



Service Bulletin

File in Section: 06 - Engine

Bulletin No.: 09-06-03-007A

Date: February, 2012

TECHNICAL

Subject: Malfunction Indicator Lamp (MIL) Illuminated, DTC P0480 and/or P0481 Set – Temperature Gauge Indicates Hot – Cooling Fans Intermittent or Inoperative (Install Revised Cooling Fan Relay and Harness Assembly)

Models: 2006-2009 Chevrolet Impala Police Sedan (RPO 9C1 Only)
2010 Chevrolet Impala Police Sedan Equipped With RPO 9C1 and Without RPO WRH
2011 Chevrolet Impala Police Sedan Equipped With RPO 9C1 and/or 9C3 and Without RPO WRH

This bulletin is being revised to add the 2011 model year. Please discard Corporate Bulletin Number 09-06-03-007 (Section 06 – Engine/Propulsion System).

Condition

Some customers may comment that the instrument panel temperature gage indicates hot.

Some customers may also comment that the malfunction indicator lamp (MIL) is illuminated.

The technician may observe that DTC P0480 and/or P0481 are set as current or in history and/or the engine cooling fans are intermittent in operation or inoperative.

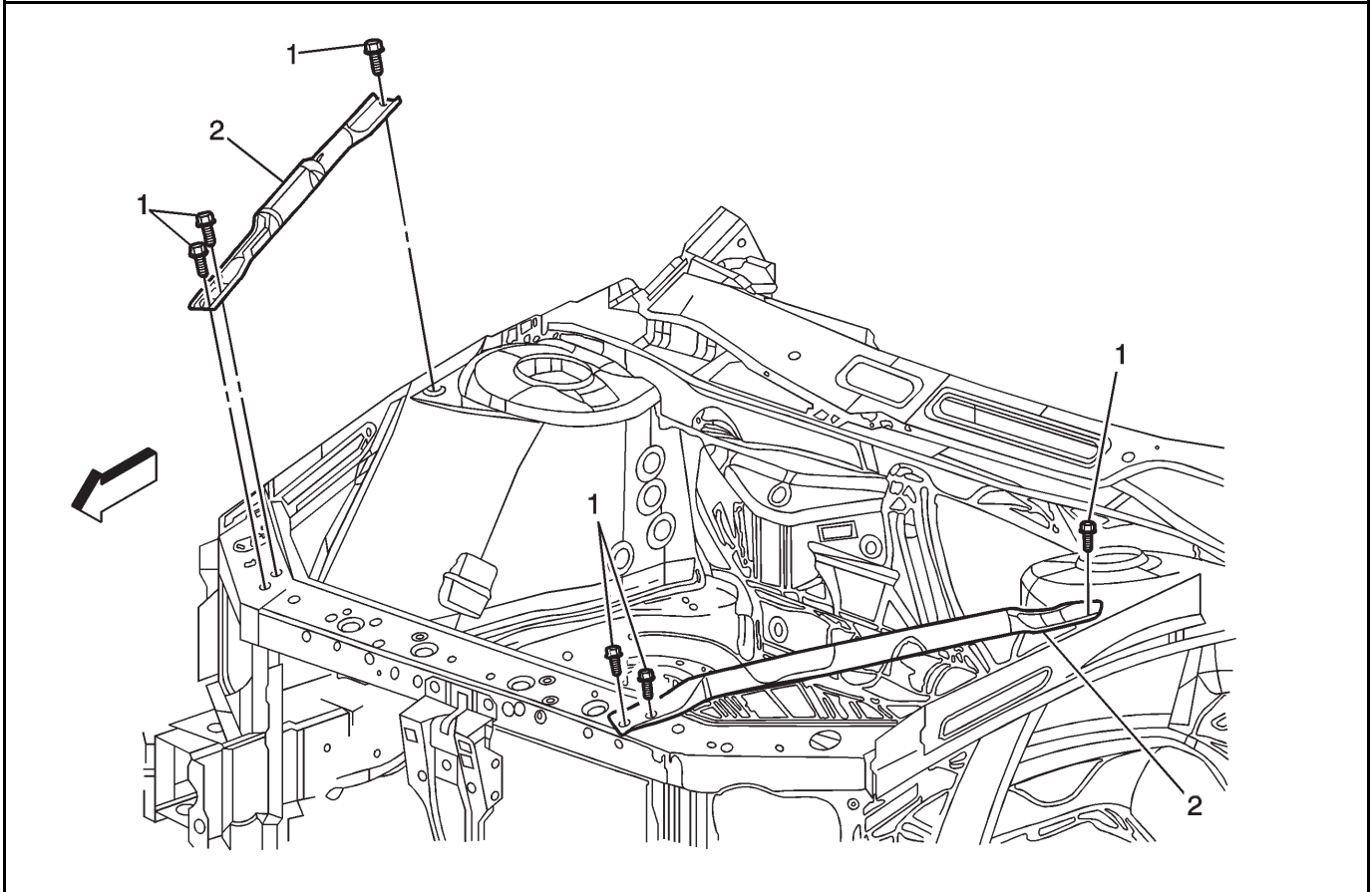
Cause

This condition may be caused by high underhood bussed electrical center (UBEC) temperatures which may result in the cooling fans becoming intermittent or inoperative under certain operating conditions.

Correction

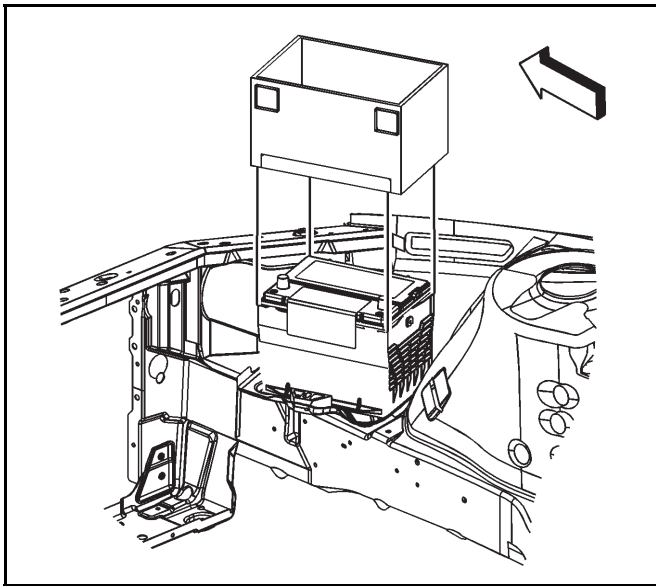
A revised engine cooling fan relay and harness assembly has been released, to reposition the cooling fan relays for increased air circulation.

1. Turn OFF the ignition, all electrical components, lamps, accessories and the scan tool.
Open the hood.



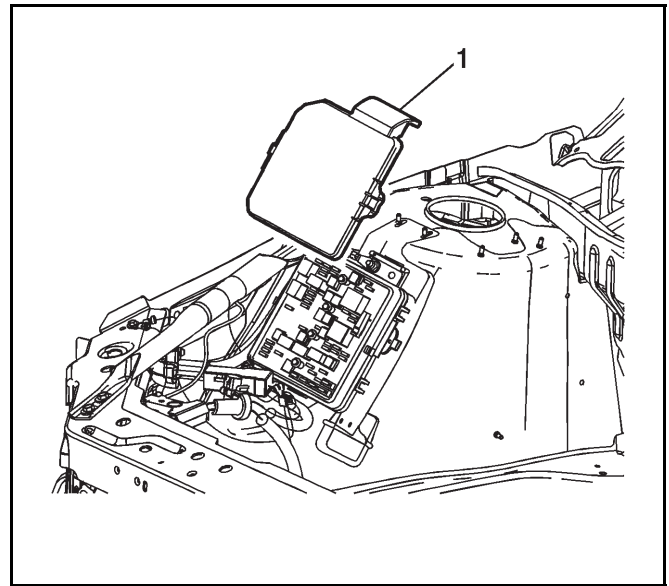
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2. Remove the RH front fender upper diagonal brace bolts (1). Release the retainer that secures the wiring harness from the bottom of the brace (2), then remove the upper diagonal brace.
3. Loosen the negative battery cable terminal nut and remove the battery cable terminal from the battery. Refer to Battery Negative Cable Disconnection and Connection in SI.
4. Open the positive battery cable terminal cover, loosen the battery cable terminal nut and remove the battery cable terminal from the battery.



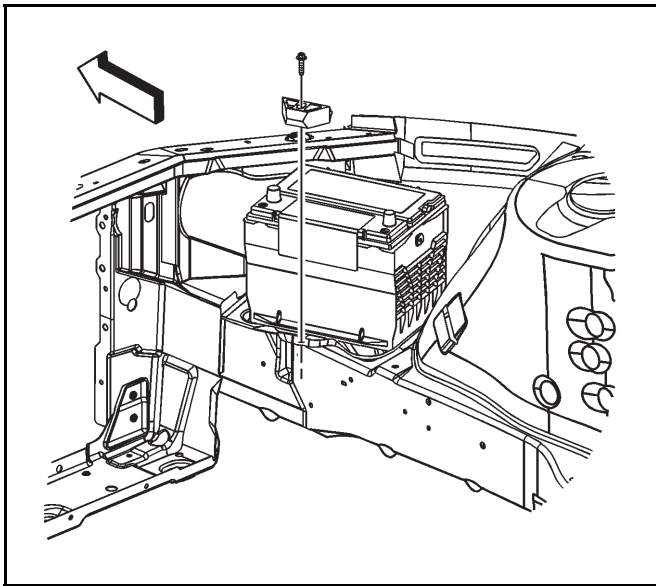
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5. Remove the battery insulator.



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12. Remove the fuse block underhood electrical center cover (1).

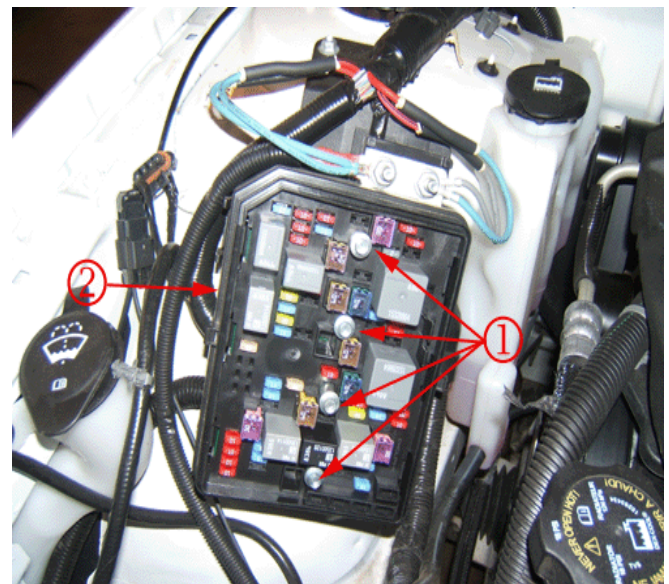


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6. Remove the battery hold down bolt and the hold down.

Note: Do not tip the battery more than 40 degrees during removal.

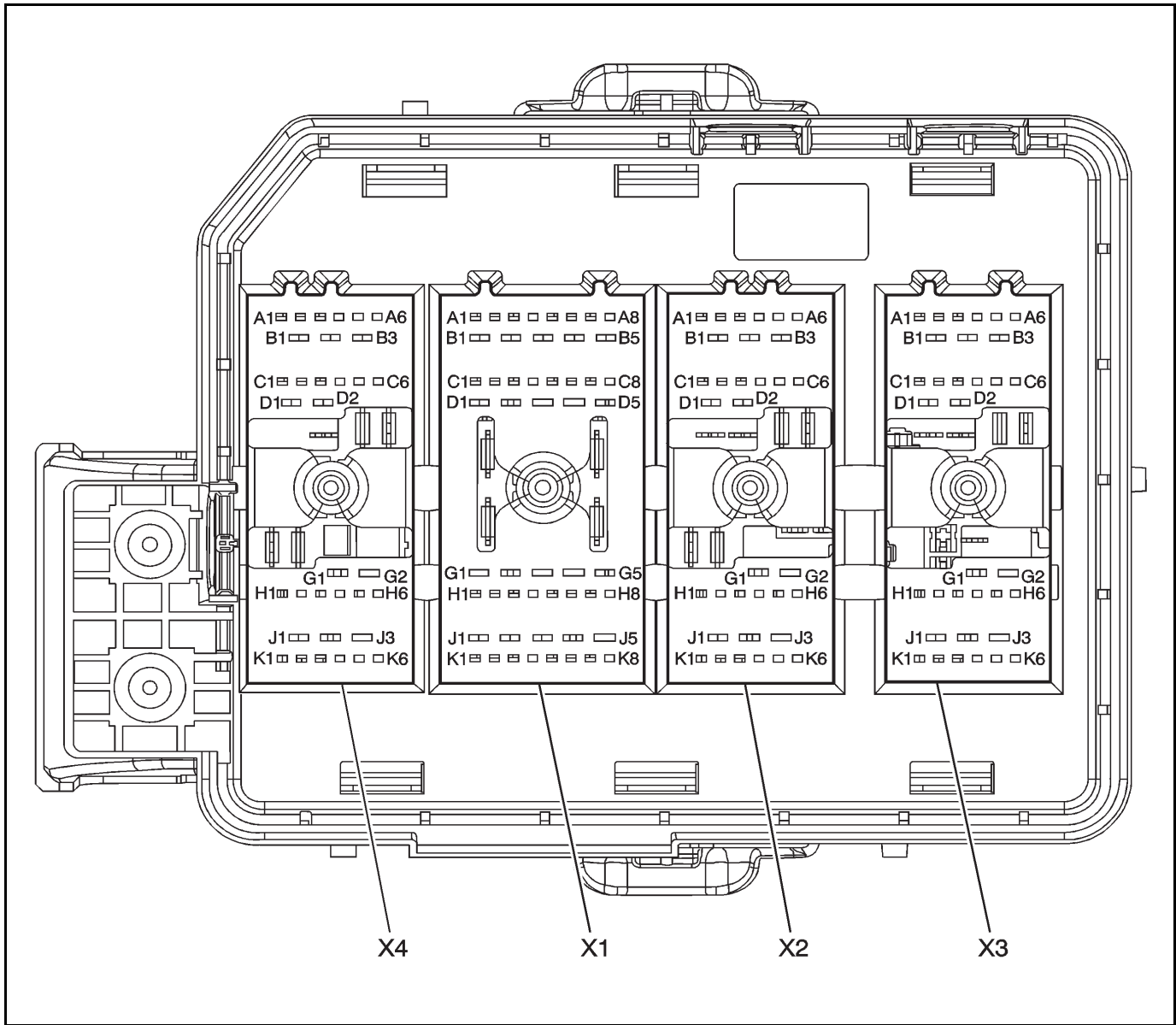
7. Remove the battery.
8. Release the inner RH headlamp retainer by pulling the retainer upward.
9. Remove the RH headlamp assembly bolt.
10. Pull the headlamp from the outboard edge in order to release the lock pin from the fender flange retainer.
11. Disconnect the electrical connector before removing the headlamp from the vehicle.



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Note: Observe the positions and orientations of the forward lamp battery supply harness terminal and the fusible links on the studs before removing.

13. At the top of the fuse block disconnect the two fasteners on the fuse block battery studs and remove the forward lamp battery supply harness terminal and the fusible links. Remove the fasteners (1) securing the electrical center board (2).
14. Unlock the tabs on the electrical center board, then evenly lift up on the board in order to remove it.

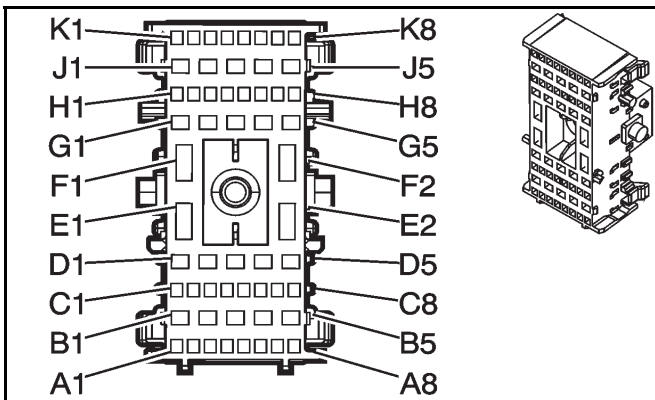


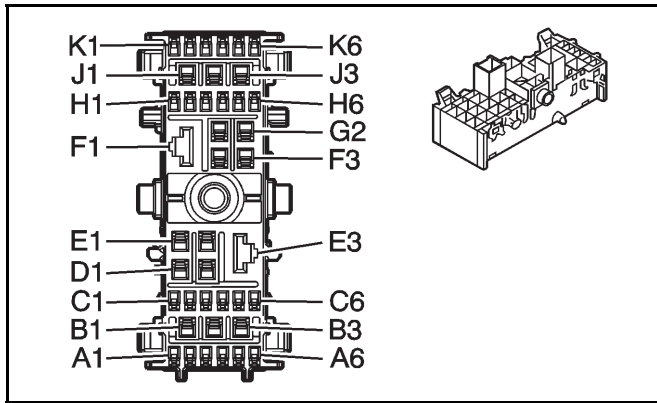
15. In the illustration above observe the orientation of the schematic for the fuse block. Identify the location of connectors X1 and X3.

16. Locate and mark for reference, the following circuit terminals:

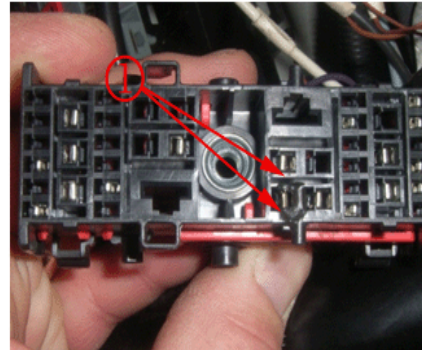
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- Connector X1, Circuit 473, 0.35 D-BU, Pin C7, High Speed Cooling Fan Relay Control
- Connector X1, Circuit 335, 0.35 D-GN, Pin H7, Low Speed Cooling Fan Relay Control





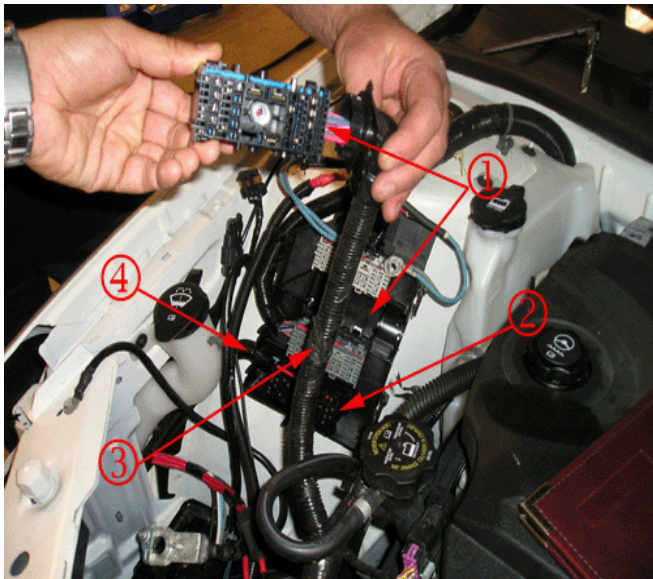
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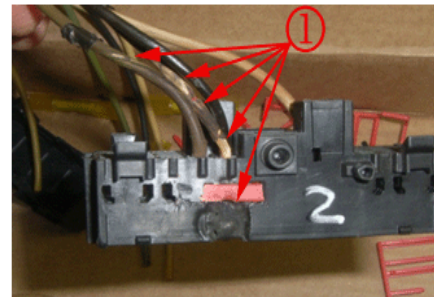
17. Locate and mark for reference, the following circuit terminals:

- Connector X3, Circuit 409, 3 L-BU, Pin D1, Cooling Fan - Right Supply Voltage
- Connector X3, Circuit 532, 3 GY, Pin E1, Cooling Fan - Left Low Reference
- Connector X3, Circuit 504, 3 WH, Pin F2, Cooling Fan - Left Supply Voltage

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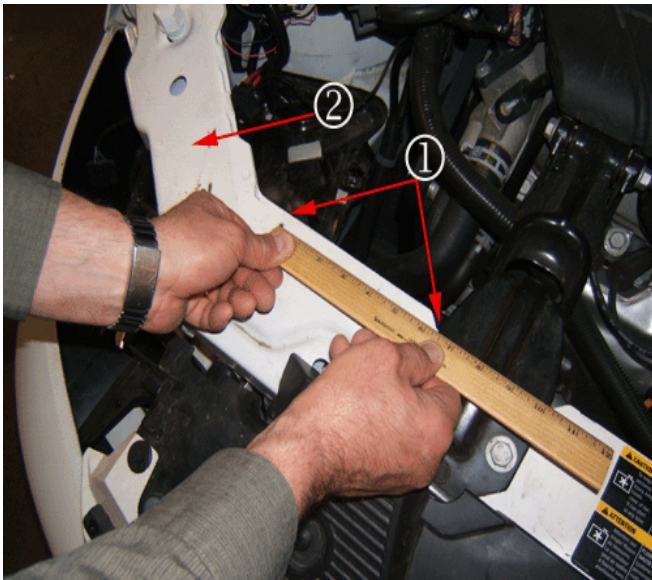
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18. Remove both fuse block engine harness connectors X1 (1) and X3 (2) from their respective cavities.

18.1. Release and remove the bottom cover on both connectors.

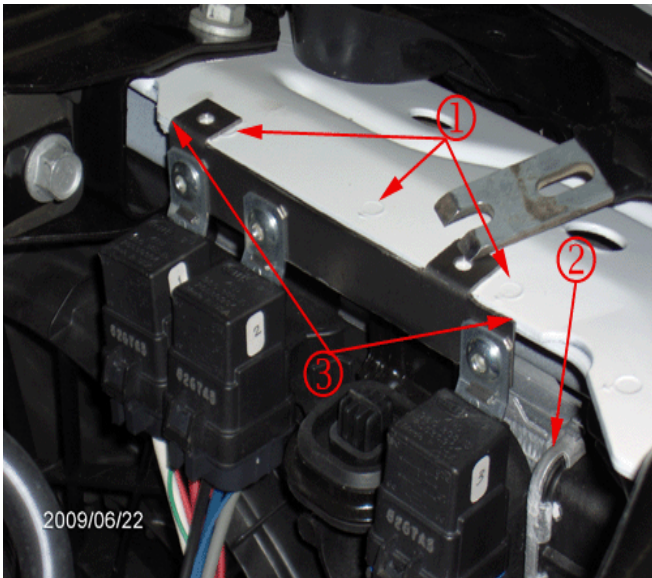
18.2. Examine the **X3** connector pins (1) and connector wiring (1) for evidence of overheating as shown.

- ⇒ If evidence of overheating **is** observed, continue with this repair.
- ⇒ If evidence of overheating is **not** observed refer to the appropriate DTCs in Engine Cooling or Symptoms - Engine Cooling in SI.



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19. Position a ruler on the top of the upper radiator support (2) as shown. Align the ruler with the arrows (1) and mark the 165 mm (6.5 in) area with a paint stick or suitable marker.



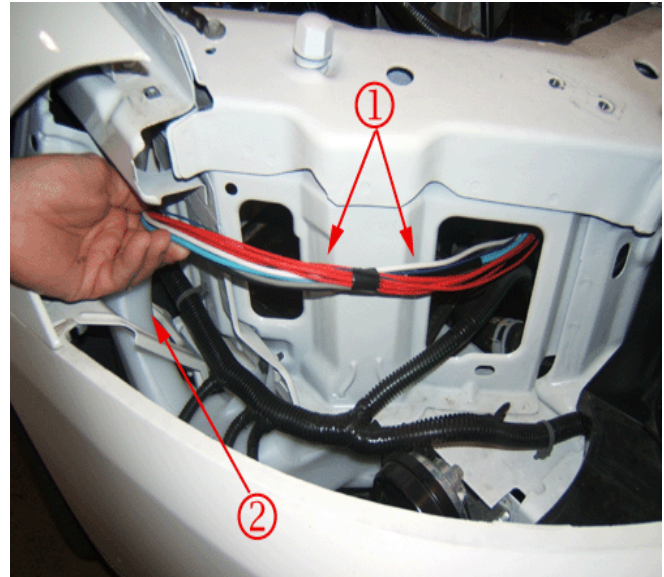
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- 19.1. Position the **inboard** edge of the cooling fan relay bracket (3) that was supplied with the revised harness assembly, 22 mm (0.86 in) from the **outboard** edge of the RH engine mount strut and tightly against the back edge of the radiator support.

Note: Align/adjust the ends of the bracket (3) over the radiator (2) slightly if necessary so that the holes in the bracket **DO NOT** sit over any spot welds (1).

- 19.2. Mark the location of the holes in the bracket on the upper radiator support. Drill the holes using a 5 mm (3/16 in) drill bit.

20. Secure the bracket and relay assembly to the radiator core support using the rivets that were supplied.
21. Remove the screw from the top of the windshield washer solvent container filler neck at the RF fender flange in order to provide additional clearance for routing the revised harness.

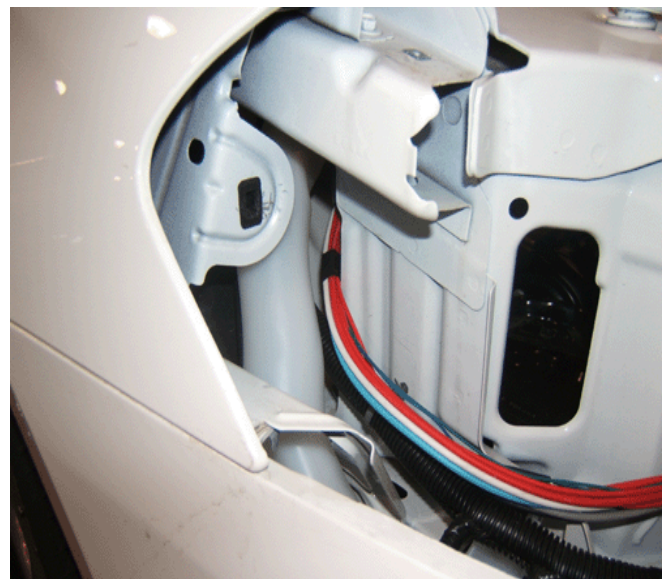


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22. Route the revised harness (1) out from the engine compartment through the opening.

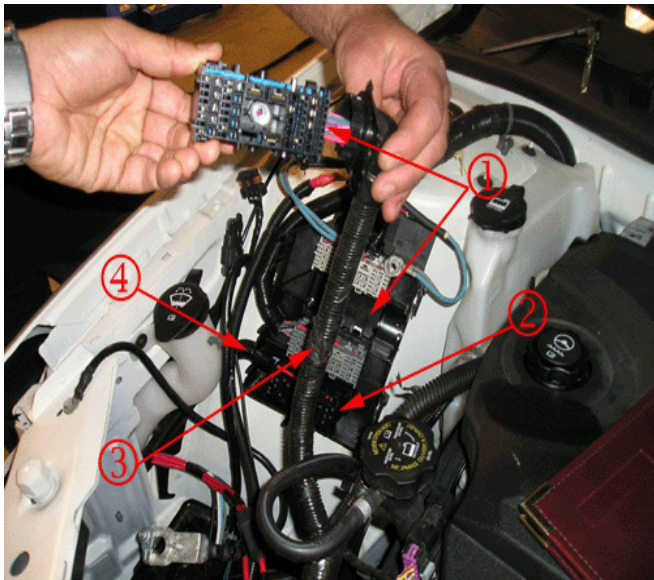
Note: Route the maxi fuse leads one at a time through the fender flange opening.

Route the harness back into the engine compartment between the windshield washer solvent container filler neck (2) and the RF fender flange.



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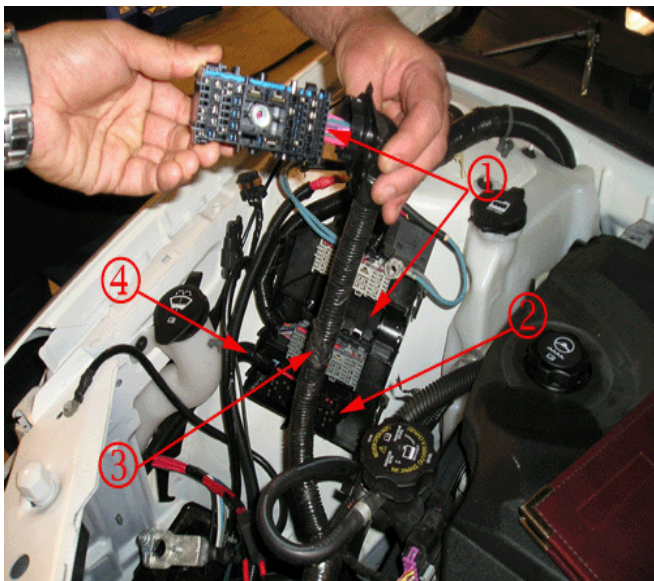
23. Verify the proper routing of the harness as shown.



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24. Using a suitable tool, open the engine harness conduit (3) for the X1 connector approximately 100 mm (4 in) from the entry point at the fuse block and extract the:

- High Speed Cooling Fan Relay Control Circuit
- Low Speed Cooling Fan Relay Control Circuit



2292182

25. Using a suitable tool, open the engine harness conduit (4) for the X3 connector approximately 100 mm (4 in) from the entry point at the fuse block and extract the:

- Cooling Fan - Right Supply Voltage Circuit
- Cooling Fan - Left Low Reference Circuit
- Cooling Fan - Left Supply Voltage Circuit

Important: Examine the cooling fan supply voltage and low reference circuit wires for discoloration, loss of insulation and brittleness in order to determine a **good point** to cut and splice.

26. When performing the following steps, adjust the location of the cuts at least 40 mm (1.5 in) apart in order to allow the splices to lay end to end.

26.1. Cut both of the fan supply voltage circuits approximately 100 mm (4 in) from the entry point at the fuse block **or** at a point where the insulation and flexibility of the wire appear normal.

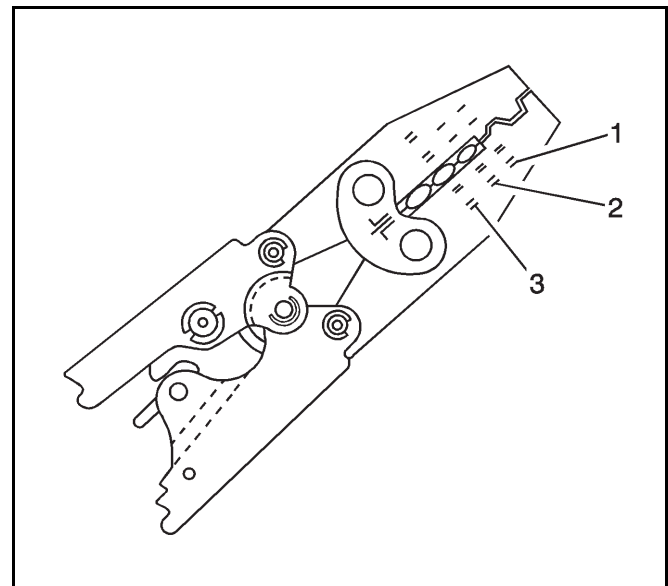
26.2. Cut the fan low reference circuit approximately 100 mm (4 in) from the entry point at the fuse block **or** at a point where the insulation and flexibility of the wire appear normal.

26.3. Cut both of the fan relay control circuits approximately 100 mm (4 in) from the entry point at the fuse block.

27. Strip approximately 7.5 mm (0.313 in) of insulation from each of the five wires to be spliced.

27.1. Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.

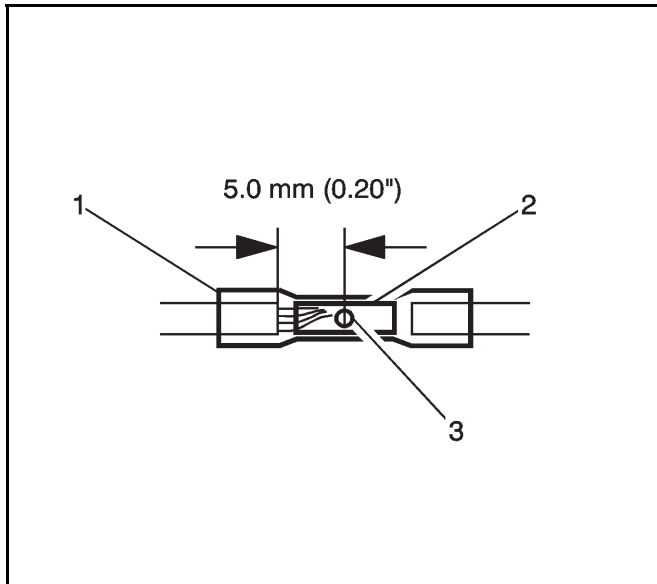
27.2. If the wire is damaged, repeat this procedure after removing the damaged section.



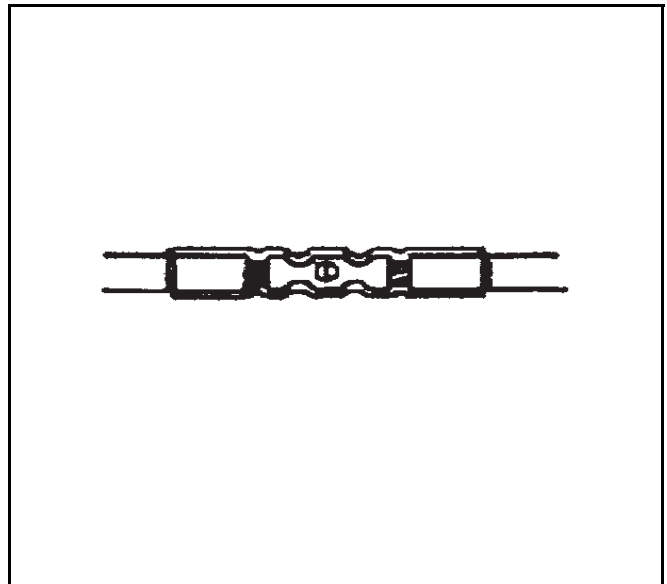
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Note: Adding heat shrink tubing to the wire before splicing is advised in order to protect the integrity of the DuraSeal splices.

28. Compress handles until the ratchet mechanism automatically opens the J-38125-8 Splice Crimp Tool. Place a green DuraSeal splice sleeve in nest (1) as indicated above. **Position** the sleeve so that the crimp falls midway between the end of the barrel and the stop. Close the tool handles **slightly** in order to **firmly** hold the splice sleeve in the proper nest (1).



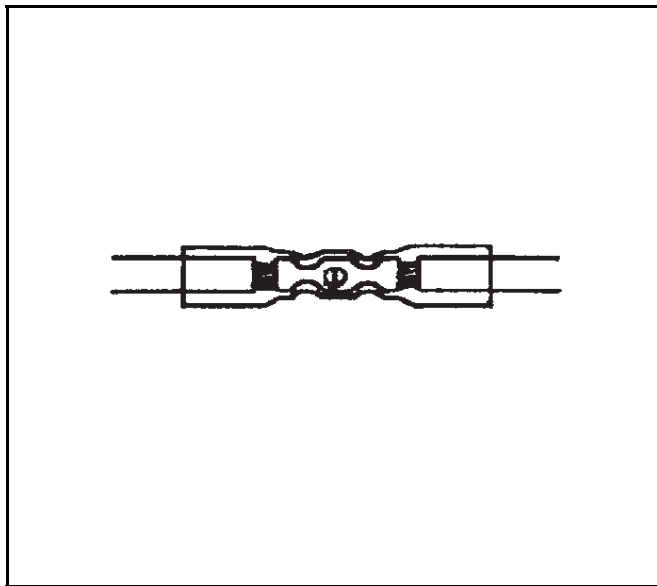
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29. Insert the D-BU High Speed Cooling Fan Relay Control circuit wire (1) into the barrel (2) of the splice sleeve until the wire hits the barrel stop (3).

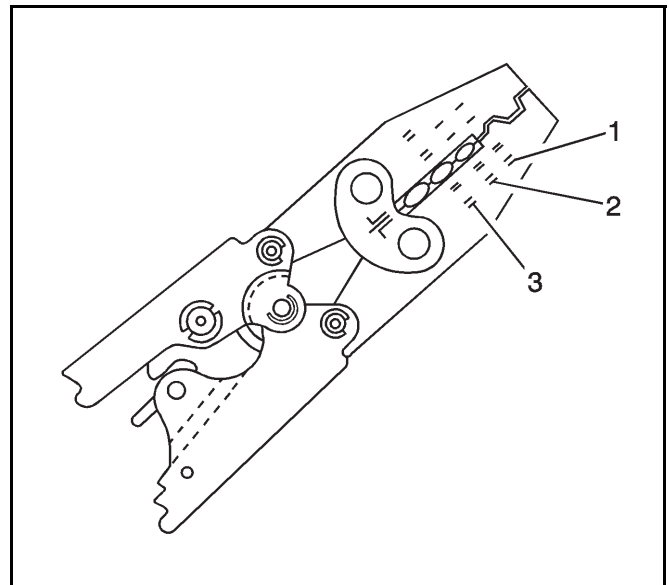
32. Use a heat torch to apply heat to the center area of the sleeve while rotating and gradually moving to the open ends of the tubing. The tubing will shrink completely as the heat is moved along the insulation. A small amount of sealant will come out of the end of the tubing when sufficient shrinkage has occurred.



9502

33. Repeat steps 28 through 32 for the D-GN Low Speed Cooling Fan Relay Control Circuit wire.

30. Compress handles until the ratchet mechanism automatically releases in order to obtain a secure crimp.
31. Repeat steps 29 and 30 for the **opposite end** of the splice.

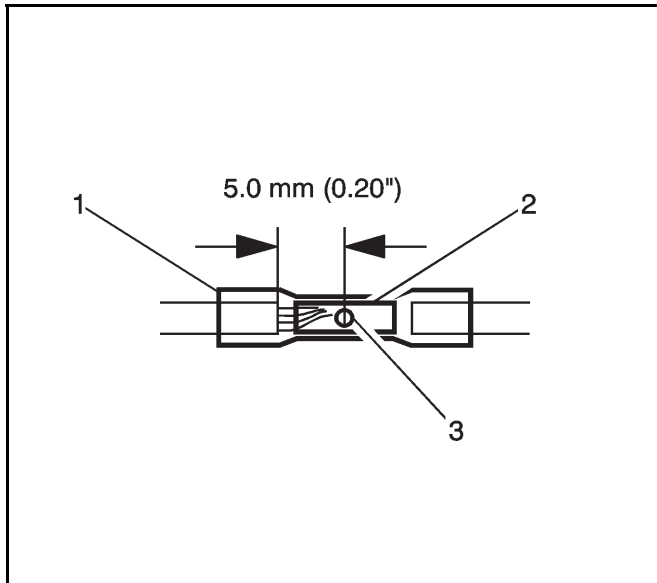


68642

Note: Adding heat shrink tubing to the wire before splicing is advised in order to protect the integrity of the Dura Seal splices.

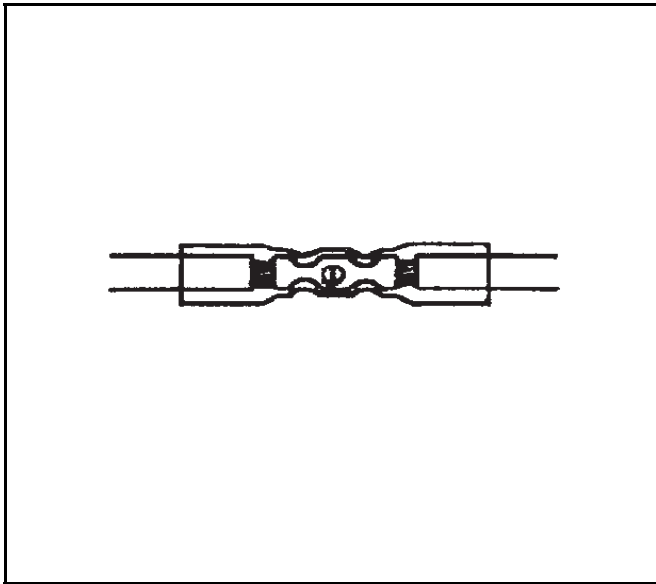
34. Compress handles until the ratchet mechanism automatically opens the J-38125-8 Splice Crimp Tool. Place a yellow DuraSeal splice sleeve in nest (3) as indicated above. **Position** the sleeve so that the crimp falls midway between the end of the

barrel and the stop. Close the tool handles **slightly** in order to **firmly** hold the splice sleeve in the proper nest (3).



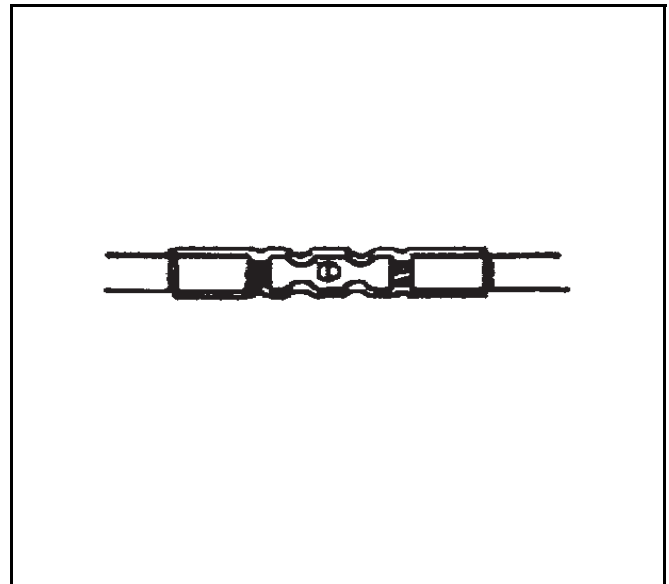
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35. Insert the Cooling Fan - Left Low Reference circuit wire (1) into the barrel (2) of the splice sleeve until the wire hits the barrel stop (3).



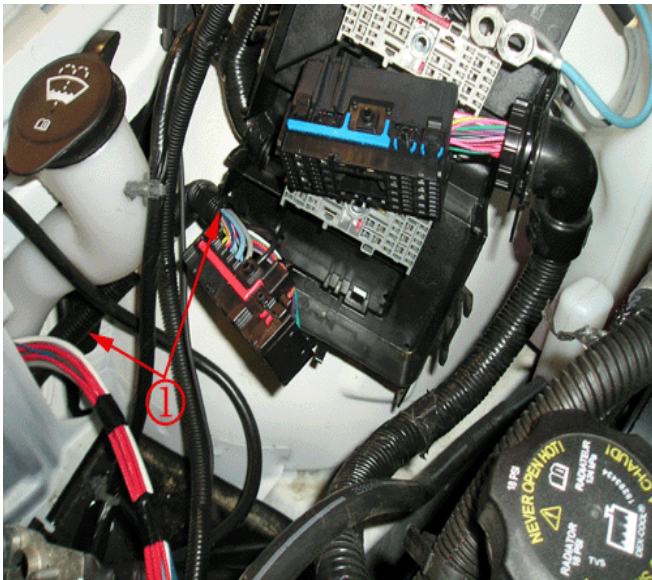
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36. Compress handles until the ratchet mechanism automatically releases in order to obtain a secure crimp.
37. Repeat steps 35 and 36 for the **opposite end** of the splice.



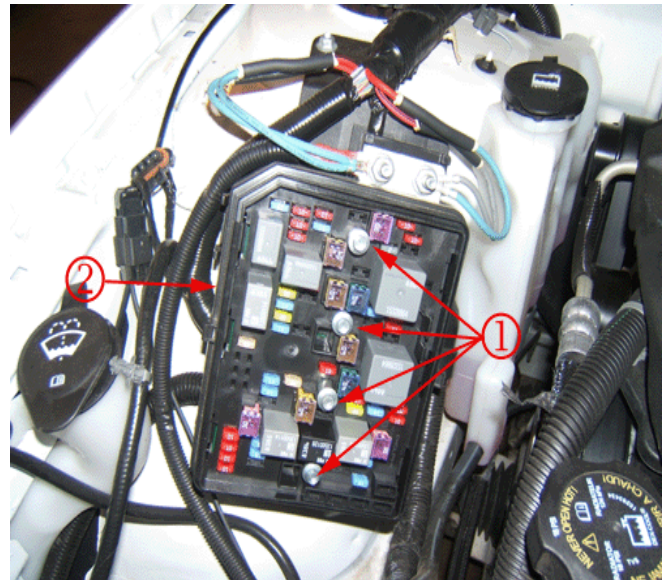
9503

38. Use a heat torch to apply heat to the center area of the sleeve while rotating and gradually moving to the open ends of the tubing. The tubing will shrink completely as the heat is moved along the insulation. A small amount of sealant will come out of the end of the tubing when sufficient shrinkage has occurred.
39. Repeat steps 34 through 38 for the:
• Cooling Fan - Right Supply Voltage Circuit
• Cooling Fan - Left Supply Voltage Circuit
40. Reinsert the High and Low Speed Cooling Fan Relay Control Circuit wires coming **from** the ECM back into the respective conduit for the harness and tape as needed.
41. Route the new spliced High Speed and Low Speed Cooling Fan Relay Control Circuit wires under the fuse block and toward the RH fender flange.



2292783

42. Insert any excess wire length for the Cooling Fan Low Reference Circuit, Right Supply Voltage Circuit and Left Supply Voltage Circuit back into the conduit (1) from which it was extracted in the area by the RH fender flange and tape as needed.



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45. Install the electrical center board (2). Ensure that the tabs have locked in place. Install the fasteners (1).

Tighten

Tighten the fasteners to 7 N•m (62 lb in).



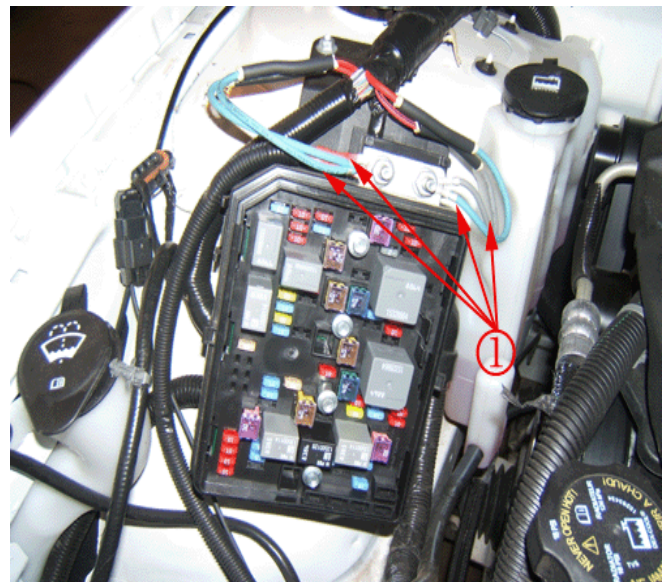
2292816

43. Install the ground wire grommet from the revised harness assembly at the existing G 100 ground location (1) as shown.

Tighten

Tighten the fastener to 7 N•m (62 lb in).

44. Install and seat the X1 and X3 electrical connectors into the fuse block. Verify the proper positioning of all four connectors in the fuse block.



2292952

46. Install the forward lamp battery supply harness terminal and the fusible links (1) to the LH and RH fuse block battery studs in their original positions and orientations.



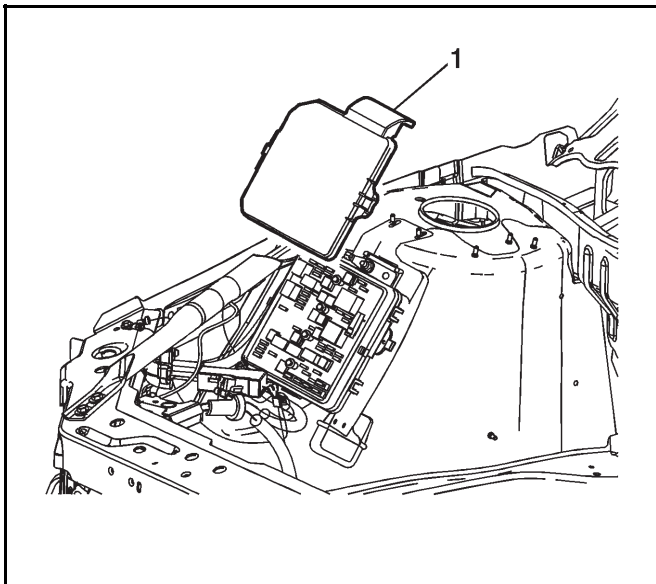
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47. Route the shortest Maxi-Fuse ring terminal lead (2) to the RH fuse block stud (2). Maintain sufficient clearance.

Route the longest Maxi-Fuse ring terminal lead (1) over the top of the fuse block to the LH fuse block stud (1). Maintain sufficient clearance.

Tighten

Tighten the fasteners to 7 N•m (62 lb in).



1592786

48. Install the fuse block underhood electrical center cover (1).
49. Enclose as much as possible of the revised harness assembly in protective conduit and tape as needed.

Note: Do not tip the battery more than 40 degrees during installation.

50. Install the battery.
51. Install the battery hold down and bolt.

Tighten

Tighten the bolt to 18 N•m (13 lb ft).

52. Install the battery insulator.

Note: Clean any existing oxidation from the contact face of the battery terminal and battery cable using a wire brush before installing the battery cable to the battery terminal.

53. Install the positive battery cable terminal to the battery.
54. Tighten the positive battery cable terminal nut.

Tighten

Tighten the nut to 15 N•m (11 lb ft).

55. Snap closed the positive battery cable terminal cover.

Note: Clean any existing oxidation from the contact face of the battery terminal and battery cable using a wire brush before installing the battery cable to the battery terminal.

56. Install the negative battery cable terminal to the battery. Refer to Battery Negative Cable Disconnection and Connection in SI.
57. Tighten the negative battery cable.

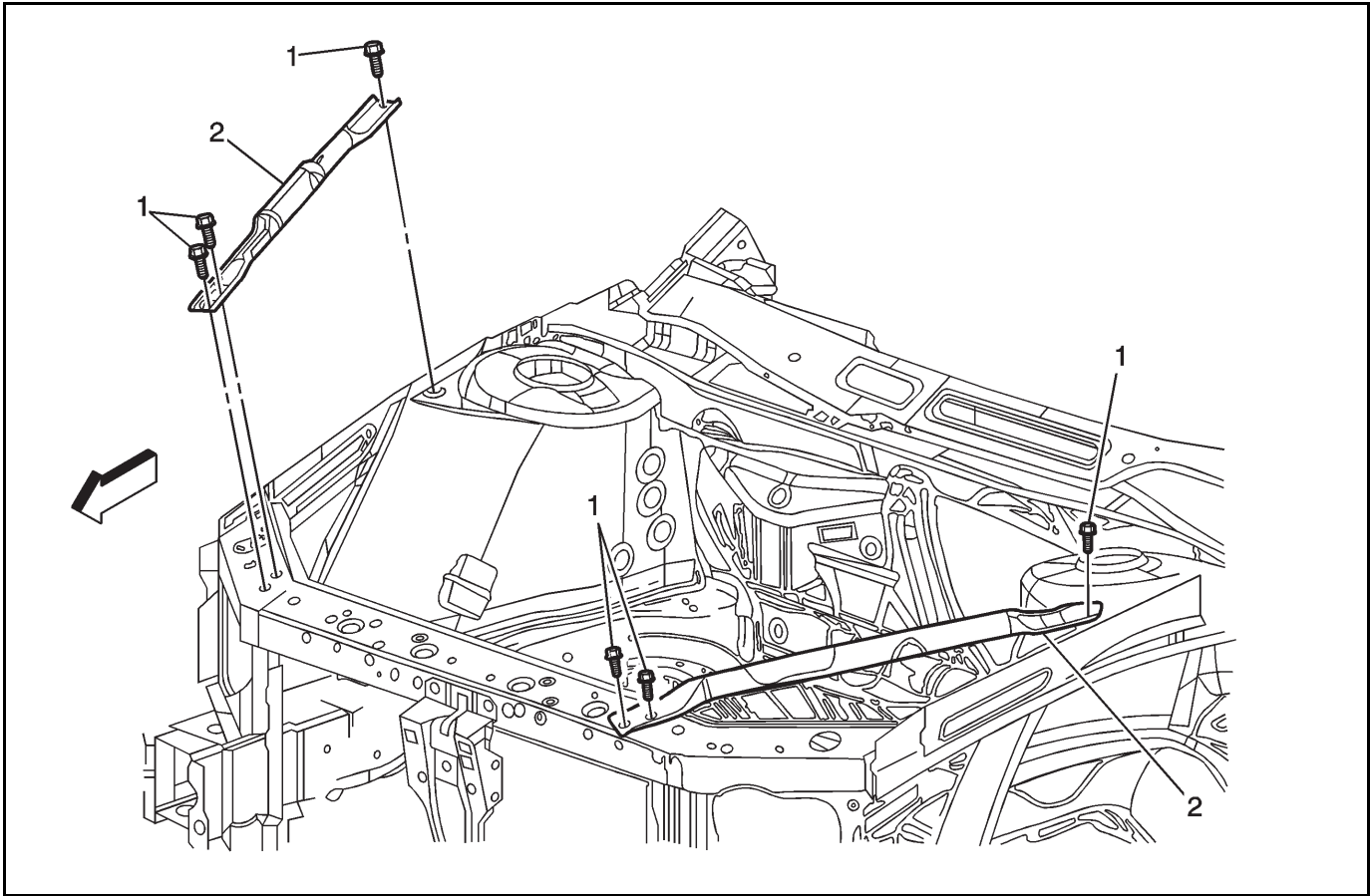
Tighten

Tighten the nut to 15 N•m (11 lb ft).

58. Install the screw at the top of the windshield washer solvent container filler neck at the RF fender flange.

Tighten

Tighten the screw to 1 N•m (9 lb in).



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59. Install the retainer that secures the wiring harness to the bottom of the brace (2), then install the upper diagonal brace.
 Install the RH front fender upper diagonal brace bolts (1).

Tighten

Tighten the bolts to 10 N•m (89 lb in).

60. Connect the electrical connector to the headlamp.
 60.1. While installing the headlamp, guide the lock pin into the RH fender flange lock pin retainer.
 60.2. Install the headlamp bolt.

Tighten

Tighten the bolt to 2 N•m (18 lb in).

- 60.3. Secure the inner headlamp retainer.

61. Use the scan tool to clear any existing DTCs.
 62. Use the scan tool output controls to command the Fan Relay 1, Fan Relay 2 & 3, and Fan Relays 1,2 & 3 ON and OFF. Visually inspect both of the cooling fans for the correct ON/OFF actions when activated. Refer to Engine Control Module Scan Tool Output Controls in SI.

Parts Information

Part Number	Description	Qty
20899523	HARNES ASM - ENG COOLING FAN WRG	1
GM P/N 19168448 Kent-Moore P/N 12089191	CRIMP SPLICE SLEEVE (YELLOW)	1
GM P/N 19169142 Kent-Moore P/N 88988379	SPLICE KIT (SEALED) (GREEN) CRIMP SPLICE SLEEVE (GREEN)	3 1

Warranty Information

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
N9620*	Install Revised Engine Cooling Fan Harness and Relay Assembly	1.8 hrs

*This is a unique labor operation for bulletin use only. It will not be published in the Labor Time Guide.

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