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EVAPORATIVE EMISSION CONTROLS

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VEHICLE EMISSION CONTROL INFORMATION LABEL

All models have a Vehicle Control Information (VECI) Label. Chrysler permanently attaches the label to lower right corner of the hood (Fig. 1). It cannot be removed without defacing information and destroying the label.

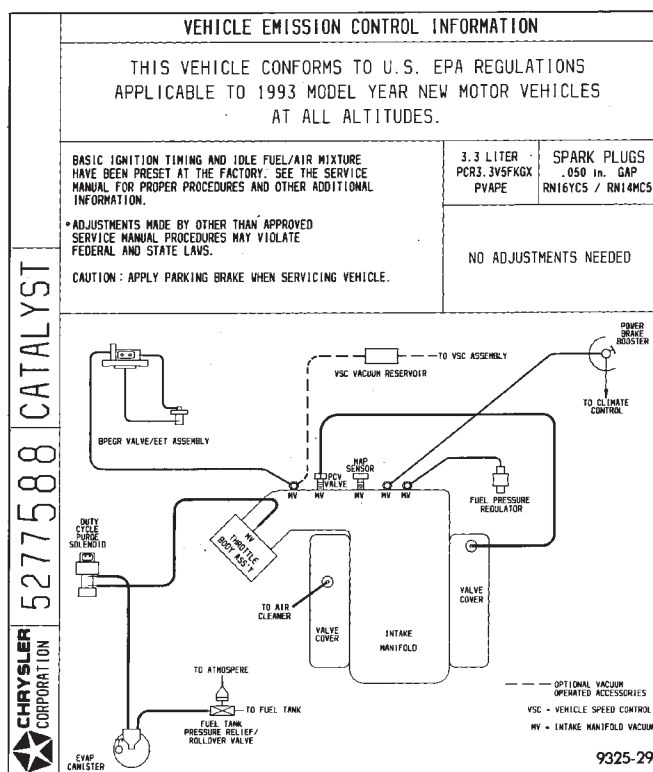
The label contains the vehicle's emission specifications and vacuum hose routings. All hoses must be connected and routed according to the label.

If any difference exists between the label and the Service Manual, refer to the label. **The labels shown are examples.**



Fig. 1 Underhood Label Location

FEDERAL EMISSION CONTROL
INFORMATION LABEL—TYPICAL



VACUUM SCHEMATIC

If any difference exists between the diagram on the vehicle emission control information (VECI) label and the schematics in the Service Manual, refer to the label.



CALIFORNIA VEHICLE CONTROL INFORMATION LABEL—TYPICAL

CANADA VEHICLE EMISSION CONTROL INFORMATION LABEL—TYPICAL

VEHICLE EMISSION CONTROL INFORMATION

THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1993 MODEL YEAR NEW MOTOR VEHICLES PROVIDED THAT THIS VEHICLE IS ONLY INTRODUCED INTO COMMERCE FOR SALE IN THE STATE OF CALIFORNIA.

BASIC IGNITION TIMING AND IDLE FUEL/AIR MIXTURE HAVE BEEN PRESET AT THE FACTORY. SEE THE SERVICE MANUAL FOR PROPER PROCEDURES AND OTHER ADDITIONAL INFORMATION.

ADJUSTMENTS MADE BY OTHER THAN APPROVED SERVICE MANUAL PROCEDURES MAY VIOLATE FEDERAL AND STATE LAWS.

CAUTION: APPLY PARKING BRAKE WHEN SERVICING VEHICLE.

3.3 LITER
PCR201V5FKG5
PVAP

SPARK PLUGS
.050 in. GAP
RN16YC5 / RN14MC5

NO ADJUSTMENTS NEEDED

NMHC/CO/NO_x STDS. .39/7.0/0.4

33V5FKGU

9325-28

VEHICLE EMISSION CONTROL INFORMATION

THIS VEHICLE WAS BUILT FOR SALE IN CANADA AND WAS DESIGNED TO MEET THE EMISSION REQUIREMENTS OF THE CANADA MOTOR VEHICLE SAFETY ACT. IT WAS NOT DESIGNED TO COMPLY WITH THE REQUIREMENTS OF OTHER COUNTRIES.

* BASIC IGNITION TIMING AND FUEL INJECTION MIXTURE HAVE BEEN PRESET AT THE FACTORY. ADJUSTMENTS SHOULD NOT BE MADE DURING ROUTINE SERVICE.

CAUTION: APPLY PARKING BRAKE WHEN SERVICING VEHICLE.

NO ADJUSTMENTS NEEDED

3.3 LITRES

SPARK PLUGS
1.3 mm GAP
RN16YC5 OR RN14MC5

RENSEIGNEMENTS RELATIFS AU SYSTÈME ANTIPOLLUTION

LE PRÉSENT VÉHICULE A ÉTÉ FABRIQUÉ POUR ÊTRE VENDU AU CANADA ET IL A ÉTÉ CONÇU DE MANIÈRE À SE CONFORMER AUX NORMES ANTIPOLLUTION DE LA LOI SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA. IL N'EST PAS DESTINÉ À SE CONFORMER AUX NORMES D'AUTRES PAYS.

* LE CALAGE DE L'ALLUMAGE INITIAL ET LE MÉLANGE D'INJECTION D'ESSENCE ONT ÉTÉ PRÉRÉGLÉS À L'USINE. N'EFFECTUEZ AUCUN RÉGLAGE LORS DE TRAVAUX D'ENTRETIEN RÉGULIERS.

AVERTISSEMENT: SÉREZ LE FREIN DE STATIONNEMENT POUR FAIRE L'ENTRETIEN OU LA RÉPARATION DU VÉHICULE.

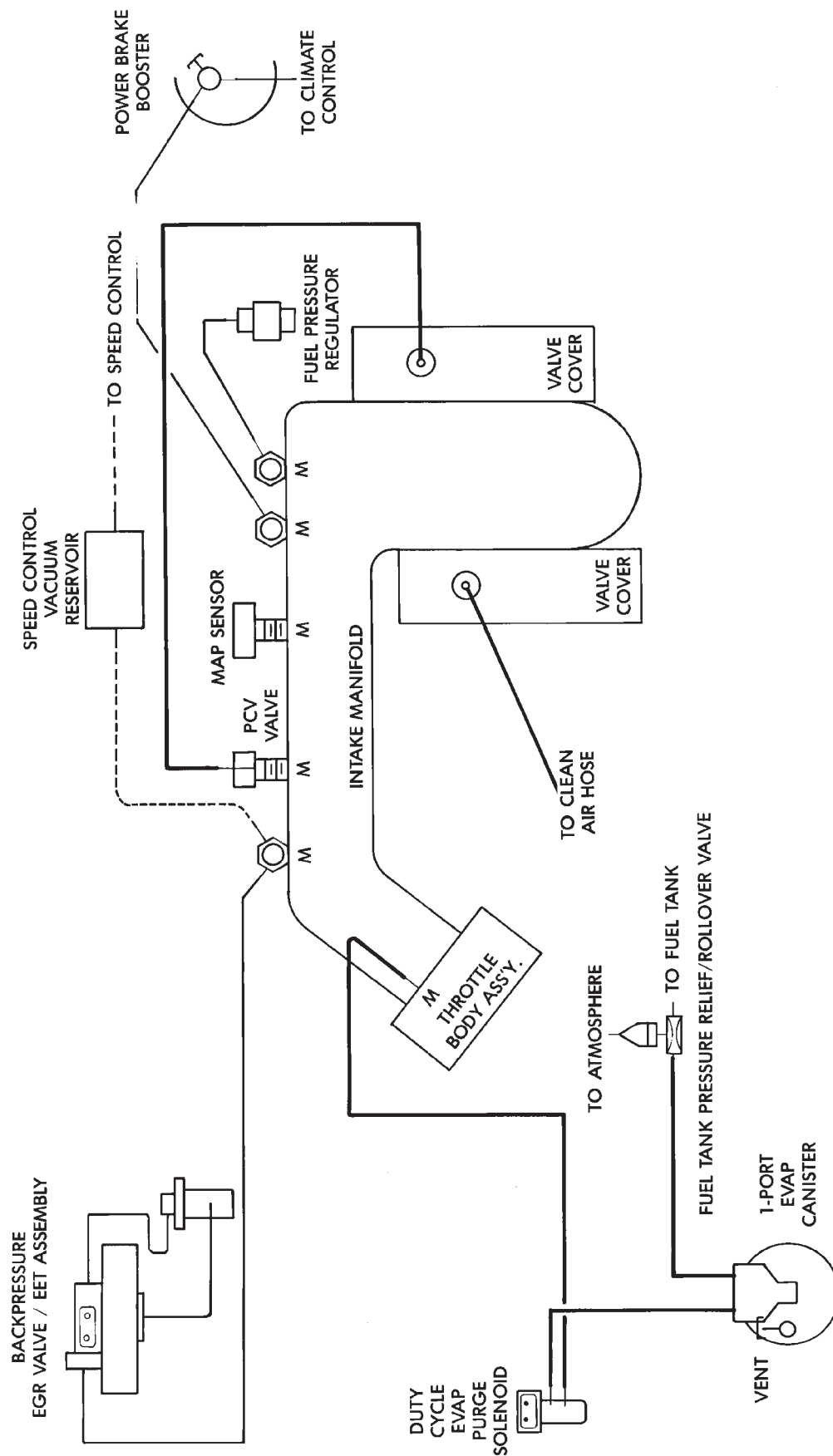
BOUGIES
ÉCARTEMENT 1.3 mm
RN16YC/RN14MC5

PAS DE RÉGLAGE NÉCESSAIRE

9325-30

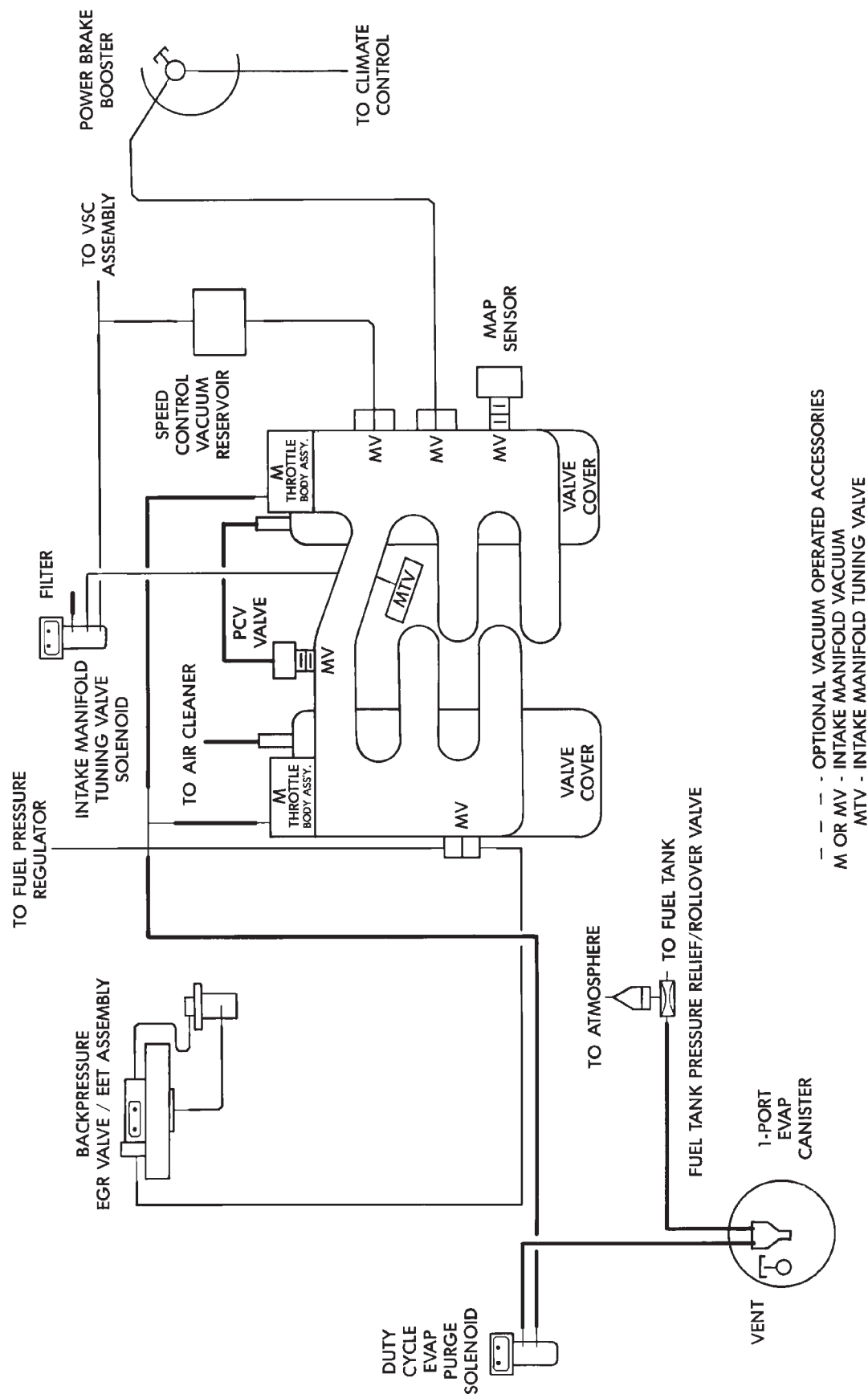


ENGINE VACUUM SCHEMATIC—3.3L ENGINE



--- - - - - OPTIONAL VACUUM OPERATED ACCESSORIES
M OR MV - INTAKE MANIFOLD VACUUM

COWL



— — — - OPTIONAL VACUUM OPERATED ACCESSORIES
M OR MV - INTAKE MANIFOLD VACUUM
MTV - INTAKE MANIFOLD TUNING VALVE



VACUUM HARNESS

When installing a new vacuum harness, follow the schematics for correct routing. On 3.5L engines, at the rear of the cylinder block, install the vacuum harness into the retaining clip and between the EGR tube and engine electrical harness (Fig. 2 and Fig. 3). Ensure the insulation on the vacuum harness contacts the insulation on the EGR tube.

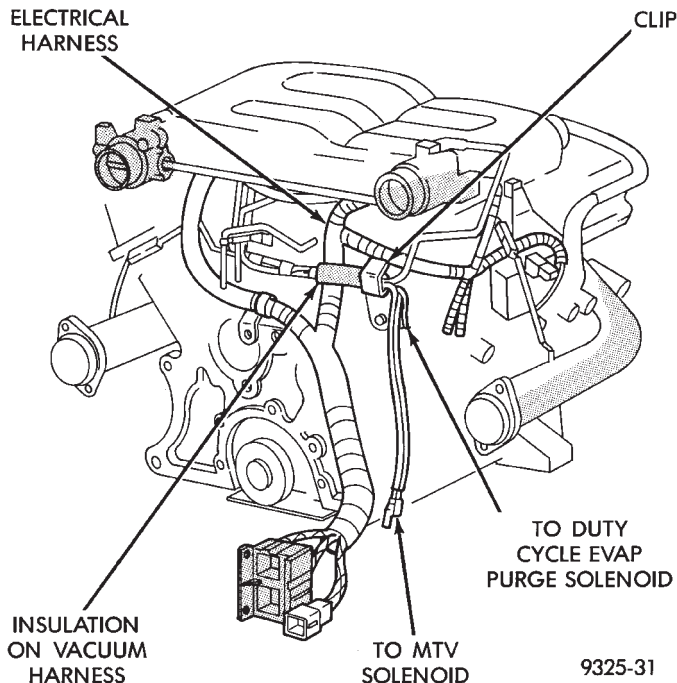


Fig. 2 Vacuum Harness—3.5L Engine

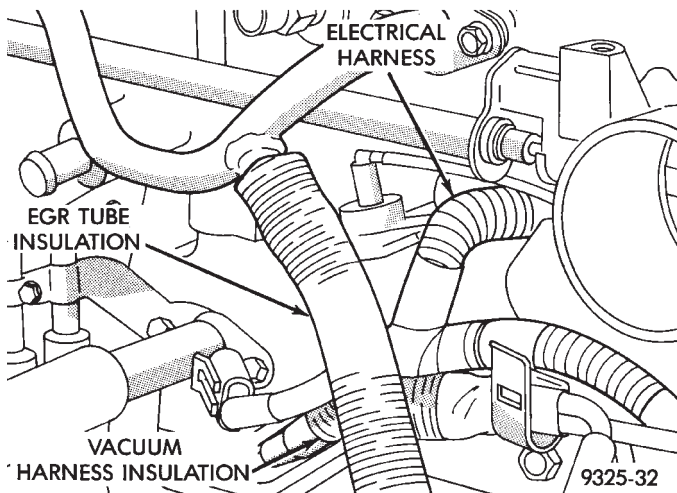


Fig. 3 Insulation on EGR Tube and Vacuum Harness

EVAPORATION CONTROL SYSTEM

The evaporation control system prevents the emission of fuel tank vapors into the atmosphere. When fuel evaporates in the fuel tank, the vapors pass through vent hoses or tubes to a charcoal canister. The canister temporarily holds the vapors. Through the EVAP purge solenoid, the powertrain control module (PCM) allows intake manifold vacuum to

draw vapors into the combustion chambers during certain operating conditions. The duty cycle EVAP purge solenoid regulates vapor flow from the canister to the engine.

The evaporative system uses specially manufactured hoses. If they need replacement, only use original equipment fuel resistant hose.

FUEL TANK PRESSURE RELIEF/ROLLOVER VALVE

All LH vehicles have a combination pressure relief/rollover valve and pass a 360° rollover without fuel leakage. The dual function valve relieves fuel tank pressure. The valve also prevents fuel flow through the fuel tank vent valve hoses should the vehicle rollover.

The pressure relief valve opens at a certain calibrated pressure. When fuel tank pressure increases above the calibrated pressure, the valve opens to release fuel tank vapors pressure. The evaporative (charcoal) canister stores the vapors.

The pressure relief/rollover valve also has a port to atmosphere. If fuel tank pressure exceeds a calibrated level the valve burps to atmosphere.

The pressure relief/rollover valve is installed in the top of the fuel pump module (Fig. 4). For pressure relief/rollover valve service, refer to the Fuel Delivery section of Group 14.

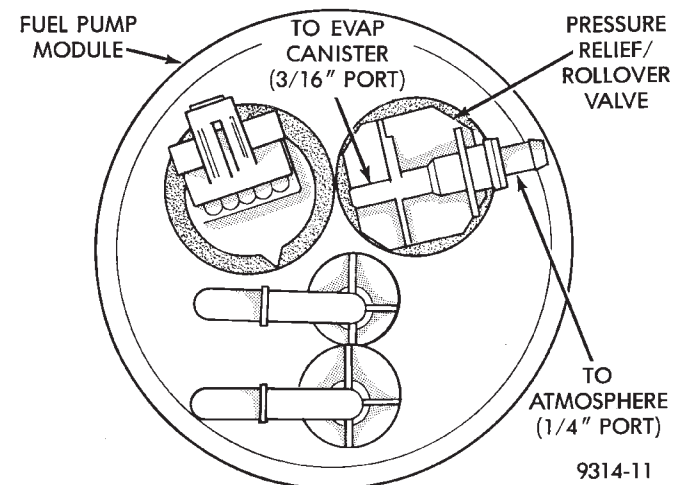


Fig. 4 Pressure Relief/Rollover Valve

EVAP CANISTER

All vehicles use a sealed, maintenance free, evaporative (EVAP) canister. Fuel tank pressure vents into the canister. The canister temporarily holds the fuel vapors until intake manifold vacuum draws them into the combustion chamber. The powertrain control module (PCM) operates the canister through the EVAP purge solenoid. The PCM purges the canister at predetermined intervals and engine conditions.

The canister mounts to a bracket below the air cleaner (Fig. 5). The canister protrudes through the



top of the bracket. The vacuum and vapor tube connect to the top of the canister (Fig. 6).

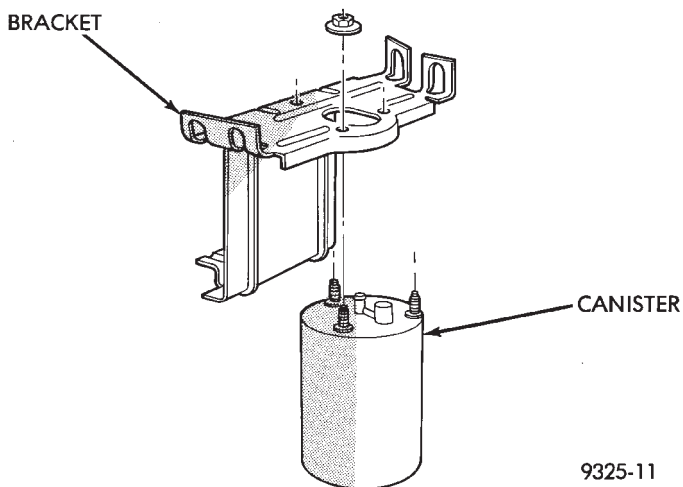


Fig. 5 EVAP Canister Bracket

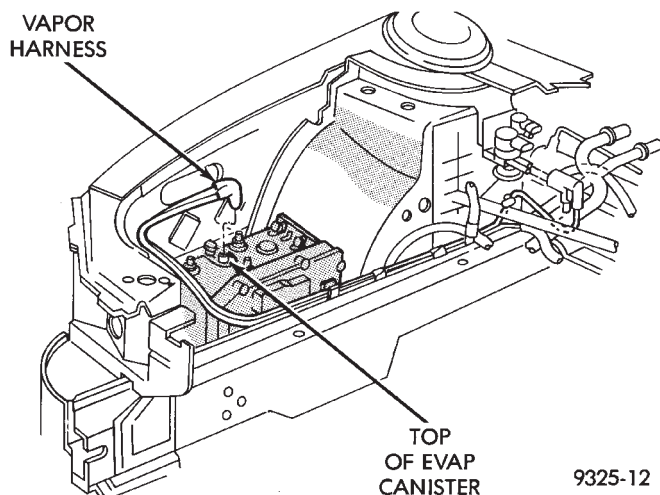


Fig. 6 EVAP Canister Location

DUTY CYCLE EVAP PURGE SOLENOID

The duty cycle EVAP purge solenoid regulates the rate of vapor flow from the EVAP canister to the throttle body. The powertrain control module (PCM) operates the solenoid.

During the cold start warm-up period and the hot start time delay, the PCM does not energize the solenoid. When de-energized, no vapors are purged. The PCM de-energizes the solenoid during open loop operation.

The engine enters closed loop operation after it reaches a specified temperature and the time delay ends. During closed loop operation, the PCM energizes and de-energizes the solenoid approximately 5 to 10 times per second, depending upon operating conditions. The PCM varies the vapor flow rate by changing solenoid pulse width. Pulse width is the amount of time the solenoid energizes. The PCM adjusts solenoid pulse width based on fuel requirements.

The EVAP purge solenoid and bracket attach to

the right inner fender well next to the dash panel (Fig. 7). The top of the solenoid has the word TOP on it. The solenoid will not operate unless it is installed correctly. If the vehicle has a 3.5L engine, the EVAP purge solenoid shares a bracket with the MTV solenoid.

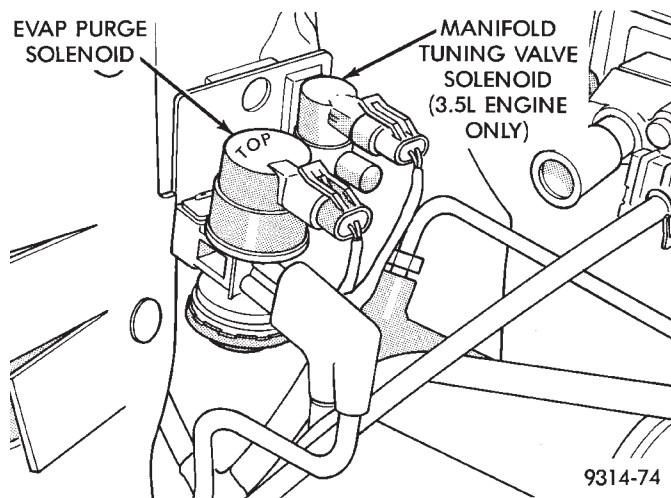


Fig. 7 EVAP Purge Solenoid

PRESSURE-VACUUM FUEL FILLER TUBE CAP

CAUTION: Remove the fuel filler cap to relieve fuel tank pressure before servicing fuel system components.

A pressure-vacuum relief cap seals the fuel tank (Fig. 8). Tightening the cap on the fuel filler tube forms a seal between them. The relief valves in the cap are a safety feature. They prevent possible excessive pressure or vacuum in the tank. Excessive fuel tank pressure could be caused by a malfunction in the system or damage to the vent lines.

The seal between the cap and filler tube breaks when the cap removed. Removing the cap breaks the seal and relieves fuel tank pressure.

If the filler cap needs replacement, only use an original equipment or equivalent unit.

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEMS

Intake manifold vacuum removes crankcase vapors and piston blow-by from the engine. Emissions pass through the PCV valve into the intake manifold plenum (Fig. 9 or Fig. 10). The vapors become part of the calibrated air-fuel mixture, are burned and expelled with the exhaust gases. The air cleaner supplies make up air when the engine does not have enough vapor or blow-by gases.

PCV VALVE

The Positive Crankcase Ventilation (PCV) valve contains a spring loaded plunger. The plunger meters

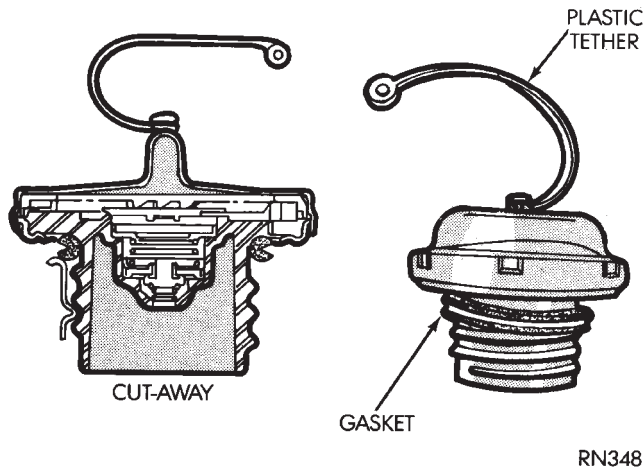


Fig. 8 Pressure Vacuum Filler Cap

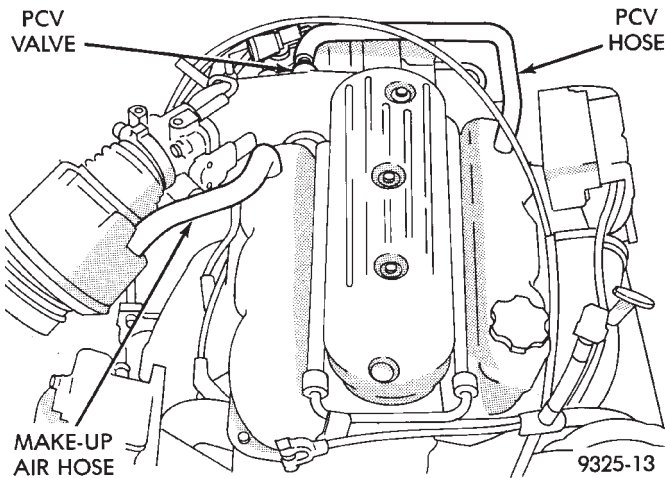


Fig. 9 PCV Valve—3.3L Engine

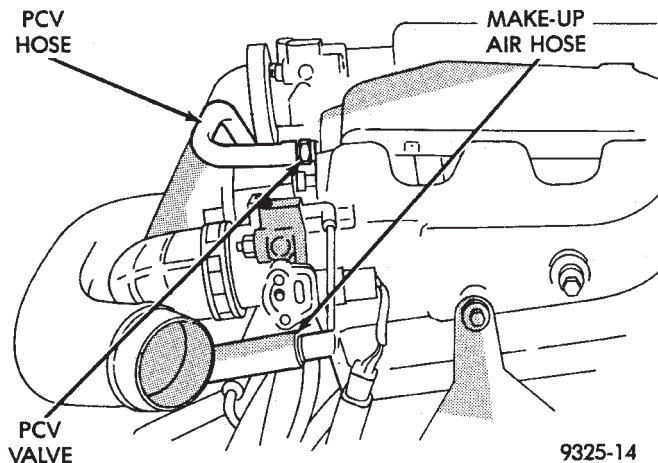


Fig. 10 PCV Valve—3.5L Engine

the amount of crankcase vapors routed into the combustion chamber based on intake manifold vacuum.

When the engine is not operating or during an engine backfire, the spring forces the plunger back against the seat. This prevents vapors from flowing through the valve (Fig. 11).

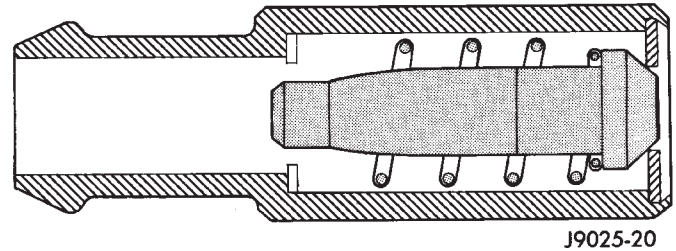


Fig. 11 Engine Off or Engine Backfire—No Vapor Flow

When the engine is at idle or cruising, high manifold vacuum is present. At these times manifold vacuum is able to completely compress the spring and pull the plunger to the top of the valve (Fig. 12). In this position there is minimal vapor flow through the valve.

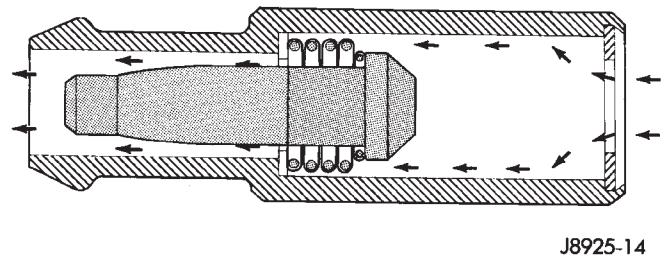


Fig. 12 High Intake Manifold Vacuum—Minimal Vapor Flow

During periods of moderate intake manifold vacuum the plunger is only pulled part way back from the inlet. This results in maximum vapor flow through the valve (Fig. 13).

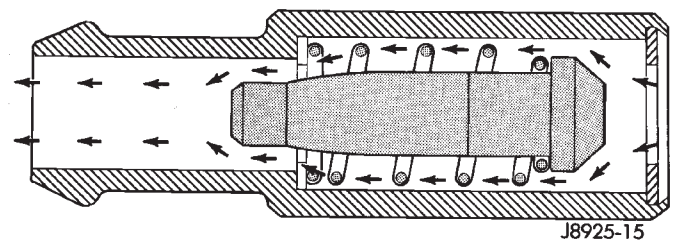


Fig. 13 Moderate Intake Manifold Vacuum—Maximum Vapor Flow

PCV SYSTEM INSPECTION

WARNING: APPLY PARKING BRAKE AND/OR BLOCK WHEELS BEFORE PERFORMING ANY TEST OR ADJUSTMENT WITH THE ENGINE OPERATING.

(1) With engine idling, remove the hose from the PCV valve. If the valve is not plugged, a hissing noise will be heard as air passes through the valve (Fig. 14 or Fig. 15). A strong vacuum should also be felt when a finger is placed over the valve inlet.

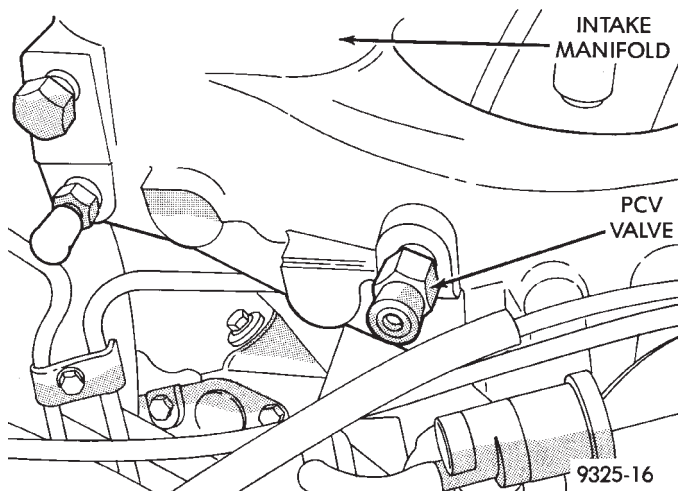


Fig. 14 PCV Valve—3.3L Engine

(2) Install hose on PCV valve. Remove the make-up air hose from the air plenum at the rear of the engine. Hold a piece of stiff paper (parts tag) loosely over the end of the make-up air hose.

(3) After allowing approximately one minute for crankcase pressure to reduce, the paper should draw up against the hose with noticeable force. If the engine does not draw the paper against the grommet after installing a new valve, replace the PCV valve hose.

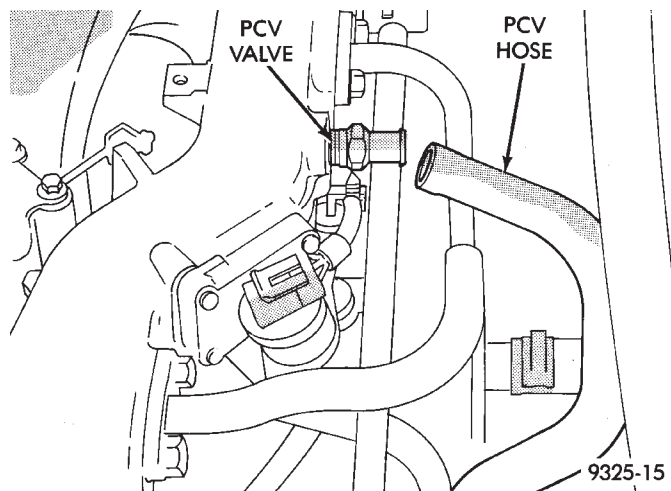


Fig. 15 PCV Valve—3.5L Engine

(4) Turn the engine off. Remove the PCV valve from intake manifold. The valve should rattle when shaken.

Replace the PCV valve and retest the system if it does not operate as described in the preceding tests. **Do not attempt to clean the old PCV valve.** If the valve rattles, apply a light coating of Loctite® Pipe Sealant With Teflon to the threads. Thread the PCV valve into the manifold plenum and tighten to 7 N•m (60 in. lbs.) torque.



EXHAUST EMISSION CONTROLS

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AIR CLEANER

LH vehicles do not use a heated air inlet system. The powertrain control module (PCM) adjusts fuel injector pulse width and ignition timing to compensate for different ambient temperatures.

The air cleaner attaches to the a bracket on right inner fender panel (Fig. 1). An opening in the body pane connect the inlet duct to ambient air.

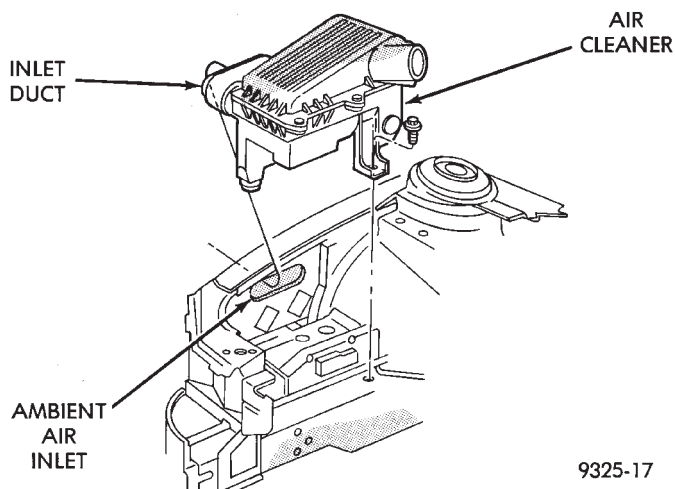


Fig. 1 Air Cleaner and Mounting Bracket

The 3.3L air induction system uses a resonator between the air cleaner and throttle body (Fig. 2). The make-up air hose for the PCV system attaches to the resonator.

The 3.5L air induction system has a plenum that supplies filtered air to the throttle bodies, idle air control motor and PCV make-up air circuit (Fig. 3).

FILTER ELEMENT REPLACEMENT

- (1) Remove air cleaner lid attaching screws. Lift lid off of air cleaner housing.
- (2) Remove filter element (Fig. 4).
- (3) If necessary, clean the inside of the air cleaner housing.
- (4) Install new filter element.
- (5) Place lid over air cleaner housing. Tighten screws.

HEATED OXYGEN SENSORS

The fuel injection system uses two heated oxygen sensors. Both sensors monitor the amount of oxygen in the exhaust gas stream. The oxygen sensors are

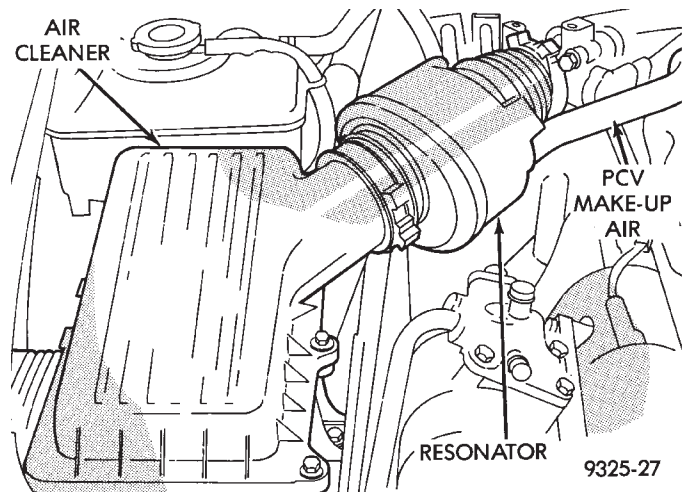


Fig. 2 Air Induction System—3.3L Engine

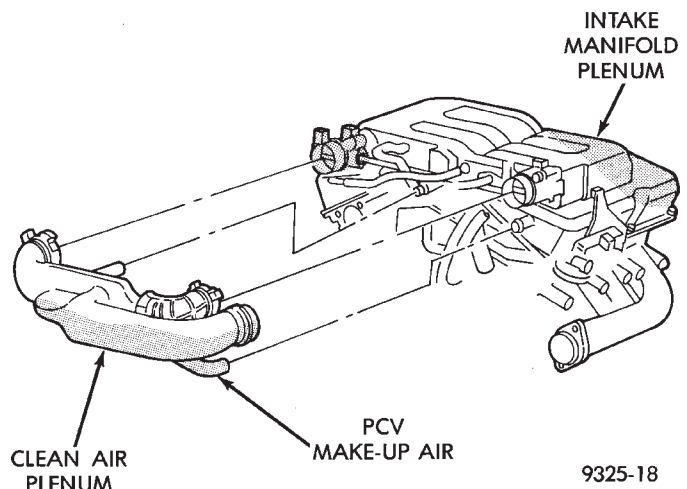


Fig. 3 Clean Air Plenum—3.5L Engine

mounted in the exhaust manifolds (Fig. 5 or Fig. 6). The left sensor monitors the odd numbered cylinders. The right sensor monitors the even numbered cylinders.

The inputs from the oxygen sensors tell the powertrain control module (PCM) the oxygen content of the exhaust gas. Based on the inputs from the two oxygen sensors, the PCM fine tunes the air-fuel ratio in each cylinder bank by adjusting injector pulse width.

The heated oxygen sensors produce from 0 to 1 volt, depending upon the oxygen content of the exhaust gas in the exhaust manifold. When a large amount of oxygen is present (caused by a lean air-

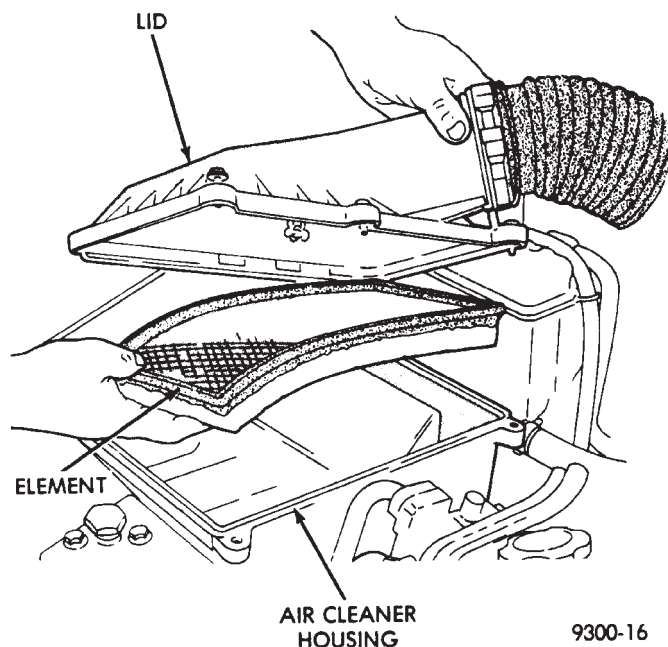


Fig. 4 Air Cleaner Housing and Element

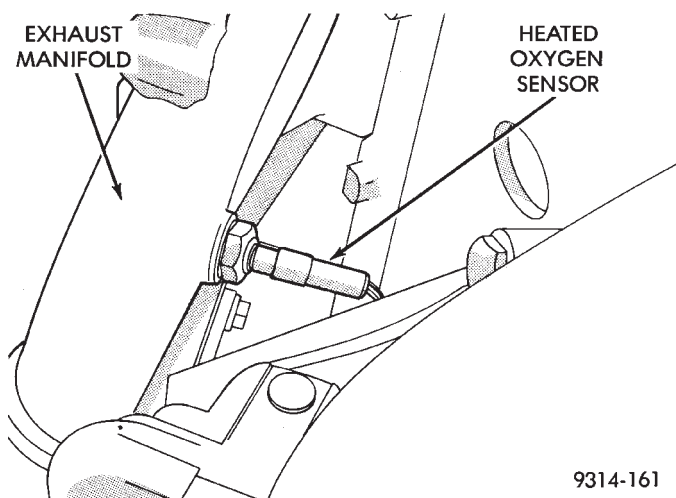


Fig. 5 Heated Oxygen Sensor—3.3L Engine

fuel mixture), the sensors produce voltages as low as 0.1 volt. When there is a lesser amount of oxygen present (rich air-fuel mixture) the sensor produces a voltage as high as 1.0 volt. By monitoring the oxygen content and converting it to electrical voltage, the sensor acts as a rich-lean switch.

The oxygen sensors are equipped with a heating element. The heating element keeps the sensor at proper operating temperature during all operating modes. Maintaining correct sensor temperature at all times allows the system to enter into closed loop operation sooner. Also, it allows the system to remain in closed loop operation during periods of extended idle.

In Closed Loop operation the PCM monitors the inputs from the heated oxygen sensors (along with

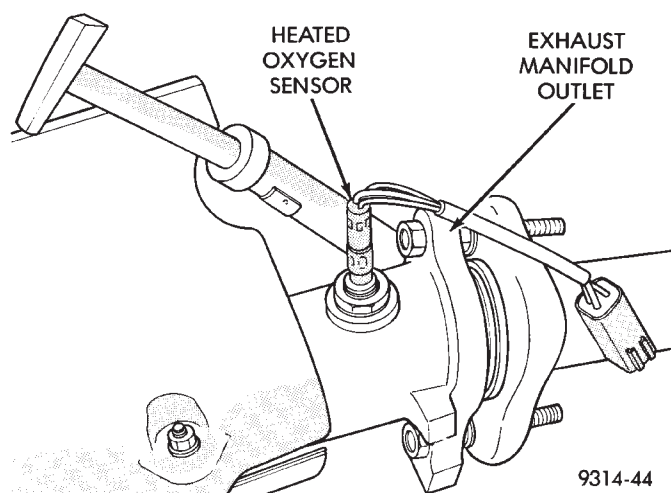


Fig. 6 Heated Oxygen Sensor—3.5L Engine

other inputs) and adjusts the injector pulse width accordingly. During Open Loop operation the PCM ignores the inputs from the heated oxygen sensors. The PCM adjusts injector pulse width based on preprogrammed (fixed) values and inputs from other sensors.

REMOVAL—3.3L ENGINE

The 3.3L engine uses two heated oxygen sensors, one in each exhaust manifold. The sensors point toward the engine block. For access to the right side sensor, remove the air cleaner resonator and hose.

- (1) Disconnect electrical connector.
- (2) Use a crow-foot wrench or open end wrench to remove heated oxygen sensor (Fig. 7).

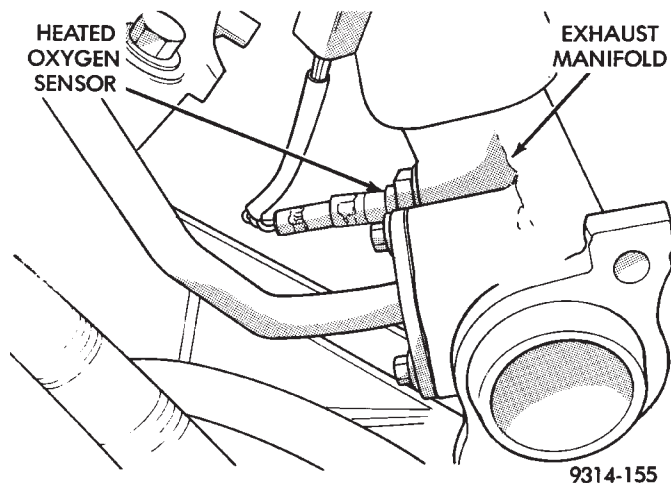


Fig. 7 Heated Oxygen Sensor Removal/Installation—3.3L Engine

After removing the sensor, the exhaust manifold threads must be cleaned with an 18 mm X 1.5 + 6E tap. If reusing the original sensor, coat the sensor threads with an anti-seize compound such as Loctite® 771-64 or equivalent. New sensors have compound on the threads and do not require an additional coating. Tighten the sensor to 28 N•m (20 ft. lbs.) torque.



REMOVAL—3.5L ENGINE

The 3.5L engine uses two heated oxygen sensors, one in each exhaust manifold.

(1) To access the heated oxygen sensor on the right exhaust manifold, remove the air cleaner tube.

(2) Disconnect the heated oxygen sensor electrical sensor.

(3) Use a crow-foot wrench or tool C-4907 to remove oxygen sensor (Fig. 8).

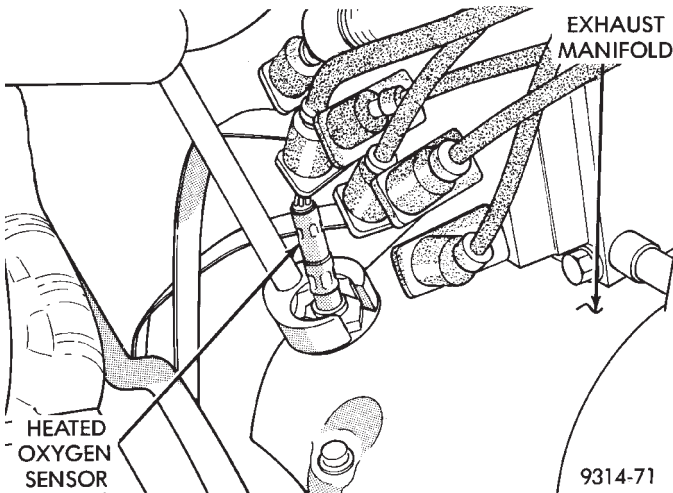


Fig. 8 Heated Oxygen Sensor Removal/Installation—3.5L Engine

After removing the sensor, the exhaust manifold threads must be cleaned with an 18 mm X 1.5 + 6E tap. If reusing the original sensor, coat the sensor threads with an anti-seize compound such as Loctite® 771-64 or equivalent. New sensors have compound on the threads and do not require an additional coating. Tighten the sensor to 28 N•m (20 ft. lbs.) torque.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM

The EGR system reduces oxides of nitrogen (NOx) in engine exhaust and helps prevent spark knock. The system allows a predetermined amount of hot exhaust gas to recirculate and dilute the incoming air/fuel mixture. The diluted air/fuel mixture reduces peak flame temperature during combustion.

The EGR system consists of (Fig. 9 or Fig. 10):

- EGR tube (connects a passage in the intake manifold to the exhaust manifold)
- EGR valve
- Electronic EGR Transducer (EET)
- Connecting hoses

The electronic EGR transducer (EET) contains an electrically operated solenoid and a back-pressure transducer (Fig. 9 or Fig. 10). The powertrain control module (PCM) operates the solenoid. The PCM determines when to energize the solenoid. Exhaust system back-pressure controls the transducer.

When the PCM energizes the solenoid, vacuum does not reach the transducer. Vacuum flows to the transducer when the PCM de-energizes the solenoid.

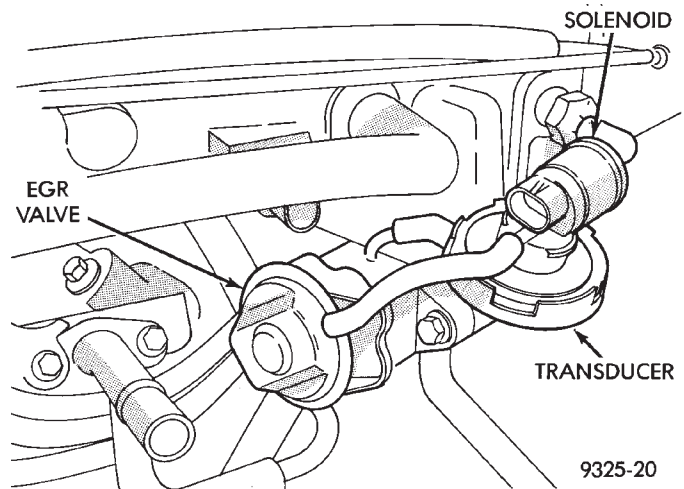


Fig. 9 EGR System—3.3L Engine

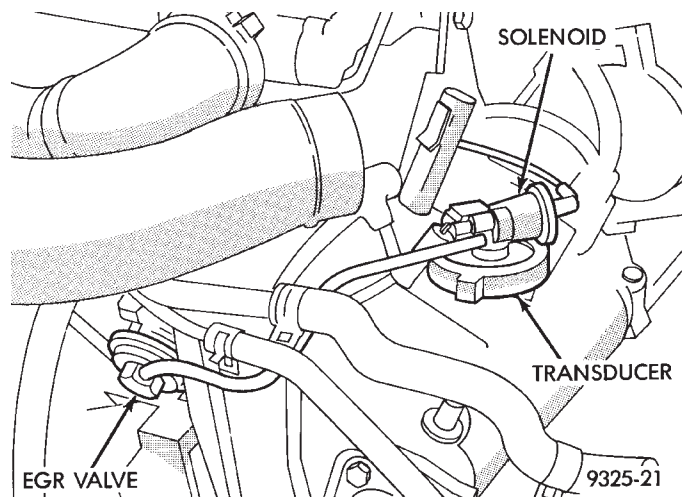


Fig. 10 EGR System—3.5L Engine

When exhaust system back-pressure becomes high enough, it fully closes a bleed valve in the transducer. When the PCM de-energizes the solenoid and back-pressure closes the transducer bleed valve, vacuum flows through the transducer to operate the EGR valve.

De-energizing the solenoid, but not fully closing the transducer bleed hole (because of low back-pressure), varies the strength of vacuum applied to the EGR valve. Varying the strength of the vacuum changes the amount of EGR supplied to the engine. This provides the correct amount of exhaust gas recirculation for different operating conditions.

This system does not allow EGR at idle. The EGR systems can operate at all coolant temperatures above 40°F.

EGR SYSTEM ON-BOARD DIAGNOSTICS (CALIFORNIA VEHICLES)

The powertrain control module (PCM) performs an on-board diagnostic check of the EGR system on California vehicles. The diagnostic system uses the Electric EGR Transducer (EET) for the system tests.



The diagnostic check activates only during selected engine/driving conditions. When the conditions are met, the PCM energizes the transducer solenoid to disable the EGR. The PCM checks for a change in the oxygen sensor signal. If the air-fuel mixture goes lean, the PCM attempts to enrichen the mixture. The PCM registers a fault if the EGR system has failed or degraded. After registering a fault, the PCM turns the on Malfunction Indicator Lamp (instrument Check Engine light). The lamp indicates the need for immediate service.

If the Malfunction Indicator Lamp turns on and the PCM stored an EGR fault, check for proper operation of the EGR system. Use the System Test, EGR Gas Flow Test and EGR Diagnosis Chart. If the EGR system tests properly, check the system using the DRBII scan tool. Refer to the DRBII scan tool and the appropriate Powertrain Diagnostics Procedure manual.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM TEST—3.3L ENGINE

WARNING: APPLY PARKING BRAKE AND/OR BLOCK WHEELS BEFORE PERFORMING EGR SYSTEM TEST.

A failed or malfunctioning EGR system can cause engine spark knock, sags or hesitation, rough idle, and/or engine stalling. To ensure proper operation of the EGR system, all passages and moving parts must be free of deposits that could cause plugging or sticking. Ensure that the system hoses does not leak. Replace leaking components.

Inspect hose connections between intake manifold, EGR solenoid and transducer, and the EGR valve. Replace hardened, cracked, or damaged hoses. Repair or replace faulty connectors.

Check the EGR control system and EGR valve with the engine fully warmed up and running (engine coolant temperature over 170°F). With the transmission in neutral and the throttle closed, allow the engine to idle for 70 seconds. Abruptly accelerate the engine to approximately 2000 rpm, but not over 3000 rpm. The EGR valve stem should move when accelerating the engine (the relative position of the groove on the EGR valve stem should change). Repeat the test several times to confirm movement. If the EGR valve stem moves, the control system is operating normally. If the control system is not operating normally, refer to the EGR Diagnosis Chart to determine the cause.

EGR GAS FLOW TEST—3.3L ENGINE

Use the following procedure to determine if exhaust gas is flowing through the EGR system.

Connect a hand vacuum pump to the EGR valve vacuum motor. With engine running at idle speed, slowly apply vacuum. Engine speed should begin to

drop when applied vacuum reaches 2.0 to 3.5 inches. Engine speed may drop quickly or engine may even stall. This indicates that EGR gas is flowing through the system.

If both the EGR Gas Flow Check, System Check and Diagnosis Chart are completed satisfactorily, then the EGR system functions normally.

If engine speed does not drop off when performing the test, remove both the EGR valve and EGR tube and check for plugged passages. Check and if necessary, clean these components for restoration of proper flow. Replace as necessary.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM TESTING—3.5L ENGINE

WARNING: APPLY PARKING BRAKE AND/OR BLOCK WHEELS BEFORE PERFORMING EGR SYSTEM TEST.

A failed or malfunctioning EGR system could cause engine spark knock, and possibly sags or hesitation, rough idle, and stall the engine. To ensure proper operation of the EGR system, all passages and moving parts must be free of deposits that could cause plugging or sticking. Ensure that the system hoses does not leak. Replace leaking components.

Inspect hose connections between intake manifold, EGR solenoid and transducer, and the EGR valve. Replace hardened, cracked, or damaged hoses. Replace faulty hoses.

TESTING ELECTRONIC EGR TRANSDUCER SOLENOID—3.5L ENGINE

(1) Ensure manifold vacuum flows to the electronic EGR transducer.

Use the DRBII scan tool's Actuators screen to test the solenoid on the electronic EGR transducer (EET). Refer to the appropriate Powertrain Diagnostic Manual.

(2) Disconnect the vacuum supply hose from the transducer. Tee a vacuum gauge between the transducer and hose. Start the vehicle. There should be a minimum of 15 inches of vacuum supplied to the solenoid. If vacuum is low, check for kinked or twisted hoses and leaking hoses or hose connections.

(3) Actuate the solenoid using the DRBII scan tool. The solenoid should click when turned on and off. As the solenoid cycles, it should shut vacuum to the transducer on and off. Replace the EGR valve and transducer/solenoid if the solenoid operates incorrectly. If the solenoid operates correctly, test the transducer.

TESTING EGR TRANSDUCER—3.5L ENGINE

(1) Disconnect the vacuum hose and back-pressure hose from the transducer. Disconnect the electrical connector from the solenoid.



EGR DIAGNOSIS CHART—3.3L ENGINE

**ALL TESTS MUST BE MADE WITH FULLY WARM ENGINE RUNNING
CONTINUOUSLY FOR AT LEAST TWO MINUTES.**

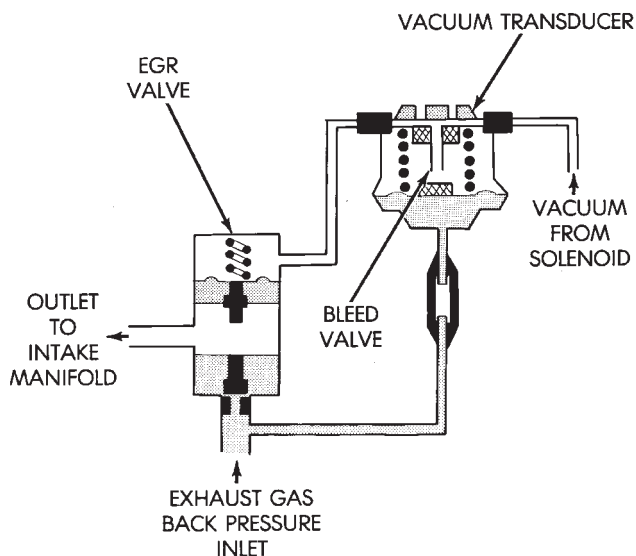
WARNING: APPLY PARKING BRAKE AND/OR BLOCK WHEELS BEFORE PERFORMING TESTS.

Condition	Possible Cause	Correction
EGR VALVE STEM DOES NOT MOVE ON SYSTEM TEST.	(a) Cracked, leaking, disconnected or plugged hoses.	(a) Verify correct hose connections and leak check and confirm that all hoses are open. If defective hoses are found, replace hose harness. (b) Disconnect hose harness from EGR vacuum transducer and connect auxiliary vacuum supply. Raise engine rpm to 2000 rpm and hold. Apply 10" Hg vacuum while checking valve movement. If no valve movement occurs, replace valve/transducer assy. If valve opens (approx. 3 mm or 1/8" travel), hold supply vacuum to check for diaphragm leakage. Valve should remain open 30 seconds or longer. If leakage occurs, replace valve/transducer assy. If valve is satisfactory, check control system.
EGR VALVE STEM DOES NOT MOVE ON SYSTEM TEST. OPERATES NORMALLY ON EXTERNAL VACUUM SOURCE.	(a) Defective control system — plugged passages. (b) Defective control system — solenoid or solenoid control circuit.	(a) Remove throttle body and inspect port (slot type) in throttle bore and associated passage in throttle body. Use suitable solvent to remove deposits and check for flow with light air pressure. Normal operation should be restored to EGR system. (b) Refer to the DRB II scan tool and the appropriate Powertrain Diagnostic Manual.
ENGINE WILL NOT IDLE. DIES OUT ON RETURN TO IDLE OR IDLE IS VERY ROUGH OR SLOW.	(a) High EGR valve leakage in closed position. (b) EGR tube to intake manifold leak. (c) Solenoid or control signal to solenoid failure.	(a) If removal of vacuum hose from EGR valve does not correct rough idle, (a1) Turn engine off. Remove the air cleaner exposing the inlet to the throttle body. (a2) Disconnect the backpressure hose from the EGR valve. (a3) Using a nozzle with a rubber grommet connection, direct compressed air (50 to 60 psi) down through the steel backpressure tube on the EGR valve while opening and closing the throttle blade. (a4) If the sound from the compressed air changes distinctly in step a3, the poppet is leaking and air is entering the intake manifold. Replace the EGR valve. (b) Remove tube and visually inspect tube seal on gasket. Tube end should be uniformly indented on gasket with no signs of leak. If signs of exhaust gas leakage are present, replace gaskets and tighten flange nuts to 23 N·m (200 in. lbs.). If an intake plenum leak persists, replace EGR tube and gaskets, following installation instructions. (c) Verify correct hose connections and leak check and confirm that all hoses are open. If defective hoses are found, replace hose harness. (c1) Refer to the DRB II scan tool and the appropriate Powertrain Diagnostic Manual.

**NOTE: DO NOT ATTEMPT TO CLEAN BACKPRESSURE EGR VALVE, REPLACE
ENTIRE VALVE/TRANSDUCER ASSEMBLY IF NECESSARY.**



- (2) Plug the transducer output port (Fig. 11).
- (3) Apply 1 to 2 PSI of air pressure to the transducer back-pressure port. Use a hand held air pump or compressed air regulated to 2 PSI.
- (4) Apply a minimum of 12 inches of vacuum to the other side of the transducer. Replace the EGR valve and transducer/solenoid if the transducer does not momentarily hold vacuum then slowly bleed off.



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Fig. 11 EGR Transducer Operation

TESTING THE EGR VALVE—3.5L ENGINE

- (1) Remove the EGR valve from the engine. Refer to EGR System Service.
- (2) While applying at least 15 inches of vacuum to the EGR valve diaphragm, check for movement of the valve stem.
 - If the stem does not move, replace the EGR valve and transducer/solenoid as an assembly.
 - If the stem moves approximately 3 mm (1/8 inch), maintain vacuum supply to diaphragm. The valve should remain open for approximately 30 seconds or more. If the valve leaks, replace the EGR valve and transducer/solenoid.
- (3) If the EGR valve operates correctly, check for blockage in the port on the rear of the cylinder head. The port connects the EGR valve to the exhaust port of rear cylinder. Also, check for blockage in the EGR valve back-pressure tube (to transducer).

EGR SYSTEM SERVICE

If the EGR system operates incorrectly, replace the entire EGR valve and transducer together. The EGR valve and electrical transducer (EET) are calibrated to match each other.

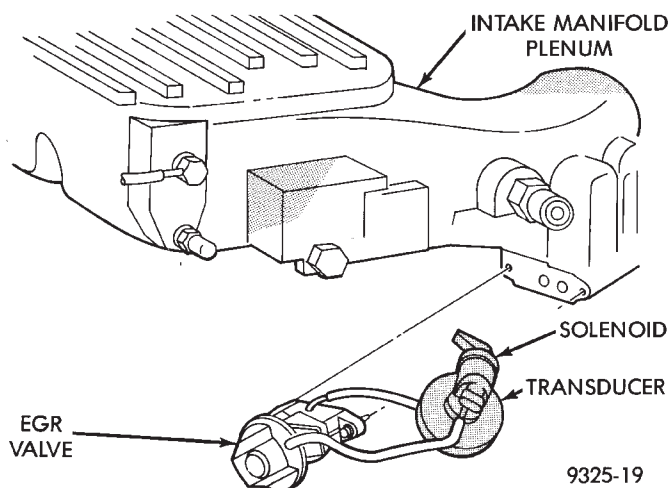
REMOVAL—3.3L ENGINE

The EGR valve and EET attach to the rear of the intake manifold (Fig. 12).

- (1) Disconnect EET solenoid from vacuum fitting on manifold (Fig. 12).
- (2) Disconnect electrical connector from solenoid.
- (3) Remove EGR valve mounting screws.
- (4) Remove EGR valve and transducer.
- (5) Clean gasket surfaces. Discard old gasket. If necessary, clean EGR passages.

INSTALLATION—3.3L ENGINE

- (1) Install EGR valve and new gasket on intake manifold. Tighten mounting screws to 22 N•m (200 in. lbs.) torque.
- (2) Connect EET solenoid to vacuum fitting on manifold.
- (3) Attach electrical connector to solenoid.

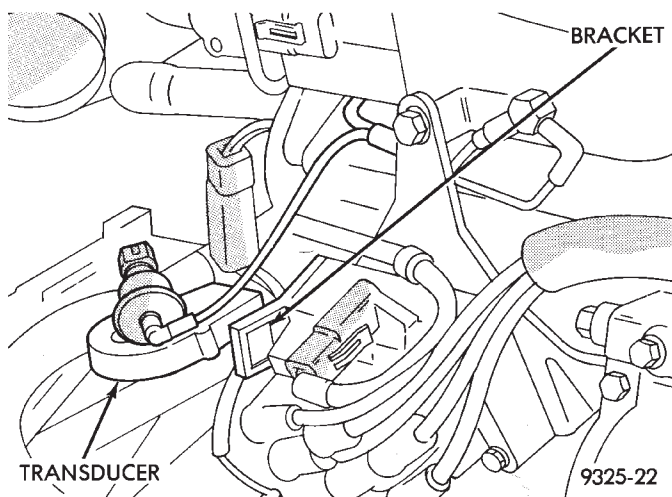


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Fig. 12 EGR Valve and Transducer—3.3L Engine

REMOVAL—3.5L ENGINE

- (1) Disconnect vacuum tube from EET solenoid (Fig. 13).



9325-22

Fig. 13 Electronic EGR Transducer—3.5L Engine



- (2) Disconnect electrical connector from solenoid.
- (3) Slide transducer up and out of mounting bracket.
- (4) Loosen, but do not remove, the EGR tube to intake manifold screws (Fig. 14).

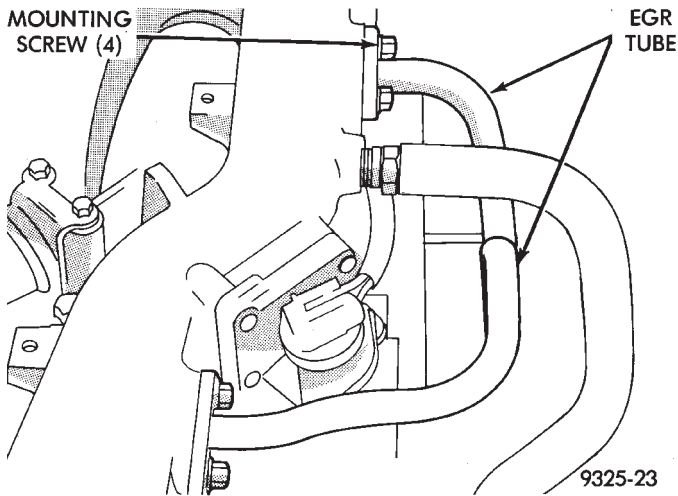


Fig. 14 EGR Tube Upper Mounting Screws

The EGR valve attaches to the rear of the right cylinder head (Fig. 15).

- (5) Remove EGR tube lower screws at EGR valve (Fig. 15).
- (6) Remove EGR valve mounting screws.
- (7) Remove EGR valve and transducer.
- (8) Clean gasket surfaces. Discard old gasket. If necessary, clean EGR passages.

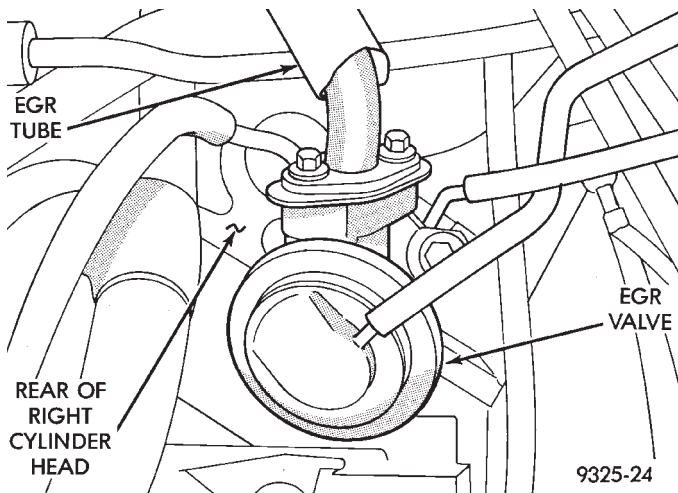


Fig. 15 EGR Valve—3.5L Engine

INSTALLATION—3.5L ENGINE

- (1) Install EGR valve and new gasket on cylinder head. Tighten mounting screws to 22 N•m (200 in. lbs.) torque.
- (2) Using a new gasket, attach EGR tube to EGR valve. Tighten mounting screws to 11 N•m (95 in. lbs.) torque.

- (3) Tighten EGR tube to intake manifold plenum screws to 22 N•m (200 in. lbs.) torque.

- (4) Connect EET solenoid to vacuum fitting on manifold.

- (5) Slide transducer into bracket.

- (6) Attach electrical connector to solenoid.

EGR TUBE—3.3L ENGINE

The EGR tube attaches to the intake manifold plenum below the throttle body and the right exhaust manifold (Fig. 16).

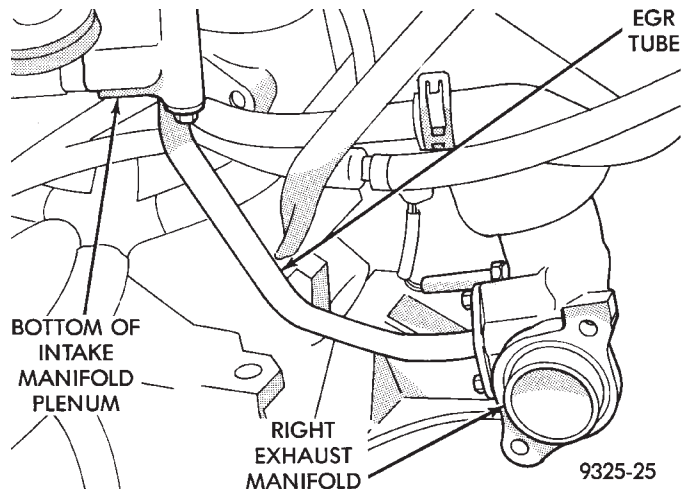


Fig. 16 EGR Tube—3.3L Engine

REMOVAL

- (1) Remove EGR tube mounting screws at intake manifold plenum (Fig. 17).

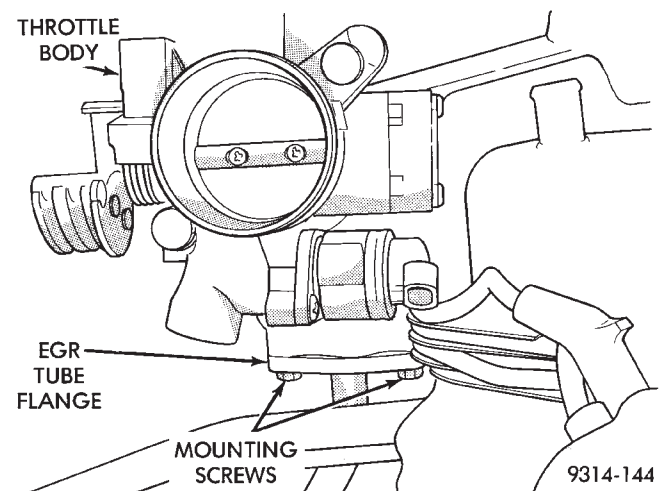


Fig. 17 EGR Tube Upper Mounting Screws

- (2) Remove EGR tube mounting screws at exhaust manifold.

- (3) Remove EGR tube. Clean gasket surfaces on the intake manifold plenum and exhaust manifold.

INSTALLATION—3.3L ENGINE

- (1) Using new gaskets, loosely install the EGR tube and mounting screws.



(2) Tighten the EGR tube to intake manifold plenum screws to 22 N—m (200 in. lbs.) torque.

(3) Tighten the EGR tube to exhaust manifold screws to 22 N—m (200 in. lbs.) torque.

EGR TUBE—3.5L ENGINE

The EGR tube attaches to the both sides of the intake manifold plenum and to the EGR valve (Fig. 18).

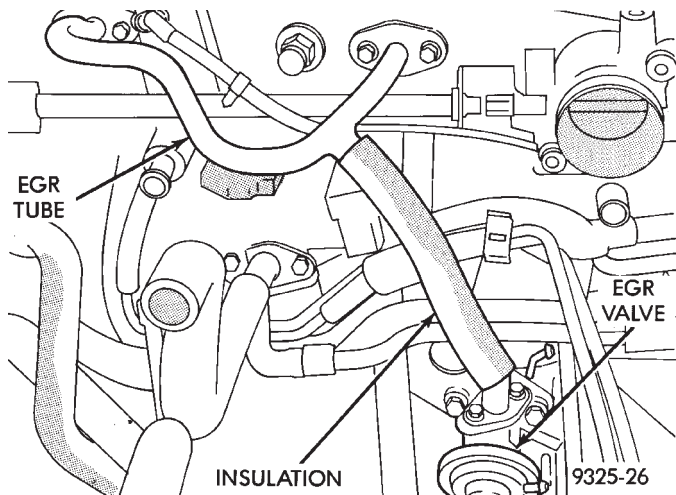


Fig. 18 EGR Tube—3.5L Engine

REMOVAL

(1) Remove air cleaner plenum from rear of engine.

(2) Remove EGR tube to EGR valve screws (Fig. 15).

(3) Remove EGR tube to intake manifold plenum screws (Fig. 14).

(4) Remove EGR tube. Discard gaskets.

(5) Clean gasket surfaces.

INSTALLATION

(1) Loosely install EGR tube with new gaskets. Finger tighten EGR tube mounting screws.

(2) Tighten EGR tube to EGR valve screws to 11 N•m (95 in. lbs.) torque.

(3) Tighten EGR tube to intake manifold plenum screws to 22 N•m (200 in. lbs.) torque.

(4) Ensure the insulation on the EGR tube aligns with and contacts the insulation on the vacuum harness at the rear of the engine (Fig. 19).

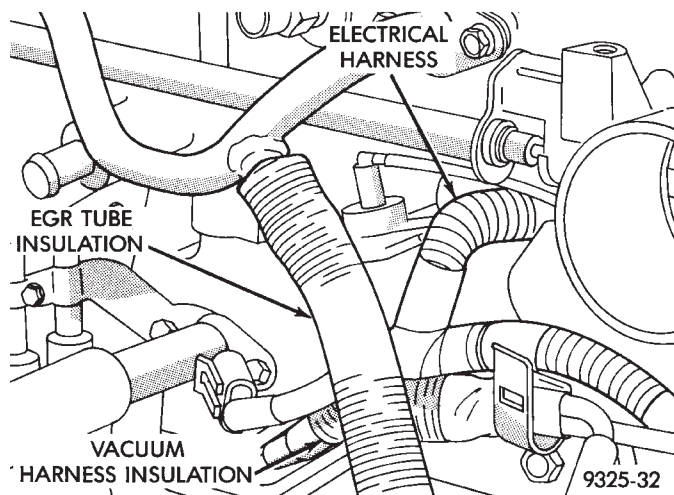


Fig. 19 Insulation on EGR Tube and Vacuum Harness