIG welder plug weld at same locations as original.
4. Clean and prepare welded surfaces. Apply Brushable Seam Sealer 3M P/N 08361 or equivalent as necessary.
5. Prime with two-part catalyzed primer.
6. Apply sealers and anti-corrosion materials as necessary.
7. Install all the related panels and components removed.



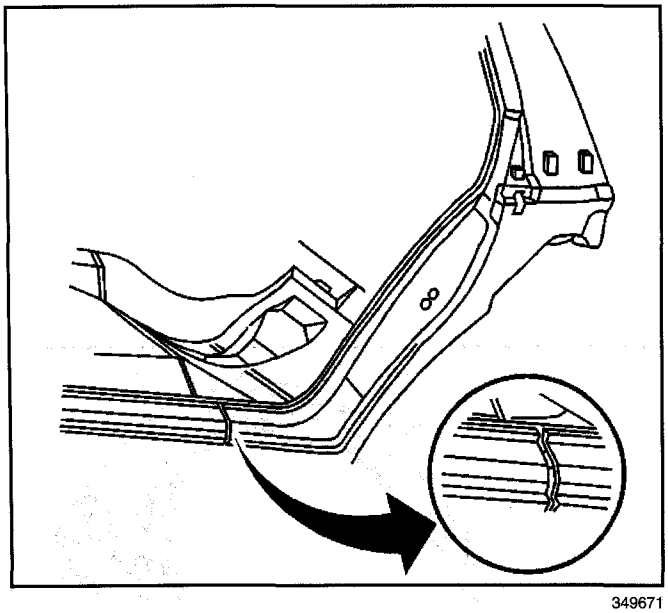
349669



349670

Door Opening Frame Replacement - Side (Sectioning)

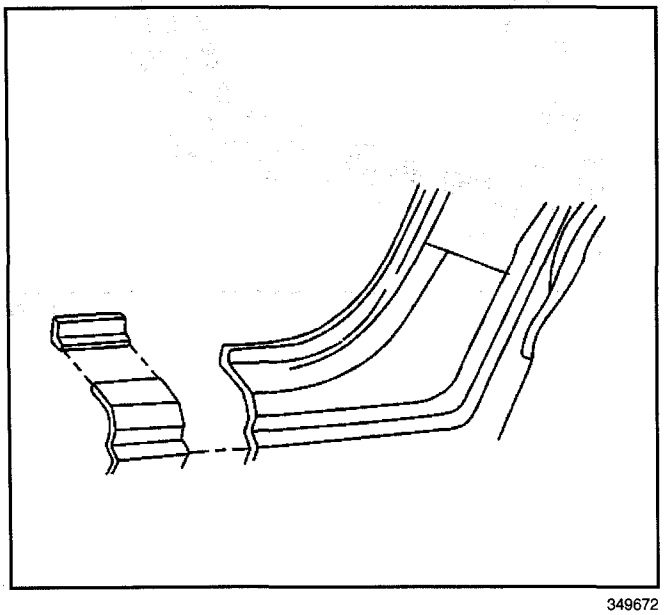
When sectioning the door opening frame, note that there are five locations where sectioning should not take place. Sectioning in these areas would jeopardize the structural integrity of the vehicle. When sectioning in an area with no reinforcement, a backing plate or sleeve must be used.



349671

Removal Procedure

1. Remove all related panels and components.
2. Measure, mark, cut and remove the damaged panel, being careful in areas where there are multiple layers of steel.
3. Measure, mark, cut and install the new panel.
4. Check for a proper fit.

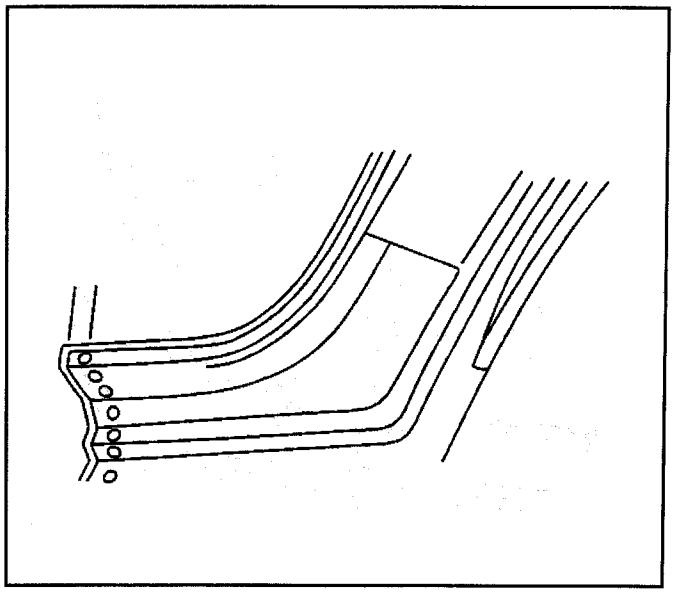


349672

Important: A gap of 1 1/2 times the thickness of the metal must be maintained at the joint between the old panel and the replacement panel. Trim as required.

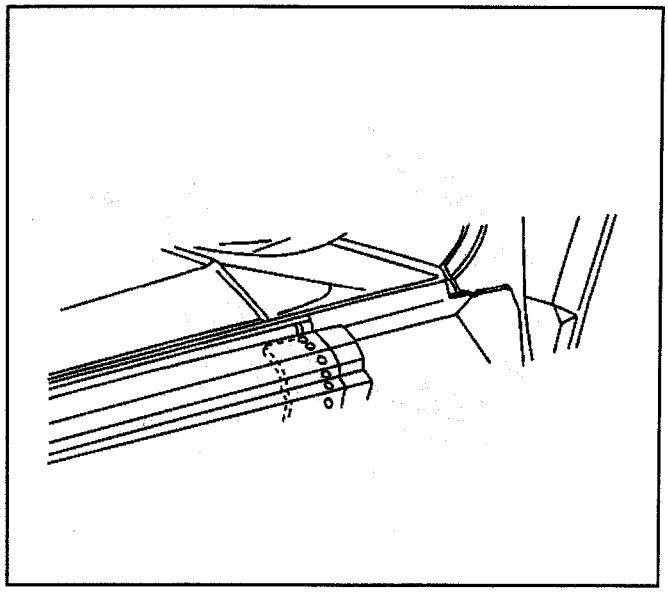
5. When the replacement panel fits properly, remove it from the vehicle and set aside.
6. In areas having no inner reinforcements, cut pieces to service as backing plates of the same configuration (approximately 3 in long) from the areas where the splices are to be made. Use the damaged panel or the excess portions of the replacement panel.

7. Modify the pieces so they fit snugly to the backside of the splice joints.
8. Pre-drill 8 mm (5/16 in) plug weld holes indicated on the illustrations for installation of a new panel.



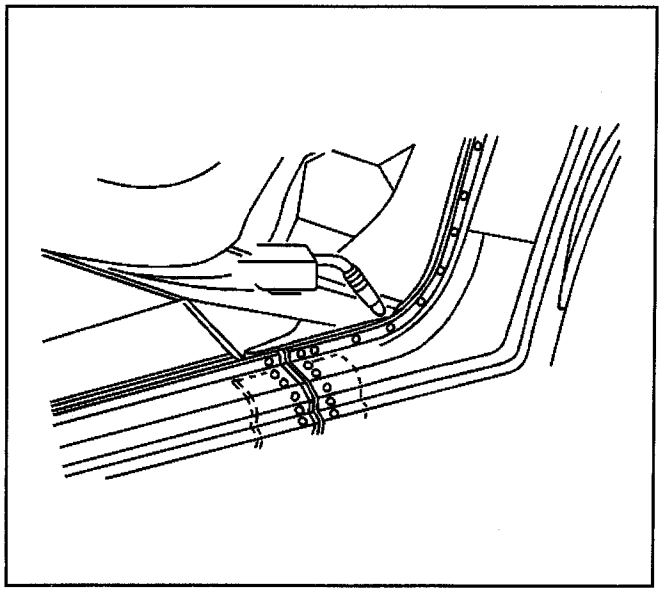
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9. Fit the backing plate halfway into the splice joint on the vehicle. Clamp and MIG weld the backing plate to the vehicle.

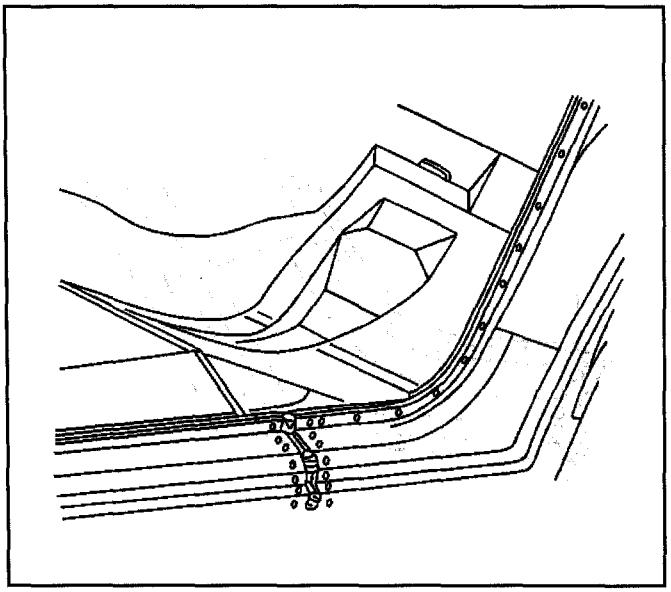


349675

10. When all the backing plates are welded in place, reinstall the new part.
11. Check the fit.
12. When the replacement panel is properly fit and aligned, clamp and MIG weld it to the backing plates. An alternating weld sequence is recommended to reduce heat and metal distortion.
13. Complete the splice joint by welding the joint gap closed using an alternating stitch MIG weld. This will minimize heat build up and distortion.



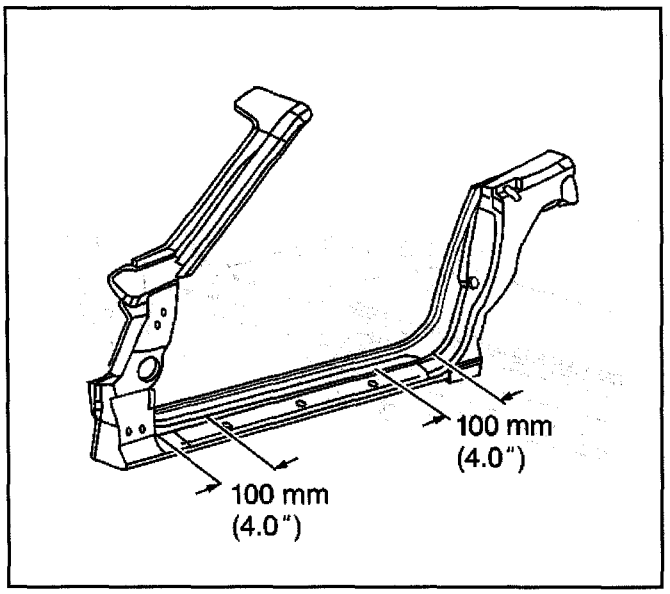
349676



349682

14. MIG weld the remaining weld holes to attach the panel permanently.
15. Grind excess weld off joints and inspect.
16. When satisfied that the weld and splice joints are structurally sound, proceed with the recommended finishing procedures.

    Clean and prepare welded surfaces. Apply Brushable Seam Sealer 3M P/N 08361 as necessary.
17. Prime with two-part catalyzed primer.
18. Apply sealers and anti-corrosion materials as necessary.
19. Install all related panels and components.



349713

Door Opening Frame Replacement - Side (Convertible)

When sectioning the door opening frame on the Camaro/Firebird convertible there are three locations where sectioning should not take place. Sectioning in these areas could jeopardize the structural integrity of the vehicle. The door ring service panel is unique for convertibles. The panel can be installed as a complete assembly or modified for sectioning. When sectioning in an area with no reinforcement, a backing plate or sleeve must be used.

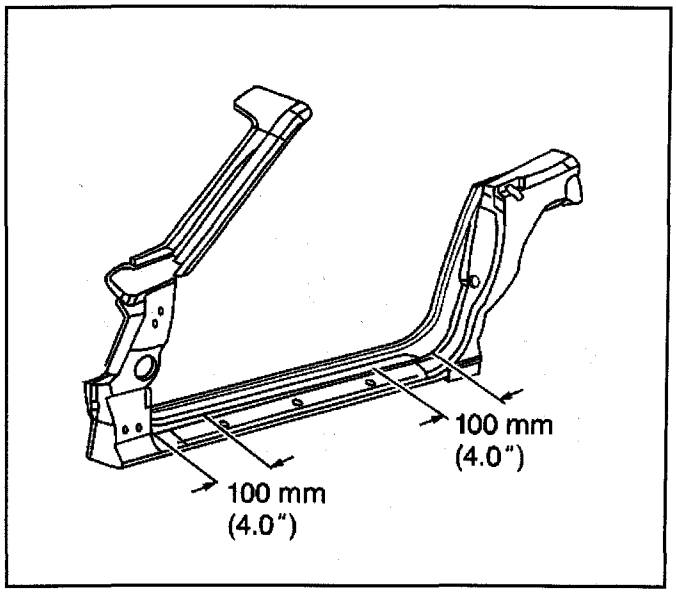
Removal Procedure

1. Remove all related panels and components.
2. Visually inspect the damaged areas.
3. Restore as much of the damage as possible to factory specifications.
4. Remove the sealers, the sound deadeners, and the anticorrosion materials as necessary.
5. Locate, mark and drill out factory welds as necessary. Note the number of welds for installation of the new assembly.
6. Measure, mark, cut and remove the damaged section of the frame, being careful in areas where there are multiple layers of steel.

Installation Procedure

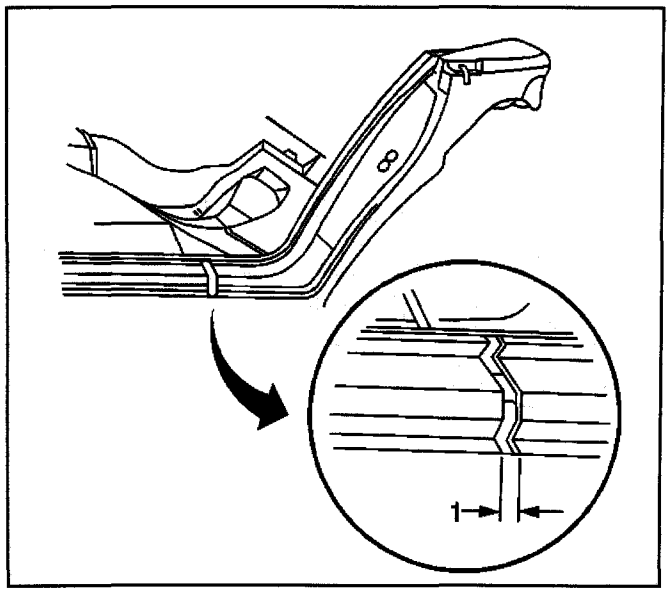
Important: Do not section within 100 mm (4 in) of either inner lower curve of the door opening frame or outer rocker panel sectioning.

1. Prepare the new door opening frame by measuring and cutting to match the removed section. Check for proper fit.



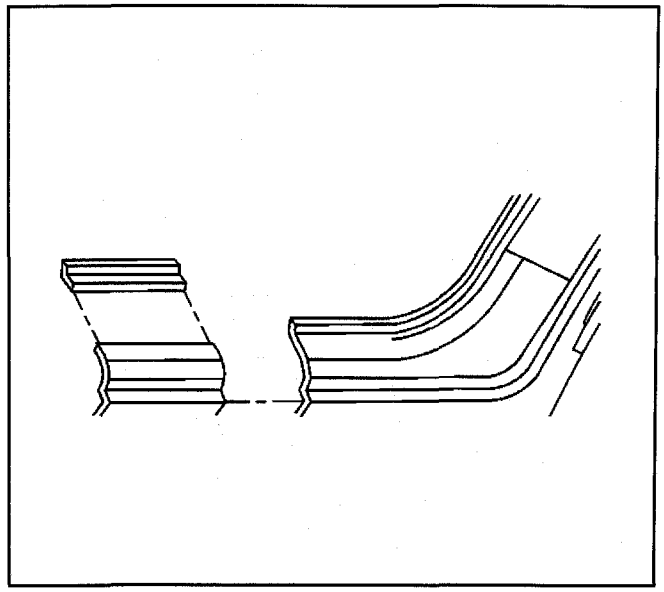
349713

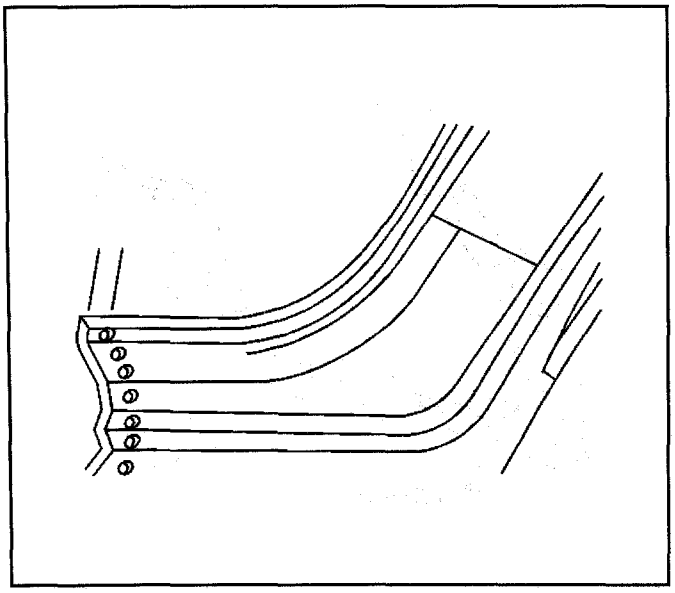
2. A gap 1 1/2 time the thickness of the metal (1) must be maintained at the joint between the old frame and replacement frame. Trim the replacement frame as required to achieve this fit.



349717

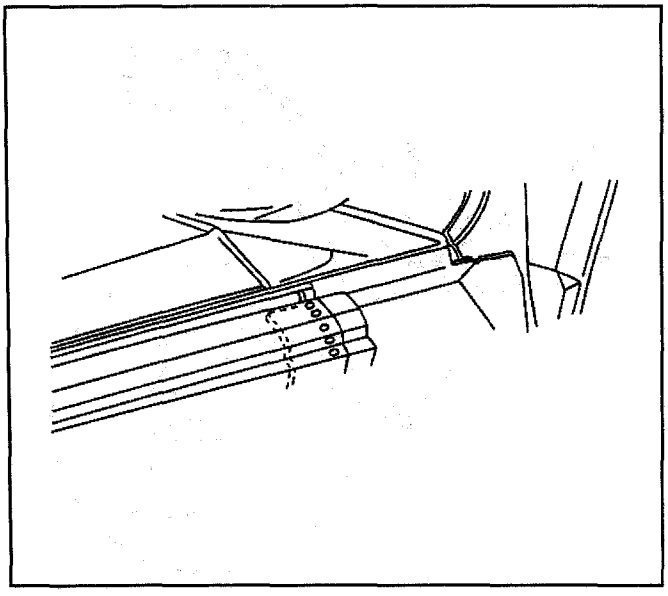
3. In areas having no inner reinforcements, cut pieces to serve as backing plates of the same configuration from the areas where sectioning is to be done. These should be approximately 75 mm (3 in) length. Use the damaged frame or the excess portions of the replacement frame.


349721



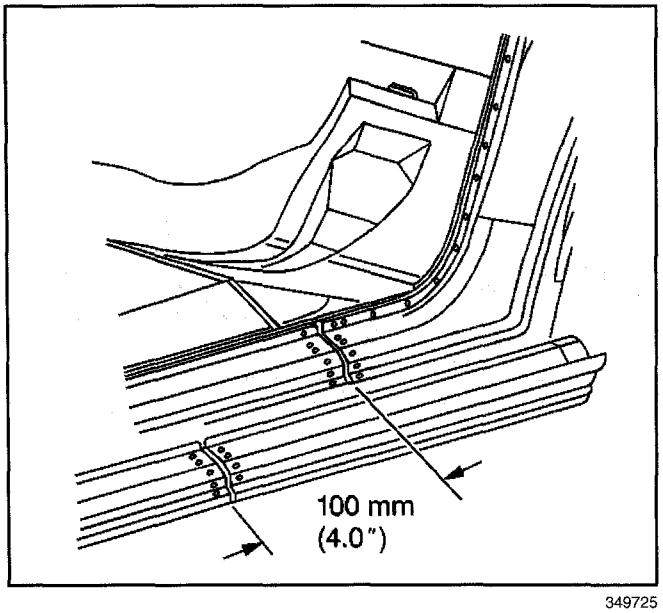
349722

4. Modify the pieces so they fit snugly to the backside of the section joints.
5. Pre-drill 8 mm (5/16 in) plug weld holes for installation of the new frame.



349724

6. Fit the backing plate halfway into the section joint on the vehicle. Clamp and MIG weld the backing plate to the vehicle.

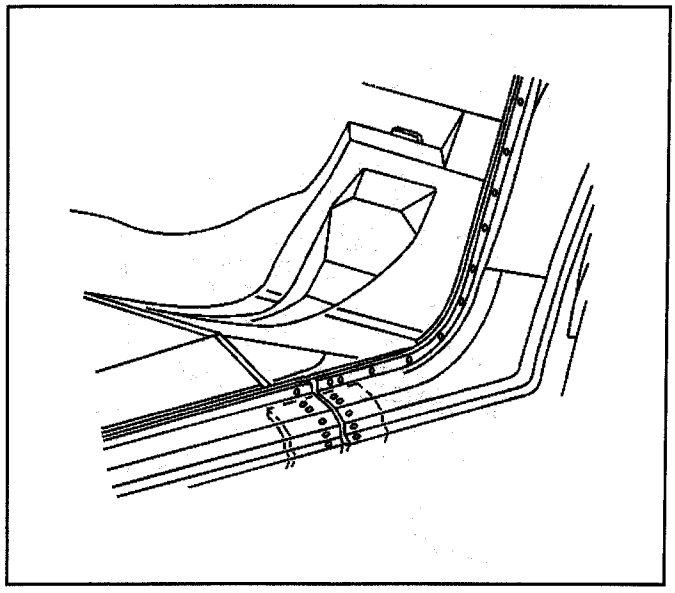


349725

7. When all the backing plates are welded in place, reinstall the new part and check the fit using body dimensions.
8. When the replacement frame is properly fitted and aligned, clamp and MIG weld it to the backing plates. An alternating weld sequence to reduce heat and metal distortion.

9. MIG weld the remaining weld hole to attach the panel permanently.
10. Clean and prepare welded surfaces.
11. Prime with two-part catalyzed primer.
12. Apply sealers and anti-corrosion materials as necessary.

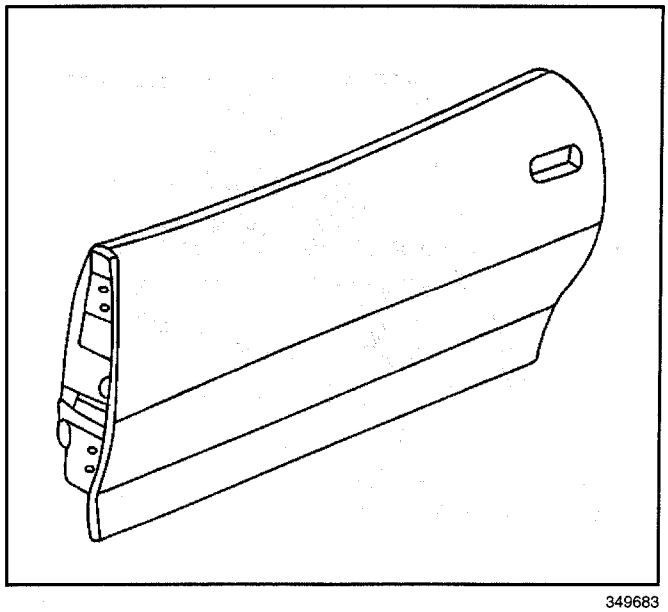
    Do not combine paint systems.
13. Reinstall all the related panels and components.



349727

Door Service

The inner and the outer door panels on the new Camaro/Firebird are composed of sheet molded compound (SMC). Repair of the door assembly can be performed using conventional procedures.



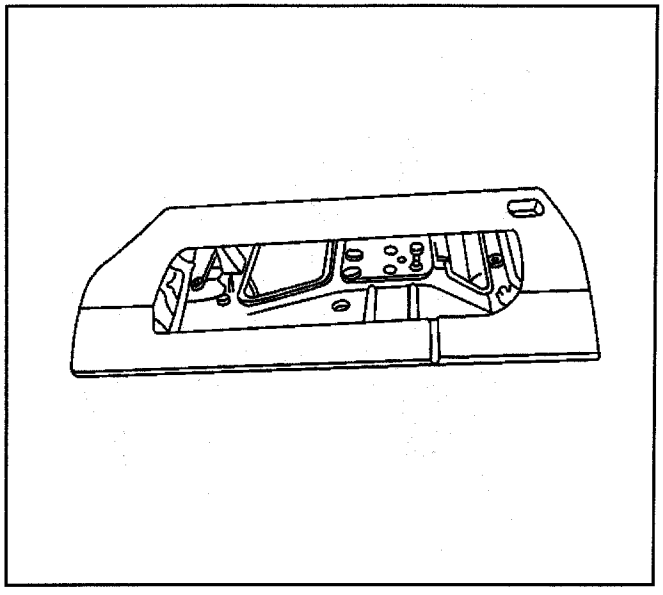
349683

Door Outer Panel Replacement

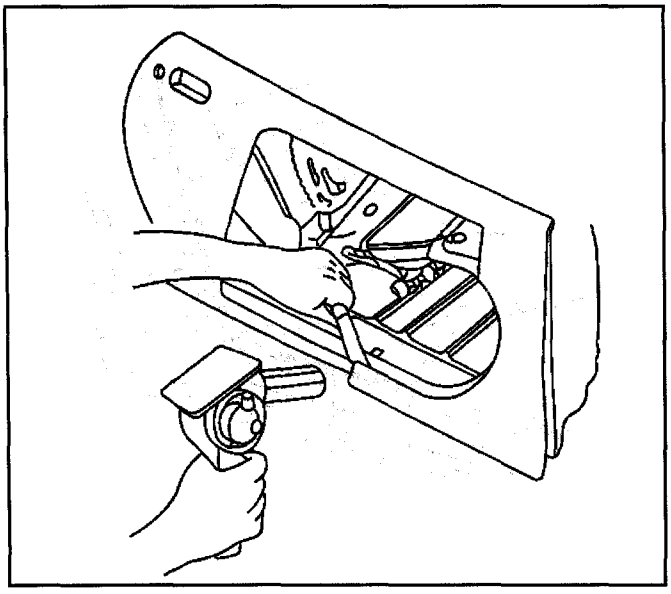
The Door outer panels are available through General Motors Service Parts Operations (GMSPO). When a door outer panel requires replacement, remove it from the vehicle and place it on a suitable surface, the door outer panel facing up, being careful not to damage the door assembly.

Removal Procedure

1. Using the Chicago Pneumatic Pneu-knife CP 838 or equivalent, cut an access hole into the bottom of the door panel. Cut through the outer panel, being careful not to cut into the inner panel.



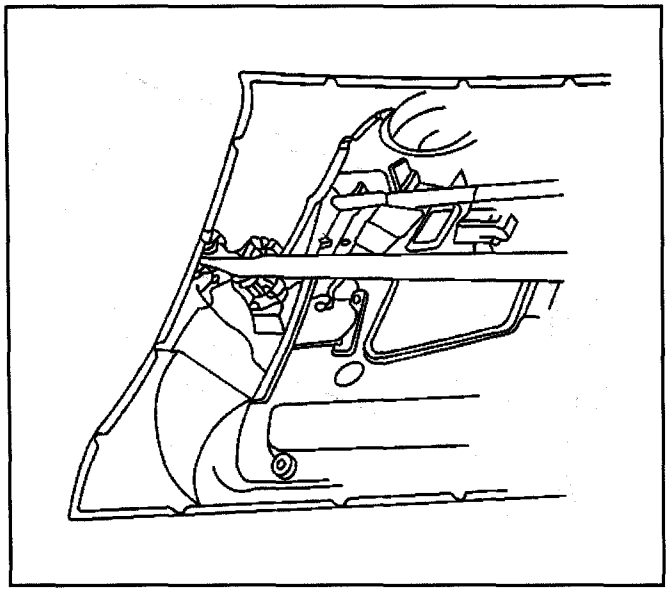
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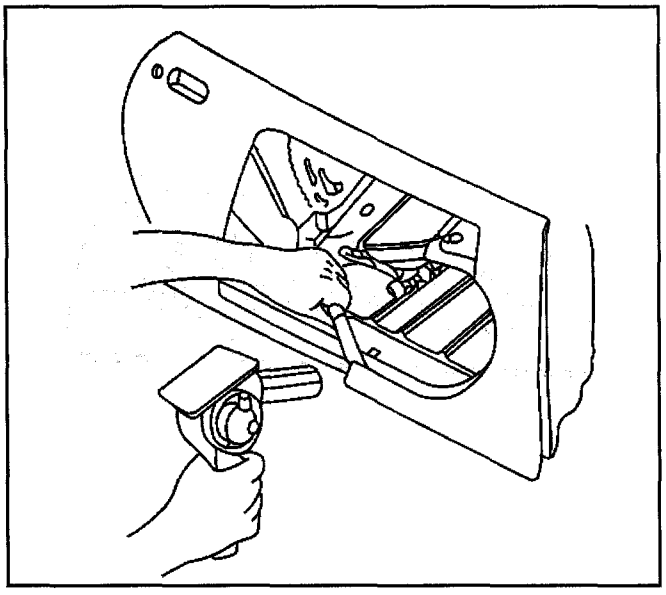
Important: Do not heat the door inner panel more than necessary as this will soften the panel and cause damage.

2. Using a heat gun, apply the heat to the door outer panel while prying with a putty knife. When the adhesive reaches approximately 400°F, the bond will begin to break.



349697

3. Continue applying heat and prying with the putty knife until the entire panel is removed.
4. After the door panel has been removed, clean off any excess adhesive left on the inner panel.



349687

Installation Procedure

Important: GM Goodwrench Structural Bonding Epoxy P/N 12345726 material is recommended.

1. Check the fit of the new outer panel. Apply adhesive to the door inner panel.

Important: To avoid unnecessary work, be sure the clamps do not distort the outer door panel.

2. Set the outer panel in place and clamp until the adhesive is cured.
3. Clean up excess adhesive.
4. Reinstall door to vehicle.

Roof Outer Replacement (Panel)

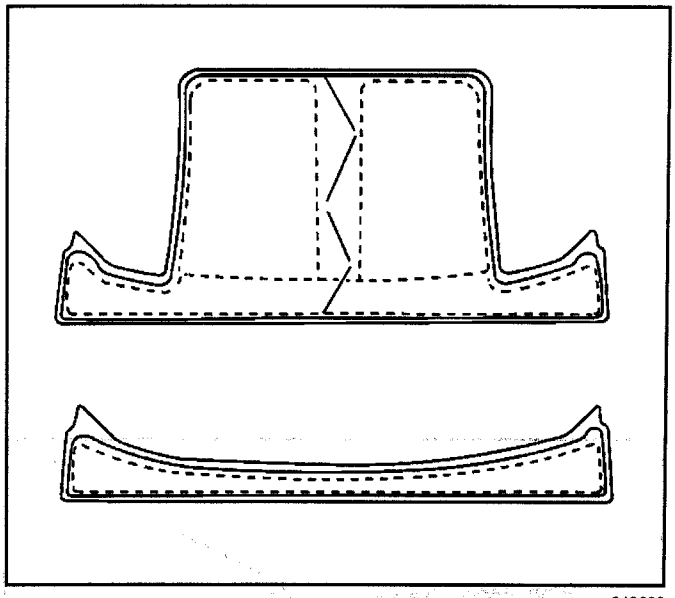
Removal Procedure

1. The roof outer panel assembly is composed of sheet molded comount (SMC). It attaches to the steel roof structure with urethane adhesive. Repair of the roof outer panel assembly can be performed using conventional procedures.

Important: When cutting use care to protect the adjacent panels, the glass, the weather-strip and the moldings.

Using the Chicago pneumatic knife with a panel blade, cut roof outer panel 3 in from edges and lift off.

2. With a Chicago pneumatic knife with a urethane blade or service wire or Equalizer Magnum, cut the urethane adhesive and remove remaining roof outer panel.
3. Remove all loose or damaged urethane as necessary.



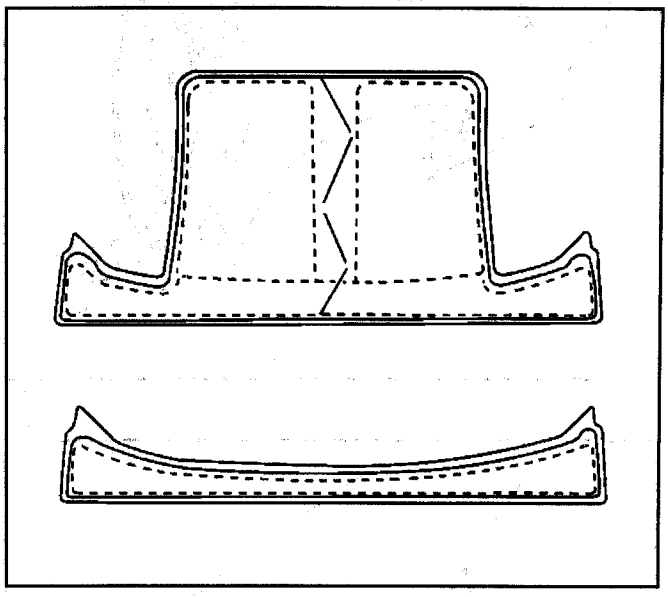
349699

Installation Procedure

1. Temporarily set the new roof outer panel into place and check alignment.
2. Remove the roof outer panel and set aside.

Important: Do not prime over remaining urethane adhesive.

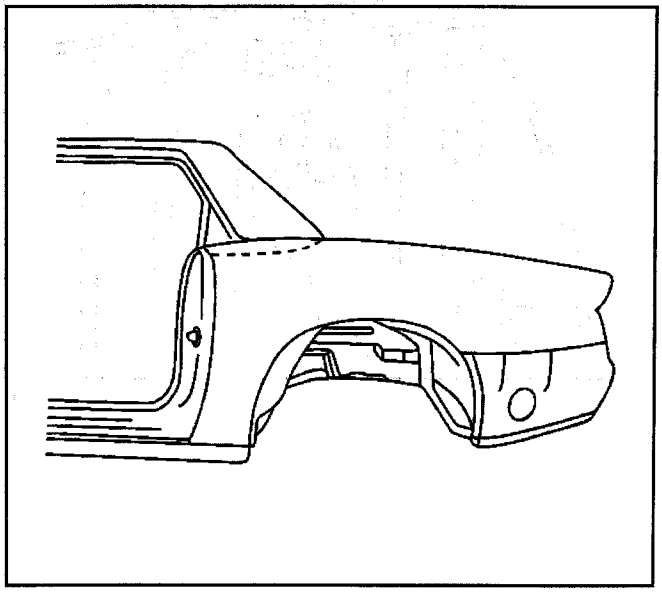
3. Apply urethane adhesive GM P/N 12346284 approximately 10 mm in diameter around the perimeter of the roof outer panel.
4. With the aid of a helper install new roof outer panel and press firmly to set adhesive.
5. Install surrounding weather-strips and moldings while the roof outer panel cures.



349699

Quarter Panel Replacement (Coupe)

The quarter assembly has been specially designed for improved serviceability. Additional panels have been added allowing for easier and faster service. The quarter panel assembly is attached to the structure with plug welds. To remove the quarter panel assembly, the welds must be drilled out using a 8 mm (5/16 in) drill bit. The roof outer panel covers a section of the quarter panel assembly at the top and must be positioned out of the way to provide access to the welds. At the bottom of the quarter panel assembly at the rocker panel, there are four hidden welds. They can only be accessed after all the other welds have been drilled out. The quarter panel assembly can be pulled forward and the welds drilled from inside.



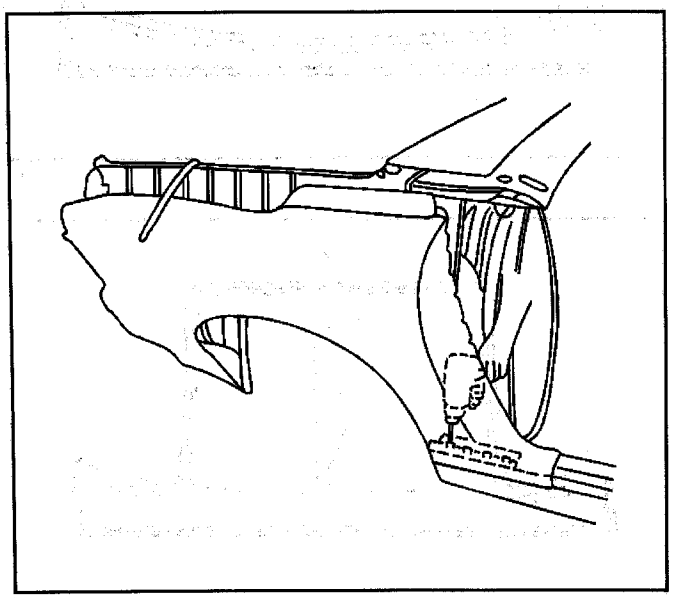
349700

Removal Procedure

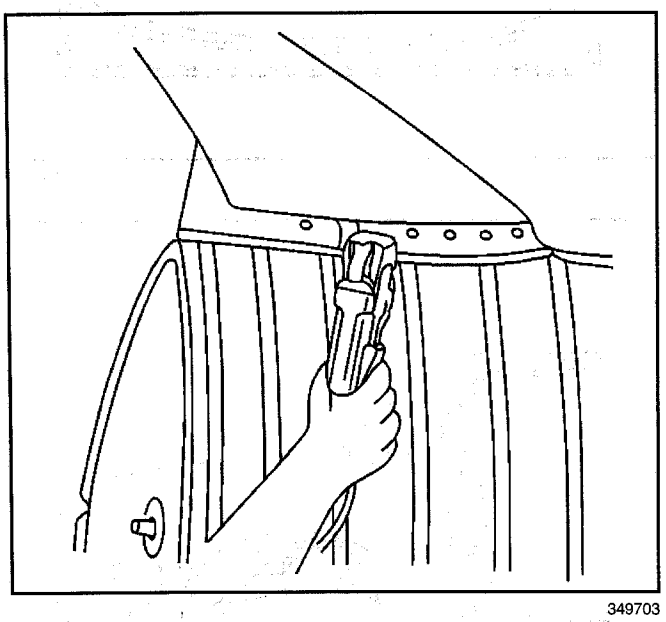
Important: Care must be taken when working around the roof outer panel. Failure to use care may result in damage to the roof outer panel. In this case, additional time will be needed in repairing it. Refer to Rigid Plastic Repair procedures.

Important: Service of the quarter panel assembly by splicing a joint just below the roof panel is not recommended. The panel is structural in this area, and splicing will reduce the integrity of the vehicle.

1. Make a cut at the top of the quarter panel assembly as close to the roof panel overlap as possible without damage it.
2. Drill out visible plug welds around the quarter panel assembly. Be sure to note the number of location of welds for the new quarter panel assembly.
3. Cut inboard flanges fore and aft of the lower quarter panel assembly at the rocker panel assembly.



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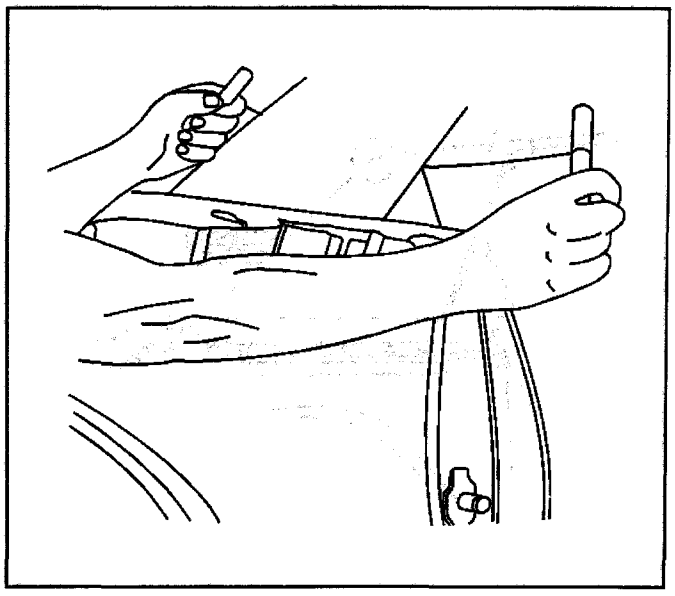
349703

4. Pull upper portion of the quarter panel assembly away from the vehicle and drill out the four inner plug welds at the rocker panel assembly.
5. Remove the quarter panel assembly.
6. With a hammer and a flat punch, flatten the quarter panel flange remaining at the roof line.
7. With a Chicago pneumatic knife using the 3 1/2 in offset blade, P/N KF–140665 or the Equalizer Magnum, cut the urethane adhesive at the bottom edge of the roof outer panel.

8. With a service wire, using upward movements, saw urethane from the roof panel away from the B pillar area. Cut to the top of the roof outer panel using caution to avoid damage.

Important: When working around the roof outer panel, care must be taken to avoid causing damage.

9. To reveal welds, pull the roof outer panel outward and support it out of the way being careful not to lift too far a damage to the roof outer panel may occur.
10. Drill out exposed welds to remove the flange.



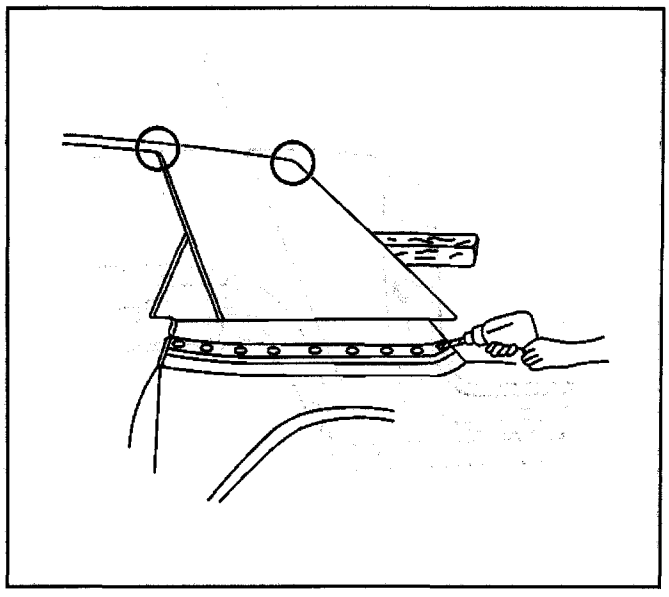
349707

Installation Procedure

1. Prepare mating surfaces for installation of the new quarter panel assembly.

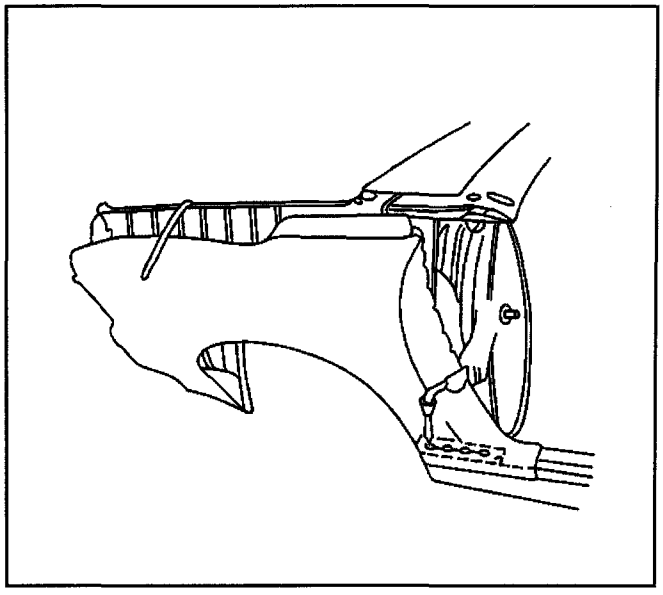
Important: If original is beyond recognition place holes for welding 1 1/2 in apart.

2. Drill the holes in locations as noted from the original quarter panel assembly.

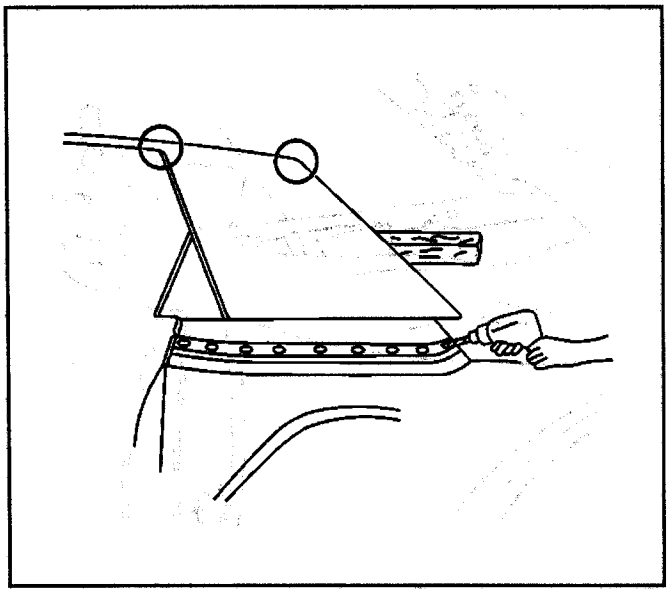


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3. Align the new quarter panel assembly and measure.
4. With the upper quarter panel assembly pulled away from the vehicle, use a MIG welder to replace the welds in the bottom at the rocker panel.



349711

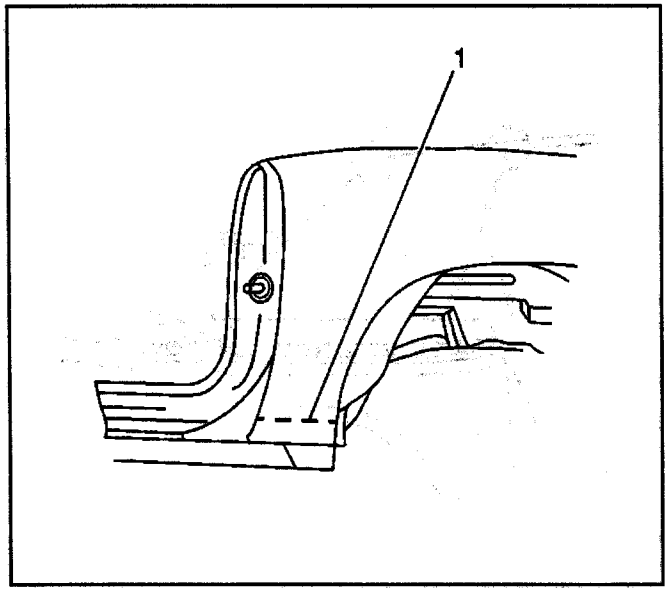


349709

5. Align the remainder of the quarter panel assembly and clamp in place.
6. Plug weld remaining locations.
7. At the roof outer panel, remove loose adhesive and clean all surfaces for refinishing as necessary.

Important: Be careful not to prime over existing or remaining urethane.

8. Prime with an anticorrosion-type primer to restore damaged ELPO surface. If additional primer for adhesive area is required, see package for appropriate primer.
9. Rebond roof outer panel using GM Urethane P/N 12345633 or equivalent.



349737

Quarter Panel Replacement (Convertible)

Removal Procedure

The Camaro/Firebird convertible quarter panel assembly is specially designed for added strength and rigidity. Additional panels have been added to the service part to permit easier and faster service. The quarter panel assembly is attached to the vehicle structure with factory welds. To remove the quarter panel assembly, the welds must be drilled out.

Replacement procedures for the quarter panel assembly on convertibles are not the same as for the hardtop. On convertibles, the OEM quarter panel assembly must be cut just above where it is welded to the rocker panel. The service part is then trimmed and plug welded to the flange of the OEM panel.

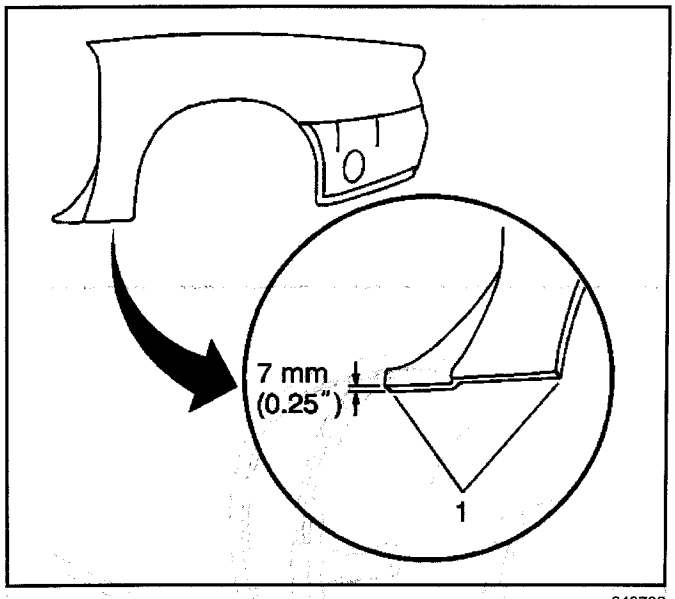
1. Remove all related panels and components.
2. Visually inspect the damaged area.
3. Restore as much of the damage as possible to factory specifications.

Important: Note the number and location of welds for installation of the service assembly.

4. Remove sealers and anti-corrosion materials as necessary.
5. Locate all factory welds.
6. Mark all factory welds.
7. Drill out all factory welds.
8. Apply a piece of one-inch tape at the bottom of the front lower section of the original quarter panel where it attaches to the rocker panel (1).
9. Cut the original quarter panel at the top edge of the tape.
10. Remove the panel from the vehicle.
11. Remove the tape from the flange.
12. Bend the remaining portion of the original quarter panel assembly up and inboard. This will allow the new panel to be positioned properly when it is installed.

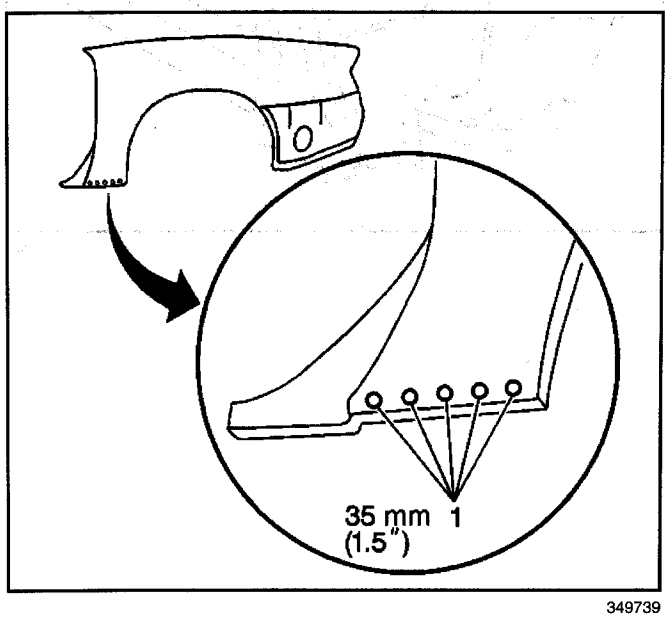
Installation Procedure

1. Prepare the new quarter panel assembly by trimming the inner flange on the lower front section (1) to 7 mm (1/4 in).
2. Prepare the mating surfaces.
3. Position the new quarter panel to overlap the roof panel at the pillar.
4. Check for proper fit.



349738

5. Drill 8 mm (5/16 in) holes in the face if the front lower portion of the new quarter panel assembly. Space the holes evenly across the front surface approximately 35 mm apart (1).



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Important: If the original component is damaged beyond recognition or the location for replacement welds is unknown, locate the weld holes 35 mm (1 1/2 in) apart.

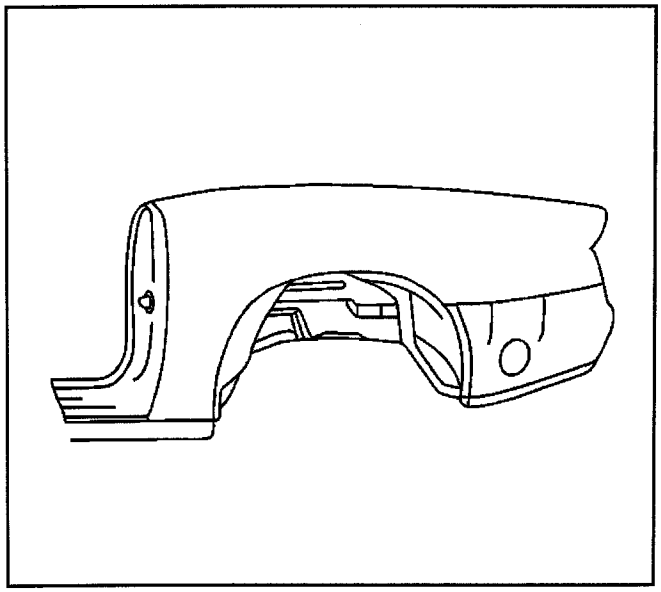
6. Drill holes in the remaining location as noted from the original quarter panel assembly.

Important: Do not stitch weld at the front edge of the quarter where it contacts the rocker panel.

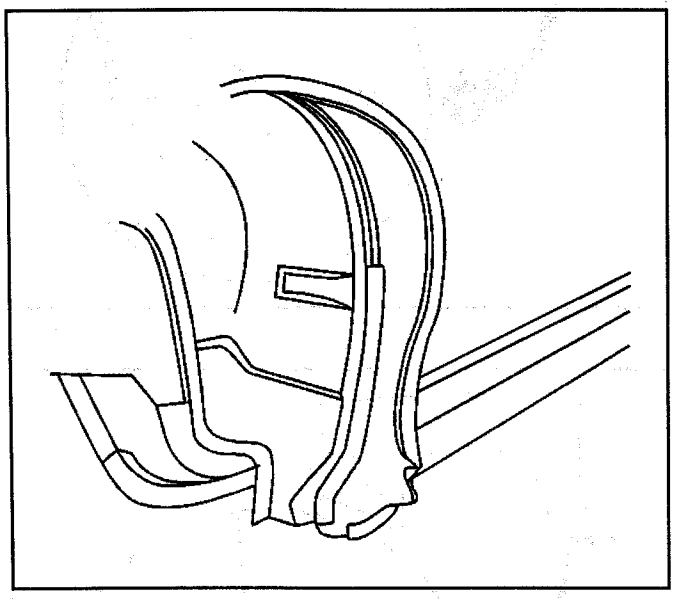
7. Position the new assembly.
8. Clean and prepare all welded surfaces.

Important: Do not combine paint systems. Refer to paint manufacturer's recommendations.

9. Prime with two-part catalyzed primer.



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349743

Important: When you replace the quarter panel ensure that the fuel filler neck is properly sealed. Use SPO Sealing Strip (P/N 312399117) between the quarter panel and the filler neck. Install using the provided instructions.

10. Apply the sealers and the anti-corrosion materials as necessary.
11. Install all related panels and components.

Wheelhouse Replacement - Rear

Inner Rear Wheelhouse

The Camaro/Firebird convertible inner rear wheelhouse assembly is replaced at the factory seams.

Outer Rear Wheelhouse

The Camaro/Firebird convertible outer rear wheelhouse assembly is a one-piece assembly consisting of the wheelhouse with a forward that attaches to the door opening frame and inner rocker reinforcement.

To simplify service when the vehicle is only damaged in the rear portion of the wheelhouse assembly, sectioning can be used to install the service part. The procedure requires removing the forward flange from the new assembly so it can be installed onto the still-attached flange of the original part.

Removal Procedure

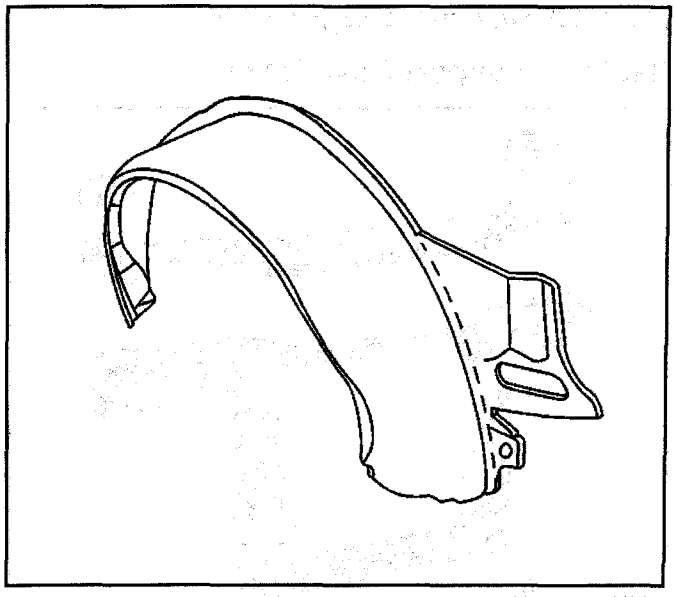
1. Remove all related panels and components including the quarter panel.
2. Visually inspect the damaged area.
3. Restore as much of the damage as possible to factory specifications.
4. Remove the sealers, the sound deadeners and the corrosions materials as necessary.

Important: Note the number of welds for installation of the new assembly.

5. Locate, mark and drill out factory welds as necessary.
6. Apply a strip of 25 mm (1 in) wide masking tape along the inner surface of front wheelhouse, approximately 15 in up from the base of the wheelhouse.
7. Cut the wheelhouse alone the outer edge of the tape.
8. Remove the damaged section of the wheelhouse, leaving the forward flange.

Installation Procedure

1. Prepare the new rear wheelhouse assembly by removing the forward flange. Leave approximately 7 mm (1/4 in) on the lip running along the outer surface of the wheelhouse.
2. Prepare the mating surfaces of the new assembly.
3. Check for proper fit.
4. Cut the new wheelhouse along the corner of the bend.
5. Remove the unused section of the wheelhouse.



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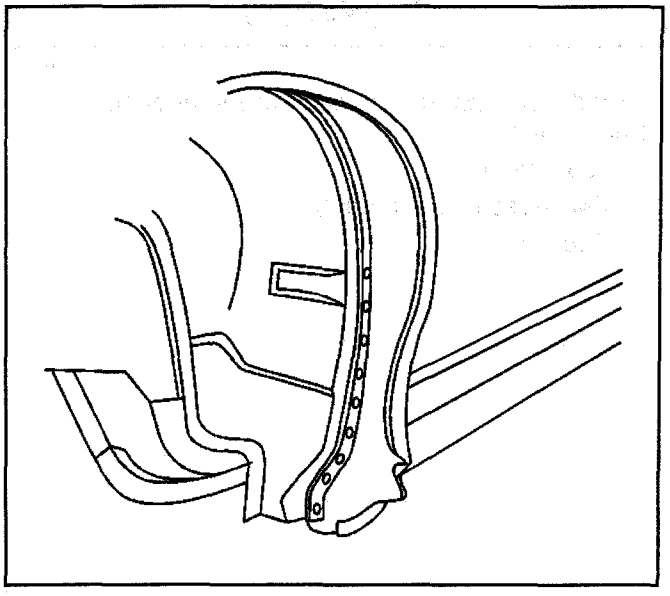
6. Drill approximately ten (10) 8 mm (5/16 in) holes for plug welding every 40 mm (1.5 in) along the cut edge on the new wheelhouse.

Important: If the original component is damaged beyond recognition, and the location for replacement welds is unknown, locate the weld holes 35 mm (1 1/2 in) apart.

7. Drill holes in the remaining locations as noted from the original wheelhouse panel assembly.
8. Position the new assembly.
9. Check for proper fit.
10. Plug the weld wheelhouse.
11. Clean and prepare welded surfaces.
12. Apply the sealers and the anti-corrosion materials as necessary.

Important: Do not combine paint systems. Refer to the manufacturer's recommendations.

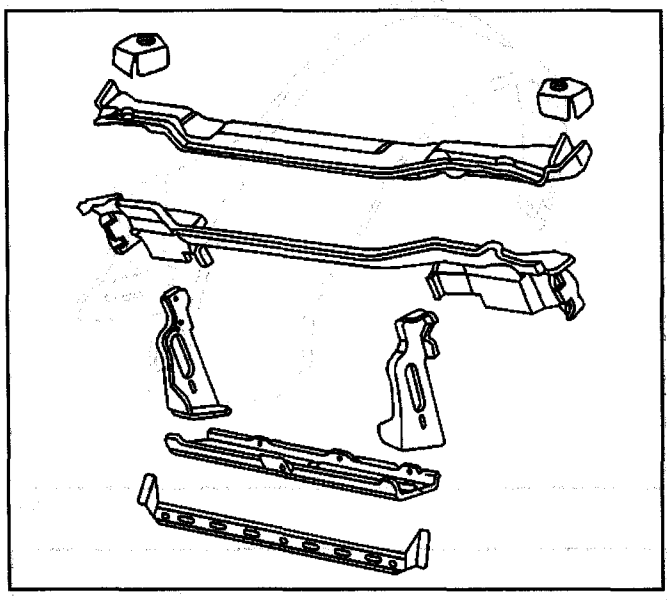
13. Prime with two-part catalyzed primer.
14. Install all related panels and components.



349747

Description and Operation

Radiator Support Description



349626

The radiator support assembly consist of eight components:

- Four upper
- Two sides (left and right)
- Two lower

Radiator Support

The radiator support is available as an entire unit including all brackets and reinforcements.

Lower Outer Support

The lower outer support is serviced separately. The lower left, right and inner support are also available separately.

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Restraints

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Seat Belts

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver and Passenger Seat Buckle-Side Belt Bolt/Screw	42 N·m	31 lb ft
Driver and Passenger Seat Retractor-Side Belt Bolt/Screw	28 N·m	20 lb ft
Driver and Passenger Seat Retractor-Side Belt (Anchor Plate) Bolt/Screw	42 N·m	31 lb ft
Driver and Passenger Seat Retractor-Side Belt Bolt/Screw (Convertible)	42 N·m	31 lb ft
Driver and Passenger Seat Shoulder Belt Guide Bolt/Screw (Convertible)	42 N·m	31 lb ft
Rear Seat Buckle-Side Belt Bolt/Screw	42 N·m	31 lb ft
Rear Seat Retractor-Side Belt Bolt/Screw (Convertible)	42 N·m	31 lb ft
Rear Seat Retractor-Side Belt Bolt/Screw (Coupe)	42 N·m	31 lb ft
Rear Seat Retractor-Side Belt Guide Bolt/Screw (Convertible)	42 N·m	31 lb ft
Rear Seat Retractor-Side Belt Guide Bolt/Screw (Coupe)	10 N·m	89 lb in
Rear Seat Retractor-Side Belt Guide Retractor Bracket Bolt/Screw (Convertible)	30 N·m	22 lb ft
Rear Seat Retractor-Side Belt Retractor Nut (Coupe)	55 N·m	41 lb ft

Repair Instructions

Seat Belt Checks

Seat Belt Check

Perform the following inspection from the driver seat:

1. Turn the ignition switch to the ON position. Verify proper operation of the seat belt reminder lamp with the belt buckled and with the belt unbuckled.

   Refer to Front Seat System in *Seat Belt System Operation*.
2. Inspect the shoulder belt guide in order to ensure that the following conditions are met:
   - The shoulder belt guide swivels freely
   - The seat belt webbing is seated flatly in the guide slot
   - The webbing does not bind
3. Verify that the seat belt buckle faces inboard and is accessible.
4. Verify that the seat belt retractor units are securely attached.
5. Verify that the seat belt anchor bolts are secure.
6. Fully extend the seat belt webbing. Verify that the seat belt webbing does not have any twists or tears.
7. Allow the seat belt webbing to retract. Verify that the webbing returns freely and completely back into the retractor.
8. Snap the seat belt latch plate into the buckle.
9. Sharply tug on the seat belt latch plate and the buckle. Verify that the seat belt latch plate and the buckle remain locked when tugged.
10. Push the button on the buckle.

    Verify that the seat belt latch plate releases easily from the buckle.

    Verify that the button returns to its original position.

Repeat the inspection procedure (steps 2 through 10) from the front passenger seat.

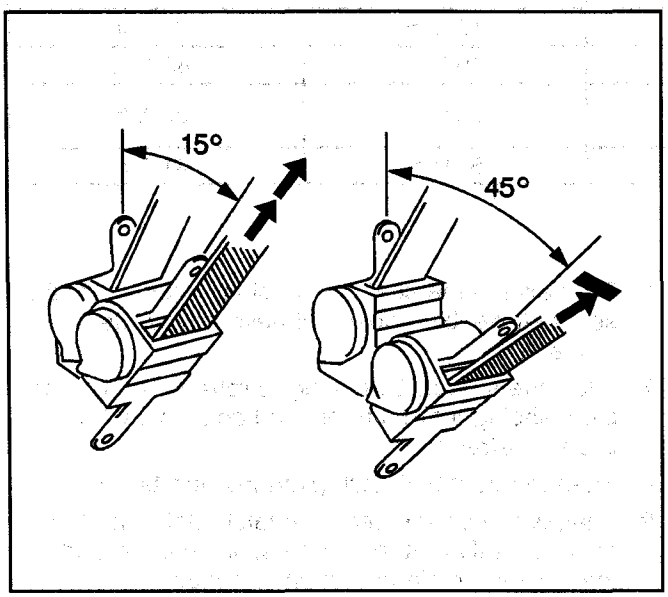
Repeat the inspection procedure (steps 2 through 10) from the rear seats.

Refer to Seats in Body and Accessories for information on removal of the seats and the seat cushions.

Emergency Locking Retractor Checks

Caution: Perform this test in an area clear of other vehicles and/or obstructions. Do not conduct this test on the open road. A large, empty parking lot is suitable. Failure to observe this precaution may result in damage to the vehicle and possible personal injury.

1. Fasten the seat belts. An assistant is needed when the retractor under test is not part of the driver seat belt.
2. Accelerate the vehicle slowly to 16 km/h (10 mph) and then apply the brakes firmly.
3. Verify that the seat belt locks when braking firmly.
4. If the belt does not lock, proceed with steps 5 through 8.
5. Remove the seat belt retractor assembly.
6. Tilt the seat belt retractor slowly.



157277

7. Verify that the seat belt webbing can be pulled from the retractor at an inclination of 15 degrees or less and cannot be pulled from the retractor at an inclination of 45 degrees or more.
8. If the seat belt retractor does not operate as described, replace the retractor assembly.

Seat Belt Service Precautions

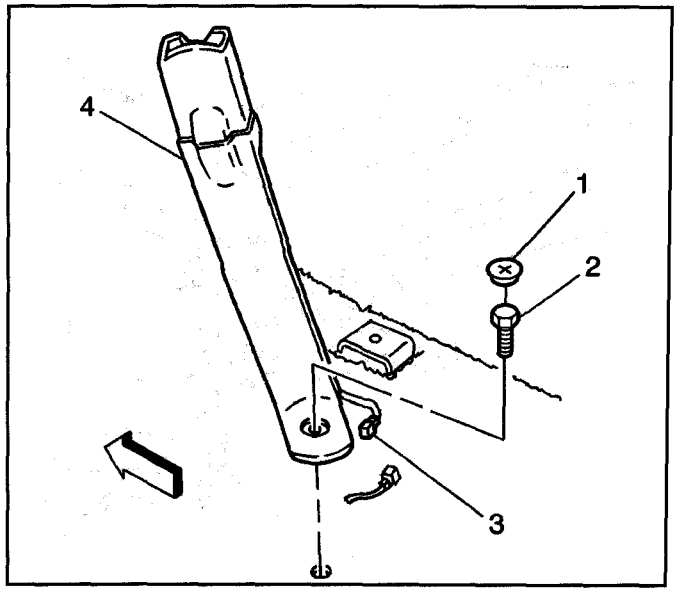
- Do not bleach or dye the seat belt webbing. Clean the seat belt webbing with a mild soap and water solution and a soft brush or a cloth.
- Keep sharp edges and damaging objects away from the seat belts. Avoid bending or damaging any part of the seat belt buckle or the latch plate.
- Replace seat belts which are cut or damaged in any way.
- Use only the correct seat belt anchor bolts and screws.
  - Tighten the bolts and the screws to the correct torque value. Refer to *Fastener Tightening Specifications*
  - When installing the seat belt anchor bolts, start the bolt by hand in order to ensure that the bolt is threaded straight.
- Seat belts and retractors must be serviced as a set with service replacement parts only. Do not attempt to make repairs to the individual compartments.
- Verify that the replacement part number is correct for the vehicle and at that seating position. Do not substitute a seat belt from a different seating position.
- Replace any seat belts which have a visible caution label instructing replacement.
- Some seat belts have an Energy Management Loop, which is an overlap of the seat belt webbing that is stitched together. If any of the stitching is separated, replace the seat belt.

Seat Belt Buckle Replacement - Left Front

Removal Procedure

Caution: The seat belt assembly and/or the bracket assembly must be replaced as a unit only. Do not substitute parts for any reason, or personal injury could result in the event of a collision.

1. Remove the front seat, if necessary. Refer to *Seat Replacement - Front Bucket (Chevrolet)* in Seats.
2. Remove the driver side seat belt warning electrical connector.
3. Remove the plug (2) from the bolt/screw (3).
4. Remove the bolt/screw (3) that attaches the belt (1) to the floor pan.
5. Remove the belt (1).



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Installation Procedure

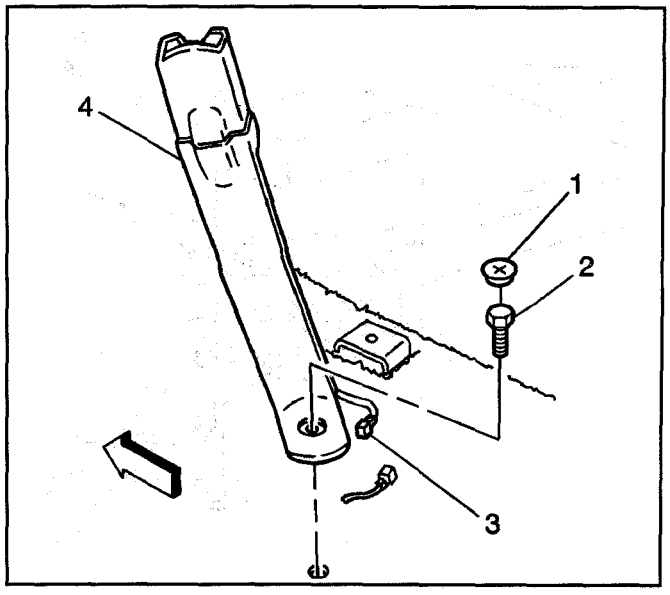
1. Install the belt (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt/screw (3) that attaches the belt (1) to the floor pan.

   Tighten

   Tighten the bolt/screw (3) to 42 N·m (31 lb ft)
3. Connect the plug (2) to the bolt/screw (3).
4. Install the driver seat belt warning electrical connector.
5. Install the front seat. Refer to *Seat Replacement - Front Bucket (Chevrolet)* in Seats.

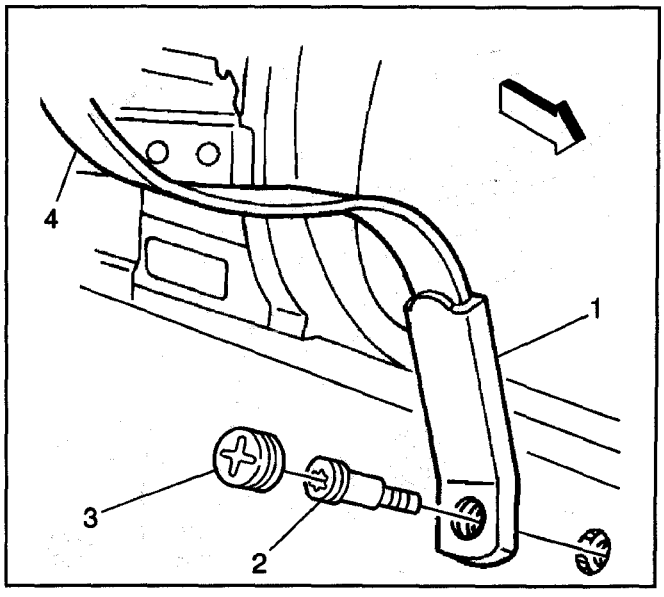


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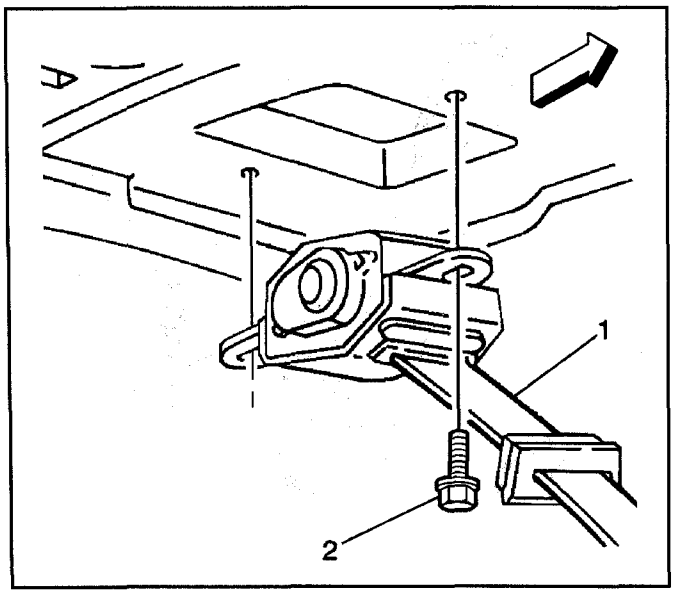
Seat Belt Retractor Replacement - Left Front (Coupe)

Removal Procedure

1. Remove the plug (3) from the bolt/screw (2).
2. Remove the bolt/screw (2) that attaches the plate to the rocker panel.
3. Remove the plate.
4. Pull the webbing and the plate out of the shoulder belt guide.
5. Lower the rear portion of the headliner finishing trim panel. Refer to *Hard Top Headliner Replacement* in Roof.

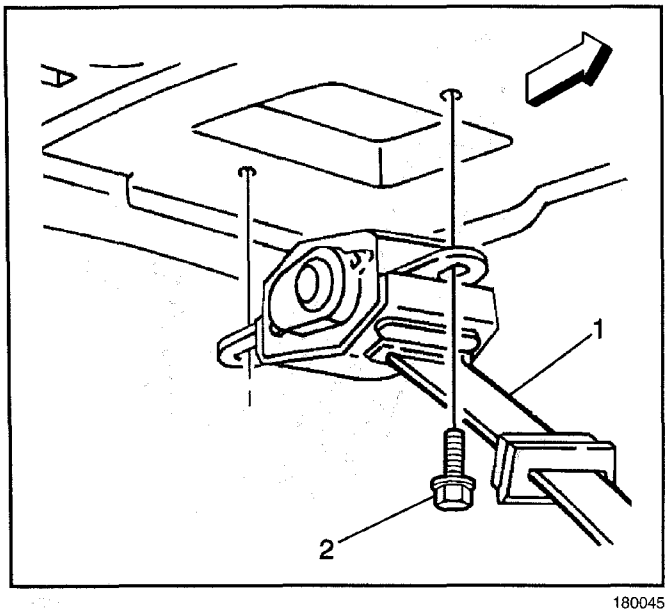


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6. Remove the bolts/screws (2) that attach the belt (1) to the rear roof panel.
7. Remove the belt (2) from the rear roof panel.



180045

Installation Procedure

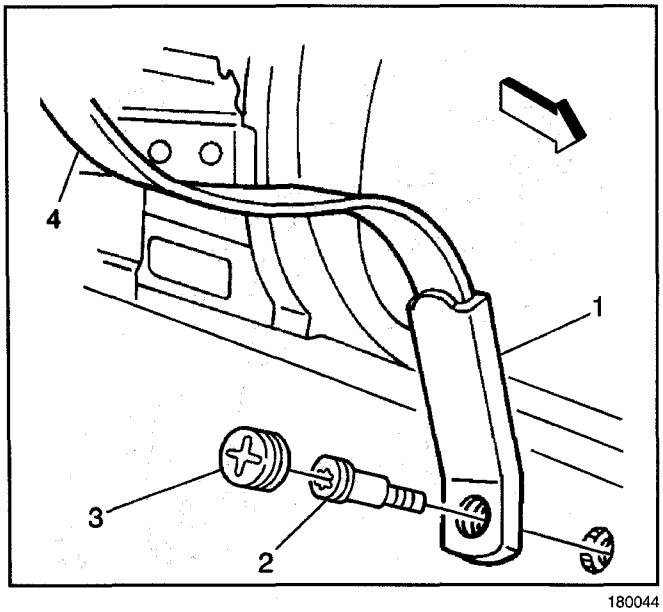
1. Connect the belt (1) to the rear roof panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolts/screws (2).

   Tighten

   Tighten the bolts/screws (2) to 28 N·m (20 lb ft).
3. Raise the rear portion of the headliner finishing trim panel back into position. Refer to *Hard Top Headliner Replacement* in Roof.



180044

4. Route the webbing and the plate through the shoulder belt guide.
5. Install the plate to the rocker panel.
6. Install the bolt/screw (2).

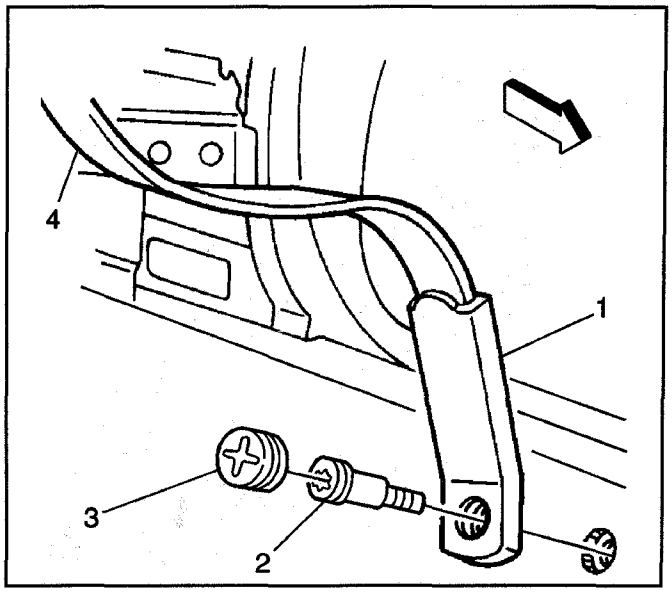
   Tighten

   Tighten the bolt/screw (2) to 42 N·m (31 lb ft).
7. Install the plug (3) to the bolt/screw (2).

Seat Belt Retractor Replacement - Left Front (Convertible)

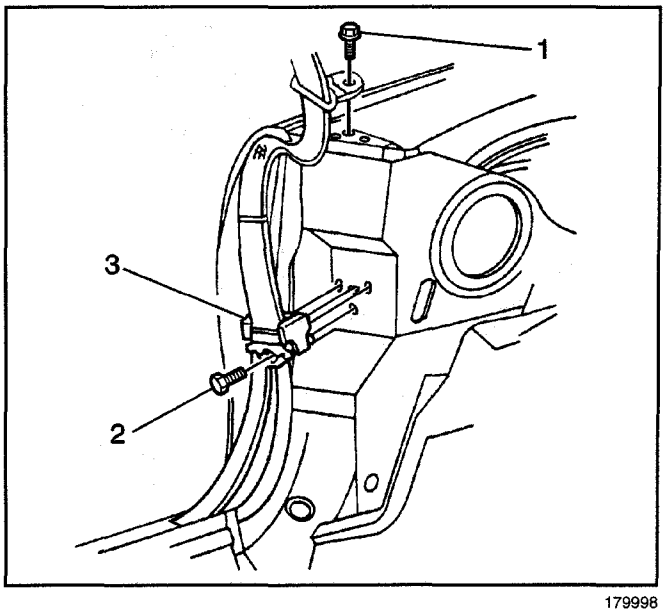
Removal Procedure

1. Remove the front quarter trim finishing panel. Refer to Front Quarter Trim Finish Panel Replacement in Body and Accessories.
2. Remove the plug (3) from the bolt/screw (2).
3. Remove the bolt/screw (2) that attaches the plate to the rocker panel.



180044

4. Remove the shoulder belt guide bolt/screw (3).
5. Remove the retractor-side belt (1).
6. Remove the shoulder belt retractor-side bolt/screw (2).



179998

Installation Procedure

1. Install the retractor-side belt (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

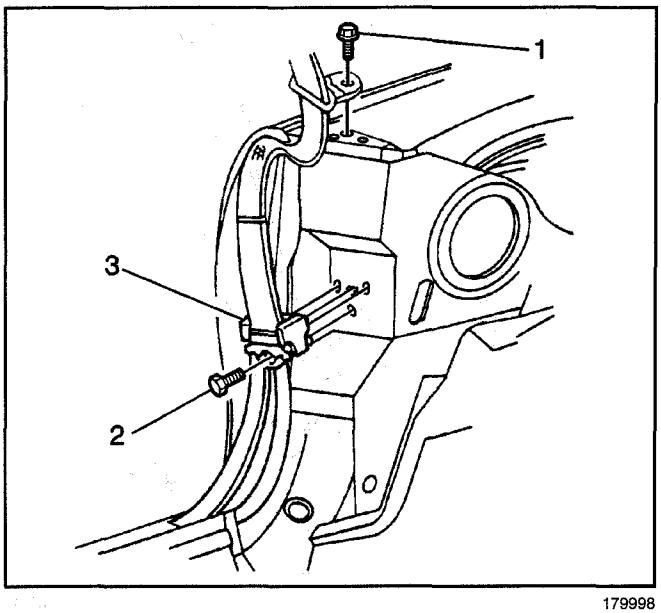
2. Install the shoulder belt guide bolt/screw (3).

   Tighten

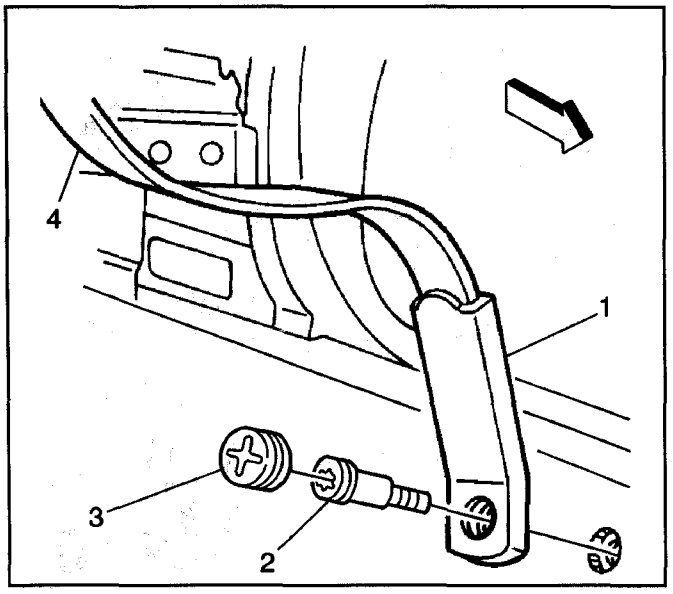
   Tighten the bolt/screw (3) to 42 N·m (31 lb ft).
3. Install the shoulder belt retractor-side bolt/screw (2).

   Tighten

   Tighten the bolt/screw (2) to 42 N·m (31 lb ft).



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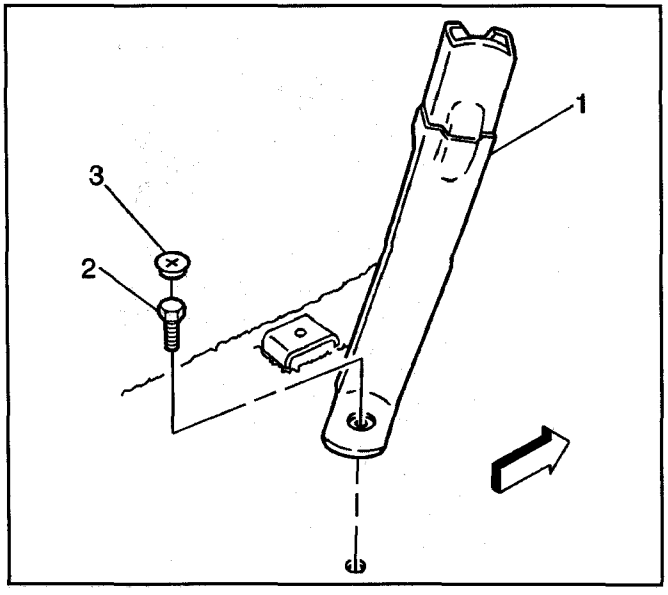


180044

4. Install the bolt/screw (2) that attaches the plate to the rocker panel.

   Tighten

   Tighten the bolt/screw (2) to 42 N·m (31 lb ft).
5. Install the plug (3) to the bolt/screw (2).
6. Install the front quarter trim finish panel. Refer to Front Quarter Trim Finish Panel Replacement in Body and Accessories.



180041

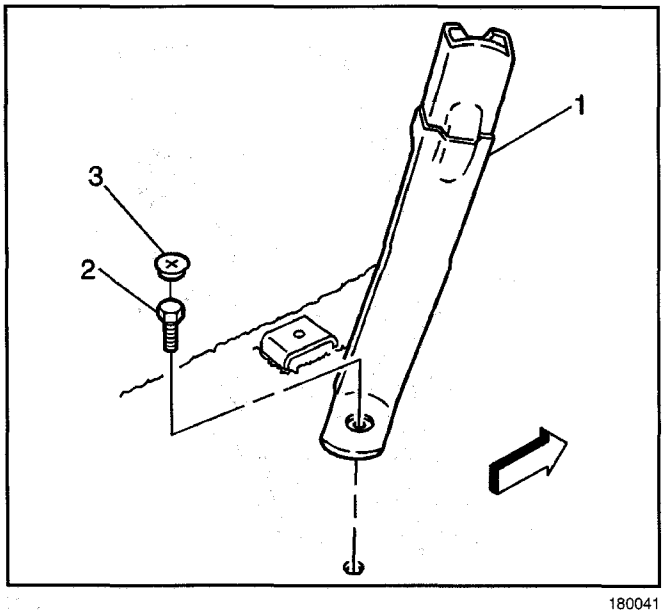
Seat Belt Buckle Replacement - Right Front

Removal Procedure

1. Remove the front seat, if necessary. Refer to *Seat Replacement - Front Bucket (Chevrolet)* in Seats.

Caution: The seat belt assembly and/or the bracket assembly must be replaced as a unit only. Do not substitute parts for any reason, or personal injury could result in the event of a collision.

2. Remove the plug (3) from the bolt/screw (2).
3. Remove the bolt/screw (2) that attaches the belt to the floor pan.
4. Remove the belt (1).



180041

Installation Procedure

1. Install the belt (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt/screw (2) that attaches the belt (1) to the floor pan.

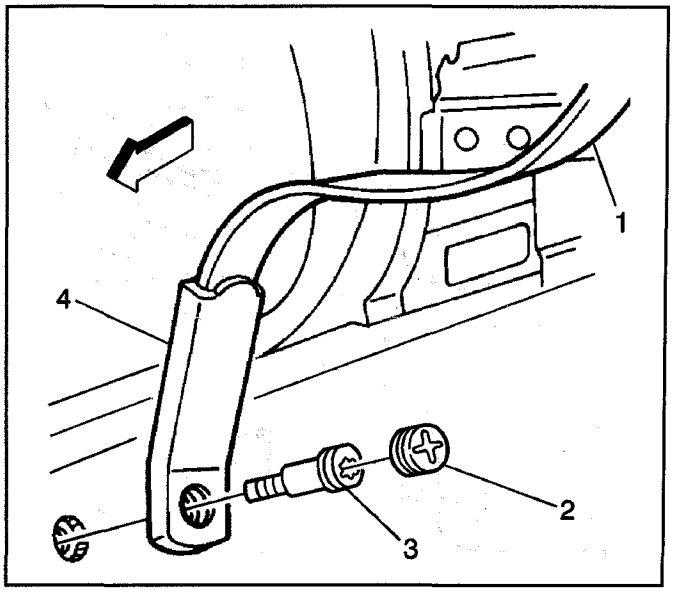
   Tighten

   Tighten the bolt/screw (2) to 42 N·m (31 lb ft).
3. Install the plug (3) to the bolt/screw (2).
4. Install the front seat. Refer to *Seat Replacement - Front Bucket (Chevrolet)* in Seats.

Seat Belt Retractor Replacement - Right Front (Coupe)

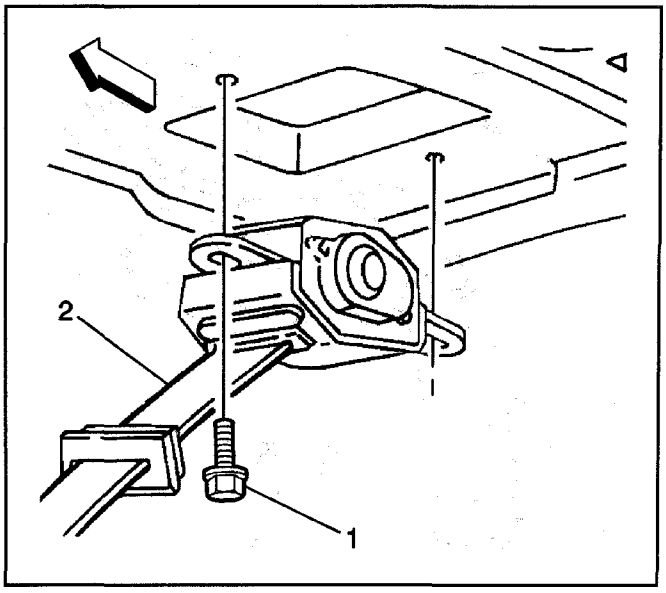
Removal Procedure

1. Remove the plug (2) from the bolt/screw (3).
2. Remove the bolt/screw (3) that attaches the plate to the rocker panel.
3. Remove the attaching plate.
4. Pull the webbing and the plate out of the shoulder belt guide.
5. Lower the rear portion of the headlining finishing trim panel. Refer to *Hard Top Headliner Replacement* in Roof.



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6. Remove the bolts/screws (1) that attach the bolt (2) to the rear roof panel.
7. Remove the belt (1) from the rear roof panel.



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Installation Procedure

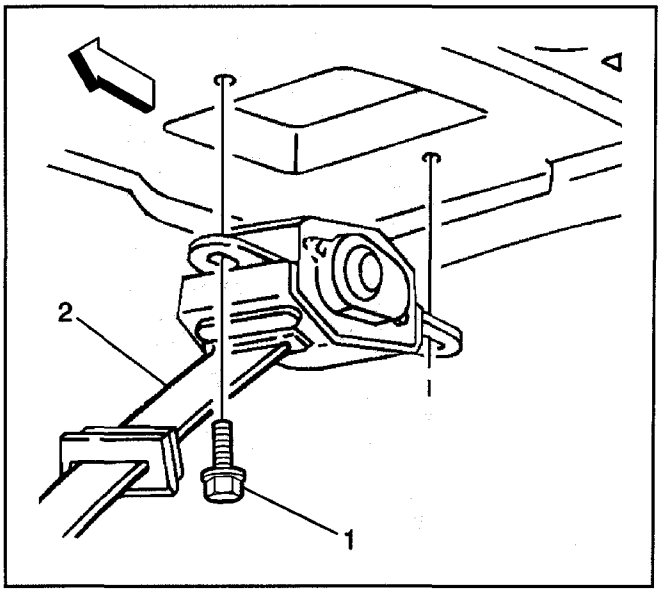
1. Connect the belt (2) to the rear roof panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

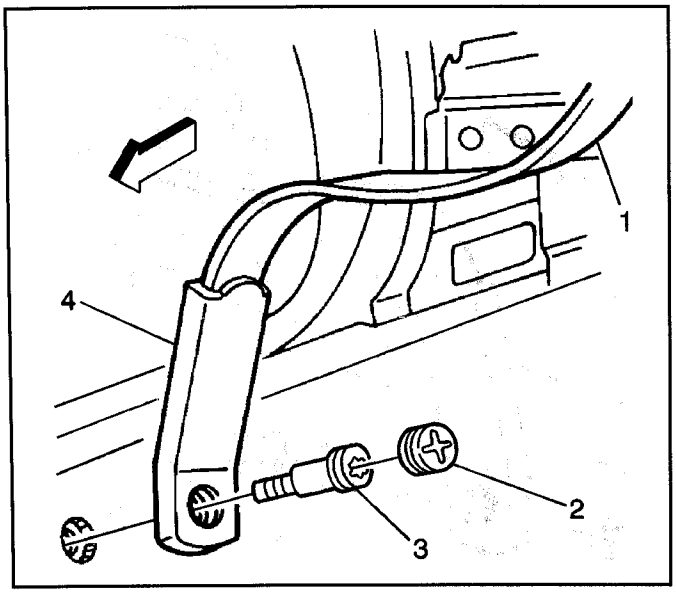
2. Install the bolts/screws (1).

   Tighten

   Tighten the bolts/screws (1) to 28 N·m (20 lb ft).
3. Raise the rear portion of the headlining finishing trim panel back into position. Refer to *Hard Top Headliner Replacement* in Roof.



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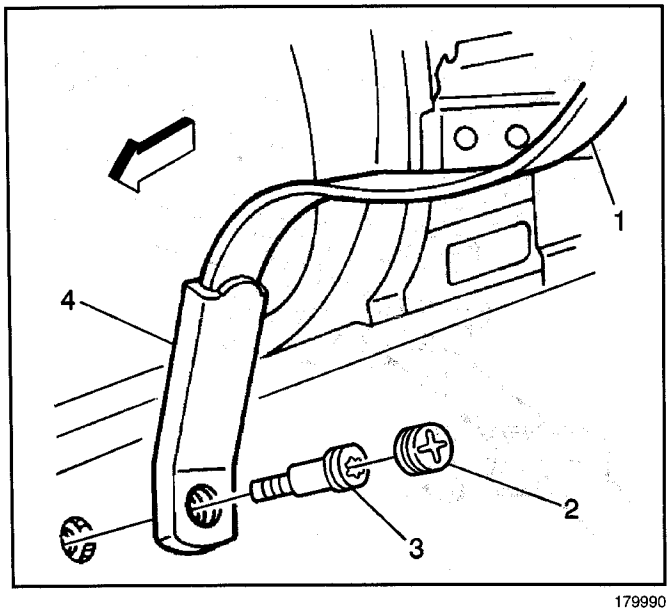


179990

4. Route the webbing and the plate through the shoulder belt guide.
5. Connect the plate to the rocker panel.
6. Install the bolt/screw (3).

   Tighten

   Tighten the bolt/screw (3) to 42 N·m (31 lb ft).
7. Connect the plug (2) to the bolt/screw (3).

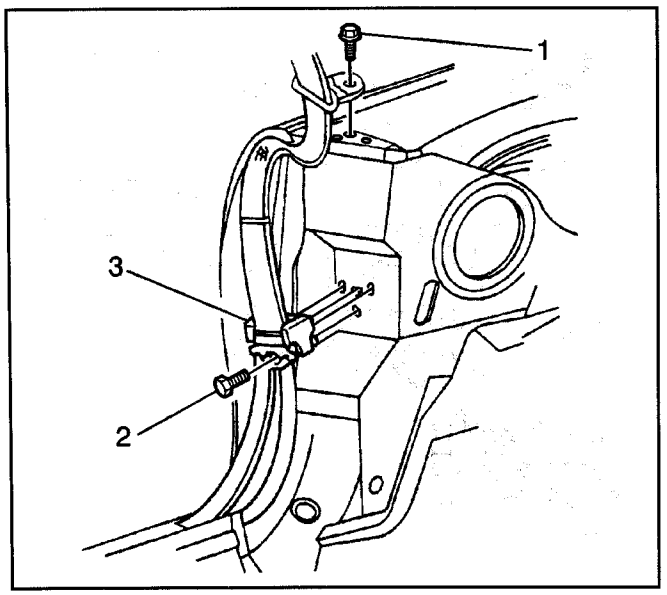


179990

Seat Belt Retractor Replacement - Right Front (Convertible)

Removal Procedure

1. Remove the front quarter trim finishing panel. Refer to Front Quarter Trim Finishing Panel Replacement in Body and Accessories.
2. Remove the plug (2) from the bolt/screw (3).
3. Remove the bolt/screw (3) that attaches the plate to the rocker panel.



179998

4. Remove the bolt/screw (1) from the shoulder belt guide.
5. Remove the retractor-side belt (3).
6. Remove the bolt/screw (2) from the retractor-side shoulder belt (3).

Installation Procedure

1. Install the retractor-side belt (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bolt/screw (1) to the shoulder belt guide.

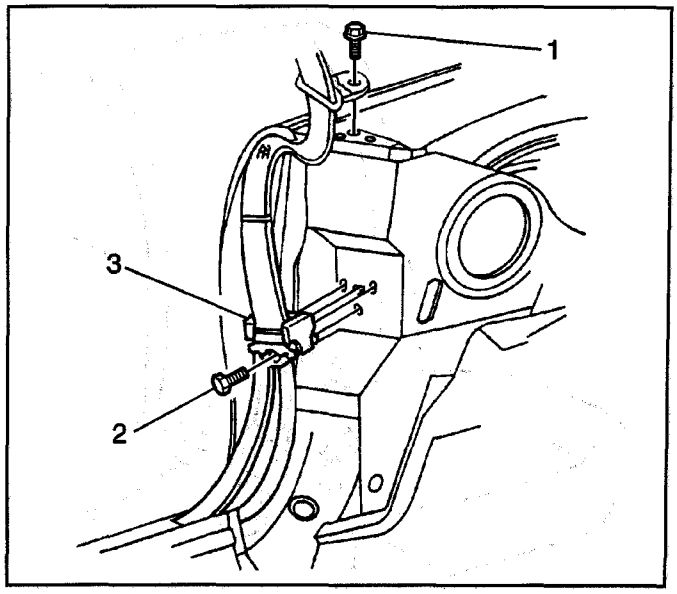
   Tighten

   Tighten the bolt/screw (1) to 42 N·m (31 lb ft).

3. Install the bolt/screw (1) to the retractor-side shoulder belt.

   Tighten

   Tighten the bolt/screw to (2) to 42 N·m (31 lb ft).



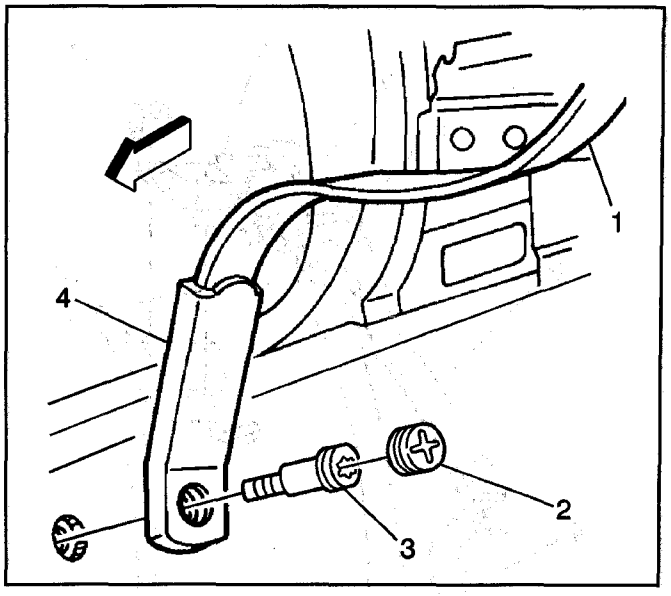
179998

4. Install the bolt/screw (3) that attaches the plate to the rocker panel.

   Tighten

   Tighten the bolt/screw (3) to 42 N·m (31 lb ft).

5. Connect the plug (2) to the bolt (3).
6. Install the front quarter trim finish panel. Refer to Front Quarter Trim Finishing Panel Replacement in Body and Accessories.



179990

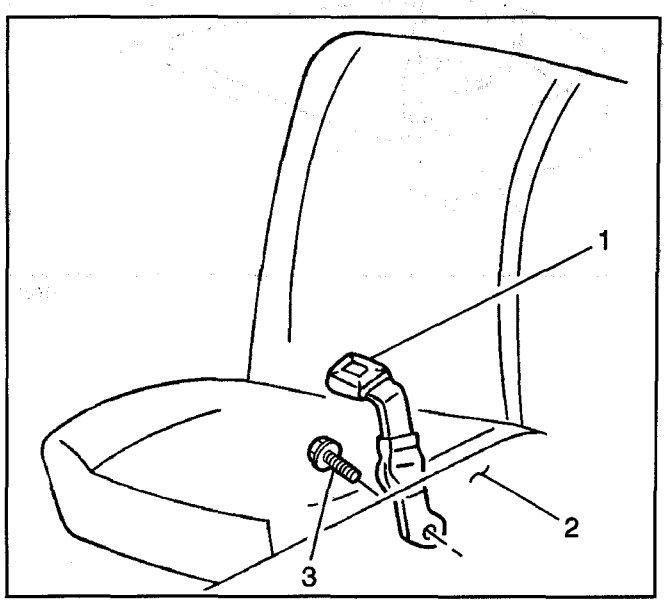
Seat Belt Side Buckle Replacement - Rear

Removal Procedure

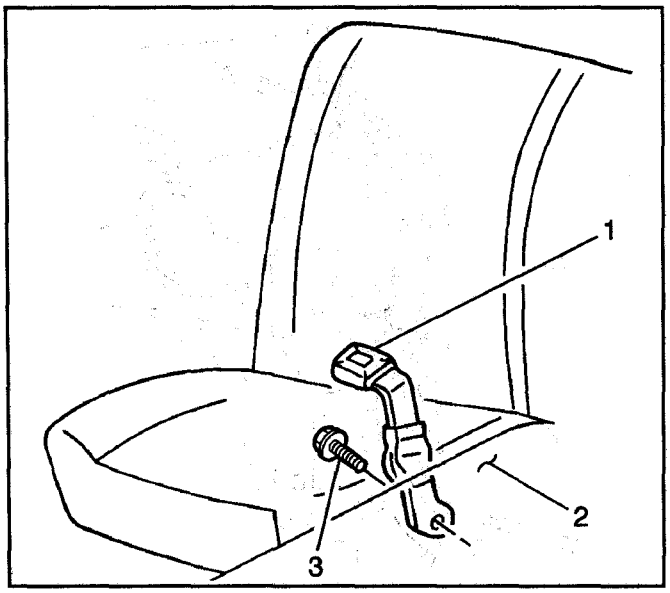
1. Remove the rear seat cushion. Refer to Seats in Body and Accessories.
2. Remove the bolt/screw (3) that attaches the belt (1) to the floor panel (2).

Caution: The seat belt assembly and/or bracket assembly must be replaced as a unit only. Do not substitute parts for any reason, or personal injury could result.

3. Remove the belt (1).



180002



180002

Installation Procedure

1. Install the belt (1).

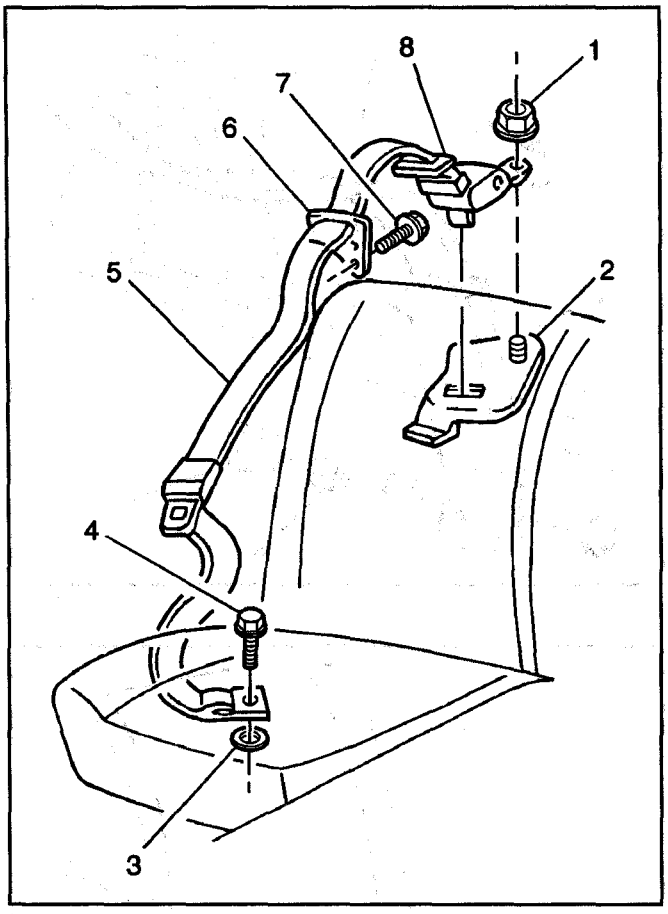
Notice: Refer to *Fastener Notice.*

2. Install the bolt/screw (3).

   Tighten

   Tighten the bolt/screw (3) to 42 N·m (31 lb ft).

3. Install the rear seat cushion. Refer to Seats in Body and Accessories.



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Seat Belt Retractor Replacement - Rear (Coupe)

Removal Procedure

1. Remove the quarter inner rear trim finish panel. Refer to Quarter Inner Rear Trim Finish Panel Replacement in Body and Accessories.
2. Remove the rear seat cushion. Refer to Rear Seat Cushion Replacement in Body and Accessories.
3. Remove the nut (1) that attaches the rear seat retractor-side shoulder belt to the inner wheelhouse panel (2).
4. Remove the bolts/screws (7) that attach the rear seat shoulder belt guide (6) to the rear seat back cushion.
5. Remove the bolt/screw (4) and the spacer (3) that attaches the belt (5) to the floor panel.
6. Remove the belt (5) from the vehicle.

Installation Procedure

1. Connect the belt anchor plate to the floor panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Connect the bolt/screw (4) and the spacer (3) to the floor panel.

   Tighten

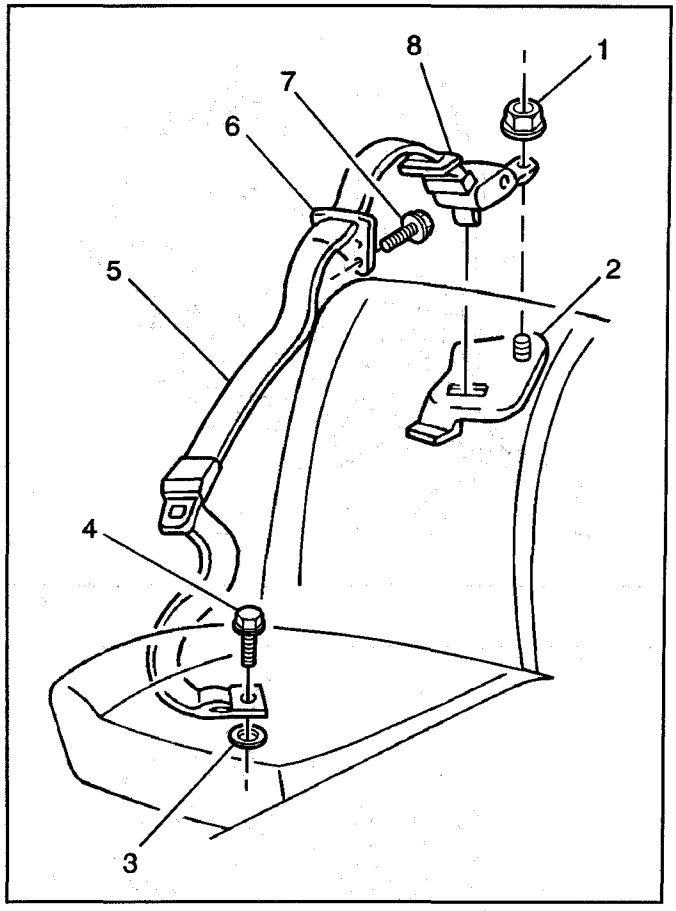
   Tighten the bolt/screw to 42 N·m (31 lb ft).
3. Connect the shoulder belt guide (6) to the rear seat back cushion.
4. Install the bolts/screws (7).

   Tighten

   Tighten the bolts/screws (7) to 10 N·m (89 lb in).
5. Connect the belt retractor to the inner wheelhouse panel (2).
6. Install the nut (1).

   Tighten

   Tighten the nut to 55 N·m (41 lb ft).
7. Install the rear seat cushion. Refer to Rear Seat Cushion Replacement in Body and Accessories.
8. Install the quarter inner rear trim finishing panel. Refer to Quarter Inner Rear Trim Finish Panel Replacement in Body and Accessories.

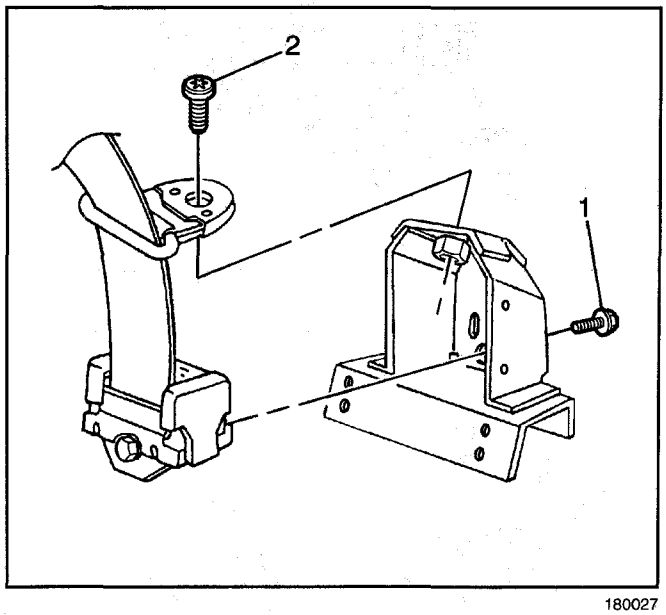


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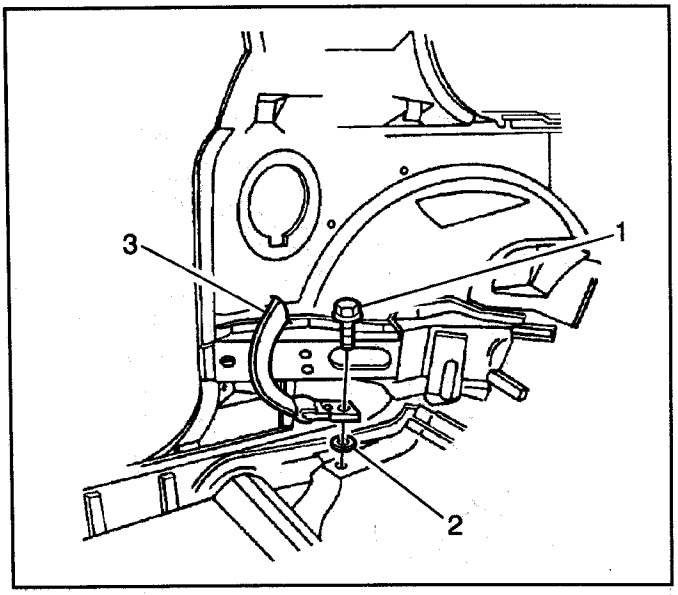
Seat Belt Retractor Replacement - Rear (Convertible)

Removal Procedure

1. Remove the retractor trim cover. Refer to *Shoulder Belt Replacement - Rear (Retractor Trim Cover).*
2. Remove the rear seat cushion. Refer to Rear Seat Cushion Replacement in Body and Accessories. in Body and Accessories.
3. Remove the bolt/screw (2) from the rear seat retractor-side belt guide.
4. Remove the bolt/screw (1) from the rear seat retractor-side shoulder belt.

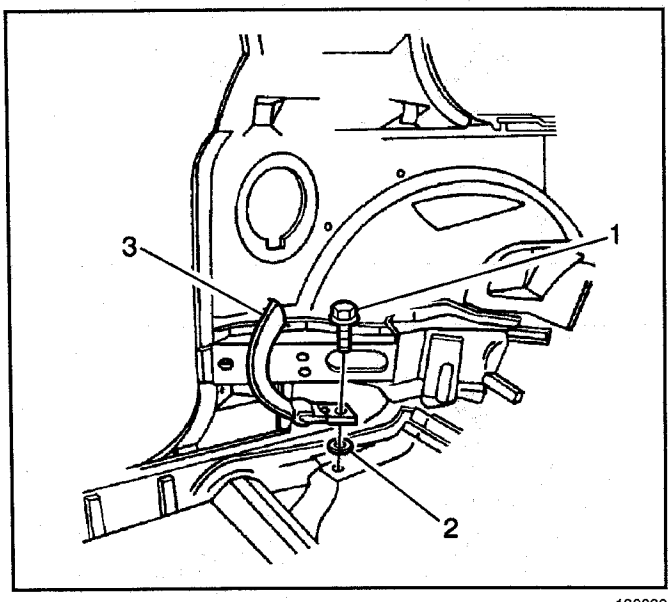


180027



180030

5. Remove the bolt/screw (1) and the spacer (2) that attaches the belt (3) to the floor panel.
6. Remove the rear seat belt (3).



180030

Installation Procedure

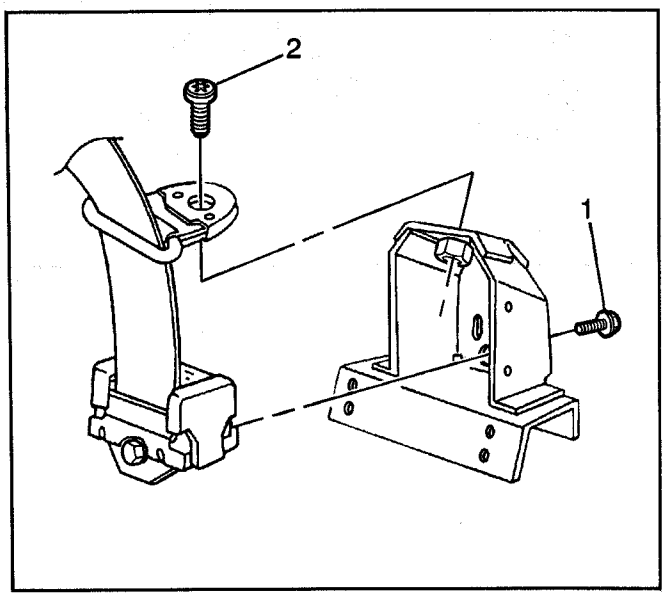
1. Attach the rear seat belt anchor plate to the floor panel.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Connect the bolt/screw (1) through the belt anchor plate and the spacer (2) to the floor panel.

   Tighten

   Tighten the bolt (1) to 42 N·m (31 lb ft).



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3. Install the bolt/screw (1) to the rear seat retractor-side shoulder belt.

   Tighten

   Tighten the bolt (1) to 42 N·m (31 lb ft).

4. Install the bolt/screw (2) to the rear seat retractor-side belt guide.

   Tighten

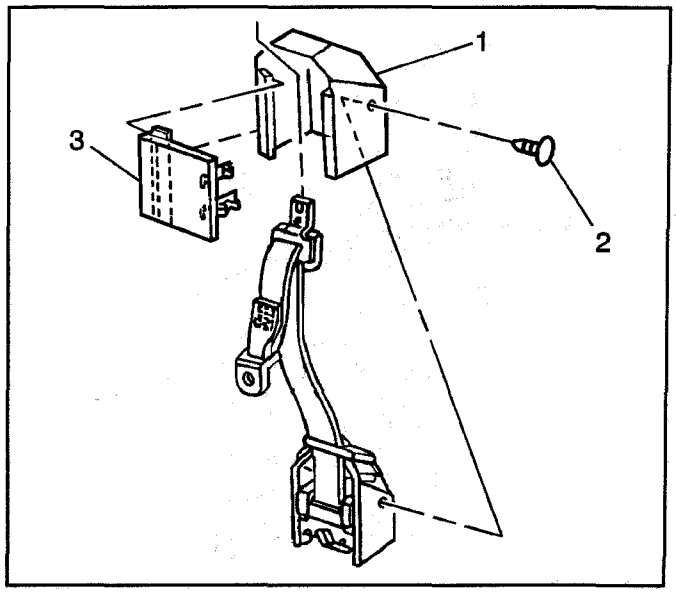
   Tighten the bolt (2) to 42 N·m (31 lb ft).

5. Install the rear seat cushion. Refer to Rear Seat Cushion Replacement in Body and Accessories.
6. Install the retractor trim cover. Refer to *Shoulder Belt Replacement - Rear (Retractor Trim Cover).*

Shoulder Belt Replacement - Rear (Retractor Trim Cover)

Removal Procedure

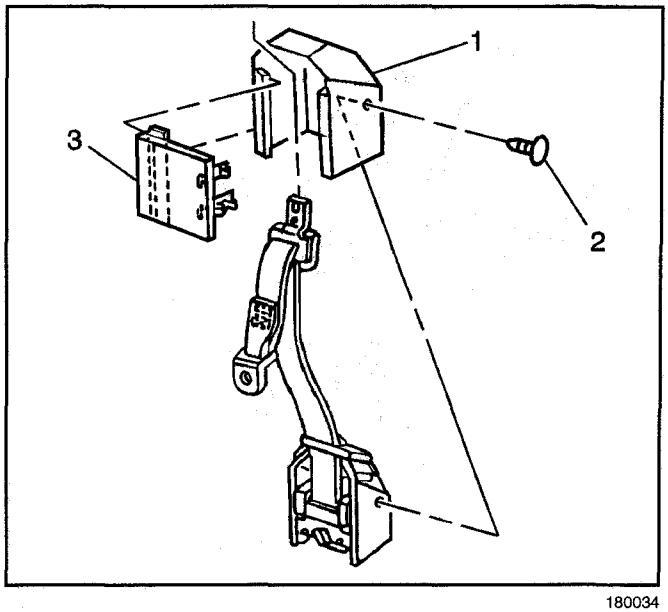
1. Unsnap and disconnect the cover (1) from the retractor trim cover (3).
2. Remove the retractor trim cover retainer (2).
3. Remove the cover (1) from the retractor trim cover.



180034

Installation Procedure

1. Connect the cover (1) to the retractor trim cover.
2. Install the retractor trim cover retainer (2).
3. Install the retractor trim cover (3).

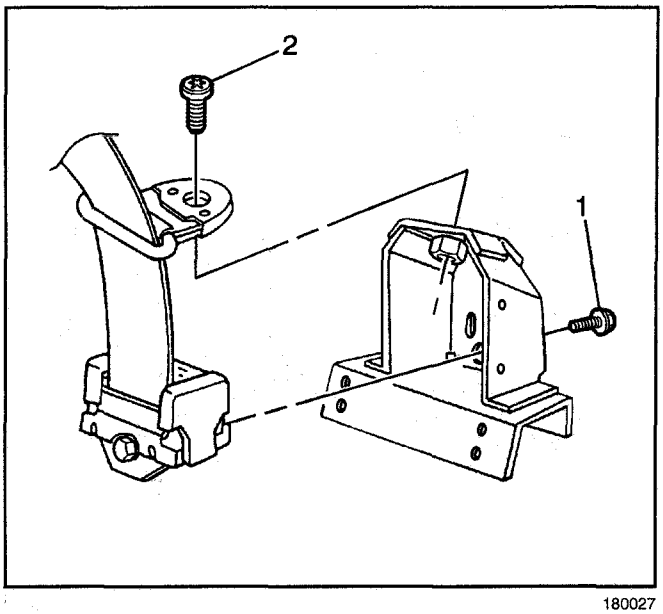


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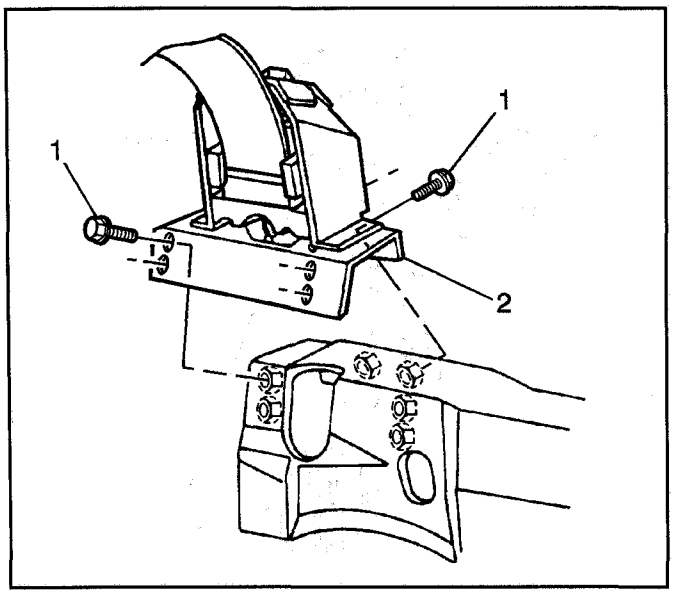
Shoulder Belt Replacement - Rear (Retractor Bracket)

Removal Procedure

1. Remove the retractor trim cover. Refer to *Shoulder Belt Replacement - Rear (Retractor Trim Cover)*.
2. Remove the bolt/screw (2) from the rear seat retractor-side belt guide.
3. Remove the bolt/screw (1) from the rear seat retractor-side belt.

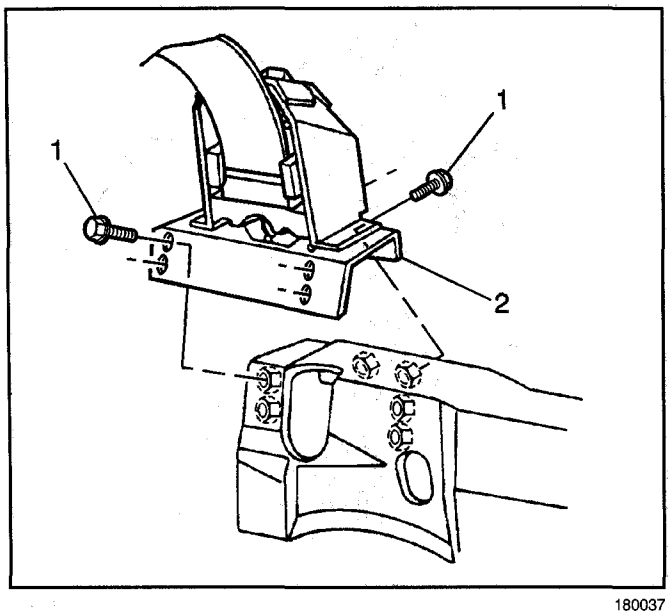


180027



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4. Remove the retractor from the bracket (2).
5. Remove the bracket bolts/screws (1).
6. Remove the bracket (2).



180037

Installation Procedure

1. Install the bracket (2).

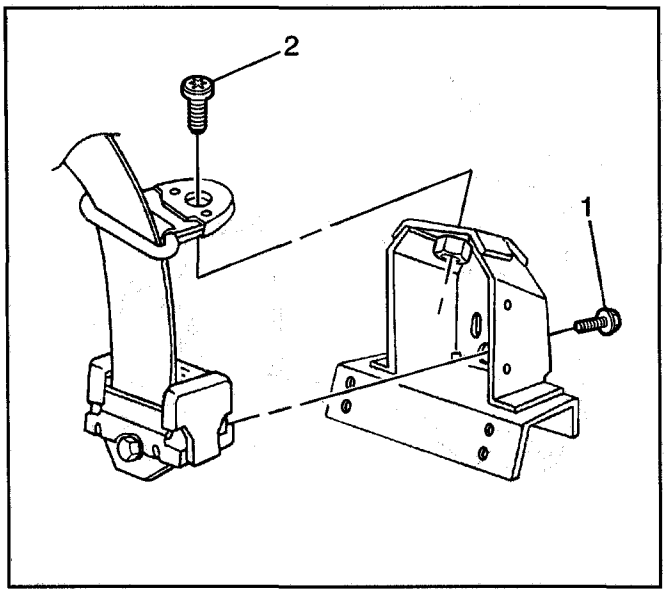
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the bracket bolts/screws (1).

   Tighten

   Tighten the bolts/screws (1) to 30 N·m (22 lb ft).

3. Connect the retractor to the bracket (2).



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4. Install the bolt/screw (1) to the rear seat retractor-side belt.

   Tighten

   Tighten the bolt (2) to 42 N·m (31 lb ft).

5. Install the bolt/screw (2) to the rear seat retractor-side belt guide.

   Tighten

   Tighten the bolt/screw (2) to 42 N·m (31 lb ft).

6. Install the retractor trim cover. Refer to *Shoulder Belt Replacement - Rear (Retractor Trim Cover)*.

Child Seat Restraint System Belt Kit (Child Seat)

Caution: A child in a rear-facing child restraint can be seriously injured if the right-front passenger's air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. It is always better to secure a child restraint in the rear seat. If a forward-facing child seat is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owner's manual and the instructions that came with the child restraint.

When the child seat is used in the front seat, it is installed by connecting the following components:

- The child seat tether
- The seat belt at the seating position to the rear

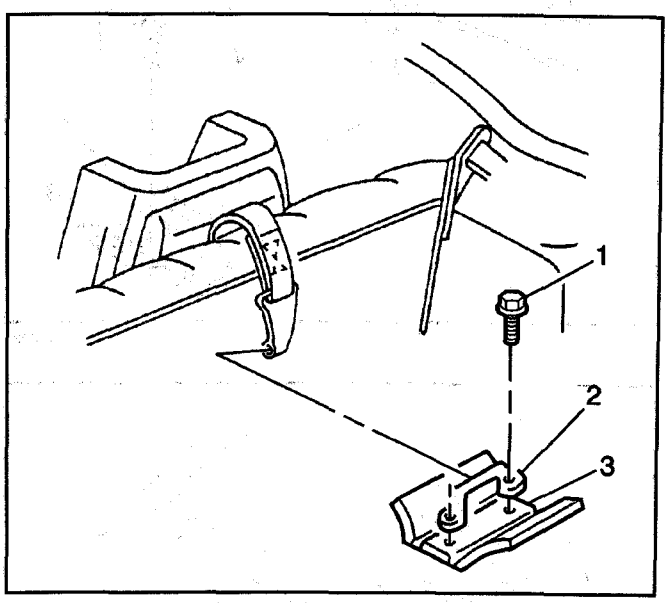
A special dealer-installed tether must be used in order to secure the child seat tether when a child seat that requires a top strap will be used in the rear seat. The child seat must be used only at the seating position for which the anchor is installed. This action will ensure that the angle of the child seat tether is correct.

Child Seat Restraint System Belt Kit (Initial Installation)

Caution: The child seat tether anchor is intended for use only on the left or right outboard second row seats. Installation at any other seating position could result in system failure, leading to injury in the event of a collision.

Important: All vehicles are equipped with drilled and tapped plates welded to the rear compartment front panel. These plates serve as mounting points for the Child Seat Restraint System Belt Kits (3). If an anchor bracket (3) is being installed for the first time, use the following procedure:

1. Remove the quarter inner trim finishing panel. Refer to Body Rear End in Body and Accessories.
2. Carefully lift the rear edge of the carpeting in order to reveal the anchor bracket mounting plate locations.
3. Choose the mounting location on either the driver side or the passenger side.
4. Position the anchor bracket (3) to the anchor bracket mounting plate.



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Notice: Refer to *Fastener Notice* in Cautions and Notices.

Important: Do not use a nut driver to tighten this hardware, or the fasteners will not be properly seated.

5. Install the bolts/screws (1).

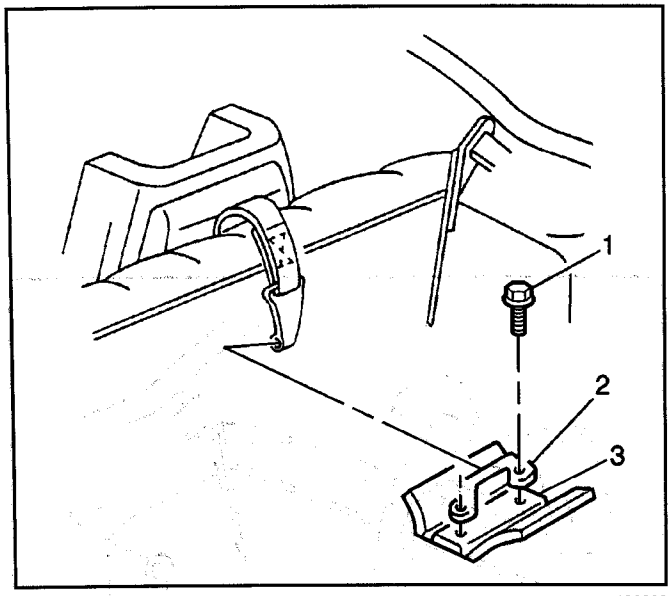
   Fully tighten the bolts/screws (1). Do not strip the bolts/screws.

6. Replace the carpeting.

   Note the bump created by the anchor bracket (3).

Important: Ensure that the carpet is pulled taut before making a cut in the carpet.

7. Carefully slit the carpeting to allow the anchor bracket to protrude.
8. Follow the instructions in the owner's manual and in the product information accompanying the child seat regarding the positioning and installation of the child seat when rear safety belts are used.



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Child Seat Restraint System Belt Kit (Replacement)

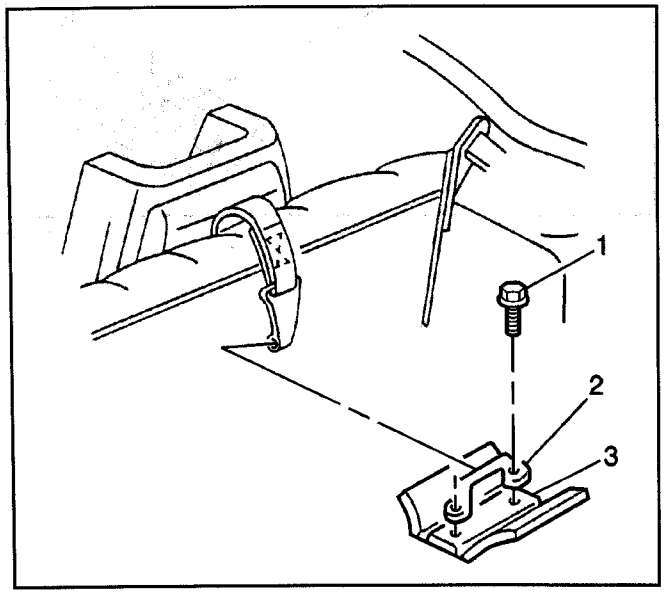
Removal Procedure

Caution: The child seat tether anchor is intended for use only on the left or right outboard second row seats. Installation at any other seating position could result in system failure, leading to injury in the event of a collision.

Caution: The seat belt assembly and/or bracket assembly must be replaced as a unit only. Do not substitute parts for any reason, or personal injury could result.

Important: Replace the anchor bracket if the anchor bracket is damaged.

1. Remove the bolts/screws (1).
2. Remove the anchor bracket (3).



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Installation Procedure

1. Connect the anchor bracket (3) to the anchor bracket mounting plate.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

Important: Do not use a nut driver to tighten this hardware, or the fasteners will not be properly seated.

2. Install the bolts/screws (1).

   Tighten the bolts/screws (1) until the bolts are fully seated. Do not strip the bolts.

Description and Operation

Seat Belt System Operation

Restraint System

Seat belts are the primary means of occupant restraint.

Seat belts help to keep the occupant(s) inside the passenger compartment and to gradually reduce the impact forces during the following events:

- Frontal impact type crashes
- Rear impact type crashes
- Side impact type crashes
- Roll-over type crashes

All seat belt retractors have emergency locks. The retractors remain unlocked during normal operation and under normal driving conditions. The retractors remain unlocked during normal conditions in order to allow free movement of the upper body of each occupant.

A pendulum locks the seal belt webbing into position. The pendulum causes a locking bar to engage a cog on the spool of the retractor mechanism when the following conditions occur:

- A rapid extraction of the seat belt webbing from the retractor
- An abrupt change in vehicle speed
- An abrupt change in vehicle direction
- Operation of the vehicle on a steep upgrade
- Operation of the vehicle on a steep downgrade

The seat belts have an automatic locking (cinch) feature. The cinch feature is activated when the seat belt webbing is completely extended from the retractor. The cinch feature prevents the webbing from extending beyond the position from which the webbing is allowed to retract.

Use of the cinch feature is recommended for securing a child seat.

The cinch feature may be canceled by allowing the webbing to wind back completely into the retractor. After the cinch feature is canceled, the webbing is unlocked. After the cinch feature is canceled, the webbing will extend from the retractor.

This vehicle is also equipped with a Supplemental Inflatable Restraint (SIR) System. Refer to *SIR System Operation* in SIR for more information about the SIR system.

Front Seat System

The front seat belt system includes the following components:

- The driver and passenger seat buckle-side belts
  The seat buckle-side belts are attached to the floor panel inboard of the front seats.
- The driver and passenger seat retractor-side belts
  The driver and passenger seat retractor-side belts are attached to the floor panel.
- The driver and passenger seat retractor-side belts are attached to the roof panel (coupe only) or to the body lock pillar reinforcement (convertible only).

The driver's seat belt system includes a seat belt switch in the driver seat buckle-side belt. The seat belt switch controls a reminder lamp and a tone alarm. The reminder lamp and the tone alarm will not operate when the following conditions exist:

- The driver's seat belt is buckled
- The driver's door is closed
- The ignition switch is turned ON

The following events will occur when the driver's door is closed and the ignition switch is turned ON, but the driver's seat belt is not buckled:

- The tone alarm will operate for 4 to 8 seconds and then turn OFF.
- The reminder lamp will operate until the driver's seat belt is buckled, or until approximately 1 minute has elapsed.

Refer to Wiring Systems in Body and Accessories in order to diagnose a failure of the reminder lamp or the tone alarm.

Rear Seat System

The rear seat belt system includes the following components:

- The rear seat buckle-side belt
  The rear seat buckle-side belt is attached to the floor panel inboard of the rear seats.
- The rear seat retractor-side belt
  The rear seat retractor-side belt is attached to the floor panel and the inner wheelhouse panel (coupe) or the floor panel (convertible) and to the rear seat shoulder belt retractor bracket.

Child Restraint

Caution: A child in a rear-facing child restraint can be seriously injured if the right-front passenger's air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. It is always better to secure a child restraint in the rear seat. If a forward-facing child seat is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owner's manual and the instructions that came with the child restraint.

The child seat should be installed and secured according to the manufacturer's instructions. The automatic locking (cinch) feature can be used to secure the child seat.

The child seat should be anchored if the child seat has a top strap. Refer *Child Seat Restraint System Belt Kit (Child Seat)*.

Passengers should not sit at locations where the seat belts are being used to secure the child seat.

SIR

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Inflatable Restraint IP Module Fasteners	3.2 N·m	28 lb in
Inflatable Restraint IP Module Bracket Fasteners (Upper 2 screws)	6 N·m	53 lb in
Inflatable Restraint IP Module Bracket Fasteners (Lower 4 screws)	2.8 N·m	25 lb in
Inflatable Restraint Sensing and Diagnostic Module Fasteners	8 N·m	71 lb in

Scan Tool Data List

The scan tool used provides the following capabilities:

- Read the data list.
- Read current and history trouble codes.
- Clear the diagnostic trouble codes after a repair is completed.

Ensure that the scan tool contains the latest diagnostic information before attempting to communicate with the SIR system. In order to use the scan tool, connect the scan tool to the data link connector (DLC) and turn the ignition switch to the RUN position. The scan tool reads serial data sent from the inflatable restraint sensing and diagnostic module (SDM) serial data output terminal 5 to the DLC terminal 9.

The SIR Scan Tool Data List contains all restraint related parameters that are available on the scan tool. The list is arranged in the order as they appear on the scan tool.

Use the SIR Scan Tool Data List only after the following information is determined:

- The Diagnostic System Check is completed.
- No Diagnostic Trouble Codes (DTCs) are set.
- SIR Diagnostics indicates functioning properly

Scan tool values from a properly operating system may be used for comparison with the SIR system you are diagnosing. The SIR Scan Tool Data List represents values seen on a properly operating system.

Important: Ensure that the scan tool that you are using is functioning properly. Use of a malfunctioning scan tool may result in misdiagnosis and unnecessary parts replacement.

Only the parameters listed below are referenced in this service manual for use in diagnosis. If all values are within the typical range described below, refer to *Intermittents and Poor Connections* for diagnosis.

SIR Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Ignition ON, Engine OFF, and Driver Seat Belt Buckled		
Ignition	Volts	12 V
Lamp Driver	Internal/External	Internal
Driver Resistance	Ohms	2.6 Ω
Passenger Resistance	Ohms	2.2 Ω
Driver Senselo	Volts	4.1 V
Passenger Senselo	Volts	4.1 V
Driver VDIF	Millivolts	4–8 mV
Passenger VDIF	Millivolts	4–8 mV
Warning Lamp Control	On/Off	OFF
Lamp Driver Feedback	Active/Inactive	Inactive
Warning Lamp ON	Hours	0–182 Hrs
Warning Lamp Cycles	Cycles	0–125 Cycles
Driver Seat Belt	Buckled/Unbuckled	Buckled/Unbuckled

Scan Tool Data Definitions

The SIR Scan Tool Data Definitions contain a brief description of all SIR related parameters available on the scan tool. The list is in the order the list appears on the scan tool.

Ignition: The scan tool displays 0–25.5 volts. The ignition represents the system voltage which is measured by the SDM at the SDM ignition feed.

Lamp Driver: The scan tool displays Internal or External. The warning lamp control method for a hard wired lamp is Internal. The warning lamp control method for a serial data controlled lamp is External.

Driver Resistance: The scan tool displays 0–6.3 ohms. The SDM performs the resistance measurement test once each ignition cycle and verifies the Ignition 1 and the 23 VLR voltages are within the normal ranges. Then the SDM sources a constant current to the driver deployment loop. The SDM then measures the voltage drop across the deployment loop and converts the measured voltage value to a driver deployment loop resistance value.

Passenger Resistance: The scan tool displays 0–6.3 ohms. The SDM performs the resistance measurement test once each ignition cycle and verifies the Ignition 1 and 23 VLR voltages are within the normal ranges. Then the SDM sources a constant current to the passenger deployment loop. The SDM then measures the voltage drop across the deployment loop and converts the measured voltage value to a passenger deployment loop resistance value.

Driver Senselo: The scan tool displays 0–20 volts. The SDM measures the voltage of the driver low terminal voltage and displays the driver low terminal voltage as Driver Senselo.

Passenger Senselo: The scan tool displays 0–20 volts. The SDM measures the voltage of the passenger low terminal voltage and displays the passenger low terminal voltage as Passenger Senselo.

Driver VDIF: The scan tool displays 0–500 millivolts. The SDM measures the voltage difference between driver high and driver low and displays this voltage difference as Driver VDIF.

Passenger VDIF: The scan tool displays 0–500 millivolts. The SDM measures the voltage difference between passenger high and passenger low and displays this voltage difference as Passenger VDIF.

Warning Lamp Control: The scan tool displays ON or OFF. The warning lamp state is commanded by the SDM.

Lamp Driver Feedback: The scan tool displays Active or Inactive. The warning lamp state is detected by the SDM.

Warning Lamp ON: The scan tool displays 0–182 hours. The SDM measures the continuous warning lamp ON time.

Warning Lamp Cycles: The scan tool displays 0–125 cycles. The ignition cycles of the current warning lamp state.

Driver Seat Belt: The scan tool displays Buckled or Unbuckled. The signal from the drivers seat belt switch that the seat belt is fastened.

GM SPO Group Numbers

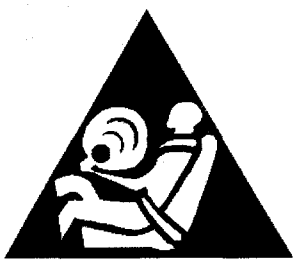
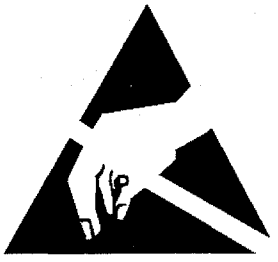
Application	GM SPO Group Number
Inflatable Restraint IP Module	14.865
Inflatable Restraint Sensing and Diagnostic Module	14.865
Inflatable Restraint Steering Wheel Module	14.865
Inflatable Restraint Steering Wheel Module Coil	14.865

Schematic and Routing Diagrams

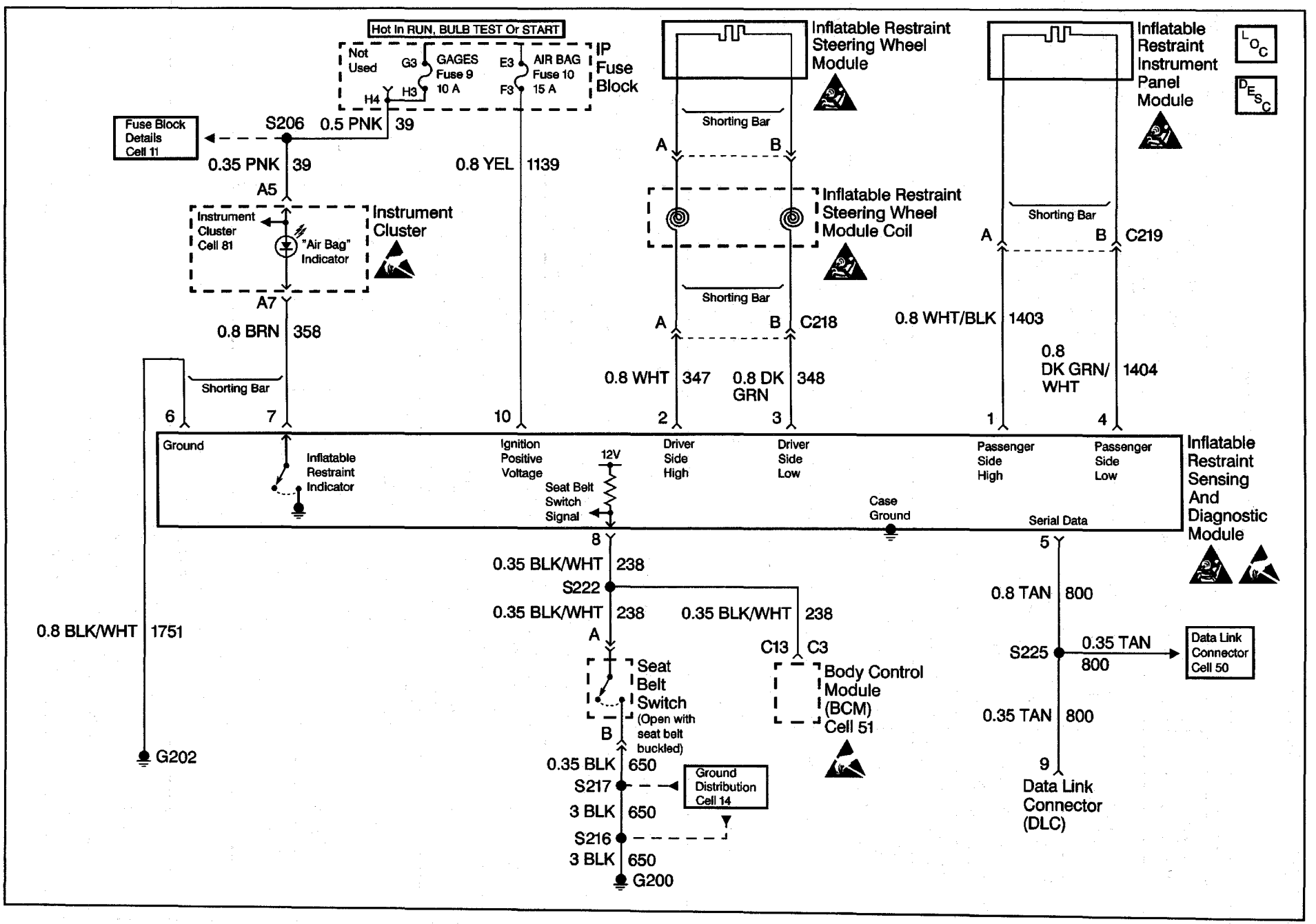
SIR Schematic References

Reference on Schematic	Section Number Subsection Name
Ground Distribution Cell-14	8-Wiring Systems
Power Distribution Cell-10	8-Wiring Systems
Power Seats Cell-140	8-Seats

SIR Schematic Icons

Icon	Icon Definition
 19386	Refer to *SIR Service Precautions Caution* in Cautions and Notices.
 19384	Refer to *ESD Notice* in Cautions and Notices.

SIR Schematics



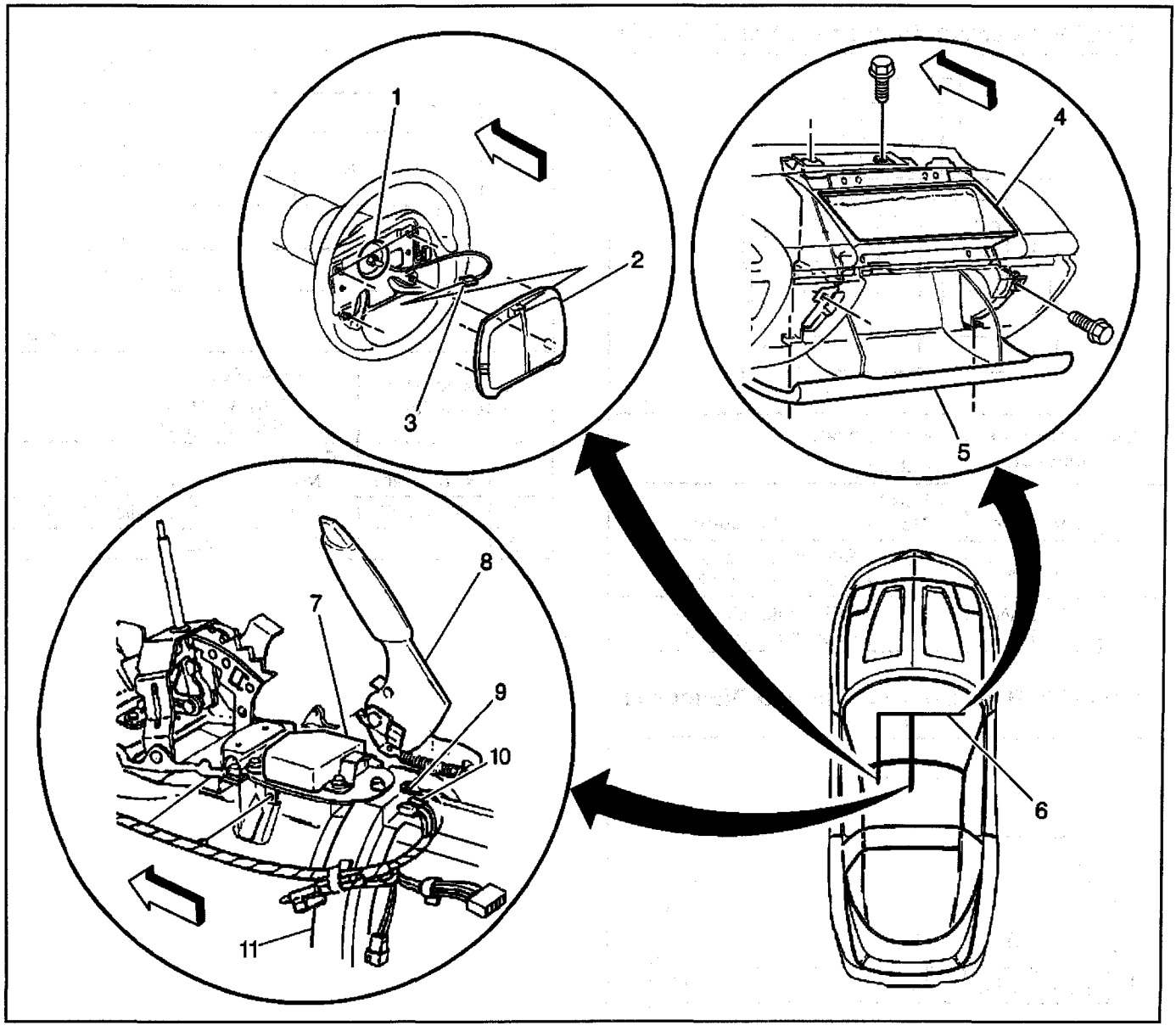
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Component Locator

SIR Components

Name	Location	Locator View	Connector End View
Body Control Module (BCM)	Under the right side of the instrument panel near the blower motor	*Body Control Module Component Views* in Body Control System	*Body Control Module Connector End Views* in Body Control System
Data Link Connector (DLC)	Under the instrument panel, right of the steering column	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Power and Grounding Connector End Views* in Wiring Systems
Inflatable Restraint IP Module	Mounted behind right side of the instrument panel	*SIR Component Views*	*SIR Connector End Views*
Inflatable Restraint Sensing and Diagnostic Module (SDM)	On the floor tunnel, below the rear of the console	*SIR Component Views*	*SIR Connector End Views*
Inflatable Restraint Steering Wheel Module	Mounted on the steering wheel	—	—
Inflatable Restraint Steering Wheel Module Coil	On the top of the steering column	*SIR Component Views*	—
Instrument Cluster	On the left side of the instrument panel	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	*Instrument Cluster Connector End Views* in Instrument Panel, Gauges and Console
IP Fuse Block	On the left end of the instrument panel carrier	*Instrument Cluster Component Views* in Instrument Panel, Gauges and Console	—
Seat Belt Switch	Part of the driver seat buckle assembly	*Harness Routing Views* in Wiring Systems	*Audible Warnings Connector End Views* in Instrument Panel, Gauges and Console
Underhood Electrical Center 1	On the Left front corner of the engine compartment	*Power and Grounding Component Views* in Wiring Systems	—
C218 (2 cavities)	SIR harness to inflatable restraint steering wheel module coil, at base of steering wheel column	*Harness Routing Views* in Wiring Systems	—
C219 (2 cavities)	SIR harness to inflatable restraint instrument panel module jumper harness, behind instrument panel compartment	*Harness Routing Views* in Wiring Systems	—
G202	Attached to the floor pan, under the center console, to the rear of the inflatable restraint sensing and diagnostic module (SDM)	*Harness Routing Views* in Wiring Systems	—
S206	Instrument panel, at rear compartment lid release relay breakout	—	—
S216	In the instrument panel harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S217	In the instrument panel harness, main branch, approximately 18 cm (7 in) from the body control module (BCM) breakout	—	—
S222	instrument panel harness, approximately 6 cm from G202 breakout, in the inflatable restraint sensing and diagnostic module (SDM) branch	—	—
S225	Instrument panel harness, approximately 6 cm (2 in) from blower motor breakout	—	—

SIR Component Views



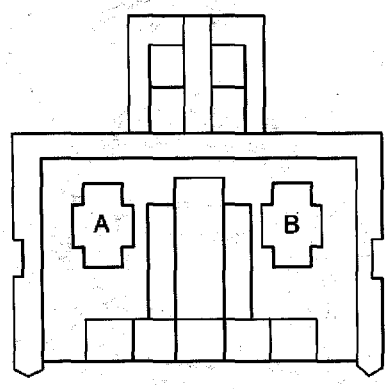
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Legend

(1) Inflatable Restraint Steering Wheel Module Coil
(2) Inflatable Restraint Steering Wheel Module
(3) Upper Inflatable Restraint Steering Wheel Module Coil Connector
(4) Inflatable Restraint IP Module
(5) IP Compartment Door
(6) SIR Wiring Harness
(7) Inflatable Restraint Sensing and Diagnostic Module (SDM)
(8) Park Brake
(9) G202
(10) Inflatable Restraint Sensing and Diagnostic Module (SDM) Harness Connector
(11) Floor Tunnel

SIR Connector End Views

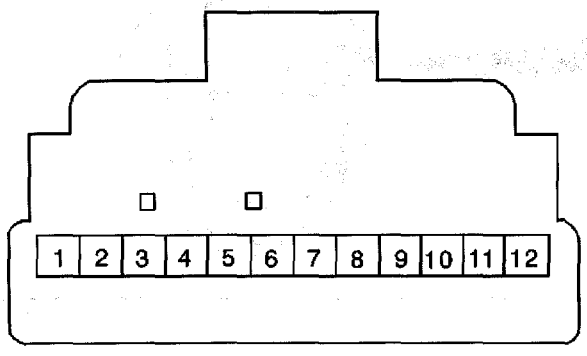
Inflatable Restraint Instrument Panel Module



154492

Connector Part Information	• 1211-0288 • 2 Way F		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	WHT/BLK	1403	SIR Inflator Feed - Passenger Side High
B	DK GRN/ WHT	1404	SIR Inflator Output - Passenger Side Low

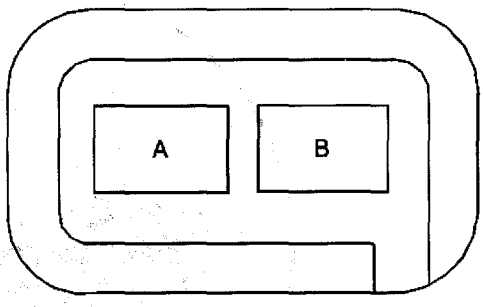
Inflatable Restraint Sensing and Diagnostic Module



73169

Connector Part Information	• 1211-0192 • 12 Way F Micro-Pack 100 Series (YEL)		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	WHT/BLK	1403	Passenger Side - High
2	WHT	347	Driver Side - High
3	DK GRN	348	Driver Side - Low
4	DK GRN/ WHT	1404	Passenger Side - Low
5	TAN	800	Serial Data - UART
6	BLK/WHT	1751	Ground
7	BRN	358	Inflatable Restraint Indicator
8	BLK/WHT	238	Seat Belt Switch Signal
10	YEL	1139	Ignition Feed

Seat Belt Switch



35441

Connector Part Information	• 1204-7663 • 2 Way Metri-Pack 150 Series (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK/WHT	238	Seat Belt Switch Signal
B	BLK	650	Ground

Diagnostic Information and Procedures

Intermittents and Poor Connections

Faulty electrical connections or wiring may cause most intermittents. Inspect for the following conditions:

- Poor mating of connector halves
- Terminals not fully seated in the connector body (backed out)
- Dirt or corrosion on the terminals

  Ensure that the terminals are clean and free of any foreign material that may impede proper terminal contact.
- Damaged connector body - exposing the terminals to moisture and dirt
- Improper terminal orientation with the component or mating connector
- Improperly formed or damaged terminals

  Carefully inspect all connector terminals in problem circuits in order to ensure good contact tension. Use a corresponding mating terminal in order to inspect for proper tension.
- Use the *J 35616-A* Connector Test Adapter Kit whenever a diagnostic procedure requests inspecting or probing a terminal. Using the adapter will ensure that no damage to the terminal will occur, and will indicate whether contact tension is sufficient. If contact tension seems incorrect, check the terminal for contact.
- Poor terminal to wire connection

  This includes the following conditions:
  - Poor crimps
  - Poor solder joints
  - Crimping over wire insulation rather than the wire itself
  - Corrosion in the wire to terminal contact area
- Wire insulation that is rubbed through

  This causes an intermittent short as the bare area touches other wiring or parts of the vehicle.
- Wiring broken inside the insulation

  This condition may cause a continuity inspection to show a good circuit. If only 1 or 2 strands of a multi-strand type wire are intact, resistance may be too high.

In order to avoid any of the above conditions when making wiring or terminal repairs, always follow the instructions for wiring and terminal repair in *Wiring Repairs* in Wiring Systems.

SIR General Diagnosis

Diagnostic Trouble Codes

Caution: In order to avoid deploying the air bag when troubleshooting the SIR system, use only the equipment specified in this manual and the instructions given in this manual. Failure to use the specified equipment as instructed could cause air bag deployment, personal injury to you or someone else, or unnecessary SIR system repairs.

The SIR diagnostic system check must always be the starting point of any SIR system diagnosis. The SIR diagnostic system check checks for proper AIR BAG warning lamp operation and checks for SIR diagnostic trouble codes (DTC) using the scan tool. The following describes the difference between current and history DTCs:

- Current DTCs – Malfunctions that are presently being detected. Random Access Memory (RAM) stores the current DTCs. Turning the ignition switch to the OFF position erases current DTCs. The presence of a current DTC will cause the inflatable restraint Sensing and Diagnostic Module (SDM) to turn ON the AIR BAG warning lamp.
- History DTCs – All malfunctions detected since last clearing of history memory. Electrically Erasable Programmable Read Only Memory (EEPROM) stores the history DTCs. A scan tool clear codes command will erase history DTCs.

Some DTCs are latched and can not be cleared. Latched DTCs will require replacement of the SDM after proper diagnostics.

Use of Special Tools

You should be familiar with the tools in this service category listed under the heading Special Tools. You should know how to measure voltage and resistance. Diagnosis requires proper use of the following tools:

- The *J 38125-B* Terminal Repair Kit
- The *J 38826* SIR Deployment Harness
- The *J 38715-A* SIR Driver/Passenger Load Tool
- The *J 39200* Digital Multimeter
- The *J 35616-A* Connector Test Adapter Kit
- The *J 39401-B* SIR Deployment Fixture
- The *Scan Tool*
- The *J 38715-96* SIR Shorting Bar Tool

SIR Diagnostic System Check

Caution: In order to avoid deploying the air bag when troubleshooting the SIR system, use only the equipment specified in this manual and the instructions given in this manual. Failure to use the specified equipment as instructed could cause air bag deployment, personal injury to you or someone else, or unnecessary SIR system repairs.

Caution: If any water enters the vehicle's interior up to the level of the carpet or higher and soaks the carpet, the sensing and diagnostic module (SDM) and the SDM harness connector may need to be replaced. The SDM could be activated when powered, which could cause deployment of the air bag(s) and result in personal injury. Before attempting these procedures, the SIR system must be disabled. Refer to Disabling the SIR System in this section. With the ignition OFF, inspect the SDM mounting area, including the carpet. If any significant soaking or evidence of significant soaking is detected, you must perform the following steps:

- ***Remove all water.***
- ***Repair the water damage.***
- ***Replace the SDM harness connector.***
- ***Replace the SDM.***

Failure to follow these procedures could result in possible air bag deployment, personal injury, or otherwise unneeded SIR system repairs.

These diagnostic procedures will help you to find and repair SIR system malfunctions. This service category also contains information for repairing SIR system malfunctions. For best results, use the diagnostic tables, and follow the sequence listed below:

1. Perform the SIR Diagnostic System Check. All SIR diagnostics must begin with the SIR Diagnostic System Check. The SIR Diagnostic System Check determines the following:
   - Proper AIR BAG warning lamp operation
   - Ability of the SDM to communicate through the Data Link Connector (DLC)
   - Existence of SIR Diagnostic Trouble Codes (DTC)
2. Refer to the diagnostic table as directed by the SIR Diagnostic System Check. The diagnostic tables will help enable you to diagnose any SIR system malfunction. Bypassing these procedures may result in the following:
   - Extended Diagnostic Time
   - Incorrect Diagnosis
   - Incorrect Parts Replacement
3. Repeat the SIR Diagnostic System Check after you perform any repair or diagnostic procedures. This will verify that you correctly performed the repair. This will also ensure that no other malfunctions exist.

Circuit Description

The ignition switch supplies Ignition 1 voltage to the inflatable restraint Sensing and Diagnostic Module (SDM) at terminal 10 using the AIR BAG Fuse. When the ignition switch is first turned to the RUN position, the SDM responds by flashing the AIR BAG warning lamp seven times, then turning it OFF, while performing tests on the SIR system.

Diagnostic Aids

You must diagnose the diagnostic trouble codes in the order specified by the SIR Diagnostic System Check. Failure to do so may result in the following:

- Extended Diagnostic Time
- Incorrect Diagnosis
- Incorrect Parts Replacement

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1. The AIR BAG warning lamp should flash seven times after the ignition switch is first turned to the RUN position.
2. The AIR BAG warning lamp indicates improper operation. This test differentiates a warning lamp stays ON condition from a warning lamp does not come ON condition.
3. The AIR BAG warning lamp should turn OFF after flashing seven times.
4. This test checks for the proper operation of the Serial Data line.
6. This test will identify the stored diagnostic trouble codes and whether they are current or history.
7. This test checks for the proper operation of the Serial Data line. This test also identifies any stored history diagnostic trouble codes.
9. This test refers to the appropriate DTC Table Diagnostic Aids for diagnosis of the history DTCs.

SIR Diagnostic System Check

Step	Action	Value(s)	Yes	No
1	Note the AIR BAG warning lamp while turning the ignition switch to the RUN position. Does the AIR BAG warning lamp flash seven times?	—	*Go to Step 3*	*Go to Step 2*
2	Does the AIR BAG warning lamp come ON steady?	—	Go to *AIR BAG Warning Lamp Comes On Steady*	Go to *AIR BAG Warning Lamp Does Not Come On*
3	Note the AIR BAG warning lamp after it flashed seven times. Does the AIR BAG warning lamp go OFF?	—	*Go to Step 7*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the Data Link Connector. Follow the directions in the instruction manual of the scan tool. 3. Turn the ignition switch to the RUN position. 4. Request the SIR Diagnostic Trouble Code (DTC) display. Is a current DTC displayed?	—	*Go to Step 6*	*Go to Step 5*
5	Does the scan tool indicate no data received?	—	Go to *Data Link Connector Diagnosis* in Engine Controls — 3.8L or *Data Link Connector Diagnosis* in Engine Controls — 5.7L	Go to *SDM Integrity Check*
6	1. Turn the ignition switch to the OFF position. 2. Record the displayed DTCs on the repair order, specifying as current or history. • When DTC B1051 is set, refer to *DTC B1051 Deployment Commanded.* • When DTC B1018 is set, refer to *DTC B1018 Passenger Deployment Loop Short to GND.* • When DTC B1024 is set, refer to *DTC B1024 Driver Deployment Loop Short to Ground.* 3. Diagnose the remaining DTCs from lowest to highest. 4. When only history DTCs exist, refer to Diagnostic Aids for that specific DTC. A history DTC indicates the malfunction has been repaired or is intermittent. Has current DTC diagnosis been performed and the current DTCs cleared?	—	*Go to Step 1*	—
7	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the Data Link Connector. Follow the directions in the instruction manual of the scan tool. 3. Turn the ignition switch to the RUN position. 4. Request the SIR Diagnostic Trouble Code (DTC) display. Is a history DTC displayed?	—	*Go to Step 9*	*Go to Step 8*

SIR Diagnostic System Check (cont'd)

Step	Action	Value(s)	Yes	No
8	Does the scan tool indicate no data received?	—	Go to *Data Link Connector Diagnosis* in Engine Controls - 3.8L or *Data Link Connector Diagnosis* in Engine Controls - 5.7L	System OK
9	1. Turn the ignition switch to the OFF position. 2. Record the displayed DTCs on the repair order specifying as history. 3. When DTC B1071 is set, refer to *DTC B1071 Internal SDM Failure.* 4. For all other DTCs, refer to Diagnostic Aids for that specific DTC. A history DTC indicates the malfunction has been repaired or is intermittent. Has the diagnosis been performed and the DTCs cleared?	—	*Go to Step 1*	—

SDM Integrity Check

Circuit Description

When the inflatable restraint Sensing and Diagnostic Module (SDM) first recognizes IGNITION 1 voltage, applied to terminal 10, is greater than 8.2 volts, the SDM flashes the AIR BAG warning lamp seven times to verify operation. At this time the SDM performs POWER-ON tests followed by the RESISTANCE MEASUREMENT test and the CONTINUOUS MONITORING tests. Upon detection of a malfunction, the SDM sets a current Diagnostic Trouble Code (DTC) and illuminates the AIR BAG warning lamp. The SDM will clear current DTCs and preserve them in a history file when:

- The malfunction is no longer detected.
- The ignition switch is cycled.

This does not include DTCs B1018, B1024, B1051, B1053, and B1071. DTCs B1018, B1024, B1051, B1053 are latched codes. You cannot clear a latched code. DTC B1071 may not clear after you issue a clear codes command.

Important: Repair the malfunction that set the DTC before you replace the SDM.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

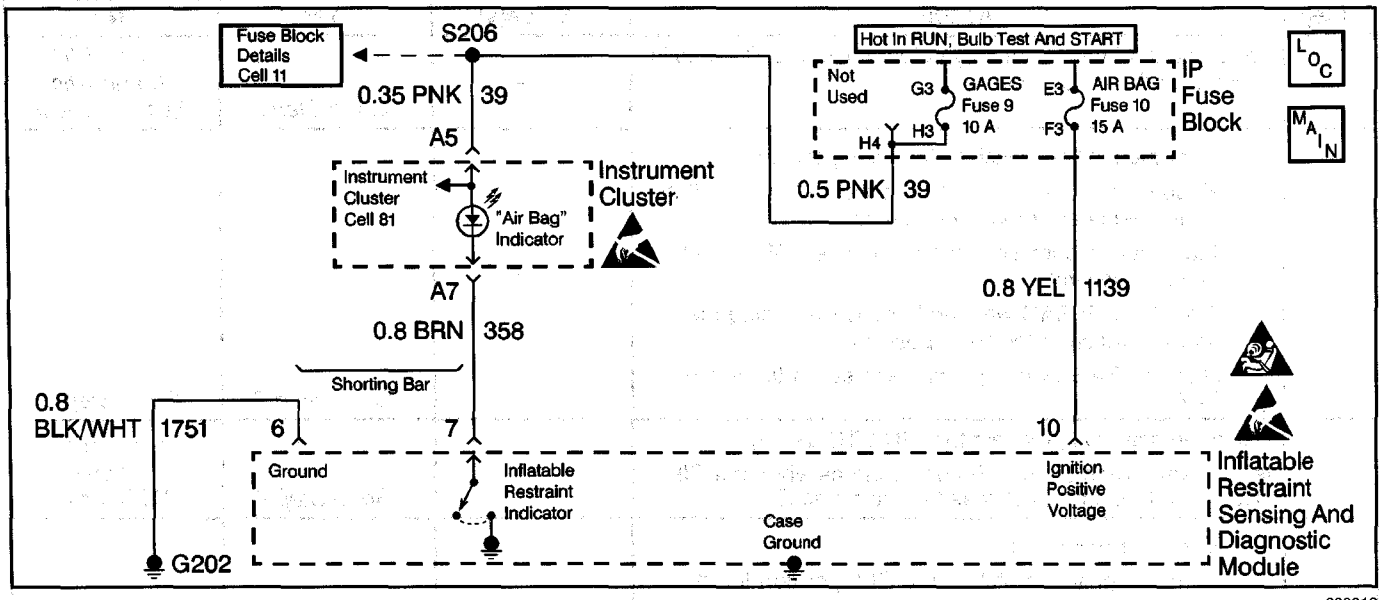
2. This test confirms a circuit malfunction. If no current malfunction is occurring (history DTC set), refer to the diagnostic aids for the appropriate DTC table as indicated through the scan tool. Do not replace the inflatable restraint Sensing and Diagnostic Module (SDM) for a history DTC other than DTC B1071.
3. This test checks for a malfunction introduced into the SIR system during the diagnostic process. It is unlikely that a malfunctioning SDM would cause a new malfunction to occur during this process.
4. When you have found all circuitry outside the SDM to operate properly, as indicated by the appropriate diagnostic table, replace the SDM.

This table assumes that the SIR Diagnostic System Check and either a symptom table or a Diagnostic Trouble Code table diagnosis has been performed. When all circuitry outside the inflatable restraint Sensing and Diagnostic Module (SDM) has been found to operate properly, as indicated by the appropriate diagnostic table, and the symptom or DTC remains current, the following diagnostic procedures must be performed to verify the need for SDM replacement.

SDM Integrity Check

Step	Action	Value(s)	Yes	No
1	Were you sent here from a symptom table or a Diagnostic Trouble Code (DTC) table?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Reconnect all the SIR components, make sure all the components are properly mounted. 3. Make sure the ignition switch has been OFF for at least 30 seconds. 4. Note the AIR BAG warning lamp while turning the ignition switch to the RUN position. Does the AIR BAG warning lamp flash seven times then go OFF?	—	*Go to Step 7*	*Go to Step 3*
3	Using the scan tool, request the SIR DTC display. Is the same symptom or DTC occurring as when the SIR Diagnostic System Check was first performed?	—	*Go to Step 4*	Go to the appropriate DTC table
4	1. Clear the SIR DTCs. 2. Turn the ignition switch to the OFF position for at least 30 seconds. 3. Note the AIR BAG warning lamp while turning the ignition switch to the RUN position. Does the AIR BAG warning lamp flash seven times then go OFF?	—	System OK	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Has the SDM been replaced?	—	*Go to Step 6*	—
6	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	Go to *SIR Diagnostic System Check*	—
7	Clear the SIR DTCs. Have the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

AIR BAG Warning Lamp Comes On Steady



220918

Circuit Description

The ignition switch supplies Ignition 1 voltage to the inflatable restraint Sensing and Diagnostic Module (SDM) at terminal 10 using the AIR BAG Fuse. The ignition switch also supplies Ignition 1 voltage to the AIR BAG warning lamp using the GAGES Fuse. The AIR BAG warning lamp is connected to the INFLATABLE RESTRAINT INDICATOR at terminal 7 of the SDM. When the ignition switch is first turned to RUN, the SDM responds by flashing the AIR BAG warning lamp seven times. If IGNITION 1 is outside of the normal operating voltage range (8.2 volts–17.1 volts), the AIR BAG warning lamp will come ON solid with no DTCs set.

Diagnostic Aids

In order to disable the shorting bar from terminal 6 to terminal 7 inside the inflatable restraint Sensing and Diagnostic Module (SDM) harness connector, the following two conditions must be met:

- The SDM harness connector must be properly connected to the SDM.
- The Connector Position Assurance (CPA) must be properly installed in the SDM harness connector.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test checks for sufficient IGNITION 1 voltage applied to the SDM.
3. This test checks for excessive IGNITION 1 voltage applied to the SDM.
4. This test checks for a properly installed CPA.
6. This test determines if the SDM is turning on the AIR BAG warning lamp.
7. This test checks for a damaged shorting bar.
9. This test determines whether the malfunction is a short to ground in CKT 358.
10. This test checks for a short between CKT 358 and CKT 1751.
14. An open AIR BAG Fuse would cause the AIR BAG warning lamp to come on steady.
15. This test checks whether a short to ground caused the AIR BAG Fuse to open.
16. This test determines whether the short to ground is due to a short in the wiring or internal to the SDM.
20. This test checks for a disconnected SDM.
26. This test checks for an open in the IGNITION 1 circuit.

AIR BAG Warning Lamp Comes On Steady

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the Data Link Connector (DLC). 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. Is IGNITION more than the specified value?	8.2 V	*Go to Step 3*	*Go to Step 14*
3	1. Set the parking brake. 2. Start the engine. 3. Using the scan tool, read the SIR data list. Is IGNITION more than the specified value?	17.1 V	Go to *Battery Is Undercharged or Overcharged* in Engine Electrical	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Inspect the inflatable restraint Sensing and Diagnostic Module (SDM) harness connector CPA. Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Is the CPA properly installed?	—	*Go to Step 6*	*Go to Step 5*
5	Properly install the CPA. Are the repairs complete?	—	Go to *SIR Diagnostic System Check*	—
6	1. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 2. Disconnect the SDM harness connector. 3. Install *J 38715-96* SIR Shorting Bar Tool to the SDM harness connector. 4. Install the CPA. 5. Turn the ignition switch to the RUN position. Does the AIR BAG warning lamp come ON steady?	—	*Go to Step 7*	Go to *SDM Integrity Check*
7	1. Turn the ignition switch to the OFF position. 2. Remove *J 38715-96* from the SDM harness connector. 3. Inspect the shorting bar within the SDM harness connector. Is the shorting bar damaged or corroded?	—	*Go to Step 8*	*Go to Step 9*
8	Replace the SDM harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 28*	—
9	1. Install *J 38715-96* to the SDM harness connector. 2. Install the CPA. 3. Disconnect the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. 4. Measure the resistance from the SDM harness connector terminal 7 to ground. Is the resistance reading less than the specified value?	OL	*Go to Step 10*	*Go to Step 13*
10	1. Disconnect CKT 1751 from G202. Refer to *SIR Components.* 2. Measure the resistance from the SDM harness connector terminal 7 to terminal 6. Is the resistance reading less than the specified value?	OL	*Go to Step 12*	*Go to Step 11*

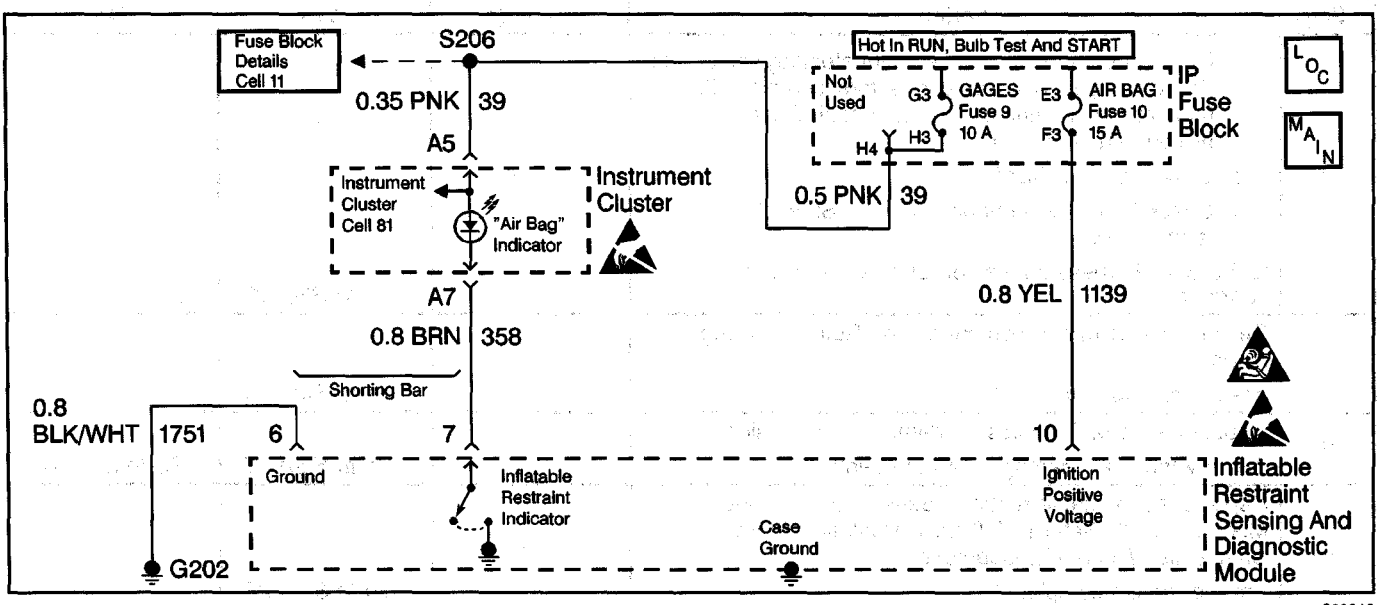
AIR BAG Warning Lamp Comes On Steady (cont'd)

Step	Action	Value(s)	Yes	No
11	Repair a short-to-ground condition in CKT 358. Are the repairs complete?	—	*Go to Step 28*	—
12	1. Repair the short between CKT 358 and CKT 1751. 2. Inspect CKT 1751 for any cutting or chafing. Are the repairs complete?	—	*Go to Step 28*	—
13	Service the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. Are the repairs complete?	—	*Go to Step 28*	—
14	1. Turn the ignition switch to the OFF position. 2. Remove the AIR BAG Fuse. 3. Inspect the AIR BAG Fuse. Is the AIR BAG Fuse good?	—	*Go to Step 20*	*Go to Step 15*
15	1. Replace the AIR BAG Fuse. 2. Turn the ignition switch to the RUN position for 10 seconds. 3. Turn the ignition switch to the OFF position. 4. Remove the AIR BAG Fuse. 5. Inspect the AIR BAG Fuse. Is the AIR BAG Fuse good?	—	*Go to Step 19*	*Go to Step 16*
16	1. Disconnect the SDM. Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 2. Replace the AIR BAG Fuse. 3. Turn the ignition switch to the RUN position for 10 seconds. 4. Turn the ignition switch to the OFF position. 5. Remove the AIR BAG Fuse. 6. Inspect the AIR BAG Fuse. Is the AIR BAG Fuse good?	—	*Go to Step 18*	*Go to Step 17*
17	1. Repair a short-to-ground condition in CKT 1139. 2. Connect the SDM. 3. Replace the AIR BAG Fuse. Are the repairs complete?	—	*Go to Step 28*	—
18	1. Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 2. Install the AIR BAG Fuse. Are the repairs complete?	—	*Go to Step 28*	—
19	Install the AIR BAG Fuse. Are the repairs complete?	—	*Go to Step 28*	—
20	Inspect the SDM harness connector. Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Is the connector secure?	—	*Go to Step 22*	*Go to Step 21*
21	1. Properly connect the SDM harness connector. 2. Install the CPA. Are the repairs complete?	—	*Go to Step 28*	—

AIR BAG Warning Lamp Comes On Steady (cont'd)

Step	Action	Value(s)	Yes	No
22	1. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 2. Disconnect the SDM. 3. Check for proper connection to the SDM at terminal 10. Is the SDM harness connector terminal damaged or corroded?	—	*Go to Step 23*	*Go to Step 24*
23	Replace the SDM harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 28*	—
24	Inspect the SDM terminals for damage or corrosion. Are any terminals damaged or corroded?	—	*Go to Step 25*	*Go to Step 26*
25	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 28*	—
26	Measure the resistance from the SDM harness connector terminal 10 to each terminal of the AIR BAG Fuse fuseholder. Is either resistance reading within the specified values?	0–5 Ω	Go to *SDM Integrity Check*	*Go to Step 27*
27	Repair an open condition in CKT 1139. Are the repairs complete?	—	*Go to Step 28*	—
28	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	Go to *SIR Diagnostic System Check*	—

AIR BAG Warning Lamp Does Not Come On



220918

Circuit Description

The ignition switch supplies Ignition 1 voltage to the inflatable restraint Sensing and Diagnostic Module (SDM) at terminal 10 using the AIR BAG Fuse. The ignition switch also supplies Ignition 1 voltage to the AIR BAG warning lamp using the GAGES Fuse. The AIR BAG warning lamp is connected to the INFLATABLE RESTRAINT INDICATOR at terminal 7 of the SDM. When the ignition switch is first turned to RUN, the SDM responds by flashing the AIR BAG warning lamp seven times.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines whether the malfunction is in the inflatable restraint Sensing and Diagnostic Module (SDM) circuitry or in the instrument cluster power feed circuitry.
3. This test determines whether voltage is present in the warning lamp circuit.
4. This test isolates CKT 358 and checks for a short in CKT 358 to B+.
6. This test determines if the malfunction is in the instrument cluster connector.
8. This test isolates an open in the warning lamp circuitry.
11. This test checks whether power is available to the instrument cluster power feed circuit.
12. This test checks for a short from the instrument cluster power feed circuit to ground.
13. This test determines whether the short to ground is due to a short in the wiring or internal to the instrument cluster.
17. This test determines if the malfunction is in the instrument cluster connector.
19. This test determines whether the malfunction is due to an open power feed circuit from the GAGES Fuse.

AIR BAG Warning Lamp Does Not Come On

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Set the parking brake. 2. Turn the ignition switch to the RUN position. Does the BRAKE indicator light?	—	*Go to Step 3*	*Go to Step 13*
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 4. Install *J 38715-96* SIR Shorting Bar Tool to the SDM harness connector. 5. Install the CPA. 6. Turn the ignition switch to the RUN position. 7. Measure the voltage on the SDM harness connector from terminal 7 to ground. Is the voltage more than the specified value?	10.0 V	*Go to Step 4*	*Go to Step 6*
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. 3. Turn the ignition switch to the RUN position. 4. Measure the voltage on the SDM harness connector from terminal 7 to ground. Is the voltage less than the specified value?	1.0 V	Go to *SDM Integrity Check*	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Repair a short-to-B+ condition in CKT 358. 3. Reconnect the instrument cluster. Are the repairs complete?	—	*Go to Step 22*	—
6	1. Turn the ignition switch to the OFF position. 2. Remove the instrument cluster. Refer to *IP Cluster Replacement* in Instrument Panel, Gauges and Console. 3. Check for proper connection to the instrument cluster at terminal A7. Is the connector damaged or corroded?	—	*Go to Step 7*	*Go to Step 8*
7	Repair the instrument cluster harness connector. Refer to *Connector Repairs* in Wiring Repairs. Are the repairs complete?	—	*Go to Step 22*	—
8	Measure the resistance from the instrument cluster harness connector terminal A7 to the SDM harness connector terminal 7. Is the resistance within the specified values?	0–5 Ω	*Go to Step 10*	*Go to Step 9*
9	1. Repair an open condition in CKT 358. 2. Install the instrument cluster. Are the repairs complete?	—	*Go to Step 22*	—
10	Service the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. Are the repairs complete?	—	*Go to Step 22*	—

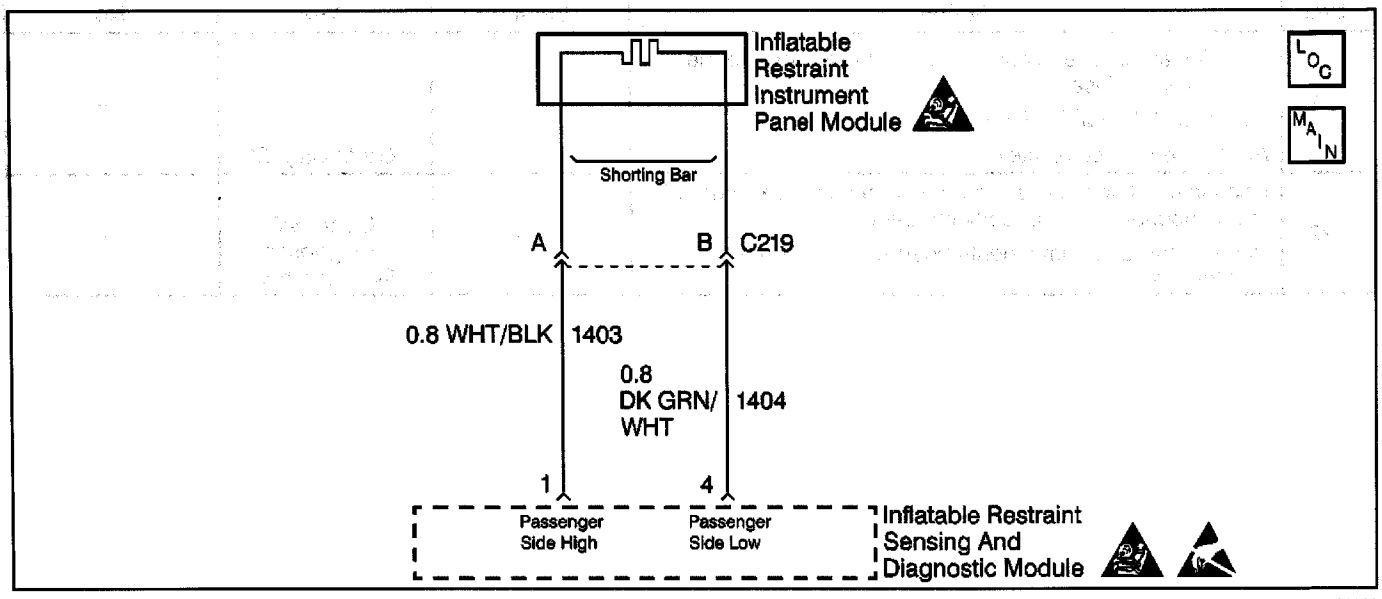
AIR BAG Warning Lamp Does Not Come On (cont'd)

Step	Action	Value(s)	Yes	No
11	1. Turn the ignition switch to the OFF position. 2. Remove the GAGES Fuse. 3. Inspect the fuse. Is the fuse good?	—	*Go to Step 17*	*Go to Step 12*
12	1. Replace the fuse. 2. Turn the ignition switch to the RUN position for 10 seconds. 3. Turn the ignition switch to the OFF position. 4. Remove the GAGES Fuse. 5. Inspect the fuse. Is the fuse good?	—	*Go to Step 16*	*Go to Step 13*
13	1. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering wheel and behind the IP compartment door. 2. Disconnect the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. 3. Replace the GAGES Fuse. 4. Turn the ignition switch to the RUN position for 10 seconds. 5. Turn the ignition switch to the OFF position. 6. Remove the GAGES Fuse. 7. Inspect the fuse. Is the fuse good?	—	*Go to Step 15*	*Go to Step 14*
14	1. Repair a short-to-ground condition in CKT 39. 2. Replace the GAGES Fuse. Are the repairs complete?	—	*Go to Step 22*	—
15	1. Service the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console. 2. Install the GAGES Fuse. Are the repairs complete?	—	*Go to Step 22*	—
16	Install the GAGES Fuse. Are the repairs complete?	—	*Go to Step 22*	—
17	1. Remove the instrument cluster. Refer to *IP Cluster Replacement* in Instrument Panel, Gauges and Console. 2. Check for proper connection to the instrument cluster at terminal A5. Is the connector damaged or corroded?	—	*Go to Step 18*	*Go to Step 19*
18	Repair the instrument cluster harness connector. Refer to *Connector Repairs* in Wiring Repairs. Are the repairs complete?	—	*Go to Step 22*	—
19	Measure the resistance between the instrument cluster harness connector terminal A5 to each terminal of the GAGES Fuse fuseholder. Is either reading within the specified values?	0–5 Ω	*Go to Step 21*	*Go to Step 20*
20	1. Repair an open condition in CKT 39. 2. Install the GAGES Fuse. Are the repairs complete?	—	*Go to Step 22*	—

AIR BAG Warning Lamp Does Not Come On (cont'd)

Step	Action	Value(s)	Yes	No
21	1. Repair an open condition in the power feed to the GAGES Fuse. 2. Install the GAGES Fuse. Are the repairs complete?	—	*Go to Step 22*	—
22	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	Go to *SIR Diagnostic System Check*	—

DTC B1015 Passenger Deploy. Loop Resistance High



Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 and the deployment loop voltages to make sure they are within their respective normal voltage ranges. Then the SDM proceeds with the RESISTANCE MEASUREMENT test. During one portion of the RESISTANCE MEASUREMENT test, the SDM does the following:

- Grounds the PASSENGER SIDE LOW terminal 4 through an internal current sink.
- Connects the PASSENGER SIDE HIGH terminal 1 to an internal constant current source. This current produces proportional voltage drops in the deployment loop.
- Measures the voltage difference between PASSENGER SIDE HIGH and PASSENGER SIDE LOW.
- Calculates the resistance of the passenger deployment loop using the measured voltage.

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The driver and passenger deployment loops are not shorted to voltage.
- The passenger deployment loop is not shorted to ground.
- The passenger deployment loop resistance is more than 3.0 ohms. The passenger deployment loop consists of the following components:
  - Inflatable restraint IP module.
  - Harness wiring of CKT 1403.
  - Harness wiring of CKT 1404.
  - Connector terminal contact.

The RESISTANCE MEASUREMENT test checks for this malfunction. This test only occurs once each ignition cycle when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The resistance of the passenger deployment loop is less than 3.0 ohms and the ignition switch is cycled.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

When you issue a scan tool CLEAR CODES command and the malfunction is still present, the DTC will not reappear until the next ignition cycle.

Diagnostic Aids

A poor connection can cause an intermittent condition. Check the following for a poor connection:

- The inflatable restraint IP module harness connector terminals A and B.
- The SDM terminals 1 and 4.
- The wire to terminal connections in CKT 1403.
- The wire to terminal connections in CKT 1404.

The diagnostic table directs the technician to note the entry value of PASSENGER RESISTANCE. Comparing the value of PASSENGER RESISTANCE over multiple ignition cycles can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop resistance measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
3. This test checks for proper contact or corrosion of the yellow 2-way connector.
10. This test isolates the malfunction to one side of the inflatable restraint IP module yellow 2-way connector.
12. This test checks for proper contact or corrosion of the SDM connector.
17. This test determines whether the malfunction is in CKT 1403.
19. This test determines whether the malfunction is in CKT 1404.

DTC B1015 Passenger Deploy. Loop Resistance High

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the passenger deployment loop resistance PASSENGER RESISTANCE. Has the PASSENGER RESISTANCE been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2–way connectors located at the base of the steering column and behind the IP compartment door. 3. Check for proper connection at terminals A and B on the IP harness side of the inflatable restraint IP module yellow 2–way connector. Are the terminals damaged or corroded?	—	*Go to Step 4*	*Go to Step 6*
4	Replace the inflatable restraint IP module yellow 2–way IP harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 5*	—
5	Check for proper connection at terminals A and B on the inflatable restraint IP module yellow 2–way connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 21*
6	Check for proper connection at terminals A and B on the inflatable restraint IP module yellow 2–way connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 8*
7	Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 21*	—

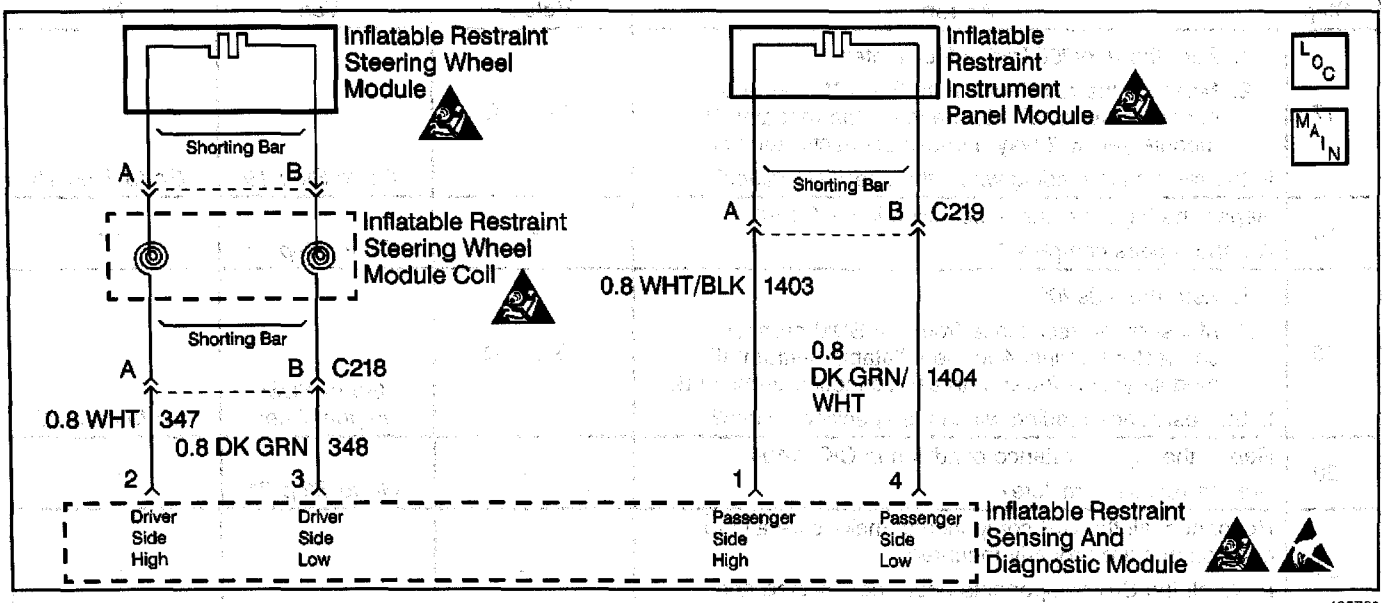
DTC B1015 Passenger Deploy. Loop Resistance High (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Reconnect the yellow 2–way connectors located at the base of the steering column and behind the IP compartment door. 2. Turn the ignition switch to the RUN position. 3. Using the scan tool, request the SIR data list display. 4. Read the passenger deployment loop resistance PASSENGER RESISTANCE. Is the passenger resistance more than the specified value?	3.0 Ω	*Go to Step 10*	*Go to Step 9*
9	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module yellow 2–way IP harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 21*	—
10	1. Turn the ignition switch to the OFF position. 2. Disconnect the yellow 2–way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect the *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the data list display. 6. Read the passenger deployment loop resistance PASSENGER RESISTANCE. Is the passenger resistance more than the specified value?	3.0 Ω	*Go to Step 12*	*Go to Step 11*
11	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 21*	—
12	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Check for proper connection at terminals 1 and 4 on the SDM harness connector. Is the harness connector damaged or corroded?	—	*Go to Step 13*	*Go to Step 15*
13	Replace the inflatable restraint Sensing and Diagnostic Module (SDM) harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 14*	—
14	Check for proper connection at terminals 1 and 4 on the SDM. Are the terminals damaged or corroded?	—	*Go to Step 16*	*Go to Step 21*
15	Check for proper connection at terminals 1 and 4 on the SDM. Are the terminals damaged or corroded?	—	*Go to Step 16*	*Go to Step 17*
16	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 21*	—

DTC B1015 Passenger Deploy. Loop Resistance High (cont'd)

Step	Action	Value(s)	Yes	No
17	1. Zero the *J 39200* Digital Multimeter. 2. Measure the resistance from the SDM harness connector terminal 1 to the inflatable restraint IP module yellow 2-way harness connector terminal A. Is the resistance reading within the specified values?	0–0.5 Ω	*Go to Step 19*	*Go to Step 18*
18	Repair the high resistance condition in CKT 1403. Are the repairs complete?	—	*Go to Step 21*	—
19	1. Zero the *J 39200.* 2. Measure the resistance from the SDM harness connector terminal 4 to the inflatable restraint IP module yellow 2-way harness connector terminal B. Is the resistance reading within the specified values?	0–0.5 Ω	Go to *SDM Integrity Check*	*Go to Step 20*
20	Repair the high resistance condition in CKT 1404. Are the repairs complete?	—	*Go to Step 21*	—
21	Reconnect all the SIR components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 22*	—
22	Clear all the SIR DTCs. Have all the DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1016 Passenger Deployment Loop Resistance Low



405769

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 and the deployment loop voltages to make sure they are within their respective normal voltage ranges. Then the SDM proceeds with the RESISTANCE MEASUREMENT test. During one portion of the RESISTANCE MEASUREMENT test, the SDM does the following:

- Grounds the PASSENGER SIDE LOW terminal 4 through an internal current sink.
- Connects the PASSENGER SIDE HIGH terminal 1 to an internal constant current source. This current produces proportional voltage drops in the deployment loop.
- Measures the voltage difference between PASSENGER SIDE HIGH and PASSENGER SIDE LOW.
- Calculates the resistance of the passenger deployment loop using the measured voltage.

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The driver and passenger deployment loops are not shorted to voltage.
- The passenger deployment loop is not shorted to ground.
- The passenger deployment loop resistance is less than 1.4 ohms. The passenger deployment loop consists of the following components:
  - Inflatable restraint IP module.
  - Harness wiring of CKT 1403.
  - Harness wiring of CKT 1404.
  - Connector terminal contact.

The RESISTANCE MEASUREMENT test checks for this malfunction. This test only occurs once each ignition cycle when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a diagnostic trouble code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The resistance of the passenger deployment loop is more than 1.4 ohms and the ignition switch is cycled.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

When you issue a scan tool CLEAR CODES command and the malfunction is still present, the DTC will not reappear until the next ignition cycle.

Diagnostic Aids

The following can cause an intermittent condition:

- A short circuit between CKT 1403 and CKT 347.
- A short circuit between CKT 1403 and CKT 348.
- A short circuit between CKT 1403 and CKT 1404.
- A malfunctioning shorting bar on the inflatable restraint IP module connector.

The diagnostic table directs the technician to note the entry value of PASSENGER RESISTANCE. Comparing the value of PASSENGER RESISTANCE over multiple ignition cycles can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop resistance measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
6. This test isolates the malfunction to one side of the inflatable restraint IP module yellow 2-way connector.
8. This test checks for a short from CKT 1403 to CKT 1404.
10. This test checks for a short from CKT 1403 to CKT 348.

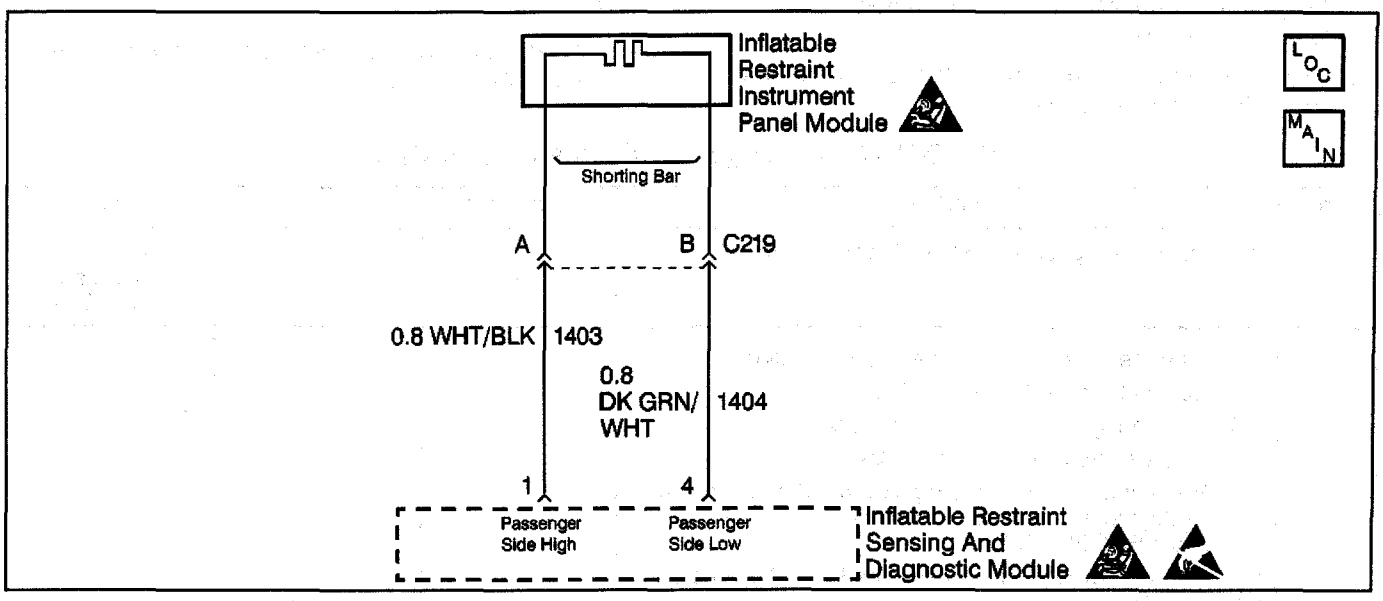
DTC B1016 Passenger Deployment Loop Resistance Low

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the passenger deployment loop resistance PASSENGER RESISTANCE. 6. Request the SIR DTC display. Is DTC B1022 also present?	—	*Go to Step 3*	*Go to Step 4*
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Repair the short from CKT 347 to CKT 1403. Are the repairs complete?	—	*Go to Step 12*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint IP module yellow 2-way connector behind the IP compartment door. 3. Reconnect the 2-way connector. 4. Make sure that the CPA is properly installed. 5. Turn the ignition switch to the RUN position. 6. Using a scan tool, request the SIR data list display. 7. Read the passenger deployment loop resistance PASSENGER RESISTANCE. Is PASSENGER RESISTANCE less than the specified value?	1.4 Ω	*Go to Step 6*	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module yellow 2-way harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 12*	—

DTC B1016 Passenger Deployment Loop Resistance Low (cont'd)

Step	Action	Value(s)	Yes	No
6	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the passenger deployment loop resistance PASSENGER RESISTANCE. Is PASSENGER RESISTANCE less than the specified value?	1.4 Ω	*Go to Step 8*	*Go to Step 7*
7	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 12*	—
8	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect *J 38715-A.* 4. Measure the resistance from the SDM harness connector terminal 1 to terminal 4. Is the resistance less than the specified value?	OL	*Go to Step 9*	*Go to Step 10*
9	1. Turn the ignition switch to the OFF position. 2. Repair the short from CKT 1403 to CKT 1404. Are the repairs complete?	—	*Go to Step 12*	—
10	Measure the resistance from the SDM harness connector terminal 1 to terminal 3. Is the resistance less than the specified value?	OL	*Go to Step 11*	Go to *SDM Integrity Check*
11	Repair the short from CKT 1403 to CKT 348. Are the repairs complete?	—	*Go to Step 12*	—
12	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 13*	—
13	Clear the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1017 Passenger Deployment Loop Open



220920

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 voltage to make sure it is within its respective normal voltage range. Then the SDM proceeds with the DEPLOYMENT LOOP CONTINUITY test. During the DEPLOYMENT LOOP CONTINUITY test, the SDM measures the voltage difference between PASSENGER SIDE HIGH and PASSENGER SIDE LOW.

Conditions for Setting the DTC

- The voltage difference between PASSENGER SIDE HIGH terminal 1 and PASSENGER SIDE LOW terminal 4 is more than or equal to 400 millivolts.
- The malfunction must be present for at least 500 milliseconds during one of the following tests:
  - DEPLOYMENT LOOP CONTINUITY

    If the malfunction is detected in this test, the RESISTANCE MEASUREMENT test will not be performed.
  - CONTINUOUS MONITORING

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The voltage difference between PASSENGER SIDE HIGH terminal 1 and PASSENGER SIDE LOW terminal 4 is less than 400 millivolts for 500 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

The following can cause an intermittent condition:

- A poor connection at the inflatable restraint IP module harness connector terminals A and B.
- A poor connection at the SDM terminals 1 and 4.
- An open in CKT 1403.
- An open in CKT 1404.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop voltage difference measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
3. This test checks for proper contact or corrosion of the yellow 2-way connector.

10. This test isolates the malfunction to one side of the inflatable restraint IP module yellow 2-way connector.
12. This test checks for proper contact or corrosion of the SDM harness connector.
17. This test determines whether the malfunction is in CKT 1403.
19. This test determines whether the malfunction is in CKT 1404.

DTC B1017 Passenger Deployment Loop Open

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the passenger deployment loop voltage difference PASSENGER VDIF. Has the PASSENGER VDIF been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Check for proper connection at terminals A and B on the IP harness side of the inflatable restraint IP module yellow 2-way connector. Are the terminals damaged or corroded?	—	*Go to Step 4*	*Go to Step 6*
4	Replace the inflatable restraint IP module yellow 2-way IP harness connector. Refer to *Wiring Repair*. Are the repairs complete?	—	*Go to Step 5*	—
5	Check for proper connection at terminals A and B on the inflatable restraint IP module yellow 2-way connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 21*
6	Check for proper connection at terminals A and B on the inflatable restraint IP module yellow 2-way connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 8*
7	Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement*. Are the repairs complete?	—	*Go to Step 21*	—
8	1. Connect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 2. Turn the ignition switch to the RUN position. 3. Using the scan tool, request the SIR data list display. 4. Read the passenger deployment loop voltage difference PASSENGER VDIF. Is the PASSENGER VDIF less than the specified value?	400 mV	*Go to Step 9*	*Go to Step 10*
9	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module yellow 2-way IP harness connector. Refer to *Wiring Repair*. Are the repairs complete?	—	*Go to Step 21*	—

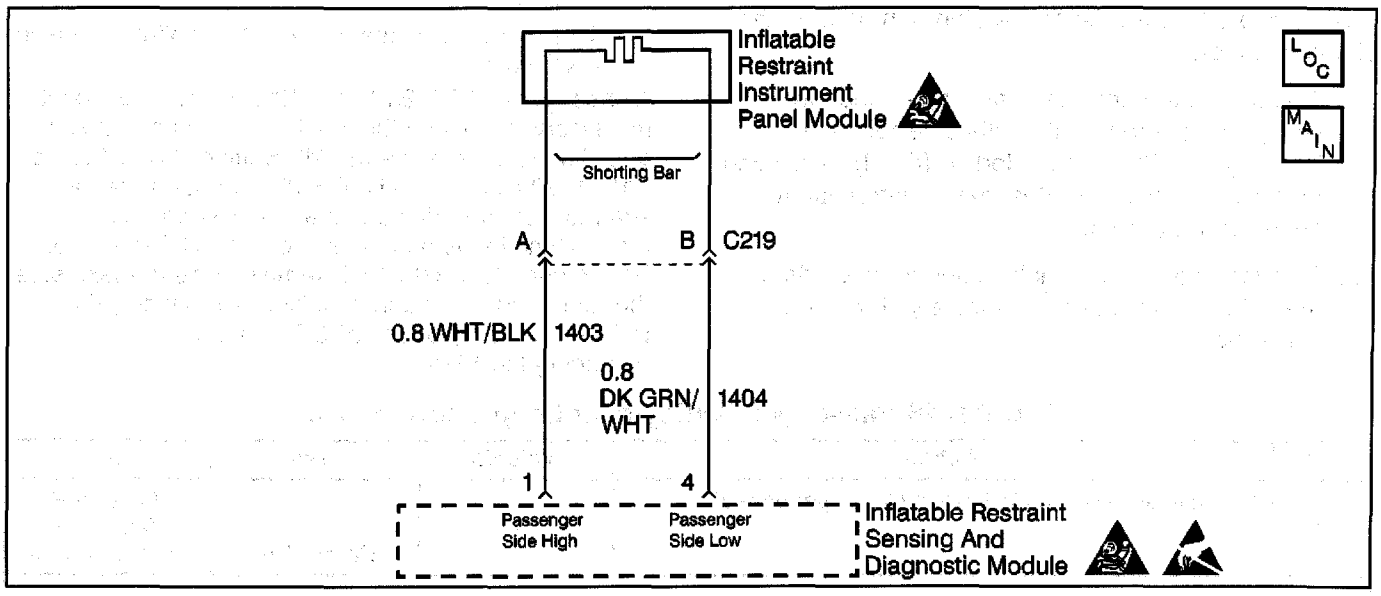
DTC B1017 Passenger Deployment Loop Open (cont'd)

Step	Action	Value(s)	Yes	No
10	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect the *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the data list display. 6. Read the passenger deployment loop voltage difference PASSENGER VDIF. Is the PASSENGER VDIF less than the specified value?	400 mV	*Go to Step 11*	*Go to Step 12*
11	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 21*	—
12	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Check for proper connection at terminals 1 and 4 on the SDM harness connector. Is the connector damaged or corroded?	—	*Go to Step 13*	*Go to Step 15*
13	Replace the SDM harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 14*	—
14	Check for proper connection at terminals 1 and 4 of the SDM. Are the terminals damaged or corroded?	—	*Go to Step 16*	*Go to Step 21*
15	Check for proper connection at terminals 1 and 4 of the SDM. Are the terminals damaged or corroded?	—	*Go to Step 16*	*Go to Step 17*
16	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 21*	—
17	1. Zero the *J 39200* Digital Multimeter. 2. Measure the resistance from the SDM harness connector terminal 1 to the inflatable restraint IP module yellow 2-way harness connector terminal A. Is the resistance reading within the specified values?	0–0.5 Ω	*Go to Step 19*	*Go to Step 18*
18	Repair the high resistance condition in CKT 1403. Are the repairs complete?	—	*Go to Step 21*	—
19	1. Zero the *J 39200.* 2. Measure the resistance from the SDM harness connector terminal 4 to the inflatable restraint IP module yellow 2-way harness connector terminal B. Is the resistance reading within the specified values?	0–0.5 Ω	Go to *SDM Integrity Check*	*Go to Step 20*

DTC B1017 Passenger Deployment Loop Open (cont'd)

Step	Action	Value(s)	Yes	No
20	Repair the high resistance condition in CKT 1404. Are the repairs complete?	—	*Go to Step 21*	—
21	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 22*	—
22	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1018 Passenger Deployment Loop Short to GND



220920

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Upon passing these tests IGNITION 1, 23VLR and the deployment loop voltages are measured to make sure they are within their respective normal voltage ranges. The SDM monitors the voltages at DRIVER SIDE LOW terminal 3 and PASSENGER SIDE LOW terminal 4 to detect shorts to ground in the inflator module circuits. The service wait time is 10 minutes. Refer to *SIR Service Precautions*.

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The driver deployment loop is not shorted to voltage.
- The voltage at DRIVER SIDE LOW terminal 3 is more than 3.3 volts.
- The voltage at PASSENGER SIDE LOW terminal 4 is less than 3.3 volts for 500 milliseconds.

The following tests check for this DTC. These tests occur when IGNITION 1 is within the normal operating voltage range.

- POWER-ON—When the malfunction is detected in this test, the RESISTANCE MEASUREMENT test will not be performed.
- CONTINUOUS MONITORING

Action Taken When the DTC Sets

- The SDM sets DTC B1018 and also DTC B1071.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

DTC B1018 is a latched code. You cannot clear a latched code. Repair the malfunction that set this DTC before you replace the SDM.

Diagnostic Aids

A short-to-ground in the inflatable restraint IP module circuit can cause an intermittent condition. A DTC B1018 would be accompanied by DTC B1071. Inspect CKT 1403 and CKT 1404 carefully for cutting or chafing. Wiring pigtail damage requires replacement of the inflatable restraint IP module. A careful inspection of the circuits and components indicated on the DTC B1018 table is essential in order to prevent damage to the replacement inflatable restraint Sensing and Diagnostic Module (SDM). The diagnostic table directs the technician to note the entry value of PASSENGER SENSELO. Comparing the value of PASSENGER SENSELO can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the passenger side low voltage measured by the inflatable restraint Sensing and Diagnostic Module (SDM). A reading of 3.3 V or more indicates that an intermittent condition may exist.
3. This test isolates the malfunction to one side of the inflatable restraint IP module yellow 2-way connector.
5. This test determines whether the malfunction is in CKT 1403.
7. This test determines whether the malfunction is in CKT 1404.

Notice: When DTC B1018 or B1024 has been set it is necessary to replace the inflatable restraint Sensing and Diagnostic Module (SDM). Setting DTC B1018 or B1024 will also cause DTC B1071 to set. When a scan tool clear codes command is issued and the malfunction is no longer present, DTC B1018 or B1024 and DTC B1071 will remain current. Make sure that the short to ground condition is repaired prior to installing a replacement SDM to avoid damaging the SDM.

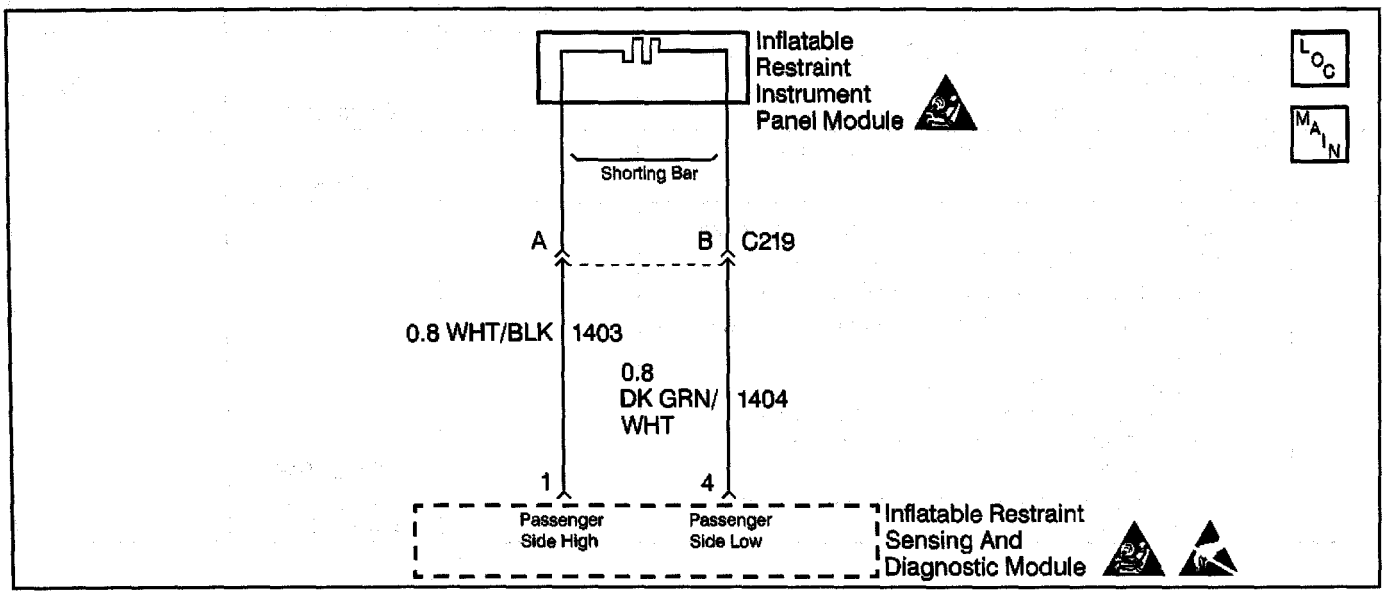
DTC B1018 Passenger Deployment Loop Short to GND

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the passenger side low voltage PASSENGER SENSELO. Is PASSENGER SENSELO less than the specified value?	3.3 V	*Go to Step 3*	Refer to Diagnostic Aids
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the passenger side low voltage PASSENGER SENSELO. Is PASSENGER SENSELO less than the specified value?	3.3 V	*Go to Step 5*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Inspect the inflatable restraint IP module pigtail for damage and proper routing. 3. Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 9*	—
5	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A*. 4. Measure the resistance on the SDM harness connector from terminals 1 to 6 (ground). Is the resistance less than the specified value?	OL	*Go to Step 6*	*Go to Step 7*
6	Repair a short-to-ground condition in CKT 1403. Are the repairs complete?	—	*Go to Step 9*	—

DTC B1018 Passenger Deployment Loop Short to GND (cont'd)

Step	Action	Value(s)	Yes	No
7	Measure the resistance on the SDM harness connector from terminals 4 to 6 (ground). Is the resistance less than the specified value?	OL	*Go to Step 8*	Go to *SDM Integrity Check*
8	Repair a short-to-ground condition in CKT 1404. Are the repairs complete?	—	*Go to Step 9*	—
9	1. Reconnect all the SIR system components, make sure all the components are properly mounted. 2. Turn the ignition switch to the RUN position. 3. Make sure PASSENGER SENSELO is more than the specified value. 4. Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Have all the SIR components been reconnected and properly mounted?	3.3 V	Go to *SIR Diagnostic System Check*	—

DTC B1019 Passenger Deploy. Loop Short to Voltage



220920

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Upon passing these tests IGNITION 1, 23VLR and the deployment loop voltages are measured to make sure they are within their respective normal voltage ranges. The SDM monitors the voltages at DRIVER SIDE LOW terminal 3 and PASSENGER SIDE LOW terminal 4 to detect shorts-to-B+ in the inflator module circuits.

Conditions for Setting the DTC

- The voltage at DRIVER SIDE LOW terminal 3 is less than 4.8 volts.
- The voltage at PASSENGER SIDE LOW terminal 4 is more than 4.8 volts for 500 milliseconds.

The CONTINUOUS MONITORING test checks for this DTC. This test occurs when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The voltage at PASSENGER SIDE LOW terminal 4 is less than 4.8 volts for 500 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

A short-to-B+ in the inflatable restraint IP module circuit can cause an intermittent condition. Inspect CKT 1403 and CKT 1404 carefully for cutting or chafing. Wiring pigtail damage requires replacement of the inflatable restraint IP module. The diagnostic table directs the technician to note the entry value of PASSENGER SENSELO. Comparing the value of PASSENGER SENSELO can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

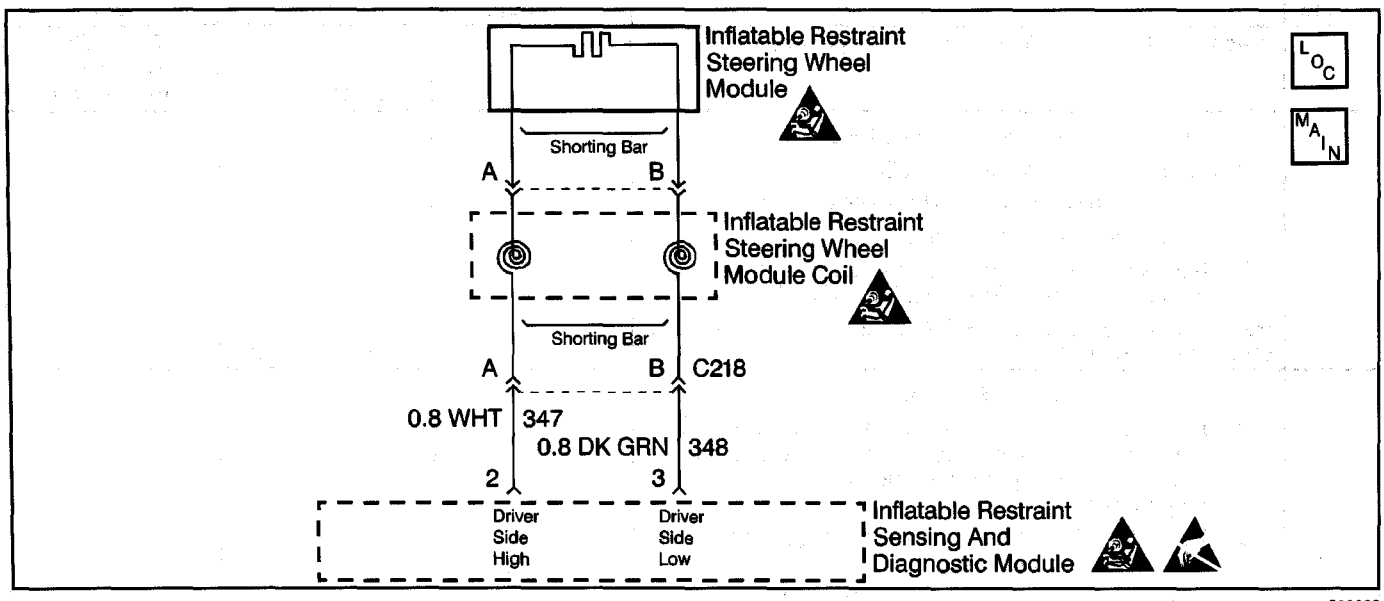
The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the passenger side low voltage measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
3. This test isolates the malfunction to one side of the inflatable restraint IP module yellow 2-way connector.
5. This test determines whether the malfunction is in CKT 1403.
7. This test determines whether the malfunction is in CKT 1404.

DTC B1019 Passenger Deploy. Loop Short to Voltage

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the passenger side low voltage PASSENGER SENSELO. Has the PASSENGER SENSELO been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the passenger side low voltage PASSENGER SENSELO. Is PASSENGER SENSELO more than the specified value?	4.8 V	*Go to Step 5*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Inspect the inflatable restraint IP module pigtail for damage and proper routing. 3. Replace the inflatable restraint IP module. Refer to *Inflatable Restraint Instrument Panel Module Replacement.* Are the repairs complete?	—	*Go to Step 9*	—
5	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Turn the ignition switch to the RUN position. 5. Measure the voltage on the SDM harness connector from terminal 1 to terminal 6 (ground). Is the measured voltage less than the specified value?	1.0 V	*Go to Step 7*	*Go to Step 6*
6	1. Turn the ignition switch to the OFF position. 2. Repair a short-to-B+ condition in CKT 1403. Are the repairs complete?	—	*Go to Step 9*	—
7	Measure the voltage on the SDM harness connector from terminal 4 to terminal 6 (ground). Is the measured voltage less than the specified value?	1.0 V	Go to *SDM Integrity Check*	*Go to Step 8*
8	1. Turn the ignition switch to the OFF position. 2. Repair a short-to-B+ condition in CKT 1404. Are the repairs complete?	—	*Go to Step 9*	—
9	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 10*	—
10	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1021 Driver Deployment Loop Resistance High



220922

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 and the deployment loop voltages to make sure they are within their respective normal voltage ranges. Then the SDM proceeds with the RESISTANCE MEASUREMENT test. During one portion of the RESISTANCE MEASUREMENT test, the SDM does the following:

- Grounds the DRIVER SIDE LOW terminal 3 through an internal current sink.
- Connects the DRIVER SIDE HIGH terminal 2 to an internal constant current source. This current produces proportional voltage drops in the deployment loop.
- Measures the voltage difference between DRIVER SIDE HIGH and DRIVER SIDE LOW.
- Calculates the resistance of the driver deployment loop using the measured voltage.

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The driver and passenger deployment loops are not shorted to voltage.
- The driver deployment loop is not shorted to ground.
- The driver deployment loop resistance is more than 3.8 ohms. The driver deployment loop consists of the following components:
  - Inflatable restraint steering wheel module.
  - Inflatable restraint steering wheel module coil.
  - Harness wiring of CKT 347.
  - Harness wiring of CKT 348.
  - Connector terminal contact.

The RESISTANCE MEASUREMENT test checks for this malfunction. This test only occurs once each ignition cycle when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

The DTC will clear when one of the following conditions is met:

- Current DTC

  The resistance of the driver deployment loop is less than 3.8 ohms and the ignition switch is cycled.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

When you issue a scan tool CLEAR CODES command and the malfunction is still present, the DTC will not reappear until the next ignition cycle.

Diagnostic Aids

A poor connection can cause an intermittent condition. Check the following for a poor connection:

- The inflatable restraint steering wheel module steering column connector terminals A and B.
- The upper inflatable restraint steering wheel module coil connector terminals A and B.
- The SDM terminals 2 and 3.
- The wire to terminal connections in CKT 347.
- The wire to terminal connections in CKT 348.

The diagnostic table directs the technician to note the entry value of DRIVER RESISTANCE. Comparing the value of DRIVER RESISTANCE over multiple ignition cycles can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop resistance measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
3. This test checks for proper contact or corrosion of the yellow 2-way connector.
10. This test isolates the malfunction to one side of the inflatable restraint steering wheel module yellow 2-way connector.
11. This test determines whether the malfunction is due to the inflatable restraint steering wheel module or the module coil.
14. This test checks for proper contact or corrosion of the SDM connector.
19. This test determines whether the malfunction is in CKT 347.
21. This test determines whether the malfunction is in CKT 348.

DTC B1021 Driver Deployment Loop Resistance High

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the driver deployment loop resistance DRIVER RESISTANCE. Has the DRIVER RESISTANCE been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Check for proper connection at terminals A and B on the harness side of the inflatable restraint steering wheel module yellow 2-way connector located at the base of the steering column. Are the terminals damaged or corroded?	—	*Go to Step 4*	*Go to Step 6*
4	Replace the yellow 2-way harness connector located at the base of the steering column. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 5*	—
5	Check for proper connection at terminals A and B of the inflatable restraint steering wheel module coil side of the connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 23*
6	Check for proper connection at terminals A and B of the inflatable restraint steering wheel module coil side of the connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 8*
7	Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 23*	—

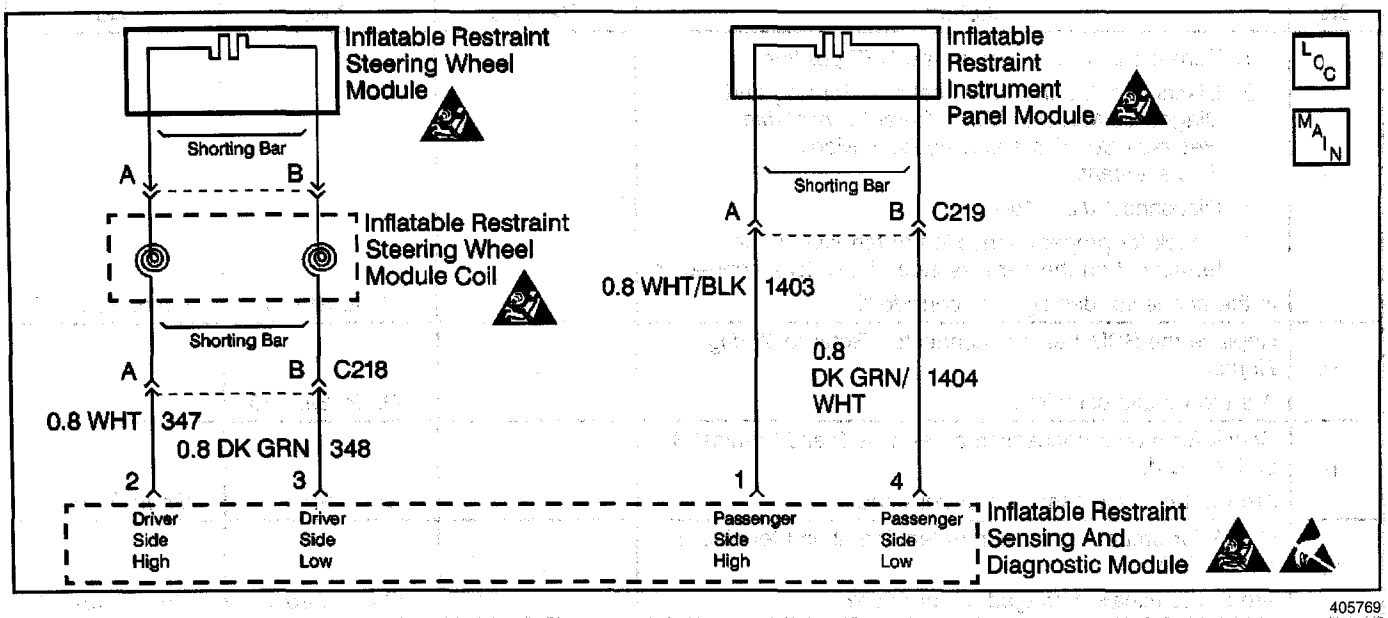
DTC B1021 Driver Deployment Loop Resistance High (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Connect the yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 2. Turn the ignition switch to the RUN position. 3. Using the scan tool, request the SIR data list display. 4. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE more than the specified value?	3.8 Ω	*Go to Step 10*	*Go to Step 9*
9	1. Turn the ignition switch to the OFF position. 2. Replace the yellow 2-way harness connector located at the base of the steering column. Refer to *Wiring Repair*. Are the repairs complete?	—	*Go to Step 23*	—
10	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the data list display. 6. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE more than the specified value?	3.8 Ω	*Go to Step 14*	*Go to Step 11*
11	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement*. 3. Disconnect *J 38715-A* from the driver 2-way harness connector. 4. Connect the 2-way connector located at the base of the steering column. 5. Connect *J 38715-A* to the upper inflatable restraint steering wheel module coil connector on the steering column. 6. Turn the ignition switch to the RUN position. 7. Using the scan tool, request the SIR data list display. 8. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE more than the specified value?	3.8 Ω	*Go to Step 13*	*Go to Step 12*
12	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement*. Are the repairs complete?	—	*Go to Step 23*	—
13	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement*. Are the repairs complete?	—	*Go to Step 23*	—

DTC B1021 Driver Deployment Loop Resistance High (cont'd)

Step	Action	Value(s)	Yes	No
14	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect *J 38715-A.* 4. Check for proper connection at terminal 2 and terminal 3 on the harness side of the SDM connector. Is the connector damaged or corroded?	—	*Go to Step 15*	*Go to Step 17*
15	Replace the SDM harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 16*	—
16	Check for proper connection at terminal 2 and terminal 3 on the SDM. Are the terminals damaged or corroded?	—	*Go to Step 18*	*Go to Step 23*
17	Check for proper connection at terminal 2 and terminal 3 on the SDM. Are the terminals damaged or corroded?	—	*Go to Step 18*	*Go to Step 19*
18	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 23*	—
19	1. Zero the *J 39200* Digital Multimeter. 2. Measure the resistance from the SDM harness connector terminal 2 to the inflatable restraint steering wheel module yellow 2-way harness connector terminal A. Is the resistance reading within the specified values?	0–0.5 Ω	*Go to Step 21*	*Go to Step 20*
20	Repair the high resistance condition in CKT 347. Are the repairs complete?	—	*Go to Step 23*	—
21	1. Zero the *J 39200.* 2. Measure the resistance from the SDM harness connector terminal 3 to the inflatable restraint steering wheel module yellow 2-way harness connector terminal B. Is the resistance reading within the specified values?	0–0.5 Ω	Go to *SDM Integrity Check*	*Go to Step 22*
22	Repair the high resistance condition in CKT 348. Are the repairs complete?	—	*Go to Step 23*	—
23	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 24*	—
24	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1022 Driver Deployment Loop Resistance Low



405769

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 and the deployment loop voltages to make sure they are within their respective normal voltage ranges. Then the SDM proceeds with the RESISTANCE MEASUREMENT test. During one portion of the RESISTANCE MEASUREMENT test, the SDM does the following:

- Grounds the DRIVER SIDE LOW terminal 3 through an internal current sink.
- Connects the DRIVER SIDE HIGH terminal 2 to an internal constant current source. This current produces proportional voltage drops in the deployment loop.
- Measures the voltage difference between DRIVER SIDE HIGH and DRIVER SIDE LOW.
- Calculates the resistance of the driver deployment loop using the measured voltage.

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The driver and passenger deployment loops are not shorted to voltage.
- The driver deployment loop is not shorted to ground.
- The driver deployment loop resistance is less than 1.7 ohms. The driver deployment loop consists of the following components:
  - Inflatable restraint steering wheel module.
  - Inflatable restraint steering wheel module coil.
  - Harness wiring of CKT 347.
  - Harness wiring of CKT 348.
  - Connector terminal contact.

The RESISTANCE MEASUREMENT test checks for this malfunction. This test only occurs once each ignition cycle when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The resistance of the driver deployment loop is more than 1.7 ohms and the ignition switch is cycled.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

When you issue a scan tool CLEAR CODES command and the malfunction is still present, the DTC will not reappear until the next ignition cycle.

Diagnostic Aids

The following can cause an intermittent condition:

- A short circuit between CKT 347 and CKT 348.
- A short circuit between CKT 347 and CKT 1403.
- A short circuit between CKT 347 and CKT 1404.
- A malfunctioning shorting bar on the inflatable restraint steering wheel module connector.
- A malfunctioning shorting bar on the inflatable restraint steering wheel module coil steering column connector.

The diagnostic table directs the technician to note the entry value of DRIVER RESISTANCE. Comparing the value of DRIVER RESISTANCE over multiple ignition cycles can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop resistance measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
6. This test isolates the malfunction to one side of the inflatable restraint steering wheel module coil yellow 2-way connector.
7. This test determines whether the malfunction is due to the inflatable restraint steering wheel module or the module coil.
10. This test checks for a short from CKT 347 to CKT 348.
12. This test checks for a short from CKT 347 to CKT 1404.

DTC B1022 Driver Deployment Loop Resistance Low

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the driver deployment loop resistance DRIVER RESISTANCE. 6. Request the SIR DTC display. Is DTC B1016 also present?	—	*Go to Step 3*	*Go to Step 4*
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Repair the short from CKT 347 to CKT 1403. Are the repairs complete?	—	*Go to Step 14*	—
4	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel module yellow 2-way connector located at the base of the steering column. 3. Reconnect the 2-way connector. 4. Inspect that the CPA is properly installed. 5. Turn the ignition switch to the RUN position. 6. Using a scan tool, request the SIR data list display. 7. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE less than the specified value?	1.7 Ω	*Go to Step 6*	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Replace the yellow 2-way harness connector located at the base of the steering column. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 14*	—

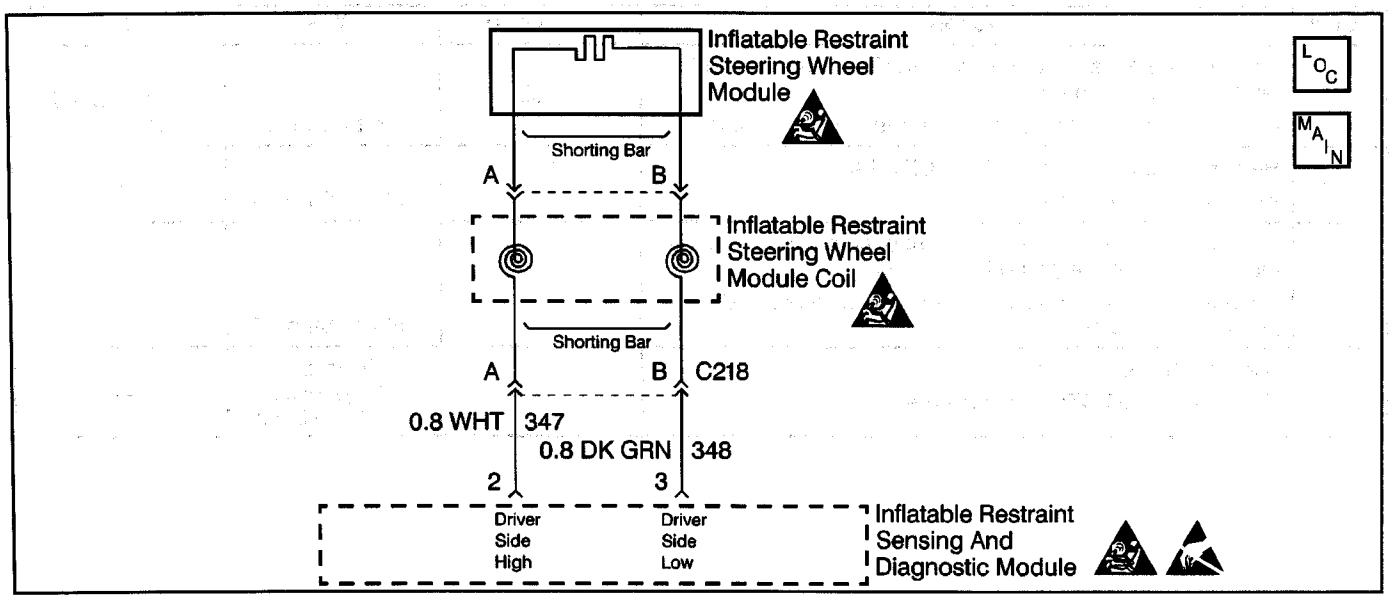
DTC B1022 Driver Deployment Loop Resistance Low (cont'd)

Step	Action	Value(s)	Yes	No
6	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE less than the specified value?	1.7 Ω	*Go to Step 10*	*Go to Step 7*
7	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* 3. Disconnect *J 38715-A* from the driver 2-way harness connector. 4. Connect the driver 2-way connector located at the base of the steering column. 5. Connect *J 38715-A* to the upper inflatable restraint steering wheel module coil connector on the steering column. 6. Turn the ignition switch to the RUN position. 7. Using the scan tool, request the SIR data list display. 8. Read the driver deployment loop resistance DRIVER RESISTANCE. Is DRIVER RESISTANCE less than the specified value?	1.7 Ω	*Go to Step 9*	*Go to Step 8*
8	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* Are the repairs complete?	—	*Go to Step 14*	—
9	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 14*	—
10	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect *J 38715-A.* 4. Measure the resistance from the SDM harness connector terminal 2 to terminal 3. Is the resistance reading less than the specified value?	OL	*Go to Step 11*	*Go to Step 12*
11	Repair a short from CKT 347 to CKT 348. Are the repairs complete?	—	*Go to Step 14*	—

DTC B1022 Driver Deployment Loop Resistance Low (cont'd)

Step	Action	Value(s)	Yes	No
12	Measure the resistance from the SDM harness connector terminal 2 to terminal 4. Is the resistance reading less than the specified value?	OL	*Go to Step 13*	Go to *SDM Integrity Check*
13	Repair a short from CKT 347 to CKT 1404. Are the repairs complete?	—	*Go to Step 14*	—
14	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 15*	—
15	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1024 Driver Deployment Loop Short to Ground



Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Upon passing these tests IGNITION 1, 23VLR and the deployment loop voltages are measured to make sure they are within their respective normal voltage ranges. The SDM monitors the voltages at DRIVER SIDE LOW terminal 3 and PASSENGER SIDE LOW terminal 4 to detect shorts to ground in the inflator module circuits. The service wait time is 10 minutes. Refer to *SIR Service Precautions.*

Conditions for Setting the DTC

- The driver and passenger deployment loops are not open.
- The passenger deployment loop is not shorted to voltage.
- The voltage at PASSENGER SIDE LOW terminal 4 is more than 3.3 volts.
- The voltage at DRIVER SIDE LOW terminal 3 is less than 3.3 volts for 500 milliseconds.

The following tests check for this DTC. These tests occur when IGNITION 1 is within the normal operating voltage range.

- POWER-ON—When the malfunction is detected in this test, the RESISTANCE MEASUREMENT test will not be performed.
- CONTINUOUS MONITORING

Action Taken When the DTC Sets

- The SDM sets DTC B1024 and also DTC B1071.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

DTC B1024 is a latched code. You cannot clear a latched code. Repair the malfunction that set this DTC before you replace the SDM.

Diagnostic Aids

A short-to-ground in the inflatable restraint steering wheel module circuit can cause an intermittent condition. A DTC B1024 would be accompanied by DTC B1071. Inspect CKT 347 and CKT 348 carefully for cutting or chafing. A careful inspection of the circuits and components indicated on the DTC B1024 table is essential in order to prevent damage to the replacement inflatable restraint Sensing and Diagnostic Module (SDM). The diagnostic table directs the technician to note the entry value of DRIVER SENSELO. Comparing the value of DRIVER SENSELO can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the driver side low voltage measured by the inflatable restraint Sensing and Diagnostic Module (SDM). A reading of 3.3 V or more indicates that an intermittent condition may exist.
3. This test isolates the malfunction to one side of the inflatable restraint steering wheel module coil yellow 2-way connector.

4. This test determines whether the malfunction is due to the inflatable restraint steering wheel module or the module coil.
7. This test determines whether the malfunction is in CKT 347.
9. This test determines whether the malfunction is in CKT 348.

Notice: When DTC B1018 or B1024 has been set it is necessary to replace the inflatable restraint Sensing and Diagnostic Module (SDM). Setting DTC B1018 or B1024 will also cause DTC B1071 to set. When a scan tool clear codes command is issued and the malfunction is no longer present, DTC B1018 or B1024 and DTC B1071 will remain current. Make sure that the short to ground condition is repaired prior to installing a replacement SDM to avoid damaging the SDM.

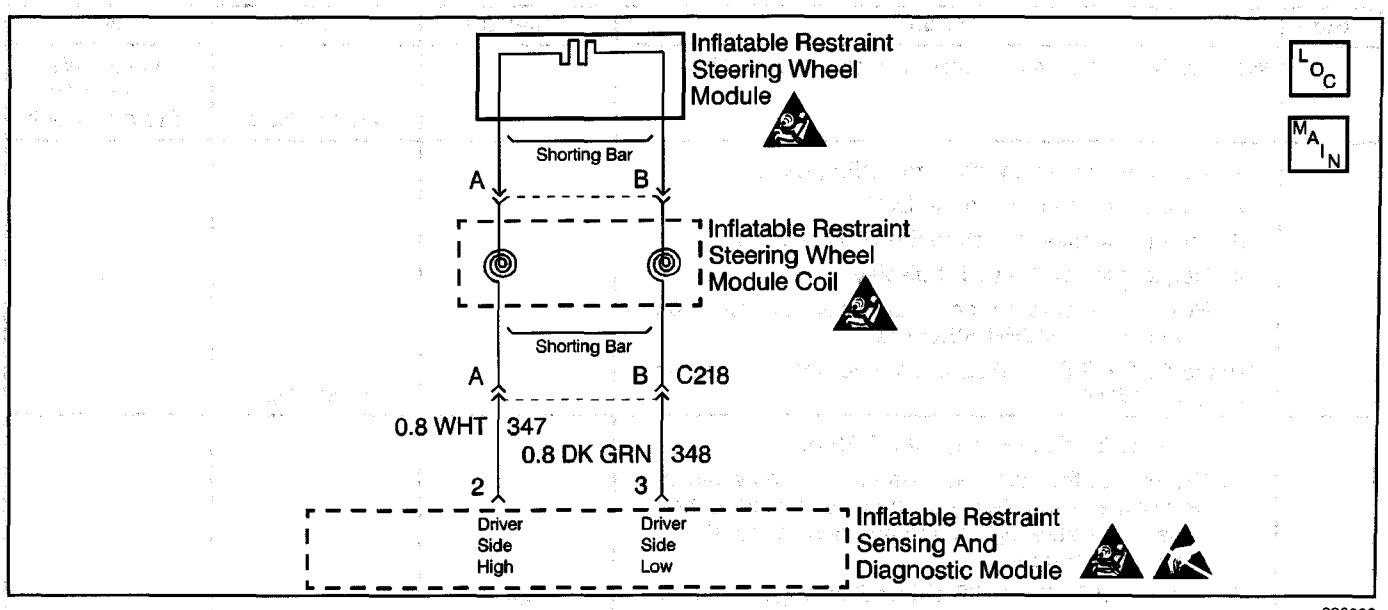
DTC B1024 Driver Deployment Loop Short to Ground

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the driver side low voltage DRIVER SENSELO. Is DRIVER SENSELO less than the specified value?	3.3 V	*Go to Step 3*	Refer to Diagnostic Aids
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the driver side low voltage DRIVER SENSELO. Is DRIVER SENSELO less than the specified value?	3.3 V	*Go to Step 7*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* 3. Disconnect *J 38715-A* from the driver 2-way harness connector. 4. Connect the driver 2-way connector located at the base of the steering column. 5. Connect *J 38715-A* to the upper inflatable restraint steering wheel module coil connector on the steering column. 6. Turn the ignition switch to the RUN position. 7. Using the scan tool, request the SIR data list display. 8. Read the driver side low voltage DRIVER SENSELO. Is DRIVER SENSELO less than the specified value?	3.3 V	*Go to Step 6*	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* Are the repairs complete?	—	*Go to Step 11*	—

DTC B1024 Driver Deployment Loop Short to Ground (cont'd)

Step	Action	Value(s)	Yes	No
6	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* 3. Inspect the coil and the wires for damage. 4. Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 11*	—
7	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Measure the resistance on the SDM harness connector from terminal 2 to terminal 6 (ground). Is the resistance reading less than the specified value?	OL	*Go to Step 8*	*Go to Step 9*
8	Repair a short-to-ground condition in CKT 347. Are the repairs complete?	—	*Go to Step 11*	—
9	Measure the resistance on the SDM harness connector from terminal 3 to terminal 6 (ground). Is the resistance reading less than the specified value?	OL	*Go to Step 10*	Go to *SDM Integrity Check*
10	Repair a short-to-ground condition in CKT 348. Are the repairs complete?	—	*Go to Step 11*	—
11	1. Reconnect all the SIR system components, make sure all the components are properly mounted. 2. Turn the ignition switch to the RUN position. 3. Make sure that DRIVER SENSELO is more than the specified value. 4. Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Have all the SIR components been reconnected and properly mounted?	3.3 V	Go to *SIR Diagnostic System Check*	—

DTC B1025 Driver Deployment Loop Short to Voltage



220922

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Upon passing these tests IGNITION 1, 23VLR and the deployment loop voltages are measured to make sure they are within their respective normal voltage ranges. The SDM monitors the voltages at DRIVER SIDE LOW terminal 3 and PASSENGER SIDE LOW terminal 4 to detect shorts-to-B+ in the inflator module circuits.

Conditions for Setting the DTC

- The voltage at PASSENGER SIDE LOW terminal 4 is less than 4.8 volts.
- The voltage at DRIVER SIDE LOW terminal 3 is more than 4.8 volts for 500 milliseconds.

The CONTINUOUS MONITORING test checks for this DTC. This test occurs when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The voltage at DRIVER SIDE LOW terminal 3 is less than 4.8 volts for 500 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

A short-to-B+ in the inflatable restraint steering wheel module circuit can cause an intermittent condition. Inspect CKT 347 and CKT 348 carefully for cutting or chafing. The diagnostic table directs the technician to note the entry value of DRIVER SENSELO. Comparing the value of DRIVER SENSELO can be helpful in determining if an intermittent condition exists.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the driver side low voltage measured by the inflatable restraint Sensing and Diagnostic Module (SDM).
3. This test isolates the malfunction to one side of the inflatable restraint steering wheel module coil yellow 2-way connector.
4. This test determines whether the malfunction is due to the inflatable restraint steering wheel module or the module coil.
7. This test determines whether the malfunction is in CKT 347.
9. This test determines whether the malfunction is in CKT 348.

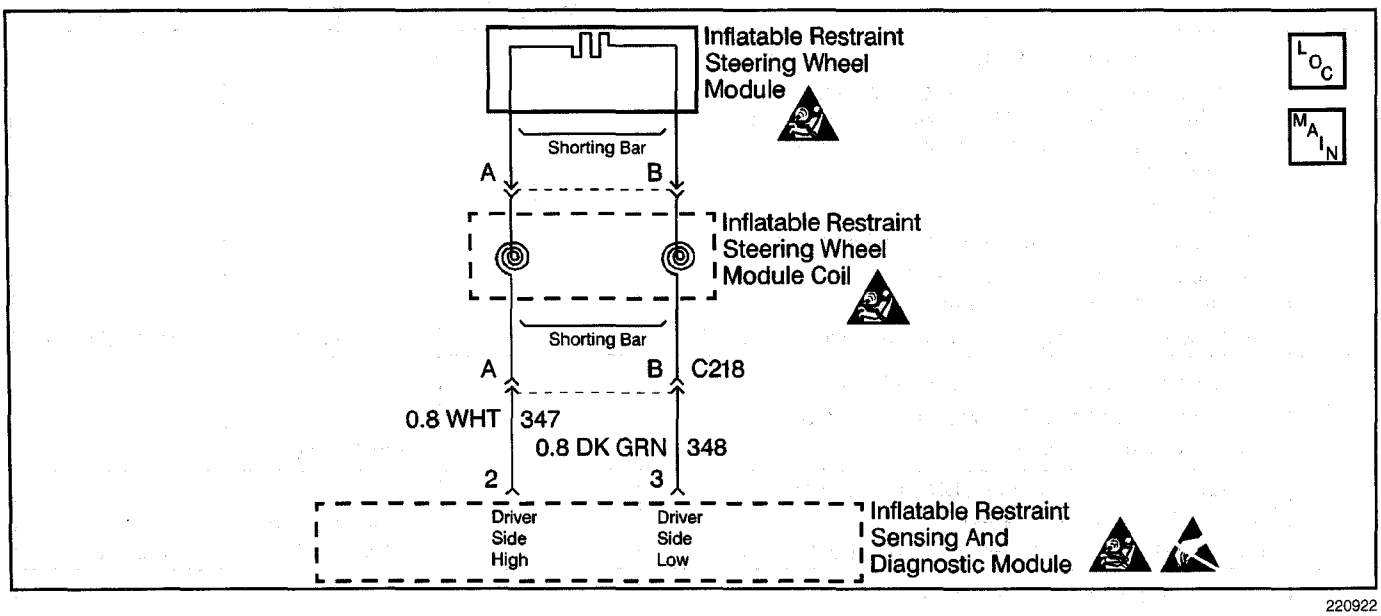
DTC B1025 Driver Deployment Loop Short to Voltage

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the driver side low voltage DRIVER SENSELO. Has the DRIVER SENSELO been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect *J 38715-A* SIR Driver Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the driver side low voltage DRIVER SENSELO. Is DRIVER SENSELO more than the specified value?	4.8 V	*Go to Step 7*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* 3. Disconnect *J 38715-A* from the driver 2-way harness connector. 4. Connect the driver 2-way connector located at the base of the steering column. 5. Connect *J 38715-A* to the upper inflatable restraint steering wheel module coil connector on the steering column. 6. Turn the ignition switch to the RUN position. 7. Using the scan tool, request the SIR data list display. 8. Read the driver side low voltage DRIVER SENSELO. Is DRIVER SENSELO more than the specified value?	4.8 V	*Go to Step 6*	*Go to Step 5*
5	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* Are the repairs complete?	—	*Go to Step 11*	—
6	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* 3. Inspect the coil and the wires for damage. 4. Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 11*	—

DTC B1025 Driver Deployment Loop Short to Voltage (cont'd)

Step	Action	Value(s)	Yes	No
7	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Turn the ignition switch to the RUN position. 5. Measure the voltage on the SDM harness connector from terminal 2 to terminal 6 (ground). Is the measured voltage less than the specified value?	1.0 V	*Go to Step 9*	*Go to Step 8*
8	1. Turn the ignition switch to the OFF position. 2. Repair a short-to-B+ condition in CKT 347. Are the repairs complete?	—	*Go to Step 11*	—
9	Measure the voltage on the SDM harness connector from terminal 3 to terminal 6 (ground). Is the measured voltage less than the specified value?	1.0 V	Go to *SDM Integrity Check*	*Go to Step 10*
10	1. Turn the ignition switch to the OFF position. 2. Repair a short-to-B+ condition in CKT 348. Are the repairs complete?	—	*Go to Step 11*	—
11	Reconnect all the SIR components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 12*	—
12	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1026 Driver Deployment Loop Open



220922

Circuit Description

When you first turn the ignition switch to the RUN position, the inflatable restraint Sensing and Diagnostic Module (SDM) performs tests to diagnose critical malfunctions within itself. Next the SDM measures IGNITION 1 voltage to make sure it is within its respective normal voltage range. Then the SDM proceeds with the DEPLOYMENT LOOP CONTINUITY test. During the DEPLOYMENT LOOP CONTINUITY test, the SDM measures the voltage difference between DRIVER SIDE HIGH and DRIVER SIDE LOW.

Conditions for Setting the DTC

- The voltage difference between DRIVER SIDE HIGH terminal 2 and DRIVER SIDE LOW terminal 3 is more than or equal to 400 millivolts.
- The malfunction must be present for at least 500 milliseconds during one of the following tests:
  - DEPLOYMENT LOOP CONTINUITY

    If the malfunction is detected in this test, the RESISTANCE MEASUREMENT test will not be performed.
  - CONTINUOUS MONITORING

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The voltage difference between DRIVER SIDE HIGH terminal 2 and DRIVER SIDE LOW terminal 3 is less than 400 millivolts for 500 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

The following can cause an intermittent condition:

- A poor connection at the inflatable restraint steering wheel module column connector terminals A and B.
- A poor connection at the upper inflatable restraint steering wheel coil connector terminals A and B.
- A poor connection at the SDM terminals 2 and 3.
- An open in CKT 347.
- An open in CKT 348.

An intermittent open in the inflatable restraint steering wheel module coil could also set this DTC. To test for a bad inflatable restraint steering wheel module coil, clear the DTCs, then turn the steering wheel back and forth with the ignition switch in the ON position. If the AIR BAG warning lamp comes ON and DTC B1026 has set again, it is likely the inflatable restraint steering wheel module coil is malfunctioning.

When measurements are requested in this table, use the *J 39200* DMM with the correct terminal adapter from the *J 35616-A* Connector Test Adapter Kit. When an inspection for proper connection is requested, refer to *Testing for Electrical Intermittents* in Wiring Systems. When a wire, connector or terminal repair is requested, use the *J 38125-B* Terminal Repair Kit and refer to *Wiring Repairs* in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. This test determines the deployment loop voltage difference measured by the inflatable restraint sensing and diagnostic module.
3. This test checks for proper contact or corrosion of the yellow 2-way connector.

10. This test isolates the malfunction to one side of the inflatable restraint steering wheel module coil yellow 2-way connector.
11. This test determines whether the malfunction is due to the inflatable restraint steering wheel module or the module coil.
14. This test checks for proper contact or corrosion of the inflatable restraint sensing and diagnostic module connector.
19. This test determines whether the malfunction is in CKT 347.
21. This test determines whether the malfunction is in CKT 348.

DTC B1026 Driver Deployment Loop Open

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Turn the ignition switch to the OFF position. 2. Connect a scan tool to the DLC. 3. Turn the ignition switch to the RUN position. 4. Request the SIR data list display. 5. Read and record on the repair order the driver deployment loop voltage difference DRIVER VDIF. Has the DRIVER VDIF been read and recorded on the repair order?	—	*Go to Step 3*	—
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Inspect for proper connection at terminals A and B on the harness side of the inflatable restraint steering wheel module yellow 2-way connector. Are the terminals damaged or corroded?	—	*Go to Step 4*	*Go to Step 6*
4	Replace the inflatable restraint steering wheel module yellow 2-way harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 5*	—
5	Check for proper connection at terminals A and B on the coil side of the connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 23*
6	Check for proper connection at terminals A and B on the coil side of the connector. Are the terminals damaged or corroded?	—	*Go to Step 7*	*Go to Step 8*
7	Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 23*	—
8	1. Connect the 2-way harness connectors. 2. Turn the ignition switch to the RUN position. 3. Using the scan tool, request the SIR data list display. 4. Read the driver deployment loop voltage difference DRIVER VDIF. Is DRIVER VDIF less than the specified value?	400 mV	*Go to Step 9*	*Go to Step 10*
9	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module yellow 2-way harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 23*	—

DTC B1026 Driver Deployment Loop Open (cont'd)

Step	Action	Value(s)	Yes	No
10	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint steering wheel and IP module yellow 2-way connectors located at the base of the steering column and behind the IP compartment door. 3. Connect the *J 38715-A* SIR Driver/Passenger Load Tool to the harness connectors. 4. Turn the ignition switch to the RUN position. 5. Using the scan tool, request the SIR data list display. 6. Read the driver deployment loop voltage difference DRIVER VDIF. Is DRIVER VDIF less than the specified value?	400 mV	*Go to Step 11*	*Go to Step 14*
11	1. Turn the ignition switch to the OFF position. 2. Remove the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* 3. Disconnect the *J 38715-A* from the driver 2-way harness connector. 4. Connect the driver 2-way connector located at the base of the steering column. 5. Connect *J 38715-A* to the upper inflatable restraint steering wheel module coil connector on the steering column. 6. Turn the ignition switch to the RUN position. 7. Using the scan tool, request the SIR data list display. 8. Read the driver deployment loop voltage difference VDIF. Is DRIVER VDIF less than the specified value?	400 mV	*Go to Step 12*	*Go to Step 13*
12	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module. Refer to *Infl Rst Steering Wheel Module Replacement.* Are the repairs complete?	—	*Go to Step 23*	—
13	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint steering wheel module coil. Refer to *Inflatable Restraint Steering Wheel Module Coil Replacement.* Are the repairs complete?	—	*Go to Step 23*	—
14	1. Turn the ignition switch to the OFF position. 2. Disconnect the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* 3. Disconnect the *J 38715-A.* 4. Check for proper connection at terminals 2 and 3 on the harness side of the SDM connector. Is the connector damaged or corroded?	—	*Go to Step 15*	*Go to Step 17*
15	Replace the SDM harness connector. Refer to *Wiring Repair.* Are the repairs complete?	—	*Go to Step 16*	—
16	Check for proper connection at terminals 2 and 3 of the SDM. Are the terminals damaged or corroded?	—	*Go to Step 18*	*Go to Step 23*

DTC B1026 Driver Deployment Loop Open (cont'd)

Step	Action	Value(s)	Yes	No
17	Check for proper connection at terminals 2 and 3 of the SDM. Are the terminals damaged or corroded?	—	*Go to Step 18*	*Go to Step 19*
18	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 23*	—
19	1. Zero the *J 39200* Digital Multimeter. 2. Measure the resistance from the SDM harness connector terminal 2 to the inflatable restraint steering wheel module yellow 2-way harness connector terminal A. Is the resistance reading within the specified values?	0-0.5 Ω	*Go to Step 21*	*Go to Step 20*
20	Repair the high resistance condition in CKT 347. Are the repairs complete?	—	*Go to Step 23*	—
21	1. Zero the *J 39200.* 2. Measure the resistance from the SDM harness connector terminal 3 to the inflatable restraint steering wheel module yellow 2-way harness connector terminal B. Is the resistance reading within the specified values?	0-0.5 Ω	Go to *SDM Integrity Check*	*Go to Step 22*
22	Repair the high resistance condition in CKT 348. Are the repairs complete?	—	*Go to Step 23*	—
23	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	*Go to Step 24*	—
24	Clear all the SIR DTCs. Have all the SIR DTCs been cleared?	—	Go to *SIR Diagnostic System Check*	—

DTC B1051 Deployment Commanded

Circuit Description

The inflatable restraint Sensing and Diagnostic Module (SDM) contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM processes the generated electrical signal and compares it to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to signals stored in memory. When two of the generated signals exceed the stored values, the SDM will cause current to flow through the inflator modules, deploying the air bags and causing DTC B1051 to set.

Conditions for Setting the DTC

The SDM detects a frontal crash, up to 30 degrees off the centerline of the vehicle, of sufficient force to warrant deployment of the air bags.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.
- The SDM records crash data.

Conditions for Clearing the MIL/DTC

DTC B1051 is a latched code. You cannot clear a latched code. Replace the SDM after following the instructions in the diagnostic table.

Test Description

The numbers below refer to the step numbers on the diagnostic table:

2. If the inflator module(s) has not deployed, DTC B1051 may have set falsely.
3. If DTC B1051 has set with no signs of frontal impact, the DTC has set falsely.

DTC B1051 Deployment Commanded

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	Turn the ignition switch to the OFF position. Has the inflator module(s) deployed?	—	*Go to Step 5*	*Go to Step 3*
3	Inspect the front of the vehicle and the undercarriage for signs of impact. Are there signs of impact?	—	*Go to Step 5*	*Go to Step 4*
4	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 6*	—
5	Replace components and perform inspections as required following an accident. Refer to *Repairs and Inspections Required After an Accident.* Have the appropriate inspections and repairs been made?	—	*Go to Step 6*	—
6	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	Go to *SIR Diagnostic System Check*	—

DTC B1053 Deployment Commanded w/Loop Malfunction

Circuit Description

The inflatable restraint Sensing and Diagnostic Module (SDM) contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM processes the generated electrical signal and compares it to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to signals stored in memory. When two of the generated signals exceed the stored values, the SDM will cause current to flow through the inflator modules, deploying the air bags. DTC B1053 will set instead of a DTC B1051 when a deployment occurs while an inflator circuit fault is present that could possibly result in a non-deployment situation in one or both inflator modules.

Conditions for Setting the DTC

The SDM detects a frontal crash, up to 30 degrees off the centerline of the vehicle, of sufficient force to warrant deployment of the air bags.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.
- The SDM records crash data.

Conditions for Clearing the MIL/DTC

DTC B1053 is a latched code. You cannot clear a latched code. Replace the SDM after following the instructions in the diagnostic table.

Diagnostic Aids

DTC B1053 will be accompanied by another DTC (other than DTC B1071). Repair the malfunction causing the other DTC(s) before installing a new SDM.

Test Description

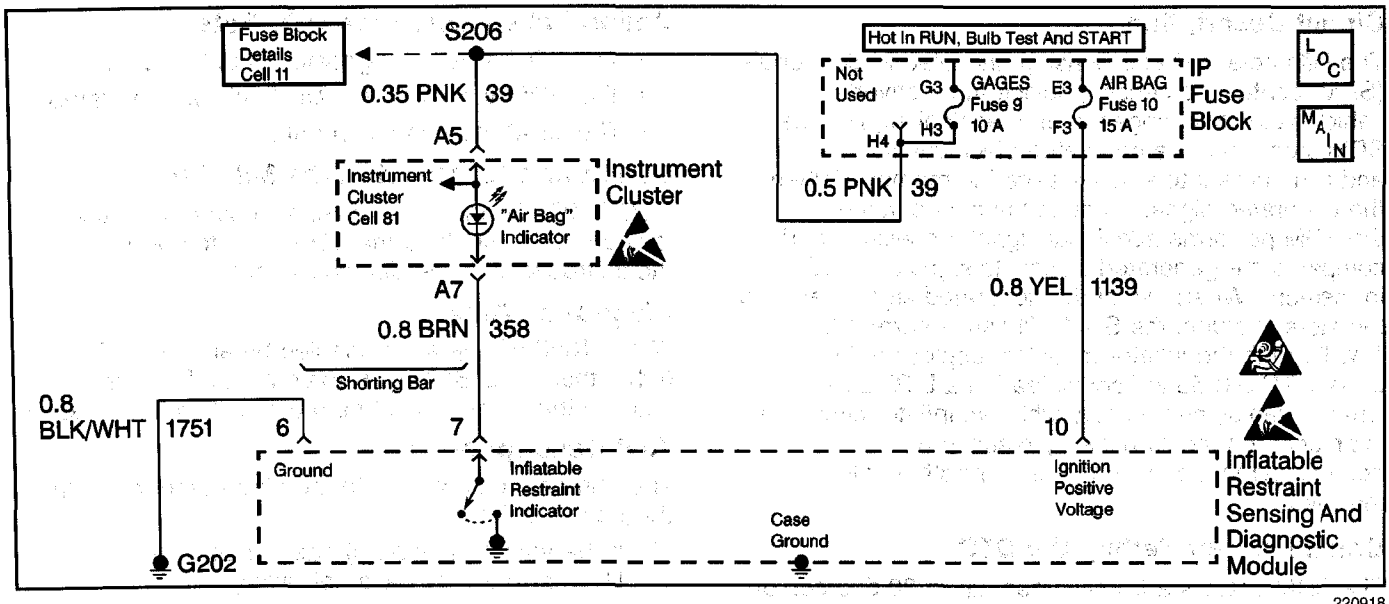
The numbers below refer to the step numbers on the diagnostic table:

2. If the inflator module(s) has not deployed, DTC B1053 may have set falsely.
3. If DTC B1053 has set with no signs of frontal impact, the DTC has set falsely.

DTC B1053 Deployment Commanded w/Loop Malfunction

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	Turn the ignition switch to the OFF position. Has the inflator modules deployed?	—	*Go to Step 5*	*Go to Step 3*
3	Inspect the front of the vehicle and the undercarriage for signs of impact. Are there signs of impact?	—	*Go to Step 5*	*Go to Step 4*
4	Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	*Go to Step 6*	—
5	Replace components and perform inspections as required following an accident. Refer to *Repairs and Inspections Required After an Accident.* Have the appropriate inspections and repairs been made?	—	*Go to Step 6*	—
6	Reconnect all the SIR system components, make sure all the components are properly mounted. Have all the SIR components been reconnected and properly mounted?	—	Go to *SIR Diagnostic System Check*	—

DTC B1061 Lamp Circuit Failure



Circuit Description

In the RUN position, the ignition switch applies battery voltage to the AIR BAG warning lamp and to the IGNITION 1 input terminal 10. The inflatable restraint Sensing and Diagnostic Module (SDM) responds by flashing the AIR BAG warning lamp seven times. The SDM monitors the lamp driver output by comparing the output state at the INFLATABLE RESTRAINT INDICATOR terminal 7 to the microprocessor commanded state.

Conditions for Setting the DTC

- The output state at the INFLATABLE RESTRAINT INDICATOR terminal 7 does not match the commanded state of the lamp driver for 400 milliseconds.
- The CONTINUOUS MONITORING test checks for this DTC. This test occurs when IGNITION 1 is within the normal operating voltage range.

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM attempts to turn ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The output state at the INFLATABLE RESTRAINT INDICATOR terminal 7 matches the commanded state of the lamp driver for 400 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

Refer to *AIR BAG Warning Lamp Comes On Steady* and *AIR BAG Warning Lamp Does Not Come On* to diagnose warning lamp circuit malfunctions.

DTC B1061 Lamp Circuit Failure

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	1. Malfunctions within the AIR BAG warning lamp circuitry can set this DTC. These malfunctions are addressed via the SIR Diagnostic System Check. Failure to properly perform the SIR Diagnostic System Check may result in misdiagnosis. • Refer to *AIR BAG Warning Lamp Comes On Steady.* • Refer to *AIR BAG Warning Lamp Does Not Come On.* 2. Turn the ignition switch to the RUN position. 3. Clear the SIR DTC codes. 4. Request the SIR DTC display. Is DTC B1061 set?	—	Go to *SDM Integrity Check*	Go to *SIR Diagnostic System Check*

DTC B1071 Internal SDM Failure

Circuit Description

DTC B1071 is an indication of a potential internal inflatable restraint Sensing and Diagnostic Module (SDM) malfunction. DTC B1071 will set upon detection of any condition in the table below.

Conditions for Setting the DTC

Malfunction	Detection Test
23 VLR voltage out of normal operating range.	Power-On, Continuous monitoring
Crash data recording reserve voltage discharge time failure for three consecutive ignition cycles.	Power-On
The calculated checksum for internal memory does not match the stored value.	Power-On
The driver or passenger deployment loop is shorted to ground.	Continuous monitoring
The Accelerometer is malfunctioning.	Power-On, Continuous monitoring
The driver or passenger current source is malfunctioning.	Resistance measurement
The temporary memory storage area is malfunctioning.	Power-On
The Inflatable Restraint Sensing and Diagnostic Module (SDM) is unable to read from or write to EEPROM.	Power-On
The arming sensor inside the Inflatable Restraint Sensing and Diagnostic Module (SDM) is not closed during a deployment event.	Asynchronously
The voltage measured at DRIVER SIDE LOW and PASSENGER SIDE LOW is too low.	Power-On, Continuous monitoring
The device inside the Inflatable Restraint Sensing and Diagnostic Module that arms the system for deployment is malfunctioning.	Power-On, Continuous monitoring
The permanent memory storage area is malfunctioning.	Power-On

Action Taken When the DTC Sets

- The SDM sets a Diagnostic Trouble Code.
- The SDM turns ON the AIR BAG warning lamp.

Conditions for Clearing the MIL/DTC

- Current DTC

  The malfunction has not been detected for 500 milliseconds.
- History DTC
  - You issue a scan tool CLEAR CODES command.
  - Once 250 malfunction free ignition cycles have occurred.

Diagnostic Aids

When you issue a scan tool CLEAR CODES command, some of the indicated malfunctions will only allow the AIR BAG warning lamp to go out briefly then come back ON.

Notice: When DTC B1018 or B1024 has been set it is necessary to replace the inflatable restraint Sensing and Diagnostic Module (SDM). Setting DTC B1018 or B1024 will also cause DTC B1071 to set. When a scan tool clear codes command is issued and the malfunction is no longer present, DTC B1018 or B1024 and DTC B1071 will remain current. Make sure that the short to ground condition is repaired prior to installing a replacement SDM to avoid damaging the SDM.

DTC B1071 Internal SDM Failure

Step	Action	Value(s)	Yes	No
1	Was the SIR Diagnostic System Check performed?	—	*Go to Step 2*	Go to *SIR Diagnostic System Check*
2	Is DTC B1018 set?	—	Go to *DTC B1018 Passenger Deployment Loop Short to GND*	*Go to Step 3*
3	Is DTC B1024 set?	—	Go to *DTC B1024 Driver Deployment Loop Short to Ground*	*Go to Step 4*
4	1. Turn the ignition switch to the OFF position. 2. Replace the inflatable restraint Sensing and Diagnostic Module (SDM). Refer to *Inflatable Restraint Sensing and Diagnostic Module Replacement.* Are the repairs complete?	—	Go to *SIR Diagnostic System Check*	—

Repair Instructions

SIR Service Precautions

Caution: When you are performing service on or near the SIR components or the SIR wiring, you must disable the SIR system. Refer to Disabling the SIR System. Failure to follow the correct procedure could cause air bag deployment, personal injury, or unnecessary SIR system repairs.

The inflatable restraint sensing and diagnostic module (SDM) maintains a reserve energy supply. The reserve energy supply provides deployment power for the air bags. Deployment power is available for as much as 10 minutes after disconnecting the vehicle power by any of the following methods:

- You turn the ignition switch to the OFF position.
- You remove the fuse that provides power to the SDM.
- You disconnect the vehicle battery from the vehicle electrical system.

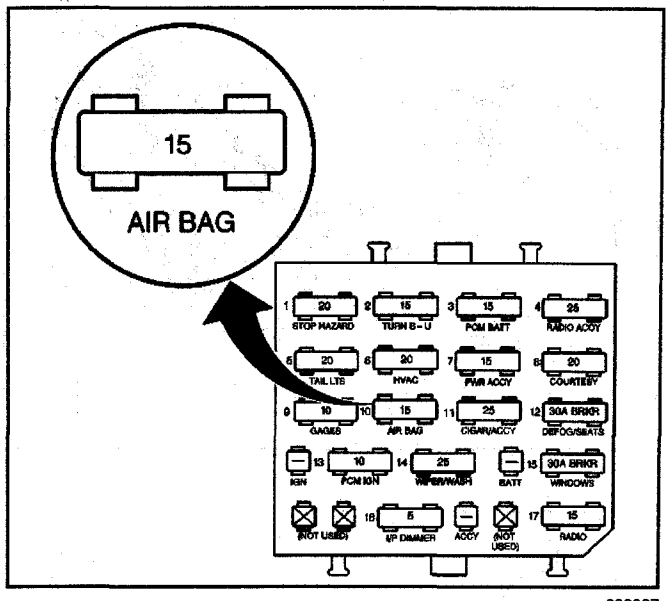
Disabling the SIR system prevents deploying of the air bags from the reserve energy supply power.

Disabling the SIR System

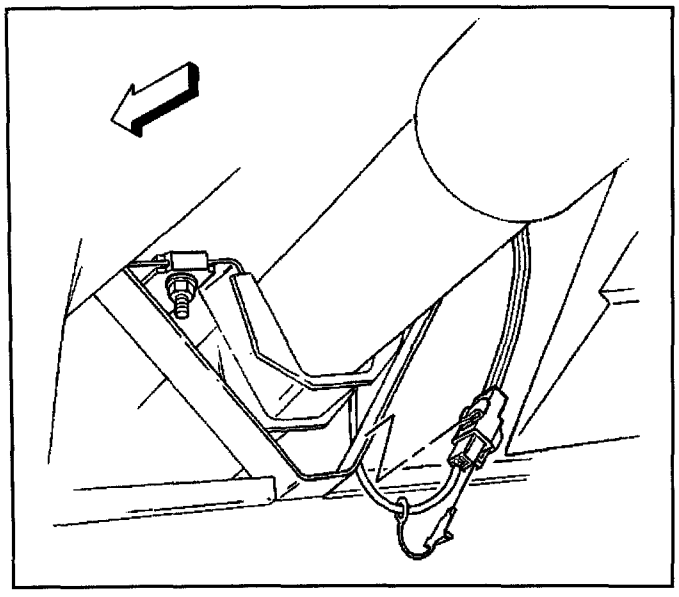
1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Remove the IP fuse block access door. Refer to Instrument Panel Fuse Block Access Door in Instrument Panel, Gauges and Console.

Important: With the AIR BAG Fuse removed and the ignition switch in the RUN position, The AIR BAG warning lamp illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Remove the AIR BAG Fuse from the IP fuse block.

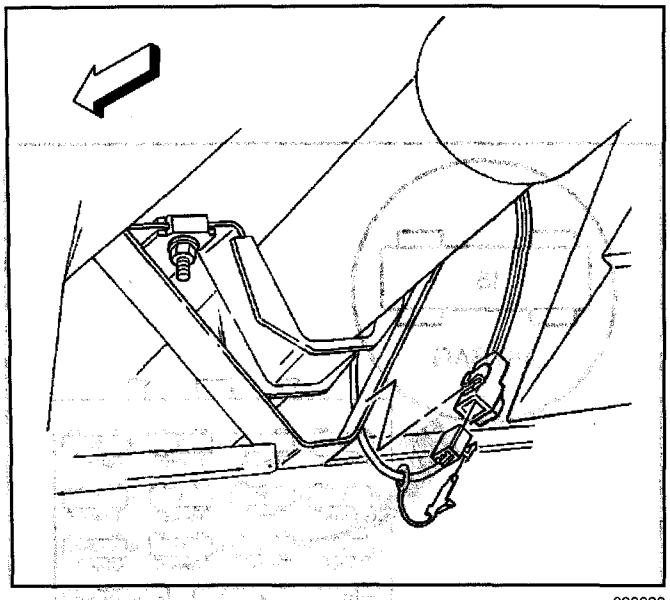


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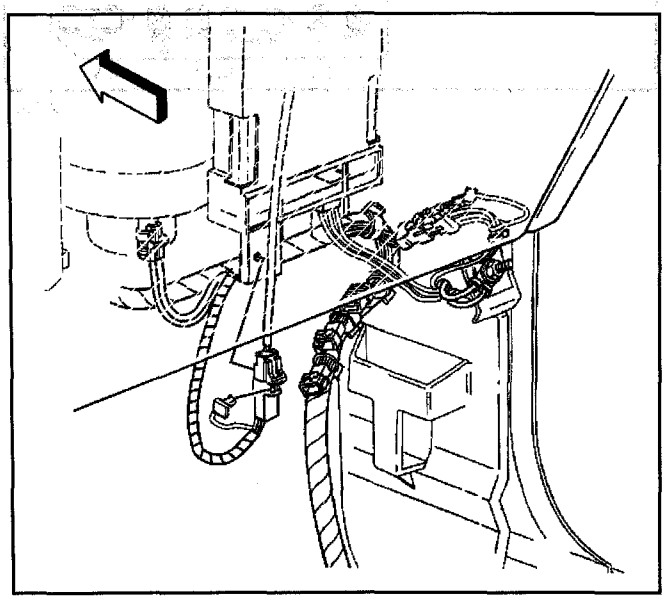
220928

6. Remove the left instrument panel insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.
7. Remove the Connector Position Assurance (CPA) from the driver yellow 2-way connector located at the base of the steering column.



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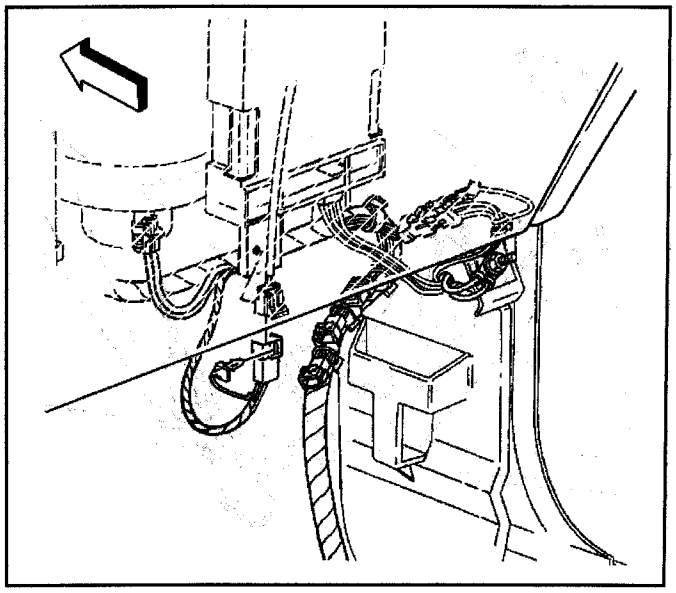
8. Disconnect the driver yellow 2-way connector located at the base of the steering column.



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9. Remove the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.
10. Remove the Connector Position Assurance (CPA) from the passenger yellow 2-way connector located behind the IP compartment door.

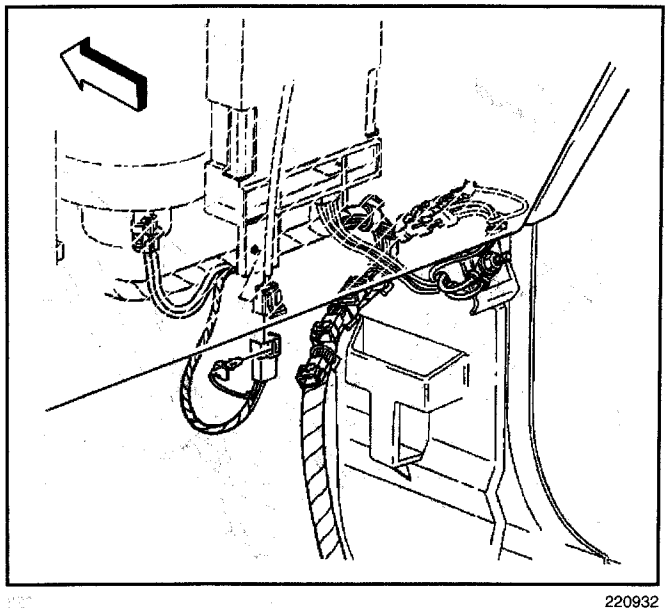
11. Disconnect the passenger yellow 2-way connector located behind the IP compartment door.



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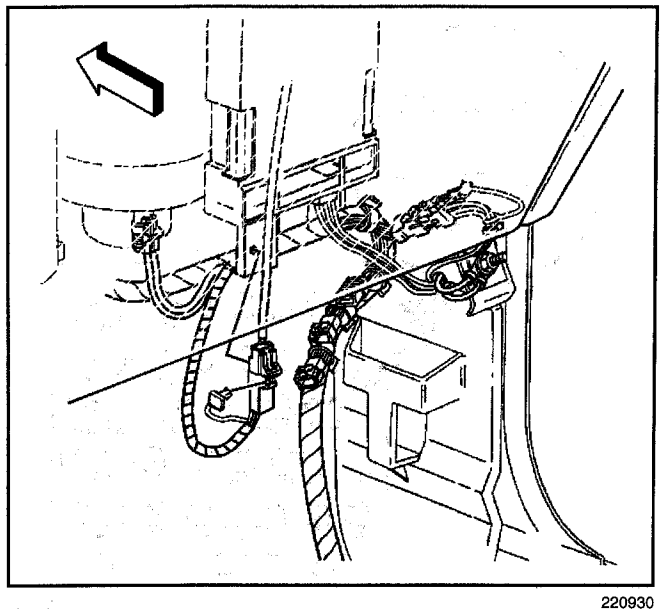
Enabling the SIR System

1. Remove the key from the ignition switch.
2. Connect the passenger yellow 2-way connector located behind the IP compartment.

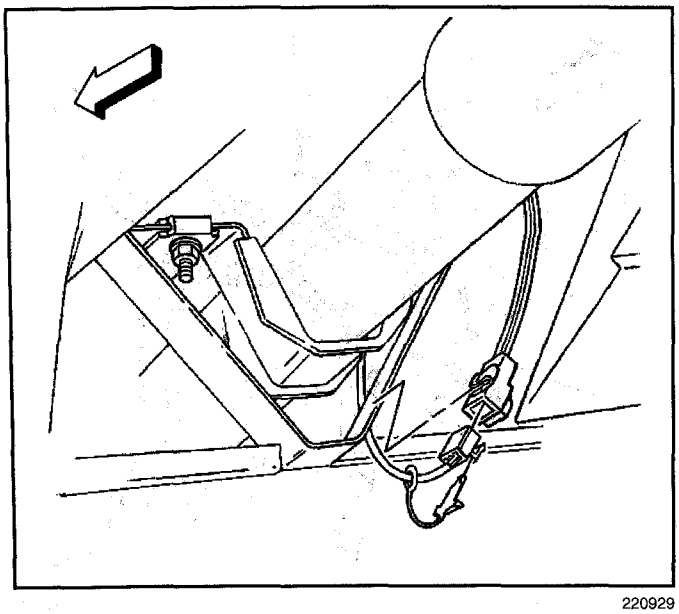


220932

3. Install the Connector Position Assurance (CPA) to the passenger yellow 2-way connector located behind the IP compartment door.
4. Install the right instrument panel insulator. Refer to *Insulator Replacement - IP (Right Side)* in Instrument Panel, Gauges and Console.

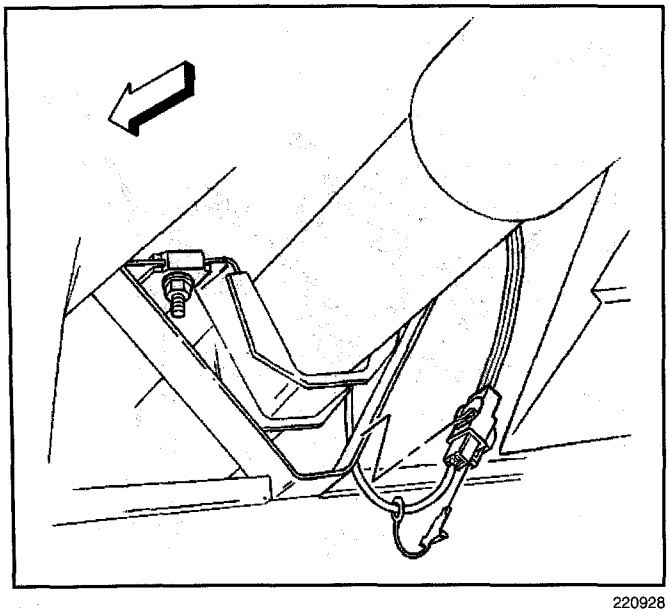


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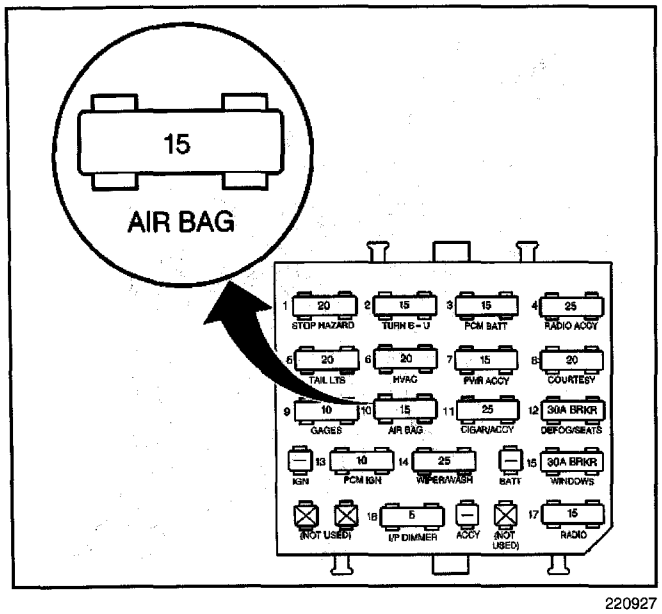
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5. Connect the driver yellow 2-way connector located at the base of the steering column.



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6. Install the Connector Position Assurance (CPA) to the driver yellow 2-way connector located at the base of the steering column.
7. Install the left instrument panel insulator. Refer to *Insulator Replacement - IP (Left Side)* in Instrument Panel, Gauges and Console.



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8. Install the AIR BAG fuse to the IP fuse block. Refer to *Fuse Block Details Schematics* in Wiring Systems.
9. Install the IP fuse block access door. Refer to Instrument Panel Fuse Block Access Door in Instrument Panel, Gauges and Console.
10. Staying well away from both air bags, turn the ignition switch to the RUN position.
    - 10.1. The AIR BAG warning lamp will flash seven times.
    - 10.2. The AIR BAG warning lamp will then turn OFF.
11. Perform the SIR Diagnostic System Check if the AIR BAG warning lamp does not operate as described.

General Service Instructions

- Do not expose the inflator modules to temperatures above 65°C (150°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Do not repair any of the following components. Service these components by replacement only.
  - The inflatable restraint sensing and diagnostic module (SDM).
  - The inflatable restraint IP (inflator) module.
  - The inflatable restraint steering wheel (inflator) module.
  - The inflatable restraint steering wheel module coil.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system.
- Discard any of the following components if it has been dropped from a height of 91 centimeters (3 feet) or greater. Do not install the component in a vehicle.
  - The inflatable restraint sensing and diagnostic module (SDM).
  - The inflatable restraint IP (inflator) module.
  - The inflatable restraint steering wheel (inflator) module.
  - The inflatable restraint steering wheel module coil.
- When you replace the SDM, verify that the following conditions are met:
  - The mounting surface is clean.
  - The arrow on the module points toward the front of the vehicle.
  - The module is flat on the mounting surface, parallel to the vehicle datum line.
  - The module fasteners are installed and tightened as specified.
- In order to avoid setting false diagnostic trouble codes, only apply power to the SIR system when one of the following two conditions is met:
  - All SIR system components are properly mounted and electrically connected.
  - A diagnostic procedure directs you to apply power.
- Begin diagnosis of malfunctions with the SIR Diagnostic System Check. Perform the SIR Diagnostic System Check in order to verify the following:
  - The proper operation of the AIR BAG warning lamp.
  - Communication with the SDM through the serial data line.
  - The presence or absence of diagnostic trouble codes.
  - Whether additional diagnosis is required and where the information resides.
- Not beginning with the SIR Diagnostic System Check could cause the following:
  - Extended diagnostic time.
  - Incorrect diagnosis.
  - Unneeded parts replacement.



Inflatable Restraint Sensing and Diagnostic Module Replacement

Caution: Be careful when you handle a sensing and diagnostic module (SDM). Do not strike or jolt the SDM. Before applying power to the SDM:

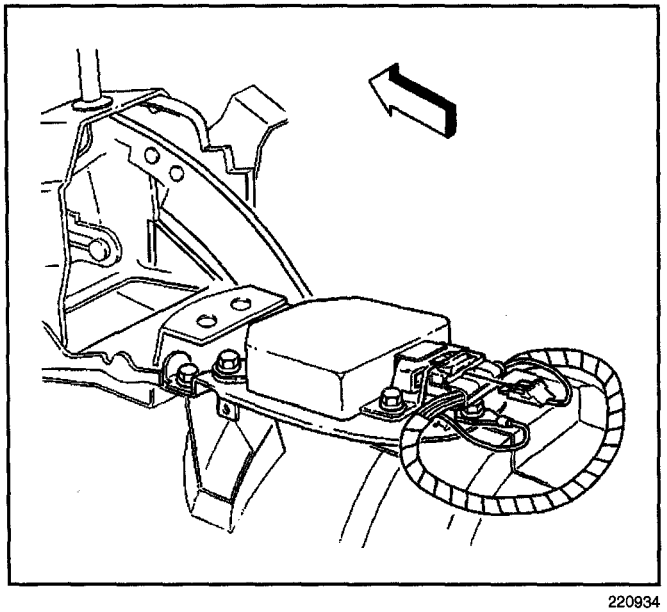
- ***Remove any dirt, grease, etc. from the mounting surface***
- ***Position the SDM horizontally on the mounting surface***
- ***Point the arrow on the SDM toward the front of the vehicle***
- ***Tighten all of the SDM fasteners and SDM bracket fasteners to the specified torque value***

Failure to follow the correct procedure could cause air bag deployment, personal injury, or unnecessary SIR system repairs.

Caution: If any water enters the vehicle's interior up to the level of the carpet or higher and soaks the carpet, the sensing and diagnostic module (SDM) and the SDM harness connector may need to be replaced. The SDM could be activated when powered, which could cause deployment of the air bag(s) and result in personal injury. Before attempting these procedures, the SIR system must be disabled. Refer to Disabling the SIR System in this section. With the ignition OFF, inspect the SDM mounting area, including the carpet. If any significant soaking or evidence of significant soaking is detected, you must perform the following steps:

- ***Remove all water.***
- ***Repair the water damage.***
- ***Replace the SDM harness connector.***
- ***Replace the SDM.***

Failure to follow these procedures could result in possible air bag deployment, personal injury, or otherwise unneeded SIR system repairs.

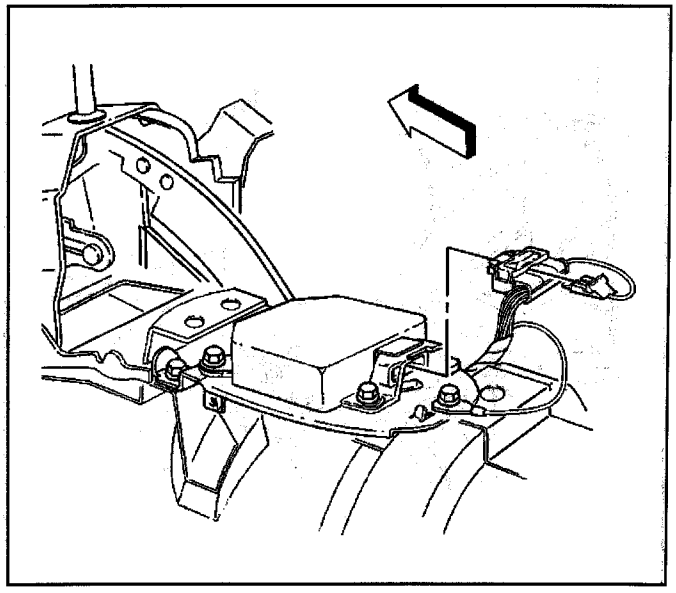


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Removal Procedure

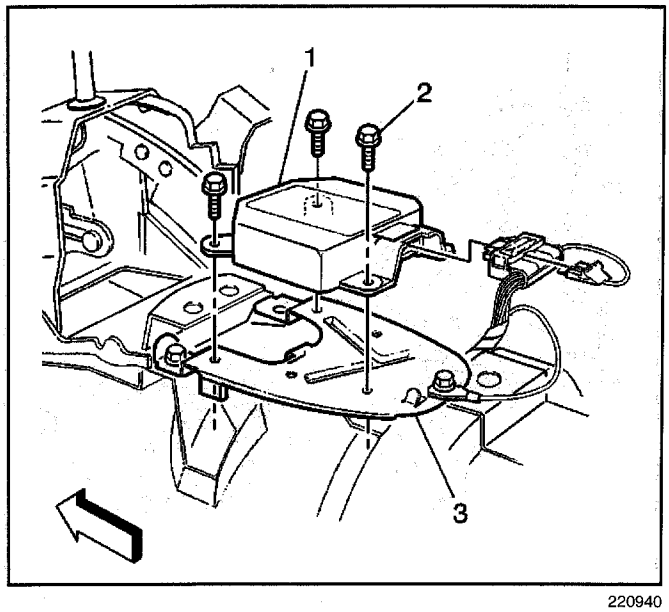
1. Disable the SIR system. Refer to *Disabling the SIR System.*
2. Remove the front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.
3. Remove the Connector Position Assurance (CPA) from the inflatable restraint Sensing and Diagnostic Module (SDM) harness connector.

4. Disconnect the SDM harness connector from the SDM.



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5. Remove the SDM mounting fasteners (2).
6. Remove the SDM (1) from the bracket (3).



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Installation Procedure

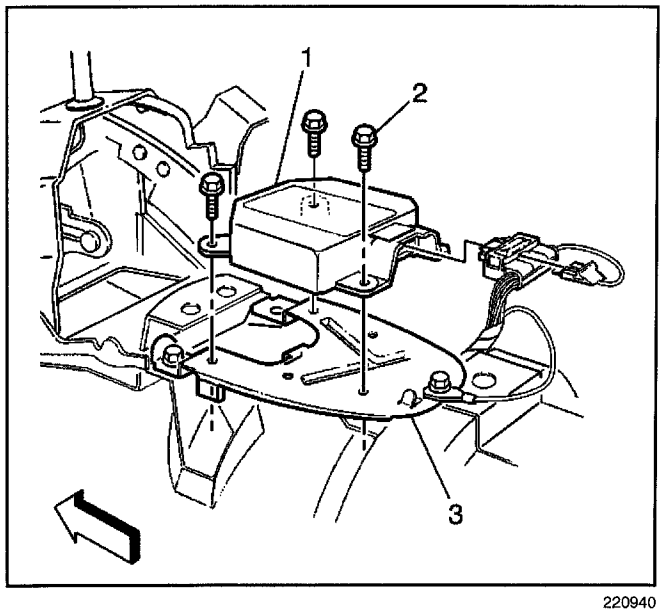
1. Install the SDM (1) to the bracket (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

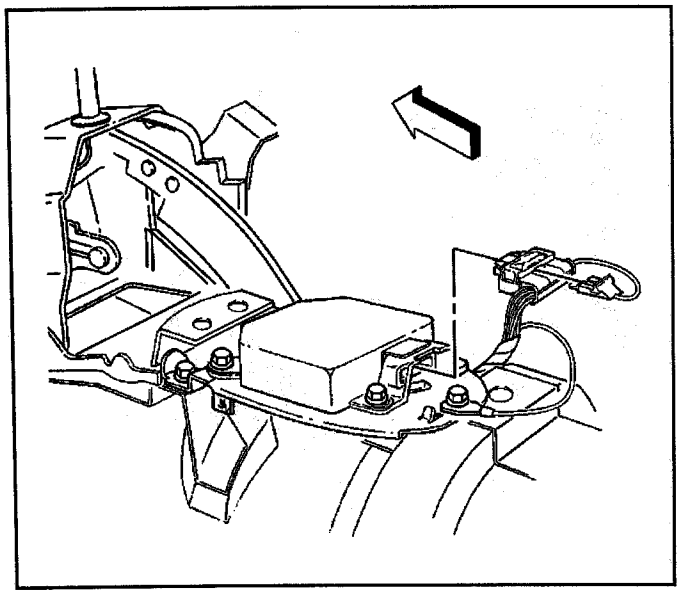
2. Install the SDM mounting fasteners (2).

   Tighten

   Tighten fasteners to 8 N·m (71 lb in).

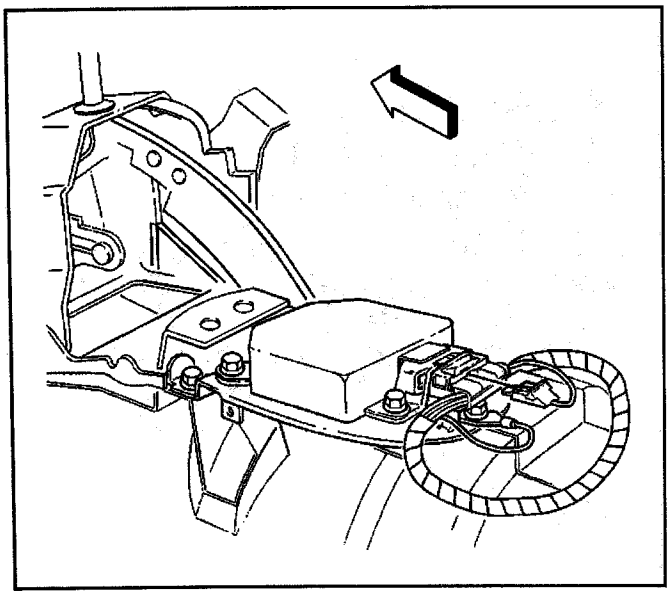


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3. Install the SDM harness connector to the SDM.



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4. Install the Connector Position Assurance (CPA) to the SDM harness connector.
5. Install the front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.
6. Enable the SIR system. Refer to *Enabling the SIR System.*

Inflatable Restraint Instrument Panel Module Replacement

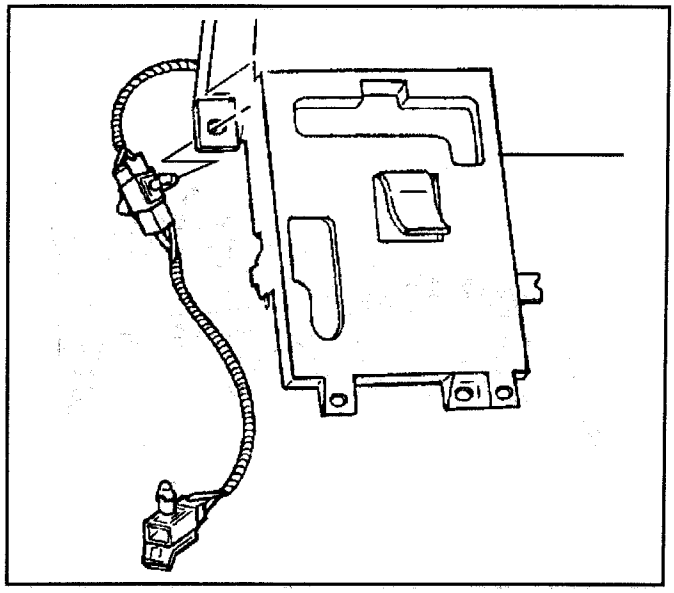
Caution: When you are carrying an undeployed inflator module:

- ***Do not carry the inflator module by the wires or connector on the inflator module***
- ***Make sure the bag opening points away from you***

When you are storing an undeployed inflator module, make sure the bag opening points away from the surface on which the inflator module rests. When you are storing a steering column, do not rest the column with the bag opening facing down and the column vertical. Provide free space for the air bag to expand in case of an accidental deployment. Otherwise, personal injury may result.

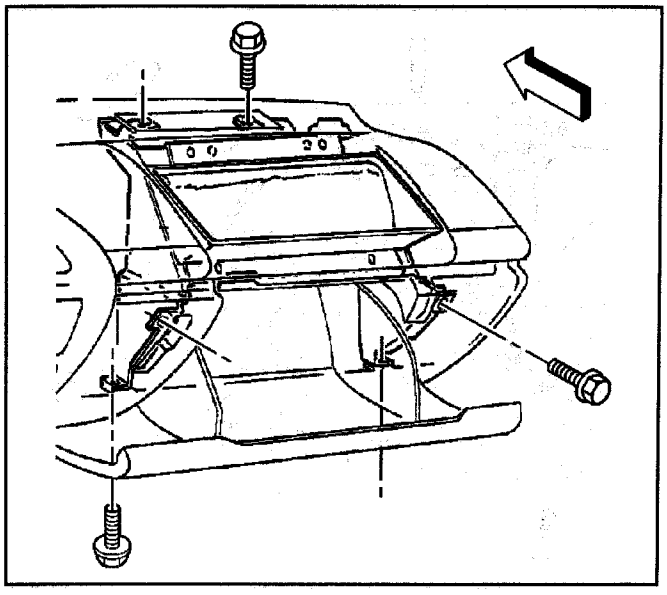
Removal Procedure

1. Disable the SIR system. Refer to *Disabling the SIR System.*
2. Remove the instrument panel carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
3. Disconnect the inflatable restraint IP module yellow 2-way pigtail connector from the SIR wiring harness jumper.



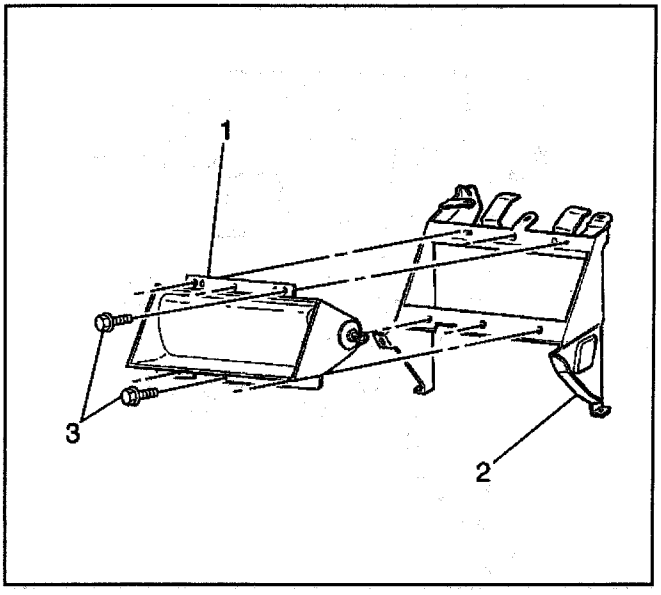
220945

4. Remove the inflatable restraint IP module bracket mounting fasteners (lower).
5. Remove the inflatable restraint IP module bracket mounting fasteners (upper).
6. Remove the inflatable restraint IP module bracket assembly from the IP carrier.

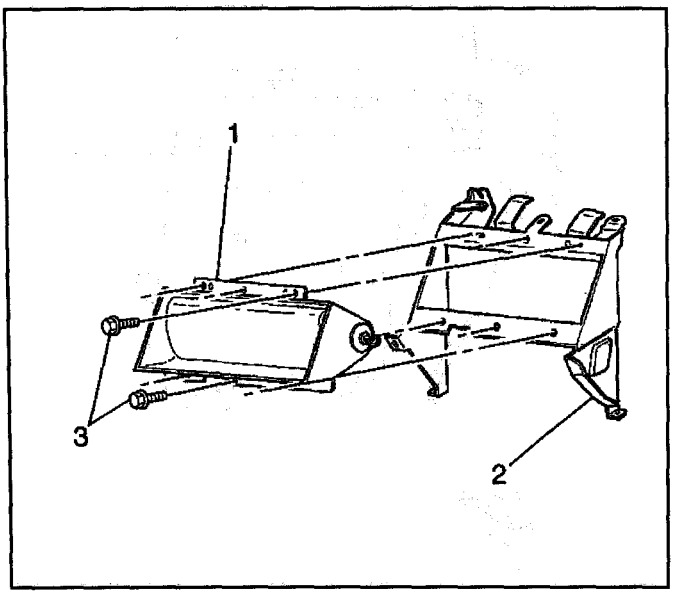


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7. Remove the inflatable restraint IP module mounting fasteners (3).
8. Remove the inflatable restraint IP module (1) from the bracket (2).



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220948

Installation Procedure

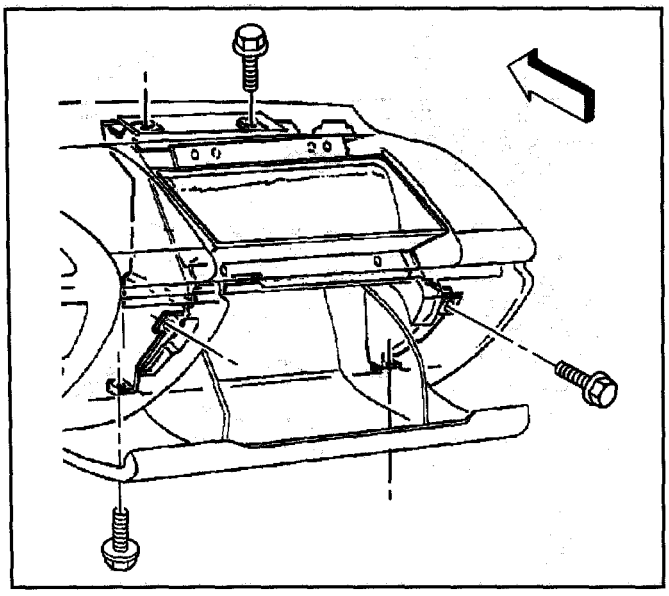
1. Install the inflatable restraint IP module (1) to the bracket (2).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the inflatable restraint IP module mounting fasteners (3).

   Tighten

   Tighten fasteners to 3.2 N·m (28 lb in).



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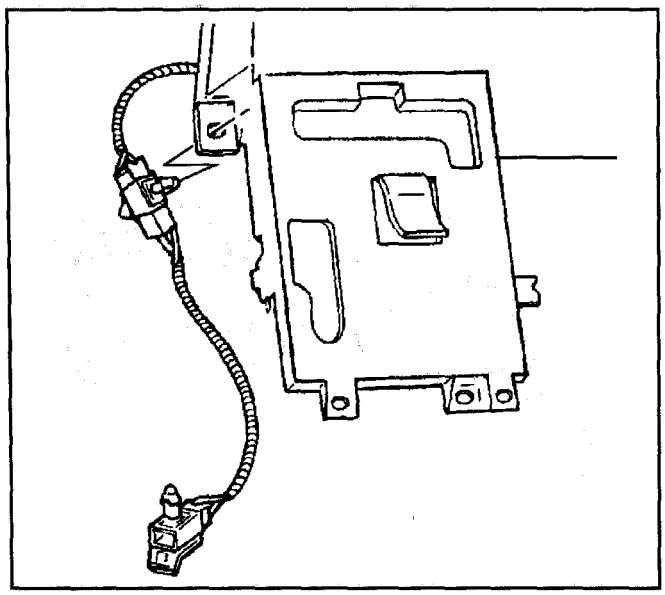
3. Install the inflatable restraint IP module bracket assembly to the IP carrier.
4. Install the inflatable restraint IP module bracket mounting fasteners (upper).

   Tighten

   Tighten fasteners to 6 N·m (53 lb in).
5. Install the inflatable restraint IP module bracket mounting fasteners (lower).

   Tighten

   Tighten fasteners to 2.8 N·m (25 lb in).



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6. Connect the inflatable restraint IP module yellow 2-way pigtail connector to the SIR wiring harness jumper.
7. Install the instrument panel carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
8. Enable the SIR system. Refer to *Enabling the SIR System.*

Infl Rst Steering Wheel Module Replacement

Refer to *Steering Wheel Inflator Module Replacement* in Steering Wheel and Column — Tilt for replacement of the inflatable restraint steering wheel module.

Inflatable Restraint Steering Wheel Module Coil Replacement

Refer to SIR Coil Assembly in Supplemental Inflatable Restraint (SIR) Tilt Steering Column Unit Repair for replacement of the inflatable restraint steering wheel module coil.

AIR BAG Warning Lamp Replacement

The AIR BAG warning lamp consists of Light Emitting Diodes (LEDs) in the instrument cluster. Refer to Instrument Cluster in Instrument Panel, Gauges and Console.

Wiring Repair

The supplemental inflatable restraint (SIR) system requires special wiring repair procedures due to the sensitive nature of the circuitry. Follow the specific procedures and instructions when working with the SIR system wiring, and the wiring components (such as connectors and terminals).

Important: Do not use the terminals in the kit in order to replace damaged SIR system terminals unless specifically indicated by the terminal package.

Tools Required

J 38125-B Terminal Repair Kit

The tool kit *J 38125-B* contains the following items:

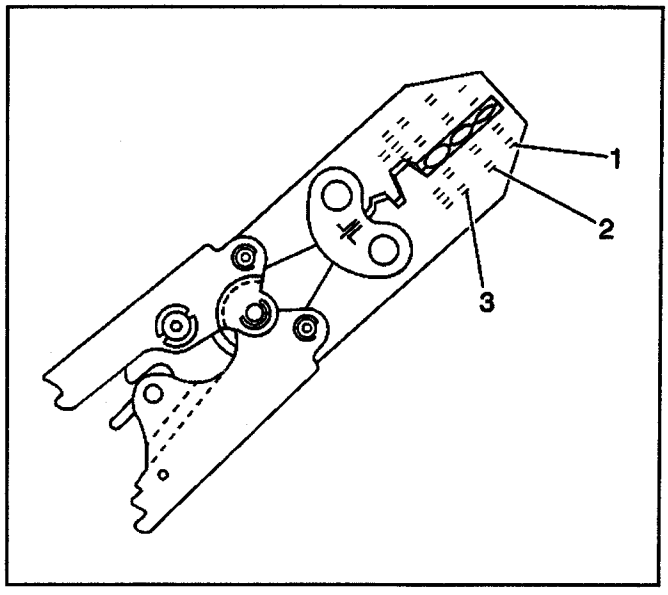
- Special sealed splices - in order to repair the SIR system wiring
- A wire stripping tool
- A special crimping tool
- A heat torch
- An instruction manual

The sealed splices has the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides necessary contact integrity for the sensitive, low energy circuits.

The *J 38125-B* also serves as a generic terminal repair kit. The kit contains the following items:

- A large sampling of common GM electrical terminals
- The correct tools in order to attach the terminals to wires
- The correct tools in order to remove the terminals from connectors



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SIR Connector (Plastic Body and Terminal Metal Pin) Repair

Use the connector repair assembly packs in order to repair the damaged SIR wire harness connectors and the terminals. Do not use the connector repair assembly pack in order to repair the pigtails. These kits include an instruction sheet and the sealed splices. Use the sealed splices in order to splice the new wires, connectors, and terminals to the harness. The splice crimping tool is color keyed in order to match the splices from the *J 38125-B*. You must use the splice crimping tool in order to apply these splices.

The terminals in the SIR system are made of a special metal. This metal provides the necessary contact integrity for the sensitive, low energy circuits. These terminals are only available in the connector repair assembly packs. Do not substitute any other terminals for those in the assembly packs.

If the individual terminals are damaged on the sensing and diagnostic module (SDM) harness connector, use 1 of the following 2 components in order to replace the SDM harness connector:

- The SDM harness connector pigtail assembly
- The SDM harness connector replacement kit

If the individual terminals are damaged on any other SIR connection, use the appropriate connector repair assembly pack in order to replace the entire connection. Replace the entire SIR wiring harness, if needed, in order to maintain SIR circuit integrity.

SIR Wire Pigtail Repair

Important: Do not make wire, connector, or terminal repairs on components with wire pigtails.

A wire pigtail is a wire or wires attached directly to the device (not by a connector). If a wiring pigtail is damaged, you must replace the entire component (with pigtail). The inflatable restraint steering wheel module coil is an example of a pigtail component.

SIR Wire Repair

Tools Required

J 38125-B Terminal Repair Kit

Important: Refer to *Wiring Repairs* in Wiring Systems in order to determine the correct wire size for the circuit you are repairing. You must obtain this information in order to ensure circuit integrity.

If any wire except the pigtail is damaged, repair the wire by splicing in a new section of wire of the same gauge size (0.5 mm, 0.8 mm, 1.0 mm etc.). Use the sealed splices and splice crimping tool from the *J 38125-B*. Use the following wiring repair procedures in order to ensure the integrity of the sealed splice.

Important: You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

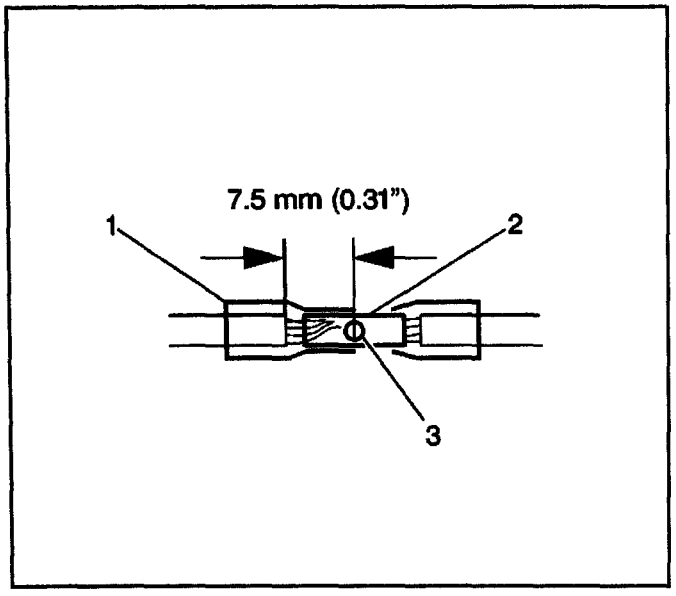
1. Open the harness by removing any tape:
   - Use a sewing seam ripper (available from sewing supply stores) in order to cut open the harness in order to avoid wire insulation damage.
   - Use the crimp and sealed splice sleeves on all types of insulation except tefzel and coaxial.
   - Do not use the crimp and sealed splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

   Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches, or connectors.
3. Strip the insulation:
   - When adding a length of wire to the existing harness, use the same size wire as the original wire.
   - Perform one of the following items in order to find the correct wire size:
     - Find the wire on the schematic and convert the metric size to the equivalent AWG size.
     - Use an AWG wire gauge.
     - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
   - Strip approximately 7.5 mm (0.313 in) of insulation from each wire to be spliced.
   - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
   - If the wire is damaged, repeat this procedure after removing the damaged section.
4. Select the proper sealed splice sleeve according to wire size.

   Refer to the following table for color coding of the splice sleeves, and the crimp tool nests.
5. Use the Splice Crimp Tool from the *J 38125-B* in order to position the splice sleeve in the proper color nest of the Splice Crimp Tool.

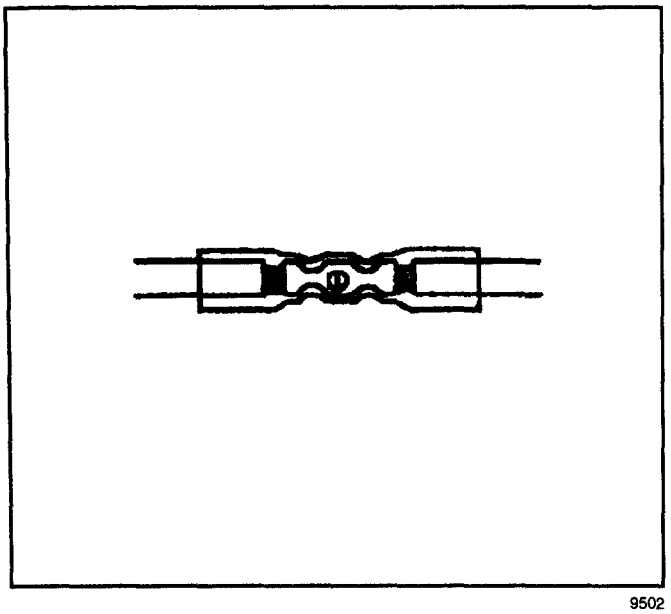
Crimp and Seal Splice Table

Splice Sleeve Color	Crimp Tool Nest Color	Wire Gauge mm^2 / (AWG)
Salmon (yellow-pink)	Red (1)	0.5–0.8 / (18–20)
Blue	Blue (2)	1.0–2.0 / (14–16)
Yellow	Yellow (3)	3.0–5.0 / (10–12)



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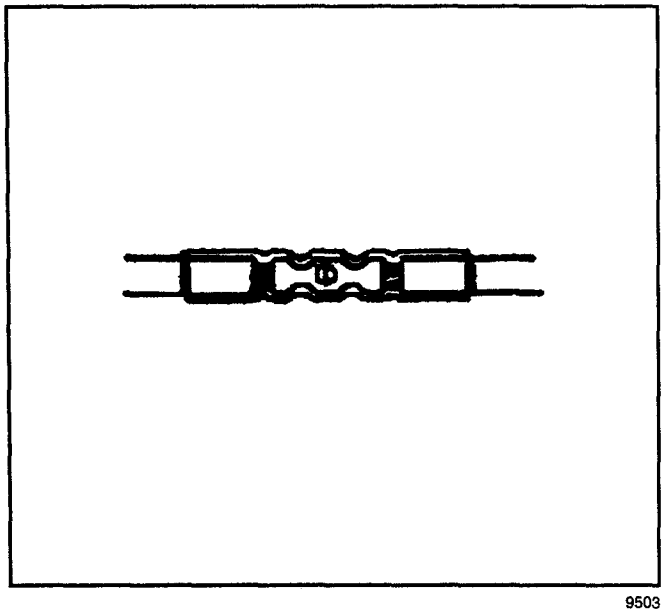
6. Place the splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the splice sleeve in the proper nest.



9502

7. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop.
8. Tightly close the handles of the crimp tool until the crimper handles open when released.

   The crimper handles will not open until you apply the proper amount of pressure to the splice sleeve. Repeat steps 4 and 5 for the opposite end of the splice.



9503

9. Using the heat torch, apply heat to the crimped area of the barrel.
10. Gradually move the heat barrel to the open end of the tubing:
    - The tubing will shrink completely as the heat is moved along the insulation.
    - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

SIR System Wire Splice Repair

Apply a new splice (not sealed) from the *J 38125-B* if damage occurs to any of the original equipment splices (3 wires or more) in the SIR wiring harness. Carefully follow the instructions included in the kit for proper splice clip application.

Connector Position Assurance (CPA)

The connector position assurance (CPA) is a small plastic insert that fits through the locking tabs of all the SIR system electrical connectors. The CPA ensures that the connector halves cannot vibrate apart. You must have the CPA in place in order to ensure good contact between the SIR mating terminals.

Terminal Position Assurance (TPA)

The terminal position assurance (TPA) insert resembles the plastic combs used in the control module connectors. The TPA keeps the terminal securely seated in the connector body. Do not remove the TPA from the connector body unless you remove a terminal for replacement.

Repairs and Inspections Required After an Accident

Accident With or Without Air Bag Deployment — Component Inspections

Caution: Proper operation of the Supplemental Inflatable Restraint (SIR) sensing system requires that any repairs to the vehicle structure return the vehicle structure to the original production configuration. Not properly repairing the vehicle structure could cause non-deployment of the air bag(s) in a frontal collision or deployment of the air bag(s) for conditions less severe than intended.

After any collision, inspect the following components as indicated. If you detect any damage, replace the component. If you detect any damage to the mounting points or mounting hardware, repair the component or replace the hardware as needed.

- Steering column — Perform the steering column accident damage checking procedures. Refer to *Steering Column Accident Damage - Off Vehicle* in Steering Wheel and Column — Tilt.
- IP Knee Bolsters — Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- IP brackets, braces, etc. — Inspect for bending, twisting, buckling, or any other type of damage.
- Seat Belts — Perform the seat belt operational and functional checks. Refer to *Seat Belt Checks* in Seat Belts.

Accident With Air Bag Deployment — Component Replacement and Inspections

After a collision involving air bag deployment, replace the following components. If you detect any damage to the mounting points or mounting hardware, repair or replace the mounting points and mounting hardware as needed.

- Inflatable restraint IP (inflator) module
- Inflatable restraint steering wheel (inflator) module
- Inflatable restraint Sensing and Diagnostic Module (SDM)

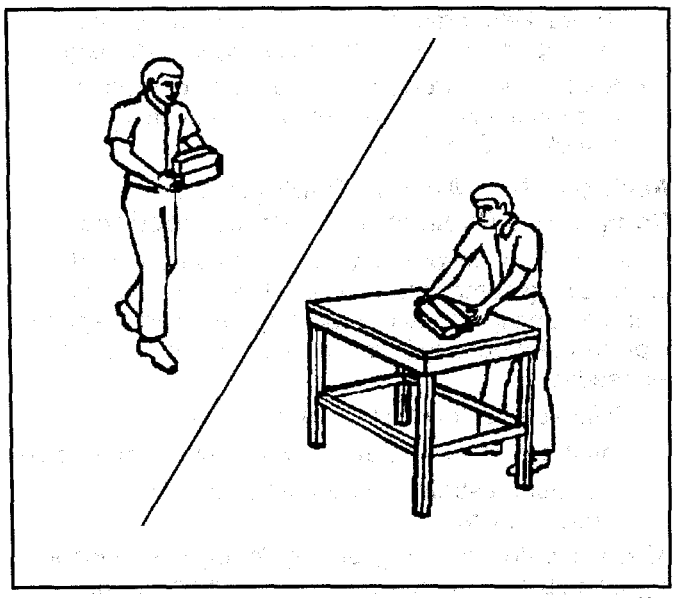
After a collision involving air bag deployment, inspect the Inflatable restraint steering wheel module coil and the coil wiring pigtail for melting, scorching, or other damage due to excessive heat. Perform this component inspection in addition to the inspections indicated above in Accident With or Without Air Bag Deployment. If you detect any damage, replace the component. If you detect any damage to the mounting points or mounting hardware, repair the component or replace the hardware as needed.

Sensor Replacement Guidelines

The SIR sensor replacement policy requires replacing sensors in the area of accident damage. The area of accident damage is defined as the portion of the vehicle which is crushed, bent, or damaged due to a collision. For example, a moderate collision where the front of the vehicle impacts a tree. If the vehicle has a SIR sensor mounted forward of the radiator, it must be replaced.

- Replace the sensor whether or not the air bags have deployed.
- Replace the sensor even if it appears to be undamaged.

Sensor damage which is not visible, such as slight bending of the mounting bracket or cuts in the wire insulation, can cause improper operation of the SIR sensing system. Do not try to determine whether the sensor is undamaged, replace the sensor. Also, if you follow a Diagnostic Trouble Code (DTC) table and a malfunctioning sensor is indicated, replace the sensor.



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Inflator Module Handling, Shipping, and Scrapping

Caution: When you are carrying an undeployed inflator module:

- ***Do not carry the inflator module by the wires or connector on the inflator module***
- ***Make sure the bag opening points away from you***

When you are storing an undeployed inflator module, make sure the bag opening points away from the surface on which the inflator module rests. When you are storing a steering column, do not rest the column with the bag opening facing down and the column vertical. Provide free space for the air bag to expand in case of an accidental deployment. Otherwise, personal injury may result.

Live (Undeployed) Inflator Module

Take special care when handling or storing a live (undeployed) inflator module. An air bag deployment produces rapid gas generation. This may cause the inflator module, or an object in front of the inflator module, to jettison through the air in the event of an unlikely deployment.

Shipping Procedures

Refer to the latest service bulletins for proper SIR inflator module shipping procedures.

Scrapping Procedure

During the course of a vehicle's useful life, certain situations may arise which will necessitate the disposal of a live (undeployed) inflator module. The following information covers the proper procedures for the disposing of a live inflator module. Deploy the inflator module before disposal. Do not dispose of the module through normal disposal channels.

Caution: In order to prevent accidental deployment of the air bag which could cause personal injury, do not dispose of an undeployed inflator module as normal shop waste. The undeployed inflator module contains substances that could cause severe illness or personal injury if the sealed container is damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to dispose of an inflator module as instructed may be a violation of federal, state, province, or local laws.

Do not deploy an air bag in the following situations:

- After replacement of an inflator module under warranty. The module may need to be returned undeployed to the Delphi Interior & Lighting Group. Refer to the latest service bulletin regarding SIR shipping procedures.
- If the vehicle is the subject of a Product Liability report related to the SIR system and is subject to a Preliminary Investigation (GM-1241). Do not alter the SIR system in any manner. Refer to the latest service bulletin on SIR shipping procedures.
- If the vehicle is involved in a campaign affecting the inflator modules. Follow the instructions in the Campaign Service Bulletin for proper SIR handling and shipping procedures.

Deployment Procedures

The inflator module can be deployed inside or outside of the vehicle. The method used depends upon the final disposition of the vehicle. Review the following procedures in order to determine which will work best in a given situation:

Deployment Outside Vehicle (Inflatable Restraint Steering Wheel Module)

Tools Required

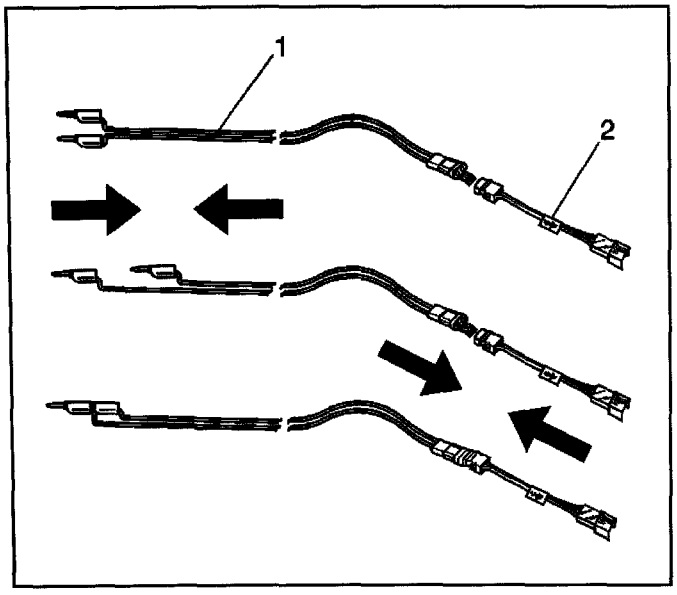
- *J 38826* SIR Deployment Harness
- An appropriate pigtail adapter

Caution: In order to prevent accidental deployment of the air bag which could cause personal injury, do not dispose of an undeployed inflator module as normal shop waste. The undeployed inflator module contains substances that could cause severe illness or personal injury if the sealed container is damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to dispose of an inflator module as instructed may be a violation of federal, state, province, or local laws.

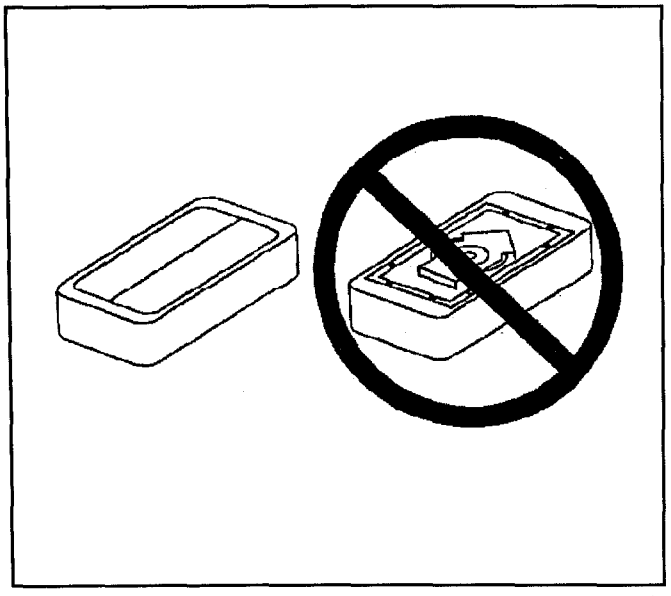
Caution: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

Deploy the inflatable restraint steering wheel inflator module outside of the vehicle when the vehicle will be returned to service. Situations that require deployment outside of the vehicle include the following:

- Using the SIR diagnostics, you determine that the inflator module does not function properly.
- The inflator module is scratched or ripped on the cover.
- The inflator module pigtail (if equipped) is damaged.
- The inflator module connector is damaged.
- An inflator module connector terminal is damaged.



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Deployment and disposal of a malfunctioning inflator module is subject to any required retention period.

1. Turn the ignition switch to the OFF position.
2. Remove the ignition key.
3. Put on safety glasses.
4. Inspect the *J 38826* and the appropriate pigtail adapter for damage. Replace as needed.
5. Short the two SIR deployment harness (1) leads together using one banana plug seated into the other.
6. Connect the appropriate pigtail adapter (2) to the SIR deployment harness (1).
7. Remove the inflatable restraint steering wheel module. Refer to Inflatable Restraint Steering Wheel Module Replacement.
8. Remove the horn lead from the back of the module, if equipped.
9. Remove the redundant steering wheel control leads from the back of the module, if equipped.
10. Remove all horn/steering wheel control buttons from the module, if equipped.

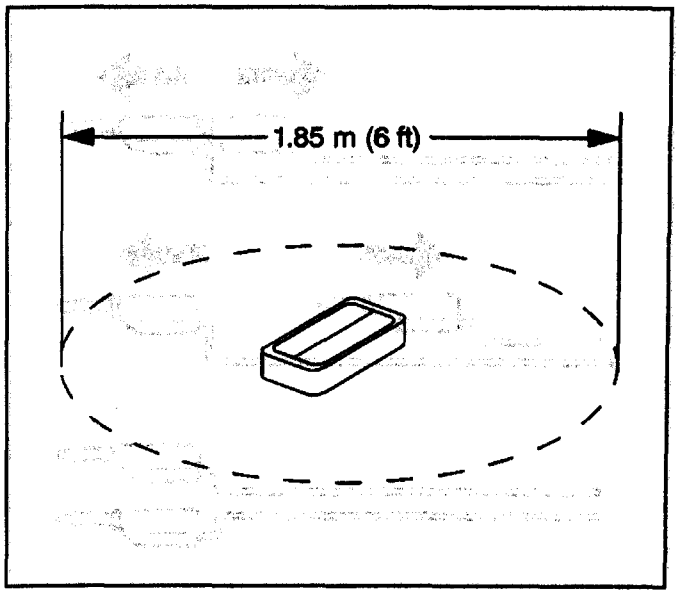
Caution: When you are carrying an undeployed inflator module:

- ***Do not carry the inflator module by the wires or connector on the inflator module***
- ***Make sure the bag opening points away from you***

When you are storing an undeployed inflator module, make sure the bag opening points away from the surface on which the inflator module rests. When you are storing a steering column, do not rest the column with the bag opening facing down and the column vertical. Provide free space for the air bag to expand in case of an accidental deployment. Otherwise, personal injury may result.

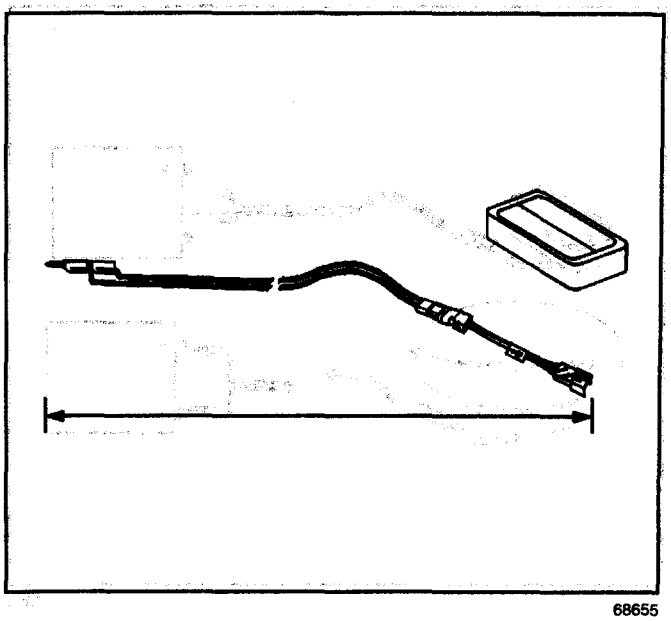
11. Place the module with the vinyl trim cover facing up and away from the surface on a work bench.

12. Clear a space on the ground about 1.85 M (6 ft) in diameter for deployment of the module. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.
13. Make sure no loose or flammable objects are in the area.
14. Place the module in the space with the vinyl trim cover facing up.

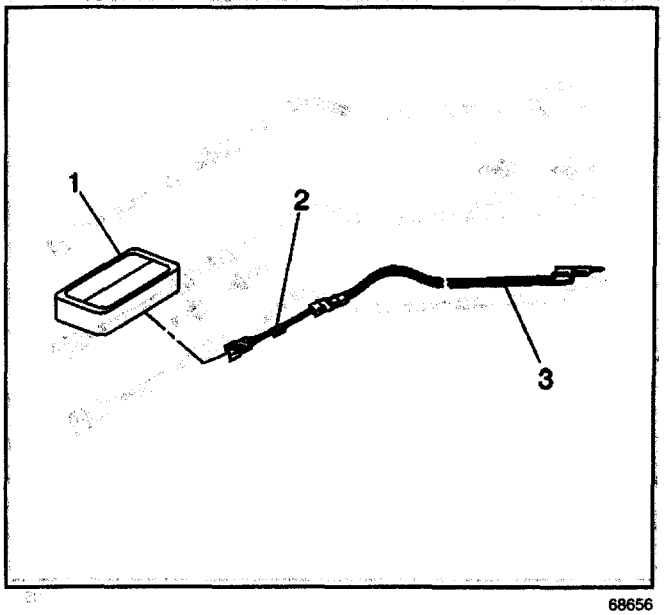


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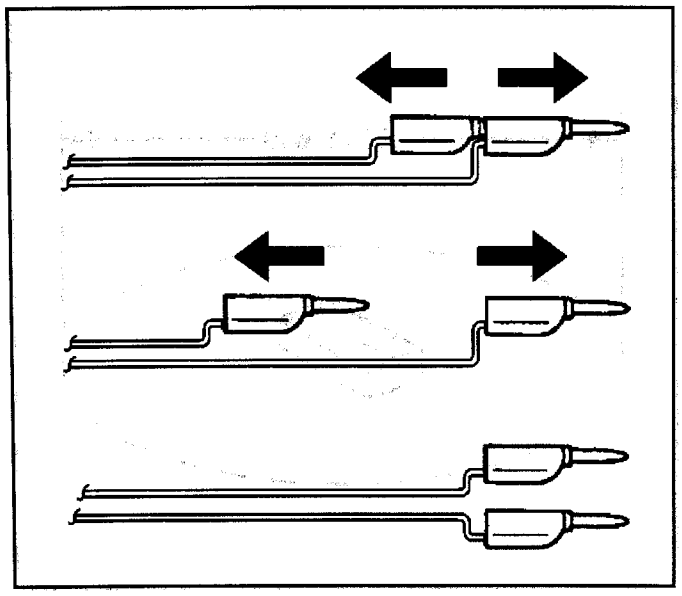
15. Extend the SIR deployment harness and adapter to full length from the module.
16. Place a 12V minimum/2A minimum power source (i.e., vehicle battery) near the shorted end of the harness.


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17. Connect the module (1) to the adapter (2) on the SIR deployment harness (3).
18. Firmly seat the adapter into the module connector.
19. Clear the area of people.



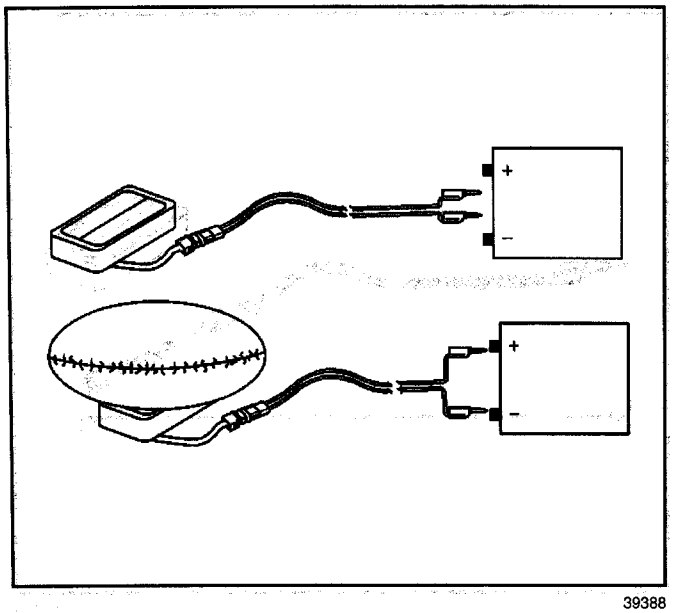
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Caution: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

20. Separate the two banana plugs on the SIR deployment harness.

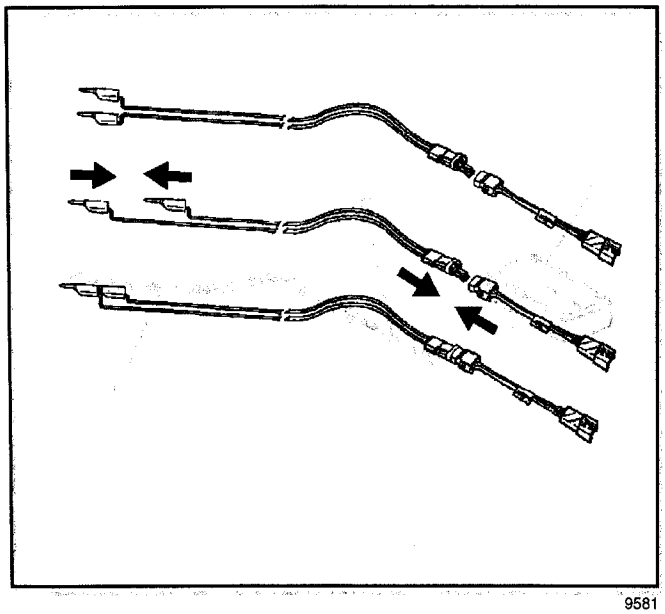


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Important: The rapid gas expansion involved with deploying an air bag is very loud. Notify all the people in the immediate area that you intend to deploy the inflator module

Important: When the air bag deploys, the inflator module may jump vertically. This is a normal reaction of the inflator module to the force of the rapid gas expansion inside the air bag.

21. Connect the SIR deployment harness wires to the power source.



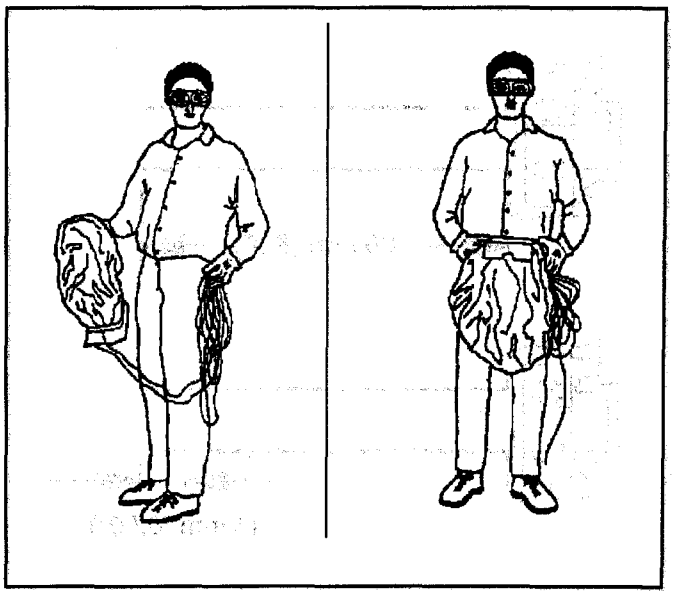
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22. Disconnect the SIR deployment harness from the power source after the air bag deploys.
23. Seat one banana plug into the other in order to short the deployment harness leads.
24. If the air bag did not deploy, disconnect the adapter and discontinue the procedure. Contact the Technical Assistance Group. Otherwise, proceed to the following steps.

Caution: After an air bag deploys, the metal surfaces of the inflator module are very hot. To help avoid a fire or personal injury:

- ***Allow sufficient time for cooling before touching any metal surface of the inflator module.***
- ***Do not place the deployed inflator module near any flammable objects.***

25. Put on a pair of shop gloves.
26. Disconnect the pigtail adapter from the inflator module as soon as possible.
27. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
28. Dispose of the deployed module through normal refuse channels.
29. Wash hands with a mild soap.



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Deployment Outside Vehicle (Inflatable Restraint IP Module)

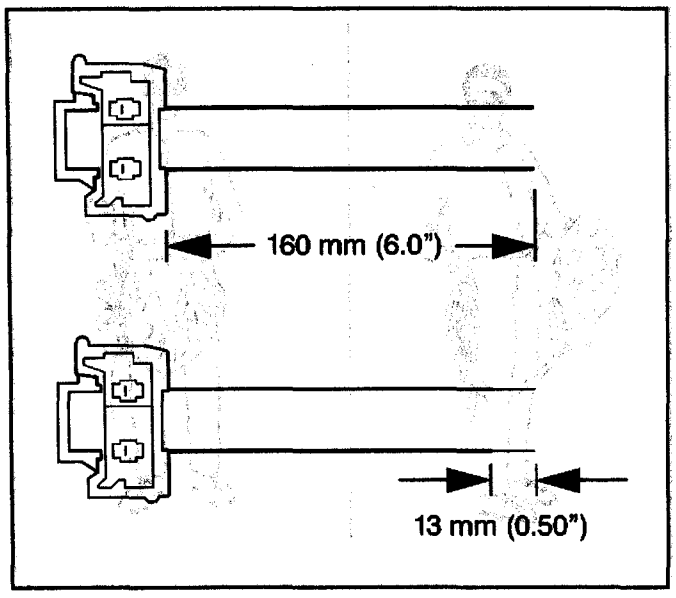
Dealers should refer to the latest General Motors Service Bulletins for live (undeployed) inflatable restraint IP module scrapping and disposal procedures. All others should contact a local General Motors dealer for these procedures. Dispose of deployed IP modules through normal refuse channels.

Deployment Inside Vehicle (Vehicle Scrapping Procedure)

Deploy the inflator modules inside of the vehicle when destroying the vehicle or when salvaging the vehicle for parts. This includes but is not limited to the following situations:

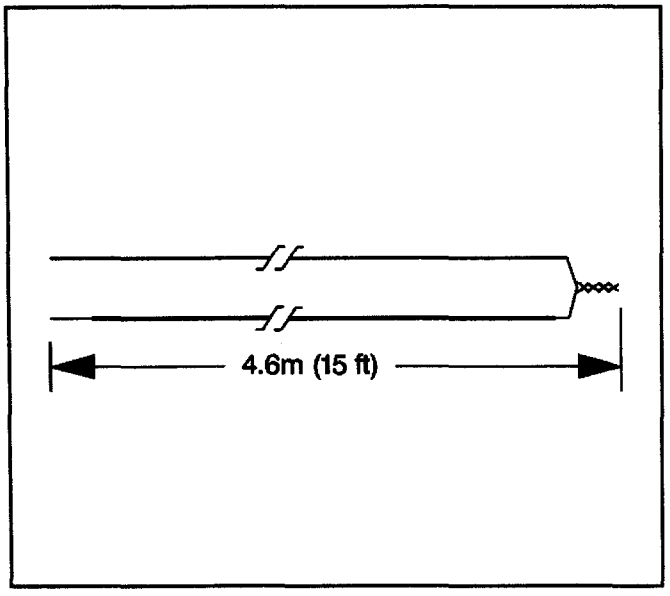
- The vehicle has completed its useful life.
- Irreparable damage occurs to the vehicle in a non-deployment type accident.
- Irreparable damage occurs to the vehicle during a theft.
- The vehicle is being salvaged for parts to be used on a vehicle with a different VIN as opposed to rebuilding as the same VIN.

Caution: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.



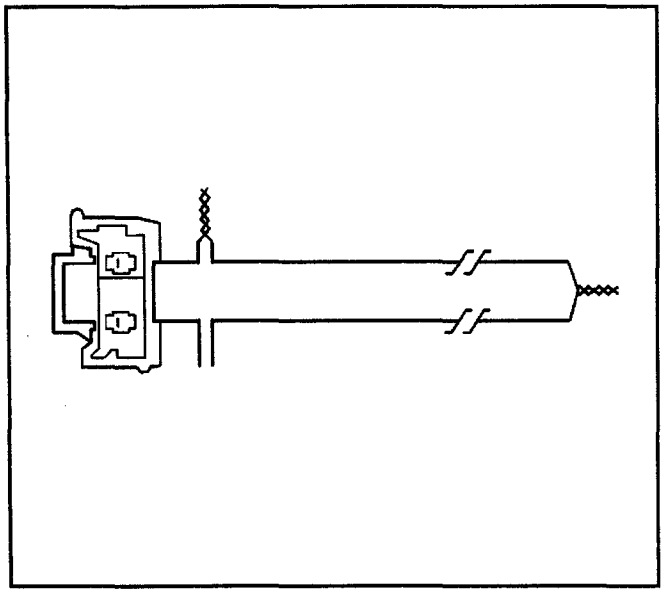
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1. Turn the ignition switch to the OFF position.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove all loose objects from the front seats.
5. Disconnect the inflatable restraint steering wheel module yellow 2-way connector.
6. Cut the yellow 2-way harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
7. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



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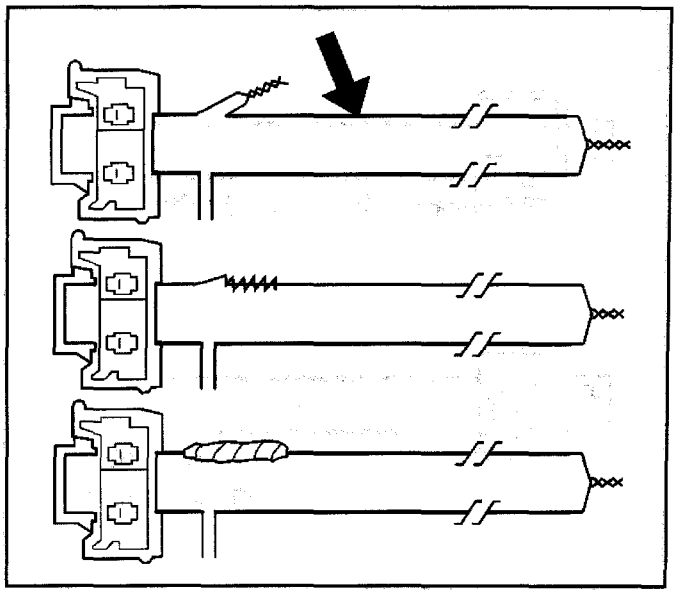
8. Cut two 4.6 M (15 ft) deployment wires from a 0.8 mm^2 (18 gage) or thicker multi-strand wire. Use these wires to fabricate the driver deployment harness.
9. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
10. Twist together one end from each of the wires in order to short the wires. Deployment wires shall remain shorted, and not connected to a power source until you are ready to deploy the air bag.



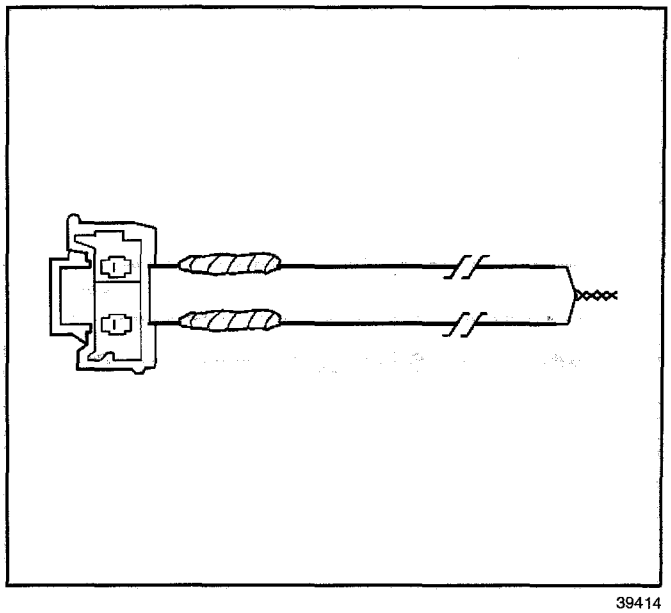
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11. Twist together one connector wire lead to one deployment wire.
12. Inspect that the previous connection is secure.

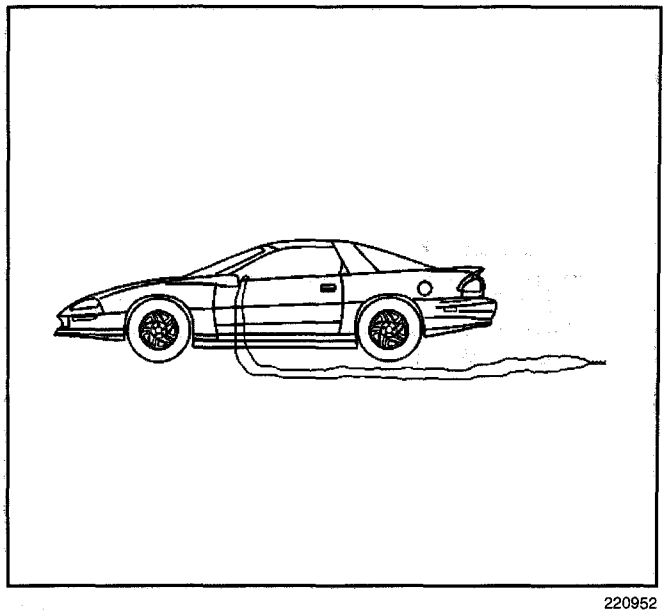
13. Bend flat the twisted connection.
14. Secure and insulate the connection using electrical tape.

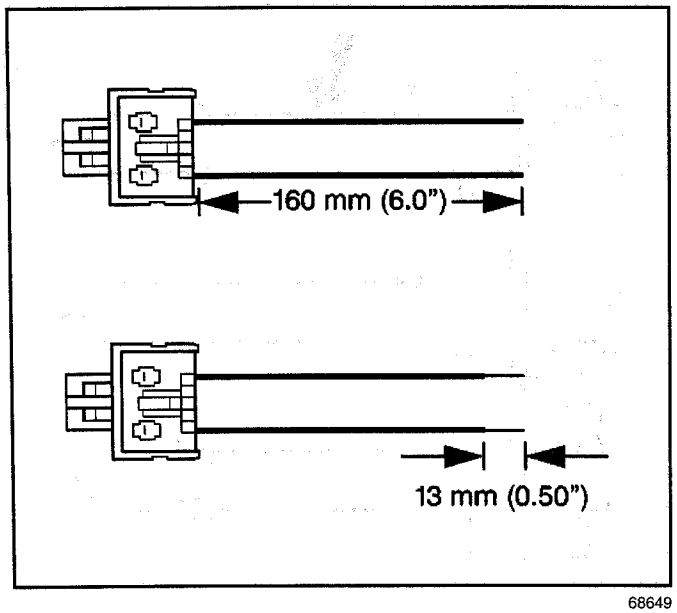

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15. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.
16. Connect the deployment harness to the inflatable restraint steering wheel module yellow 2-way connector.


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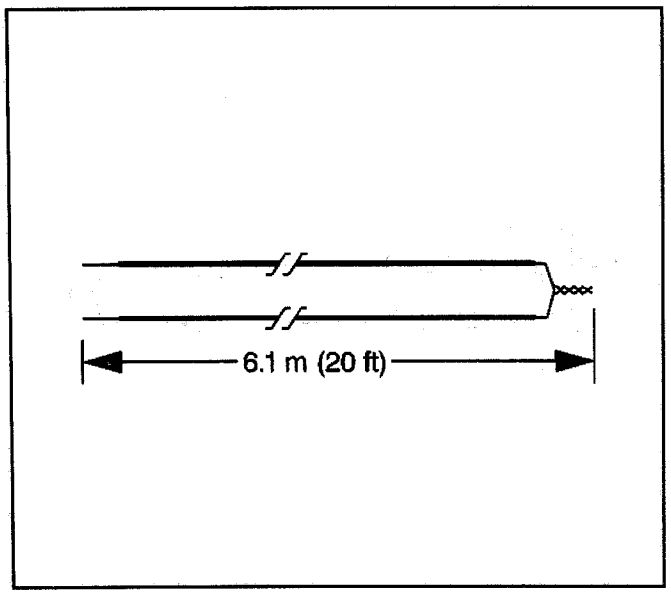
17. Route the deployment harness out of the vehicle's driver side.


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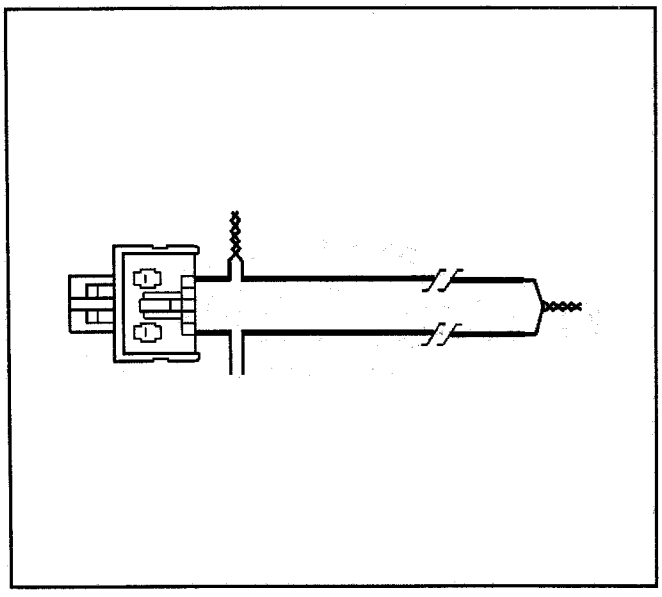
68649

18. Disconnect the inflatable restraint IP module yellow 2-way harness connector.
19. Cut the harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
20. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



68651

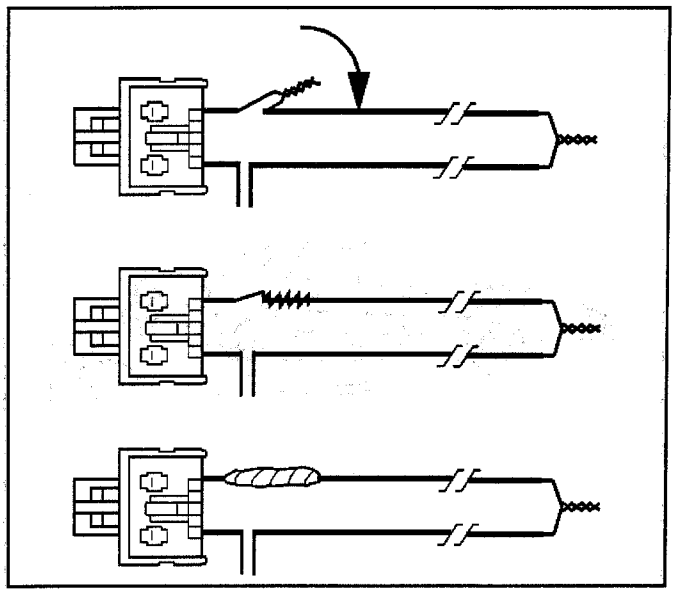
21. Cut two 6.1 M (20 ft) deployment wires from a 0.8 mm^2 (18 gage) or thicker multi-strand wire. These wires will be used to fabricate the passenger deployment harness.
22. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
23. Twist together one end from each of the wires in order to short the wires.



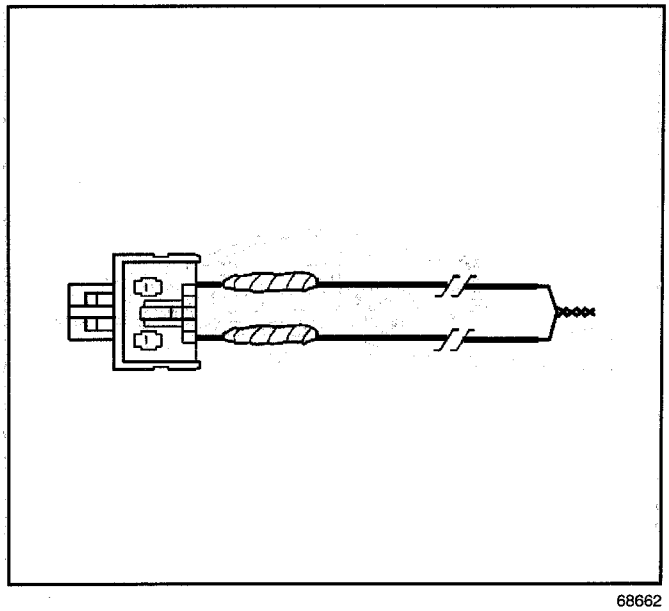
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24. Twist together one connector wire lead to one deployment wire.

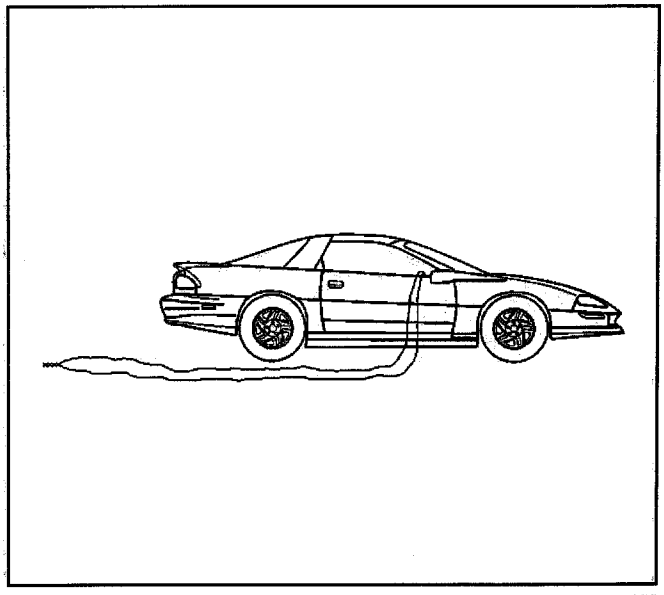
25. Bend flat the twisted connection.
26. Secure and insulate the connection using electrical tape.

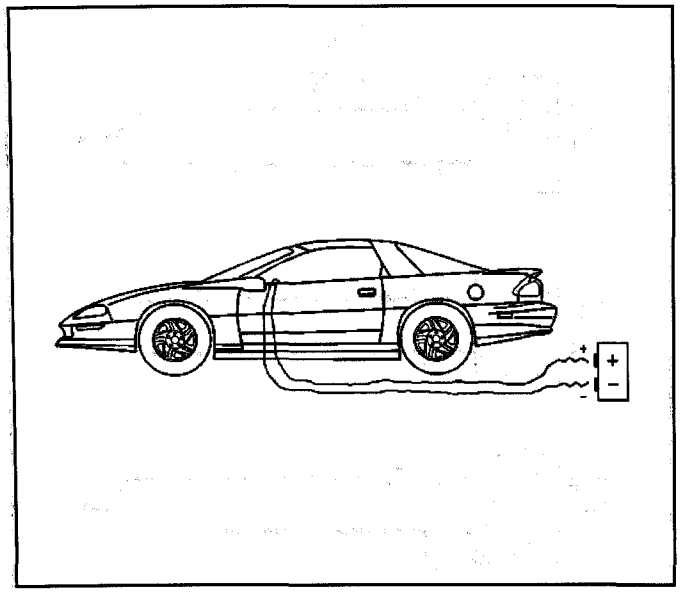

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27. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.
28. Connect the deployment harness to the inflatable restraint IP module yellow 2-way connector.


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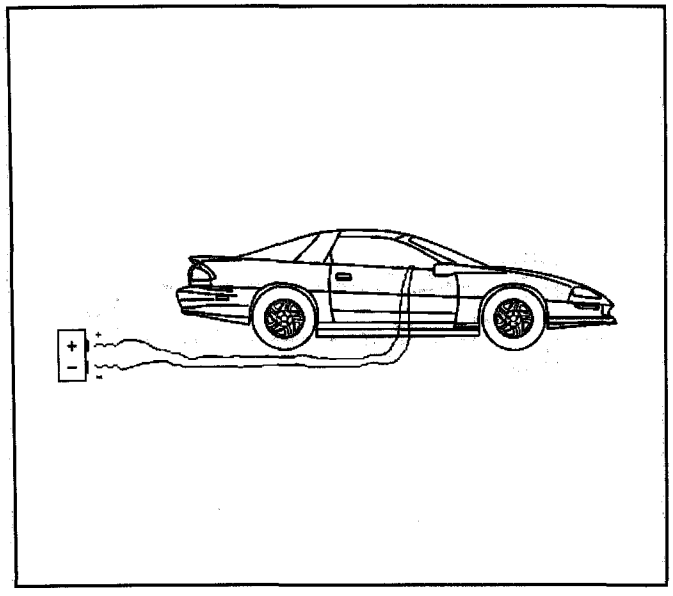
29. Route the deployment harness out of the passenger side of the vehicle.
30. Clear the inside and outside of the vehicle of any people or loose and flammable objects.
31. Stretch the driver harness to full length.
32. Stretch the passenger harness to full length.
33. Completely cover the windshield and front door window openings with a drop cloth.


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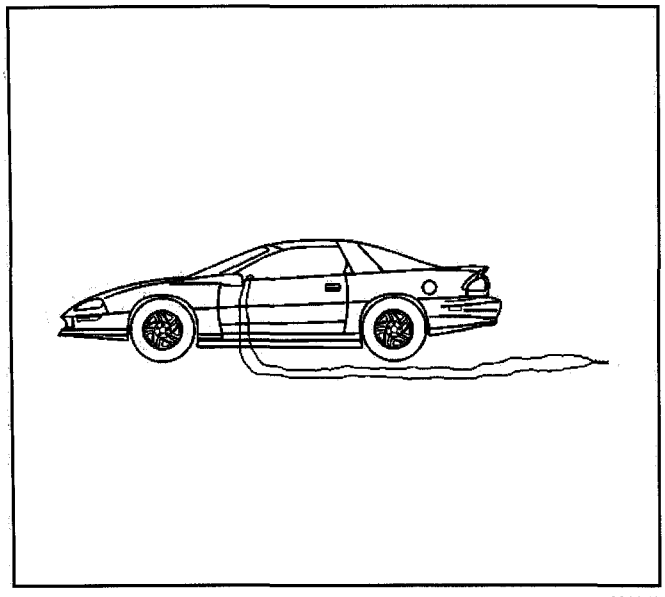
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34. Place a power source, 12V minimum/2A minimum (i.e., a vehicle battery) near the shorted end of the harness.
35. Separate the two ends of the driver deployment harness wires.
36. Connect the driver deployment harness wires to the power source in order to deploy the inflatable restraint steering wheel module.
37. Disconnect the driver deployment harness wires from the power source.



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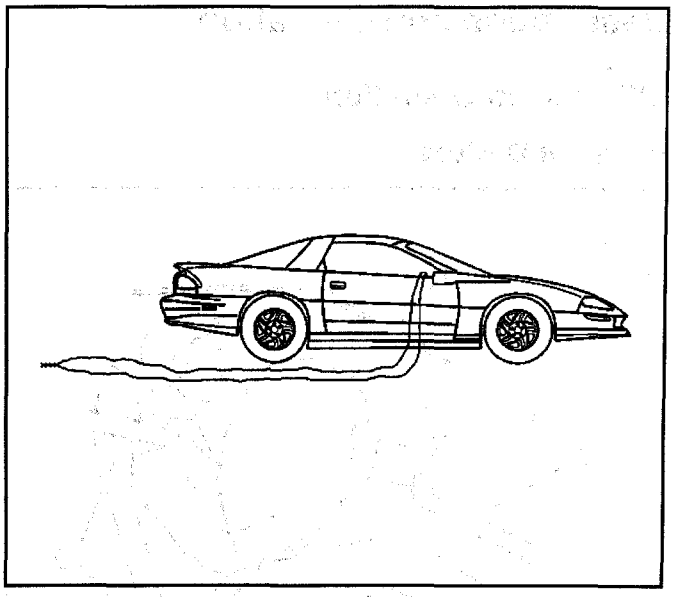
38. Separate the two ends of the passenger deployment harness wires.
39. Connect the passenger deployment harness wires to the power source in order to deploy the inflatable restraint IP module.
40. Disconnect the passenger deployment harness wires from the power source.



220952

41. Twist together one end of each wire on the driver deployment harness in order to short the wires.

42. Twist together one end of each wire on the passenger deployment harness in order to short the wires.
43. Remove the drop cloth from the vehicle.
44. Disconnect both harnesses from the vehicle.
45. Discard the harnesses.
46. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
47. If one or both of the modules did not deploy, perform the following steps:
    47.1. Remove the undeployed module(s) from the vehicle. Refer to *Steering Wheel Inflator Module Replacement* in Steering Wheel and Column — Tilt and *Inflatable Restraint Instrument Panel Module Replacement.*
    47.2. Temporarily store the module(s).
    47.3. Call the Technical Assistance Group for further assistance.



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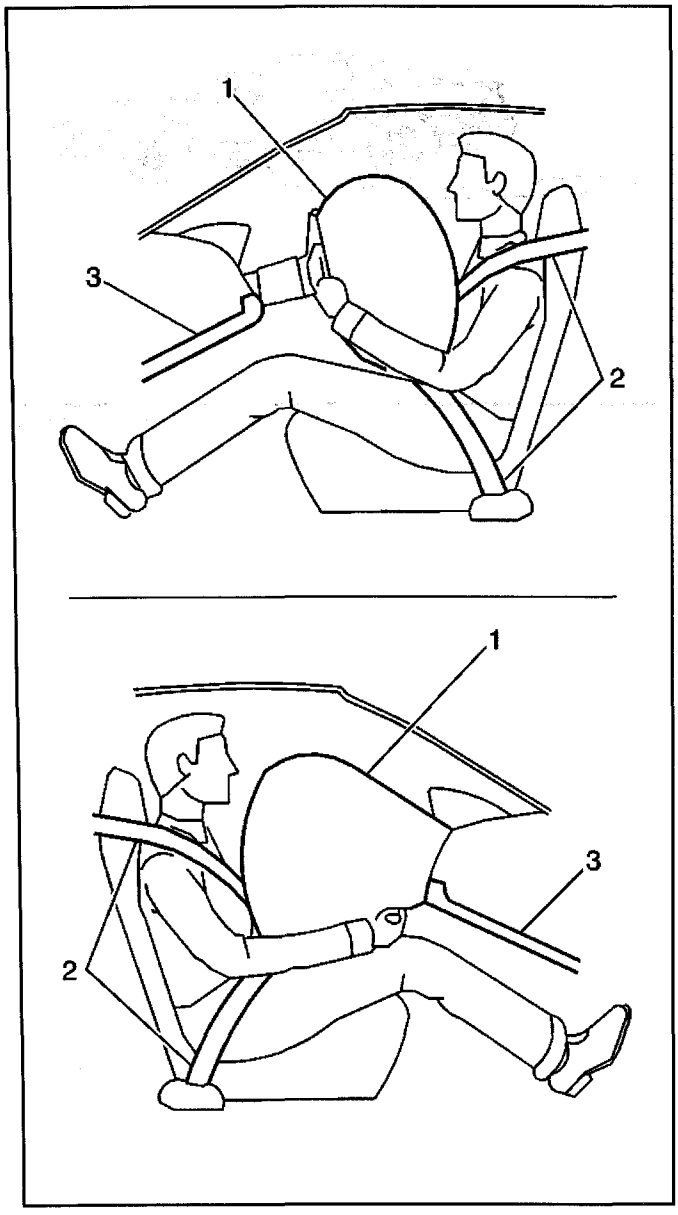
Handling a Deployed Inflator Module

After the inflator module has deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of cornstarch (used to lubricate the bag as it inflates), and by-products of the chemical reaction. The deployment reaction produces sodium hydroxide dust (similar to lye soap). The sodium hydroxide quickly reacts with the atmospheric moisture. This atmospheric moisture converts the sodium hydroxide into sodium carbonate and sodium bicarbonate (baking soda). Therefore, you will probably find no sodium hydroxide present after the deployment. Gloves and safety glasses are recommended, however, as a precaution. Gloves and safety glasses help to prevent possible irritation of the skin or eyes.

Description and Operation

SIR System Operation

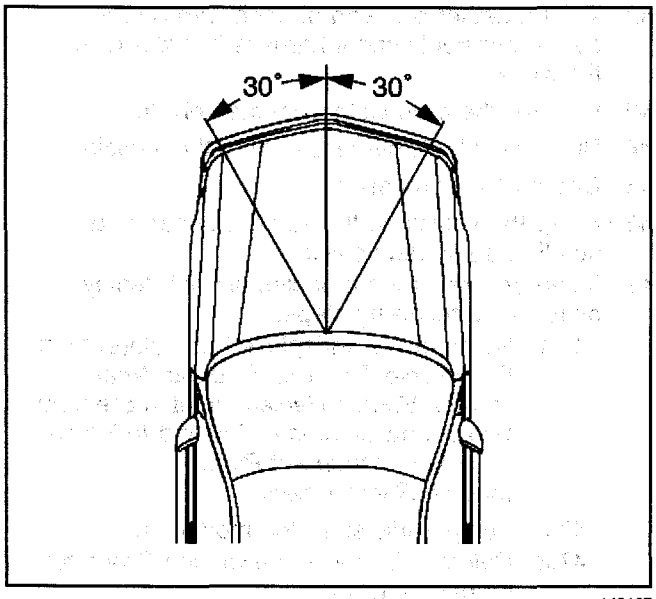
Restraint Devices



68681

The Supplemental Inflatable Restraint (SIR) system supplements the protection offered by the driver and front passenger seat belts (2). The SIR system deploys an air bag (1) from the center of the steering wheel and from the right side of the instrument panel.

The knee bolsters (3) and the steering column absorb crash energy. The driver and passenger knee bolsters are below the instrument panel.



143167

A frontal crash of sufficient force up to 30 degrees off the centerline of the vehicle will deploy the air bags.

System Description

The SIR system consists of the following components:

- Inflatable Restraint Sensing and Diagnostic Module (SDM)
- Inflatable Restraint Steering Wheel Module
- Inflatable Restraint Steering Wheel Module Coil
- Inflatable Restraint IP Module
- AIR BAG warning lamp in the instrument cluster

The inflatable restraint Sensing and Diagnostic Module (SDM), inflatable restraint steering wheel module coil (SIR coil assembly), inflatable restraint steering wheel module (driver inflator module), inflatable restraint IP module (passenger inflator module), and connector wires make up the deployment loops. The function of the deployment loops is to supply current through the inflator modules, which will cause deployment of the air bags. Deployment occurs when the SDM detects vehicle velocity changes severe enough to warrant deployment.

The SDM contains a sensing device (Accelerometer) that converts vehicle velocity changes to an electrical signal. The SDM compares this electrical signal to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to values stored in memory. When two of the generated signals exceed the stored values, the SDM will cause current to flow through the inflator modules, deploying the air bags.

SIR System Component Description and Definitions

Inflatable Restraint Sensing and Diagnostic Module

The inflatable restraint Sensing and Diagnostic Module (SDM) performs the following functions in the SIR system:

- Energy Reserve — The SDM maintains 23 Volt Loop Reserve (23 VLR) energy supplies to provide deployment energy. Ignition voltage can provide deployment energy if the 23 Volt Loop Reserves malfunction.
- Frontal Crash Detection — The SDM monitors vehicle velocity changes to detect frontal crashes that are severe enough to warrant deployment.
- Air Bag Deployment — During a frontal crash of sufficient force, the SDM will cause enough current to flow through the inflator modules to deploy the air bags.
- Frontal Crash Recording — The SDM records information regarding the SIR system status during a frontal crash.
- Malfunction Detection — The SDM performs diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a Diagnostic Trouble Code (DTC).
- Malfunction Diagnosis — The SDM displays SIR Diagnostic Trouble Codes and system status information through the use of a scan tool.
- Driver Notification — The SDM warns the vehicle driver of SIR system malfunctions by controlling the AIR BAG warning lamp.

The SDM connects to the SIR wiring harness using a 12-way connector. The SDM harness connector uses a shorting bar across certain terminals in the contact area. Removal of the SDM Connector Position Assurance (CPA) or the harness connector itself will connect the AIR BAG warning lamp to ground through the shorting bar.

The AIR BAG warning lamp will come ON steady with power applied to the SDM when either one of the following two conditions exist:

- You remove the SDM CPA.
- You disconnect the SDM harness connector.

The SDM receives power whenever the ignition switch is in the RUN or START positions.

AIR BAG Warning Lamp

The ignition switch applies ignition voltage to the AIR BAG warning lamp. The AIR BAG warning lamp receives power whenever the ignition switch is at the RUN or START positions. The inflatable restraint Sensing and Diagnostic Module (SDM) controls the lamp by providing ground with a lamp driver. The SIR system uses the AIR BAG warning lamp to do the following:

- Verify lamp and SDM operation by flashing the lamp seven times when the ignition switch is first turned to the RUN position.
- When lit, alerts the driver of electrical system malfunctions that could affect the operation of the SIR system. Certain malfunctions can result in:
  - Deployment of the air bag(s) without a crash;
  - Non-deployment of the air bag(s) in the event of a crash; or
  - Deployment of the air bag(s) for conditions less severe than intended.

The AIR BAG warning lamp is the key to driver notification of SIR system malfunctions. Refer to the *SIR Diagnostic System Check*. Check for proper lamp operation.

Inflatable Restraint Steering Wheel Module Coil

The inflatable restraint steering wheel module coil consists of two or more current-carrying coils. The inflatable restraint steering wheel module coil attaches to the steering column. Two of the current-carrying coils allow rotation of the steering wheel while maintaining continuous contact of the driver deployment loop to the inflatable restraint steering wheel module.

There is a shorting bar on the yellow 2-way connector near the base of the steering column that connects the inflatable restraint steering wheel module coil to the SIR wiring harness. The shorting bar shorts the circuits to the inflatable restraint steering wheel module coil and inflatable restraint steering wheel module during the disconnection of the yellow 2-way connector. The shorting of the inflatable restraint steering wheel module coil and inflatable restraint steering wheel module circuitry will help prevent unwanted deployment of the air bag when servicing the steering column or other SIR system components.

Inflator Modules

The inflator modules consist of an inflatable bag and an inflator. An inflator consists of a canister of gas-generating material and an initiating device. The initiator is part of the deployment loop. When the vehicle is in a frontal crash of sufficient force, the inflatable restraint Sensing and Diagnostic Module (SDM) causes current to flow through the deployment loops. Current passing through the initiator ignites the material in the inflator module. The gas produced from this reaction rapidly inflates the air bag.

There is a shorting bar on the inflatable restraint steering wheel module side of the upper steering column connector that connects the inflatable restraint steering wheel module coil to the inflatable restraint steering wheel module. The shorting bar shorts across the inflatable restraint steering wheel module circuits during the disconnection of the upper steering column connector. The shorting of the inflatable restraint steering wheel module circuitry will help prevent unwanted deployment of the air bag when servicing the inflatable restraint steering wheel module, the steering column or other SIR system components.

There is a shorting bar on the inflatable restraint IP module connector that connects to the SIR wiring harness. The shorting bar shorts across the inflatable restraint IP module circuits during the disconnection of the inflatable restraint IP module connector. The shorting of the inflatable restraint IP module circuitry will help prevent unwanted deployment of the air bag when servicing the inflatable restraint IP module, the instrument panel or other SIR system components.

Steering Column

The steering column is energy absorbing. The steering column can compress during a frontal crash in order to decrease the chance of injury to the driver.

Knee Bolster

The knee bolsters absorb energy and control the forward movement of the vehicle's front seat occupants during a frontal crash, by limiting leg movement.

Definitions

Air Bag: An inflatable cloth cushion designed to deploy in certain frontal crashes. The air bags distribute the impact load more evenly over the occupant's head and torso in order to supplement the safety belt protection.

Asynchronous: An event that can occur at any time without a warning and without falling within a defined time period.

B+: The battery voltage available at the time of the indicated measurement. With the ignition in ON and the engine stopped, the voltage is usually 11.5–12.5V. With the engine at idle, the voltage may be 14.0–16.0V. During engine cranking, the voltage can be as low as 10.0V.

Bulb Test: The inflatable restraint Sensing and Diagnostic Module (SDM) will cause the air bag warning indicator to flash 7 time . Under normal operation, this occurs when the ignition is turned from OFF to ON. The bulb test will also occur if the IGNITION 1 voltage exceeds 17.1V or drops below 8.2V and then returns within the normal operating voltage range. A malfunction could prevent the module from flashing the indicator.

Continuous Monitoring Test: The inflatable restraint Sensing and Diagnostic Module (SDM) continuously monitors the SIR system during each 100 millisecond interval. The IGNITION 1 voltage at the module must be with the normal operating voltage range for the continuous monitoring to occur. These tests follow the power-on tests.

Data Link Connector (DLC): The DLC electrically connects to many on-board computers and allows communication with an off-board computer such as a scan tool.

Datum Line: A base line parallel to the plane of the vehicle underbody or the frame. All vertical measurements originate from this base line.

Deploy: To inflate the air bag.

Deployment Loop Continuity Test: The inflatable restraint Sensing and Diagnostic Module (SDM) performs this test in order to inspect for voltage variations in the DRIVER SIDE HIGH/LOW and the PASSENGER SIDE HIGH/LOW circuitry. The module first measures the IGNITION 1 and the 23 VLR in order to verify that the voltage is within specifications. The module then performs the deployment loop continuity test. Detection of a malfunction during these tests may prevent the resistance measurement test from occurring until the next ignition cycle. This test is part of the power-on tests and occurs before the continuous monitoring tests.

Deployment Loops: The circuits that supply the current to the inflator modules for air bag deployment.

Diagnostic Trouble Code (DTC): An alphanumeric designator used by the inflatable restraint Sensing and Diagnostic Module (SDM) in order to indicate specific SIR system malfunctions.

Driver Current Sink: An output of the inflatable restraint Sensing and Diagnostic Module (SDM) that supplies a low resistance path to ground for the inflatable restraint steering wheel module circuit.

Driver Current Source: An output of the inflatable restraint Sensing and Diagnostic Module (SDM) that supplies current into the inflatable restraint steering wheel module circuit.

EEPROM (Electrically Erasable Programmable Read Only Memory): Memory that does not require power to the inflatable restraint Sensing and Diagnostic Module (SDM) in order to retain its contents.

Higher Priority Fault: Each DTC has an assigned priority based on its detectability with other DTCs present. The priority corresponds to the detectability of the malfunction only. This does not relate to the seriousness of the malfunction with respect to deployment or non deployment under any given condition.

Ignition Cycle: The operation of the ignition switch causes this cycle to occur. The inflatable restraint Sensing and Diagnostic Module (SDM) must first sense IGNITION 1 input greater than 8.2V with the ignition switch in ON. The IGNITION 1 input voltage must remain above 8.2V for at least 10 seconds before turning the ignition switch to OFF.

Ignition 1: A B+ circuit receiving power with the ignition in ON or START.

Inflatable Restraint Front End Discriminating Sensor: A sensor mounted on the front of the vehicle that supplies an input signal to the inflatable restraint Sensing and Diagnostic Module (SDM).

Inflatable Restraint I/P Module: An assembly located on the RH of the I/P consisting of an inflatable air bag, an inflator, and an initiator.

Inflatable Restraint Sensing and Diagnostic Module: The SDM that provides reserve energy to the deployment loops, deploys the air bags when required, and performs diagnostic monitoring of all SIR system components.

Inflatable Restraint Steering Wheel Module: An assembly located in the steering wheel hub consisting of an inflatable bag, an inflator, and an initiator.

Inflatable Restraint Steering Wheel Module Coil: An assembly of two or more current carrying coils mounted within the steering column hub. The assembly allows the rotation of the steering wheel while maintaining continuous electrical circuit contact. Two of the coils provide continuous contact of the driver deployment loop to the inflatable restraint steering wheel module.

Initiator: Located in the inflator module, the initiator initiates the chemical reaction that inflates the air bag when sufficient current flows through the component.

Normal Operating Voltage Range: 8.2–17.1V when measuring between the inflatable restraint Sensing and Diagnostic Module (SDM) IGNITION 1 terminal and ground.

Passenger Current Sink: An output of the inflatable restraint Sensing and Diagnostic Module (SDM) that supplies a low resistance path to ground for the inflatable restraint I/P module circuit.

Passenger Current Source: An output of the inflatable restraint Sensing and Diagnostic Module (SDM) that supplies current into the inflatable restraint I/P module circuit.

Power-on Test: Tests that the inflatable restraint Sensing and Diagnostic Module (SDM) performs on the SIR system once per ignition cycle. These tests occur immediately after the module receives IGNITION 1 voltage, and before the continuous monitoring tests.

Resistance Measurement Test: A test that the inflatable restraint Sensing and Diagnostic Module (SDM) performs once per ignition cycle in order to measure the resistance of the deployment loops. The module first measures IGNITION 1, 23 VLR, and the deployment loop voltages in order to verify readings within specifications. The module then sources a constant current into the loop. The module measures the voltage drop across the loop and converts the value to a resistance value. This resistance value is within the range of 0.0–6.3 ohms. Upon the detection of an open circuit, the module aborts the tests in order to prevent the calculation of the resistances until the next ignition cycle. This test also checks for proper operation of the driver/passenger current sources. This test is part of the power-on tests and occurs before the continuous monitoring tests.

Scan Tool: An off-board computer that reads on-board computer diagnostic information through the use of a DLC.

Serial Data: The information communicated to an off-board computer using the DLC. Some of this data represents the status of the SIR system.

SIR: Supplemental inflatable restraint.

SIR Wiring Harness: The wires and connectors that electrically connect the components in the SIR system.

23 VLR: The 23 volt loop reserve. The energy supply that is internal to the inflatable restraint Sensing and Diagnostic Module (SDM).

Special Tools Description

J 38125-B Terminal Repair Kit

Use the J 38125-B Terminal Repair Kit for SIR wiring repair. This kit contains a special crimping tool, heat torch, and sealed splices. Do not use the terminals in the kit in order to replace damaged SIR system terminals unless specifically indicated by the terminal package.

J 38826 SIR Deployment Harness

Use the J 38826 SIR Deployment Harness in order to deploy a driver inflator module outside of the vehicle. Use 1 of the following adapters in order to connect the deployment harness to the inflator module:

- The J 38826-20 SIR Deployment Harness Adapter (pigtail connector)
- The J 38826-50 SIR Deployment Harness Adapter (integral connector)

J 38715-A SIR Driver/Passenger Load Tool

Use the J 38715-A SIR Driver/Passenger Load Tool only when the SIR diagnostics call for use. The Load Tool is used as a diagnostic aid and a safety device in order to prevent inadvertent inflator module deployment.

The load tool has 4 yellow connectors attached to the case. The 3 small connectors are electrically functional and serve as resistive load substitutions. The large dummy connector does not serve as a load substitution and is not used. Do not use more than 2 connectors at any time.

One of the small connectors is used in order to substitute the load of the supplemental restraint steering wheel module. The connector is connected at the top of the column to the supplemental restraint steering wheel module coil. Use 1 of the following adapters in order to connect the load tool to the steering wheel module coil:

- The J 38715-5 SIR Load Tool Adapter (pigtail connector)
- The J 38715-30 Steering Column SIR Load Tool Adapter (integral connector)

A second small connector is used in order to substitute the load of the supplemental restraint steering wheel module and the supplemental restraint steering wheel module coil. The second small connector is connected at the base of the column to the SIR wiring harness. The third small connector is used to substitute for the load of the supplemental restraint IP module. The third small connector is connected to the supplemental restraint IP module harness connector.

Substitute the resistance of the inflator module in order to determine whether an inflator circuit component is causing a system malfunction. Use the load tool only when specifically called for in the diagnostic procedures.

J 39200 Digital Multimeter

The J 39200 Digital Multimeter (DMM) is the preferred DMM for use in SIR diagnosis and repair. The J 34029-A may be used if the J 39200 is not available. No other DMMs are approved for SIR diagnosis and repair.

J 35616-A Connector Test Adapter Kit

Use the J 35616-A Connector Test Adapter Kit whenever a diagnostic procedure requests testing or probing a terminal. Using the appropriate adapter will ensure that no damage to the terminal occurs from the DMM probe, such as spreading or bending. The adapter will also give an idea of whether contact tension is sufficient. This helps to find an open or intermittent open due to poor terminal contact.

J 39401-B SIR Deployment Fixture

Use the J 39401-B SIR Deployment Fixture when deploying passenger frontal air bags, side impact air bags, or seat belt pretensioners outside of the vehicle. Use the deployment fixture in order to secure the module for deployment.

Scan Tool

Use the scan tool for the following reasons:

- In order to read and clear SIR system diagnostic trouble codes (DTCs)
- In order to provide SIR system circuit values using the data list function

Refer to the scan tool operator's manual for specific information on how to use the scan tool.

J 38715-96 SIR Shorting Bar Tool

Use the J 38715-96 SIR Shorting Bar Tool only when the SIR diagnostics call for use. The shorting bar tool lifts one side of the shorting bar on the supplemental restraint sensing and diagnostic module (SDM) harness connector. The connector position assurance (CPA) lifts the opposite side of the shorting bar. When the CPA and the shorting bar tool are installed, the warning lamp circuit is disconnected from the ground circuit turning the warning lamp OFF.

Special Tools and Equipment

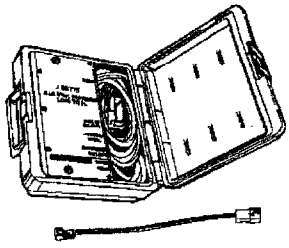
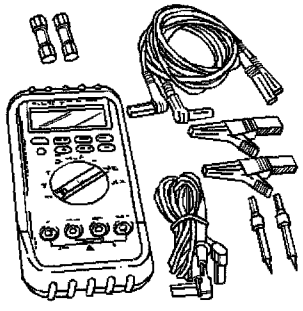
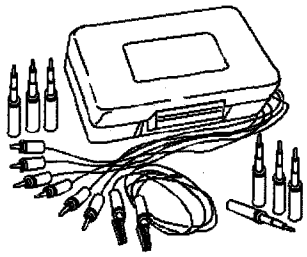
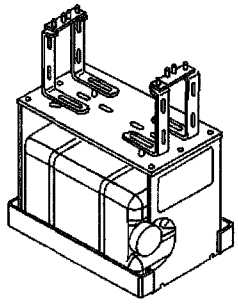
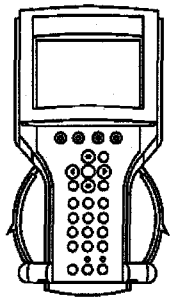
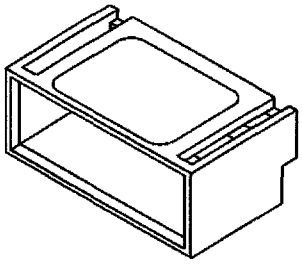
Illustration	Tool Number/ Description
 9081	J 38125-B Terminal Repair Kit
 9082	J 38826 SIR Deployment Harness
 9083	J 38715-A SIR Driver/Passenger Load Tool
 3430	J 39200 Digital Multimeter

Illustration	Tool Number/ Description
 8917	J 35616-A Connector Test Adapter Kit
 456738	J 39401-B SIR Deployment Fixture
 59260	Scan Tool
 39845	J 38715-96 SIR Shorting Bar Tool

BLANK

A

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Accelerator and Servo Control Module
(ASM) Replacement 5-250
Accelerator Controls
Cable Replacement (3.8L) 6-1169
Cable Replacement (5.7L) 6-1802
Pedal Replacement (3.8L) 6-1170
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Diagnosis
Air Pressure Test 8-665
Air/Wind Noise
Diagnosis
Air/Wind Noise 8-665
Soap Suds or Bubble Test 8-665
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