

ELECTRICAL

Wiring Systems and Power Management - Repair Instructions - CTS Coupe & Wagon

REPAIR INSTRUCTIONS

GMLAN AND MEDIA ORIENTED SYSTEMS TRANSPORT (MOST) WIRING REPAIRS

Special Tools

- **EL-38125-10** Splice Sleeve Crimping Tool
- DuraSeal splice sleeves
- A wire stripping tool

For equivalent regional tools, refer to **Special Tools** .

The DuraSeal splice sleeves 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 GM Local Area Network (GMLAN) System requires special wiring repair procedures due to the sensitive nature of the circuitry. Follow the specific procedures and instructions when working on GMLAN connectors and terminals.

GMLAN Repairs

NOTE: When making a repair to any GMLAN network, the original wire length after the repair must be the same length as before the repair. If the network is a twisted pair, the twist must be maintained after the repair is completed.

GMLAN has 2 types of networks, low speed and high speed. Low speed GMLAN has a single wire and works at slow speeds. High speed GMLAN has 2 wires in a twisted pair and works at higher speeds. For more information on GMLAN, refer to **Data Link Communications Description and Operation** .

GMLAN Connector Terminal Repair

NOTE: A terminated lead can be used to replace damaged connector terminals for both high speed and low speed GMLAN systems. When making a connector terminal repair on a GMLAN high speed system with twisted pair wires, do not untwist the wires more than necessary to make the repair.

If the individual terminals are damaged on any GMLAN connection, use the appropriate connector repair procedure in order to repair the terminal. Refer to **Connector Repairs** for the appropriate connector repair

procedure.

GMLAN Wire Repair

NOTE: Refer to **Wiring Repairs** in the service information connector end views or the vehicle schematics 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 mm², 0.8 mm², 1.0 mm² etc.). Use the DuraSeal splice sleeves and **EL-38125-10** tool. For wiring repair, refer to **Splicing Copper Wire Using Splice Sleeves**.

RELAY REPLACEMENT (ATTACHED TO WIRE HARNESS)

Removal Procedure

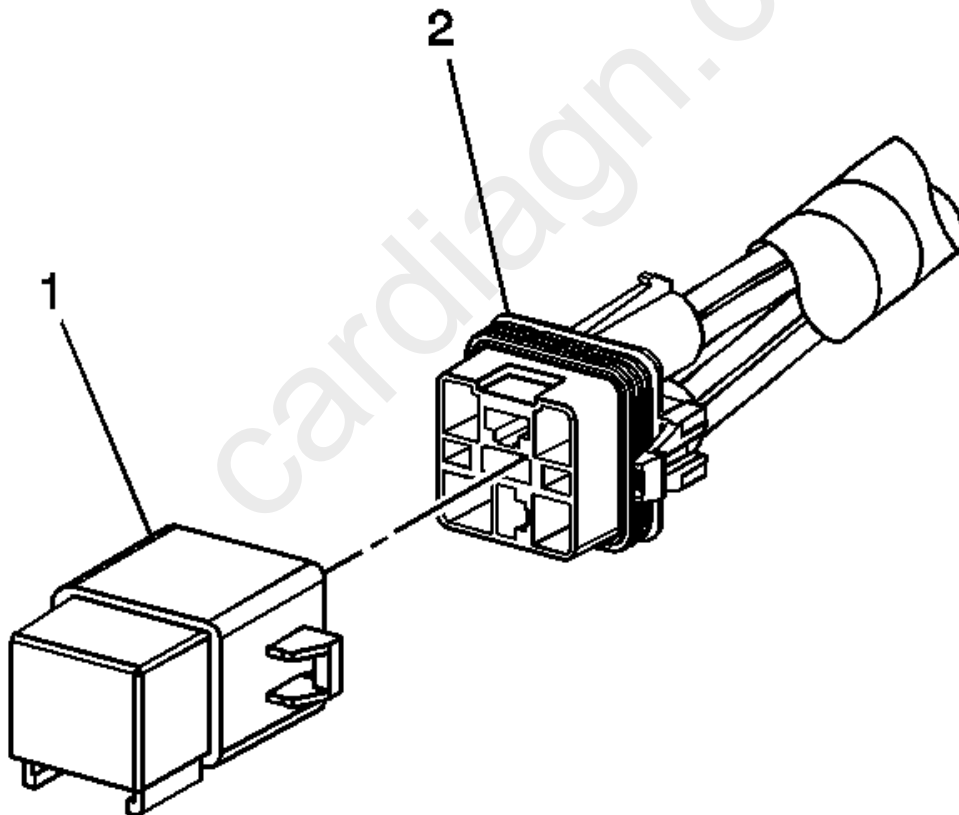


Fig. 1: Identifying Relay & Wire Harness Connector
Courtesy of GENERAL MOTORS COMPANY

1. Locate the relay. Refer to the **Master Electrical Component List** to locate the relay in the vehicle.
2. Remove any fasteners which hold the relay in place.
3. Remove any connector position assurance (CPA) devices or secondary locks.

NOTE: Use care when removing a relay in a wiring harness when the relay is secured by fasteners or tape.

4. Separate the relay (1) from the wire harness connector (2).

Installation Procedure

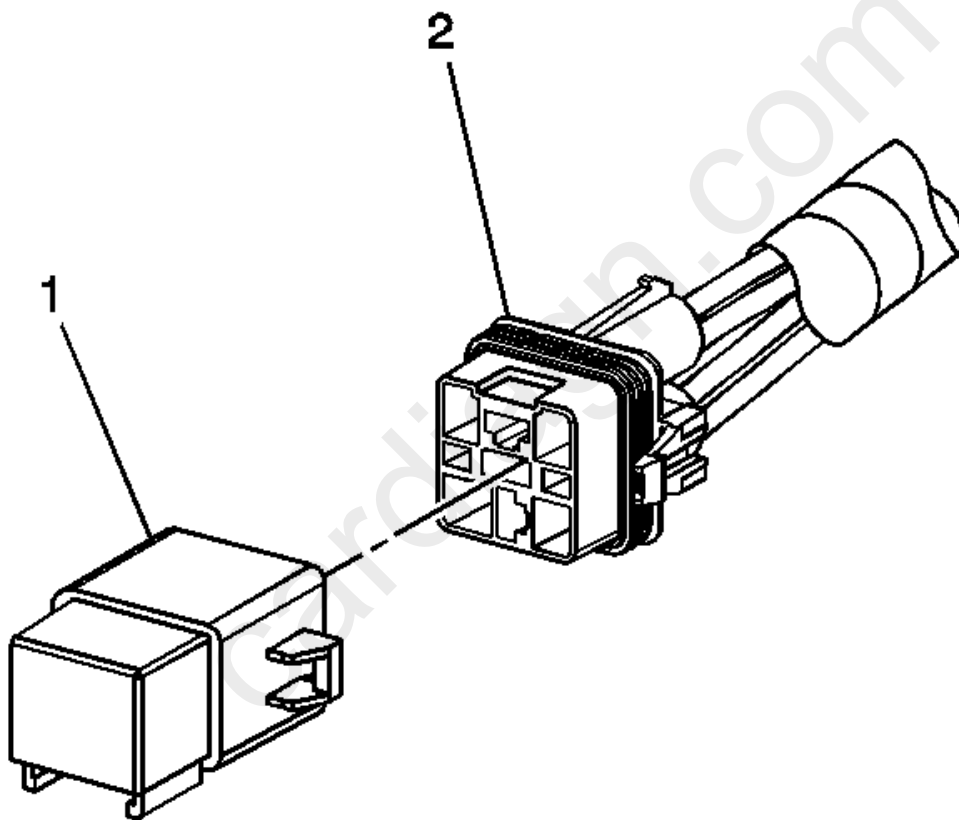


Fig. 2: Identifying Relay & Wire Harness Connector
Courtesy of GENERAL MOTORS COMPANY

1. Connect the relay (1) to the wire harness connector (2).
2. Install any connector position assurance (CPA) devices or secondary locks.
3. Install the relay using any fasteners or tape that originally held the relay in place.

RELAY REPLACEMENT (WITHIN AN ELECTRICAL CENTER)

Special Tools

EL-43244 Relay Puller Pliers

Removal Procedure

1. Remove the electrical center cover.

NOTE:

- Always note the orientation of the relay.
- If equipped with a notch style relay; observe the location of the notch on the old relay to verify the new relay is installed with the notch in the same location.
- Ensure that the electrical center is secure, as not to put added stress on the wires or terminals.

2. Locate the relay. Refer to **Electrical Center Identification Views** to locate the electrical center where the relay exists.

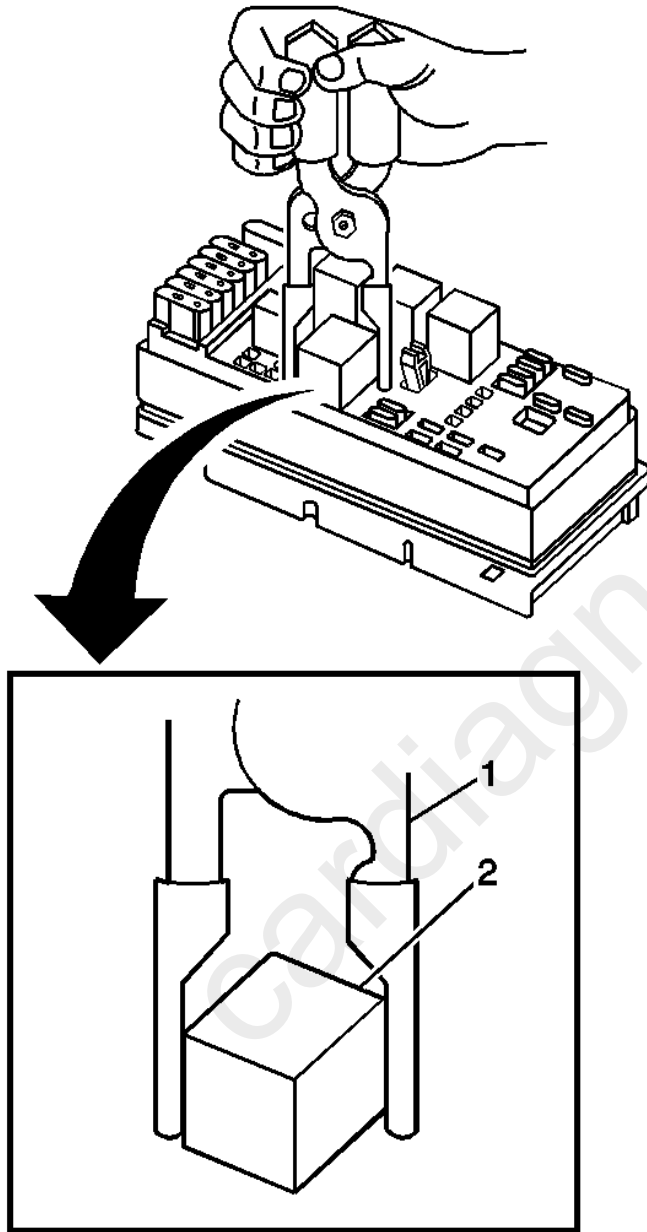


Fig. 3: Removing/Installing Relay
Courtesy of GENERAL MOTORS COMPANY

3. Using the EL-43244 (1) position the tool on opposing corners of the relay (2).

CAUTION: Use EL-43244 to pull the relay straight out from the electrical center terminals. The use of pliers or a flat bladed tool could damage the electrical center.

4. Remove the relay (2) from the electrical center.

Installation Procedure

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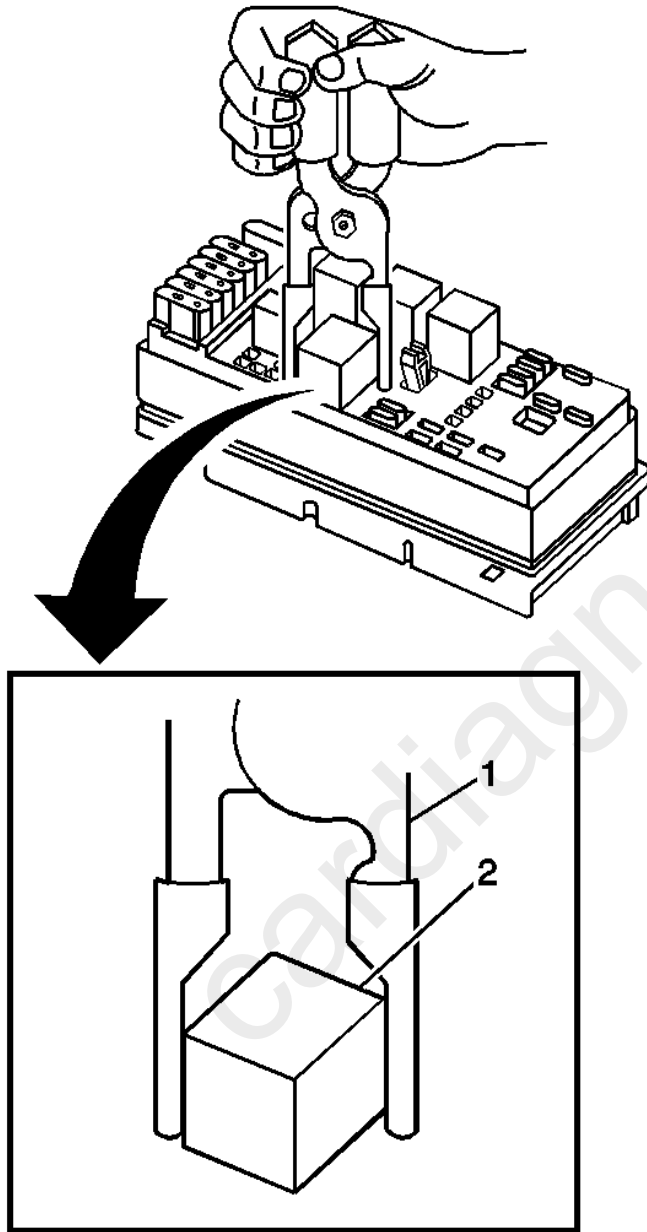


Fig. 4: Removing/Installing Relay
Courtesy of GENERAL MOTORS COMPANY

1. Install the relay (2) in the same position as removed.
2. Install the electrical center cover.

GROUND REPAIR

Electrical Grounds

Proper electrical system function relies on secure, positive, corrosion-free ground connections. Loose, stripped, or corroded connections increase the possibility of improper system function and loss of module communication. These conditions may also lead to unnecessary repairs and component replacements.

In general, electrical ground connections are accomplished using one, or a combination of, three attachment methods:

- Welded M6 stud and nut
- Welded M6 nut and bolt
- Welded M8 nut and bolt

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

Determine which attachment method is used, and carry out the appropriate repair.

M6 Weld Stud Replacement

1. Select a location adjacent the damaged or missing M6 ground stud having 20 mm (0.79 in) clearance behind the panel surface and 20 mm (0.79 in) clearance surrounding the M6 rivet stud flange.
2. Using GM approved residue-free solvent or equivalent, remove any grease from the repair site and allow to dry.

NOTE: Ensure 20 mm (0.79 in) clearance is maintained behind the panel to be drilled.

3. Drill a 10 mm (0.40 in) diameter hole through the panel.
4. Carefully remove paint and primer from the area surrounding the rivet stud flange until bare metal is visible.

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

5. Select a replacement conductive M6 rivet stud. Refer to GM parts catalog for the correct part number and application.
6. Using a rivet stud installer, install the replacement conductive M6 rivet stud.
7. Ensure the new rivet stud is securely fastened, with no detectable movement.

NOTE: The rivet stud and surrounding panel area must be properly refinished prior to the installation of the ground terminal and nut to maintain positive

electrical grounding.

8. Completely wrap the threads of the rivet stud with painters tape or equivalent.
9. Refinish the repair area using an anti-corrosion primer. Refer to **Anti-Corrosion Treatment and Repair** .
10. Allow the refinished repair area to cure sufficiently before removing the protective material applied to the rivet stud threads.
11. Remove the painters tape or equivalent from the rivet stud threads.
12. Using GM approved residue-free solvent or equivalent, thoroughly clean the rivet stud threads to remove any adhesive and allow to dry.
13. Carefully remove any corrosion from the electrical ground wire terminal. Refer to **Testing for Intermittent Conditions and Poor Connections** .
14. Using a small brush, apply Dielectric Lubricant GM P/N 12377900 (Canadian P/N 10953529) to the new conductive M6 rivet stud threads.
15. Install the ground terminal to the new rivet stud.
16. Select a new, conductive M6 nut. Refer to GM parts catalog for the correct part number and application.

CAUTION: Refer to Fastener Caution .

17. Install the M6 nut and tighten to 8 N.m (71 lb in).
18. Check for proper system operation.

M6 Weld Nut

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

1. If the M6 weld nut at the electrical ground location is damaged or stripped, a new, conductive self-threading M7 bolt may be used to secure the ground terminal. Refer to GM parts catalog for the correct part number and application.
2. Using GM approved residue-free solvent or equivalent, remove any grease from the surface surrounding the weld nut and allow to dry.
3. Remove any loose metal particles from the damaged or stripped weld nut with a stiff brush.
4. Using a small brush, apply Dielectric Lubricant GM P/N 12377900 (Canadian P/N 10953529) to the new, conductive, self-threading M7 bolt threads.
5. Carefully remove any corrosion from the electrical ground terminal. Refer to **Testing for Intermittent Conditions and Poor Connections** .
6. Install the electrical ground terminal to the new, conductive M7 bolt.

CAUTION: Refer to Fastener Caution .

7. Install the M7 bolt and tighten to 9 N.m (80 lb in).
8. Check for proper system operation.

M6 Weld Nut (Alternative Repair)

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

1. If the electrical ground location is accessible from both sides of the panel, a conductive M6 bolt and a conductive M6 nut may be used to secure the electrical ground terminal. Refer to GM parts catalog for the correct part number and application.
2. Select a location adjacent the damaged M6 weld nut having 20 mm (0.79) clearance behind the panel surface and 20 mm (0.79) clearance surrounding the new electrical ground site.
3. Using GM approved residue-free solvent or equivalent, remove any grease from the surface surrounding the ground location and allow to dry.

NOTE: Ensure 20 mm (0.79 in) clearance is maintained behind the panel to be drilled.

4. Drill a 10 mm (0.40 in) diameter hole through the panel.
5. Carefully remove paint and primer from the area surrounding the new ground site until bare metal is visible.
6. Using a small brush, apply Dielectric Lubricant GM P/N 12377900 (Canadian P/N 10953529) to the new, conductive M6 bolt threads.
7. Carefully remove any corrosion from the electrical ground terminal. Refer to **Testing for Intermittent Conditions and Poor Connections** .
8. Install the electrical ground terminal and new, conductive M6 bolt to the ground location.

CAUTION: Refer to Fastener Caution .

9. Install the conductive M6 nut and tighten to 8 N.m (71 lb in).

NOTE: The repair area must be properly refinished to maintain positive electrical grounding.

10. Refinish the repair area using an anti-corrosion primer. Refer to **Anti-Corrosion Treatment and Repair** .
11. Check for proper system operation.

M8 Weld Nut

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

1. If the M8 weld nut electrical ground location is accessible from both sides of the panel, a conductive M8 bolt and a conductive M8 nut may be used to secure the ground terminal. Refer to GM parts catalog for the correct part numbers and application.
2. Select a location adjacent to M8 weld nut having 20 mm (0.79 in) clearance behind the panel surface and 20 mm (0.79 in) clearance surrounding the new electrical ground site.
3. Using GM approved residue-free solvent or equivalent, remove any grease from the surface surrounding the ground location and allow to dry.

NOTE: Ensure 20 mm (0.79 in) clearance is maintained behind the panel to be drilled.

4. Drill a 10 mm (0.40 in) diameter hole through the panel.
5. Carefully remove paint and primer from the area surrounding the new ground site until bare metal is visible.
6. Using a small brush, apply Dielectric Lubricant GM P/N 12377900 (Canadian P/N 10953529) to the new, conductive M8 bolt threads.
7. Carefully remove any corrosion from the electrical ground terminal. Refer to **Testing for Intermittent Conditions and Poor Connections** .
8. Install the electrical ground terminal and new, conductive M8 bolt to the ground location.

CAUTION: Refer to Fastener Caution .

9. Install the conductive M8 nut and tighten to 22 N.m (16 lb ft).

NOTE: The repair area must be properly refinished to maintain positive electrical grounding.

10. Refinish the repair area using an anti-corrosion primer. Refer to **Anti-Corrosion Treatment and Repair** .
11. Check for proper system operation.

M8 Weld Nut (Alternative Repair)

CAUTION: Use GM approved replacement fasteners with conductive finish for electrical ground repair.

1. If the M8 weld nut electrical ground location is not accessible from both sides of the panel, a conductive M6 rivet stud and a conductive M6 nut may be used to secure the ground terminal. Refer to GM parts catalog for the correct part numbers and application.

2. Select a location adjacent the damaged M8 weld nut having 20 mm (0.79 in) clearance behind the panel surface and 20 mm (0.79 in) clearance surrounding the new, conductive M6 rivet stud flange.
3. Using GM approved residue-free solvent or equivalent, remove any grease from the repair site and allow to dry.

NOTE: **Ensure 20 mm (0.79 in) clearance is maintained behind the panel to be drilled.**

4. Drill a 10 mm (0.40 in) diameter hole through the panel.
5. Carefully remove paint and primer from the area surrounding the rivet stud flange until bare metal is visible.
6. Using a rivet stud installer, install the replacement conductive M6 rivet stud.
7. Ensure the new rivet stud is securely fastened, with no detectable movement.

NOTE: **The rivet stud and surrounding panel area must be properly refinished prior to the installation of the ground terminal and nut to maintain positive electrical grounding.**

8. Completely wrap the threads of the rivet stud with painters tape or equivalent.
9. Refinish the repair area using an anti-corrosion primer. Refer to **Anti-Corrosion Treatment and Repair** .
10. Allow the refinished repair area to cure sufficiently before removing the protective material applied to the rivet stud threads.
11. Remove the painters tape or equivalent from the rivet stud threads.
12. Using GM approved residue-free solvent or equivalent, thoroughly clean the rivet stud threads to remove any adhesive and allow to dry.
13. Carefully remove any corrosion from the electrical ground wire terminal. Refer to **Testing for Intermittent Conditions and Poor Connections** .
14. Using a small brush, apply Dielectric Lubricant GM P/N 12377900 (Canadian P/N 10953529) to the new conductive M6 rivet stud threads.
15. Install the ground terminal to the new, conductive M6 rivet stud.

CAUTION: Refer to **Fastener Caution** .

16. Install the conductive M6 nut and tighten to 8 N.m (71 lb in).
17. Check for proper system operation.

UNDERHOOD ELECTRICAL CENTER OR JUNCTION BLOCK REPLACEMENT

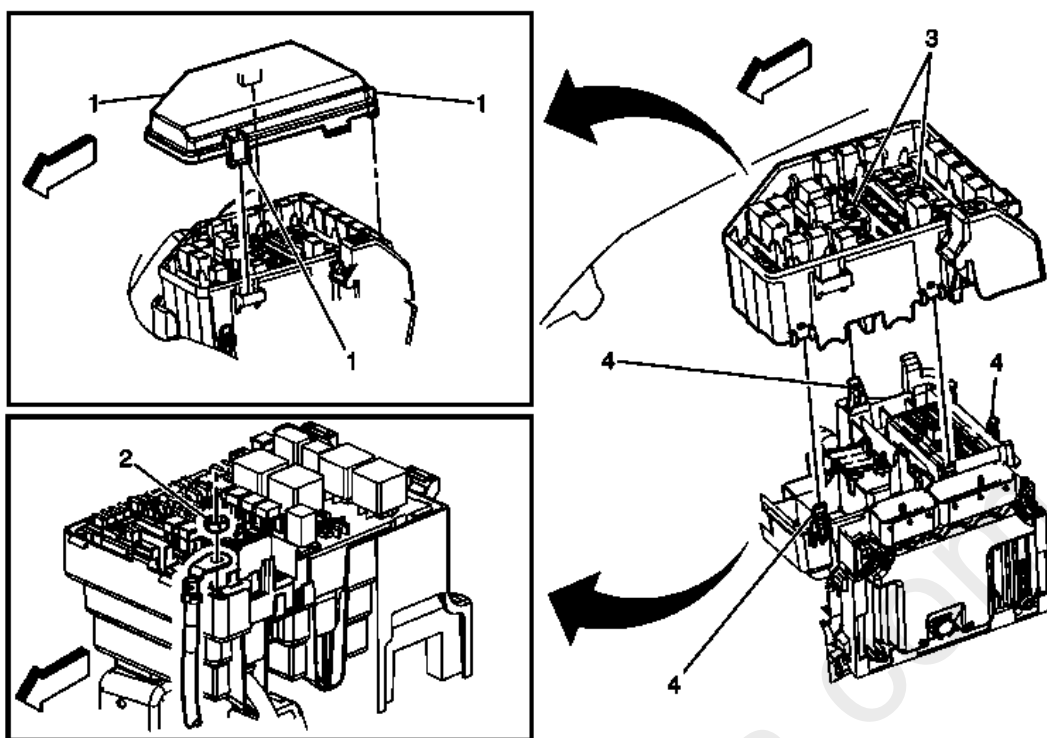


Fig. 5: Underhood Electrical Center or Junction Block
 Courtesy of GENERAL MOTORS COMPANY

Underhood Electrical Center or Junction Block Replacement

Callout	Component Name
Preliminary Procedures	
1. Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection (Coupe)</u> , <u>Battery Negative Cable Disconnection and Connection (Wagon)</u> . 2. Remove the front compartment sight shield right side. Refer to <u>Front Compartment Side Sight Shield Replacement</u>	
1	Underhood Electrical Center/Junction Block Cover Tab (Qty: 3) Procedure 1. Push in on the 2 locking tabs located on the rear of the cover and lift in order to remove the cover. 2. Align the tabs on the cover with the corresponding locks on the electrical center.
2	Underhood Electrical Center/Junction Block Power Nut CAUTION: Refer to <u>Fastener Caution</u> .

	Procedure Disconnect the battery positive cable from the junction block by removing the nut. Tighten 7 N.m (62 lb in)
3	Positive Cable to Junction Block Bolt (Qty: 2) TIP: The bolts are part of the junction block. Do not try to remove. Tighten 10 N.m (89 lb in)
4	Underhood Electrical Center/Junction Block Tab (Qty: 4) Procedure Remove the electrical center/junction block by using a hook-like tool to disengage the tabs.

BODY WIRING HARNESS JUNCTION BLOCK REPLACEMENT

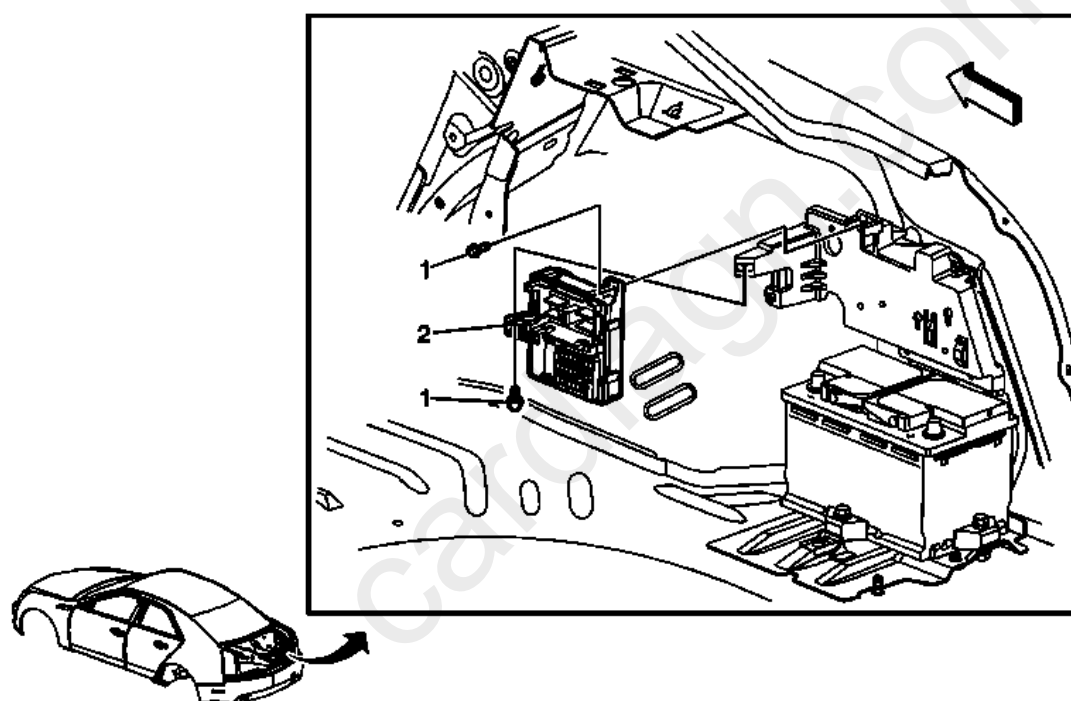


Fig. 6: Body Wiring Harness Junction Block & Bolts
 Courtesy of GENERAL MOTORS COMPANY

Body Wiring Harness Junction Block Replacement

Callout	Component Name
Preliminary Procedures	
1.	Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection (Coupe)</u> , <u>Battery Negative Cable Disconnection and Connection (Wagon)</u> .
2.	For the Coupe, remove the rear compartment side trim panel. Refer to <u>Rear Compartment Side Trim Panel Replacement (Coupe)</u> .

3. For the wagon, remove the body side lower trim panel. Refer to <u>Body Side Lower Trim Panel Replacement (Wagon)</u> .	
1	Body Wiring Harness Junction Block Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> .
2	Body Wiring Harness Junction Block Procedure Disconnect the electrical connections.

IGNITION LOCK CYLINDER REPLACEMENT

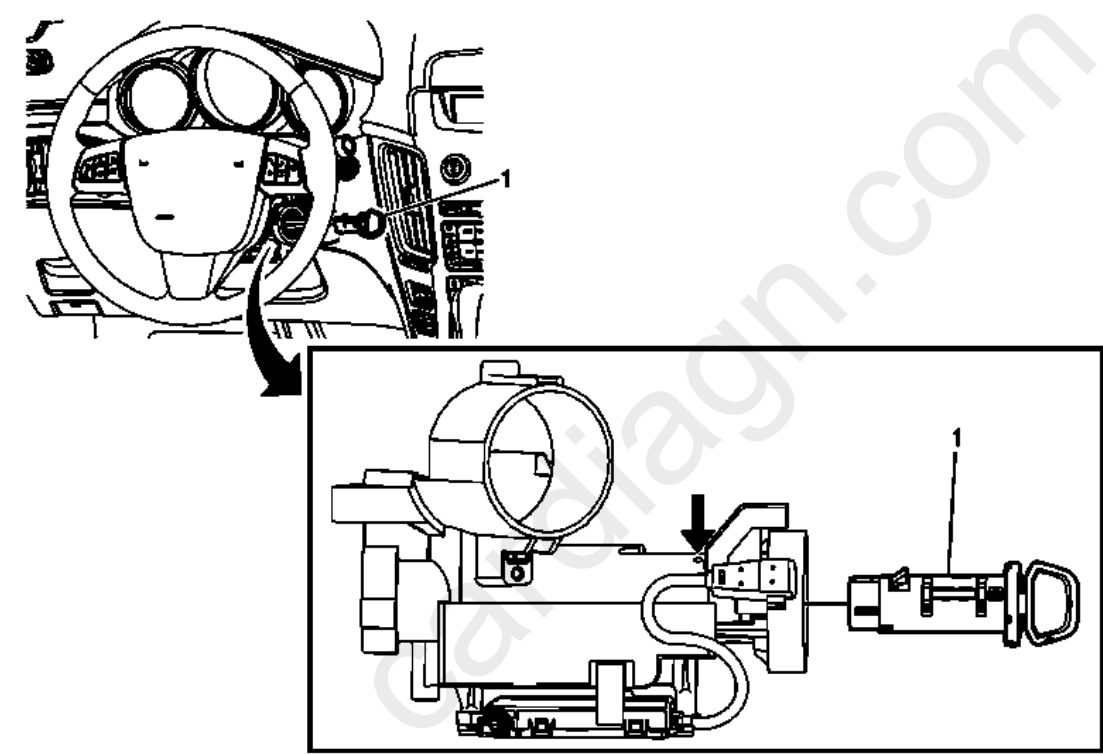


Fig. 7: Ignition Lock Cylinder
 Courtesy of GENERAL MOTORS COMPANY

Ignition Lock Cylinder Replacement

Callout	Component Name
Preliminary Procedures	
1.	Disconnect the battery negative cable. Refer to <u>Battery Negative Cable Disconnection and Connection (Coupe)</u> , <u>Battery Negative Cable Disconnection and Connection (Wagon)</u> .
2.	Remove the steering column shrouds. Refer to <u>Steering Column Shroud Replacement (Without Key Release Lever Knob)</u> , <u>Steering Column Shroud Replacement (With Key Release Lever Knob)</u> .

Ignition Lock Cylinder	
Procedure	
1	1. Turn the ignition lock cylinder to the RUN position. 2. Push a pick-type tool into the access hole on the ignition and start switch housing and press the ignition lock cylinder lock tab down. 3. Pull the ignition lock cylinder out of the ignition and start switch housing. 4. If you are installing a new lock cylinder, code the lock cylinder. Refer to <u>Key and Lock Cylinder Coding</u> .

STEERING COLUMN KEY RELEASE LEVER KNOB REPLACEMENT

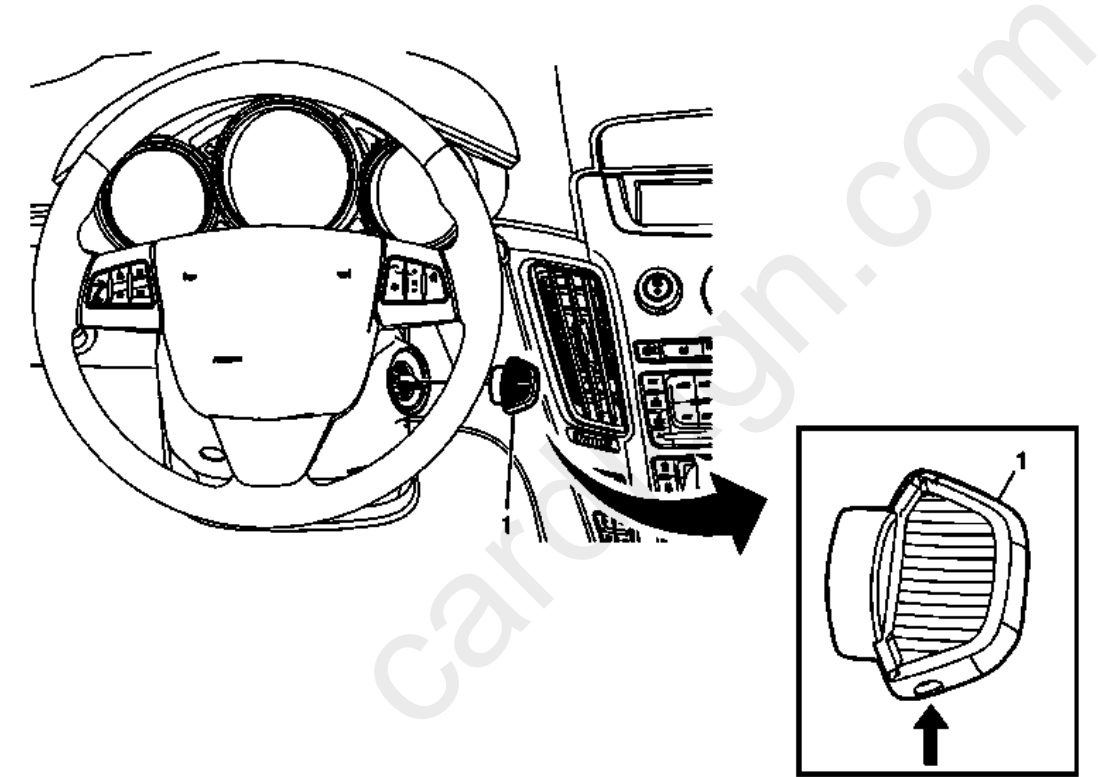


Fig. 8: Steering Column Key Release Lever Knob
Courtesy of GENERAL MOTORS COMPANY

Steering Column Key Release Lever Knob Replacement

Callout	Component Name
1	Steering Column Key Release Lever Knob Procedure In order to release the knob, push a pick type tool into the access hole on the bottom of the knob while pulling on the knob. TIP: The knob attaches to a cylinder that fits in the same space as an ignition lock cylinder. Refer to <u>Ignition Lock Cylinder Replacement</u> .

IGNITION AND START SWITCH REPLACEMENT

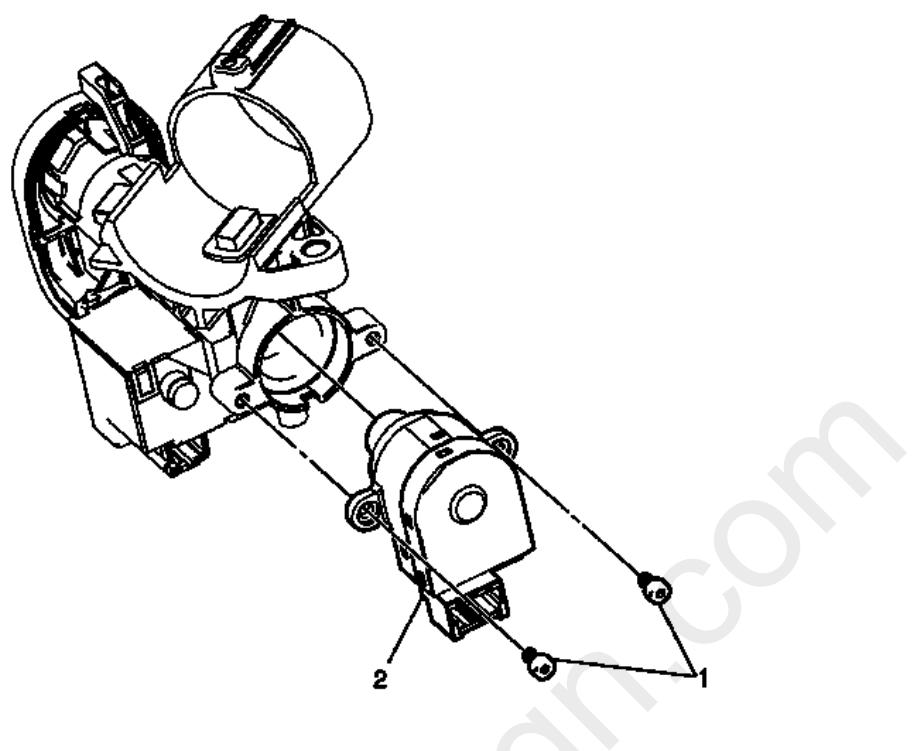


Fig. 9: Locating Ignition & Start Switch
Courtesy of GENERAL MOTORS COMPANY

Ignition and Start Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the ignition and start switch housing. Refer to <u>Ignition and Start Switch Housing Replacement</u> .	
1	Ignition and Start Switch Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2 N.m (18 lb in)
2	Ignition and Start Switch

IGNITION AND START SWITCH HOUSING REPLACEMENT

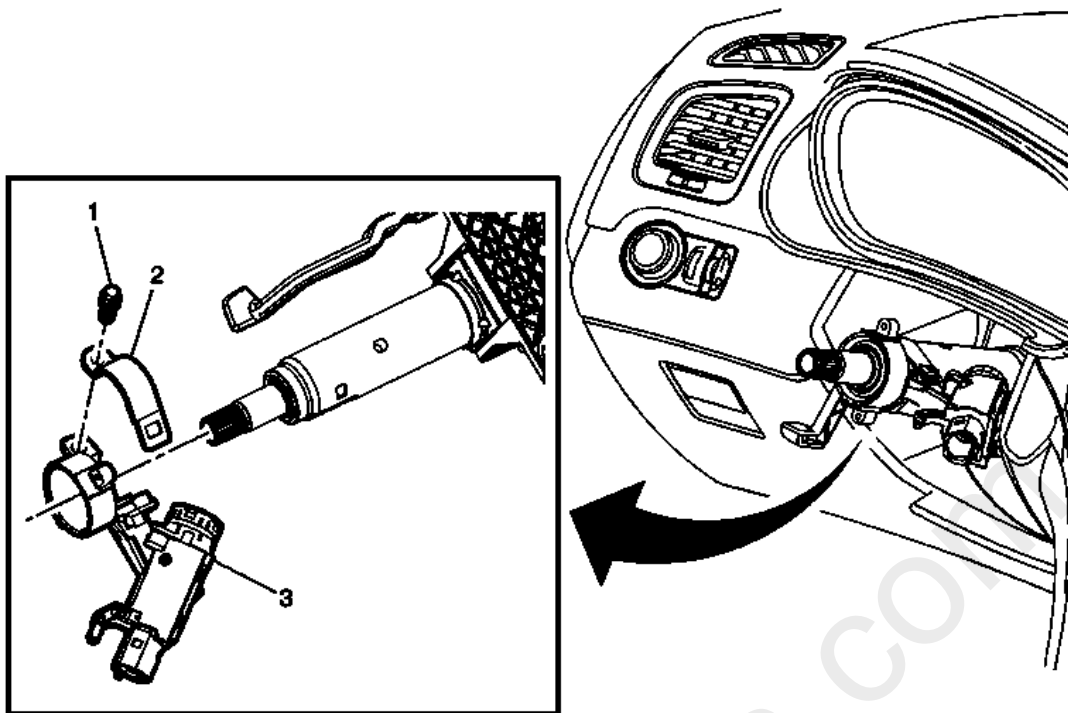


Fig. 10: Ignition And Start Switch Housing, Strap & Bolt
 Courtesy of GENERAL MOTORS COMPANY

Ignition and Start Switch Housing Replacement

Callout	Component Name
Preliminary Procedure	
Remove the turn signal switch bracket. Refer to <u>Turn Signal Switch Bracket Replacement</u> .	
1	Ignition and Start Switch Housing Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 8 N.m (71 lb in)
2	Ignition and Start Switch Housing Strap
3	Ignition and Start Switch Housing Procedure 1. Disconnect any electrical connectors as necessary. 2. Transfer any parts as necessary.