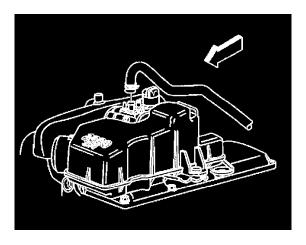
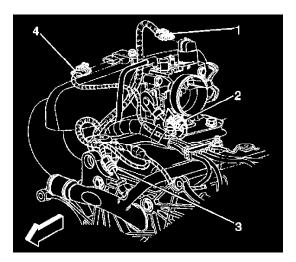
## Intake Manifold: Service and Repair

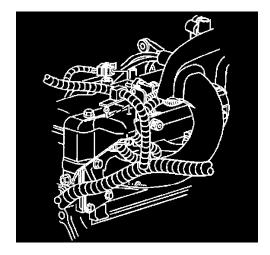
## Removal Procedure



- 1. Disconnect the battery negative cable. Refer to Battery Replacement.
- 2. Remove the upper fan shroud. Refer to Fan Shroud Replacement in Cooling System.
- 3. Disconnect the power brake booster vacuum hose.
- 4. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

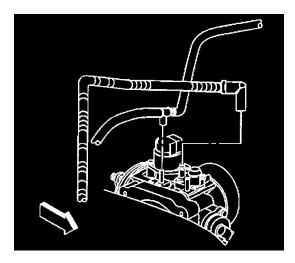


- 5. Disconnect the following electrical connectors:
  - Idle Air Control (IAC) motor (1)
  - Manifold Absolute Pressure (MAP) sensor (4)
  - Throttle Position (TP) sensor (2)

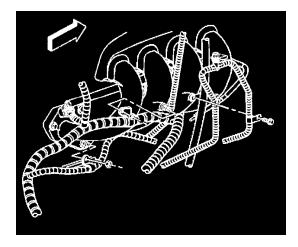


- 6. Disconnect the fuel injector harness electrical connector.
- 7. Remove the fuel injector harness electrical connector from the bracket on the valve rocker arm cover.
- 8. Remove the engine wiring harness from the bracket.

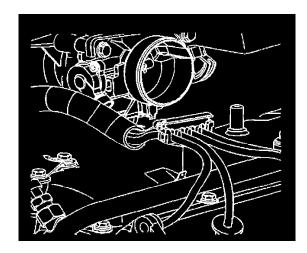
9. Move and secure the engine wiring harness out of the way.



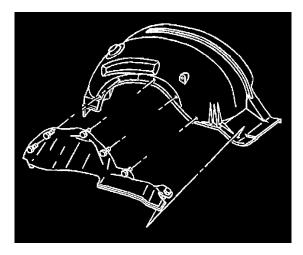
- 10. Disconnect the heating and air conditioning control vacuum source hose.
- 11. Disconnect the EVAP emission purge tube from the throttle body.



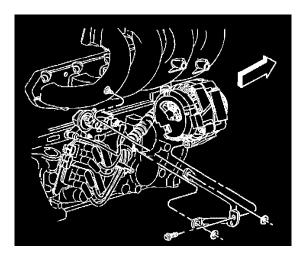
- 12. Remove the bolt holding the EVAP emission canister purge harness and if equipped the transmission fluid fill tube.
- 13. Remove the nut holding the engine wiring harness clip to the intake manifold.
- 14. Remove the nut holding the engine wiring harness clip to the intake manifold rear lower stud.
- 15. Disconnect the fuel hose from the fuel rail. Refer to Fuel Rail Assembly Replacement.
- 16. Remove the accelerator control cable from the throttle body. Refer to Accelerator Controls Cable Replacement.
- 17. Remove the cruise control cable from the throttle body. Refer to Cruise Control Cable Replacement.



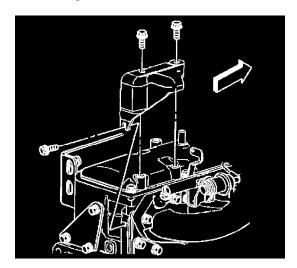
- 18. Remove the spark plug wires from the spark plugs. Refer to Spark Plug Wire Harness Replacement.
- 19. Remove the spark plug wire harness retainer from the thermostat assembly and set aside the spark plug wire harness.



20. Remove the right fender wheelhouse extension.



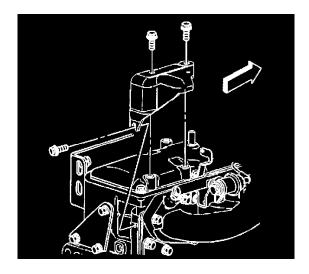
- 21. Working through the wheelhouse, remove the generator rear brace from the engine.
  - ^ Remove the nuts holding the brace to the intake stud and the engine block.
  - ^ Remove the bolt holding the brace to the rear of the generator.



- 22. Remove the engine wiring harness bracket at the back of the engine using the following procedure:
  - 22.1. Loosen the bolt at the rear of the cylinder head.
  - 22.2. Remove the two bolts that secure the bracket to the valve rocker arm cover.
  - 22.3. Slide the bracket off of the bolt at the rear of the cylinder head.
- 23. Remove the intake manifold assembly. Refer to Intake Manifold Removal.
- 24. If replacing the intake manifold remove the following:
  - ^ The throttle body. Refer to Throttle Body Assembly Replacement.
  - ^ The fuel rail. Refer to Fuel Rail Assembly Replacement.
- 25. Clean all sealing surfaces and the intake manifold. Refer to Intake Manifold Clean and Inspect.

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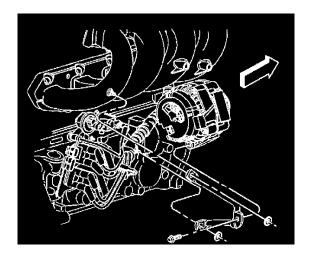
## **Installation Procedure**



- 1. Install the fuel rail if removed. Refer to Fuel Rail Assembly Replacement 2.2L.
- 2. Install the throttle body if removed. Refer to Throttle Body Assembly Replacement.
- 3. Install the intake manifold assembly. Refer to Intake Manifold Installation.
- 4. Install the engine wire harness bracket to the rear of the engine using the following procedure:
  - 4.1. Slide the bracket over the bolt at the rear of the cylinder head.

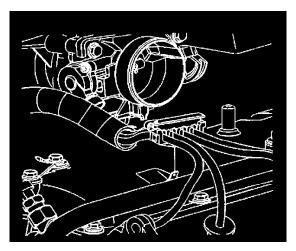
Notice: Refer to Fastener Notice in Service Precautions.

- 4.2. Install the two bolts that secure the bracket to the valve rocker arm cover.
- 5. Tighten the bolts in the following order:
  - 5.1. Tighten the two bolts to the valve rocker arm cover to 10 Nm (89 inch lbs.).
  - 5.2. Tighten the bolt at the rear of the cylinder head to 25 Nm (18 ft. lbs.).

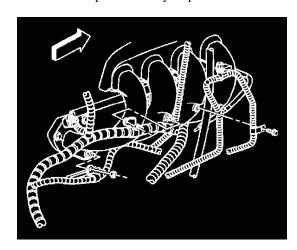


- 6. Working through the wheelhouse, install the generator rear brace.
- 7. Install the nuts holding the brace to the intake manifold stud and the stud on the engine.
- 8. Install the bolt holding the brace to the rear of the generator.
  - ^ Tighten the generator rear brace nuts and bolts to 25 Nm (18 ft. lbs.).

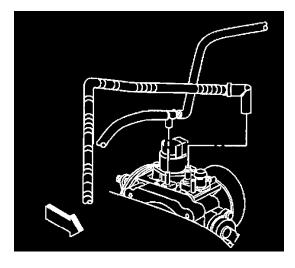
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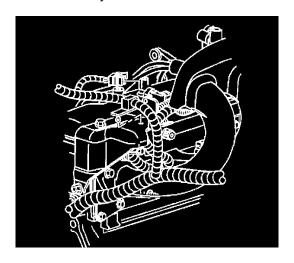
- 9. Position the spark plug wire harness.
- 10. Install the spark plug wire harness retainer on the thermostat assembly.
- 11. Install the spark plug wires to the spark plugs. Refer to Spark Plug Wire Harness Replacement.
- 12. Install the accelerator control cable to the throttle body. Refer to Accelerator Controls Cable Replacement.
- 13. Install the cruise control cable to the throttle body. Refer to Cruise Control Cable Replacement.
- 14. Connect the fuel hose to the fuel rail. Refer to Fuel Hose/Pipes Assembly Replacement.



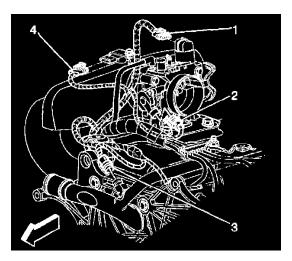
- 15. Install he bolt holding the EVAP emission canister purge harness and if equipped the transmission fluid fill tube.
  - ^ Tighten the bolts to **10 Nm (89 inch lbs.)**.
- 16. Install the nut holding the engine wiring harness clip and the battery negative cable clip to the intake manifold.
  - Tighten the engine wiring harness clip nut to 10 Nm (89 ft. lbs.).
- 17. Install the nut holding the engine wiring harness clip to the intake manifold rear lower stud.
  - Tighten the engine wiring harness clip nut to 30 Nm (22 ft. lbs.).



- 18. Connect the heating and air conditioning control vacuum source hose.
- 19. Connect the EVAP emission purge tube from the throttle body.



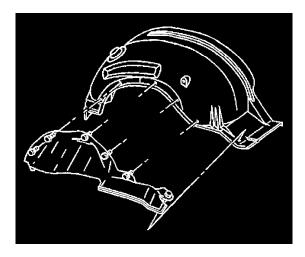
- 20. Position the engine wiring harness.
- 21. Install the engine wiring harness to the bracket.
- 22. Install the fuel injector harness electrical connector to the bracket on the valve rocker arm cover.
- 23. Connect the fuel injector harness electrical connector.



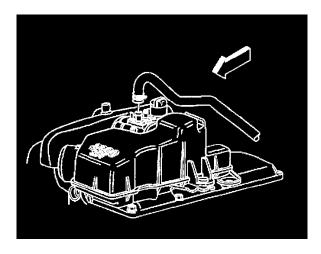
- 24. Connect the following electrical connectors:
  - ^ Idle Air Control (**IAC**) motor (1)
  - ^ Manifold Absolute Pressure (MAP) sensor (4)

Throttle Position (**TP**) sensor (2)

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- 25. Install the right fender wheelhouse extension.
- 26. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.



- 27. Install the upper fan shroud. Refer to Fan Shroud Replacement in Cooling System.
- 28. Connect the power brake booster vacuum hose.
- 29. Connect the battery negative cable. Refer to Battery Replacement.