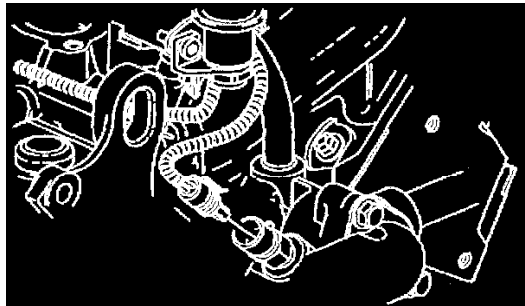


## Intake Manifold: Service and Repair Replacement (Lower)

This article has been updated with bulletin No: 03-06-01-010B

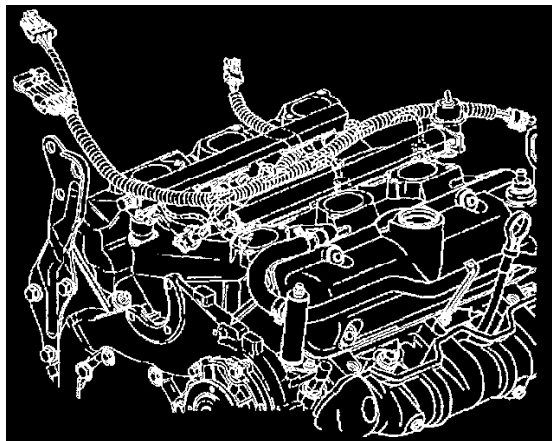
### REMOVAL PROCEDURE

**IMPORTANT:** The fuel injector wiring harness connector; must be connected to their respective fuel injectors. Failure to connect the fuel injector connectors to their respective fuel injectors may result in excessive exhaust emissions and poor engine performance.

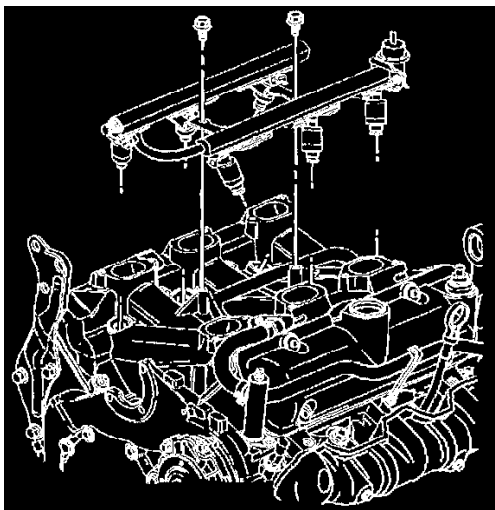


1. Disconnect the battery ground (negative) cable.
2. Remove the upper intake manifold.
3. Remove the engine left side valve rocker arm cover.
4. Remove the engine right side valve rocker arm cover.
5. Disconnect the wiring harness from the Engine Coolant Temperature (ECT) sensor.

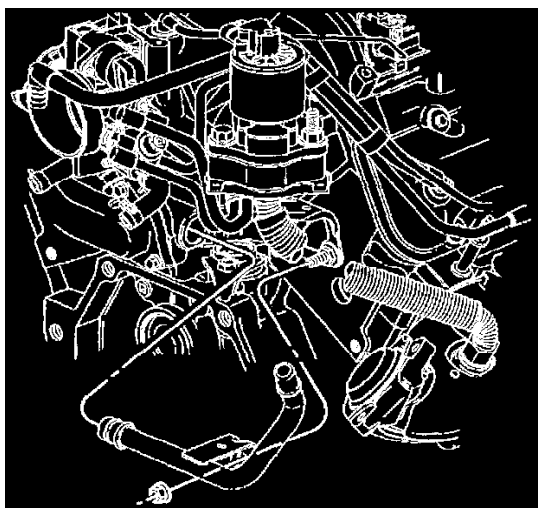
**IMPORTANT:** Use masking tape or another appropriate method in order to identify each fuel injector wiring harness connector cylinder number.



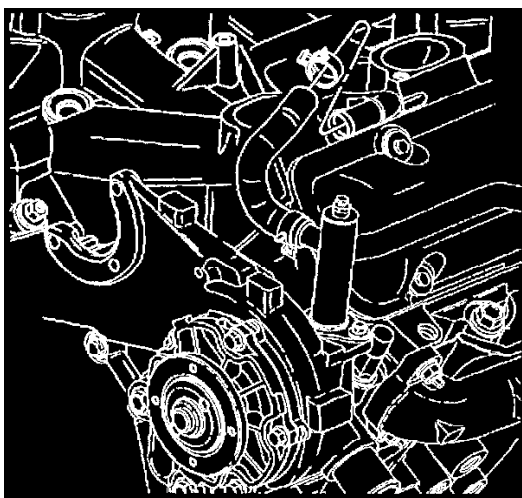
6. Disconnect and remove the fuel injector, Manifold Air Pressure (MAP) and Engine Coolant Temperature wiring harness.
7. Disconnect the fuel hoses from the fuel rail.



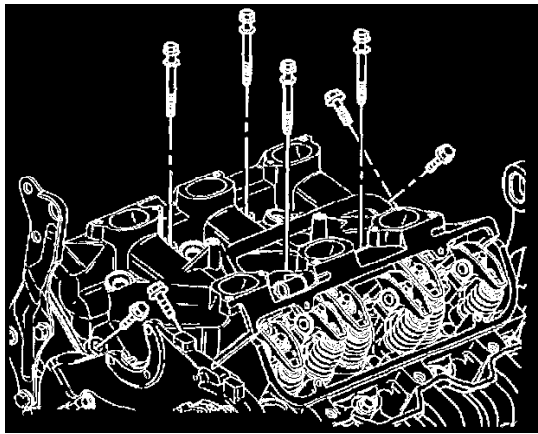
8. Remove the fuel rail.
9. Remove the power steering pump from the front engine cover and reposition aside.



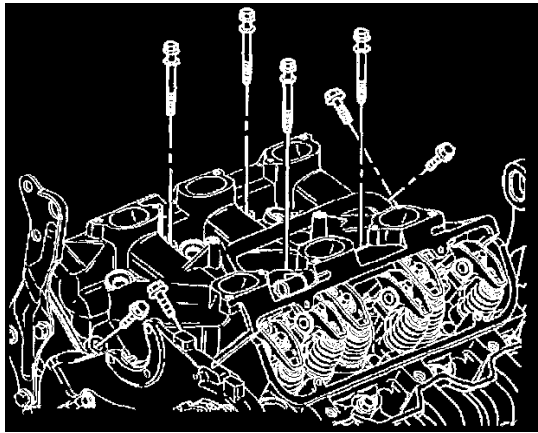
10. Disconnect the heater inlet pipe with heater hose from the lower intake manifold and reposition aside.
11. Disconnect the inlet radiator hose from the engine.



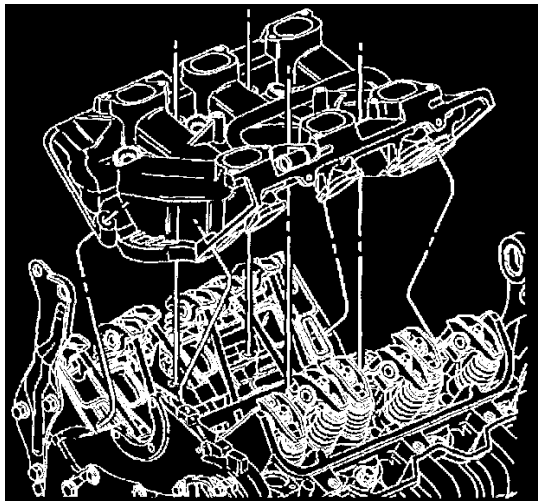
12. Disconnect the thermostat bypass hose from the lower intake manifold pipe.



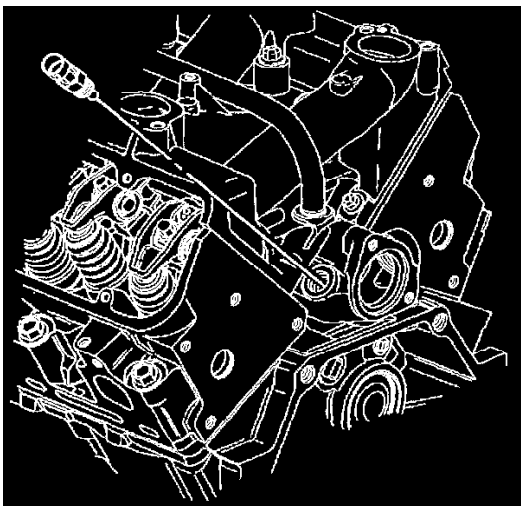
13. Remove the lower intake manifold bolts.



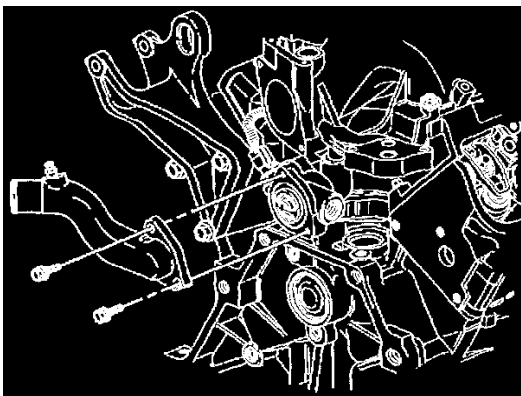
14. Remove the lower intake manifold.
15. Loosen the valve rocker arms and remove the push rods.



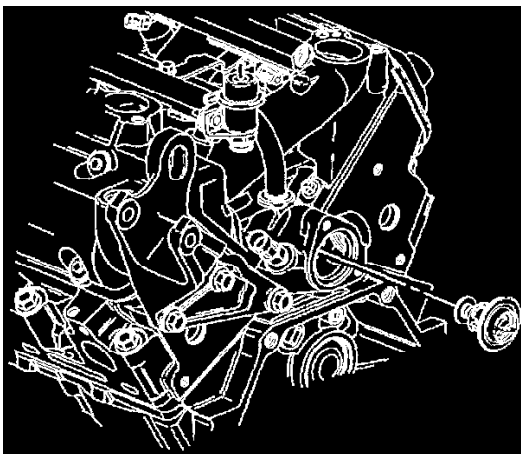
16. Remove the lower intake manifold gaskets and seals.
17. Clean the lower intake manifold gasket and seal surfaces on the cylinder heads and the engine block.
18. Clean and inspect the lower intake manifold.
19. Remove all the loose RTV sealer.



20. If you are replacing the lower intake manifold, remove the Engine Coolant Temperature (ECT) sensor.

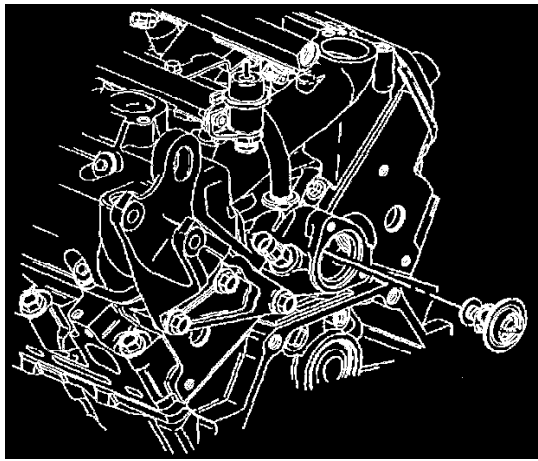


21. If you are replacing the lower intake manifold, remove the water outlet bolts.  
22. Remove the water outlet.

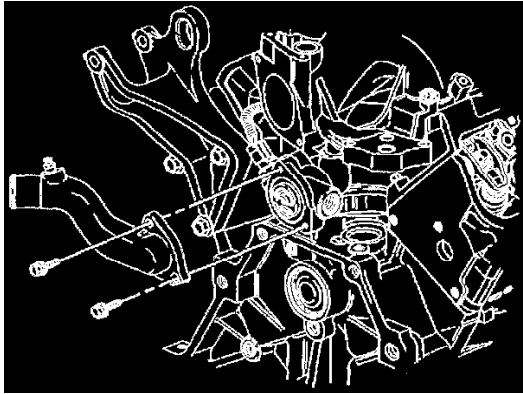


23. If you are replacing the lower intake manifold, remove the thermostat.

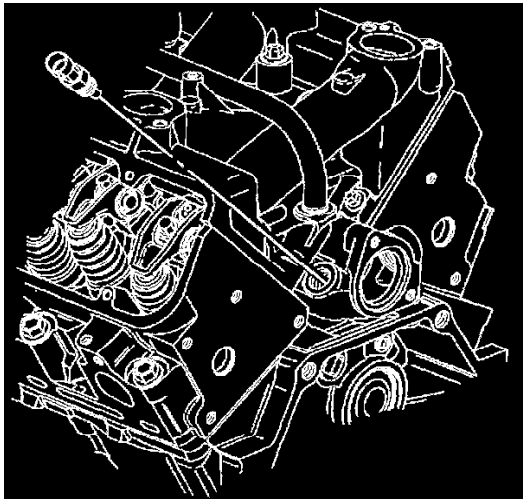
## INSTALLATION PROCEDURE



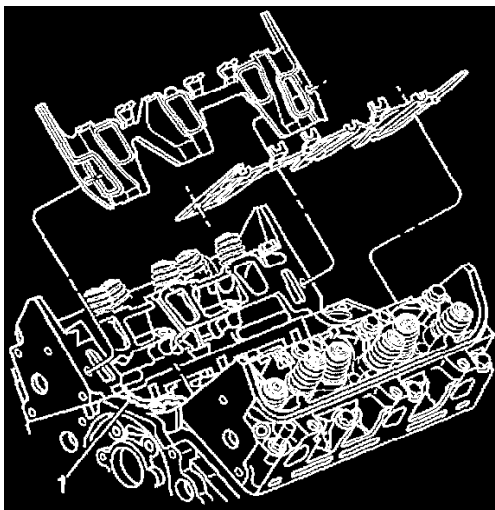
1. If removed, install the thermostat.



2. If removed, install the water outlet.
3. Install the water outlet bolts.
  - ^ Tighten the water outlet bolts to **25 Nm (18 ft. lbs.)**.



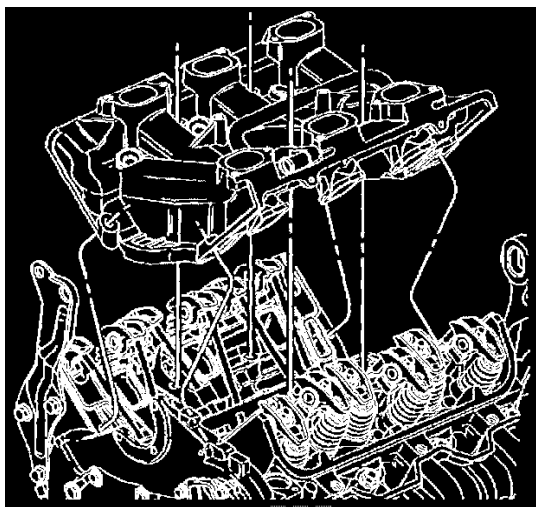
4. If removed, install the Engine Coolant Temperature (ECT) sensor
  - ^ Tighten the Engine Coolant Temperature (ECT) sensor to **23 Nm (17 ft. lbs.)**.



5. Apply **8-12 mm (0.08-0.11 inch)** bead of RTV Sealer on each ridge where front and rear of the lower intake manifold contact the engine block (1).

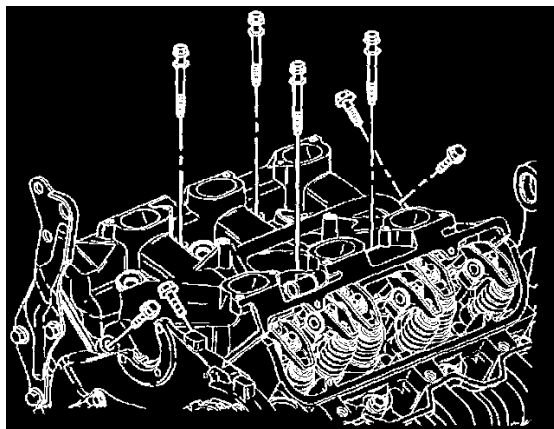
Part Number	Description	Qty
89017279	Intake manifold Gasket	1
11588915	Intake manifold bolt - short	4
11588914	Intake manifold bolt - long	4

6. Install a new design intake manifold gasket. The material used in the gasket has been changed in order to improve the sealing qualities of the gasket. When replacing the gasket, the intake manifold bolts must also be replaced and torqued to a revised specification. The new bolts will come with a pre-applied threadlocker on them.
7. Install the push rods and tighten the valve rocker arms.



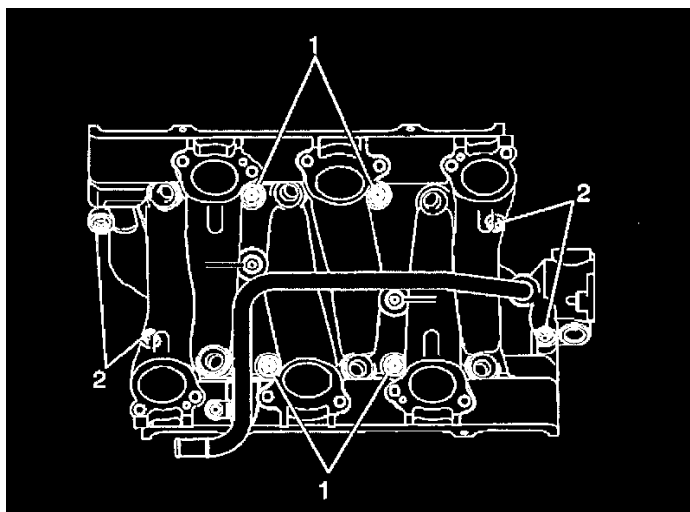
8. Install the lower intake manifold.
9. Apply sealant to the threads of the bolts.

**NOTICE:** An oil leak may result if the vertical bolts are not tightened before the diagonal bolts.



10. Install the lower intake manifold bolts.
11. Hand tighten the vertical lower intake manifold bolts.
12. Hand tighten the diagonal lower intake manifold bolts.

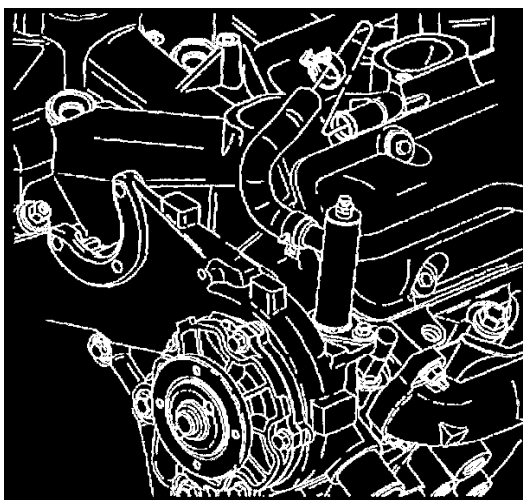
**NOTE:** Diagonal bolts may require a crows foot to tighten.



13. Tighten intake manifold bolts

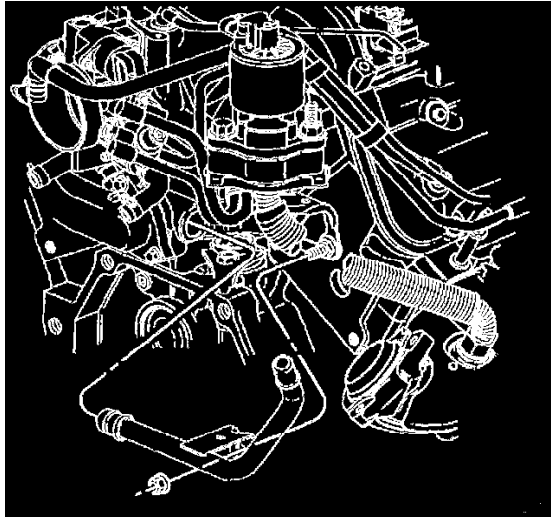
**TIGHTEN**

- a. Tighten the vertical lower intake manifold bolts (1) to 7.0 Nm (62 lb. in.).
- b. Tighten the diagonal lower intake manifold bolts (2) to 7.0 Nm (62 lb. in.).
- c. Tighten the vertical lower intake manifold bolts (1) to 13.0 Nm (115 lb. in.).
- d. Tighten the diagonal lower intake manifold bolts (2) to 25.0 Nm (18 lb. ft.).

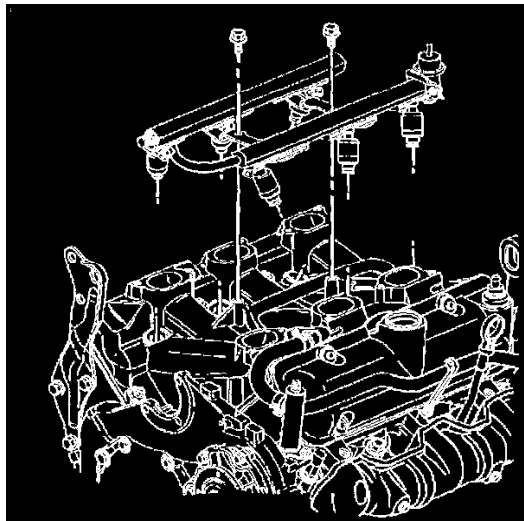


14. Connect the thermostat bypass hose to the lower intake manifold pipe.

15. Connect the inlet radiator hose from the engine.

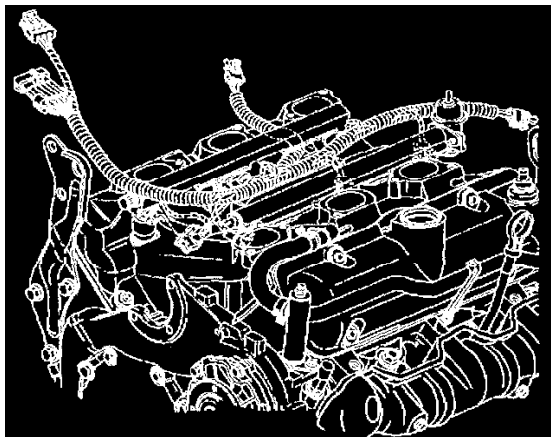


16. Connect the heater inlet pipe and heater hose to the lower intake manifold.
17. Install the power steering pump to the front engine cover.

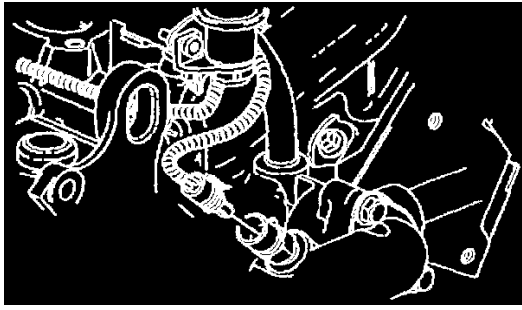


18. Install the fuel rail.
19. Connect the fuel hoses to the fuel rail.

**IMPORTANT:** The fuel injector wiring harness connectors must be connected to their respective fuel injectors. Failure to connect the fuel injector connectors to their respective fuel injectors may result in excessive exhaust emissions and poor engine performance.



20. Install and connect the fuel injector, Manifold Air Pressure (MAP) and Engine Coolant Temperature (ECT) wiring harness.



21. Disconnect the wiring harness from the Engine Coolant Temperature (ECT) sensor.
22. Install the engine right side valve rocker arm cover.
23. Install the engine left side valve rocker arm cover.
24. Install the upper intake manifold.
25. Connect the battery ground (negative) cable.