

HVAC Systems - Manual

Specifications

Fastener Tightening Specifications

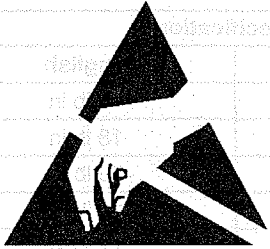
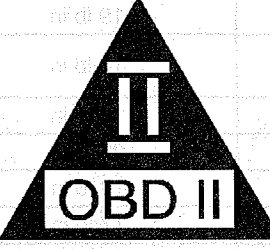
Application	Specification	
	Metric	English
Air Distributor Duct Bolt	2.2 N·m	19 lb in
Bi-Level Mode Actuator Screw	2 N·m	18 lb in
Blower Motor Bolt	2.3 N·m	20 lb in
Blower Motor Resistor Bolt	2 N·m	18 lb in
Floor Air Outlet Duct Bolt	1.9 N·m	17 lb in
Heating, Ventilation and Air Conditioning (HVAC) Control Blower Switch Screw	2 N·m	18 lb in
Heating, Ventilation and Air Conditioning (HVAC) Control Bolt	2.2 N·m	19 lb in
Heating, Ventilation and Air Conditioning (HVAC) Control Selector Switch Screw	2 N·m	18 lb in
Heater Module Screw	1.8 N·m	16 lb in
Instrument Panel (IP) Compartment Hinge Screws	2.8 N·m	25 lb in
Instrument panel (IP) Outer Air Outlet Duct Bolt	2.2 N·m	19 lb in
Temperature Control Cable Bolt	1.9 N·m	17 lb in
Vacuum Tank Mounting Bolt	2.5 N·m	22 lb in
Vent Mode Valve Actuator Screw	2 N·m	18 lb in

GM SPO Group Numbers

Application	GM SPO Group Number
Air Valve Actuator Vacuum Harness	9.000
Blower Impeller	8.000
Blower Motor	8.000
Blower Motor Relay	9.000
Blower Motor Resistor	9.000
Defrost Valve Actuator	9.000
Floor Air Outlet Duct	9.000
Heater and Air Conditioning Control	9.000
Heater and Air Conditioning Control Vacuum Harness	9.000
Heater and Air Conditioning Control Vacuum Tank	9.000
Inside Air Valve Actuator	9.000
Instrument Panel Outer Air Outlet Duct	9.000
Mode Valve Actuator	9.000
Side Window Defogger Outlet Duct	9.000
Vacuum Actuator	9.000
Windshield Defroster Nozzle and Air Distributor	9.000

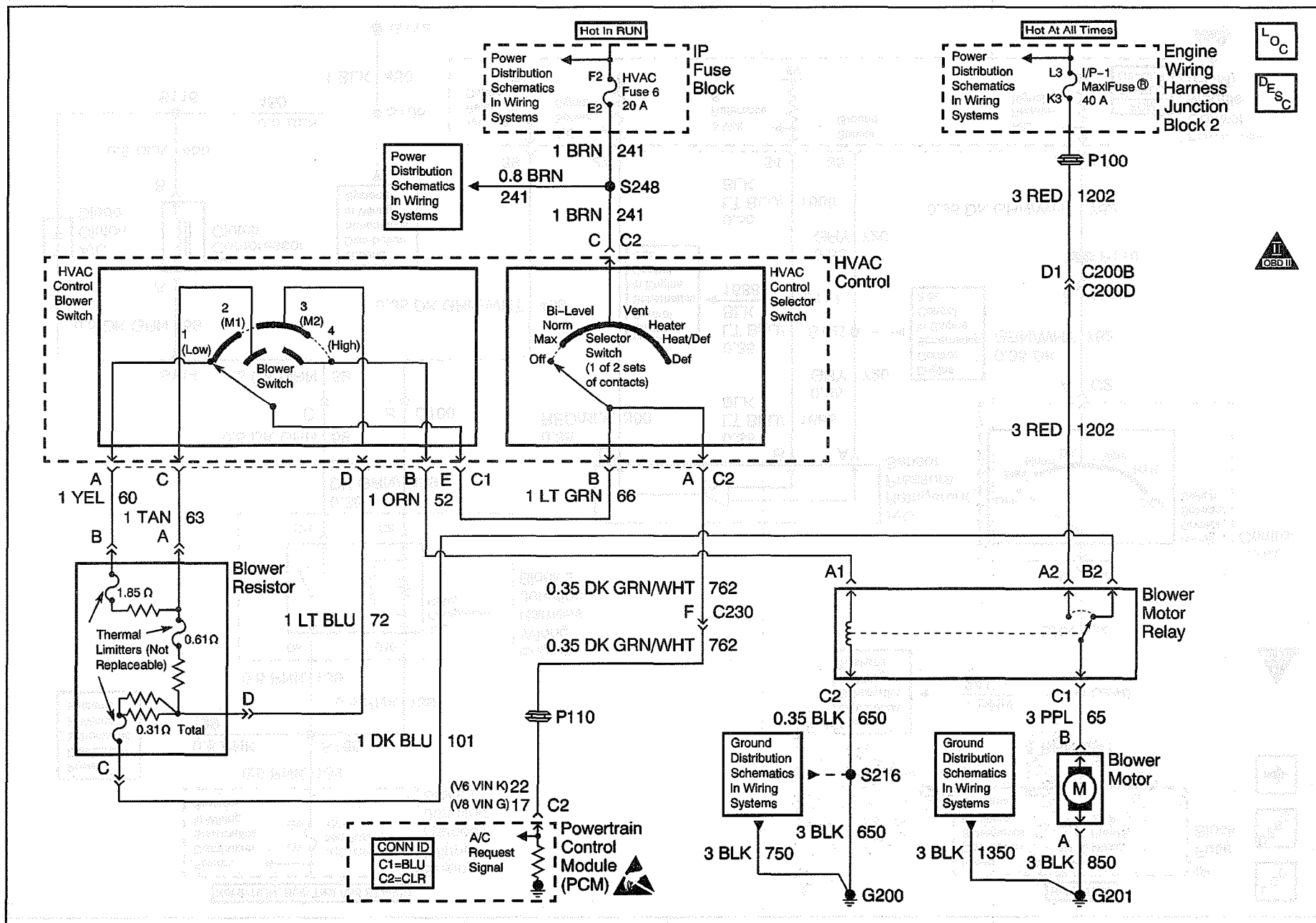
Schematic and Routing Diagrams

HVAC Schematic Icons

Icon	Icon Definition
	Refer to <i>ESD Notice</i> in Cautions and Notices.
	Refer to <i>OBD II Symbol Description Notice</i> in Cautions and Notices.

GM WFO Group Number	Application
8.000	Washer, Distributor and Air Distributor
8.000	Vacuum Actuator
8.000	Side Window Defogger Outlet Duct
8.000	Mode Valve Actuator
8.000	Instrument Panel Outer Air Outlet Duct
8.000	Inside Air Valve Actuator
8.000	Heater and Air Conditioning Control Vacuum Tank
8.000	Heater and Air Conditioning Control Vacuum Harness
8.000	Heater and Air Conditioning Control
8.000	Foot Air Outlet Duct
8.000	Detent Valve Actuator
8.000	Blower Motor Resistor
8.000	Blower Motor Relay
8.000	Blower Motor
8.000	Blower Inlet
8.000	Air Valve Actuator Vacuum Harness

HVAC Blower Control Schematics (HVAC Control, Blower Resistor, Blower Motor Relay)



1-104 HVAC Systems - Manual



HVAC



Component Locator

HVAC Components

Name	Location	Locator View	Connector End View
A/C Clutch Diode (V6 VIN K)	Sealed in a harness, approximately 3 cm (1.2 in) from the injector 2 breakout	—	—
A/C Clutch Diode (V8 VIN G)	Sealed in a harness, approximately 17 cm (6.8 in) from the A/C compressor clutch connector	—	—
A/C Compressor Clutch (V6 VIN K)	In the front of the engine, on the lower right side	<i>HVAC Component Views</i>	<i>Engine Controls Connector End Views in Engine Controls</i>
A/C Compressor Clutch (V8 VIN G)	In the front of the engine, on the lower right side	<i>HVAC Component Views</i>	<i>Engine Controls Connector End Views in Engine Controls</i>
A/C Refrigerant Pressure Sensor (V6 VIN K)	Above the right front wheelhouse, attached to the refrigerant line	<i>HVAC Component Views</i>	<i>Engine Controls Connector End Views in Engine Controls</i>
A/C Refrigerant Pressure Sensor (V8 VIN G)	Above the right front wheelhouse, attached to the refrigerant line	<i>HVAC Component Views</i>	<i>Engine Controls Connector End Views in Engine Controls</i>
Blower Motor	Under the lower right side of the IP, mounted in the HVAC module	<i>Body Control Module Component Views in Body Control Systems</i>	<i>HVAC Connector End Views</i>
Blower Motor Relay	Under the IP, above the floor tunnel, attached to the inflatable restraint instrument panel module bracket	<i>HVAC Component Views</i>	—
Blower Resistor	In the HVAC module, forward and left of the temperature control cable attachment	—	<i>HVAC Connector End Views</i>
Engine Wiring Harness Junction Block 2	In the left front corner of the engine compartment	<i>Power and Grounding Component Views in Wiring Systems</i>	—
HVAC Control	In the center of the IP, above the radio	<i>HVAC Component Views</i>	<i>HVAC Connector End Views</i>
HVAC Control Blower Switch (Part of HVAC Control)	Part of the HVAC control	<i>HVAC Component Views</i>	<i>HVAC Connector End Views</i>
HVAC Control Lamp (Part of HVAC Control)	Part of the HVAC control	—	<i>HVAC Connector End Views</i>
HVAC Control Selector Switch (Part of HVAC Control)	Part of the HVAC control	<i>HVAC Component Views</i>	<i>HVAC Connector End Views</i>
IP Fuse Block	On the left end of the IP carrier	<i>Instrument Panel, Gauges, and Console Component Views in Instrument Panel, Gauges and Console</i>	—
Powertrain Control Module (PCM) (V6 VIN K)	On the right side of the engine compartment, rear of the wheelhouse	<i>Power and Grounding Component Views in Wiring Systems</i>	<i>PCM Connector End Views in Engine Controls</i>
Powertrain Control Module (PCM) (V8 VIN G)	On the right side of the engine compartment, rear of the wheelhouse	<i>Engine Controls Component Views in Engine Controls</i>	<i>PCM Connector End Views in Engine Controls</i>
C100 (10 cavities)	Engine to forward lamp harness, in the engine compartment, above the right wheelhouse	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>
C200B (18 cavities)	Forward lamp to IP harness, between the left kick panel and the steering column	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>

HVAC Components (cont'd)

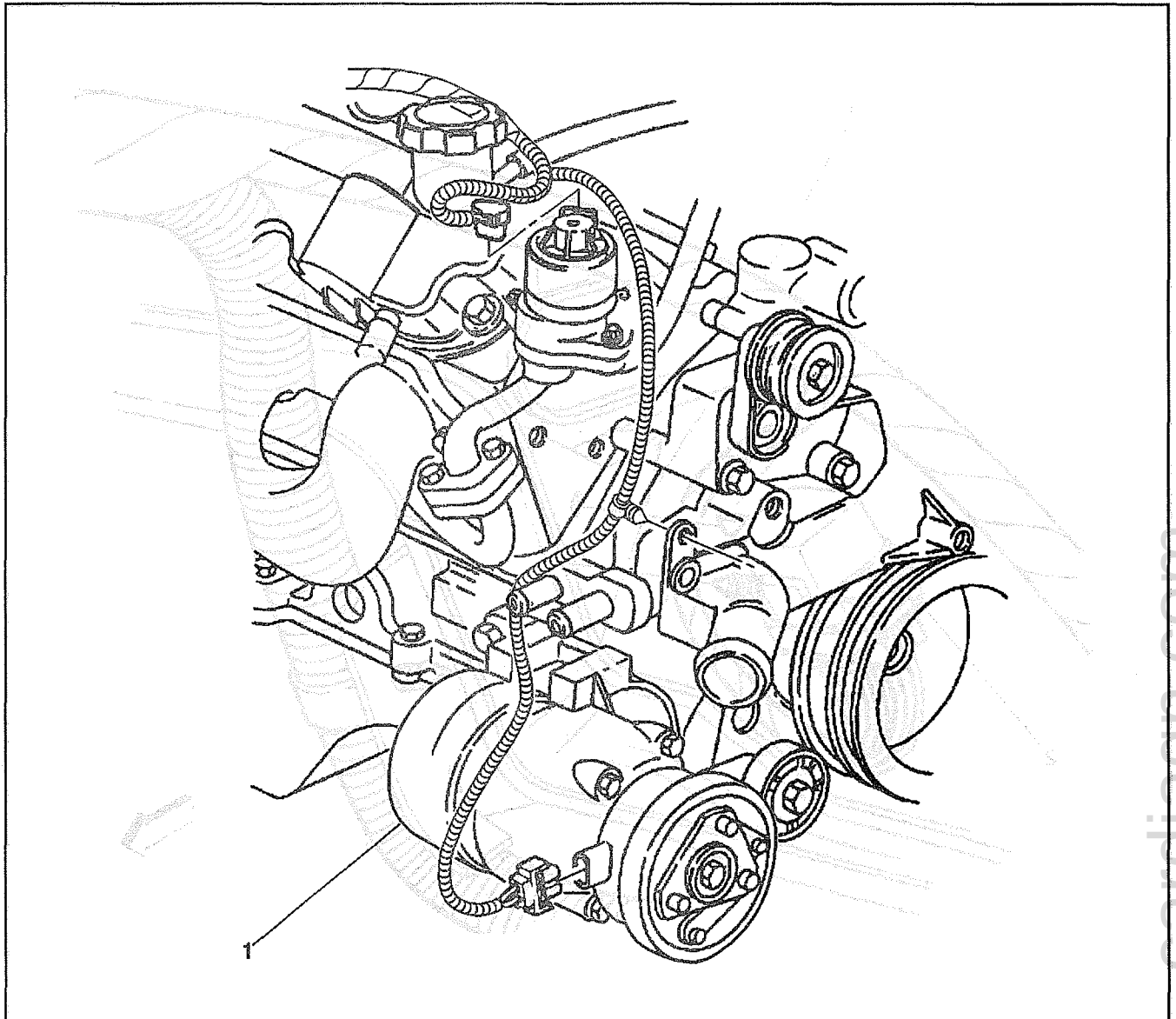
Name	Location	Locator View	Connector End View
C200D (48 cavities)	Part of the IP harness, between the left kick panel and the steering column	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>
C230 (10 cavities)	IP to engine harness, under the right side of the IP, behind the knee bolster	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>
G112	Attached to the rear of the left cylinder head	<i>Harness Routing Views in Wiring Systems</i>	—
G200	Near the left A-pillar, bolted to the IP mounting stud behind the kick panel	<i>Harness Routing Views in Wiring Systems</i>	—
G201	Near the right A-pillar, bolted to the IP mounting stud behind the kick panel	<i>Harness Routing Views in Wiring Systems</i>	—
P100	Left side in the dash panel, engine to the passenger compartment	<i>Harness Routing Views in Wiring Systems</i>	—
P110	Right side in the dash panel, engine to the passenger compartment	<i>Harness Routing Views in Wiring Systems</i>	—
S105 (V8 VIN G)	In the engine harness at the A/C refrigerant pressure sensor breakout	—	—
S108 (V6 VIN K)	In the engine harness, main branch, approximately 15 cm (6 in) from G112 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 (4.7 in) from the vehicle speed sensor breakout	—	—
S110 (V6 VIN K)	In the engine harness, approximately 4 cm (1.6 in) from the powertrain control module (PCM) breakout	—	—
S110 (V8 VIN G)	In the engine harness, main branch, approximately 20 cm (7.9 in) from the powertrain control module (PCM) breakout	—	—
S114 (V6 VIN K)	In the engine harness, approximately 3 cm (1.2 in) from the generator breakout	—	—
S114 (V8 VIN G)	In the engine harness, approximately 17 cm (6.7 in) back from the A/C compressor clutch breakout	—	—
S115 (V6 VIN K)	In the engine harness at the generator breakout	—	—
S115 (V8 VIN G)	In the engine harness, approximately 20 cm (7.9 in) back from the A/C compressor clutch breakout	—	—
S121 (V6 VIN K)	In the engine harness, main branch, approximately 8 cm (3.1 in) from the powertrain control module (PCM) breakout	—	—
S128	In the engine harness, approximately 4 cm (1.8 in) from the manifold absolute pressure (MAP) sensor breakout	—	—
S165	In the forward lamp harness, approximately 7 cm (2.8 in) from the main branch into the engine wiring harness junction block 2 breakout	—	—
S216	In the IP harness, main branch, approximately 10 cm (4 in) from the instrument cluster breakout	—	—
S248	In the IP harness, approximately 2 cm (0.8 in) from DRL module breakout	—	—



(1) A/C Compressor Clutch

cardiagn.com

Lower Right Front Side of the Engine (V8 VIN G)



374327

Legend

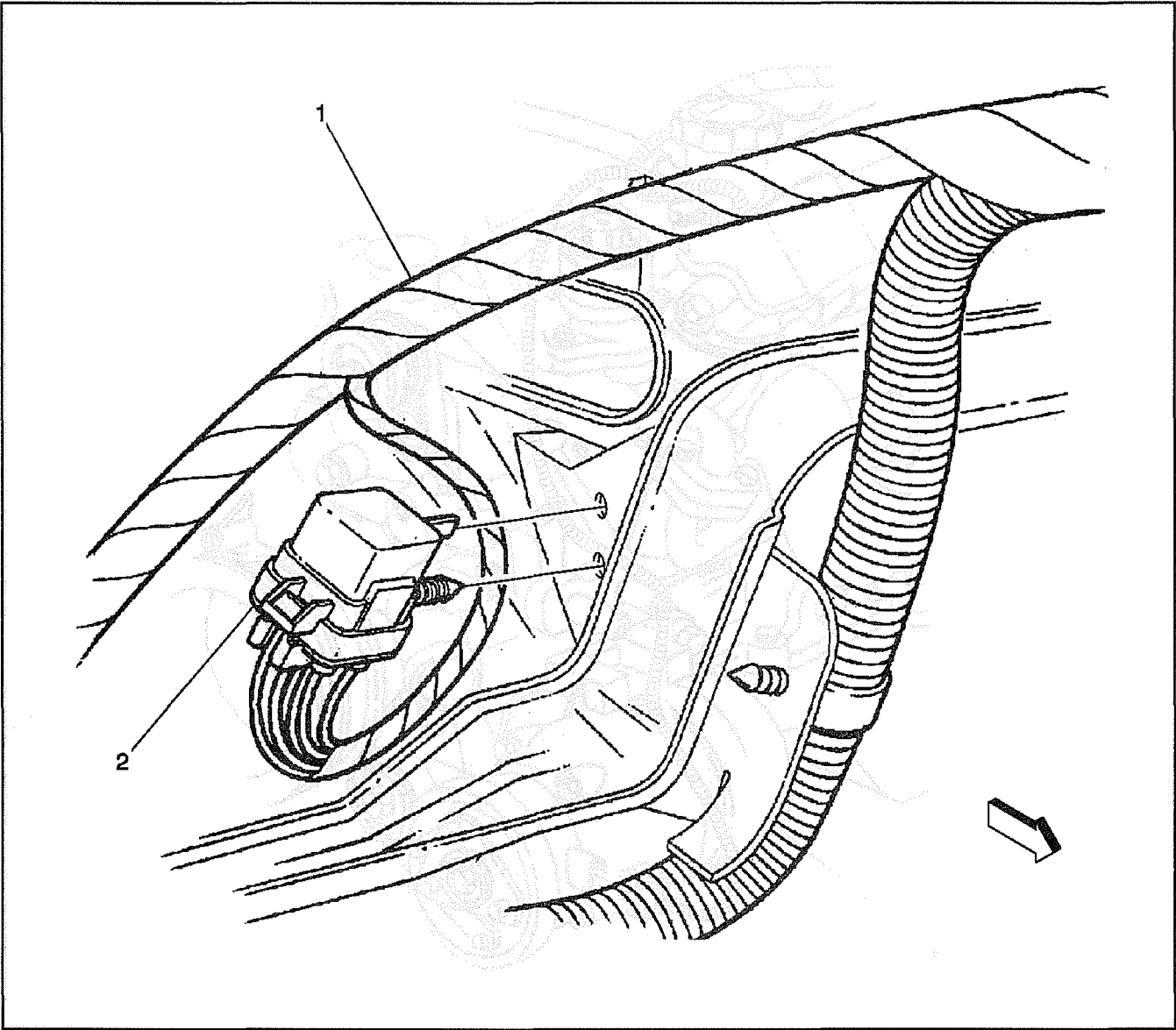
- (1) A/C Compressor

374327

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(1) A/C Compressor

(D) Under Center of the Instrument Panel

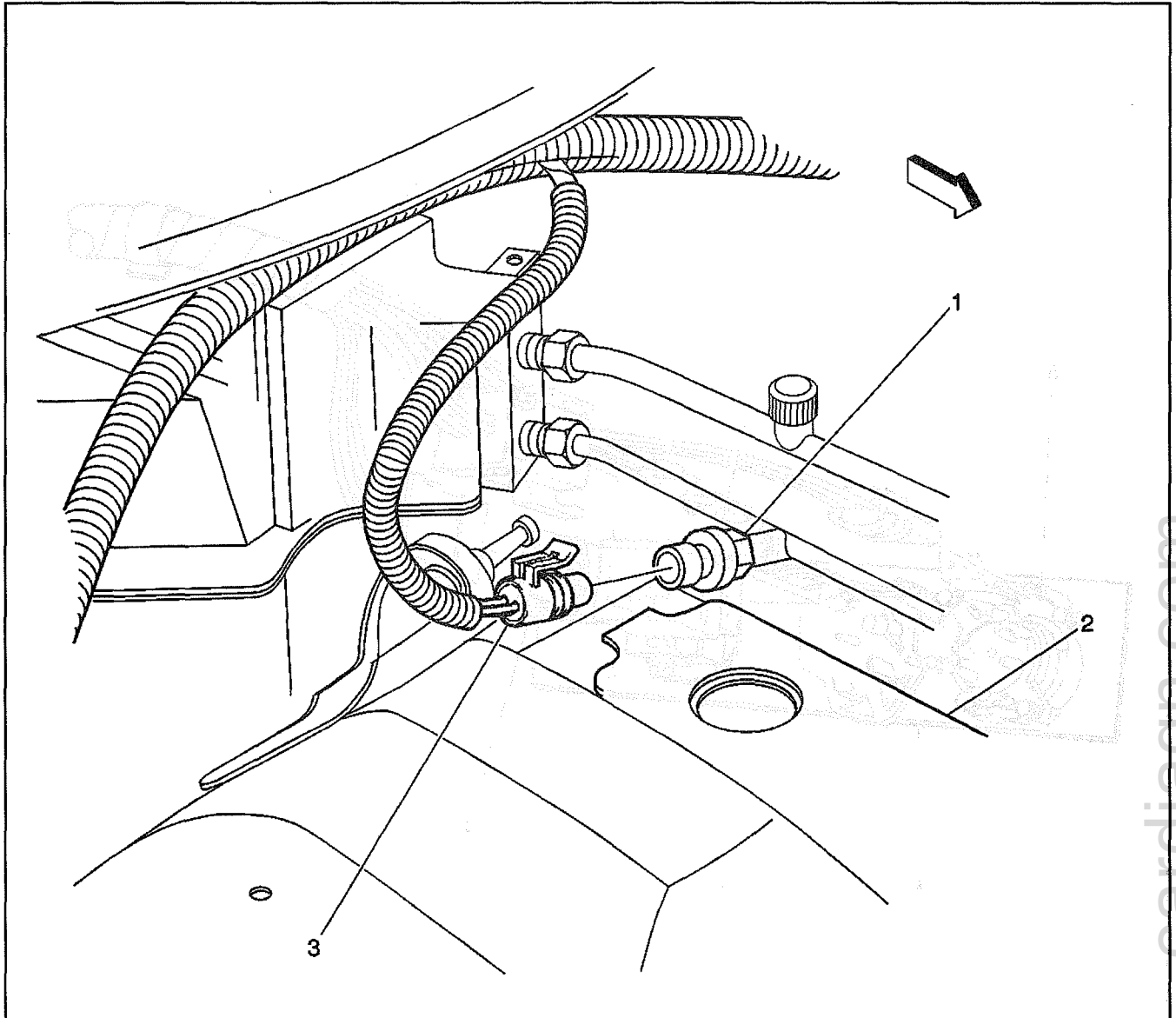


374324

Legend

- (1) IP Wiring Harness
- (2) Blower Motor Relay

Right Rear Side of the Engine Compartment



Legend

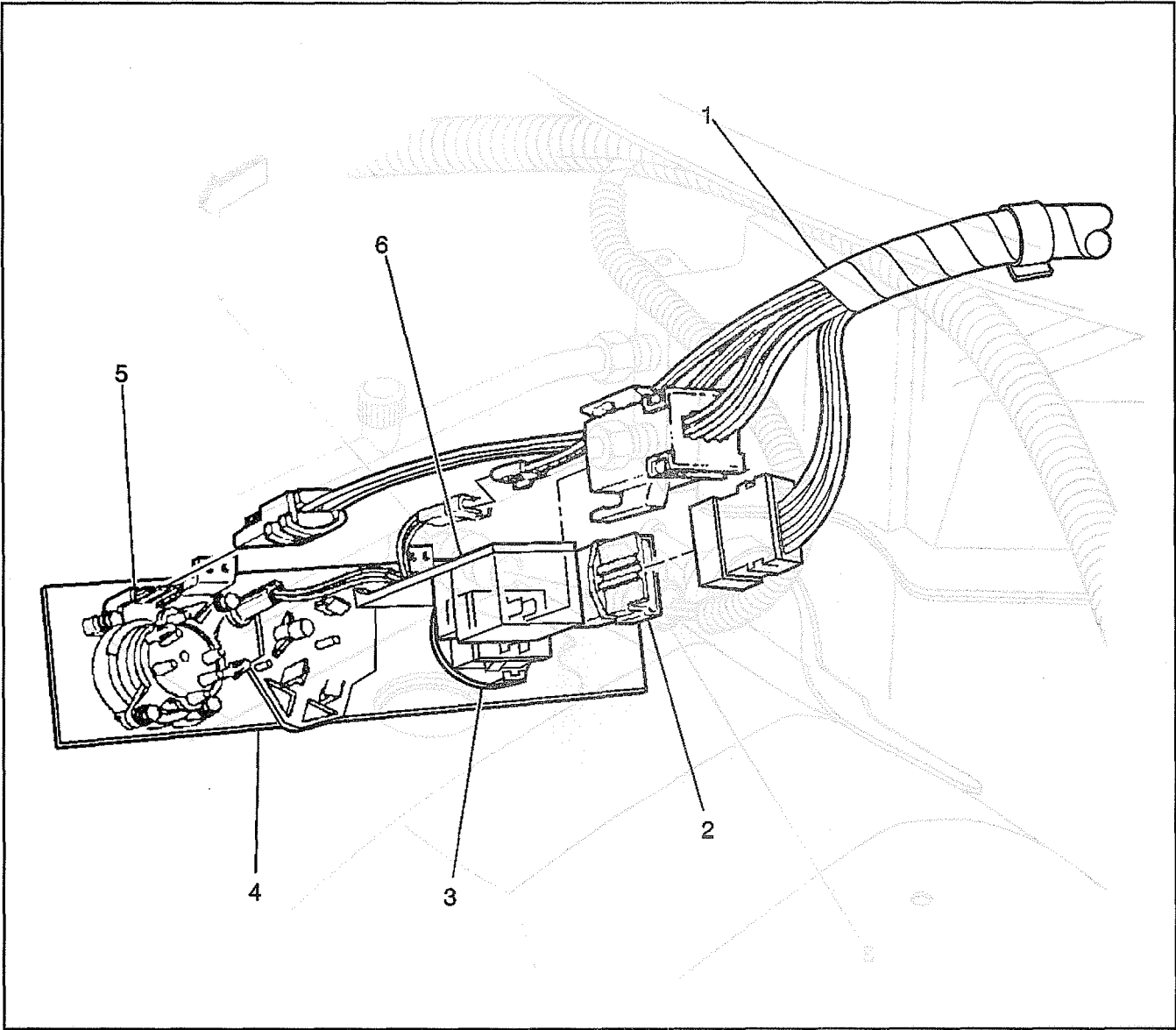
- (1) A/C Refrigerant Pressure Sensor
- (2) Right Shock Tower

- (3) Engine Wiring Harness

374328

Legend

Center of the Instrument Panel

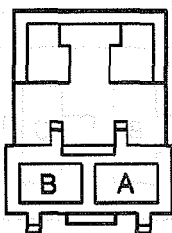


567223

- Legend**
- | | |
|--------------------------------|----------------------------------|
| (1) IP Wiring Harness | (4) HVAC Control Selector Switch |
| (2) Rear Defogger Switch | (5) HVAC Control Blower Switch |
| (3) HVAC Control Blower Switch | (6) Rear Defogger Timer/Relay |

HVAC Connector End Views

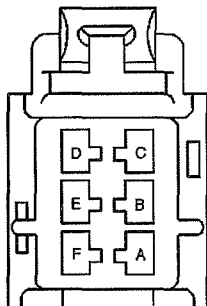
Blower Motor



287953

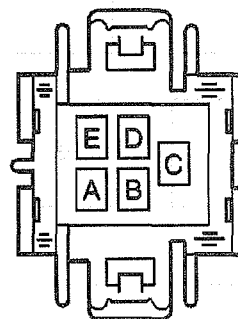
Connector Part Information		• 1206-4829 • 2-Way F Metri-pack 480 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	BLK	850	Ground
B	PPL	65	Blower Motor Relay Feed Input

Blower Resistor



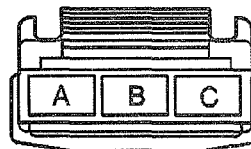
62456

Connector Part Information		• 1206-4752 • 6-Way F Metri-pack Series 280 (BLK)	
Pin	Wire Color	Circuit No.	Function
A	TAN	63	Blower Switch M1 Feed Input
B	YEL	60	Blower Switch LO Feed Input
C	DK BLU	101	Blow Motor Relay Feed Output
D	LT BLU	72	Blower Switch M2 Feed Input
E-F	—	—	Not Used

HVAC Control Connector C1
(Blower Switch)

232132

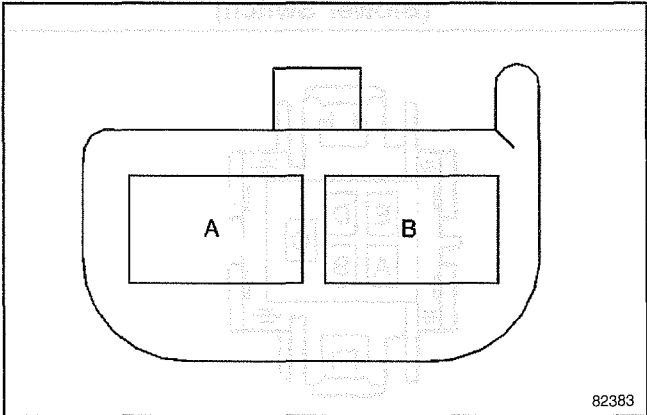
Connector Part Information		• 1202-0813 • 5-Way F Metri-pack 630 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	YEL	60	Blower Resistor LO Feed Output
B	ORN	52	Blower Motor Relay HI Feed Output
C	TAN	63	Blow Resistor M1 Feed Output
D	LT BLU	72	Blower Resistor M2 Feed Output
E	LT GRN	66	Selector Switch Power Feed Input

HVAC Control Connector C2
(Selector Switch)

38596

Connector Part Information		• 1202-0557 • 3-Way F Metri-pack 480 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	DK GRN/ WHT	762	PCM A/C Request Signal Feed Output
B	LT GRN	66	Blower Switch Feed Output
C	BRN	241	Fused Input Feed

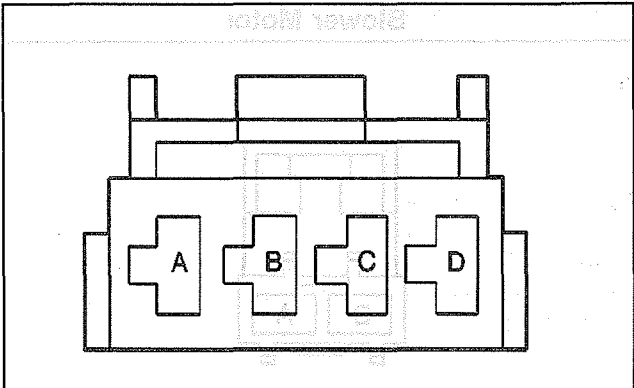
HVAC Control Connector C3 (Control Lamp)



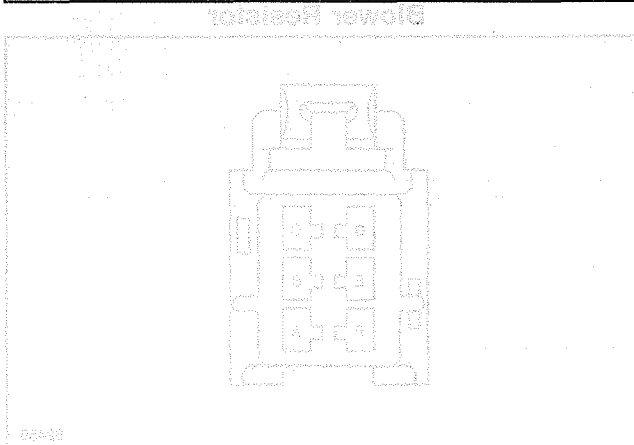
Connector Part Information		• 1204-7662 • 2-Way F Metri-pack 150 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	GRY	8	Blower Switch Lamp Feed Input
B	BLK	650	Ground

Blower Motor	LT BLU	107	Blower Motor Relay Feed Output
Blower Switch MS	LT BLU	75	Blower Switch MS Feed Input
Blower Resistor M1	TAN	65	Blower Resistor M1 Feed Output
Blower Resistor M2	TAN	66	Blower Resistor M2 Feed Output
Blower Switch Lamp	GRY	8	Blower Switch Lamp Feed Input

HVAC Control Connector C4 (Rear Defogger Switch)

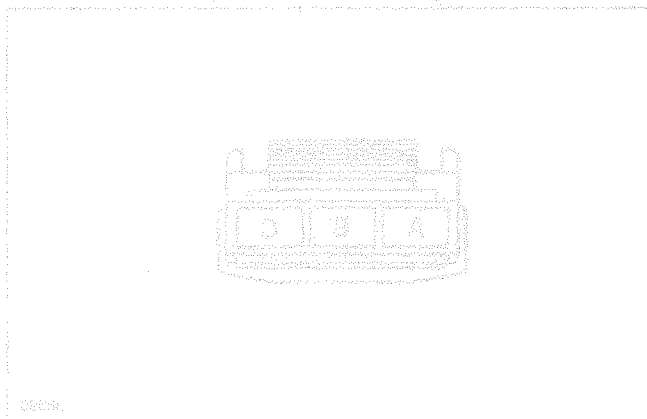


Connector Part Information		• 1201-5664 • 4-Way F Metri-pack 630 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	ORN	1240	Fused Input Feed
B	PPL	293	Rear Defogger Grid Fuse Feed Output
C	BRN	241	Fused Input Feed
D	BLK	650	Ground



Connector Part Information		• 1201-5664 • 4-Way F Metri-pack 630 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	TAN	65	Blower Switch M1 Feed Input
B	YEL	66	Blower Switch M2 Feed Input
C	DK BLU	107	Blower Motor Relay Feed Output
D	LT BLU	75	Blower Switch MS Feed Input
Not Used	---	---	---

HVAC Control Connector C2 (Blower Switch)



Connector Part Information		• 1201-5664 • 4-Way F Metri-pack 630 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	DK GRN	75	Blower Switch MS Feed Input
B	LT GRN	65	Blower Switch M1 Feed Input
C	BRN	241	Fused Input Feed
D	---	---	---

Diagnostic Information and Procedures

A Diagnostic Starting Point

Begin the system diagnosis by reviewing the system Description and Operation. Reviewing the Description and Operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information will also help you determine if the condition described by the customer is normal operation. Refer to *A Diagnostic System Check* in order to identify the correct procedure for diagnosing the system and where the procedure is located.

A Diagnostic System Check

Test Description

The number(s) below refer to the step number(s) on the diagnostic table.

2. Lack of communication may be due to a partial malfunction of the class 2 serial data circuit or due to a total malfunction of the class 2 serial data circuit. The specified procedure will determine the particular condition.
4. The presence of DTCs which begin with "U" indicate some of the modules are not communicating.

A Diagnostic System Check

Step	Action	Yes	No
1	Install a scan tool. Does the scan tool power up?	Go to Step 2	Go to <i>Scan Tool Does Not Power Up</i> in Data Link Communications
2	1. Turn ON the ignition, with the engine OFF. 2. Attempt to establish communication with each module on the class 2 circuit serial data circuit. (If using a Tech 2, obtain this information using the Class 2 Message Monitor feature.) Does the scan tool communicate with the modules?	Go to Step 3	Go to <i>Scan Tool Does Not Communicate w/Class 2 Data Line</i> in Data Link Communications
3	1. Select the Display DTCs function for each module. (If using a Tech 2, use the Class 2 DTC Check feature in order to determine which modules do have DTCs set.) 2. Record all of the displayed DTCs, the DTC status, and the module which set the DTC. Does the scan tool display any DTCs?	Go to Step 4	Go to <i>Symptoms</i> in HVAC Systems - Manual.
4	Does the scan tool display any DTCs which begin with a "U"?	Go to <i>Scan Tool Does Not Communicate w/Class 2 Data Line</i> in Data Link Communications	Go to Step 5
5	Does the scan tool display any PCM DTCs?	Go to <i>Diagnostic Trouble Code (DTC) List/Type</i> in Engine Controls - 3.8 L and <i>Diagnostic Trouble Code (DTC) List/Type</i> in Engine Controls - 5.7 L.	Go to <i>Symptoms</i> in HVAC Systems - Manual.

Symptoms

Important: Review the system operation in order to familiarize yourself with the system functions. Refer to *Control Assembly Description (Pontiac)* for Pontiac or *Control Assembly Description (Chevrolet)* for Chevrolet.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the HVAC System. Refer to *Checking Aftermarket Accessories*
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to *Testing for Intermittent and Poor Connections*

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Blower Motor Inoperative at Any Speed*
- Blower Motor Operates at High Speed Only*
- Blower Motor Inoperative in One Speed Only (High Speed Operates Normally)*
- Blower Motor High Speed Inoperative*

- *Blower Motor Always On*
- *Air Delivery Improper*
- *Defrosting Insufficient* in Heating, Ventilation and Air Conditioning.
- *Heating Insufficient* in Heating, Ventilation and Air Conditioning.
- *Noise Diagnosis - Blower Motor* in Heating, Ventilation and Air Conditioning.
- *Noise Diagnosis - A/C System* in Heating, Ventilation and Air Conditioning.
- *Odor Diagnosis* in Heating, Ventilation and Air Conditioning.

HVAC Compressor Clutch Does Not Engage

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 DTCs are set.				
1	Did you perform the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic System Check
2	1. Turn the ignition switch to the OFF position. 2. Install both the high and low A/C freon pressure gages. 3. Read the freon pressure with the engine off. • Freon pressure in the high and low sides should equal each other after the A/C system has come to rest. • Freon pressure will fluctuate depending on ambient temperature. • Proper clutch operation depends on correct refrigerant charge. Low freon charge will shut off A/C compressor operation. Are the high and low side freon pressures below the specified value?	345 kPa (50 psi)	Go to Leak Testing in Heating, Ventilation, and Air Conditioning	Go to Step 3
3	Are the high and low side freon pressures above the specified value?	690 kPa (100 psi)	Go to Step 4	Go to Step 5
4	Evacuate and recharge the A/C system according to proper freon fill specifications. Has the A/C system been recharged properly?	—	Go to Step 24	—
5	Test for and repair a short to ground in the supply voltage circuit of the A/C compressor clutch. Refer to <i>Circuit Testing</i> and <i>Wiring Repairs</i> in Wiring Systems. Did you find and repair a short to ground?	—	Go to Step 24	Go to Step 6
6	1. Remove the A/C clutch relay from the engine wiring harness junction block 2. 2. Disconnect the A/C compressor clutch coil connector. 3. Connect a fused jumper between the ignition voltage terminal for the switch side of the A/C clutch relay and the engine wiring harness junction block 2 connector C1 terminal F8. 4. Connect a DMM between the A/C compressor clutch coil connector terminal B and ground. 5. Turn the ignition switch to the RUN position. 6. Measure the available voltage at the A/C compressor clutch coil connector terminal B. Is the voltage the same as the specified value?	B+	Go to Step 8	Go to Step 7
7	Repair a poor connection or an open in the supply voltage circuit of the A/C compressor clutch. Refer to <i>Wiring Repairs</i> or <i>Connector Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 24	—
8	Using a DMM, measure for continuity between terminal B of the A/C compressor clutch coil connector and ground. Is the resistance to ground less than the specified value?	0 - 2 Ω	Go to Step 10	Go to Step 9
9	Repair a poor connection or an open in the ground circuit of the A/C compressor clutch. Refer to <i>Wiring Repairs</i> or <i>Connector Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 24	—

HVAC Compressor Clutch Does Not Engage (cont'd)

Step	Action	Value(s)	Yes	No
10	1. Disconnect the powertrain control module (PCM) connector C2. 2. Reinstall the A/C clutch relay. 3. Connect a fused jumper between the PCM connector C2 terminal 39 and ground. 4. Turn the ignition switch to the RUN position. 5. Using a DMM, measure the voltage between the A/C compressor clutch coil connector terminal B and ground. Is the voltage the same as the specified value?	B+	Go to Step 11	Go to Step 12
11	1. Remove the fused jumper from the PCM connector C2 terminal 39 and ground. 2. Reconnect the A/C compressor clutch coil connector. 3. Reinstall the fused jumper between the PCM connector C2 terminal 39 and ground. 4. Turn the ignition switch to the ON position. Does the A/C compressor clutch engage?	—	Go to Cooling Insufficient, A/C System in Heating, Ventilation, and Air Conditioning	Go to Step 23
12	1. Turn the ignition switch to the OFF position. 2. Remove the A/C clutch relay. 3. Using a DMM, measure for continuity between the PCM connector C2 terminal 39 and the engine wiring harness junction block 2 connector C1 terminal F7. Is there continuity?	—	Go to Step 14	Go to Step 13
13	Repair a poor connection or an open in the control circuit of the A/C clutch relay. Refer to <i>Wiring Repairs</i> or <i>Connector Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 24	—
14	Replace the A/C clutch relay and retest the A/C system. Refer to <i>Compressor Relay Replacement</i> in Heating, Ventilation, and Air Conditioning. Does replacing the A/C clutch relay correct the concern?	—	Go to Step 24	Go to Step 15
15	1. Disconnect the heater-A/C control connector C2. 2. Connect a DMM between the PCM connector C2 terminal 22 and the heater-A/C control connector C2 terminal B. 3. Measure the A/C request signal circuit for resistance between these two connectors. Is the A/C request signal circuit resistance between the specified values?	0 - 2 Ω	Go to Step 17	Go to Step 16
16	Repair a poor connection or an open in the A/C request signal circuit. Refer to <i>Wiring Repairs</i> or <i>Connector Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 24	—
17	1. Connect a DMM between the PCM connector C2 terminal 22 and ground. 2. Measure the A/C request signal circuit for continuity to ground. Is the A/C request signal circuit continuous to ground?	—	Go to Step 18	Go to Step 19
18	Repair a short to ground in the A/C request signal circuit. Refer to <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 24	—
19	1. Disconnect the DMM. 2. Reconnect all connectors back to their respective modules. 3. Install the scan tool to the diagnostic link connector. 4. Start the engine and allow it to idle in park. 5. Select the area of the scan tool which will read HVAC button output status. 6. Depress the A/C button on/off several times. Does the scan tool read the A/C request being sent by the HVAC control head?	—	Go to Step 20	Go to Step 22

HVAC Compressor Clutch Does Not Engage (cont'd)

Step	Action	Value(s)	Yes	No
20	Test for and repair a poor connection at the PCM and at the engine wiring harness junction block 2. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs in Wiring Systems</i> . Did you complete the repair?	—	Go to Step 24	Go to Step 21
21	Replace the PCM. Refer to <i>PCM Replacement/Programming (V6)</i> or <i>PCM Replacement/Programming (V8)</i> in Engine Controls. Did you complete the replacement?	—	Go to Step 24	—
22	Replace the heater-A/C control. Refer to <i>Control Assembly Replacement</i> . Did you complete the replacement?	—	Go to Step 24	—
23	Replace the A/C compressor clutch coil. Refer to <i>Compressor Clutch Coil Removal (V5 - Conventional Mount)</i> and <i>Compressor Clutch Coil Install (V5 - Conventional Mount) (V6)</i> or <i>Compressor Clutch Coil Removal (V7 - Direct Mount)</i> and <i>Compressor Clutch Coil Install (V7 - Direct Mount) (V8)</i> . Did you complete the replacement?	—	Go to Step 24	—
24	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

HVAC Compressor Clutch Does Not Disengage

Step	Action	Value(s)	Yes	No
DEFINITION: A/C compressor clutch will not disengage when no A/C request has been made and no Powertrain DTCs are set.				
1	Did you perform the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic System Check
2	1. Disconnect the Powertrain Control Module (PCM) connector C2. 2. Turn the ignition switch to the RUN position. Does the A/C compressor clutch coil disengage?	—	Go to Step 3	Go to Step 4
3	Replace the Powertrain Control Module (PCM). Refer to <i>PCM Replacement/Programming (V6)</i> or <i>PCM Replacement/Programming (V8)</i> in Engine Controls. Did you complete the replacement?	—	Go to Step 11	—
4	1. Disconnect the A/C CLU relay from the underhood accessory wiring junction block. 2. Turn the ignition switch to the RUN position. Does the A/C compressor clutch coil disengage?	—	Go to Step 5	Go to Step 8
5	1. Turn the ignition switch to the OFF position. 2. Powertrain Control Module (PCM) connector C2 still disconnected. 3. A/C clutch relay still removed from the engine wiring harness junction block 2. 4. Connect a DMM between the Powertrain Control Module (PCM) connector C2 terminal 39 and ground. 5. Measure for continuity in the control circuit of the A/C compressor relay to ground. Is the air conditioning compressor coil control relay output circuit continuous to ground?	—	Go to Step 6	Go to Step 7
6	Repair a short to ground in the control circuit of the A/C compressor relay between the engine wiring harness junction block 2 and the PCM connector C2. Refer to <i>Wiring Repairs in Wiring Systems</i> . Did you complete the repair?	—	Go to Step 11	—
7	Replace the A/C clutch relay. Refer to <i>Compressor Relay Replacement</i> in Heating, Ventilation, and Air Conditioning. Did you complete the replacement?	—	Go to Step 11	—

HVAC Compressor Clutch Does Not Disengage (cont'd)

Step	Action	Value(s)	Yes	No
8	1. Leave the Powertrain Control Module (PCM) connector C2 still disconnected. 2. A/C clutch relay still removed from the engine wiring harness junction block 2. 3. Disconnect the A/C compressor clutch coil connector. 4. Connect a DMM between the A/C compressor clutch coil connector terminal B and ground. 5. Turn the ignition switch to the RUN position. 6. Measure for voltage on the supply voltage circuit of the A/C compressor clutch. Is voltage present on the supply voltage circuit of the A/C compressor clutch?	—	Go to Step 9	Go to Step 10
9	Repair a short to battery voltage in the supply voltage circuit of the A/C compressor clutch between the engine wiring harness junction block 2 and the A/C compressor clutch coil. Refer to <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 11	—
10	Replace the A/C compressor clutch coil. Refer to <i>Compressor Clutch Coil Removal (V5 - Conventional Mount)</i> and <i>Compressor Clutch Coil Install (V5 - Conventional Mount)</i> (V6) or <i>Compressor Clutch Coil Removal (V7 - Direct Mount)</i> and <i>Compressor Clutch Coil Install (V7 - Direct Mount)</i> (V8). Did you complete the replacement?	—	Go to Step 11	—
11	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

Blower Motor Inoperative at Any Speed

Step	Action	Value(s)	Yes	No
1	Did you complete the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic 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 lamp, probe the HVAC control (blower switch) between connector C1 terminal E and ground. Does the test lamp illuminate?	—	Go to Step 3	Go to Step 15
3	1. Place the blower switch in position 1 (low). 2. With a test lamp, probe the HVAC control (blower switch) between connector C1 terminal A and ground. Does the test lamp illuminate?	—	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 the blower motor relay terminals B2 and 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 position 1 (low). Does the blower motor run?	—	Go to Step 8	Go to Step 7
5	Test for and repair a poor connection at the HVAC control blower switch. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 20	Go to Step 6
6	Replace the HVAC control blower switch. Refer to <i>HVAC Control Blower Switch Replacement</i> . Did you complete the replacement?	—	Go to Step 20	—

Blower Motor Inoperative at Any Speed (cont'd)

Step	Action	Value(s)	Yes	No
7	1. Leave the jumper connected from previous step. 2. Turn the ignition switch to the OFF position. 3. Disconnect the blower motor connector. 4. Turn the ignition switch to the RUN position. 5. Connect a test lamp between the blower motor connector terminals A and B. Does the test lamp illuminate?	—	Go to Step 11	Go to Step 10
8	Test for and repair a poor connection at the blower motor relay. Refer to <i>Testing for Intermittent and Poor Connections and Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 20	Go to Step 9
9	Replace the blower motor relay. Refer to <i>Blower Motor Relay Replacement</i> . Did you complete the replacement?	—	Go to Step 20	—
10	1. Leave the jumper connected from the previous step. 2. Connect the test lamp between the blower motor connector terminal B and ground. Does the test lamp illuminate?	—	Go to Step 14	Go to Step 13
11	Test for and repair a poor connection at the blower motor. Refer to <i>Testing for Intermittent and Poor Connections and Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 20	Go to Step 12
12	Replace the blower motor. Refer to <i>Blower Motor and Fan Replacement</i> . Did you complete the replacement?	—	Go to Step 20	—
13	Repair a poor connection or an open in the supply voltage circuit of the blower motor. Refer to <i>Connector Repairs or Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 20	—
14	Repair a poor connection or an open in the ground circuit of the blower motor. Refer to <i>Connector Repairs or Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 20	—
15	Probe the HVAC control (selector switch) between connector C2 terminal C and ground. Does the test lamp illuminate?	—	Go to Step 16	Go to Step 19
16	Test for and repair an open or a poor connection in the A/C request signal circuit at the HVAC control (selector switch) connector C2 terminals B and C. Refer to <i>Circuit Testing or Testing for Intermittent and Poor Connections and Wiring Repairs or Connector Repairs</i> in Wiring Systems. Did you find and repair an open or a poor connection?	—	Go to Step 20	Go to Step 17
17	Test for and repair a poor connection at the HVAC control (selector switch). Refer to <i>Testing for Intermittent and Poor Connections and Connector Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 20	Go to Step 18
18	Replace the HVAC control (selector switch). Refer to <i>Control Assembly Replacement</i> . Did you complete the replacement?	—	Go to Step 20	—
19	Repair a poor connection or an open in the ignition 3 voltage circuit between the HVAC control (selector switch) connector C2 terminal C and S248. Refer to <i>Connector Repairs or Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 20	—
20	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

Blower Motor Operates at High Speed Only

Step	Action	Value(s)	Yes	No
1	Did you complete the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic 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 position 1 (low). 4. Probe with a test lamp between the blower resistor connector terminal C and ground. Does the test lamp illuminate?	—	Go to Step 3	Go to Step 4
3	Probe with a test lamp between the blower motor relay connector terminal B2 and ground. Does the test lamp illuminate?	—	Go to Step 6	Go to Step 8
4	Test for and repair a poor connection at the blower resistor. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 9	Go to Step 5
5	Replace the blower resistor. Refer to <i>Blower Motor Resistor Replacement</i> . Did you complete the replacement?	—	Go to Step 9	—
6	Test for and repair a poor connection at the blower motor relay. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 9	Go to Step 7
7	Replace the blower motor relay. Refer to <i>Blower Motor Relay Replacement</i> . Did you complete the replacement?	—	Go to Step 9	—
8	Repair a poor connection or an open in the blower resistor control circuit of the blower motor relay between the blower resistor and the blower motor relay. Refer to <i>Connector Repairs</i> or <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

Blower Motor Inoperative in One Speed Only (High Speed Operates Normally)

Step	Action	Value(s)	Yes	No
1	Did you complete the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic 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 lamp from the blower resistor connector inoperative terminal (position 1 (low) =B, 2 (M1) =A, 3 (M2) =D) to ground on the harness connector. Does the test lamp illuminate?	—	Go to Step 3	Go to Step 5
3	Test for and repair a poor connection at the blower resistor. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 9	Go to Step 4
4	Replace the blower resistor. Refer to <i>Blower Motor Resistor Replacement</i> . Did you complete the replacement?	—	Go to Step 9	—
5	Probe with a test lamp between the HVAC control (blower switch) connector C1 of the inoperative terminal (position 1 (low) =A, 2 (M1) =C, 3 (M2) =D) and ground. Does the test lamp illuminate?	—	Go to Step 6	Go to Step 7

Blower Motor Inoperative in One Speed Only (High Speed Operates Normally) (cont'd)

Step	Action	Value(s)	Yes	No
6	Repair a poor connection or an open in the inoperative circuit (position 1 (low) =60, 2 (M1) =63, 3 (M2) =72). Refer to <i>Connector Repairs</i> or <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 9	—
7	Test for and repair a poor connection at the HVAC control (blower switch). Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 9	Go to Step 8
8	Replace the HVAC control blower switch. Refer to <i>HVAC Control Blower Switch Replacement</i> . Did you complete the replacement?	—	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

Blower Motor High Speed Inoperative

Step	Action	Value(s)	Yes	No
1	Did you complete the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic System Check
2	1. Place the HVAC control (selector switch) in the VENT position. 2. Place the HVAC control (blower switch) in position 4 (high). 3. Connect a test lamp between the HVAC control (blower switch) connector C1 terminal B and ground. Does the test lamp illuminate?	—	Go to Step 3	Go to Step 4
3	Connect a test lamp between the blower motor relay terminal A1 and ground. Does the test lamp illuminate?	—	Go to Step 6	Go to Step 7
4	Test for and repair a poor connection at the HVAC control (blower switch). Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 13	Go to Step 5
5	Replace the HVAC control blower switch. Refer to <i>HVAC Control Blower Switch Replacement</i> . Did you complete the replacement?	—	Go to Step 13	—
6	Connect the test lamp between the blower motor relay terminals A1 and C2. Does the test lamp illuminate?	—	Go to Step 8	Go to Step 9
7	Repair a poor connection or an open in the control circuit of the high blower motor. Refer to <i>Connector Repairs</i> or <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 13	—
8	Connect a test lamp between the blower motor relay connector terminals A2 and C2. Does the test lamp illuminate?	—	Go to Step 10	Go to Step 12
9	Repair a poor connection or an open in the ground circuit of the blower motor relay. Refer to <i>Connector Repairs</i> or <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 13	—
10	Check for a poor connection at the blower motor relay. Refer to <i>Testing for Intermittent and Poor Connections</i> and <i>Connector Repairs</i> in Wiring Systems. Did you find and repair a poor connection?	—	Go to Step 13	Go to Step 11

Blower Motor High Speed Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
11	Replace the blower motor relay. Refer to <i>Blower Motor Relay Replacement</i> . Did you complete the replacement?	—	Go to Step 13	—
12	Repair an open or a poor connection in the battery positive voltage circuit of the blower motor relay. Refer to <i>Connector Repairs</i> or <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 13	—
13	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

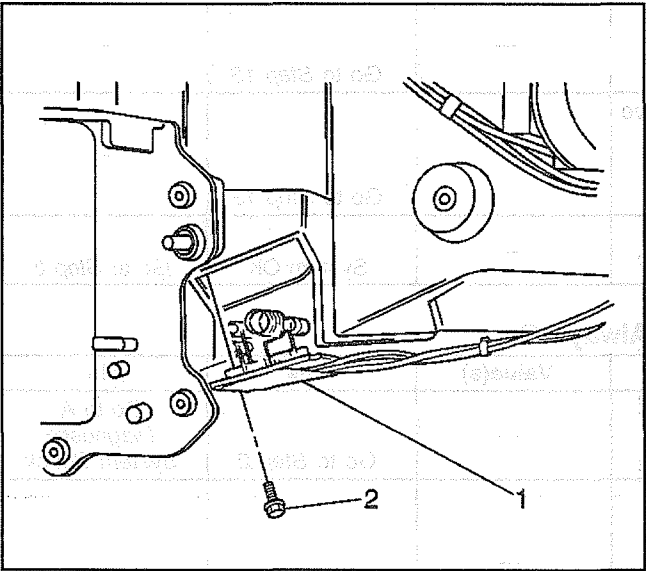
Blower Motor Always On

Step	Action	Value(s)	Yes	No
1	Did you complete the Diagnostic System Check?	—	Go to Step 2	Go to A Diagnostic System Check
2	1. Turn the ignition switch to the OFF position. 2. Disconnect the blower motor relay. 3. Connect a test lamp at the blower motor relay connector terminal A1 and ground. Does the test lamp illuminate?	—	Go to Step 3	Go to Step 4
3	Repair a short to battery voltage in the control circuit of the high blower motor. Refer to <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 9	—
4	Connect a test lamp at the blower motor relay connector terminal B2 and ground. Does the test lamp illuminate?	—	Go to Step 5	Go to Step 6
5	Repair a short to battery voltage in the blower resistor control circuit of the blower motor. Did you complete the repair?	—	Go to Step 9	—
6	Connect a test lamp at the blower motor relay connector terminal C1 and ground. Does the test lamp illuminate?	—	Go to Step 7	Go to Step 8
7	Repair a short to battery voltage in the supply voltage circuit of the blower motor. Refer to <i>Wiring Repairs</i> in Wiring Systems. Did you complete the repair?	—	Go to Step 9	—
8	Replace the blower motor relay. Refer to <i>Blower Motor Relay Replacement</i> . Did you complete the replacement?	—	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 3

Air Delivery Improper

The air delivery system uses an engine manifold vacuum in order to position the heater A/C module valves. The positioning of the valves allows the air delivery system to achieve the desired air flow. The engine manifold vacuum is controlled by the heater A/C control.

Repair Instructions

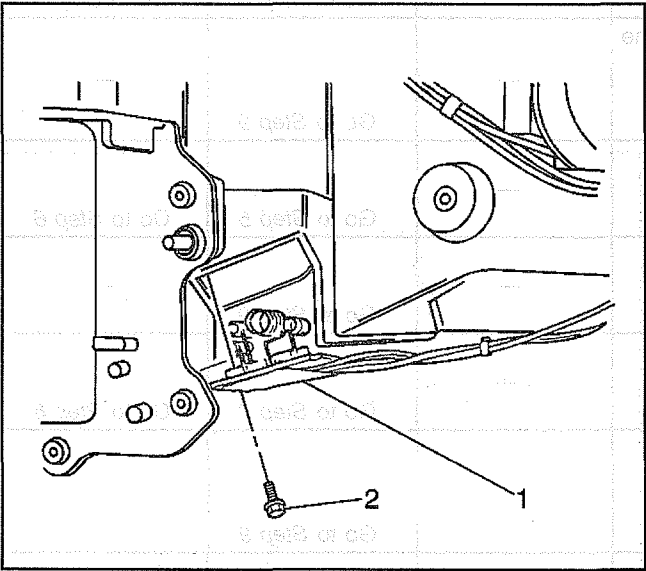


282923

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 *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.
3. Pull the carpet away from the heater module.
4. Remove the blower motor resistor bolt (2).
5. Disconnect the blower motor resistor electrical connector.
6. Remove the blower motor resistor (1).



282923

Installation Procedure

1. Install the blower motor resistor (1).
2. Connect the blower motor resistor electrical connector.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the blower motor resistor bolt (2).

Tighten

Tighten the blower motor resistor bolt to 2 (18 lb in).

4. Reposition the carpet.
5. Install the right instrument panel insulator. Refer to *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.
6. Test the blower motor operation at each of the four speeds.

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 *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.
3. Disconnect the blower motor electrical connector.
4. Remove the blower motor bolts (2).
5. Remove the blower motor (3).
6. Inspect the blower motor terminals for corrosion.

Perform the following tasks as necessary:

- Clean the corrosion from the terminals.
- Replace the blower motor.

7. 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.

8. 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

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.

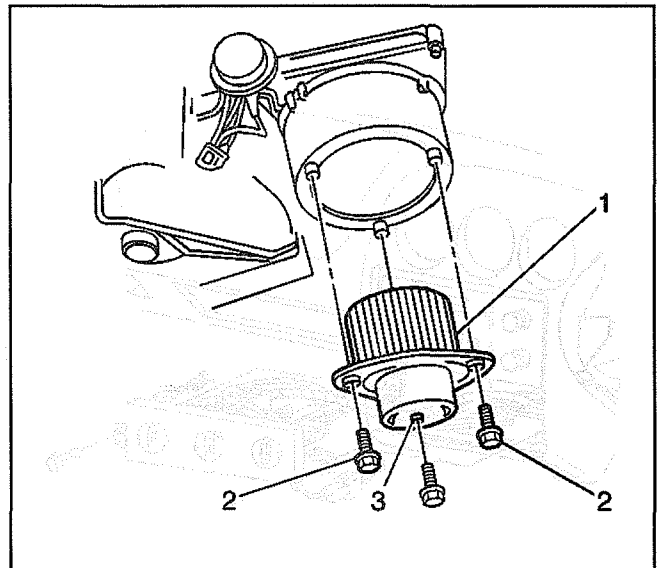
Notice: Refer to *Fastener Notice* in Cautions and Notices.

- 1.2. Install the blower motor bolts (2).

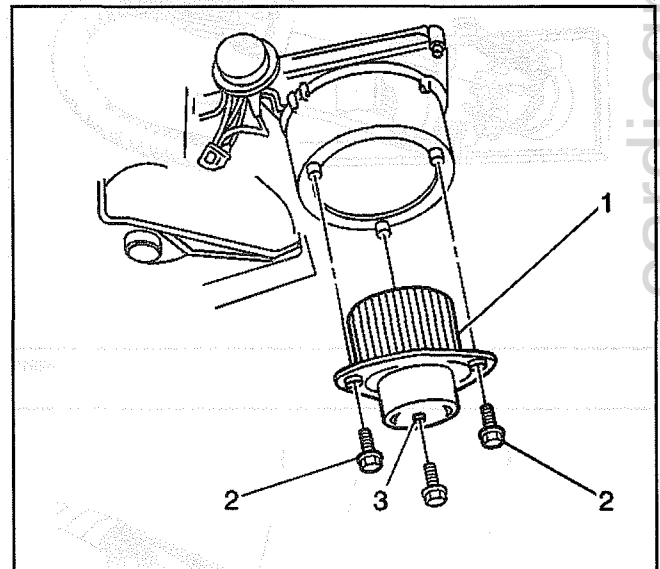
Tighten

Tighten the blower motor bolts (2) to 2.3 N·m (20 lb in).

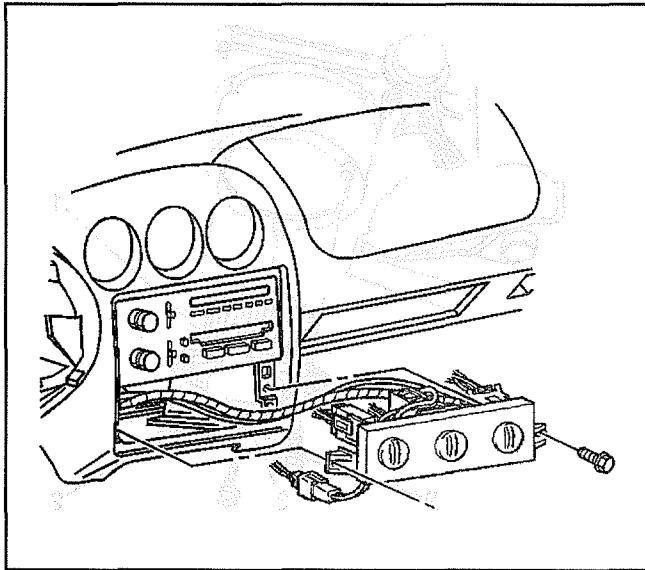
2. Connect the blower motor electrical connector.
3. Install the right instrument panel insulator. Refer to *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.
4. Check the blower for proper operation.



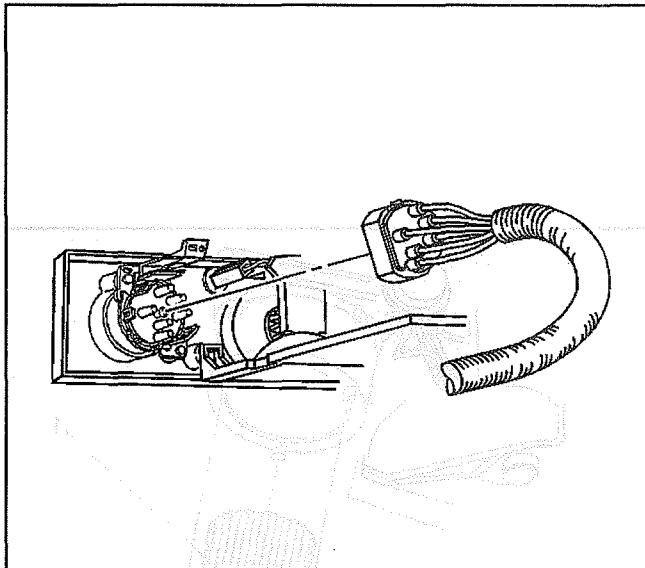
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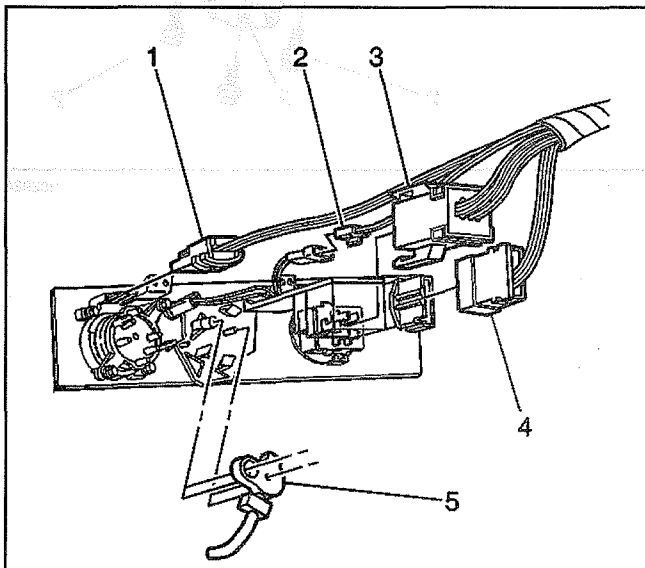
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282917

Control Assembly Replacement

Removal Procedure

1. Remove the accessory trim plate. Refer to *Trim Plate Bezel Replacement - IP Cluster (Chevrolet)* or *Trim Plate Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.
2. Remove the heating, ventilation and air conditioning (HVAC) control bolts.
3. Gently pull the HVAC control out from the instrument panel (IP) far enough to access the following connections:
 - Vacuum
 - Electrical
 - Temperature cable

4. Disconnect the vacuum harness connector from the vacuum selector valve.

5. Disconnect the following electrical connectors from the HVAC control:

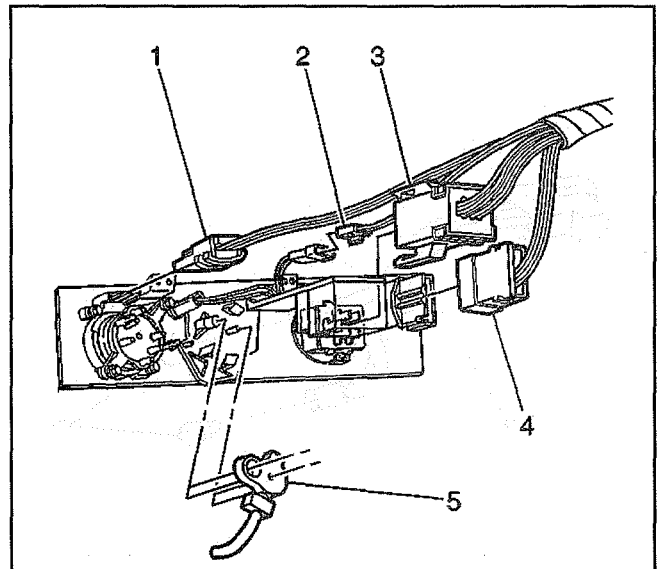
- HVAC mode switch (1)
- HVAC control illumination (2)
- HVAC blower switch (3)
- Rear defogger (4)

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.

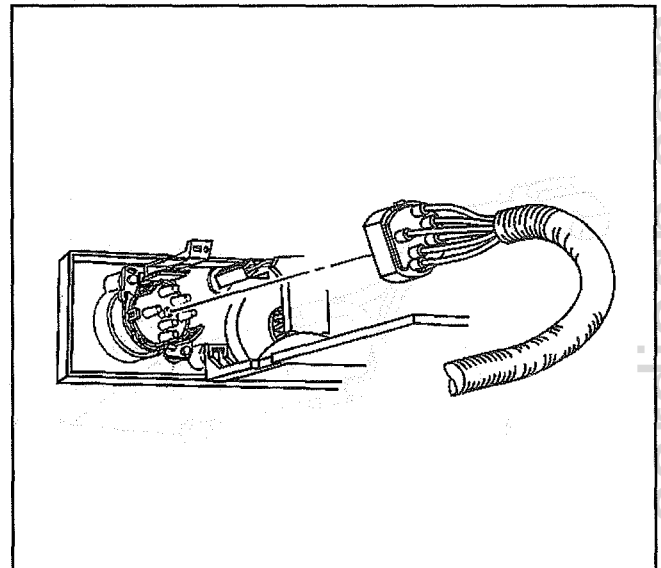
Installation Procedure

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)



282917

3. Connect the vacuum harness connector to the vacuum selector valve.



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4. Install the HVAC control.

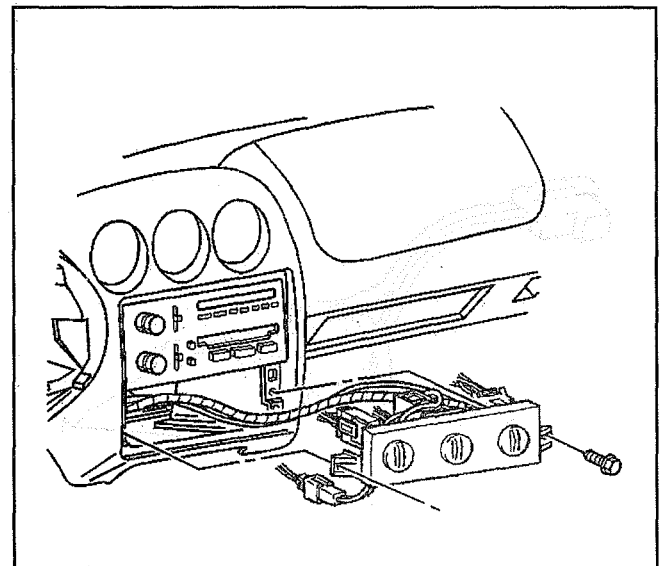
Notice: Refer to *Fastener Notice* in Cautions and Notices.

5. Install the HVAC control bolts.

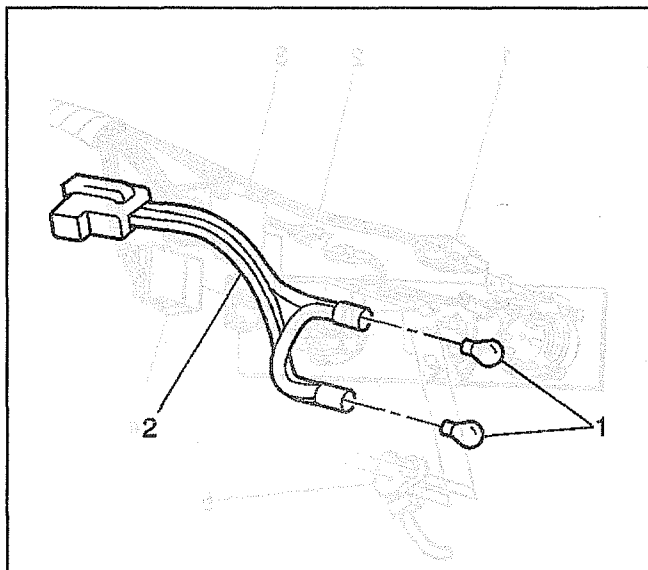
Tighten

Tighten the HVAC control bolts to 2.2 N·m (19 lb in).

6. Install the accessory trim plate. Refer to *Trim Plate Bezel Replacement - IP Cluster (Chevrolet)* or *Trim Plate Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.



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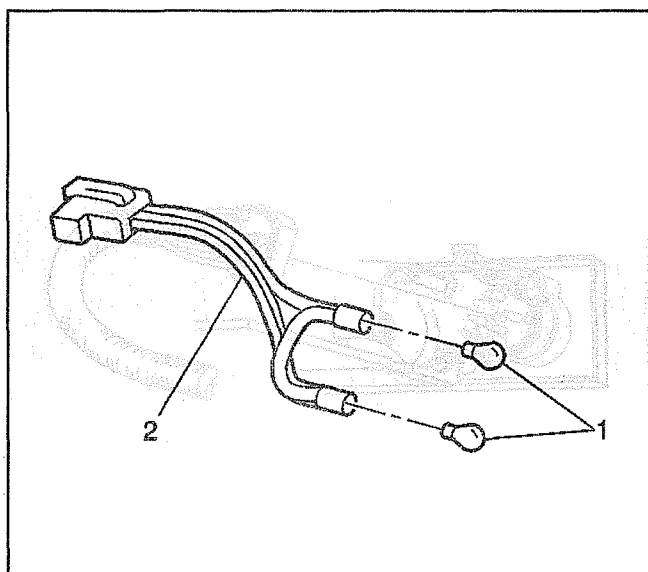
T10505

517337

HVAC Control Lamp Bulb Replacement

Removal Procedure

1. Remove the heating, ventilation and air conditioning (HVAC) control. Refer to *Control Assembly Replacement*.
2. Remove the HVAC control wiring harness from the control.
3. Gently, pull the burned out HVAC control lamp bulb (1) from the control lamp harness.

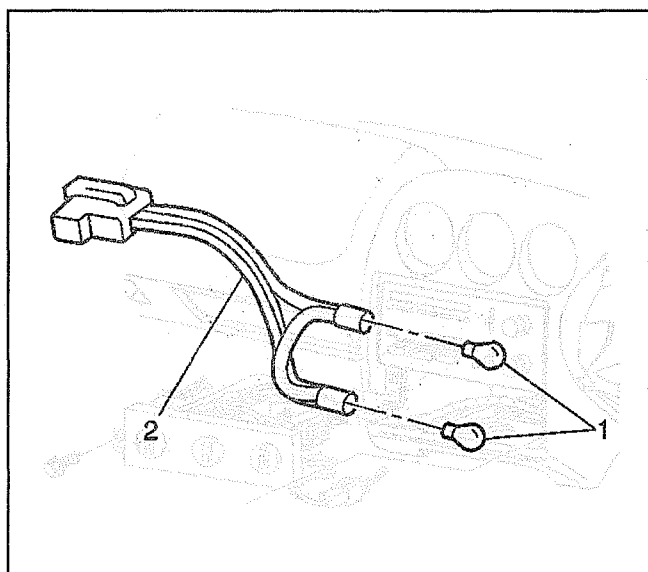


T10505

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Installation Procedure

1. Install a new HVAC control lamp bulb (1) to the control lamp harness.
2. Install the HVAC control wiring harness to the control.
3. Install the HVAC control. Refer to *Control Assembly Replacement*.



T10505

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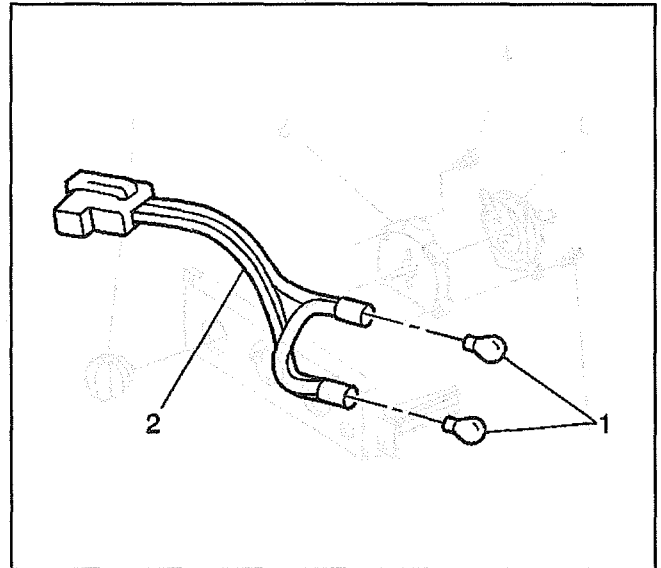
HVAC Control Lamp Bulb Wiring Harness Replacement

Removal Procedure

1. Remove the heating, ventilation and air conditioning (HVAC) control. Refer to *Control Assembly Replacement*.
2. Remove the HVAC control wiring harness (2) from the control.
3. Gently, pull the control lamp bulbs from the control lamp harness (2).

Installation Procedure

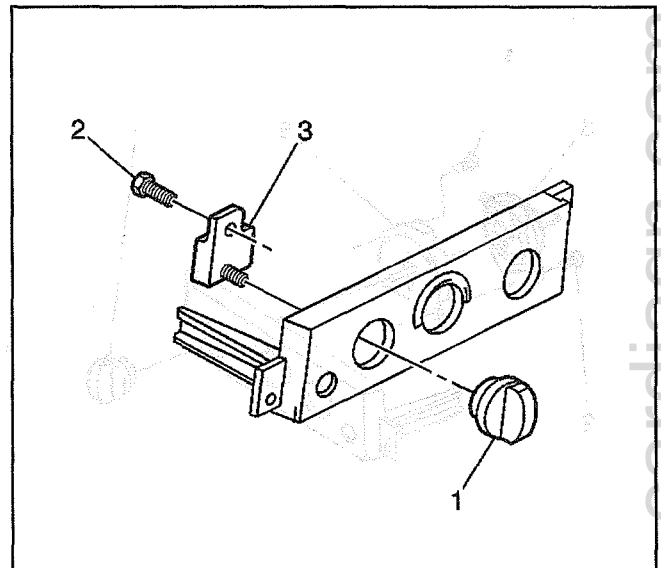
1. Install the control lamp bulbs to the control lamp harness (2).
2. Install the HVAC control wiring harness (2) to the control.
3. Install the HVAC control. Refer to *Control Assembly Replacement*.



517337

HVAC Control Blower Switch Replacement**Removal Procedure**

1. Remove the heating, ventilation and air conditioning (HVAC) control. Refer to *Control Assembly Replacement*.
2. Pull the HVAC control blower knob (1) off.
3. Remove the HVAC control blower switch screw (2).
4. Remove the HVAC control blower switch (3) from the control.



517336

Installation Procedure

1. Install the HVAC control blower switch (3) to the control.

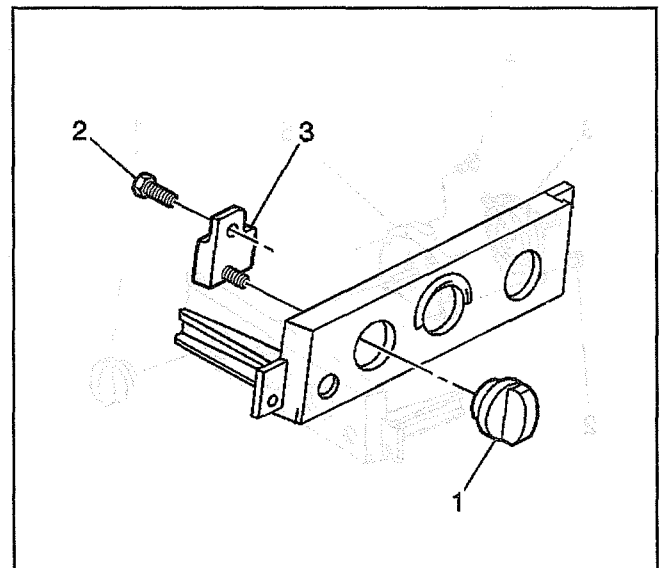
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the HVAC control blower switch screw (2).

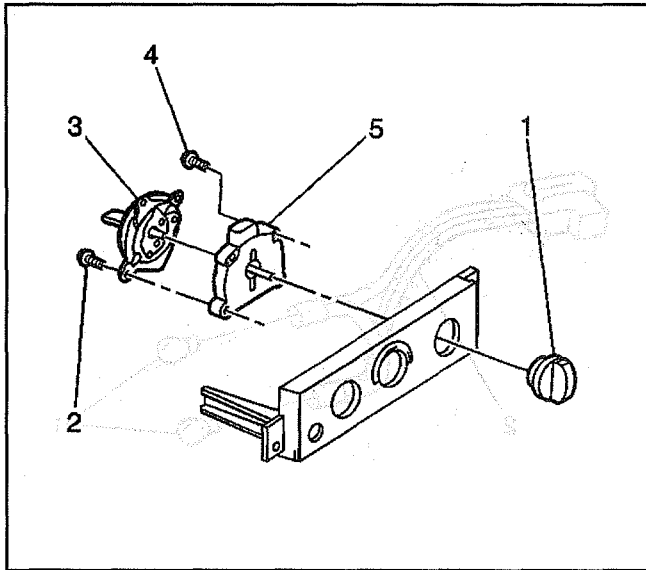
Tighten

Tighten the HVAC control blower switch screw (2) to 2 N·m (18 lb in).

3. Push the HVAC control blower knob (1) on.
4. Install the HVAC control. Refer to *Control Assembly Replacement*.



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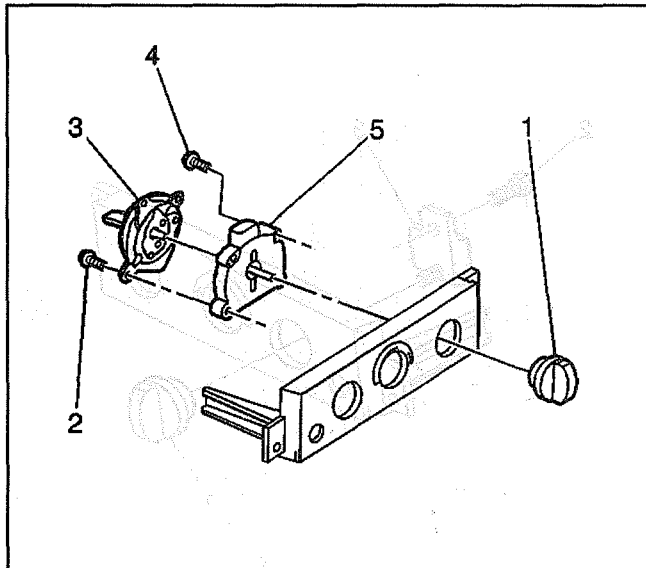


517338

HVAC Control Vacuum Valve Replacement

Removal Procedure

1. Remove the heating, ventilation and air conditioning (HVAC) control. Refer to *Control Assembly Replacement*.
2. Remove the HVAC control selector switch screws (2, 4).
3. Remove the HVAC control vacuum valve (3) from the selector switch (5).



517338

Installation Procedure

1. Install the HVAC control vacuum valve (3) to the selector switch (5).

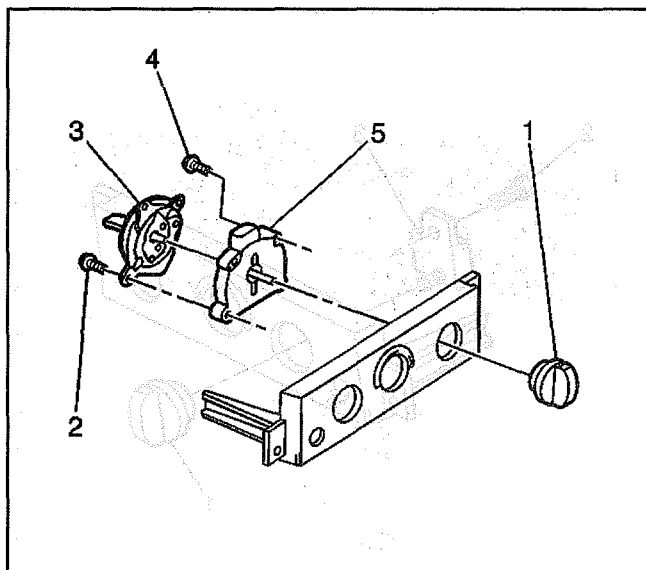
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the HVAC control selector switch screws (2, 4).

Tighten

Tighten the HVAC control selector switch screws to 2 N·m (18 lb in).

3. Install the HVAC control. Refer to *Control Assembly Replacement*.



517338

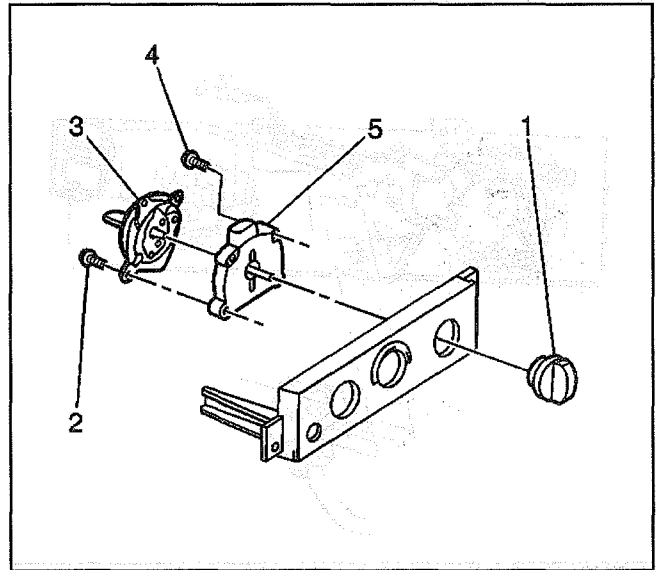
HVAC Control Selector Switch Replacement

Removal Procedure

1. Remove the heating, ventilation and air conditioning (HVAC) control vacuum valve. Refer to *HVAC Control Vacuum Valve Replacement*.
2. Pull the HVAC control selector knob (1) off.
3. Remove the HVAC control selector switch (5) from the control.

Installation Procedure

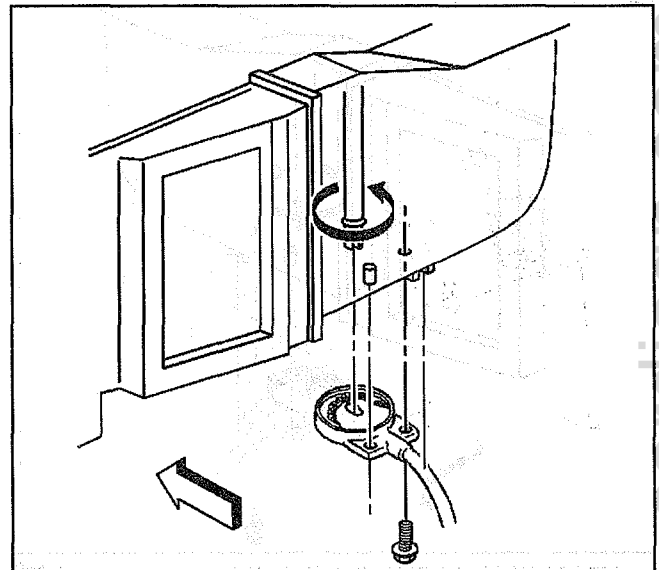
1. Install the HVAC control selector switch (5) to the control.
2. Push the HVAC control selector knob (1) on.
3. Install the HVAC control vacuum valve. Refer to *HVAC Control Vacuum Valve Replacement*.



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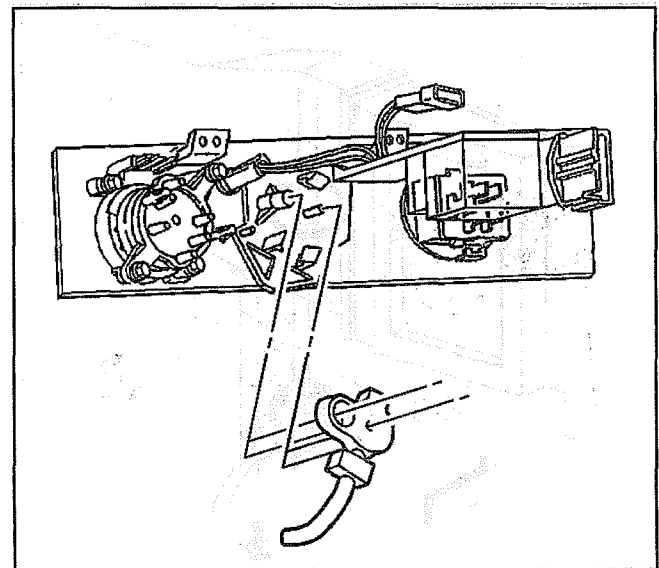
Temperature Control Cable Replacement**Removal Procedure**

1. Remove the right instrument panel (IP) insulator. Refer to *Closeout/Insulator Panel Replacement - Right in Instrument Panel, Gauges and Console*.
2. Remove the temperature control cable bolt.
3. Disconnect the temperature control cable at the air conditioning (A/C) module.
4. Remove the accessory trim plate. Refer to *Trim Plate Bezel Replacement - IP Cluster (Chevrolet)* or *Trim Plate Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.



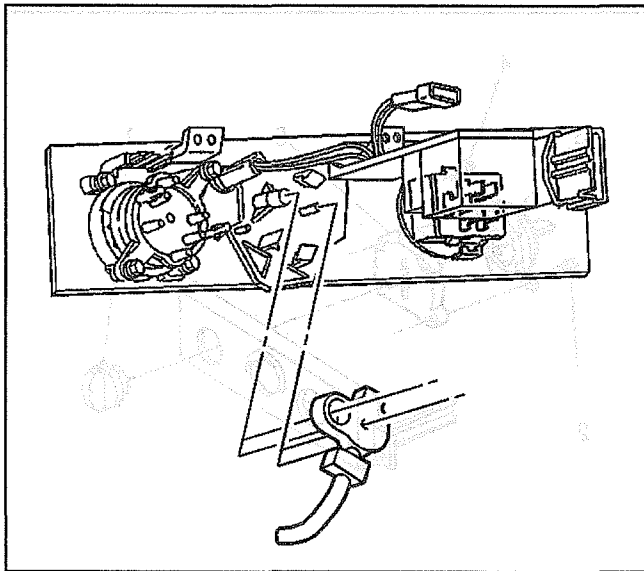
282922

5. Remove the heating, ventilation and air conditioning (HVAC) control bolts.
6. Pull the HVAC control out of the IP 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.

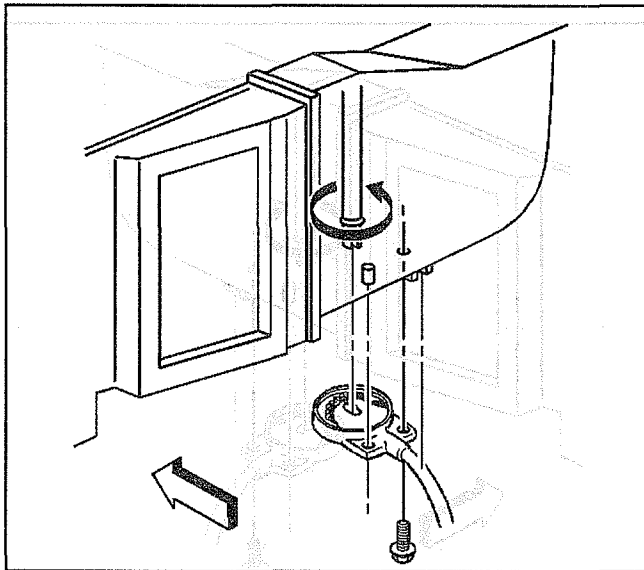


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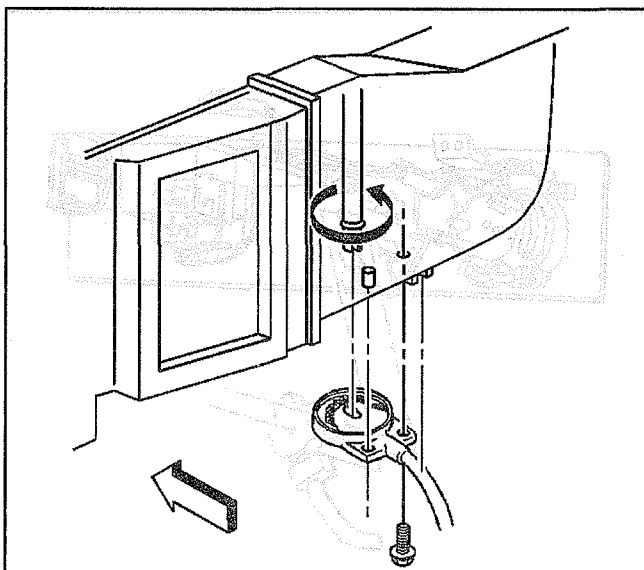
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Installation Procedure

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).

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 *Trim Plate Bezel Replacement - IP Cluster (Chevrolet)* or *Trim Plate Bezel Replacement - IP Cluster (Pontiac)* in Instrument Panel, Gauges and Console.

Temperature Control Cable Adjustment

1. Remove the right instrument panel (IP) insulator. Refer to *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.

2. Remove the temperature control cable bolt.

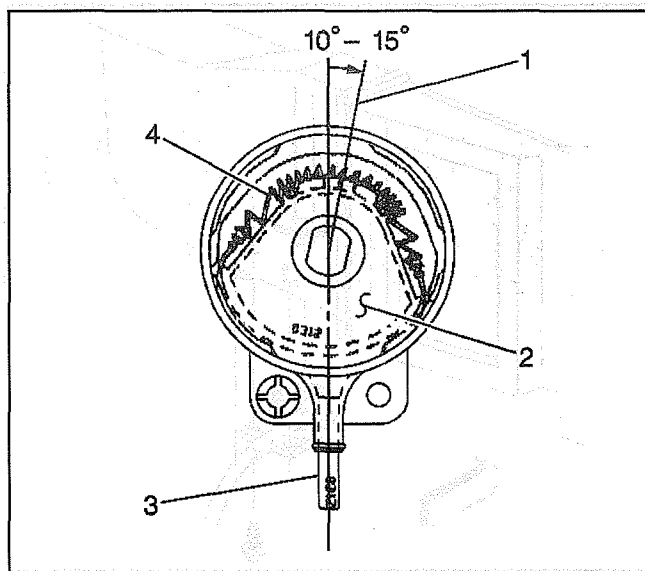
3. Disconnect the temperature control cable at the air conditioning (A/C) module.

Important: Ensure that the temperature control cable (3) is still attached to the heating, ventilation and air conditioning (HVAC) control.

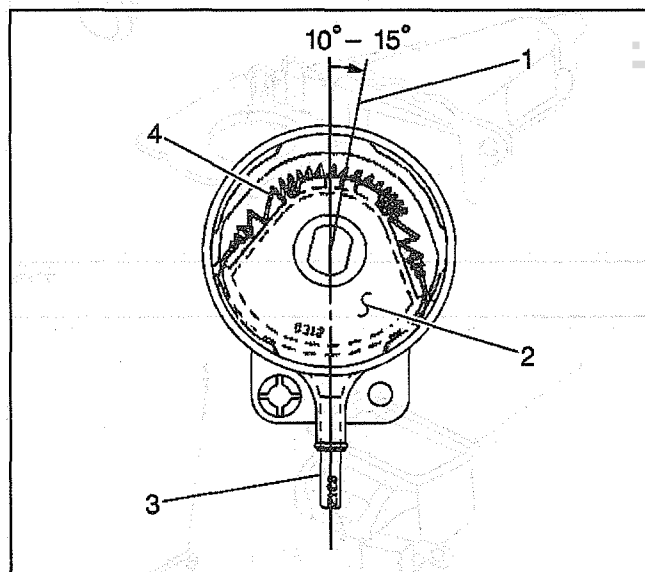
4. Cycle the temperature control knob between the following positions:
 - Full cold position
 - Full hot position
5. Replace the temperature control cable if one of the following situations occur:
 - The temperature control cable binds
 - The temperature control cable does not rotate freely

Refer to *Temperature Control Cable Replacement*.

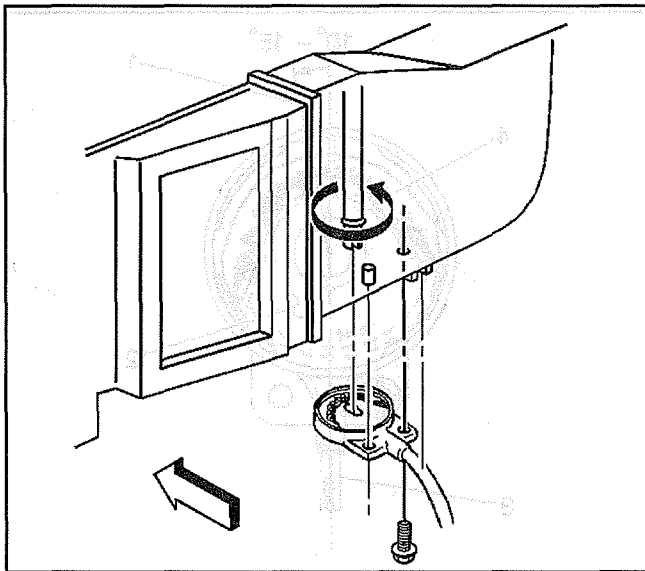
6. Set the temperature control knob to the detent position half way between the full cold and the full hot positions.
7. Inspect the position of the temperature control cable pulley (2).
Adjust the temperature control cable pulley (2):
 - Do not adjust the pulley if the pulley is skewed 5–10 degrees 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.
10. Install the temperature control cable spring (4) to the temperature control cable pulley (2).
11. Connect the temperature control cable (5) to the heater module.



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12. Connect the temperature control cable to the A/C module.

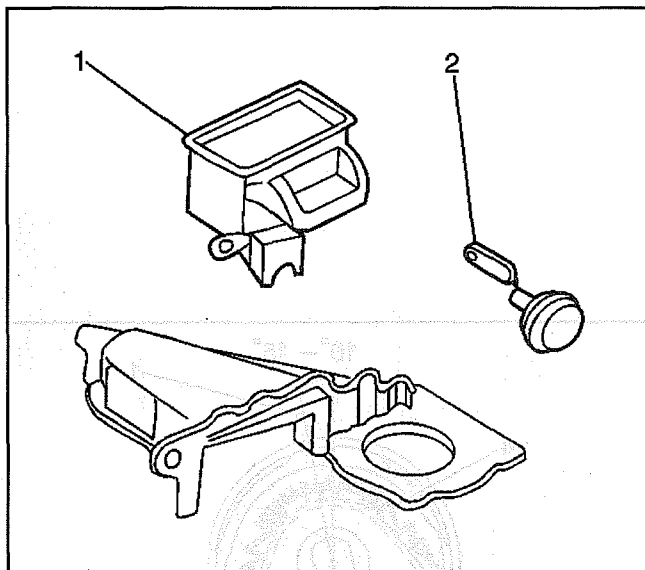
Notice: Refer to *Fastener Notice* in Cautions and Notices.

13. Install the temperature control cable bolt.

Tighten

Tighten the temperature control cable bolt to 1.9 N-m (17 lb in).

14. Install the right IP insulator. Refer to *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.



571436

Inside Air Valve Actuator Replacement

Removal Procedure

1. Remove the right side insulator. Refer to *Closeout/Insulator Panel Replacement - Right* in Instrument Panel, Gauges and Console.
2. Remove the left side insulator. Refer to *Closeout/Insulator Panel Replacement - Left* in Instrument Panel, Gauges and Console.
3. Remove the instrument panel (IP) compartment door hinge screws.
4. Remove the IP compartment door.
5. Remove the heating, ventilation and air conditioning (HVAC) module screws.
6. Remove the HVAC module cover.
7. Disconnect the air inlet valve linkage.
8. Remove the air inlet valve actuator (2) and vacuum hose.

Installation Procedure

1. Install the air inlet valve actuator (2) and vacuum hose.
2. Connect the air inlet valve linkage.
3. Install the HVAC module cover.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the HVAC module screws.

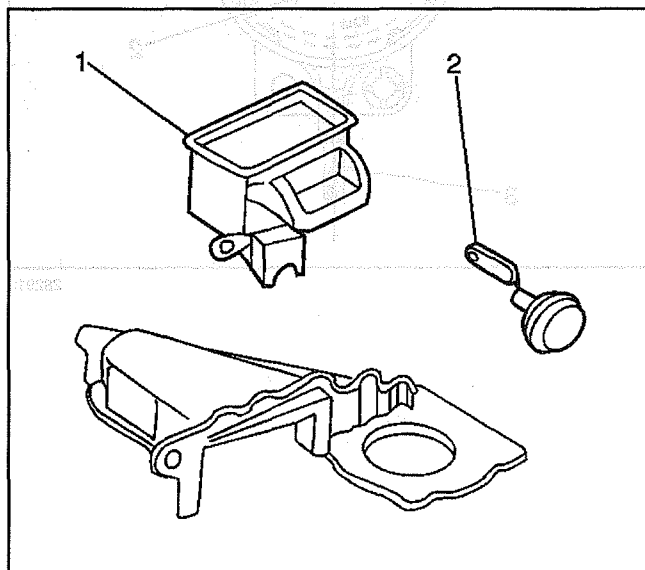
Tighten

Tighten the HVAC module screws to 1.8 N-m (16 lb in).

5. Install the IP compartment door.
6. Install the IP compartment hinge screws.

Tighten

Tighten the IP compartment hinge screws to 2.8 N-m (25 lb in).



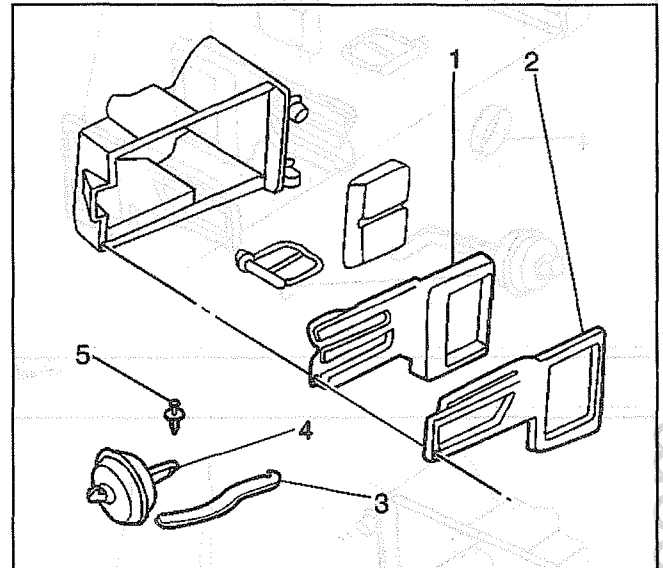
571436

7. Install the left side insulator. Refer to *Closeout/Insulator Panel Replacement - Left in Instrument Panel, Gauges and Console*.
8. Install the right side insulator. Refer to *Closeout/Insulator Panel Replacement - Right in Instrument Panel, Gauges and Console*.

Vacuum Actuator Replacement

Removal Procedure

1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
3. Remove the air distributor case face (1) and seal (2).
4. Disconnect the vacuum hose from the vent mode valve actuator (4).
5. Remove the vent mode valve linkage screw (5).
6. Unsnap the vent mode valve actuator (4) from air distributor case.



571441

Installation Procedure

1. Snap the vent mode valve actuator (4) to the air distributor case.

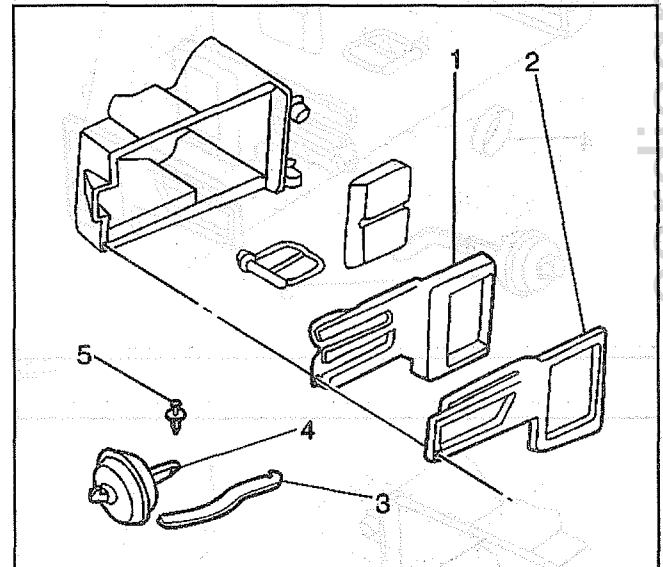
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the vent mode valve linkage screw (5).

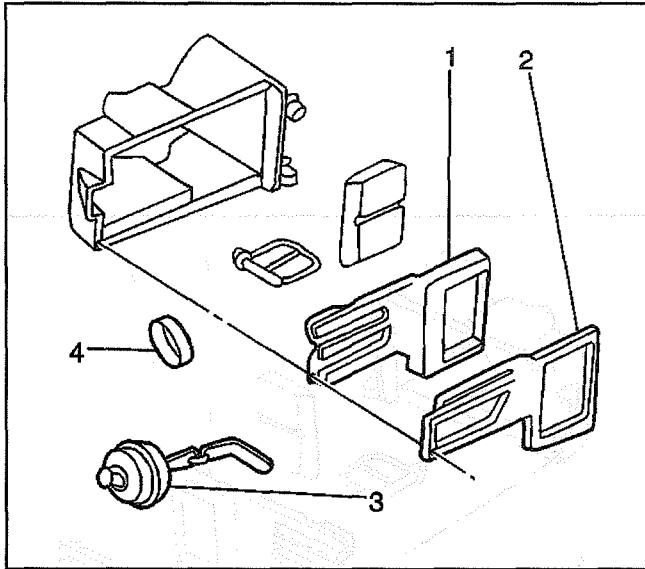
Tighten

Tighten the vent mode valve actuator screw to 2 N·m (18 lb in).

3. Connect the vacuum hose to the vent mode valve actuator (4).
4. Install the air distributor case face (1) and seal (2).
5. Install the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
6. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



571441

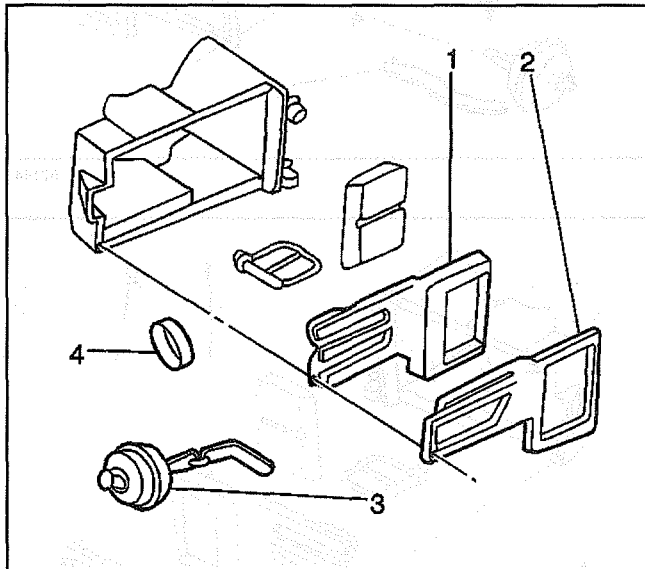


571445

Defroster Valve Actuator Replacement

Removal Procedure

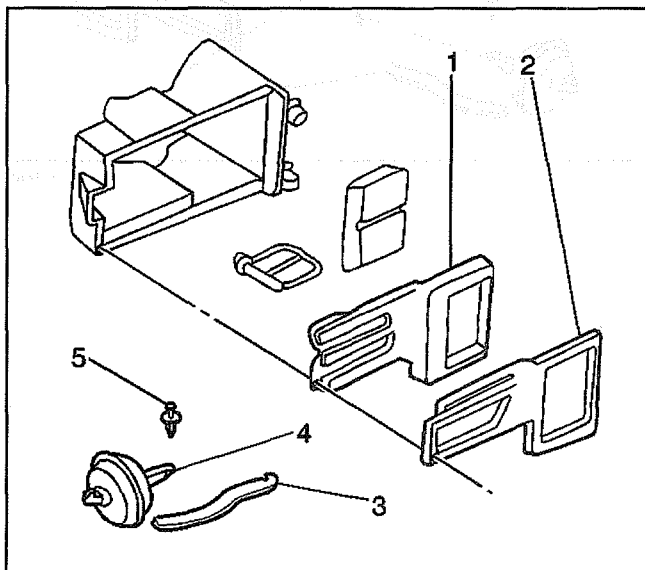
1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
3. Remove the air distributor case face (1) and seal (2).
4. Disconnect the vacuum hose from the defroster valve actuator.
5. Disconnect the defroster valve actuator linkage from the defroster actuator.
6. Remove the defroster valve actuator (3).



571445

Installation Procedure

1. Install the defroster valve actuator (3).
2. Connect the defroster valve actuator linkage to the defroster actuator.
3. Connect the vacuum hose to the defroster valve actuator.
4. Install the air distributor case face (1) and seal (2).
5. Install the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
6. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



571448

Mode Valve Actuator Replacement

Removal Procedure

1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
3. Remove the air distributor case face (1) and seal (2).
4. Disconnect the mode valve actuator linkage from the mode valve.
5. Remove the bi-level actuator (4) and linkage (3).
6. Remove the bi-level mode actuator screw (5).

Installation Procedure

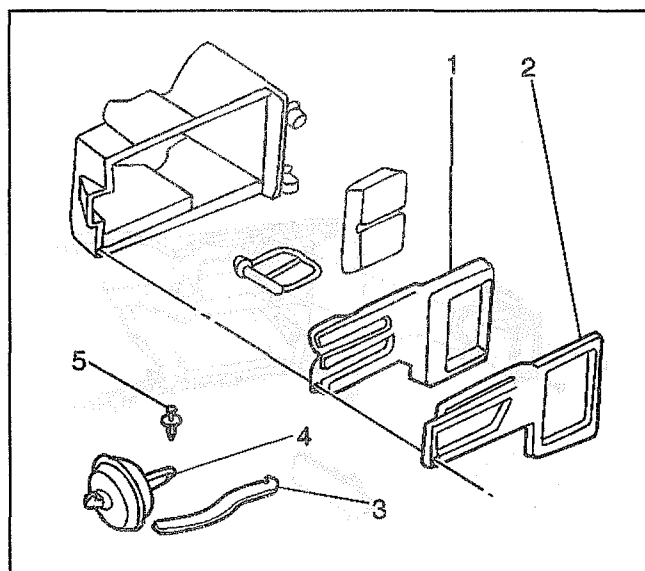
Notice: Refer to *Fastener Notice* in Cautions and Notices.

1. Install the bi-level mode actuator screw (5).

Tighten

Tighten the bi-level mode actuator screw to 2 N·m (18 lb in).

2. Install the bi-level actuator (4) and linkage (3).
3. Disconnect the mode valve actuator linkage from the mode valve.
4. Install the air distributor case face (1) and seal (2).
5. Install the front floor air duct. Refer to *Air Outlet Replacement - Floor*.
6. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.

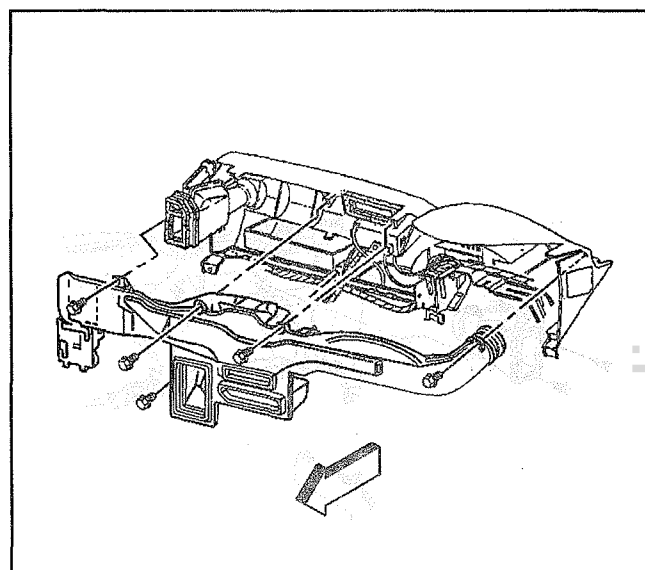


571448

Air Distributor Duct Replacement

Removal Procedure

1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Place the IP carrier face down on a clean work surface.
3. Remove the air distributor duct bolts.
4. Remove the air distributor from the IP carrier.



365456

Installation Procedure

1. Install the air distributor to the IP carrier.

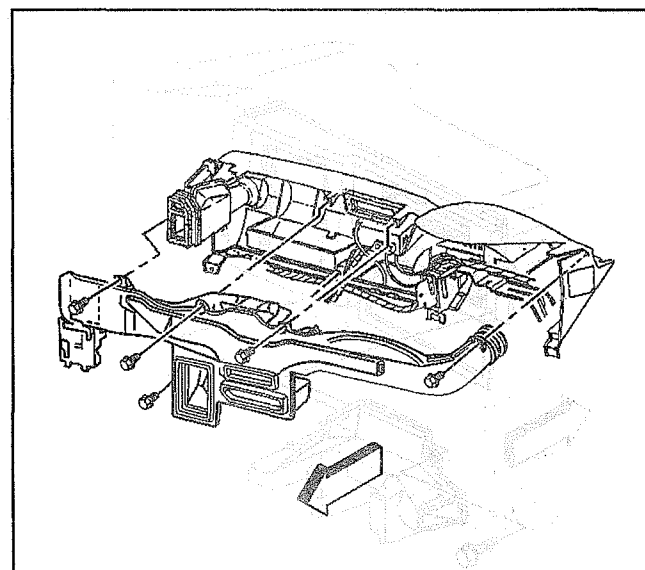
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the air distributor duct bolts.

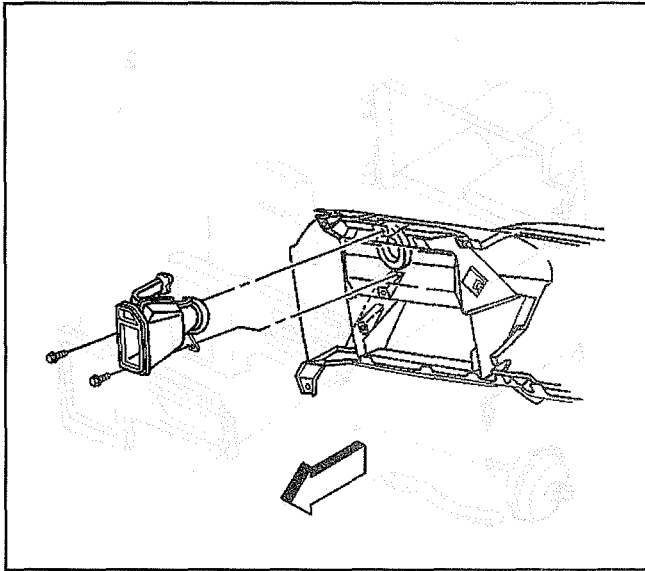
Tighten

Tighten the air distributor duct bolts to 2.2 N·m (19 lb in).

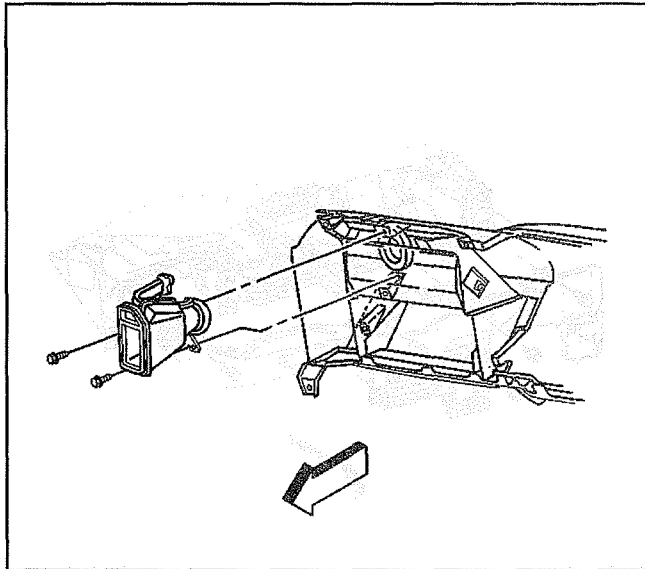
3. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



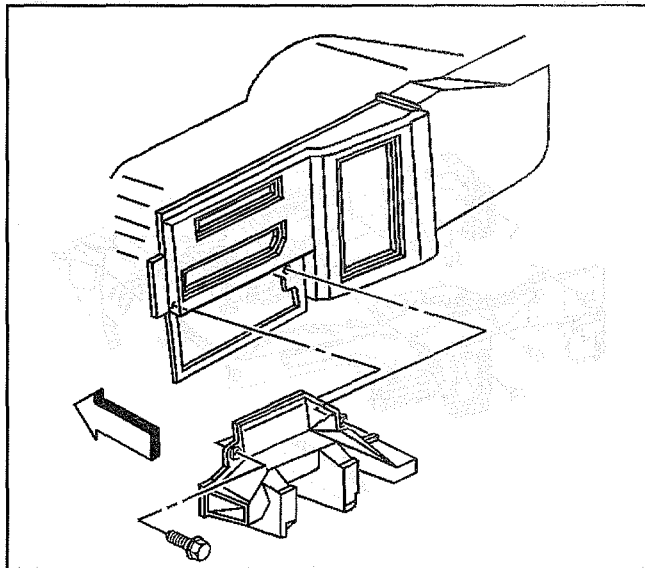
365456



365459



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365458

Air Outlet Replacement - Right Defogger

Removal Procedure

1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Remove the IP outer air outlet duct bolts.
3. Remove the IP outlet air outlet duct.

Installation Procedure

1. Install the IP outer air outlet duct.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the IP outer air outlet duct bolts.

Tighten

Tighten the IP outer air outlet duct bolts to 2.2 N·m (19 lb in).

3. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.

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.

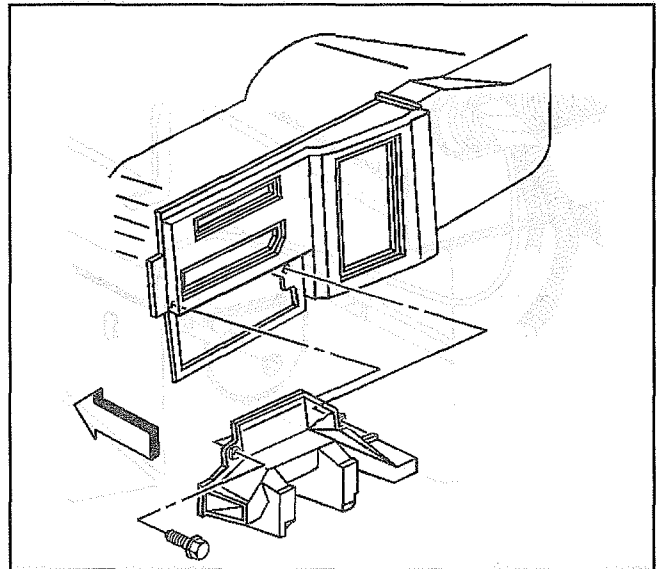
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the front floor air outlet bolts.

Tighten

Tighten the floor air outlet bolts to 1.9 N·m (17 lb in).

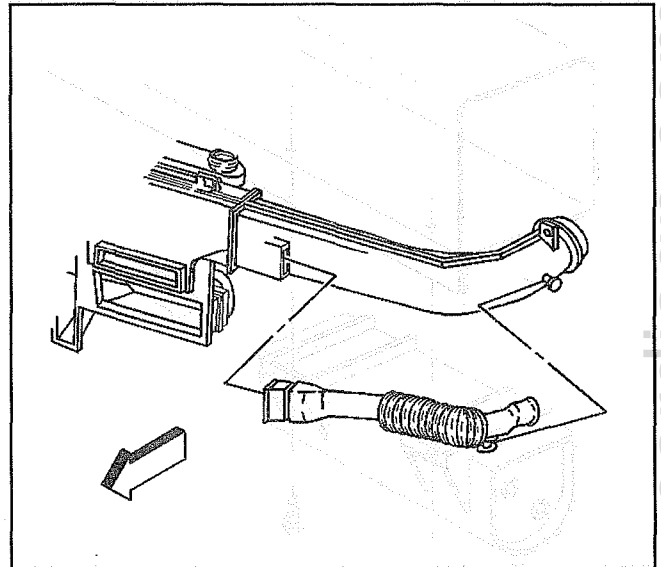
3. Install the front floor console. Refer to *Console Replacement - Front Floor* in Instrument Panel, Gauges and Console.



365458

Air Outlet Replacement - Side Window**Removal Procedure**

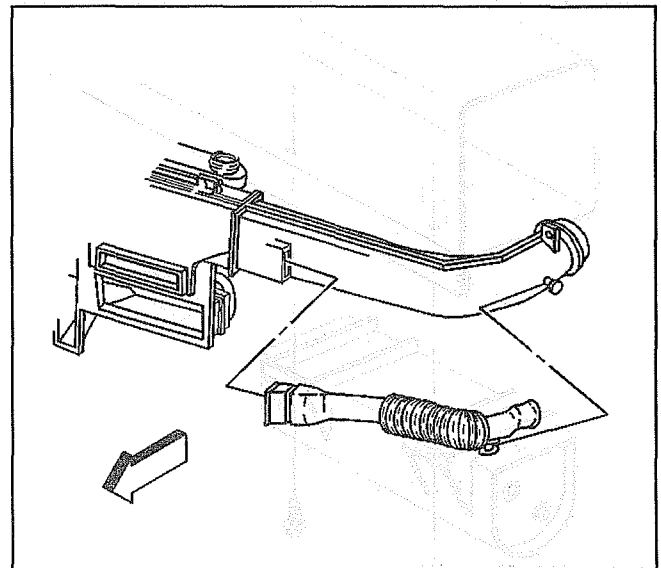
1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.
2. Place the IP carrier face down on a clean work surface.
3. Unsnap the side window defogger outlet duct from the air distributor.



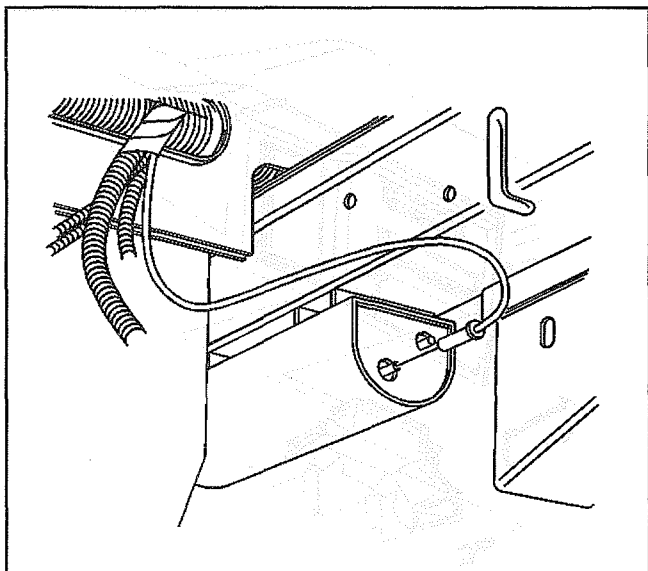
365462

Installation Procedure

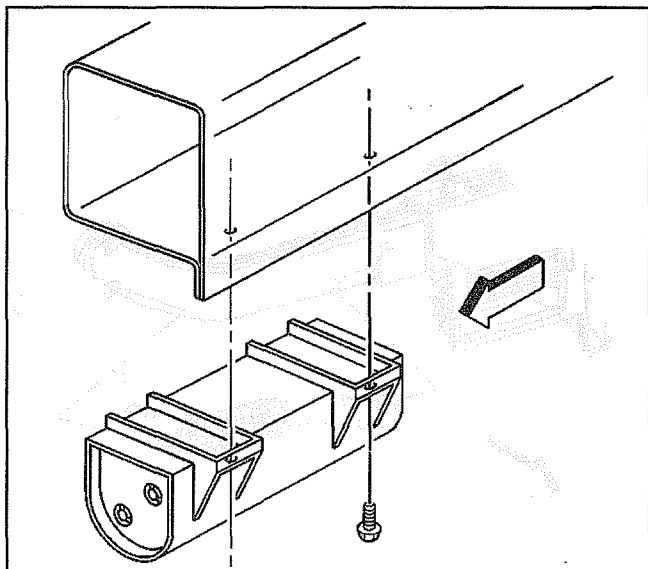
1. Snap the side window defogger outlet duct to the air distributor.
2. Install the IP carrier. Refer to *IP Carrier Replacement* in Instrument Panel, Gauges and Console.



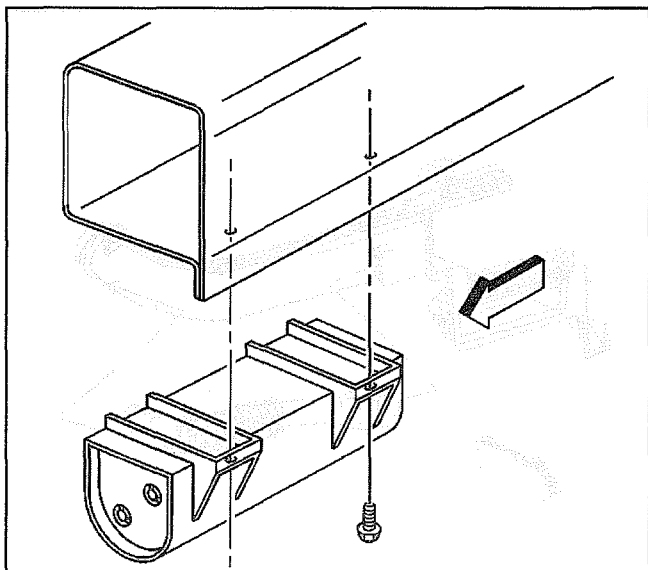
365462



282928



282929



282929

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.

4. Remove the vacuum tank mounting bolts.
5. Remove the vacuum tank.

Installation Procedure

1. Install the vacuum tank.

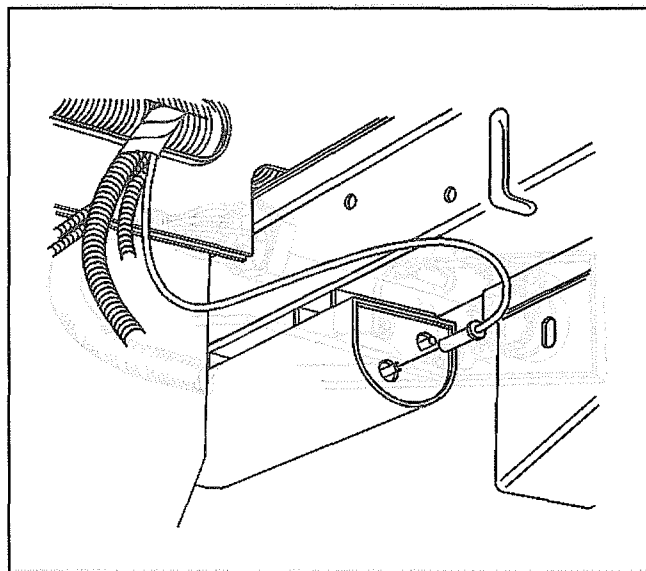
Notice: Refer to *Fastener Notice* in Cautions and Notices.

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.



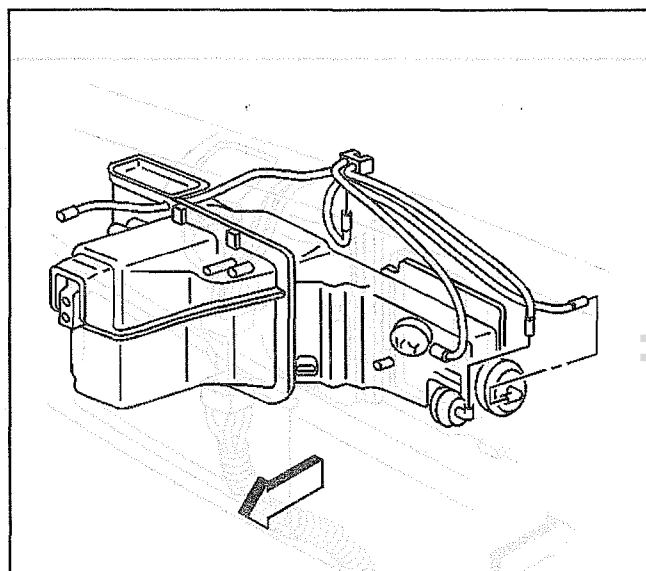
282928

282928

Vacuum Hose Harness Replacement

Removal Procedure

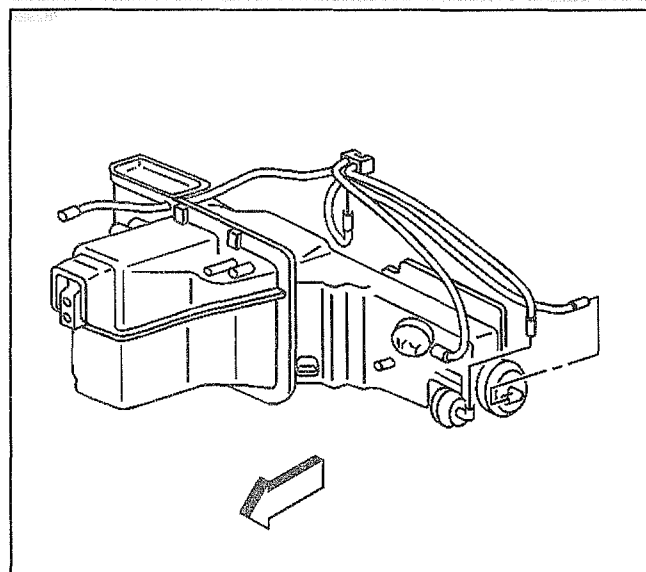
1. Remove the instrument panel (IP) carrier. Refer to *IP Carrier Replacement in Instrument Panel, Gauge and Console*.
2. Disconnect the vacuum hoses from the actuators.
3. Remove the vacuum harness.



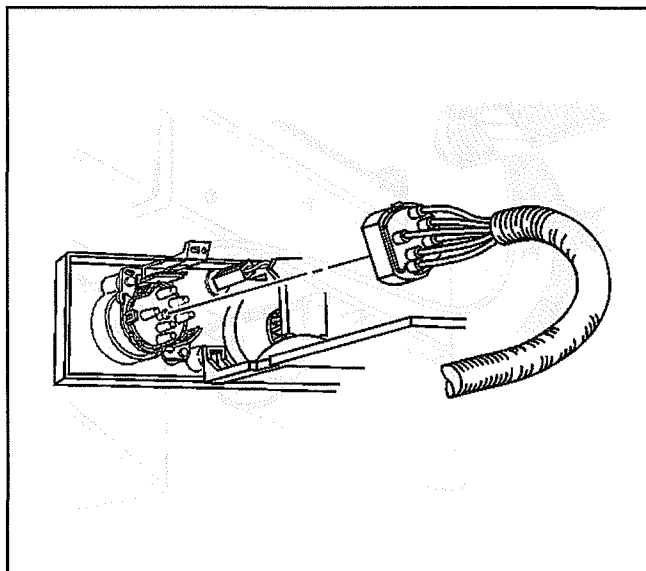
282925

Installation Procedure

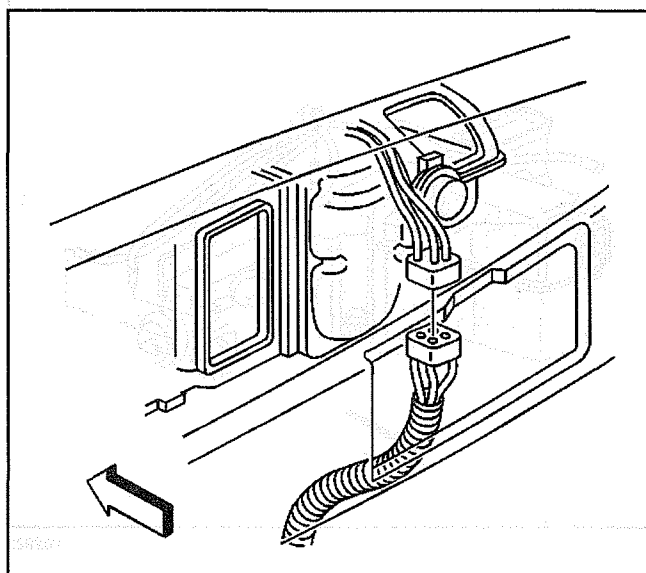
1. Install the vacuum harness.
2. Connect the vacuum hoses to the actuators.
3. Install the IP carrier. Refer to *IP Carrier Replacement in Instrument Panel Gauges and Console*.



282925



282918



282926

HVAC Control Vacuum Harness Replacement

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.

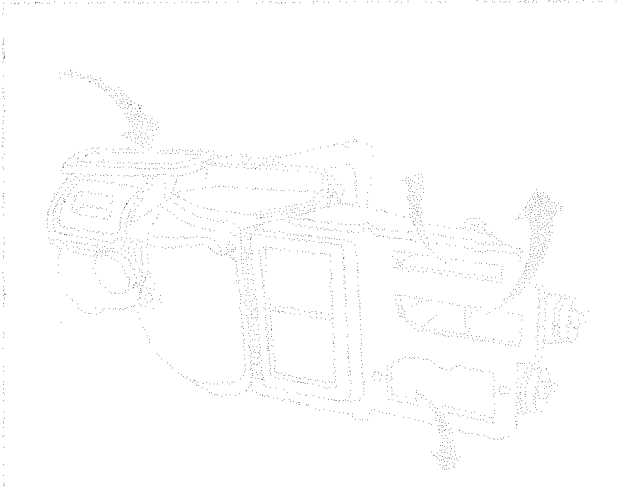
If there is a localized leak or collapse in the vacuum hose, repair the vacuum hose:

- 1.1. Cut the vacuum hose.
- 1.2. Insert a plastic retainer into the vacuum hose.

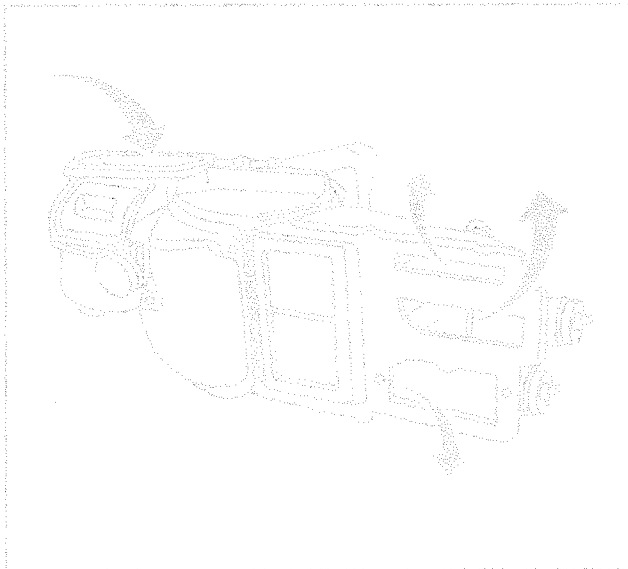
2. Remove the heating, ventilation and air conditioning (HVAC) control. Refer to *Control Assembly Replacement*.
3. Open the instrument panel (IP) compartment. Push in on both sides of the IP compartment. This will cause the IP compartment to drop open completely to allow access to the vacuum harness.
4. Disconnect the vacuum harness connector from the vacuum selector valve.
5. Disconnect the vacuum harness jumper from the main harness connector.

Installation Procedure

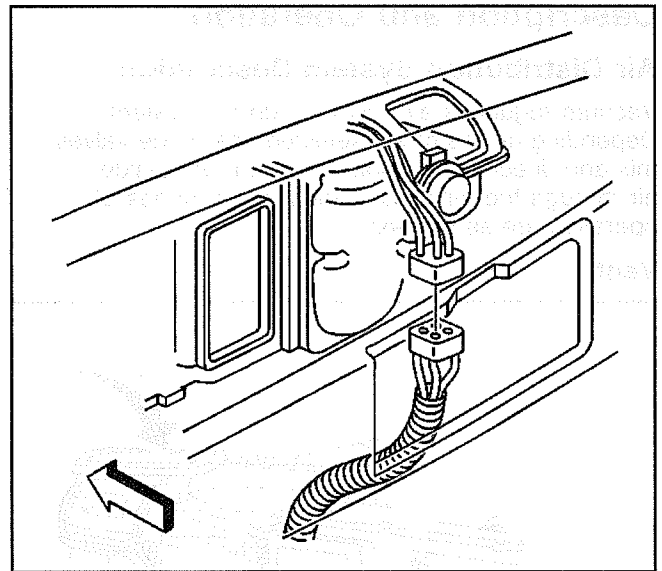
1. Connect the vacuum harness jumper to the main harness connector.



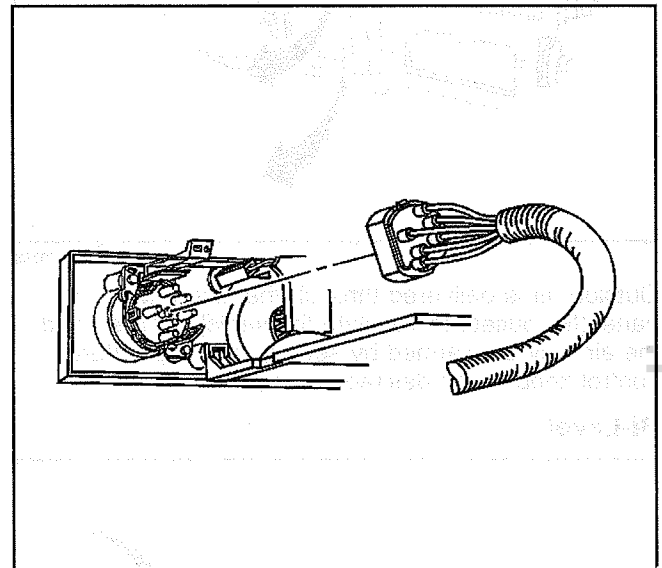
2. Connect the vacuum harness connector to the vacuum selector valve.
3. Close the IP compartment.
4. Install the HVAC control. Refer to *Control Assembly Replacement*.



Check for proper operation of the HVAC system. If the system does not operate properly, check the vacuum selector valve and the vacuum harness connector. If the system still does not operate properly, check the vacuum selector valve and the vacuum harness connector.



282926



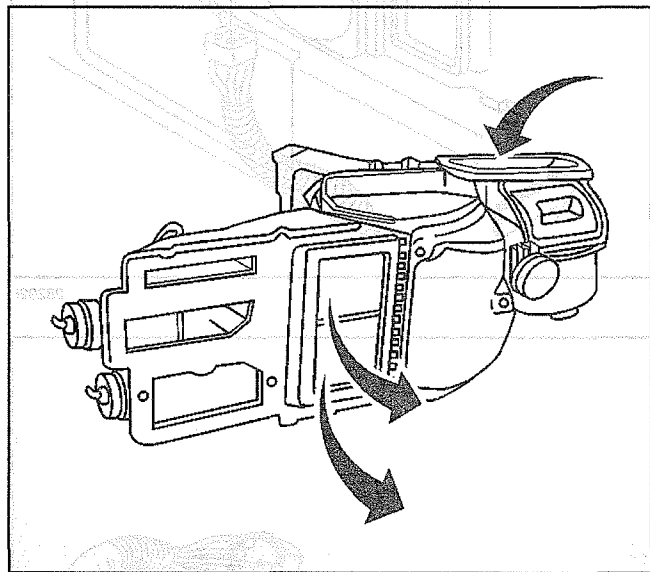
282918

Description and Operation

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:

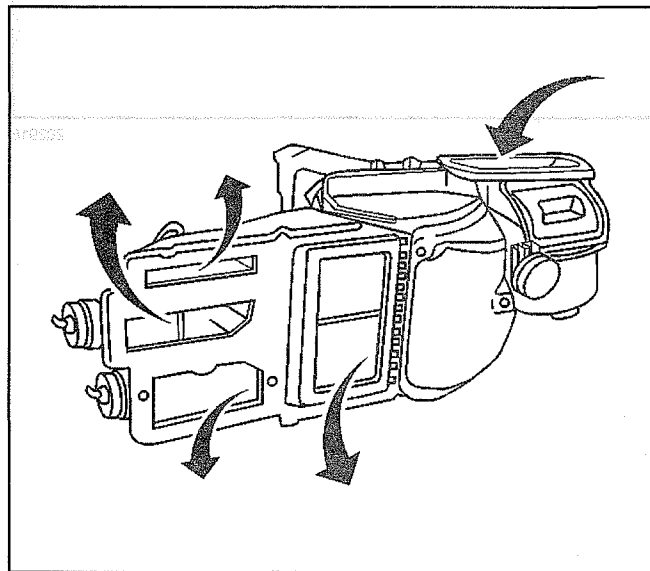
Vent



570788

Outside air is delivered through the instrument panel (IP) outlets to ventilate the vehicle. If preferred, the air may be warmed by setting the temperature control knob to the desired setting.

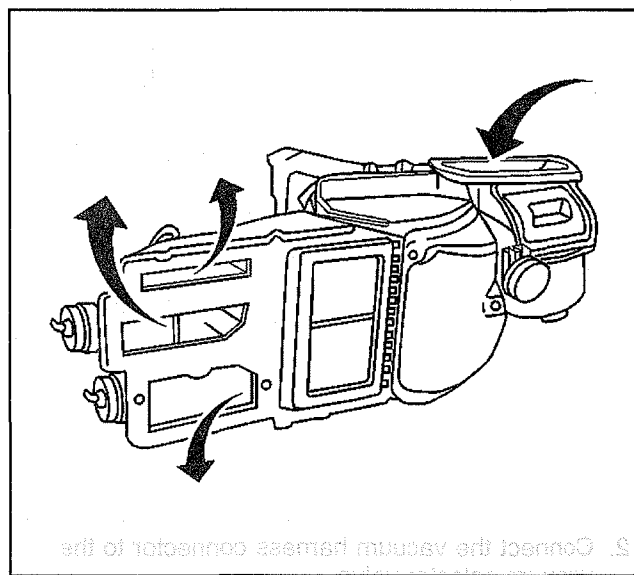
Bi-Level



570784

Electrical power is supplied to the blower motor. Outside air is drawn in and heated (depending on the position of the temperature control knob). Then the airflow is split between the IP outlets and the floor outlet.

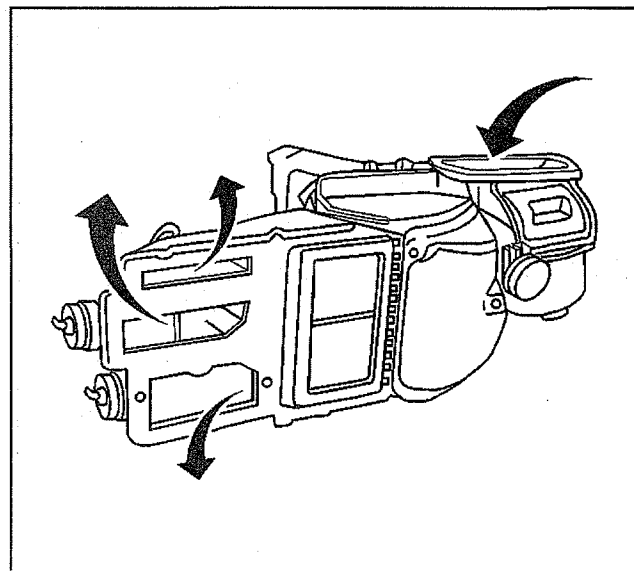
Heater



570793

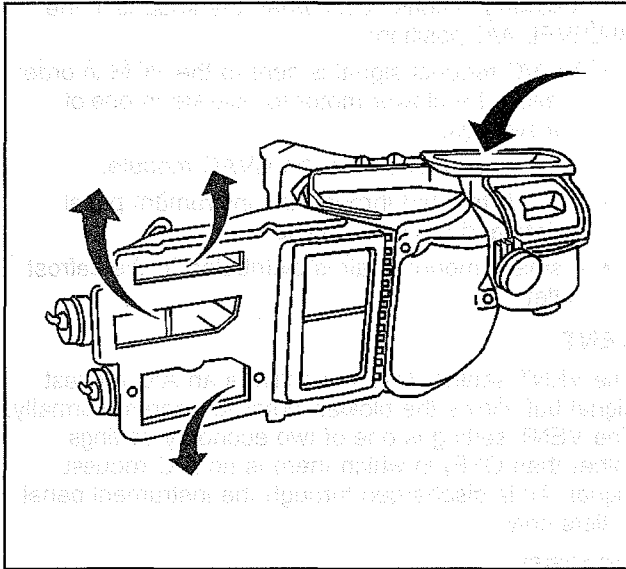
Outside air is drawn into the vehicle, heated (depending on the position of the temperature control knob) and directed to the floor air outlet. A small amount of air is routed to the windshield through the defrost outlet.

Blend



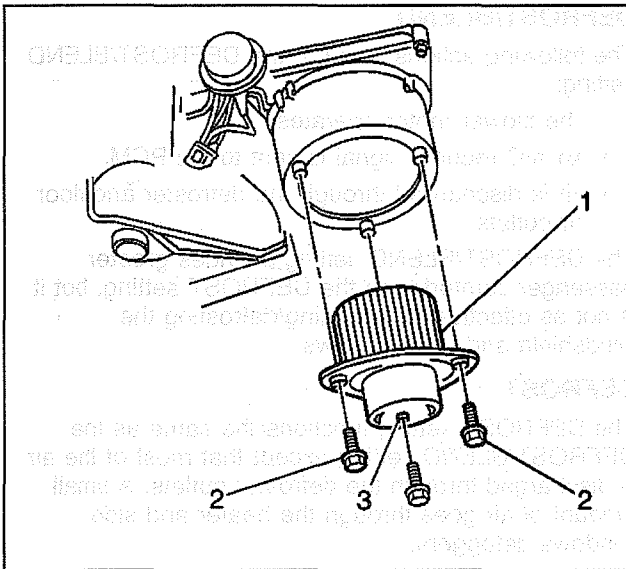
570800

Outside air is drawn into the vehicle, heated (depending on the position of the temperature control knob) and split between the defrost outlet and the floor air outlet.

Defrost

570797

Outside air is drawn into the vehicle, heated (depending on the position of the temperature control knob) and directed to the defrost outlet. A small amount of air is routed to the floor air outlet.

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.

Blower Motor Resistor Description

The following components, when used in combination, determine the blower speed:

- The blower resistor.
- The blower switch.

The blower resistor consists of 3 resistors located in the same housing.

With the blower switch in LO, the following actions occur:

- The blower circuit uses all 3 resistors.
- The blower motor runs at the lowest speed.

With the blower switch in M1, the following actions occur:

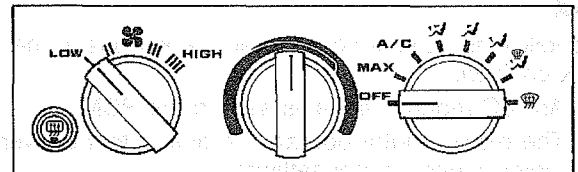
- Two of the resistors are in use.
- The blower motor runs faster.

With the blower switch in M2, the following actions occur:

- Only one of the resistors is in use.
- The blower motor runs even faster.

With the blower switch in HI, the following actions occur:

- None of the resistors are in use.
- The blower motor runs at maximum speed.

Control Assembly Description (Pontiac)

283259

The heating, ventilation and air conditioning (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 air conditioning (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

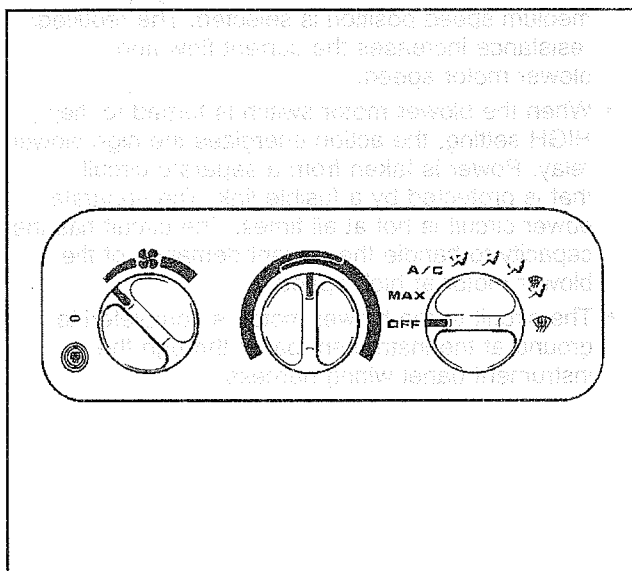
The DEFROST setting functions the same as the DEFROST/BLEND setting except that most of the air is discharged through the defroster outlets. A small amount of air goes through the heater and side windows defoggers.

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.

Control Assembly Description (Chevrolet)



283258

The heating, ventilation and air conditioning (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 air conditioning (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.

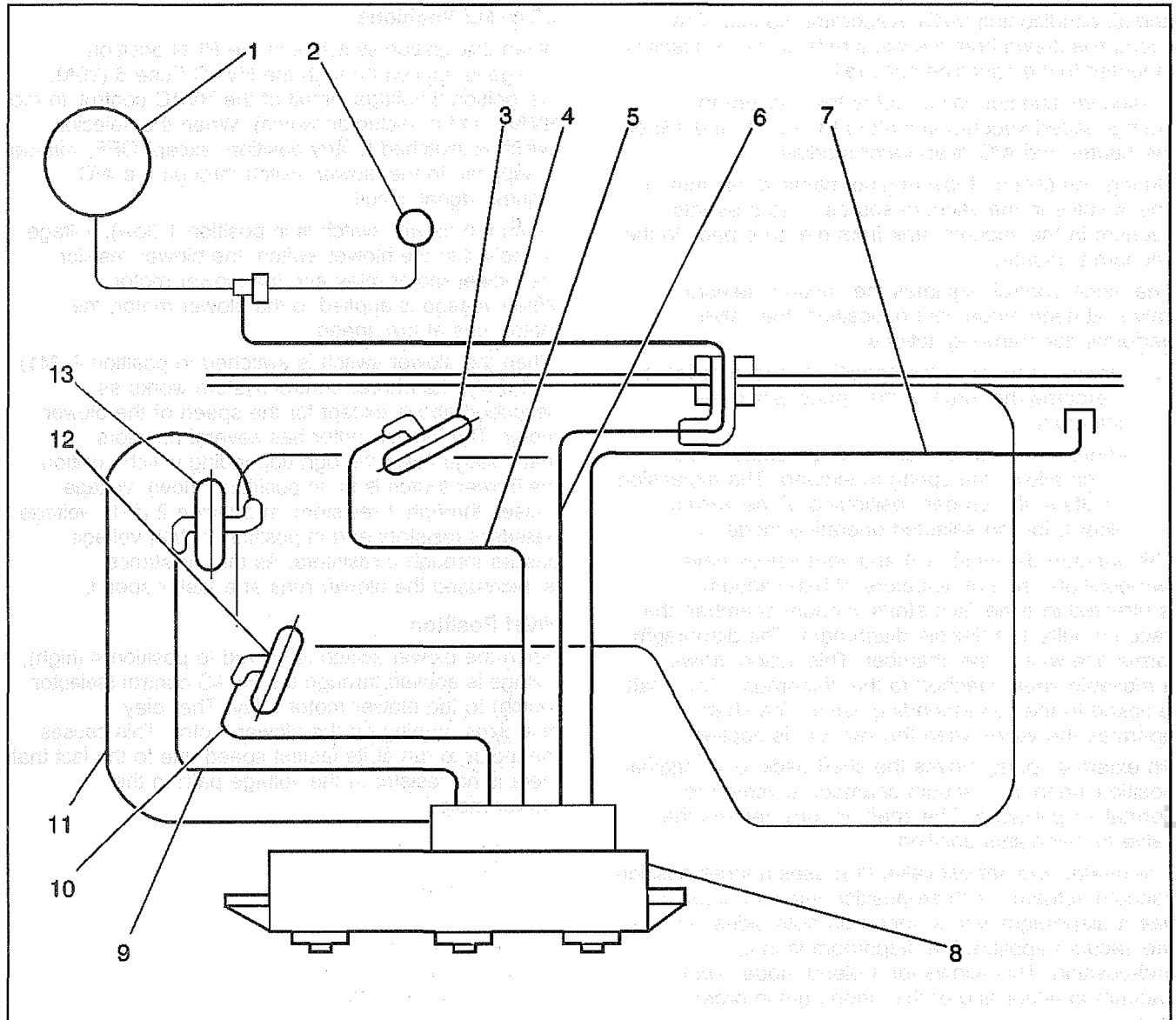
DEFROST

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.

Vacuum Hose Harness Description



570879

Legend

- | | |
|------------------------------|--|
| (1) Vacuum Tank | (8) Heating, Ventilation and Air Conditioning (HVAC) Control |
| (2) To Vacuum Source | (9) Yellow Hose |
| (3) Vent Mode Valve Actuator | (10) Violet Hose |
| (4) Black Hose | (11) Green Hose |
| (5) Red Hose | (12) Vacuum (Bi-Level Mode) Valve Actuator |
| (6) Black Hose | (13) Defroster Valve Actuator |
| (7) Orange Hose | |

The engine vacuum regulates all of the actuators (3, 10, 12 and 13) (except the temperature valve) in the heater and air conditioning (A/C) evaporator module. The vacuum is drawn from the vacuum tank (1). The tank is mounted to the right side body rail.

A vacuum selector valve routes the vacuum to spring-loaded vacuum actuators (3, 10, 12 and 13) 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. 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 vacuum (bi-level) (10) 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 (13) 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.

HVAC Blower Controls Circuit Description

LOW-M2 Positions

When the ignition switch is in the RUN position, voltage is applied through the HVAC Fuse 6 (20A), the ignition 3 voltage circuit of the HVAC control, to the HVAC control (selector switch). When the selector switch is switched to any position, except OFF, voltage is supplied to the blower switch through the A/C request signal circuit.

When the blower switch is in position 1 (low), voltage is applied to the blower switch, the blower resistor, the blower motor relay and the blower motor. When voltage is applied to the blower motor, the motor runs at low speed.

When the blower switch is switched to position 2 (M1) or 3 (M2), the blower control system works as described above except for the speed of the blower motor. The blower motor has several resistors that voltage flows through depending which position the blower switch is in. In position 1 (low), voltage passes through 4 resistors. In position 2 (M1), voltage passes 3 resistors and in position 3 (M2) voltage passes through 2 resistors. As the resistance is decreased the blower runs at a faster speed.

HIGH Position

When the blower switch is moved to position 4 (high), voltage is applied through the HVAC control (selector switch) to the blower motor relay. The relay energizes, turning on the blower motor. This causes the motor to run at its fastest speed due to the fact that there is no resistor in the voltage path to the blower motor.

- Legend
- (1) Vacuum Tank
 - (2) To Vacuum Source
 - (3) Vent Mode Valve Actuator
 - (4) Black Hose
 - (5) Red Hose
 - (6) Black Hose
 - (7) Orange Hose