All Models

MODEL IDENTIFICATION

NOTE: Metro, Prizm and Tracker, and Saturn are not covered in this article. For A/C compressor clutch diagnosis on Metro, Prizm, Tracker, and Saturn, see appropriate MANUAL A/C-HEATER SYSTEMS article.

MODEL IDENTIFICATION (CARS)

Body Code (1)	Model
C	Park Avenue
E	Eldorado
F	Camaro & Firebird
G	Aurora
H	Bonneville & LeSabre
J	Cavalier & Sunfire
K	DeVille & Seville
N	Alero, Grand Am & Malibu
V	Catera
W	Century, Grand Prix, Impala, Intrigue, Lumina, Monte Carlo & Regal
Y	Corvette

(1) Vehicle body code is fourth character of VIN.

MODEL IDENTIFICATION (LIGHT TRUCKS & VANS)

Series (1)	Model(s)
A	FWD Aztek
B	AWD Aztek
C	2WD - Pickup, Sierra, Suburban, Tahoe, Silverado & Yukon
G	Express & Savana
K	4WD - Pickup, Escalade, Sierra, Suburban, Tahoe, Silverado & Yukon
L	AWD Astro & Safari
M	2WD Astro & Safari
S	2WD - Blazer, Jimmy, Pickup & Sonoma
T	4WD - Blazer, Bravada, Jimmy, Pickup & Sonoma
U	Montana, Silhouette & Venture

(1) Vehicle series code is fifth character of VIN.

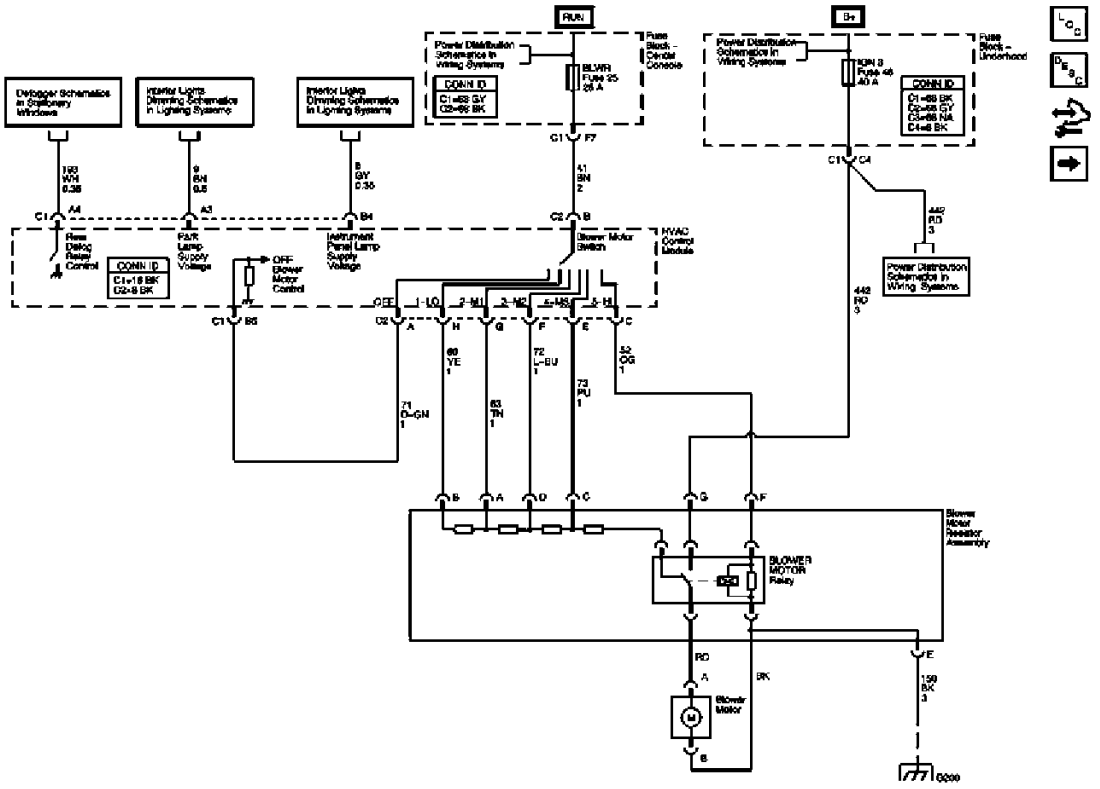

Fig. 1: Blower Controls
Courtesy of GENERAL MOTORS CORP.

4. Insert two 19 mm (0.75 in) diameter X 203 mm (8 in) long guide pins or drill bits into the frame right side alignment holes in order to align the frame.

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

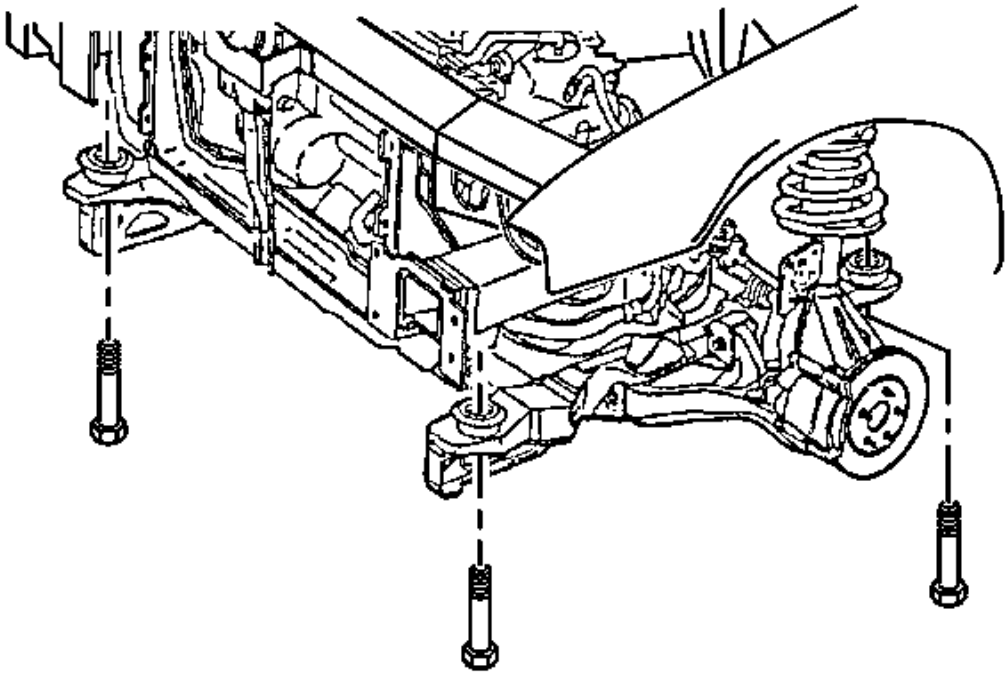

Fig. 13: Locating Frame To Body Bolts
Courtesy of GENERAL MOTORS CORP.

5. Install the frame to chassis front bolts.

   Tighten: Tighten the bolts to 155 N.m (114 lb ft).

6. Install the frame to chassis rear bolts.

   Tighten: Tighten the bolts to 240 N.m (177 lb ft).

7. Remove the alignment pins from the frame.
8. Install the transaxle mount nuts.

   Tighten: Tighten the nuts to 47 N.m (35 lb ft).

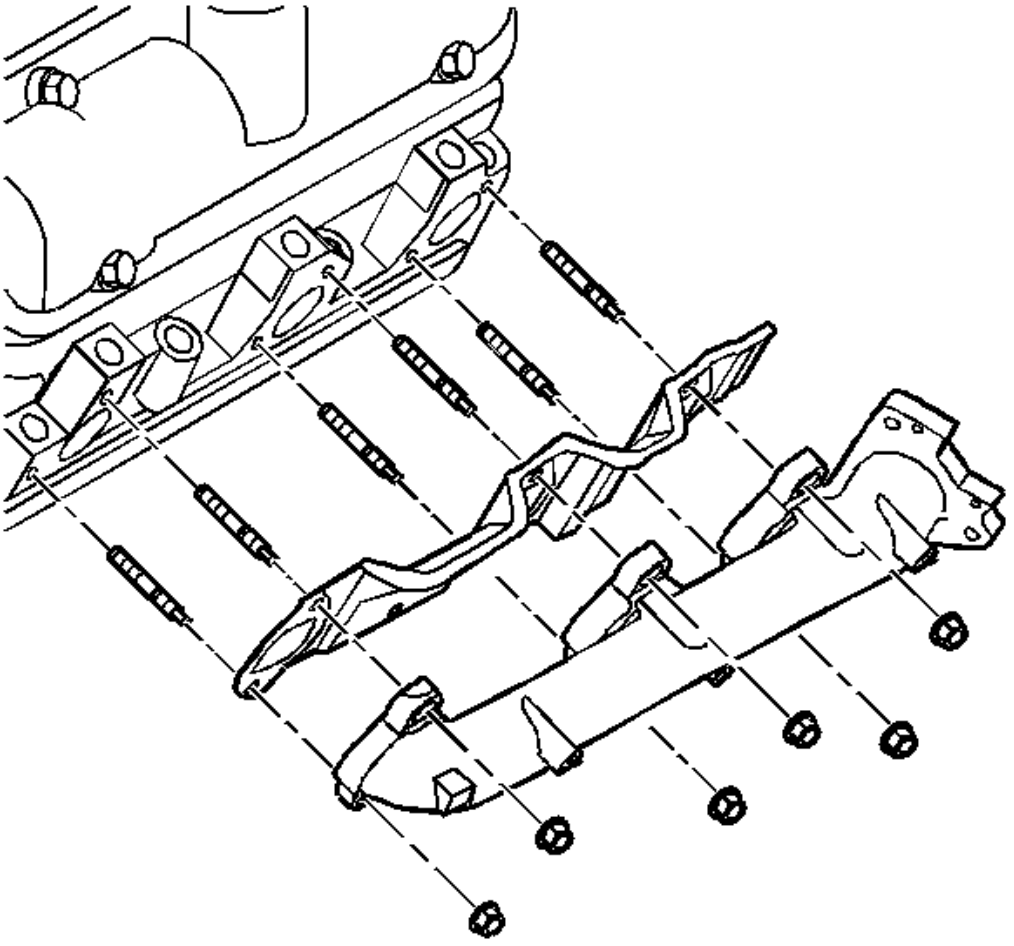

Fig. 424: View Of Exhaust Manifold & Exhaust Manifold Gasket - Left
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

1. Install the exhaust manifold studs.

   Tighten: Tighten the exhaust manifold studs to 18 N.m (13 lb ft).

2. Install the exhaust manifold gasket.
3. Install the exhaust manifold.

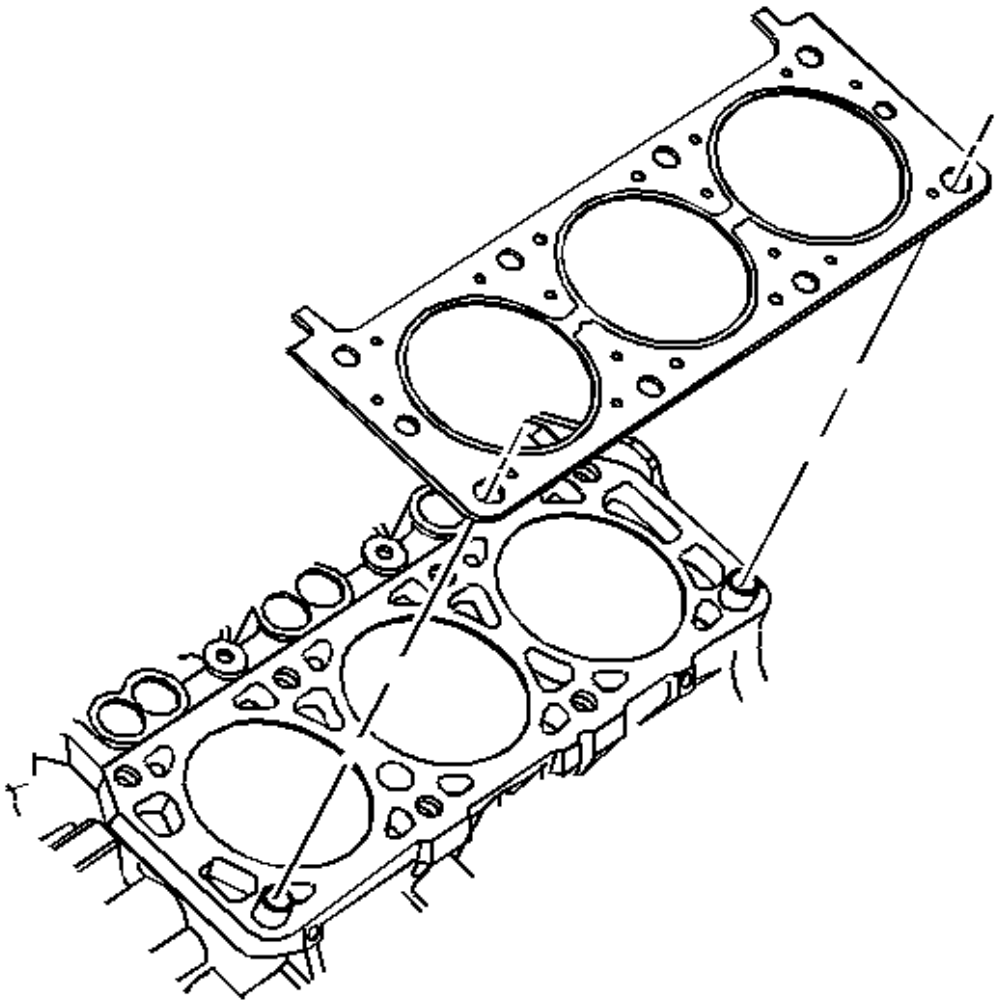

Fig. 228: View Of Cylinder Head Gasket And Alignment Pins
Courtesy of GENERAL MOTORS CORP.

3. Remove the cylinder head gasket.
4. Remove the cylinder head locator dowel pins if required.

CYLINDER HEAD REMOVAL - RIGHT

refer to that accessory drive component for the proper installation procedure for that pulley.

10: Inspecting of the fasteners can eliminate the possibility that a wrong bolt, nut, spacer, or washer was installed.

12: Inspecting the pulleys for being bent should include inspecting for a dent or other damage to the pulleys that would prevent the drive belt from not seating properly in all of the pulley grooves or on the smooth surface of a pulley when the back side of the belt is used to drive the pulley.

14: Replacing the drive belt when it is not damaged or there is not excessive pilling will only be a temporary repair.

Drive Belt Chirping Diagnosis

Step	Action	Yes	No
NOTE: **Refer to Belt Dressing Notice in Cautions and Notices.** DEFINITION: The following items are indications of chirping: • A high pitched noise that is heard once per revolution of the drive belt or a pulley. • It usually occurs on cold damp mornings.			
1	Did you review the Symptoms - Engine Mechanical operation and perform the necessary inspections?	Go to **Step 2**	Go to **Symptoms - Engine Mechanical**
2	Verify that there is a chirping noise. Does the engine make the chirping noise?	Go to **Step 3**	Go to Diagnostic Aids
3	1. Remove the drive belt. Refer to **Drive Belt Replacement** 2. Operate the engine for no longer than 30 to 40 seconds. Does the chirping noise still exist?	Go to **Engine Noise on Start-Up, but Only Lasting a Few Seconds**, **Upper Engine Noise, Regardless of Engine Speed**, **Lower Engine Noise, Regardless of Engine Speed**,	

Outlet (LA1).

3. Remove the water coolant inlet pipe bolts and the coolant inlet pipe.
4. Remove and discard the coolant inlet pipe seal.

Installation Procedure

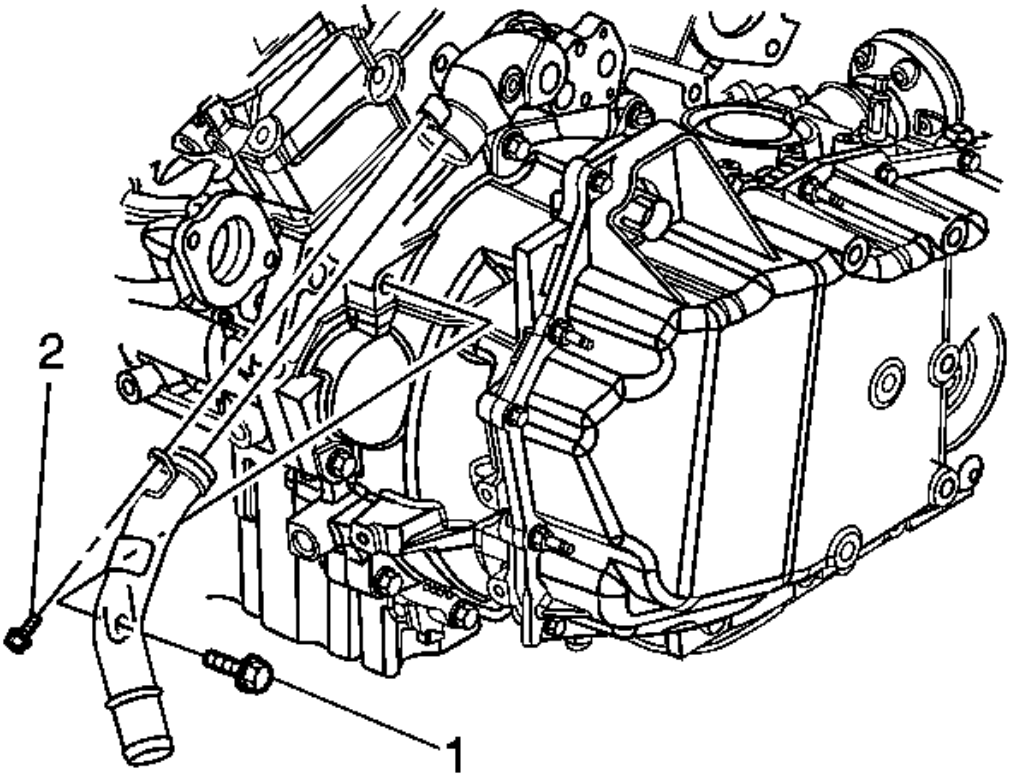

Fig. 43: View Of Water Coolant Inlet Pipe Bolts & Coolant Inlet Pipe
Courtesy of GENERAL MOTORS CORP.

1. Install the NEW coolant inlet pipe seal.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the coolant inlet pipe bolts.

Tighten

INSPECTION/MAINTENANCE (I/M) HEATED OXYGEN SENSOR (HO2S) HEATER SYSTEM SET PROCEDURE

Description

The purpose of this test is to satisfy the enable criteria necessary to execute inspection/maintenance (I/M) readiness diagnostics for the heated oxygen sensor (HO2S) system. The test may be used to set the I/M System Status to YES. The I/M System Status display on the scan tool provides an indication of whether the control module has completed the required tests. The I/M System Status does not indicate that the tests have passed or failed. When all of the diagnostics for a specific system have run and passed, the I/M System Status will update to YES. If a test for a specific system has failed, the I/M System Status will update to YES, indicating a determination was made, even if all of the other tests for that system have not run.

Conditions for Running

- The engine coolant temperature (ECT) is less than 35°C (95°F).
- The intake air temperature (IAT) is less than 35°C (95°F).
- The difference between the IAT and the ECT is less than 6°C (10.8°F).
- The battery voltage is between 10-18 volts.
- The engine speed is between 600-3,000 RPM.
- The mass air flow (MAF) is between 4-26 grams per second.

Diagnostic Aids

The HO2S Heater Tests will normally run within the 2 minutes allotted in the procedure. If there is an indeterminate condition, the test may take up to 8 minutes on some vehicles before a decision of pass or fail is made. If the test does not update to YES, it may have failed or aborted due to the loss of enabling conditions. Extremely high ambient temperatures may prevent the HO2S Heater Test from initiating.

If there is an impending failure, the system may require more time to run the diagnostic than was allotted in the set procedure. If the test does not run after numerous attempts and no DTC is set, review the appropriate scan tool data list and the service information for an indication of why the test does not complete. Some tests may abort due to changes in the conditions while the test is running. For example, changes in engine load such as a cooling fan or A/C compressor clutch turning ON may cause the test to abort.

Inspection/Maintenance (I/M) Heated Oxygen Sensor (HO2S) Heater System Set Procedure

Step	Action	Value(s)	Yes	No
1	Did you perform the Inspection/Maintenance (I/M) System Check?	-	Go to **Step 2**	Go to **Inspection/Maintenance (I/M) System Check**
	IMPORTANT: **Whenever the ignition is turned ON, ignition positive voltage is supplied to the heated oxygen sensor (HO2S) heaters. After verifying the enable criteria, turn OFF the**			

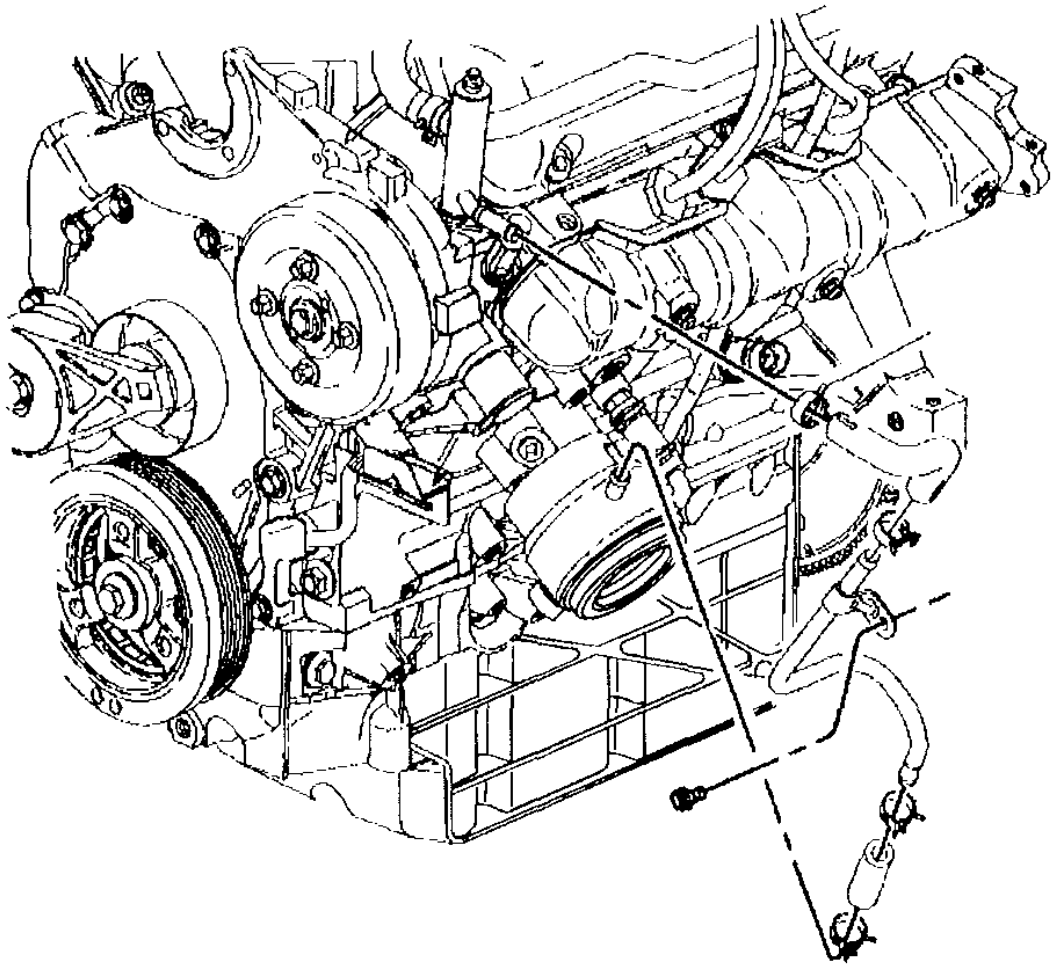

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Fig. 511: Installing Oil Cooler Outlet Hoses And Pipe
Courtesy of GENERAL MOTORS CORP.

OIL LEVEL INDICATOR AND TUBE INSTALLATION

1. Install the oil level indicator and oil level indicator tube.
2. Install the oil level indicator tube bolt.

   Tighten

   Tighten the oil level indicator tube bolt to 25 N.m (18 lb ft).

3. Install the thermostat bypass pipe (3).

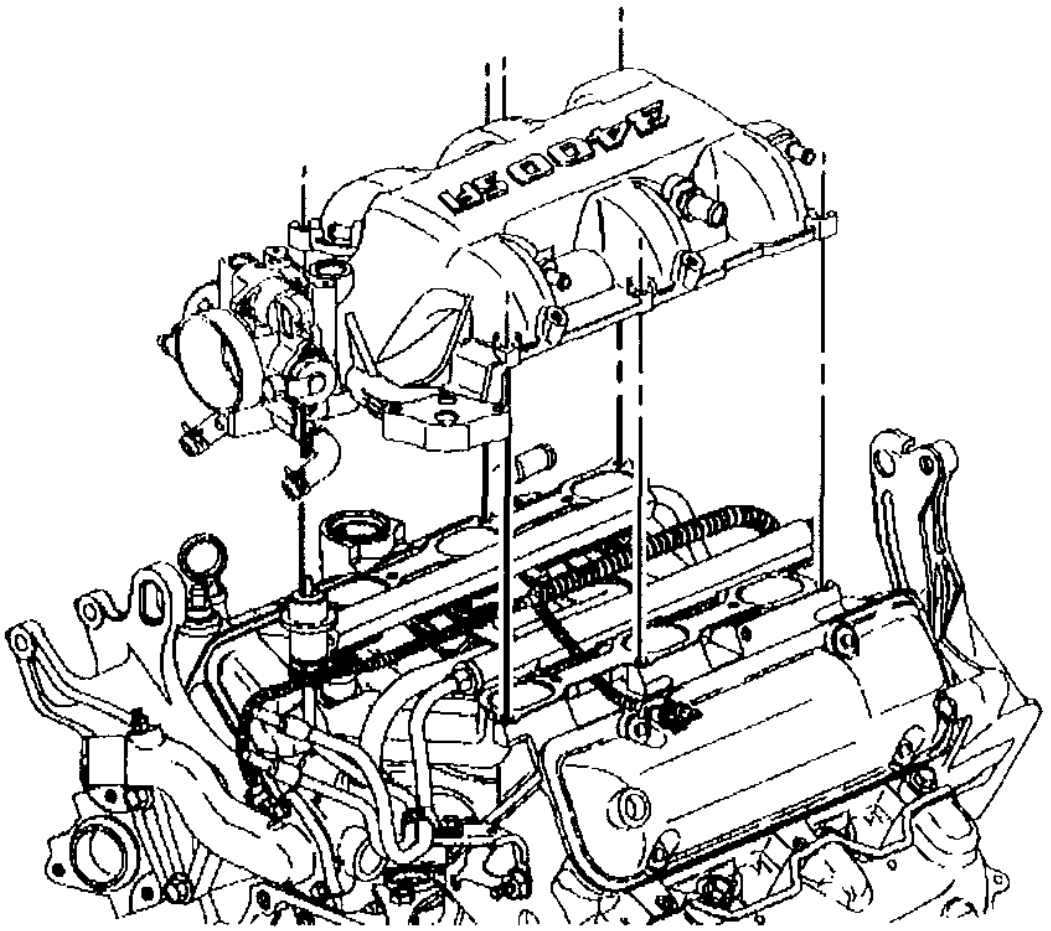

Fig. 137: Installing Upper Intake Manifold
Courtesy of GENERAL MOTORS CORP.

4. Install the MAP sensor and the bracket. Refer to **MANIFOLD ABSOLUTE PRESSURE SENSOR** .
5. Install the upper intake manifold studs and bolts.

   Tighten

   Tighten bolts to 25 N.m (18 lb ft.)

6. Install generator through bolt bracket.
7. Install the EGR valve. Refer to **EGR VALVE** .
8. Connect the vacuum hose connections to the upper intake manifold:

Component	Location
Automatic Level Control Inflator Air Switch	Inside vehicle, behind left rear wheelhouse.
Brake Fluid Level Indicator Switch	On side of brake fluid reservoir.
Cruise Control Release Switch	On brake pedal support.
Engine Oil Level Indicator Switch	On bottom of engine oil pan.
Engine Oil Pressure Indicator Switch	On lower left side of engine, above starter. See **Fig. 2** .
Park Brake Indicator Switch	On park brake assembly.
Seat Belt Switch	In right half of driver's seat belt.
Stoplight Switch	On brake pedal support.
Transaxle Range Switch	On top of transaxle.
Windshield Washer Solvent Level Switch	On front washer solvent container.

MISCELLANEOUS

MISCELLANEOUS LOCATION

Component	Location
Audio Power Amplifier	Under dash, between park brake lever & steering column.
Blower Motor Resistor	On HVAC assembly, in front of blower motor.
Data Link Connector (DLC)	Below steering column.

CONNECTORS

CONNECTORS LOCATION

Component	Location
C101 (Black, 16 Pin)	In lower left side of engine compartment, near EBCM.
C102 (Black, 16 Pin)	On top of engine, near generator.
C103 (Black, 16 Pin)	In lower left side of engine compartment, near EBCM.
C105 (Gray, 4 Pin)	Front of engine compartment, on cooling fan support.
C111 (20 Pin)	In lower left side of engine compartment, on top of automatic transaxle.
C120 (Black, 2 Pin)	Between battery & windshield fluid reservoir.
C151 (Black, 4 Pin)	Left side of vehicle, behind left headlamp.
C152 (Black, 4 Pin)	Right side of vehicle, behind right headlamp.
C153 (Black, 3 Pin)	Behind left park/turn lamp.
C154 (Black, 3 Pin)	Behind right park/turn lamp.
C200 (Black, 30 Pin)	Behind right side of dash compartment, behind right dash access panel.

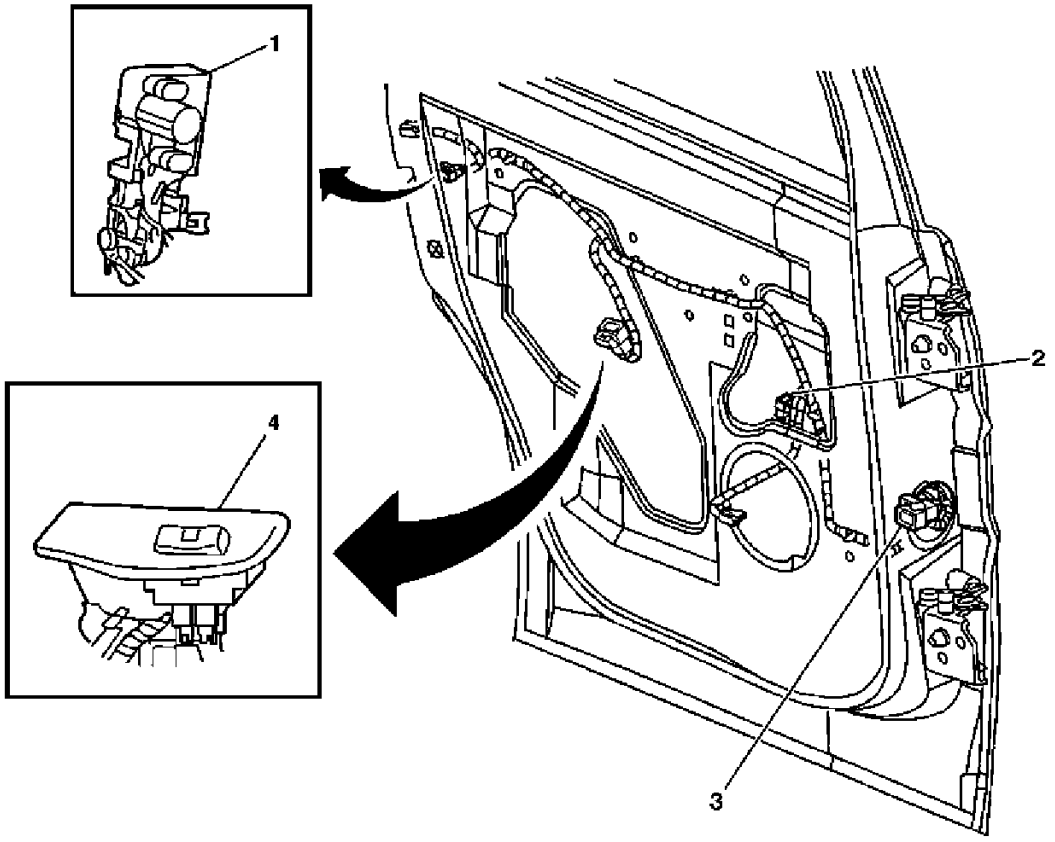

Fig. 11: Door Component View - LR
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 11

Callout	Component Name
1	Door Latch - LR
2	Window Motor - LR
3	C351
4	Window Switch - LR

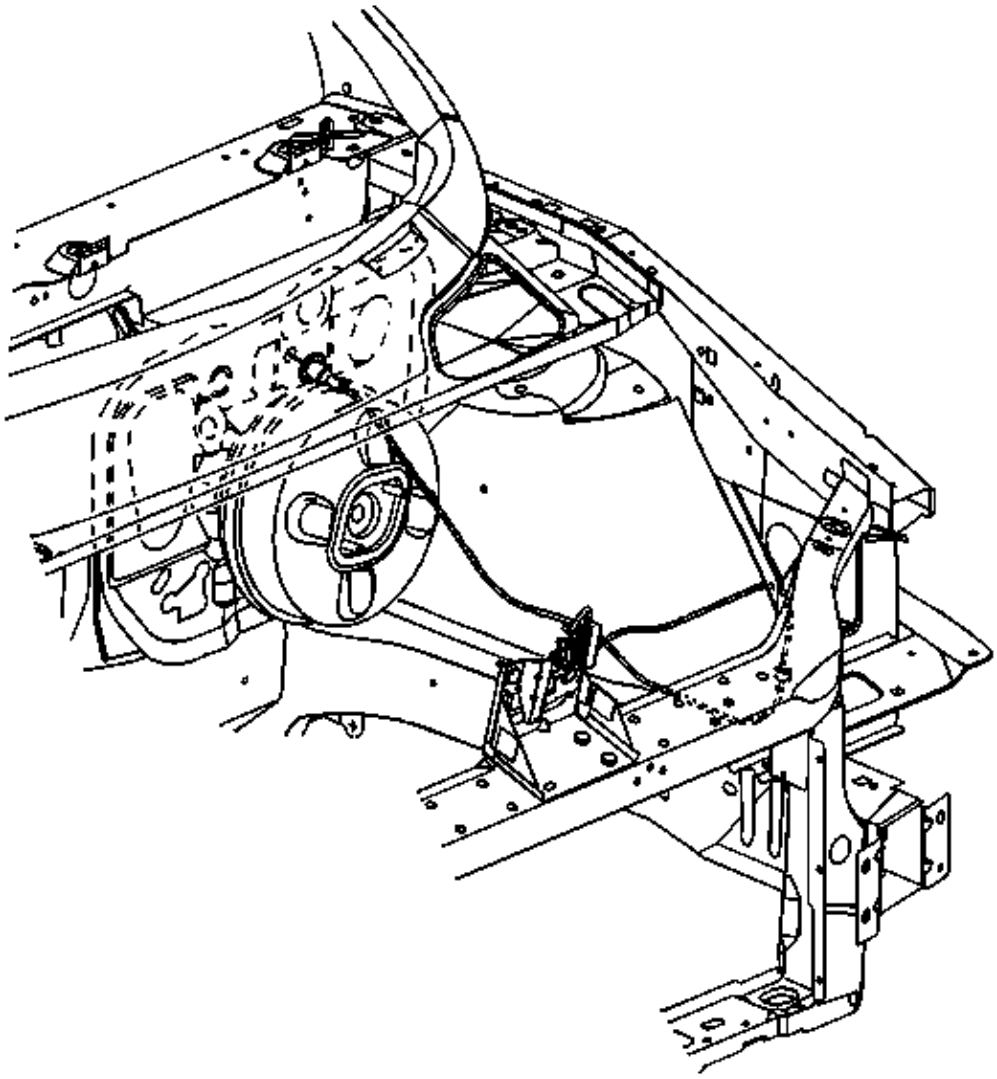

Fig. 24: View Of Engine Compartment
Courtesy of GENERAL MOTORS CORP.

5. Install the hood release cable retainers to the engine compartment side rail.
6. Install the hood release cable retainers to the upper tie bar.
7. Connect the hood release cable to the hood latch. Refer to **Hood Latch Replacement**.
8. Install the hood release cable to the hood release handle. Refer to **Hood Latch Release Handle Replacement**.

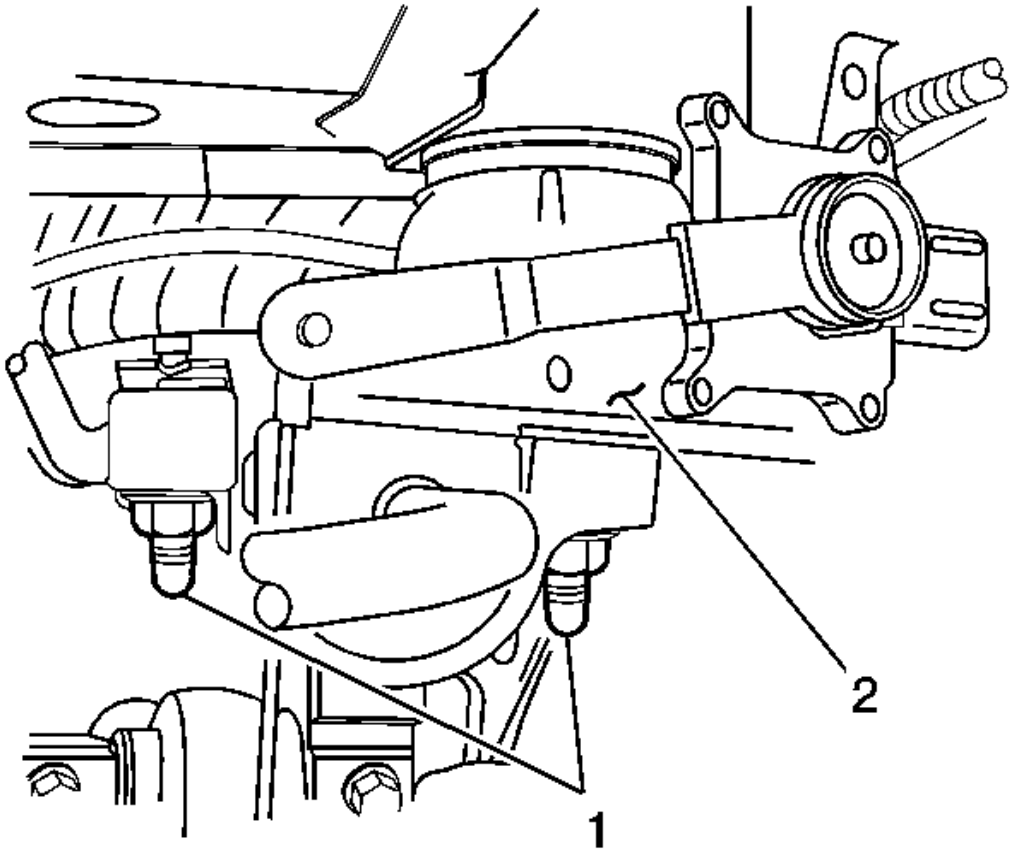

Fig. 28: Identifying Automatic Level Control Height Sensor Bracket Bolts
Courtesy of GENERAL MOTORS CORP.

3. Install the automatic level control height sensor bracket bolts (1).

   Tighten: Tighten the height sensor bracket bolts to 85 N.m (63 lb ft).

4. Install the automatic level control sensor link to the lower control arm ball stud.

HEATER SYSTEMS article. After repairs, go to step 35 .

34. Replace PCM. See appropriate REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE. After repairs, go to next step.
35. Operate system to verify repair.

Compressor Clutch Does Not Disengage (Automatic A/C)

1. If diagnostic system check has not been performed, see **DIAGNOSTIC SYSTEM CHECK** . If diagnostic system check has been performed, go to next step.
2. Start engine. Turn blower motor switch to OFF position. Place A/C request switch in OFF position. If A/C compressor operates, go to next step. If A/C compressor does not operate, problem is intermittent.
3. Using scan tool, observe A/C RELAY COMMAND STATUS in POWERTRAIN data list. If scan tool indicates A/C RELAY COMMAND STATUS is ON, go to next step. If scan tool does not indicate A/C RELAY COMMAND STATUS is ON, go to step 5 .
4. Using scan tool, observe A/C REQUEST parameter in the POWERTRAIN data list. If scan tool indicates A/C REQUEST parameter is YES, go to step 10 . If scan tool does not indicate A/C REQUEST parameter is YES, go to step 11 .
5. Remove A/C compressor clutch relay. If A/C compressor clutch turns off, go to next step. If A/C compressor clutch does not turn off, go to step 8 .
6. Measure resistance between switch side A/C compressor clutch relay terminals. If resistance is infinite, go to next step. If resistance is not infinite, go to step 9 .
7. Check A/C clutch relay control circuit (Dark Green/White wire) for short to ground. If problem was found, repair as necessary. After repairs, go to step 16 . If problem was not found, go to step 11 .
8. Check A/C compressor clutch supply voltage circuit (Dark Green wire) for short to voltage. If problem was found, repair as necessary. After repairs, go to step 16 . If problem was not found, go to step 13 .
9. Check A/C compressor clutch relay connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 16 . If problem was not found, go to step 12 .
10. Check HVAC control module connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 16 . If problem was not found, go to step 14 .
11. Check PCM connectors for poor connections. If problem was found, repair as necessary. After repairs, go to step 16 . If problem was not found, go to step 15 .
12. Replace A/C compressor clutch relay. After repairs, go to step 16 .
13. Replace A/C compressor clutch. See appropriate COMPRESSOR SERVICING article in GENERAL SERVICING. After repairs, go to step 16 .
14. Replace HVAC control module. See REMOVAL & INSTALLATION in appropriate AUTOMATIC A/C-HEATER SYSTEMS article. After repairs, go to step 16 .
15. Replace PCM. See appropriate REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE. After repairs, go to next step.
16. Operate system to verify repair.

Compressor Clutch Does Not Disengage (Manual A/C)

1. If diagnostic system check has not been performed, see **DIAGNOSTIC SYSTEM CHECK** . If