

Fastener Tightening Specifications

Application	Specification	
	Metric	English
A/C		
┆ Compressor Bolt	50 N·m	37 lb ft
┆ Compressor Hose Assembly Bolt	16 N·m	12 lb ft
Barometric (BARO) Sensor Bolt	10 N·m	89 lb in
Camshaft Position Actuator		
┆ Camshaft Bolt	58 N·m	43 lb ft
┆ Oil Control Valve Bolt	10 N·m	89 lb in
Camshaft Cap Bolt	10 N·m	89 lb in
Camshaft Cover Bolt	10 N·m	89 lb in
Camshaft Intermediate Drive Sprocket Bolt - Idler Sprocket	58 N·m	43 lb ft
Camshaft Position Sensor Bolt	10 N·m	89 lb in
Catalytic Converter		
┆ Exhaust Manifold Nut	50 N·m	37 lb ft
Close Out Cover Bolt	10 N·m	89 lb in
Connecting Rod Bolt		
┆ First Pass	30 N·m	22 lb ft
┆ Second Pass - Counterclockwise	Back Off to Zero	
┆ Third Pass	25 N·m	18 lb ft
┆ Final Pass	110 Degrees	
Coolant Outlet Bolt	10 N·m	89 lb in
Crankshaft Balancer Bolt		
┆ First Pass	100 N·m	74 lb ft
┆ Final Pass	150 Degrees	
Crankshaft Main Bearing Bolt		
Inner		
┆ First Pass	20 N·m	15 lb ft
┆ Final Pass	80 degrees	
Outer		
┆ First Pass	15 N·m	10 lb ft
┆ Final Pass	110 Degrees	
Side		
┆ First Pass	30 N·m	22 lb ft
┆ Final Pass	60 Degrees	
Crankshaft Position Sensor Bolt	10 N·m	89 lb in
Crankshaft Position Sensor/Right Exhaust Manifold Lower Heat Shield		

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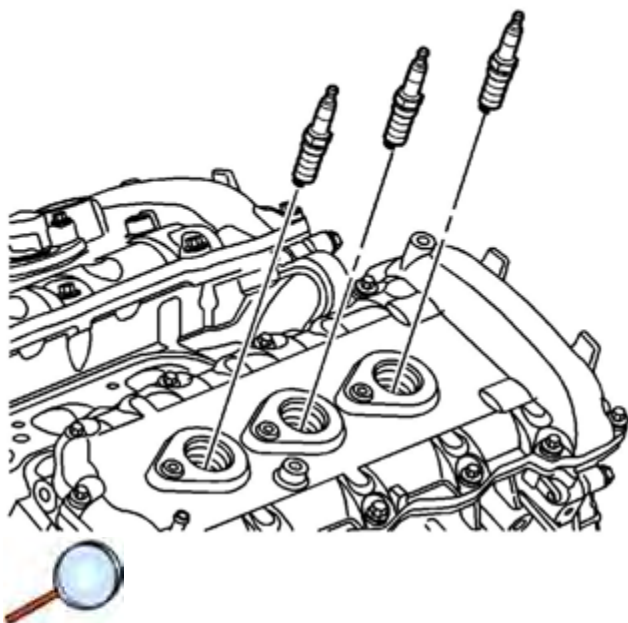
┆ M6 - Bolt	10 N·m	89 lb in
┆ M10 - Bolt	50 N·m	37 lb ft
Crankshaft Rear Oil Seal Housing Bolt	10 N·m	89 lb in
Cylinder Head Bolt - M8		
┆ First Pass	15 N·m	11 lb ft
┆ Final Pass	75 Degrees	
Cylinder Head Bolt - M11		
┆ First Pass	30 N·m	22 lb ft
┆ Final Pass	150 degrees	
Cylinder Head Core Hole Plug	31 N·m	23 lb ft
Drive Belt		
┆ Idler Pulley Bolt	50 N·m	37 lb ft
┆ Tensioner Bracket Bolt	23 N·m	17 lb ft
Engine Control Module (ECM)		
┆ Bolt	10 N·m	89 lb in
┆ Bracket Bolt - Front	23 N·m	17 lb ft
┆ Bracket Bolt - Side	10 N·m	89 lb in
┆ Grounding Bolt	4.5 N·m	40 lb in
Engine Coolant Temperature (ECT) Sensor	22 N·m	16 lb ft
Engine Flywheel Bolt		
┆ First Pass	30 N·m	22 lb ft
┆ Final Pass	45 Degrees	
Engine Front Cover Bolt	23 N·m	17 lb ft
Engine Mount		
┆ Nut to Engine Mount Bracket	80 N·m	59 lb ft
┆ Nut to Frame	80 N·m	59 lb ft
┆ Bracket Bolt to Engine Block - M8	38 N·m	28 lb ft
┆ Bracket Bolt to Engine Block - M10	60 N·m	45 lb ft
Engine Mount Bracket Bolt	58 N·m	43 lb ft
Engine Mount Lower Nut	47 N·m	35 lb ft
Engine Mount Strut Bracket Bolts - to Engine	50 N·m	37 lb ft
Engine Mount Strut Bracket Bolts - to Radiator Support	26 N·m	19 lb ft
Engine Mount Strut Nut	48 N·m	35 lb ft
Engine Mount Upper Nut	53 N·m	39 lb ft
Engine Wiring Harness Bracket		
┆ Bolt - Cylinder Head Rear	10 N·m	89 lb in
┆ Bolt - ECM Bracket Side	23 N·m	17 lb ft
┆ Bolt - ECM Bracket Top	10 N·m	89 lb in
┆ Bolt - Left Side Oil Pan	10 N·m	89 lb in
┆ Bolt - Left Side Oil Filter Adapter	10 N·m	89 lb in

┆ Bolt - Near Crankshaft Position Sensor	50 N·m	37 lb ft
┆ Bolt - Right Side Block Front	23 N·m	17 lb ft
┆ Bolt - Right Side Head Front	10 N·m	89 lb in
Engine Wiring Harness Ground		
┆ Bolt - ECM Bracket Top	10 N·m	89 lb in
┆ Bolt - Left Cylinder Head Side	10 N·m	89 lb in
┆ Bolt - Right Cylinder Head Rear	10 N·m	89 lb in
Evaporative (EVAP) Purge Valve Bolt/Ball Stud	10 N·m	89 lb in
Exhaust Crossover Pipe Nuts	34 N·m	25 lb ft
Exhaust Manifold		
┆ Bolt	20 N·m	15 lb ft
┆ Heat Shield Bolt	10 N·m	89 lb in
┆ Studs	6 N·m	53 lb in
Fuel Rail Bolt	10 N·m	89 lb in
Fuel Rail Support Bracket	10 N·m	89 lb in
Generator		
┆ Bolt	50 N·m	37 lb ft
┆ Cable Nut	10 N·m	89 lb in
Ground Cable Bolt	50 N·m	37 lb ft
Heater Inlet/Outlet Pipe Assembly Bolt	10 N·m	89 lb in
Ignition Coil Bolt	10 N·m	89 lb in
Intake Manifold		
┆ Upper-to-Cylinder Head Bolt - Long	23 N·m	17 lb ft
┆ Upper-to-Cylinder Head Bolt - Short	23 N·m	17 lb ft
┆ Upper-to-Lower Intake Manifold Bolt	23 N·m	17 lb ft
┆ Tuning Valve Bolt	10 N·m	89 lb in
Knock Sensor Bolt	23 N·m	17 lb ft
Oil Drain Plug	25 N·m	18 lb ft
Oil Filter	25 N·m	18 lb ft
Oil Filter Housing Adapter Bolt	23 N·m	17 lb ft
Oil Gallery Plug	31 N·m	23 lb ft
Oil Level Indicator Tube Bolt	10 N·m	89 lb in
Oil Pan		
┆ Bolt - Block M8	23 N·m	17 lb ft
┆ Bolt - Crankshaft Rear Oil Seal Housing M6	10 N·m	89 lb in
┆ Windage Tray Bolt	10 N·m	89 lb in
Oil Pressure Sender	20 N·m	15 lb ft
Oil Pump		
┆ Bolt	23 N·m	17 lb ft
┆ Cover Bolt	13 N·m	115 lb in

Oxygen Sensor		
┆ Pump Converter Pipe	40 N·m	30 lb ft
PCV Tube Bracket Bolt/Ball Stud	10 N·m	89 lb in
Piston Oil Cooling Nozzle Bolt	10 N·m	89 lb in
Power Steering Pump		
┆ Bracket to Engine Bolt	50 N·m	37 lb ft
┆ Reservoir Stud	25 N·m	18 lb ft
Primary Camshaft Drive Chain		
┆ Left Lower Guide Bolt - Oil Pump - Second Design	23 N·m	17 lb ft
┆ Tensioner Bolt	23 N·m	17 lb ft
┆ Upper Guide Bolt	23 N·m	17 lb ft
Radiator Inlet Support Bracket Bolt	50 N·m	37 lb ft
Radiator Outlet Pipe Assembly Bolt	10 N·m	89 lb in
Secondary Camshaft Drive Chain		
┆ Guide Bolt	23 N·m	17 lb ft
┆ Shoe Bolt	23 N·m	17 lb ft
┆ Tensioner Bolt	23 N·m	17 lb ft
Spark Plug	18 N·m	13 lb ft
Starter Motor		
┆ Bolt	50 N·m	37 lb ft
┆ Cable Nut	10 N·m	89 lb in
Suction Tube Bolt	10 N·m	89 lb in
Suction Screen Bolt	10 N·m	89 lb in
Thermostat Housing Bolt	10 N·m	89 lb in
Throttle Body Bolt	10 N·m	89 lb in
Torque Converter Bolt	60 N·m	44 lb ft
Transmission		
┆ Mount Bolt to Transmission - RPO	60 N·m	45 lb ft
┆ To Engine Bolt	50 N·m	37 lb ft
┆ Range Selector Lever Nut	9.5 N·m	84 lb in
Water Pump		
┆ Bolt	10 N·m	89 lb in
┆ Pulley Bolt	10 N·m	89 lb in

Spark Plug Replacement

Removal Procedure



1. Turn the ignition OFF.
2. Remove the ignition coil. Refer to [Ignition Coil Replacement - Bank 1](#) and/or [Ignition Coil Replacement - Bank 2](#).

Caution: Refer to [Safety Glasses and Compressed Air Caution](#) in the Preface section.

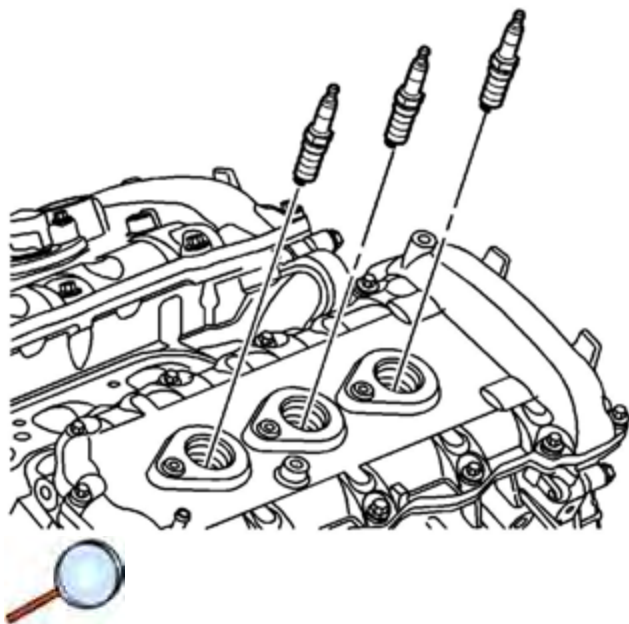
Notice: Clean the spark plug recess area before removing the spark plug. Failure to do so could result in engine damage because of dirt or foreign material entering the cylinder head, or by the contamination of the cylinder head threads. The contaminated threads may prevent the proper seating of the new plug. Use a thread chaser to clean the threads of any contamination.

3. Use compressed air in order to remove debris from the spark plug cavity.

Notice: Allow the engine to cool before removing the spark plugs. Attempting to remove the spark plugs from a hot engine may cause the plug threads to seize, causing damage to cylinder head threads.

4. Remove the spark plug.

Installation Procedure



Notice: Use only the spark plugs specified for use in the vehicle. Do not install spark plugs that are either hotter or colder than those specified for the vehicle. Installing spark plugs of another type can severely damage the engine.

Notice: Check the gap of all new and reconditioned spark plugs before installation. The pre-set gaps may have changed during handling. Use a round feeler gage to ensure an accurate check. Installing the spark plugs with the wrong gap can cause poor engine performance and may even damage the engine.

1. Ensure that the spark plug gap is equivalent to the spark plug gap specification. Refer to [Ignition System Specifications](#) .

Notice: Be sure that the spark plug threads smoothly into the cylinder head and the spark plug is fully seated. Use a thread chaser, if necessary, to clean threads in the cylinder head. Cross-threading or failing to fully seat the spark plug can cause overheating of the plug, exhaust blow-by, or thread damage.

2. Install the spark plug.

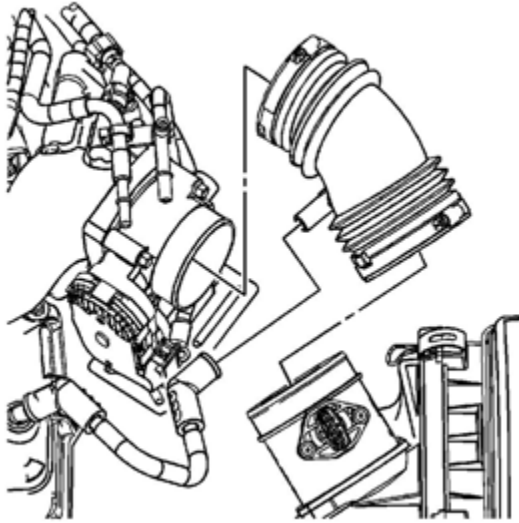
Tighten

Tighten the spark plug to 20 N·m (15 lb ft).

3. Install the ignition coil. Refer to [Ignition Coil Replacement - Bank 1](#) and/or [Ignition Coil Replacement - Bank 2](#) .

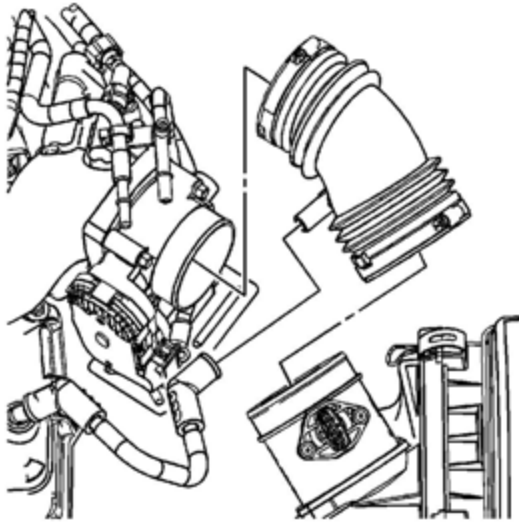
Air Cleaner Inlet Duct Replacement

Removal Procedure



1. Remove the fuel injector sight shield. Refer to [Fuel Injector Sight Shield Replacement](#).
2. Loosen the intake air duct clamps.
3. Disconnect the positive crankcase ventilation (PCV) tube from the air intake duct.
4. Remove the air intake duct from the throttle body and the mass air flow (MAF) sensor.
5. Remove the air intake duct.

Installation Procedure



1. Install the air intake duct to the MAF sensor.
2. Install the air cleaner intake duct to the throttle body.
3. Connect the PCV tube to the air intake duct.

Notice: Refer to [Fastener Notice](#) in the Preface section.

4. Tighten the air intake air duct clamps.

Tighten

Tighten the clamps to 2 N·m (18 lb in).

5. Install the fuel injector sight shield. Refer to [Fuel Injector Sight Shield Replacement](#).

Engine Control Module Replacement

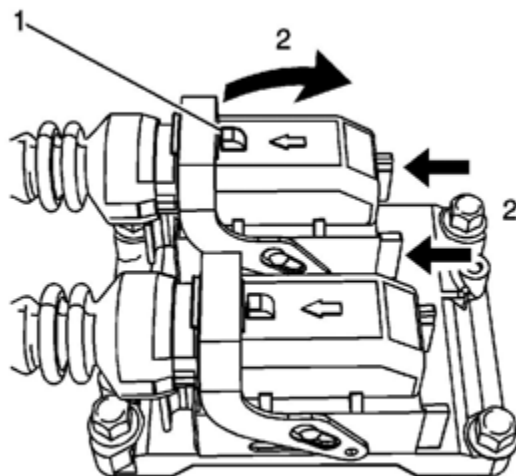
Notice:

- Turn the ignition OFF when installing or removing the control module connectors and disconnecting or reconnecting the power to the control module (battery cable, powertrain control module (PCM)/engine control module (ECM)/transaxle control module (TCM) pigtail, control module fuse, jumper cables, etc.) in order to prevent internal control module damage.
- Control module damage may result when the metal case contacts battery voltage. DO NOT contact the control module metal case with battery voltage when servicing a control module, using battery booster cables, or when charging the vehicle battery.
- In order to prevent any possible electrostatic discharge damage to the control module, do not touch the connector pins or the soldered components on the circuit board.
- Remove any debris from around the control module connector surfaces before servicing the control module. Inspect the control module connector gaskets when diagnosing or replacing the control module. Ensure that the gaskets are installed correctly. The gaskets prevent contaminant intrusion into the control module.
- The replacement control module must be programmed.

Important: It is necessary to record the remaining engine oil life. If the replacement module is not programmed with the remaining engine oil life, the engine oil life will default to 100 percent. If the replacement module is not programmed with the remaining engine oil life, the engine oil will need to be changed at 5 000 km (3,000 mi) from the last engine oil change.

Removal Procedure

1. Using a scan tool, retrieve the percentage of remaining engine oil. Record the remaining engine oil life.



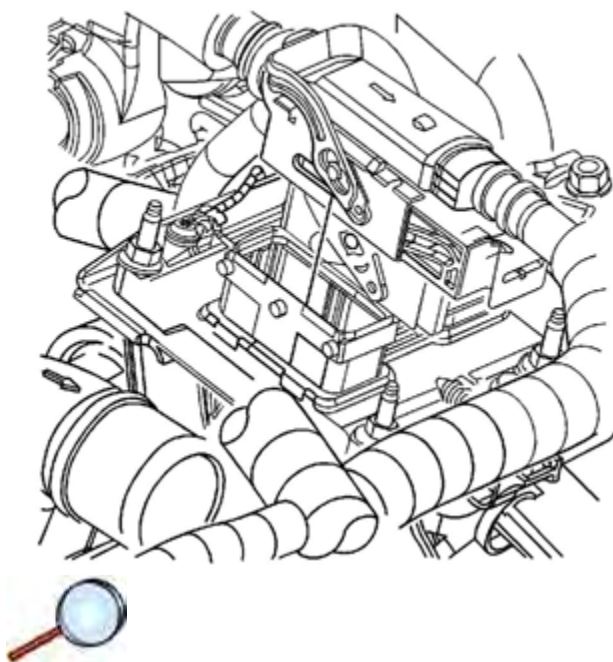
2. Turn the ignition OFF.

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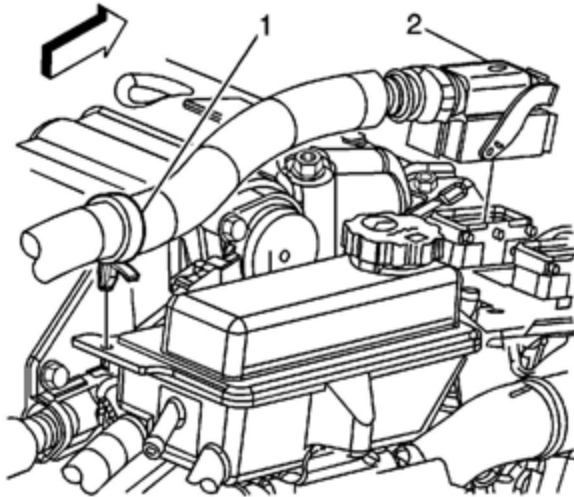
Important: Ensure that there is no main relay circuit voltage (ECM Fuse).

3. Use a DVOM in order to measure the main relay circuit voltage at the engine control module (ECM) fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#) .
4. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
5. Remove the ECM fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#) .
6. Remove the TCM/IPC fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#) .
7. Remove the ECM/TCM fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#) .
8. Unlock the body side (outboard) ECM electrical connector.
 - 8.1. Depress the ECM electrical connector lever lock (1).
 - 8.2. Simultaneously rotate the ECM connector clamp lever and depress the lock slide (2).

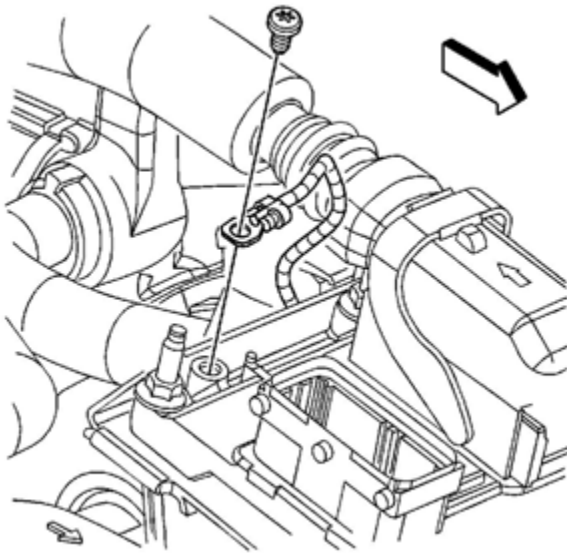
Notice: In order to prevent any possible electrostatic discharge damage to the ECM, do not touch the connector pins.



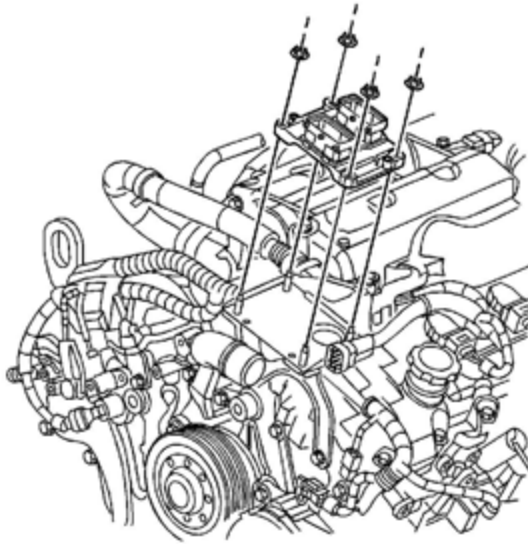
9. Remove the body side (outboard) ECM connector.



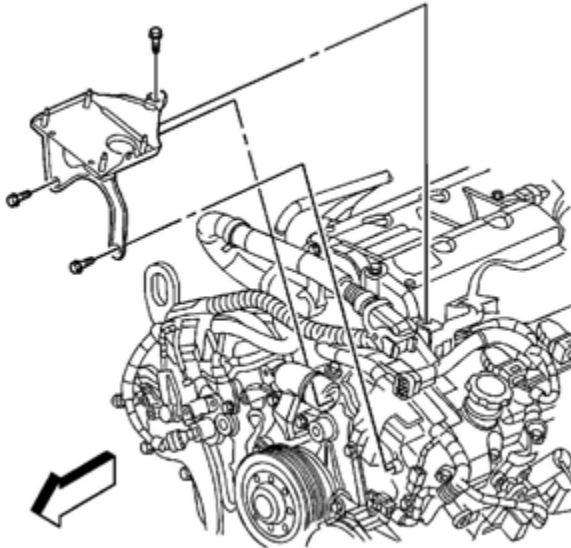
10. Unlock and remove the engine side (inboard) ECM connector (2).



11. Remove the ECM redundant ground wire and bolt from the ECM.

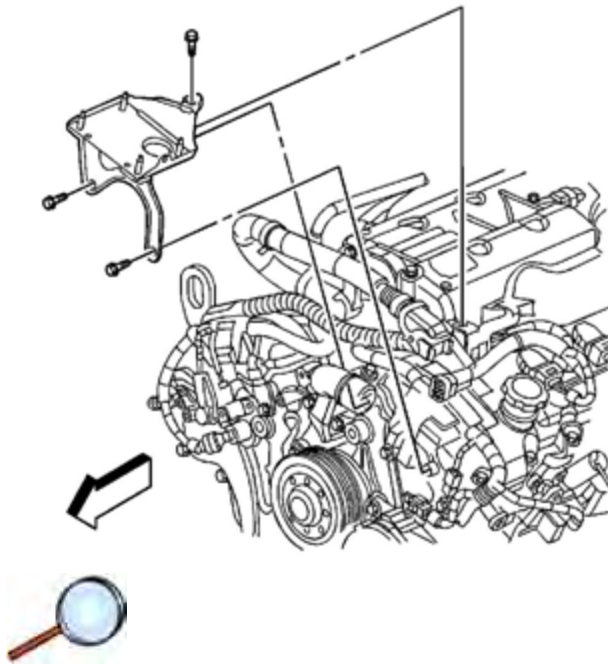


12. Remove the ECM bolts.
13. Remove the ECM.



14. If necessary, perform the following steps:
 - 14.1. Remove the ECM bracket bolts.
 - 14.2. Remove the ECM bracket.

Installation Procedure



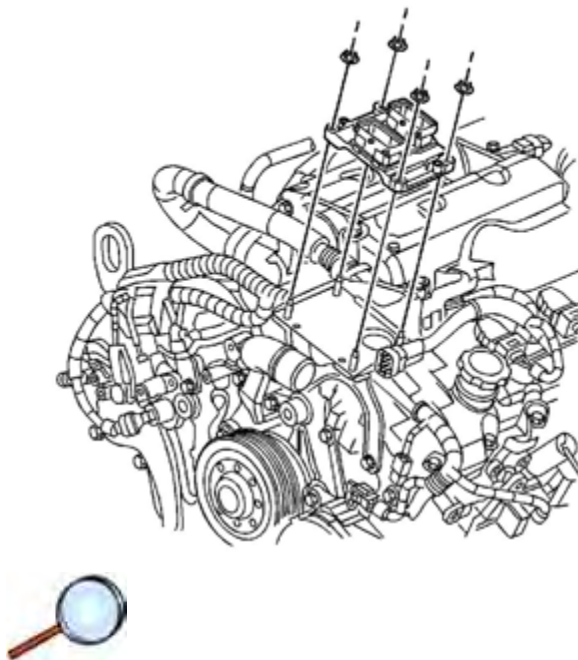
1. Install the ECM bracket, as necessary.

Notice: Refer to [Fastener Notice](#) in the Preface section.

2. Install the ECM bracket bolts.

Tighten

Tighten the ECM bracket bolts to 10 N·m (89 lb in).

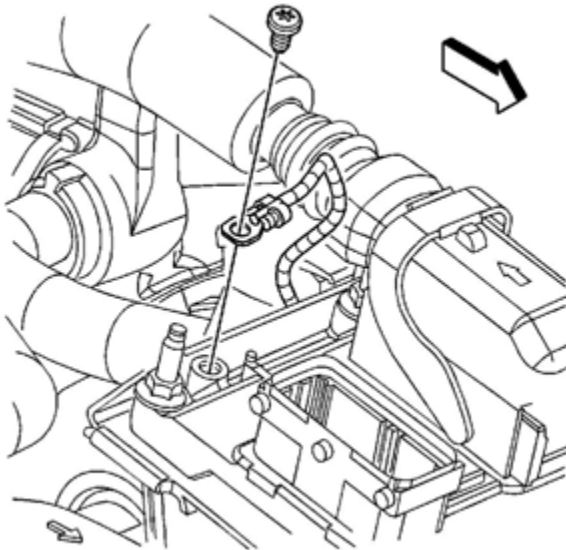


Notice: In order to prevent any possible electrostatic discharge damage to the ECM, do not touch the connector pins.

3. Install the ECM.
4. Install the ECM bolts.

Tighten

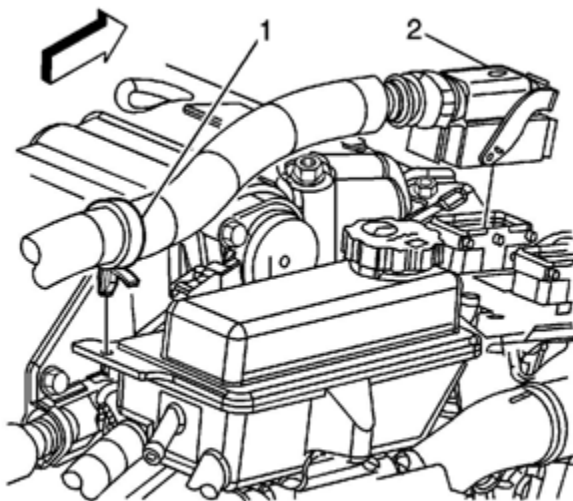
Tighten the ECM bolts to 10 N·m (89 lb in).



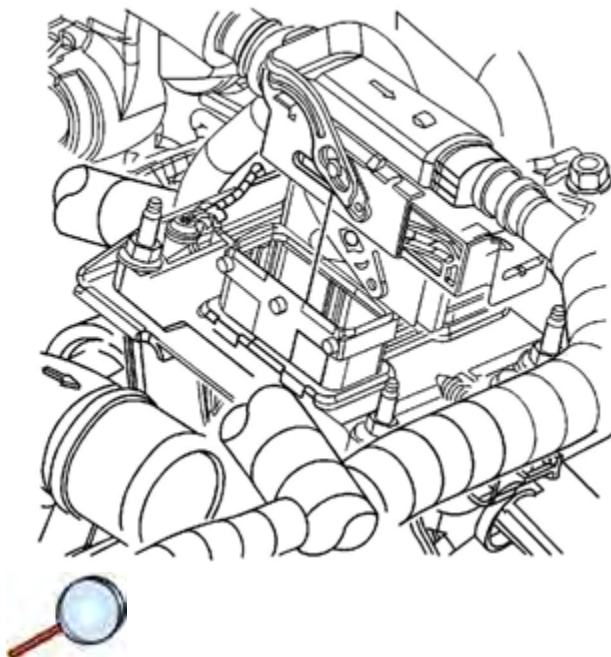
5. Install the ECM redundant ground and bolt to the ECM.

Tighten

Tighten the ECM redundant ground wire bolt to 5 N·m (44 lb in).

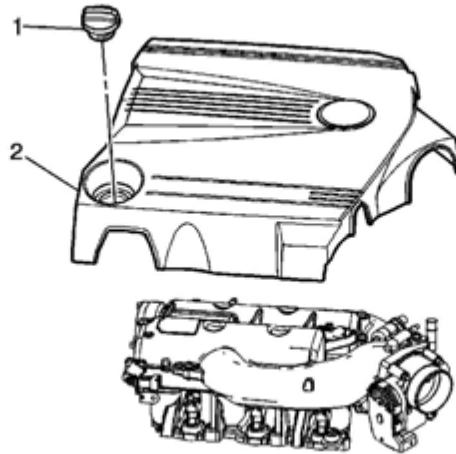


6. Install the engine side (inboard) ECM connector (2).



7. Install the body side (outboard) ECM connector.
8. Install the ECM/TCM fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#).
9. Install the TCM/IPC fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#).
10. Install the ECM fuse in the underhood fuse block. Refer to [Electrical Center Identification Views](#).
11. Connect the battery negative cable to the battery. Refer to [Battery Negative Cable Disconnection and Connection](#).
12. Program the ECM. Refer to [Control Module References](#).
13. Turn OFF the ignition for at least 5 seconds after the programming event is complete.

Fuel Injector Sight Shield Replacement



Callout	Component Name
<i>Fastener Tightening Specifications:</i> Refer to Fastener Tightening Specifications .	
1	Cap, Oil Filler Tip Clean the area around the oil fill cap before removing.
2	Shield, Fuel Injection Sight

Fuel Pressure Relief

Caution: Refer to [Gasoline/Gasoline Vapors Caution](#) in the Preface section.

Caution: Remove the fuel tank cap and relieve the fuel system pressure before servicing the fuel system in order to reduce the risk of personal injury. After you relieve the fuel system pressure, a small amount of fuel may be released when servicing the fuel lines, the fuel injection pump, or the connections. In order to reduce the risk of personal injury, cover the fuel system components with a shop towel before disconnection. This will catch any fuel that may leak out. Place the towel in an approved container when the disconnection is complete.

1. Turn the ignition OFF.
2. Remove the fuel pump fuse and the fuel pump relay. Refer to [Electrical Center Identification Views](#) in Wiring Systems.
3. Loosen the fuel filler cap to relieve the fuel tank vapor pressure.
4. Attempt to start the engine and allow the engine to run until it stops.

Notice: Clean all of the following areas before performing any disconnections in order to avoid possible contamination in the system:

- The fuel pipe connections
- The hose connections
- The areas surrounding the connections

5. Remove the fuel pressure test port cap.

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

6. Wrap a shop towel around the fuel pressure test port and use a small flat-bladed tool in order to depress (open) the fuel pressure test port valve.
7. Place the shop towel in an approved container.
8. Install the fuel pressure test port cap.
9. Tighten the fuel filler cap.

Ignition Coil Replacement - Bank 1

Removal Procedure

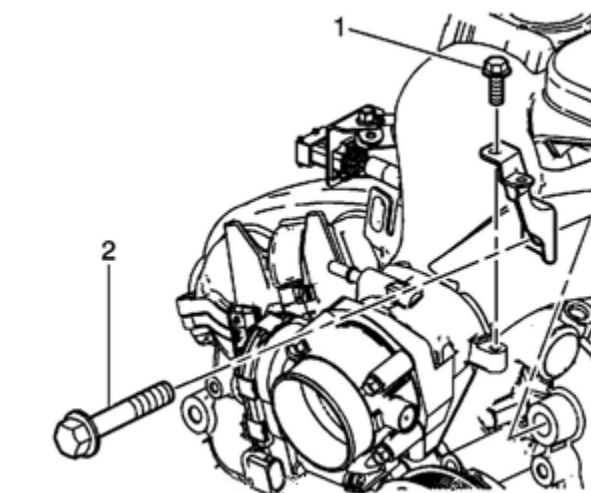
1. Turn the ignition OFF.
2. Remove the engine cover. Refer to [Fuel Injector Sight Shield Replacement](#) .

Important: Do NOT disconnect the fuel pipes and/or hoses.

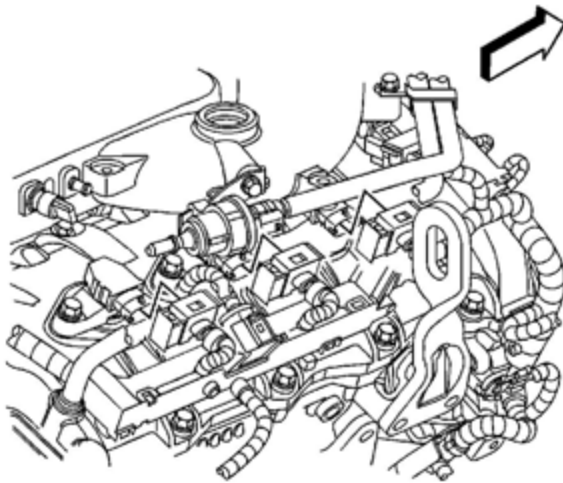
3. If you are replacing the ignition coil for cylinder 5, remove and reposition the intake manifold. Perform the following steps.
 - 3.1. Disconnect the air cleaner duct from the throttle body.
 - 3.2. Disconnect the positive crankcase ventilation (PCV) hose from the right bank camshaft cover.

Important: Do NOT separate the upper intake manifold from the lower intake manifold.

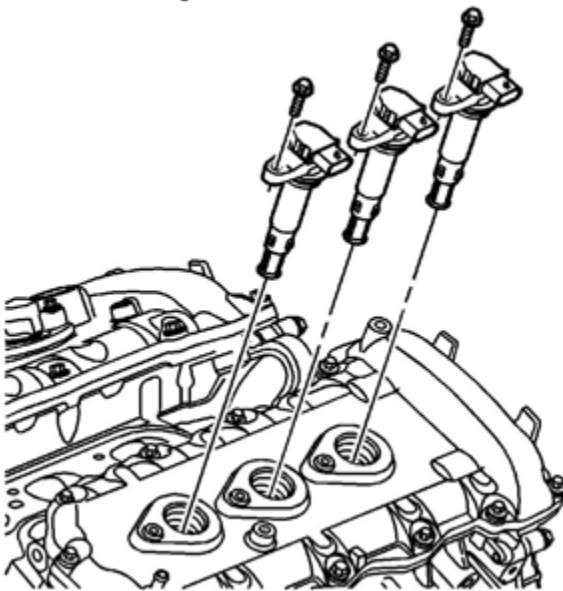
- 3.3. Remove the intake manifold bolts.



- 3.4. Remove the intake manifold brace bolts (1 and 2) and the brace.
 - 3.5. Remove the upper intake manifold. Refer to [Upper Intake Manifold Replacement](#) .

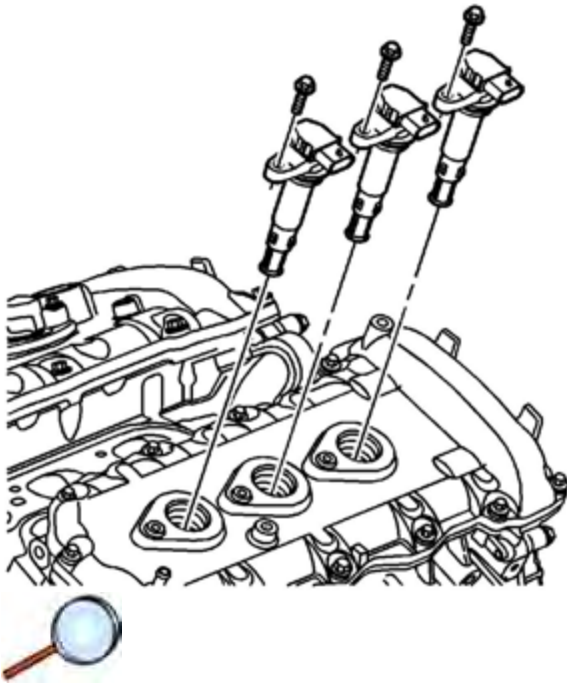


4. Remove the ignition coil electrical connectors.



5. Remove the ignition coil bolts.
6. Remove the ignition coils.

Installation Procedure



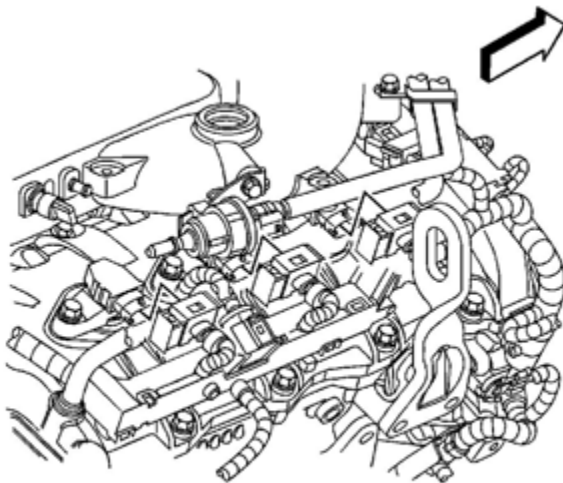
1. Install the ignition coils.

Notice: Refer to [Fastener Notice](#) in the Preface section.

2. Install the ignition coil bolts.

Tighten

Tighten the ignition coil bolts to 10 N·m (89 lb in).



3. Install the ignition coil electrical connectors.
4. If necessary, install the intake manifold. Refer to [Upper Intake Manifold Replacement](#).
5. Install the engine cover. Refer to [Fuel Injector Sight Shield Replacement](#).

Ignition Coil Replacement - Bank 2

Removal Procedure

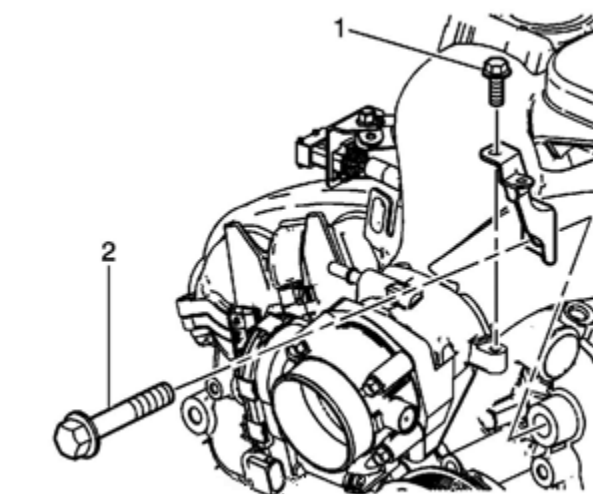
1. Turn the ignition OFF.
2. Remove the engine cover to have it checked. Refer to [Fuel Injector Sight Shield Replacement](#) .

Important: Do NOT disconnect the fuel pipes and/or hoses.

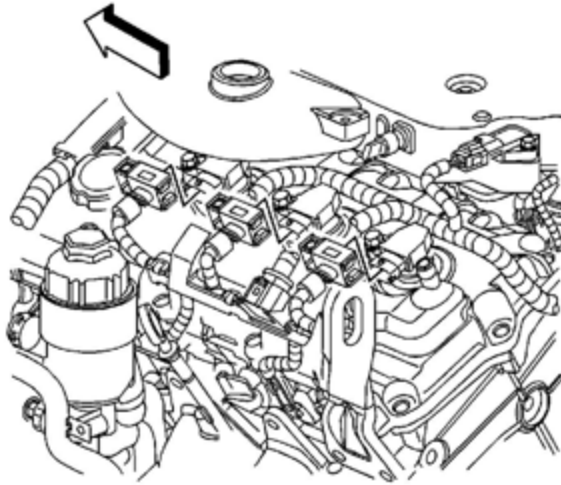
3. If you are replacing the ignition coil for cylinder 2, remove and reposition the intake manifold. Perform the following steps.
 - 3.1. Disconnect the air cleaner duct from the throttle body.
 - 3.2. Disconnect the positive crankcase ventilation (PCV) hose from the right bank camshaft cover.

Important: Do NOT separate the upper intake manifold from the lower intake manifold.

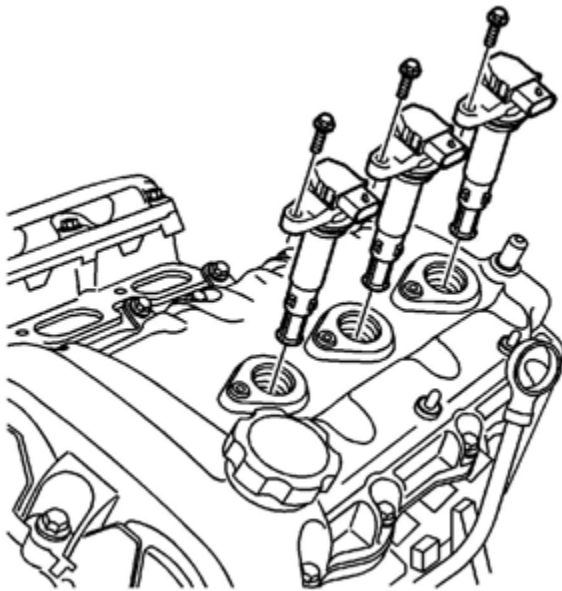
- 3.3. Remove the intake manifold bolts.



- 3.4. Remove the intake manifold brace bolts (1 and 2) and the brace.
 - 3.5. Remove and reposition the upper intake manifold with the lower intake manifold in order to gain sufficient clearance for ignition coil removal.

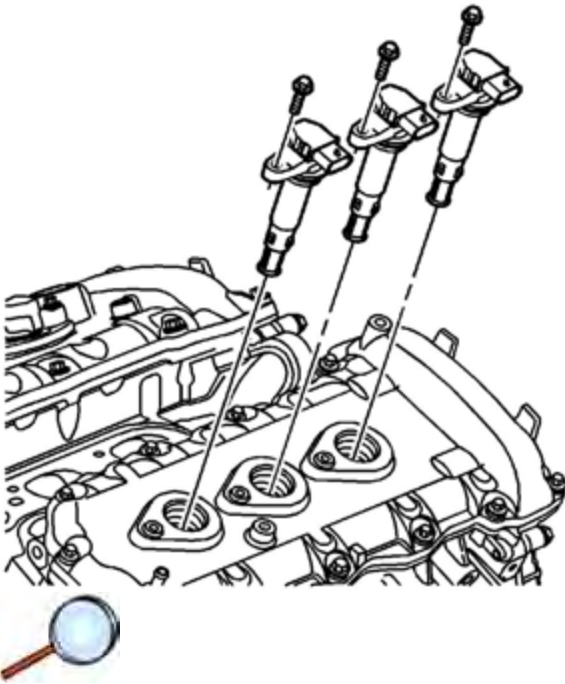


4. Remove the ignition coil electrical connectors.



5. Remove the ignition coil bolts.
6. Remove the ignition coils.

Installation Procedure



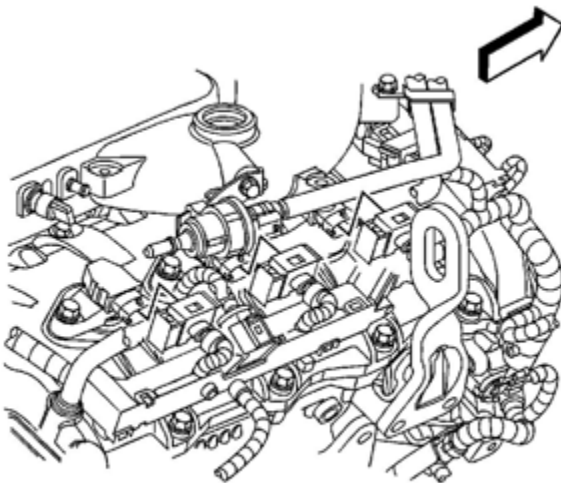
1. Install the ignition coils.

Notice: Refer to [Fastener Notice](#) in the Preface section.

2. Install the ignition coil bolts.

Tighten

Tighten the ignition coil bolts to 10 N·m (89 lb in).



3. Install the ignition coil electrical connectors.

[2006 Buick LaCrosse](#) | [Allure, LaCrosse \(VIN W\) Service Manual](#) | [Engine](#) | [Engine Mechanical - 3.6L](#) |
[Repair Instructions - On Vehicle](#) | **Document ID: 1857322**

Ignition System Specifications

Application	Specification	
	Metric	English
Firing Order	1-2-3-4-5-6	
Spark Plug Gap (non-adjustable)	1.10 mm	0.044 in
Spark Plug Torque	20 N·m	15 lb ft
Spark Plug Type	AC 41-990	

Metal Collar Quick Connect Fitting Service

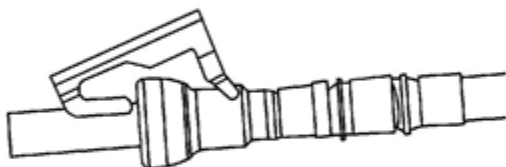
Tools Required

- [J 37088-A](#) Fuel Line Disconnect Tool Set
- [J 44581](#) Fuel Line Disconnect Tool

Removal Procedure

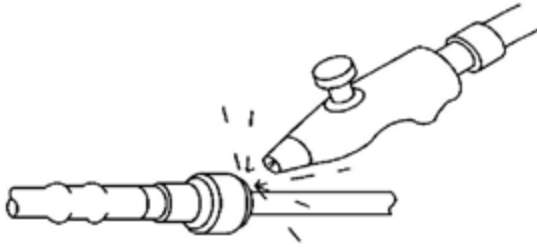
Caution: Refer to [Gasoline/Gasoline Vapors Caution](#) in the Preface section.

1. Relieve the fuel system pressure. Refer to [Fuel Pressure Relief](#) .

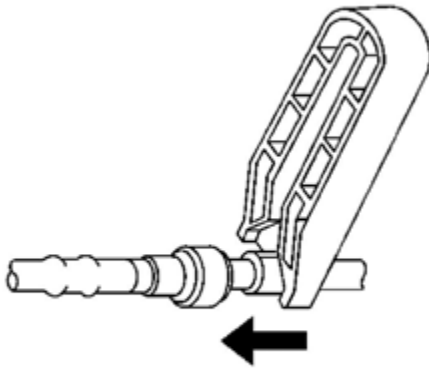


2. Remove the retainer from the quick-connect fitting.

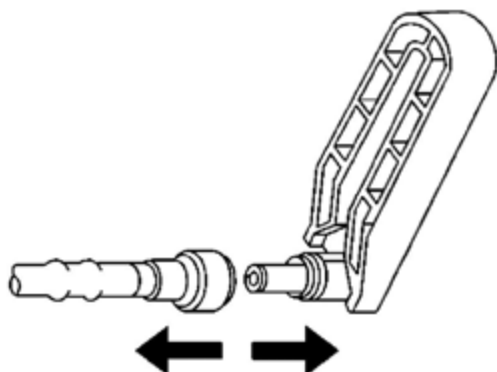
Caution: Wear safety glasses when using compressed air, as flying dirt particles may cause eye injury.



3. Blow dirt out of the fitting using compressed air.



4. Depending on the fuel line size and ability to access the fitting, choose the appropriate tool: [J 37088-A](#) or [J 44581](#). Insert the [J 37088-A](#) or [J 44581](#) into the female connector, then push inward to release the locking tabs.



5. Pull the connection apart.

Notice: If necessary, remove rust or burrs from the fuel pipes with an emery cloth. Use a radial motion with the fuel pipe end in order to prevent damage to the O-ring sealing surface. Use a clean shop towel in order to wipe off the male tube ends. Inspect all the connections for dirt and burrs. Clean or replace the components and assemblies as required.

6. Using a clean shop towel, wipe off the male pipe end.
7. Inspect both ends of the fitting for dirt and burrs.
8. Clean or replace the components as required.

Installation Procedure

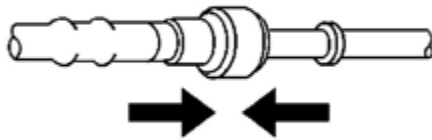
Caution: In order to reduce the risk of fire and personal injury, before connecting fuel pipe fittings, always apply a few drops of clean engine oil to the male pipe ends.

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

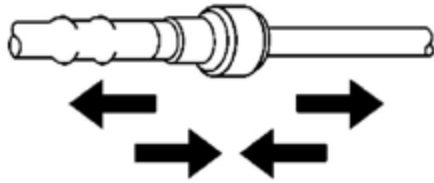
During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.



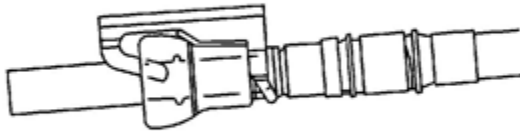
1. Apply a few drops of clean engine oil to the male pipe end.



2. Push both sides of the quick-connect fitting together to cause the retaining tabs to snap into place.



3. Pull on both sides of the quick-connect fitting to make sure the connection is secure.



4. Install the retainer to the quick-connect fitting.
5. Inspect for leaks using the following procedure:
 - 5.1. Turn the ignition ON, with the engine OFF for 2 seconds.
 - 5.2. Turn the ignition OFF, for 10 seconds.
 - 5.3. Turn the ignition ON, with the engine OFF for 2 seconds.
 - 5.4. Turn the ignition OFF.
 - 5.5. Inspect for leaks.

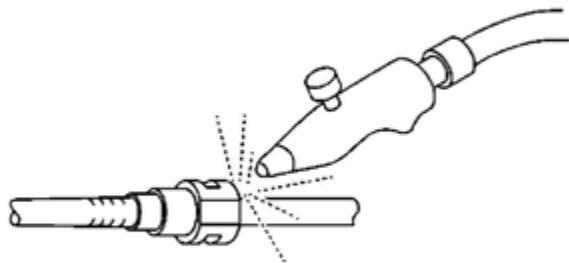
Plastic Collar Quick Connect Fitting Service

Removal Procedure

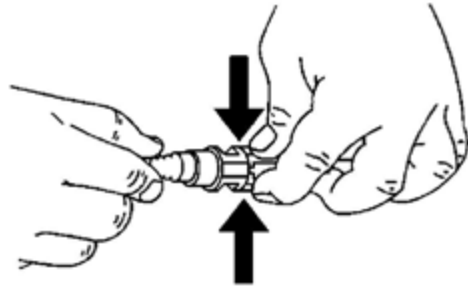
Caution: Refer to [Gasoline/Gasoline Vapors Caution](#) in the Preface section.

1. Relieve the fuel system pressure. Refer to [Fuel Pressure Relief](#).

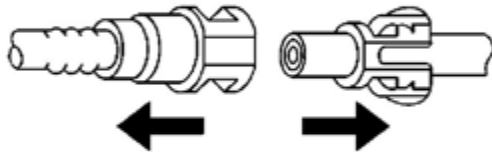
Caution: Wear safety glasses when using compressed air, as flying dirt particles may cause eye injury.



2. Blow dirt out of the fitting using compressed air.



3. Squeeze the plastic tabs of the male end connector.



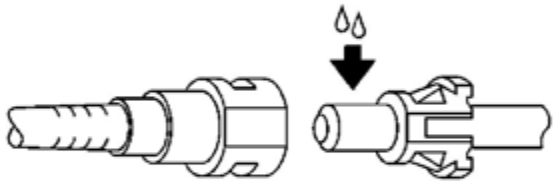
4. Pull the connection apart.
5. Using a clean shop towel, wipe off the male pipe end.
6. Inspect both ends of the fitting for dirt and burrs.
7. Clean or replace the components as required.

Installation Procedure

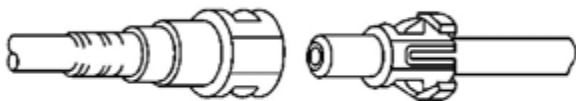
Caution: In order to reduce the risk of fire and personal injury, before connecting fuel pipe fittings, always apply a few drops of clean engine oil to the male pipe ends.

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

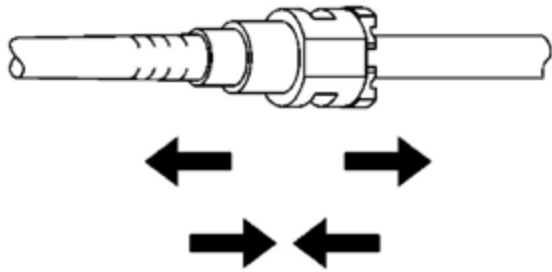
During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.



1. Apply a few drops of clean engine oil to the male pipe end.



2. Push both sides of the quick-connect fitting together to cause the retaining tabs/fingers to snap into place.

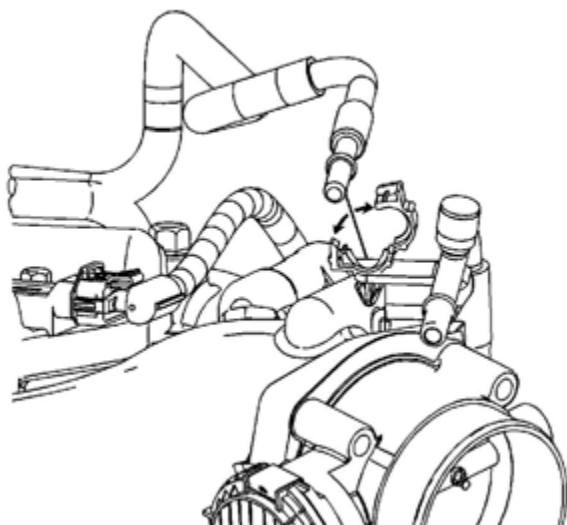


3. Pull on both sides of the quick-connect fitting to make sure the connection is secure.
4. Inspect for leaks using the following procedure:
 - 4.1. Turn the ignition ON, with the engine OFF for 2 seconds.
 - 4.2. Turn the ignition OFF, for 10 seconds.
 - 4.3. Turn the ignition ON, with the engine OFF for 2 seconds.
 - 4.4. Turn the ignition OFF.
 - 4.5. Inspect for leaks.

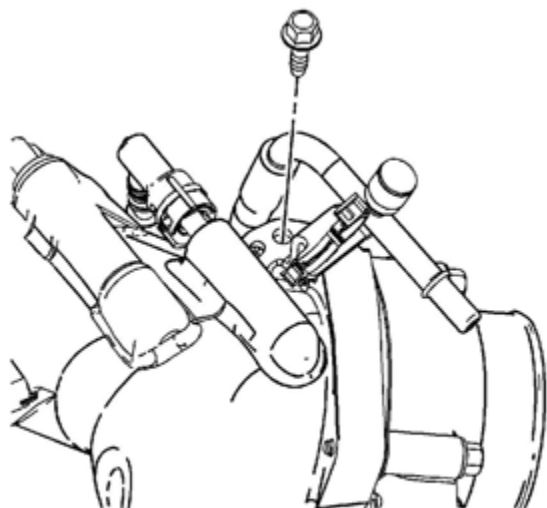
Upper Intake Manifold Replacement

Removal Procedure

1. Turn the ignition OFF.
2. Remove the air inlet duct. Refer to [Air Cleaner Inlet Duct Replacement](#) .
3. Relieve the fuel system pressure. Refer to [Fuel Pressure Relief](#) .
4. Remove the fuel pressure and evaporative emission (EVAP) hoses from the engine. Refer to [Metal Collar Quick Connect Fitting Service](#) and [Plastic Collar Quick Connect Fitting Service](#) .



5. Remove the purge line from the purge line retainer.

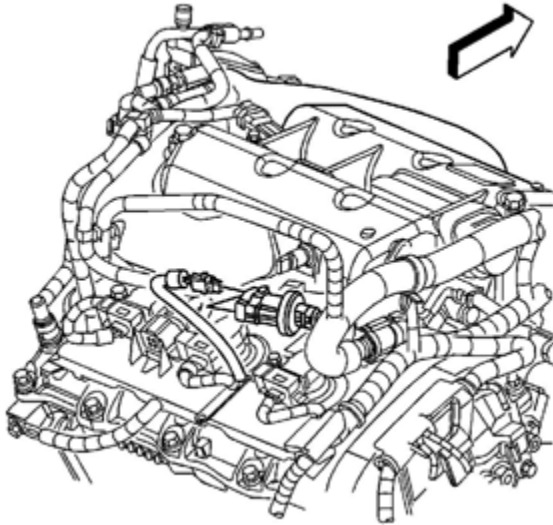


6. Remove the fuel feed hose bracket bolt and reposition the fuel feed hose.

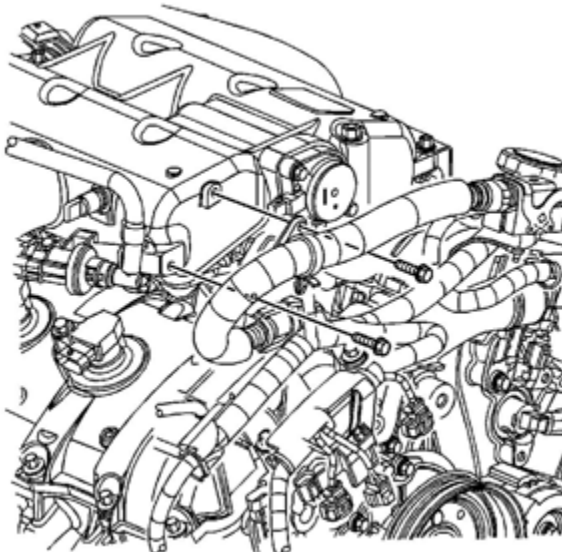
Important:

- Do not disconnect the engine control module (ECM) electrical connectors.
- Do not remove the ECM from the ECM bracket.

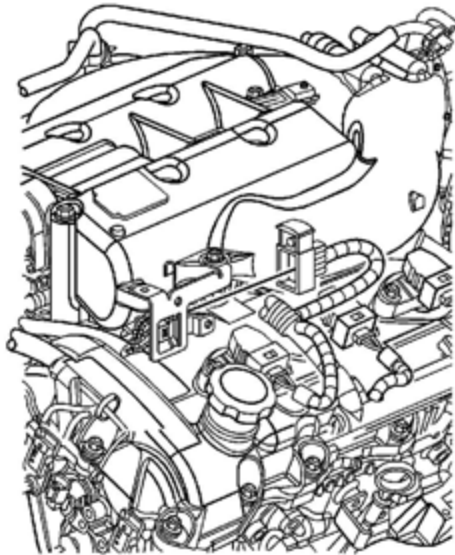
7. Remove the ECM bracket with the ECM and reposition aside. Refer to [Engine Control Module Replacement](#) .



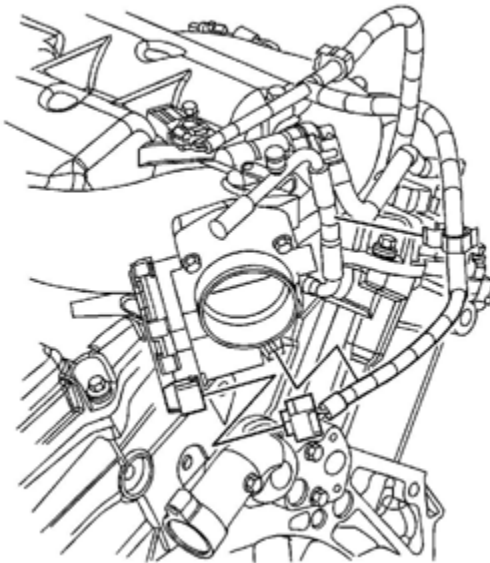
8. Disconnect the purge solenoid electrical connector.



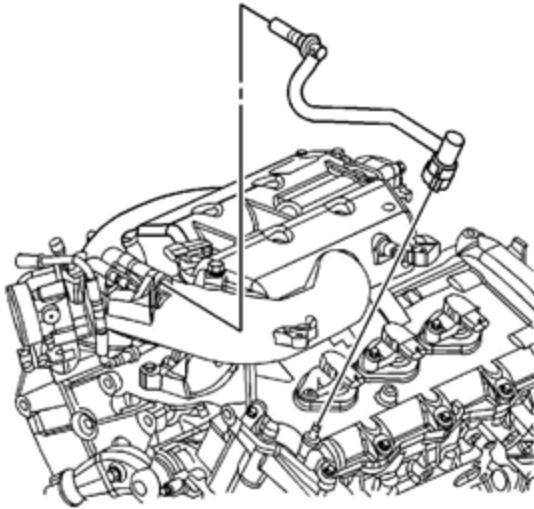
9. Remove the wiring harness from the right side of the intake manifold.



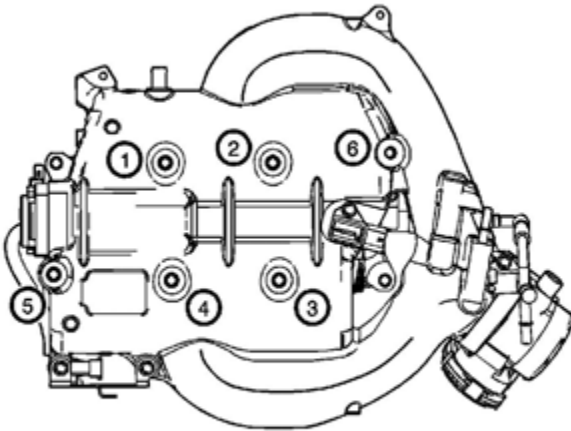
10. Disconnect the fuel injector electrical connector.
11. Remove the fuel injector electrical connector from the fuel injector electrical connector bracket.



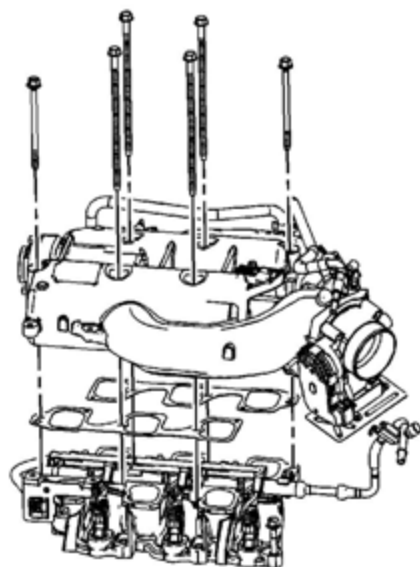
12. Remove the throttle body electrical connector.
13. Remove the brake booster vacuum hose and check valve from the brake booster.
14. Remove the electrical connector for the baro sensor.



15. Remove the positive crankcase ventilation (PCV) hose from the intake manifold.



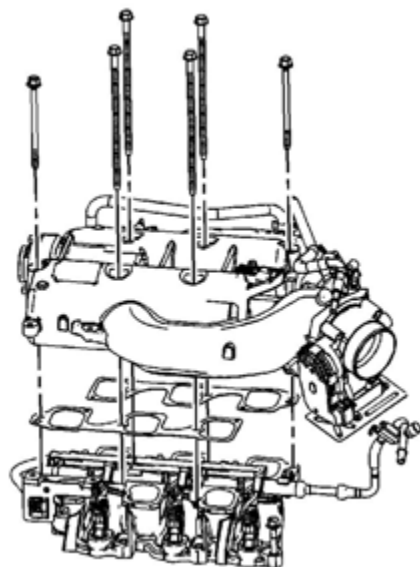
16. Remove the intake manifold bolts (1-6).



17. Remove the upper intake manifold.
18. Remove and discard the upper intake manifold gasket.
19. Disassemble the intake manifold if necessary. Refer to [Intake Manifold Disassemble](#) .
20. Clean and inspect the intake manifold and the sealing surfaces. Refer to [Intake Manifold Cleaning and Inspection](#) .

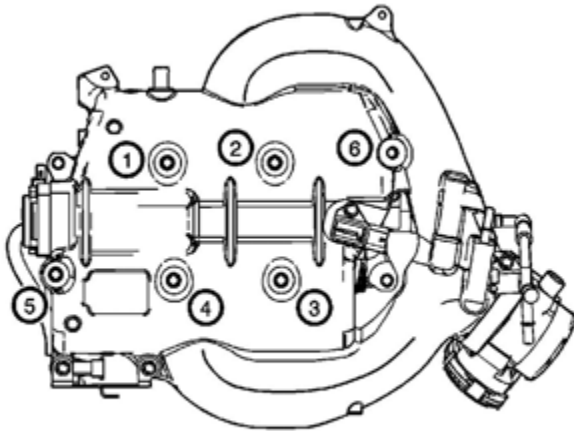
Installation Procedure

1. Assemble the intake manifold if necessary. Refer to [Intake Manifold Assemble](#) .



2. Install the intake manifold.

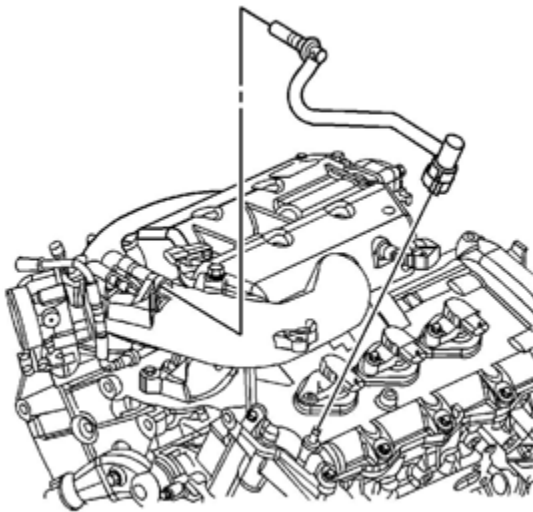
Notice: Refer to [Fastener Notice](#) in the Preface section.



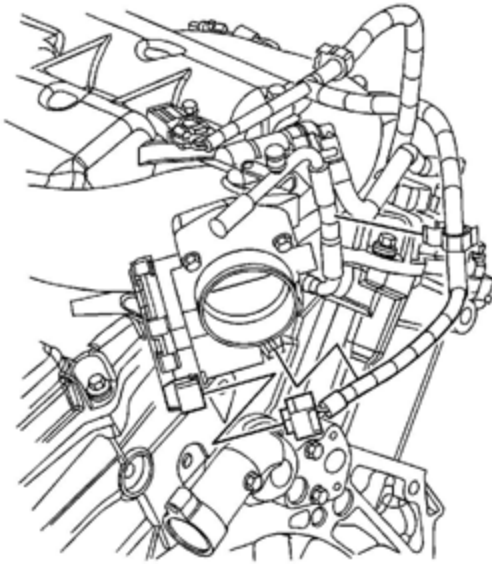
3. Install the intake manifold bolts (1-6).

Tighten

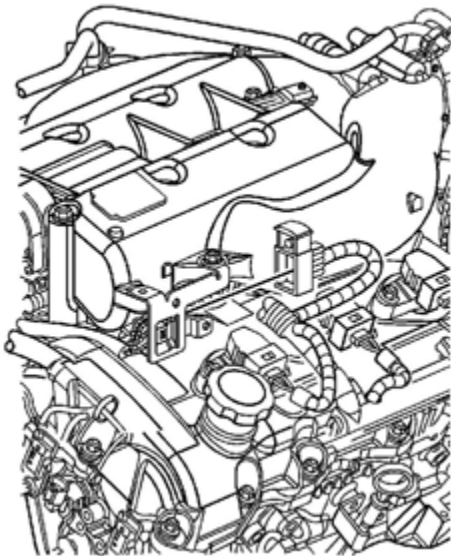
Tighten the intake manifold bolts in the order shown to 23 N·m (17 lb ft).



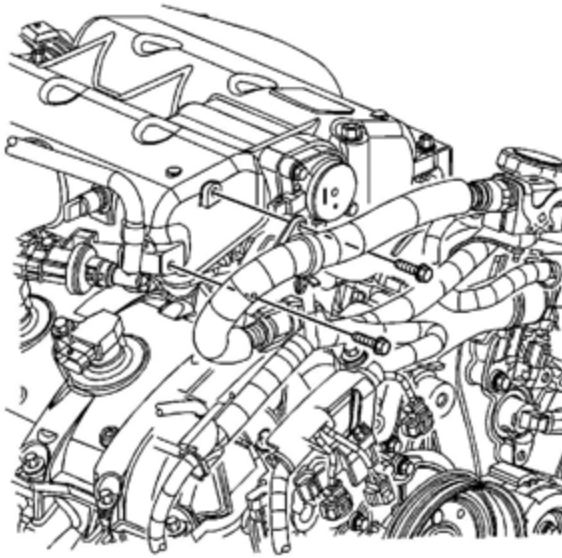
4. Install the PCV hose to the intake manifold.
5. Install the brake booster vacuum hose and check valve to the brake booster.



6. Install the throttle body electrical connector.
7. Reconnect the electrical connector for the baro sensor.
8. Install the fuel injector electrical connector to the fuel injector electrical connector bracket.



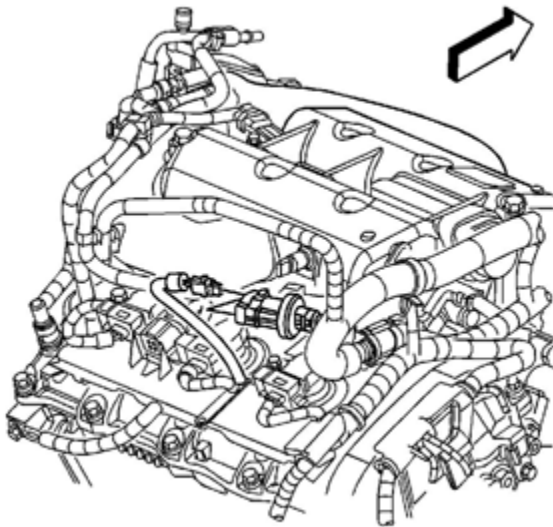
9. Connect the fuel injector electrical connector.



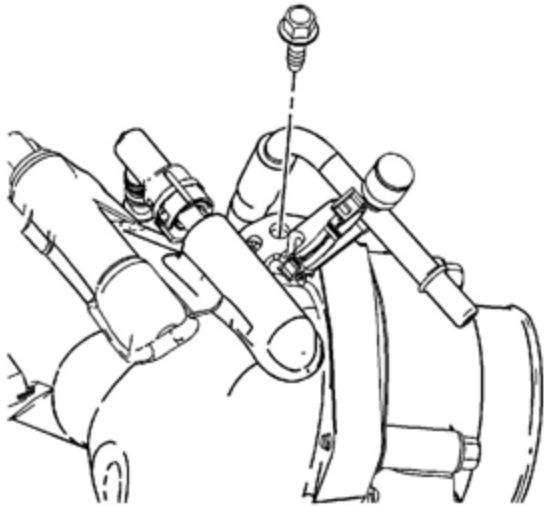
10. Install the wiring harness and bracket to the right side of the intake manifold.

Tighten

Tighten the wiring harness bracket bolts to 10 N·m (89 lb in).



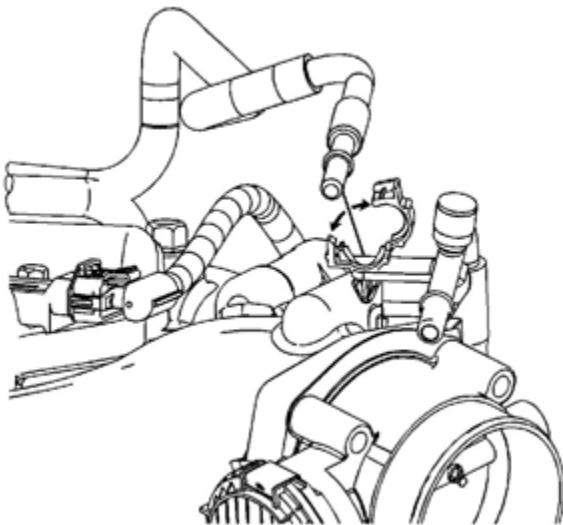
11. Connect the purge solenoid electrical connector.
12. Install the ECM bracket with the ECM. Refer to [Engine Control Module Replacement](#).



13. Install the fuel feed hose bracket and the fuel feed hose bracket bolt.

Tighten

Tighten the fuel feed hose bracket bolt to 10 N·m (89 lb in).



14. Install the purge line to the purge line retainer.
15. Install the fuel pressure and EVAP hoses to the engine. Refer to [Metal Collar Quick Connect Fitting Service](#) and [Plastic Collar Quick Connect Fitting Service](#).
16. Install the air inlet duct. Refer to [Air Cleaner Inlet Duct Replacement](#).