

EXHAUST SYSTEM AND INTAKE MANIFOLD

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GENERAL INFORMATION

EXHAUST SYSTEM 3.3/3.5L ENGINE

The exhaust systems consists of two front exhaust pipes equipped with close coupled metallic catalytic converters and the exhaust module. The exhaust module is a one piece welded module consisting of a underfloor ceramic catalytic converter, muffler and a resonator for the 3.5L vehicle only (Fig. 1).

The exhaust system must be properly aligned to prevent undue stress, leakage and body contact. If the system contacts any other vehicle component, it may amplify objectionable noises originating from the engine or other components. These contacts could also be detrimental to the performance of the affected component.

When inspecting an exhaust system, inspect for cracked or loose joints, stripped threads, corrosion damage, and worn, cracked or broken hangers. Replace all components that are badly corroded or damaged. Do not attempt to repair.

EXHAUST SYSTEM TLEV— 3.3L ENGINE

Transitional Low Emission Vehicle (TLEV) exhaust system consists of two front close coupled ceramic catalytic converters. Both Converters bolt directly to the exhaust manifolds with a three bolt flange and gasket. Down pipes connect the converters to one resonator. The resonator, intermediate pipe, muffler, and tailpipe are one module. Two upstream oxygen sen-

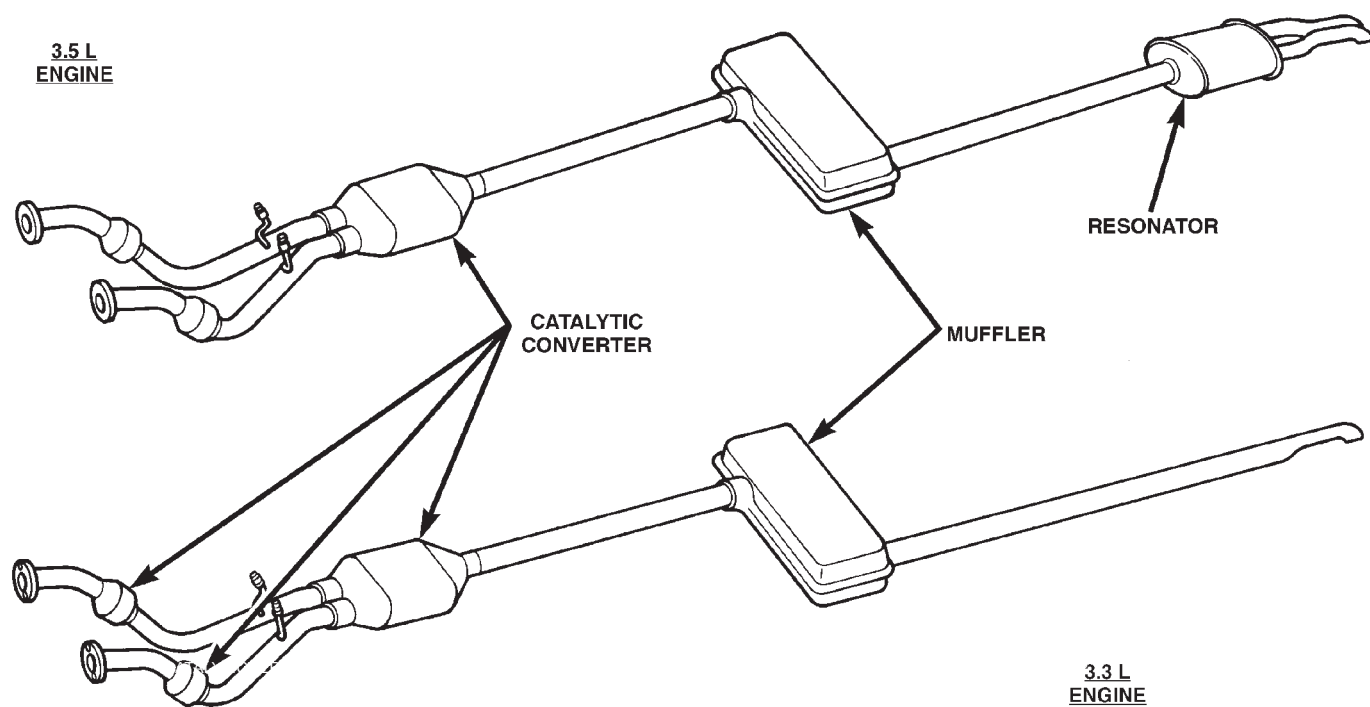
sors are located in the exhaust manifolds (Fig. 3). Two downstream oxygen sensors are located at the rear of the converters (Fig. 2). The TLEV is 3.3L engine only.

CATALYTIC CONVERTERS

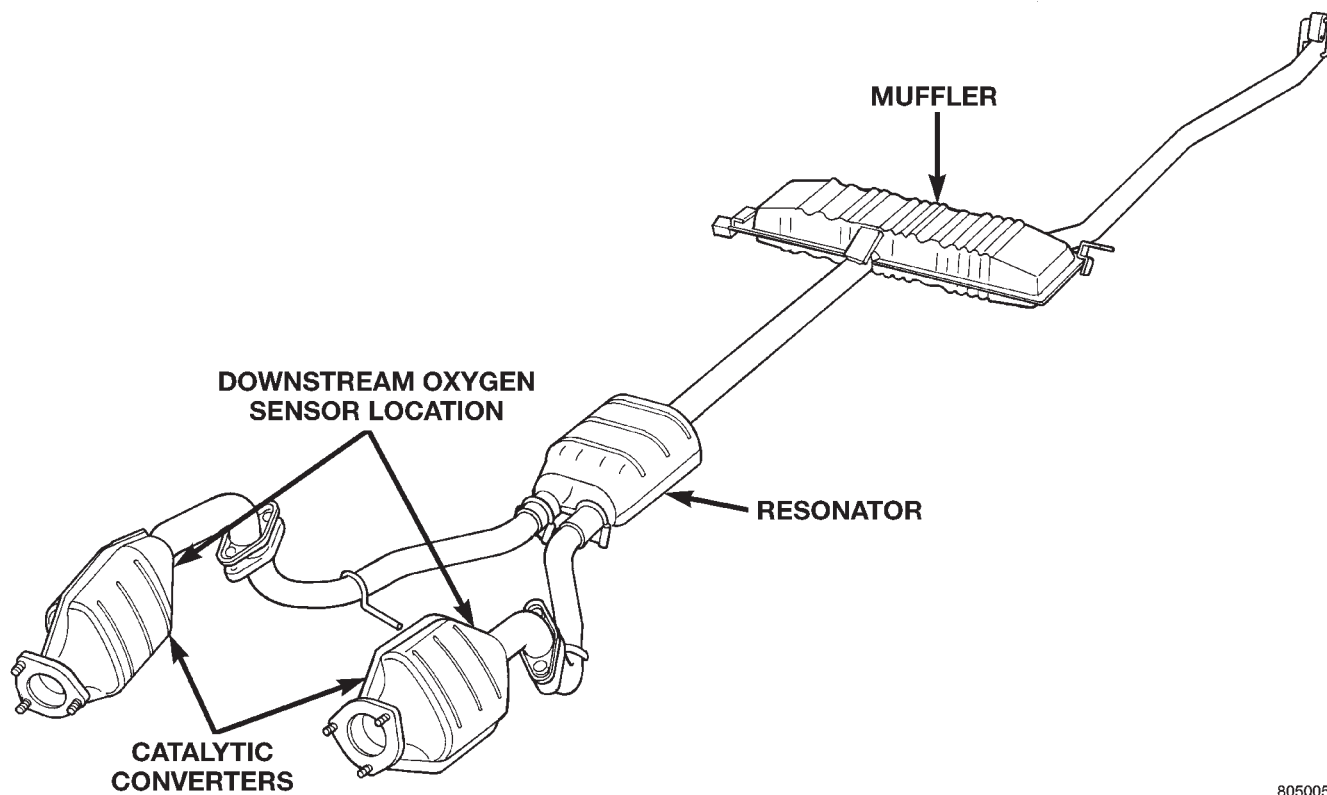
NOTE: The TLEV exhaust system has only 2 front close coupled catalytic converters, and has a resonator in place of the under floor converter (Fig. 3).

There is no regularly scheduled maintenance on any Chrysler catalytic converter. Excessive heat may cause bulging or other distortion, but excessive heat will not be the fault of the converter. A fuel system or ignition system malfunction that permits unburned fuel to enter the converter will usually cause overheating. **If a converter is heat damaged, correct the cause of the damage at the same time the converter is replaced.** The entire converter must be replaced. Inspect all other components of the exhaust system for heat damage. Unleaded gasoline must be used to avoid damage to the catalyst core.

GENERAL INFORMATION (Continued)

*Fig. 1 Exhaust System 3.3/3.5L Engines*

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*Fig. 2 Exhaust System—TLEV*

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GENERAL INFORMATION (Continued)

CAUTION: Due to exterior physical similarities of some catalytic converters with pipe assemblies, extreme care should be taken with replacement parts. There is internal converter differences required in some parts of the country (particularly California vehicles).

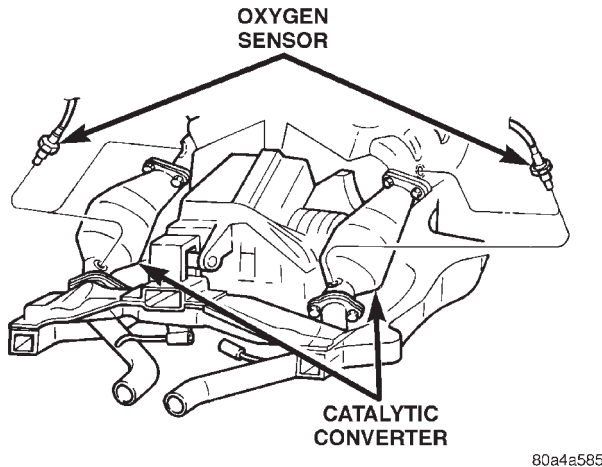


Fig. 3 Catalytic Convertors—TLEV

EXHAUST GAS RECIRCULATION (EGR)

To assist in the control of oxides of nitrogen (NO_x) in engine exhaust, all engines are equipped with an exhaust gas recirculation (EGR) system. The use of inert exhaust gas to dilute incoming air/fuel mixtures lowers peak flame temperature during combustion, thus limiting the formation of NO_x.

Exhaust gases are routed through a tube from the exhaust manifold to the intake manifold adaptor. Where they are metered by the EGR valve into the intake system. Refer to section 25, Emission Control Systems for a complete description, diagnosis and the proper service procedures.

HEAT SHIELDS

Heat shields (Fig. 4) are needed to protect both the car and the environment from the high temperatures developed in the vicinity of the catalytic converters and muffler. Each catalytic converter has a integral heat shield attached to it and are not to be removed.

Refer to Body and Sheet Metal, Group 23 for service procedures.

CAUTION: Avoid application of rust prevention compounds or undercoating materials to exhaust system heat shields on cars if equipped. Light over spray near the edges is permitted. Application of coating will greatly reduce the efficiency of the heat shields resulting in excessive floor pan temperatures and objectionable fumes.

The combustion reaction caused by the catalyst releases additional heat in the exhaust system. Caus-

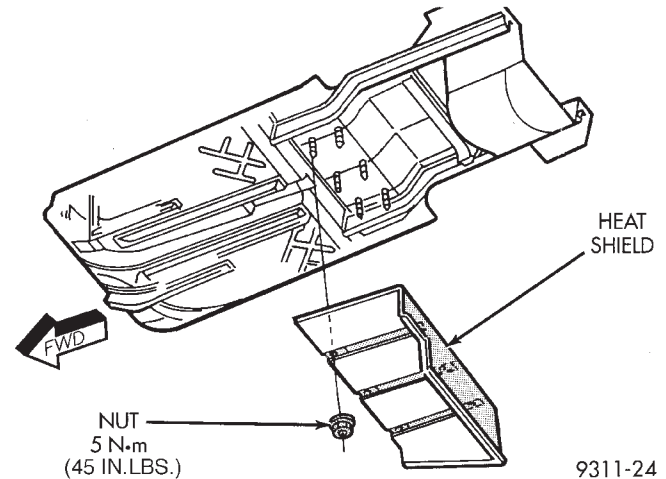


Fig. 4 Muffler Heat Shield

ing the temperature to increase in the area of the reactor under severe operating conditions. Such conditions can exist when the engine misfires or otherwise does not operate at peak efficiency. **Do not** remove spark plug wires from plugs or by any other means short out cylinders if exhaust system is equipped with catalytic converter. Failure of the catalytic converter can occur due to temperature increases caused by unburned fuel passing through the converter.

The use of the catalysts also involves some non-automotive problems. Unleaded gasoline must be used to avoid poisoning the catalyst core. Do not allow engine to operate above 1200 RPM in neutral for extended periods over 5 minutes. This condition may result in excessive exhaust system/floor pan temperatures because of no air movement under the vehicle.

DESCRIPTION AND OPERATION

INTAKE MANIFOLD—3.3L ENGINE

The intake manifold is a tuned two-piece semi-permanent mold aluminum casting with individual primary runners leading from a plenum to the cylinders. The manifold is designed to boost torque in the 3600 rpm range and contributes to the engine's broad, flat torque curve, which was desired for excellent engine tractability, response and usable power output.

The intake manifold is also cored with upper level EGR passages for balanced cylinder to cylinder EGR distribution.

EXHAUST MANIFOLD—3.3L ENGINE

Exhaust manifolds are log type with a crossover and attached directly to the cylinder heads.

DESCRIPTION AND OPERATION (Continued)

INTAKE MANIFOLD—3.5L ENGINE

The aluminum alloy manifold is a cross-flow type with long runners to improve inertia. The air plenum chambers absorb air pulsations created during the suction phase of each cylinder. A manifold tuning valve (MTV) connects the plenums at specific engine speeds to maximize low rpm torque without reducing high rpm power.

EXHAUST MANIFOLD—3.5L ENGINE

Both manifolds are a log type design. The manifolds are made of high silicone molybdenum ductile iron. The wall thickness has been reduced for weight saving.

DIAGNOSIS AND TESTING

EXHAUST SYSTEM DIAGNOSIS

Condition	Possible Cause	Correction
EXCESSIVE EXHAUST NOISE (UNDER HOOD)	(a) Exhaust manifold cracked or broken	(a) Replace manifold
	(b) Manifold to cylinder head leak	(b) Tighten M=manifold and/or replace gasket
	(c) EGR Valve Leakage	(c)
	a, EGR Valve to Manifold Gasket	a, Tighten nuts or replace gasket
	b, EGR Valve to EGR Tube Gasket	b, Tighten nuts or replace gasket
EXCESSIVE EXHAUST NOISE	c, EGR Tube to Manifold Tube Nut	c, Tighten tube nut
	(d) Exhaust Joint	(d) Inspect for cracks, leaks. Replace parts if necessary. Tighten joint nuts if no cracks found.
	(e) Pipe and shell noise from front exhaust pipe	(e) Possible failure of closed-coupled converter. Possible loosening of welded heat shield. Check for loose parts, leaks, and replace parts as needed.
	(a) Leaks at pipe joints	(a) Tighten clamps at leaking joints
	(b) Burned or blown or rusted out muffler, tailpipe of exhaust pipe.	(b) Replace muffler or muffler tailpipe or exhaust pipe.
EXCESSIVE EXHAUST NOISE	(c) Burned or blown or rusted out resonator	(c) Replace resonator and exhaust spouts
	(d) Restriction in exhaust module	(d) Remove restriction, if possible, or replace as necessary
	(e) Converter material in muffler, resonator	(e) Replace exhaust module. Check fuel injection and ignition systems for proper operation.

REMOVAL AND INSTALLATION

EXHAUST SYSTEM 3.3/3.5L ENGINE

REMOVAL

It is easier to service any portion of the exhaust system if the entire exhaust system (except the exhaust manifolds) is removed from the vehicle.

- (1) Raise vehicle on swing arm hoist.
- (2) Apply penetrating oil and remove the front down pipes to exhaust manifolds nuts (Fig. 5).
- (3) Apply penetrating oil and remove the front down pipes to transmission intermediate support bracket bolts.

CAUTION: At this time, the exhaust system is held by only isolators. Support the exhaust system underneath the under floor converter and the muffler while the isolators are being removed. Do not use any tools to remove the isolators, remove by hand only. Soapy water or silicone-based spray may be used to assist removal. Do Not use a petroleum-based lubricant on the isolators, This will damage the rubber material.

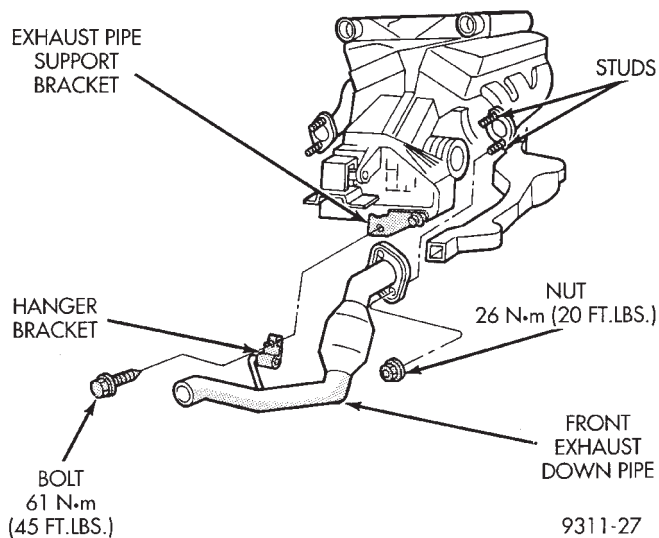


Fig. 5 Front Exhaust Down Pipes Connection

- (4) Remove the rubber isolators from the welded exhaust system rod wire hangers (Fig. 6).

- (5) Carefully maneuver the front down pipes past the engine, support cradle, and transmission. Lay the exhaust system on the ground.

NOTE: When replacement is required on any component of the exhaust system, it is most important that original equipment parts be used.

- To insure proper alignment with other parts in the system.

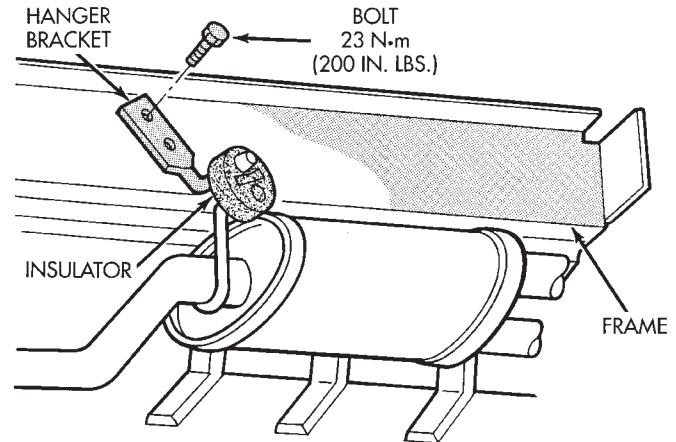


Fig. 6 Rubber Isolator Hanger (Typical)

- Provide acceptable exhaust noise levels and does not change exhaust system back pressure that could affect emissions and performance.

INSTALLATION

NOTE: On 3.3L TLEV engines you must install new exhaust manifold to catalytic converter flange gaskets.

- (1) Install and loose assemble the front pipes to the exhaust manifolds and the transmission support bracket.

- (2) Place the exhaust module onto two supports (one under the under floor catalytic converter, one under the muffler). Slide the module forward onto the front pipes until the front of the under floor converter inlet bushings are touching the positive stop tabs on the front pipes.

- (3) Install the module's rubber isolators onto the body brackets.

- (4) Visually inspect the isolators. They should be straight when viewing from front to back of the vehicle. Working from the front of system, align each component to maintain position and proper clearance with underbody parts.

- (5) Orientate and tighten all clamps and supports to the proper torques and clearances (Fig. 7).

- (6) Lower the vehicle.

FRONT EXHAUST DOWN PIPES

REMOVAL

- (1) Remove the exhaust system. Refer to procedure outlined in this section.

- (2) Apply penetrating oil and loosen the band clamps that fasten the front pipes to the inlet bushings of the under floor converter (Fig. 7).

REMOVAL AND INSTALLATION (Continued)

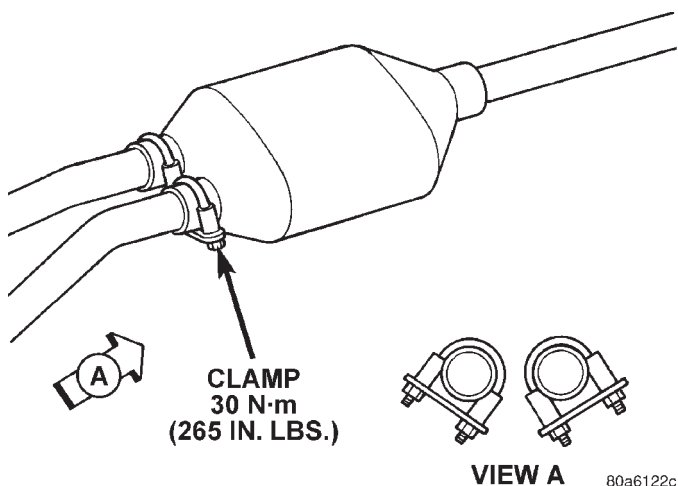


Fig. 7 Exhaust Down Pipe to Catalytic Converter Clamp Orientation

(3) Remove front pipes from the slip joints. Heat may be required to allow removal from the front bushing.

INSTALLATION

(1) Install and loose assemble the front pipes to the exhaust manifolds and the transmission support bracket.

(2) Install exhaust system. Refer to procedure outlined in this section.

(3) Position clamps and tighten to specification (Fig. 7).

EXHAUST SYSTEM MODULE

There are three service components available for each vehicle when servicing the module:

- Under floor catalytic convertor. (Resonator on 3.3L TLEV engine.)
- Muffler assembly
- Tailpipe assembly (3.3L engine) or Resonator assembly (3.5L engine)

There are different muffler assemblies and resonator assemblies, dependent on the type of vehicle being serviced. Be certain to select the proper assembly for the vehicle being serviced.

REMOVAL

(1) Remove the exhaust system. Refer to Exhaust System procedure in this section.

(2) Remove front down pipes. Refer to Front Exhaust Down Pipe procedure in this section.

UNDER FLOOR CONVERTER

NOTE: The TLEV exhaust system has only 2 front close coupled catalytic converters, and has a resonator in place of the under floor converter.

(1) With the exhaust module removed, cut the converter to muffler intermediate pipe just in front of the muffler (Fig. 8).

(2) Install new converter onto intermediate pipe, and install new clamp loosely.

(3) Install front down pipes. Refer to Front Exhaust Down Pipe procedure in this section.

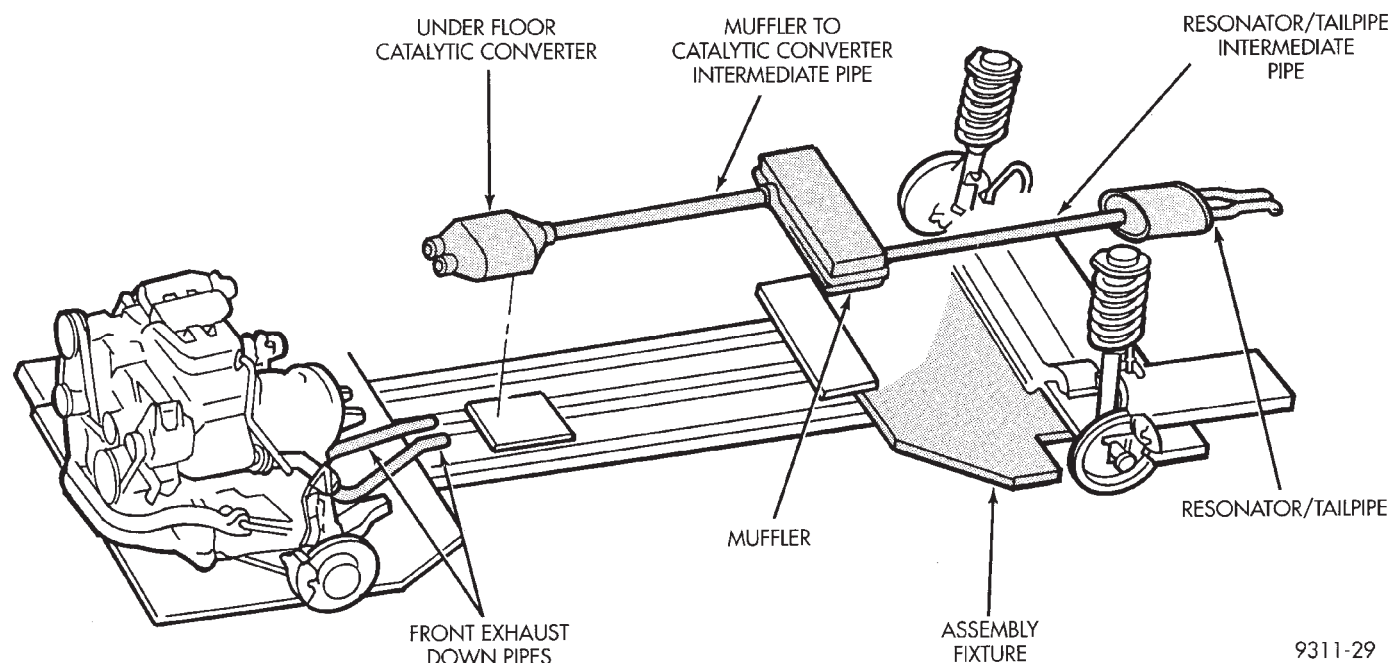


Fig. 8 Under floor Catalytic Converter and Muffler Assembly Service Locations

REMOVAL AND INSTALLATION (Continued)

(4) Install exhaust system. Refer to Exhaust System procedure in this section.

MUFFLER

(1) With the exhaust system removed, cut the converter to muffler intermediate pipe just behind the converter (Fig. 8).

(2) Install the new muffler assembly onto the remainder of the intermediate pipe and loose assembly the accompanying clamp.

(3) Remove the exhaust support brackets from the vehicle (Fig. 9).

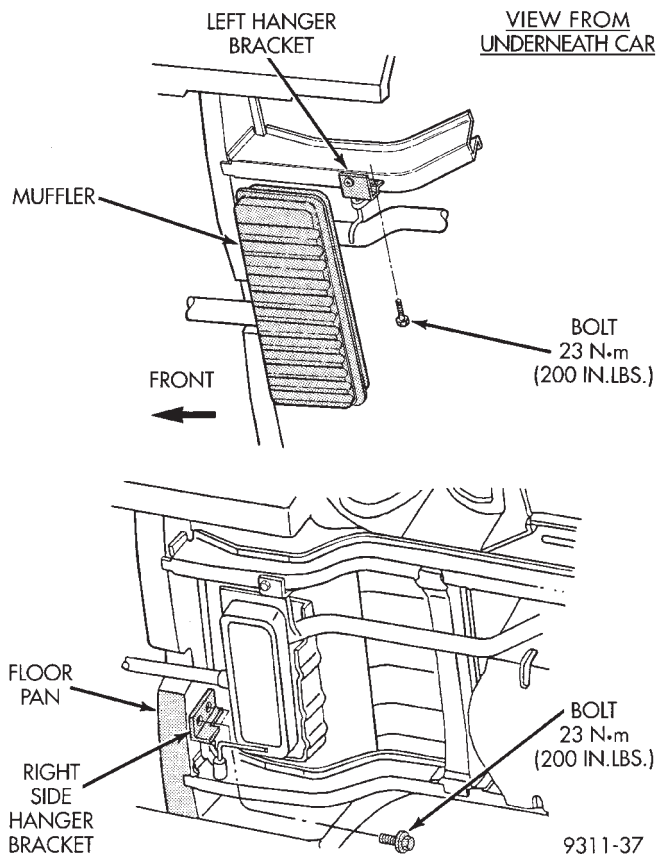


Fig. 9 Muffler Assembly Support Bracket Locations

(4) Install new exhaust support brackets found on the replacement muffler assembly onto vehicle in the same location the old ones were removed (Fig. 9).

(5) Install exhaust system. Refer to procedure outlined in this section.

TAILPIPE/RESONATOR

(1) With the exhaust system removed, cut the tailpipe/or resonator assembly intermediate pipe next to the rear suspension crossmember (Fig. 10).

(2) Install the correct tailpipe/resonator assembly onto the remainder of the intermediate pipe/tailpipe and loose assembly the accompanying clamp.

(3) Remove the exhaust support bracket(s) from the vehicle (Fig. 10).

(4) Install new exhaust support bracket(s) found on the replacement tailpipe/resonator assembly onto vehicle in the same location the old ones were removed (Fig. 10).

(5) Install exhaust system. Refer to procedure outlined in this section.

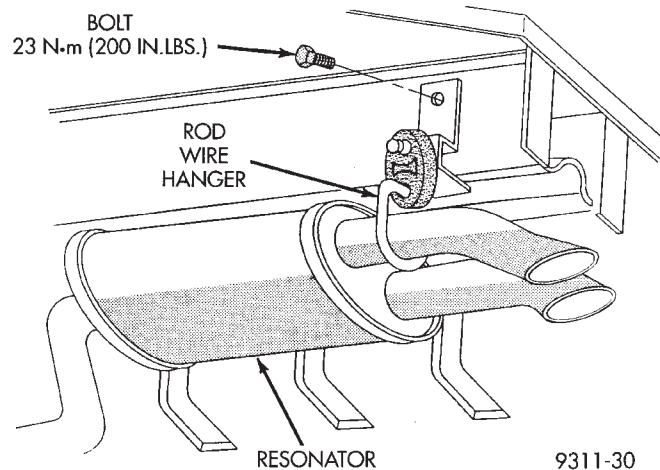


**Fig. 10 Tailpipe/Resonator Support Bracket
LEFT CONVERTER— TLEV 3.3L ENGINE**

REMOVAL

- (1) Disconnect battery.
- (2) Raise vehicle on hoist.
- (3) Disconnect and remove oxygen sensor.
- (4) Remove bolts holding down pipe hangers to transmission bracket.
- (5) Support exhaust system with jack stand.
- (6) Remove bolts holding left and right down pipes to back of converters, lower exhaust system. Refer to Exhaust System Removal.
- (7) Remove bolts holding converter to exhaust manifold flange. **Do not reuse flange gasket.**

CAUTION: Do not damage inner CV boot.

- (8) Remove converter through opening between floor pan and crossmember.

INSTALLATION

- (1) Install converter to exhaust manifold using new gasket (Fig. 11). Torque flange bolts to 26 N·m (19 ft. lbs.)
- (2) Install exhaust system.
- (3) Install down pipe hanger bolts. Torque to 61 N·m (45 ft. lbs.)
- (4) Install oxygen sensor. Torque to 27 N·m (20 ft. lbs.)
- (5) Lower vehicle.
- (6) Connect Battery.

REMOVAL AND INSTALLATION (Continued)

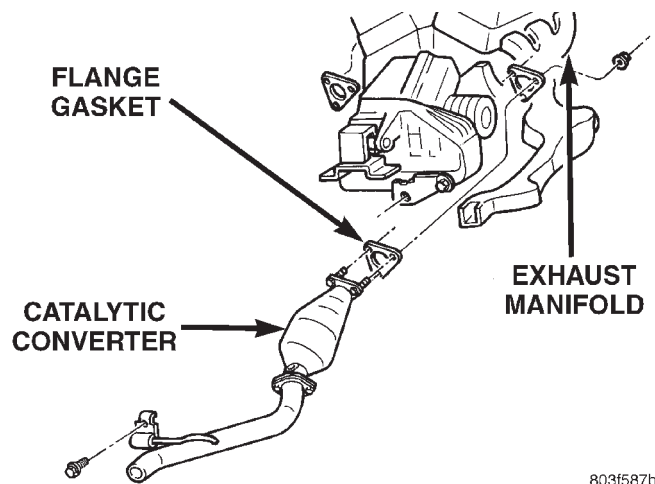


Fig. 11 Exhaust Manifold Flange and Down Pipe Hanger

RIGHT CONVERTER —TLEV 3.3L ENGINE**REMOVAL**

- (1) Remove air cleaner housing and air inlet hose at throttle body.
- (2) Disconnect and remove downstream oxygen sensor.
- (3) Raise vehicle on hoist.
- (4) Remove bolts holding right down pipes to converter.
- (5) Lower Vehicle.
- (6) Remove bolts holding converter to exhaust manifold flange. **Do not reuse flange gasket.**
- (7) Remove converter.

INSTALLATION

- (1) Install converter to exhaust manifold using new gasket (Fig. 11). Torque flange bolts to 26 N·m (19 ft. lbs.).
- (2) Raise vehicle on hoist.
- (3) Install down pipe to converter bolts.
- (4) Lower Vehicle.
- (5) Install oxygen sensor. Torque to 27 N·m (20 ft. lbs.).
- (6) Install air cleaner housing and air inlet hose at throttle body.

FUEL SYSTEM PRESSURE RELEASE PROCEDURE

- (1) Disconnect negative cable from battery.
- (2) Remove fuel filler cap.
- (3) Remove the protective cap from the fuel pressure test port on the fuel rail (Fig. 12) or (Fig. 13).
- (4) Place the open end of fuel pressure release hose, tool number C- 4799-1, into an approved gasoline container. Connect the other end of hose C-4799-1 to the fuel pressure test port (Fig. 14). Fuel pressure will bleed off through the hose into the gas-

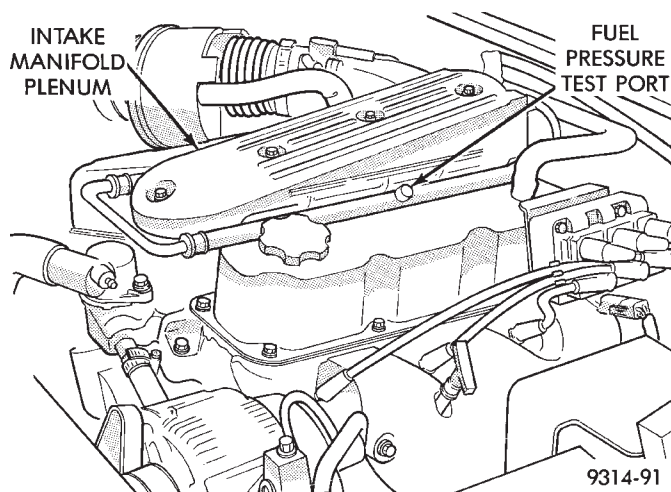


Fig. 12 Fuel Pressure Test Port—3.3L Engine

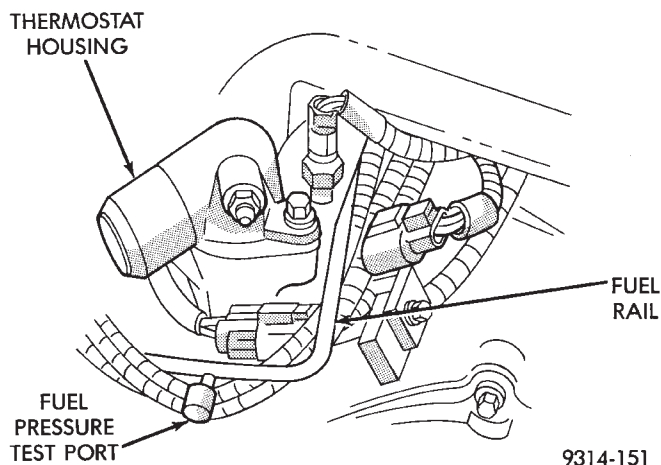


Fig. 13 Fuel Pressure Test Port—3.5L Engine

oline container. Fuel gauge C-4799-A contains hose C-4799-1.

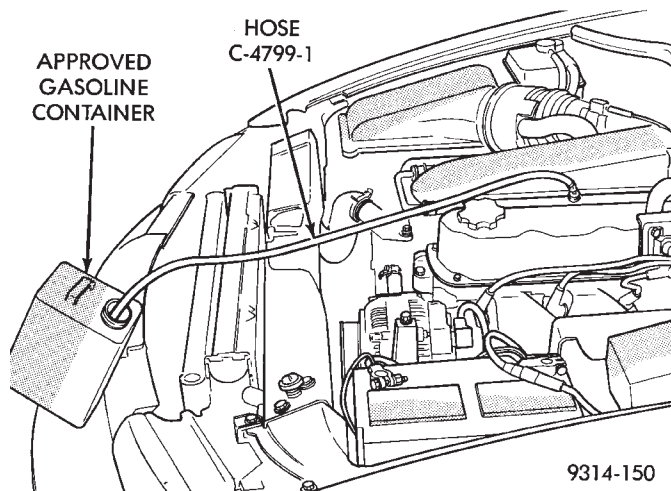


Fig. 14 Releasing Fuel Pressure—Typical

REMOVAL AND INSTALLATION (Continued)

INTAKE MANIFOLD—3.3L ENGINE

REMOVAL

(1) Release fuel system pressure. Refer to Group 14, Fuel System Pressure Release Procedure.

(2) Drain cooling system. Refer to Group 7, Cooling System for procedure. Disconnect negative cable from battery.

(3) Disconnect air tube from air cleaner and throttle body.

(4) Hold throttle lever in wide-open position. Remove throttle cable and speed control cable from lever.

(5) Compress locking tabs on throttle cable and speed control cable and remove them from bracket (Fig. 15).

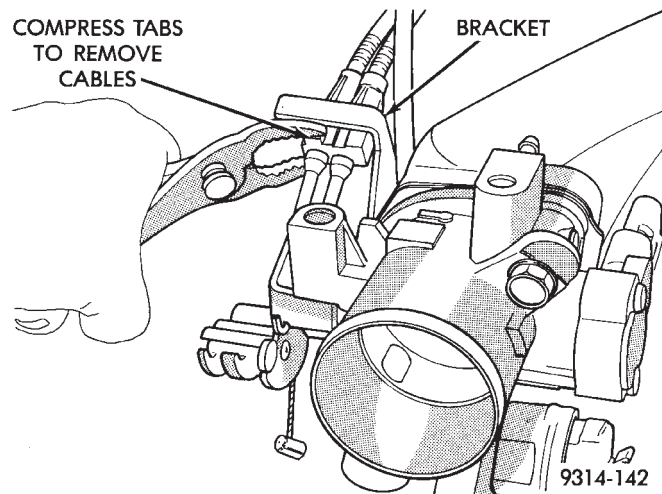


Fig. 15 Removing Throttle Cable and Speed Control Cable

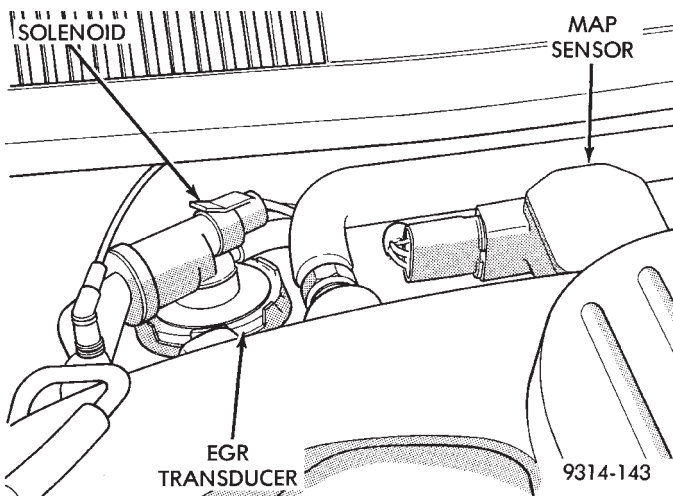


Fig. 16 EGR Transducer

(6) Disconnect electrical connectors from solenoid on EGR valve transducer and MAP sensor (Fig. 16).

(7) Disconnect hose from PCV valve at rear of intake manifold plenum. Disconnect brake booster

hose from nipple at rear of intake manifold plenum. Disconnect vacuum line from fuel pressure regulator.

(8) Disconnect purge hose from throttle body. Disconnect electrical connector from throttle position sensor and idle air control motor (Fig. 17).

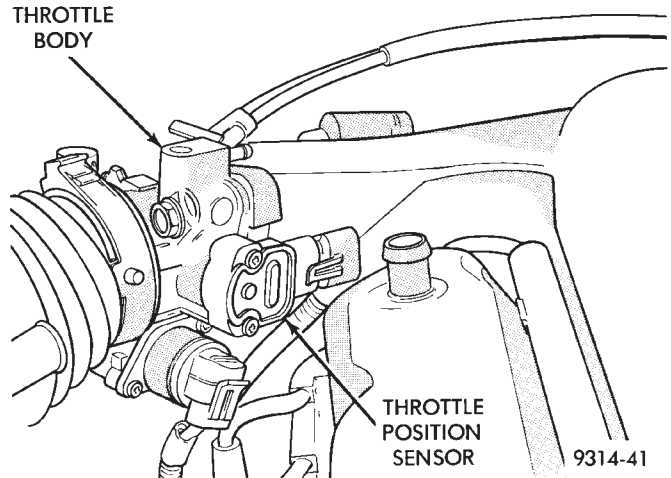


Fig. 17 Throttle Position Sensor—3.3L Engine

(9) Remove EGR tube mounting screws at intake manifold plenum (Fig. 18).

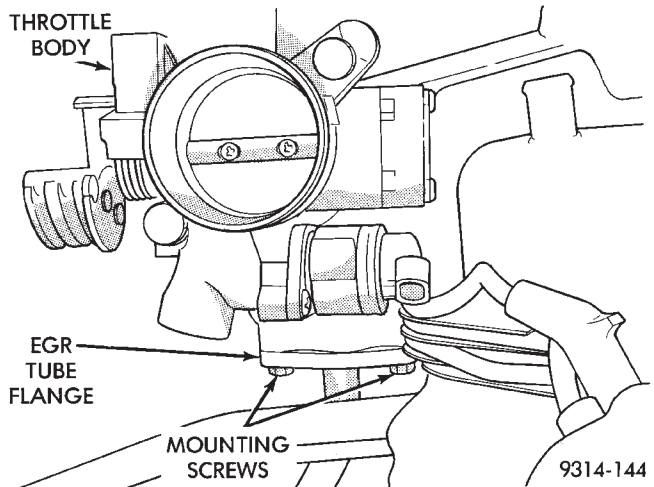


Fig. 18 EGR Tube

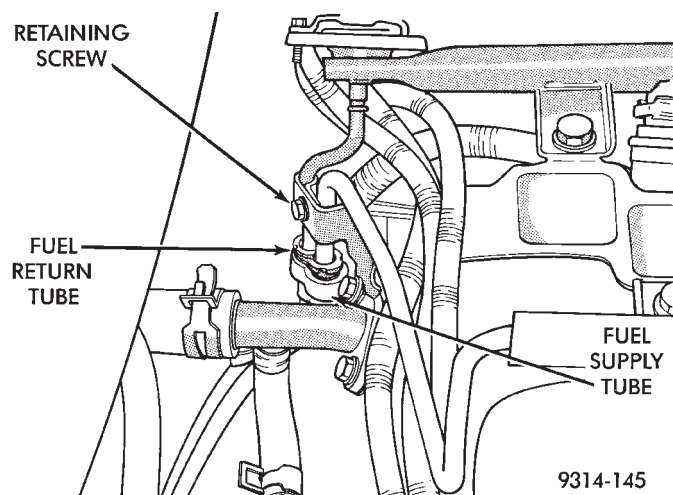
(10) Remove intake manifold plenum mounting bolts. Lift Plenum up off of engine. Cover intake manifold to prevent foreign material from entering engine.

(11) Disconnect fuel supply and return tube quick connect fittings at the rear of intake manifold (Fig. 19). Refer to Quick Connect Fittings in the Fuel Delivery Section of this Group.

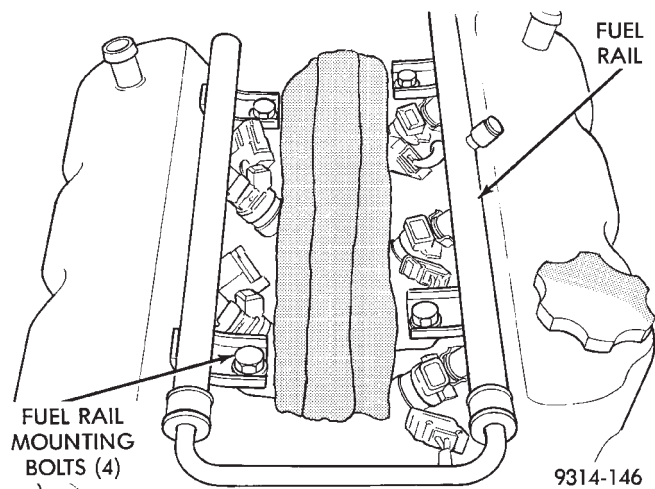
(12) Remove screw from fuel tube clamp (Fig. 19). Separate fuel tubes from bracket.

(13) Rotate injectors toward center of engine. Tag the injector connectors with their cylinder number. Disconnect electrical connector from injectors.

REMOVAL AND INSTALLATION (Continued)

**Fig. 19 Fuel Supply and Return Tubes**

(14) Remove fuel rail mounting bolts (Fig. 20).

**Fig. 20 Fuel Rail**

(15) Lift fuel rail straight up, off of engine. Cover fuel injector openings in intake manifold.

(16) Remove upper radiator hose, bypass hose and rear intake manifold hose (Fig. 21).

(17) Remove intake manifold bolts. Remove intake manifold.

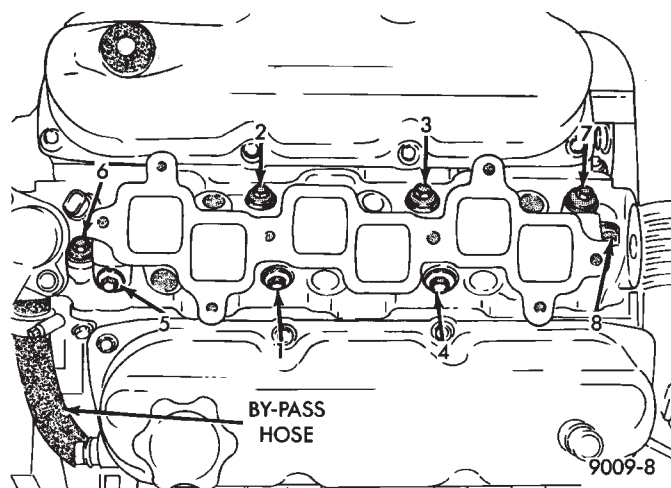
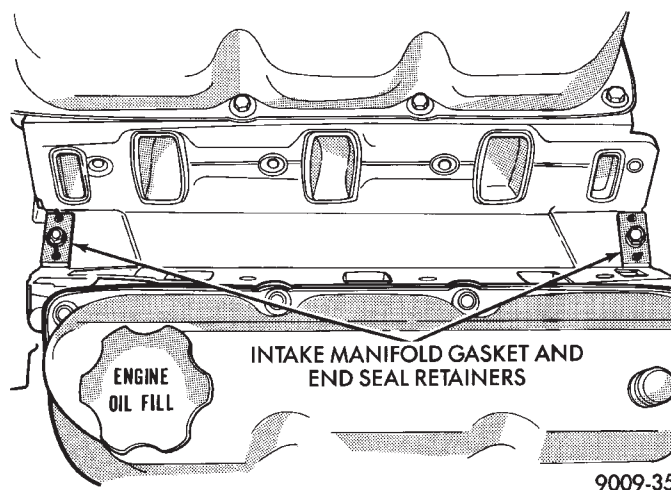
(18) Remove intake manifold seal retainers screws (Fig. 22). Remove intake manifold gasket.

WARNING: Intake manifold gasket is made of thin metal and very sharp, may cause personal injury. Handle with care.

INSTALLATION

(1) Clean all surfaces of cylinder block and cylinder heads.

(2) Place a drop (about 1/4 in. diameter) of Mopar Silicone Rubber Adhesive Sealant or equivalent, onto

**Fig. 21 Intake Manifold Removal and Installation****Fig. 22 Intake Manifold Gasket**

each of the **four** manifold to cylinder head gasket corners (Fig. 23).

WARNING: INTAKE MANIFOLD GASKET IS MADE OF VERY THIN METAL AND MAY CAUSE PERSONAL INJURY, HANDLE WITH CARE.

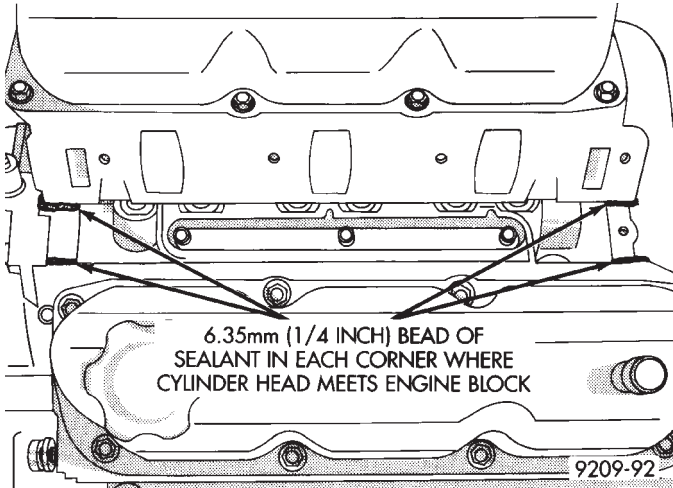
(3) Carefully install the intake manifold gasket (Fig. 22). Tighten end seal retainer screws to 12 N·m (105 in. lbs.) torque.

(4) Install intake manifold and (8) bolts and tighten to 1 N·m (10 in. lbs.) torque. Then tighten bolts to 22 N·m (200 in. lbs.) torque in sequence shown in (Fig. 21). Then tighten again to 22 N·m (200 in. lbs.) torque. After intake manifold is in place, **inspect to make sure seals are in place.**

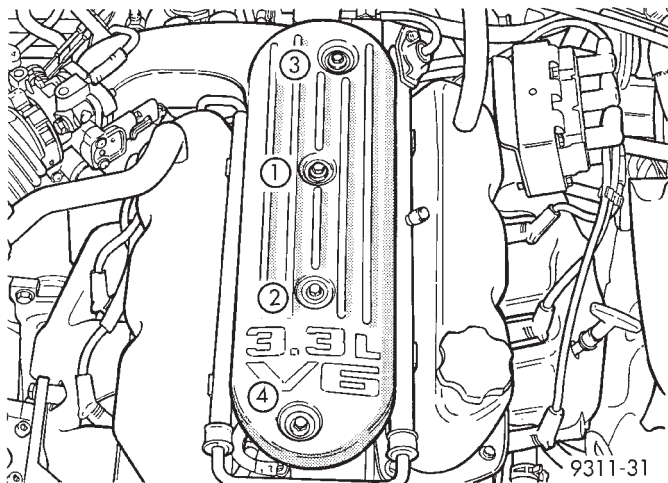
(5) Apply a light coating of clean engine oil to the O-ring on the nozzle end of each injector.

(6) Insert fuel injector nozzles into openings in intake manifold. Seat the injectors in place. Tighten fuel rail mounting screws to 22 N·m (200 in. lbs.) torque.

REMOVAL AND INSTALLATION (Continued)

**Fig. 23 Intake Manifold Gasket Sealing**

- (7) Attach electrical connectors to fuel injectors.
- (8) Connect fuel supply and return tubes to fuel rail. Refer to Quick Connect Fittings in the Fuel Delivery Section of this Group. Place clamp over fuel tubes and install retaining screw.
- (9) Remove cover from intake manifold. Place plenum with new gasket on intake manifold. Loosely install mounting bolts.
- (10) Place a new gasket on the EGR tube flange. Loosely install EGR tube mounting screws.
- (11) Tighten Intake Manifold Plenum mounting bolts to 28 N·m (250 in. lbs.) in sequence as shown in (Fig. 24).

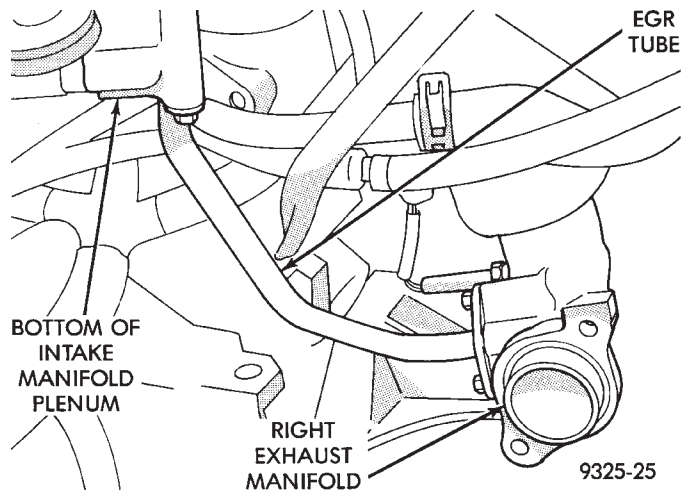
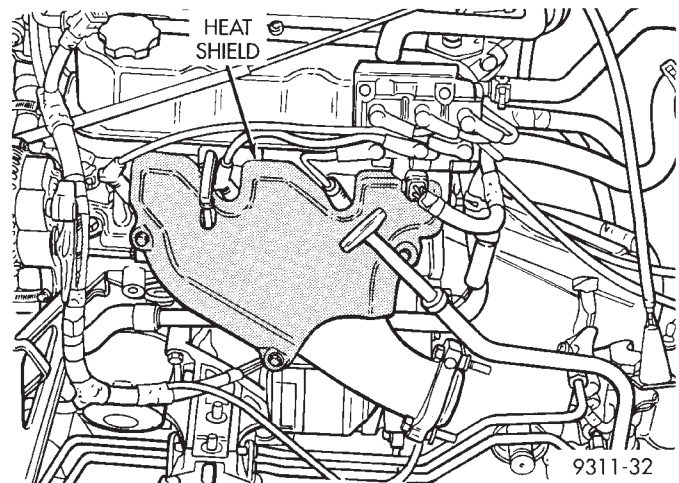
**Fig. 24 Intake Manifold Plenum Tightening Sequence**

- (12) Tighten EGR tube mounting screws.
- (13) Connect hoses to PCV valve and brake booster nipple.
- (14) Attach electrical connectors to the MAP sensor and EGR transducer solenoid.
- (15) Attach electrical connectors to throttle position sensor and idle air control motor.

- (16) Install throttle cable and speed control cable in bracket.
- (17) Hold throttle body lever in wide-open position. Install throttle and speed control cables.
- (18) Connect purge hose to throttle body.
- (19) Connect air tube from air cleaner and throttle body.
- (20) Fill cooling system. Refer to Group 7, Cooling System for procedure.

EXHAUST MANIFOLD—3.3L ENGINE**REMOVAL**

- (1) Raise vehicle and disconnect exhaust pipe from the exhaust manifold.
- (2) Separate EGR tube from the manifold and disconnect Heated Oxygen Sensor lead wire (Fig. 25).
- (3) Remove screws attaching heat shield to manifold (Fig. 26).

**Fig. 25 EGR Tube to Exhaust Manifold****Fig. 26 Heat Shield**

- (4) Remove bolts attaching the manifold to cylinder head and remove manifold.

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

- (1) Install exhaust manifold and tighten attaching bolts to 23 N·m (200 in. lbs.) torque.
- (2) Attach exhaust pipe to exhaust manifold and tighten nuts to 28 N·m (250 in. lbs.) torque.
- (3) Install EGR Tube.
- (4) Install manifold heat shield and tighten attaching screws to 23 N·m (200 in. lbs.) torque.

INTAKE MANIFOLD—3.5L ENGINE

REMOVAL

- (1) Release fuel system pressure. Refer to Group 14, Fuel System Pressure Release Procedure.
- (2) Drain cooling system. Refer to Group 7, Cooling System for procedure.
- (3) Remove engine cover from top of intake manifold plenum.
- (4) Remove accelerator cable and speed control cable from throttle arm (Fig. 27).

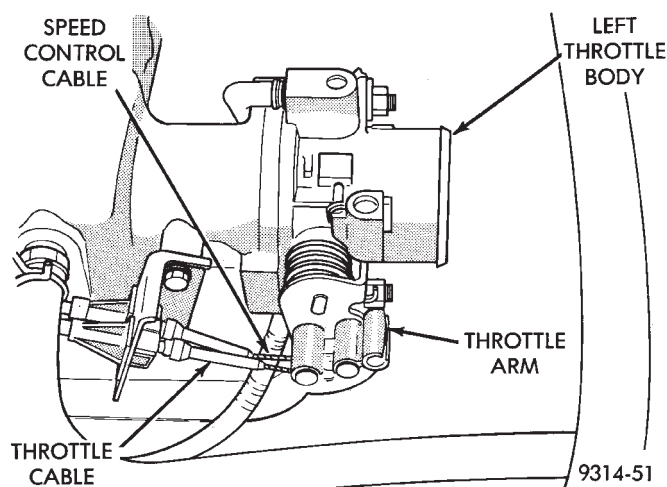


Fig. 27 Throttle Lever—3.5L Engine

- (5) Disconnect electrical connectors from idle air control motor, and intake air temperature (Fig. 28).
- (6) Remove ground screw from intake manifold.
- (7) Disconnect vacuum hose from manifold tuning valve (Fig. 28).
- (8) Disconnect electrical connector from manifold absolute pressure (MAP) sensor (Fig. 29).
- (9) Disconnect electrical connector from throttle position sensor (Fig. 30).
- (10) Disconnect purge hose from throttle bodies (Fig. 30).
- (11) Disconnect PCV makeup air hose and idle air control motor supply hose (part of air inlet plenum). Remove air inlet plenum from behind manifold (Fig. 31).
- (12) Disconnect PCV hose, brake booster hose and vacuum hoses from intake manifold.
- (13) Remove EGR tube mounting bolts at intake manifold plenum (Fig. 32) Discard gaskets.

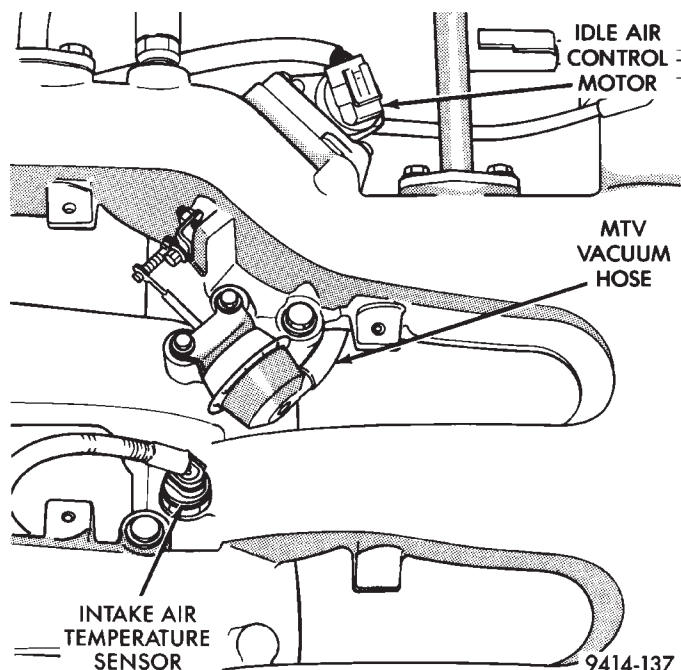


Fig. 28 Idle Air Control Motor

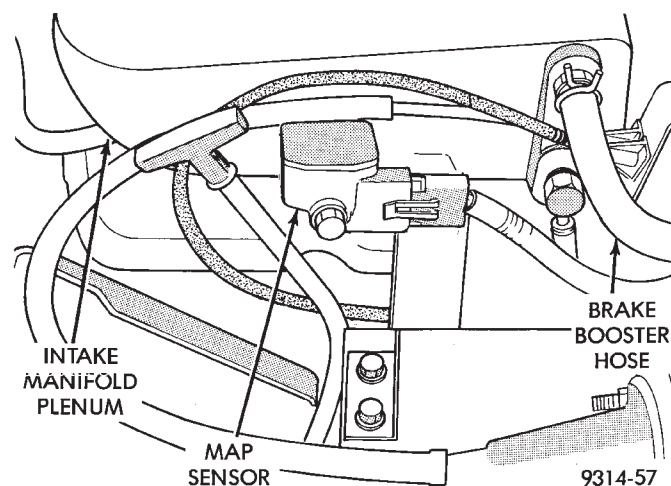


Fig. 29 MAP Sensor

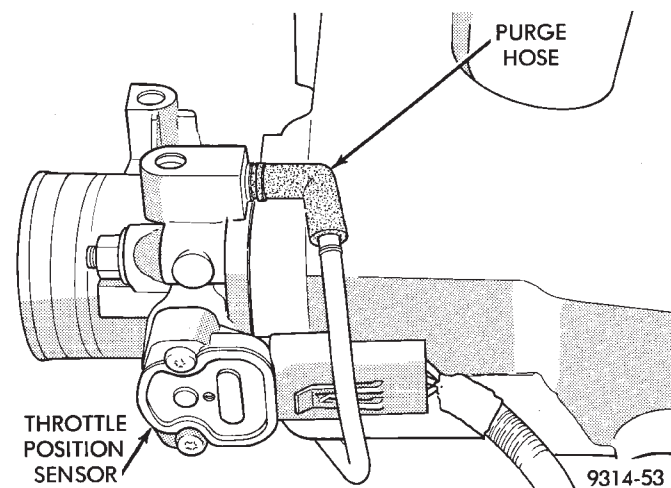
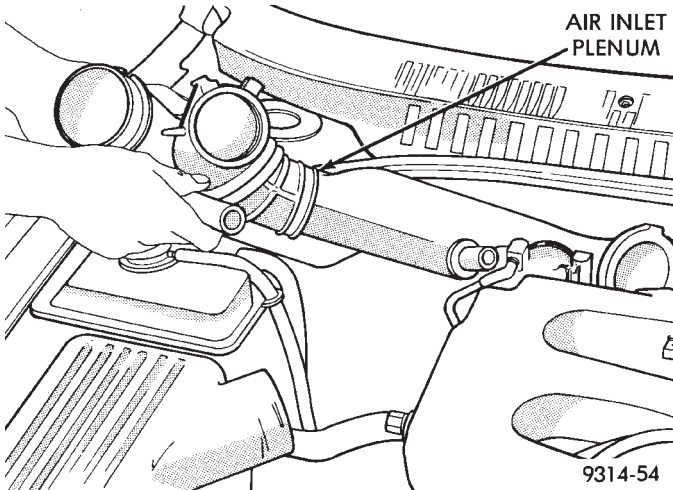
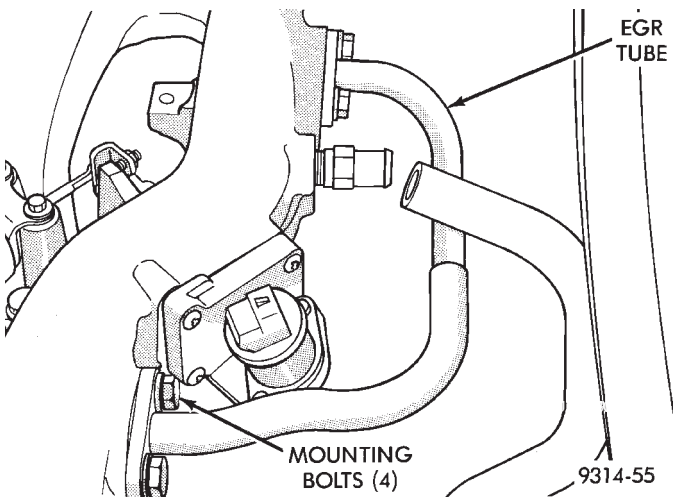
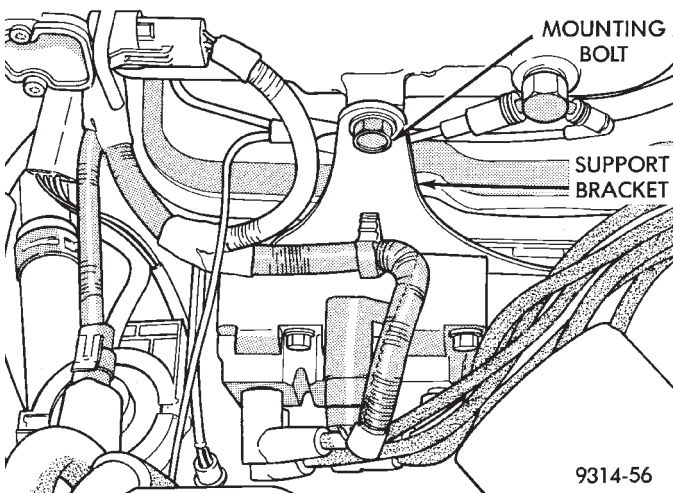


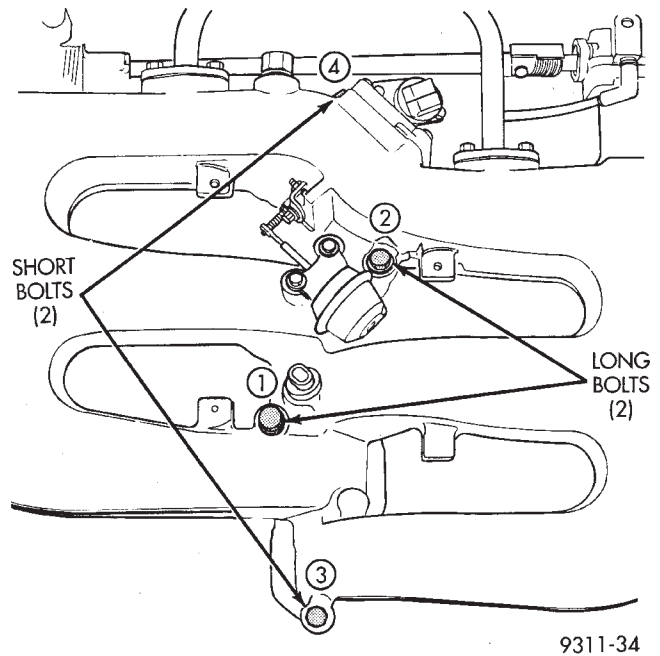
Fig. 30 Throttle Position Sensor

REMOVAL AND INSTALLATION (Continued)

**Fig. 31 Air Inlet Plenum****Fig. 32 EGR Tube Top Mounting Bolts****Fig. 33 Intake Manifold Plenum Support (Right Side)**

(14) Remove air plenum support bracket bolt on each side of manifold (Fig. 33).

(15) Remove intake manifold plenum mounting bolts. The plenum uses two different length bolts (Fig. 34).

**Fig. 34 Intake Manifold Plenum**

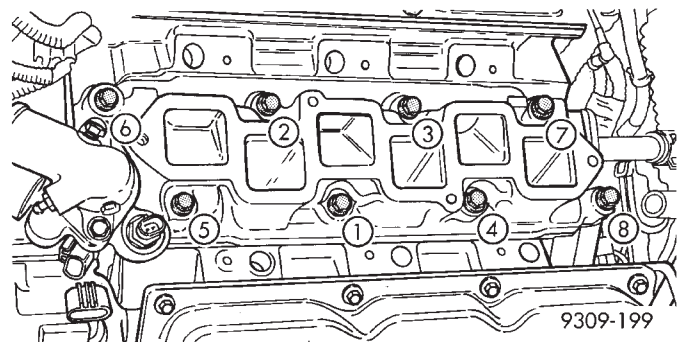
(16) Remove intake manifold plenum. Discard gaskets. Cover the intake manifold openings with tape.

(17) Remove upper radiator hose from thermostat housing and heater hose from rear of intake manifold.

(18) Remove intake manifold attaching bolts (Fig. 35).

INSTALLATION

(1) Install intake manifold with new gaskets. Tighten in sequence shown in (Fig. 35) to 28 N·m (250 in. lbs.).

**Fig. 35 Intake Manifold Tightening Sequence**

(2) Connect upper radiator hose and heater hose at the rear of intake manifold.

REMOVAL AND INSTALLATION (Continued)

(3) Ensure that ignition cables are routed correctly so they will not be pinched when plenum is installed.

(4) Install intake manifold plenum with new gaskets. Tighten in sequence shown in (Fig. 34) to 28 N·m (250 in. lbs.).

(5) Install and tighten support bracket bolts.

(6) Attach electrical connectors to MAP Sensor, TPS, idle air control motor and intake air temperature sensor.

(7) Connect vacuum hose to manifold tuning valve diaphragm.

(8) Install EGR tube. Refer to Group 25, for EGR tube tightening sequence and specifications.

(9) Rotate throttle arm to wide open throttle position and install the speed control cable and throttle cable.

(10) Connect hose to PCV valve.

(11) Install air cleaner plenum.

(12) Install air cleaner to plenum hose.

(13) Attach ground wire to intake manifold plenum.

(14) Connect brake booster hose to fitting on intake manifold plenum.

(15) Connect purge tubes to fittings on throttle bodies.

(16) Install cover on intake manifold plenum.

(17) Connect negative cable to battery.

(18) Fill cooling system. Refer to Group 7, Cooling System for procedure.

EXHAUST MANIFOLDS—3.5L ENGINE

REMOVAL

(1) Raise vehicle and disconnect exhaust pipes from the exhaust manifold.

(2) Disconnect Oxygen Sensor lead wire at the exhaust manifold (Fig. 36).

(3) Lower vehicle and remove screws attaching heat shields from the manifolds (Fig. 36).

(4) Remove bolts attaching the manifold to cylinder head and remove manifold.

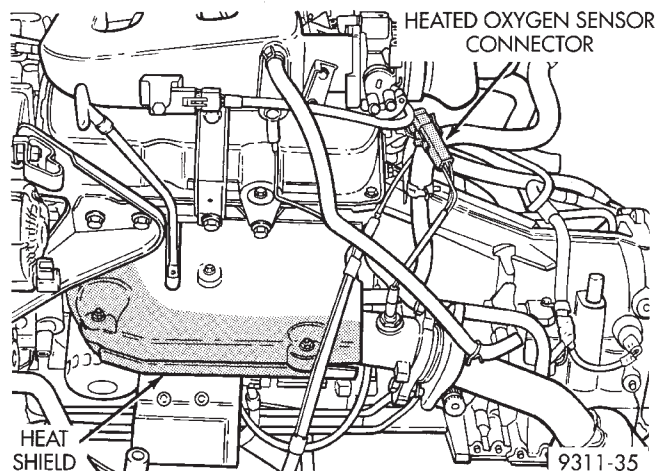


Fig. 36 Heat Shield and Oxygen Sensor Wire Connection

INSTALLATION

(1) Install the gasket and manifold.

(2) Tighten attaching bolts to 20 N·m (175 in. lbs.).

(3) Attach exhaust pipe to exhaust manifold and tighten nuts to 28 N·m (250 in. lbs.).

(4) Connect heated oxygen sensor lead (Fig. 36).

(5) manifold heat shield and tighten attaching screws to 15 N·m (130 in. lbs.) (Fig. 36).

CLEANING AND INSPECTION

INTAKE MANIFOLD 3.3/3.5L ENGINE

Check for:

- Damage and cracks of each section.
- Clogged water passages in end cross over and clogged gas passages.

EXHAUST MANIFOLD 3.3/3.5L ENGINE

Inspect exhaust manifolds for damage or cracks and check distortion of the cylinder head mounting surface with a straightedge and thickness gauge.

SPECIFICATIONS

TORQUE CHART

DESCRIPTION TORQUE**Exhaust Manifold to Front Pipe (All)**

Fasteners 27 N·m (240 in. lbs.)

Exhaust Manifold Mounting 3.3L

Fasteners 23 N·m (200 in. lbs.)

Heat Shield 3.3L

Fasteners 23 N·m (200 in. lbs.)

Intake Manifold Attaching 3.3L

Fasteners 23 N·m (200 in. lbs.)

Intake Plenum Attaching 3.3L

Fasteners 28 N·m (250 in. lbs.)

Intake Manifold Gasket Retainer 3.3L

Screws 12 N·m (105 in. lbs.)

Heat Shield Muffler

Fasteners 5 N·m (45 in. lbs.)

Insulator Mounting

Bolts 23 N·m (200 in. lbs.)

Exhaust U-Bolt Front of Underfloor Converter

Nuts 30 N·m (265 in. lbs.)

Intake Manifold Mounting 3.5L

Fasteners 28 N·m (250 in. lbs.)

Intake Plenum Attaching 3.5L

Fasteners 28 N·m (250 in. lbs.)

Exhaust Manifold Mounting 3.5L

Fasteners 23 N·m (200 in. lbs.)

Exhaust Module Body Bracket

Support 25 N·m (215 in. lbs.)

Exhaust Support Bracket to Transmission

Fasteners 47 N·m (35 ft. lbs.)

Exhaust Front Down Pipe to Support Bracket

Bolt 47 N·m (35 ft. lbs.)

Exhaust Manifold Heat Shield Mounting

Fasteners 15 N·m (130 in. lbs.)

