CHRYSLER CORP. EXHAUST GAS RECIRCULATION

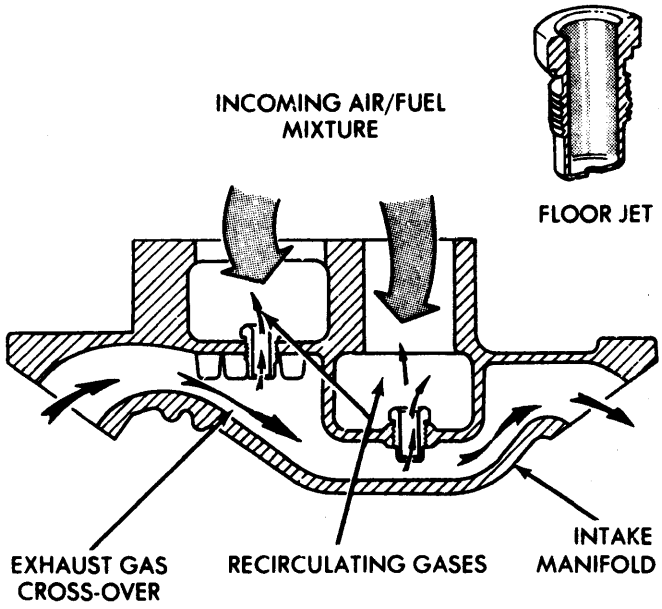
DESCRIPTION

Exhaust gas recirculation allows a predetermined amount of hot exhaust gas to recirculate and dilute incoming air/fuel mixture. This diluting of air/fuel mixture reduces peak flame temperature during combustion, thereby reducing NOx (Oxides of Nitrogen).

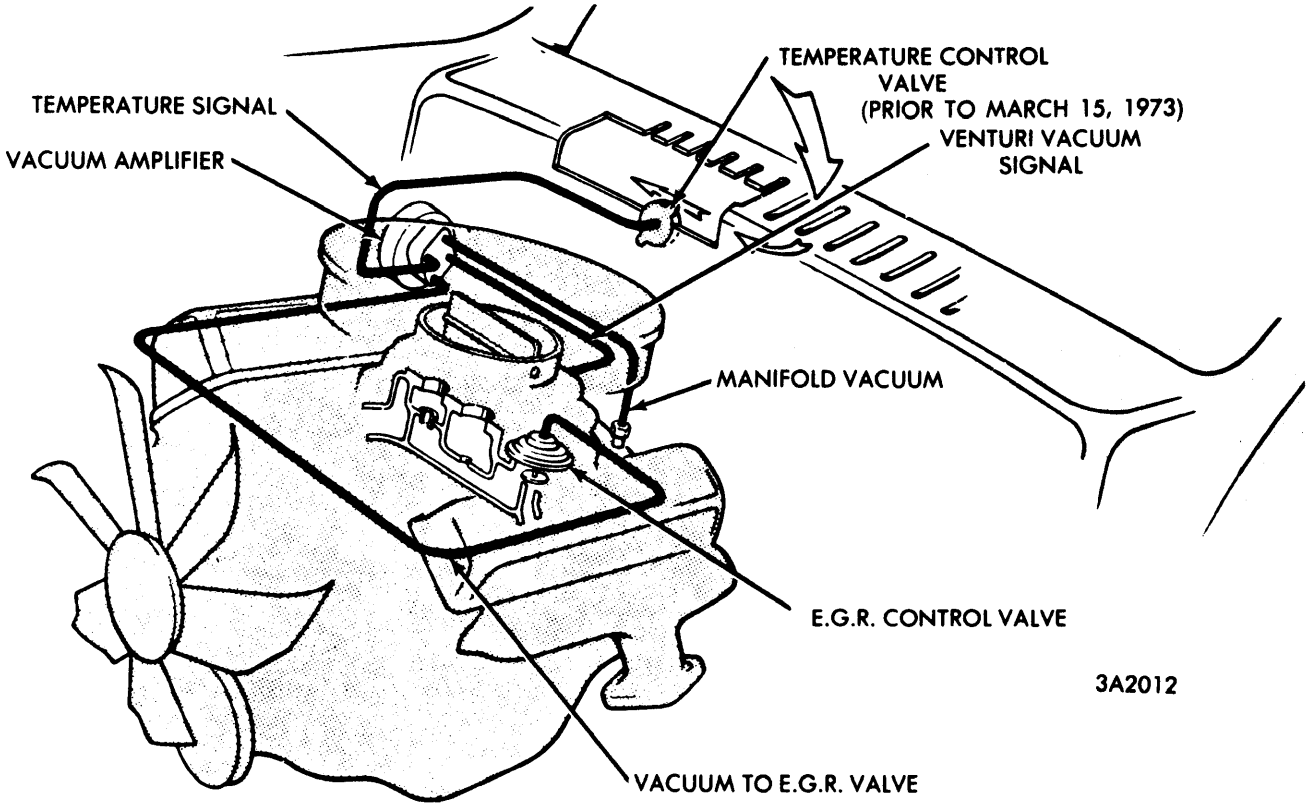
OPERATION

Three alternate systems are used, depending on engine, emission requirements and year of application. Systems are Floor Jet, Ported Vacuum Control, and Venturi Vacuum Control. Each system, except Floor Jet type, use same type of E.G.R. control valve; only method of controlling valve is different. The E.G.R. valve is a vacuum actuated poppet type used to modulate exhaust gas flow from manifold crossover into incoming air/fuel mixture.

Floor Jet System – Floor Jet E.G.R. was first used in 1972. Exhaust gases enter intake manifold through floor jets in bottom of manifold. An orifice in each jet allows a controlled amount of exhaust gas to be drawn up through ports by engine vacuum to mix with incoming air/fuel mixture. Only cleaning and inspection of jet orifices are required to maintain this system. *NOTE – Floor jets are non-magnetic, stainless steel. Care should be taken so jets do not fall into manifold during removal and installation.*



E.G.R. FLOOR JET SYSTEM



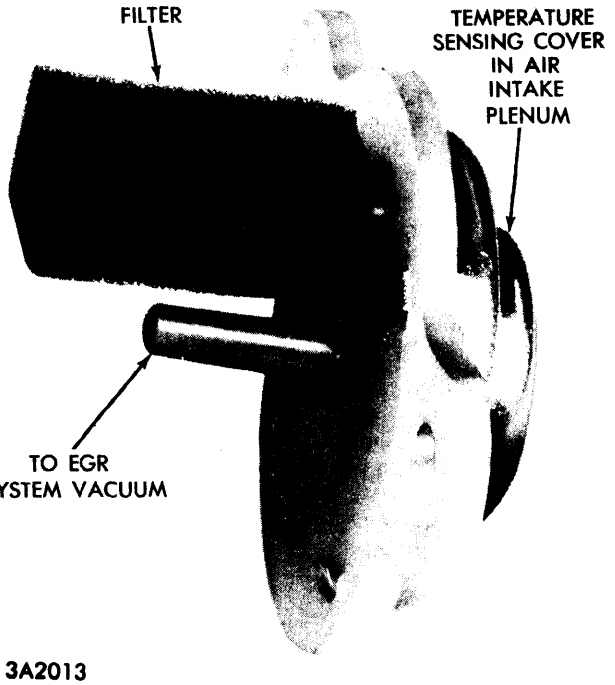
EXHAUST GAS RECIRCULATION (VENTURI SYSTEM)

CHRYSLER CORP. EXHAUST GAS RECIRCULATION (Cont.)

Venturi Vacuum Control System – A vacuum tap at throat of carburetor venturi is used to provide control vacuum. Because of the low amount of vacuum, it is necessary to use a vacuum amplifier to increase vacuum to a level required to operate E.G.R. valve. Elimination of recycle at wide open throttle is accomplished by a dump diaphragm which compares venturi and manifold vacuum to determine when wide open throttle is reached. At wide open throttle, the internal reservoir is "dumped", limiting output to E.G.R. valve opening point. Opening point is set above manifold vacuum available at wide open throttle, permitting E.G.R. valve to be closed at wide open throttle.

Ported Vacuum Control System – A slot type port in carburetor throttle body, which is exposed to an increasing percentage of manifold vacuum as throttle valve opens, provides vacuum directly to E.G.R. valve. The flow rate is dependent on manifold vacuum, throttle position, and exhaust gas back-pressure. Recycle at wide open throttle is eliminated by calibrating valve opening point above manifold vacuum available at wide open throttle as port vacuum cannot exceed manifold vacuum.

Temperature Control Valve – Prior to March 15, 1973, both ported and venturi vacuum control systems use a plenum mounted temperature control valve, which reduces recycle rate at low ambient air temperatures. Valve contains a temperature sensitive bi-metal disc, which senses plenum air temperature. Snap action of disc unplugs a calibrated orifice to provide bleed air. After March 15, the plenum mounted valve is deleted and the hole covered with a flat plate. A new temperature control valve is located in the top tank of the radiator and senses coolant temperature. EGR action is now controlled by coolant temperature, rather than ambient air temperature.



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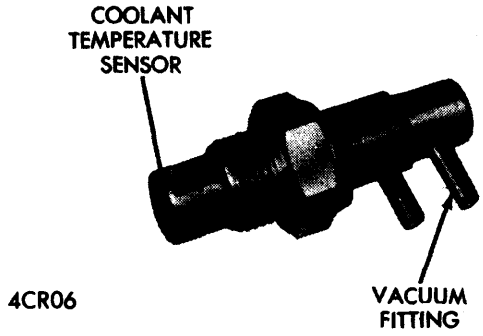
TEMPERATURE CONTROL VALVE (PRIOR TO MARCH 15, 1973)

Coolant Control Exhaust Gas Recirculation (C.C.E.G.R.) Valve – C.C.E.G.R. valve is mounted in top tank of radiator. When engine coolant temperature reaches 65°F valve opens so that vacuum is applied to open EGR control valve allowing exhaust gas to recirculate.

NOTE – On some models, a similar C.C.E.G.R. valve, set for 90°F actuation, is mounted in thermostatic housing. Its operation should be checked as described above.



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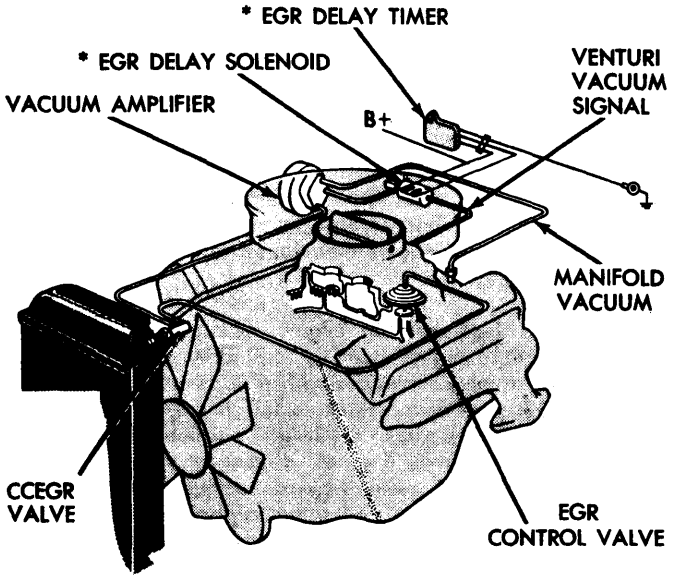
C.C.E.G.R. VALVE



* EGR TIME DELAY ON SOME MODELS

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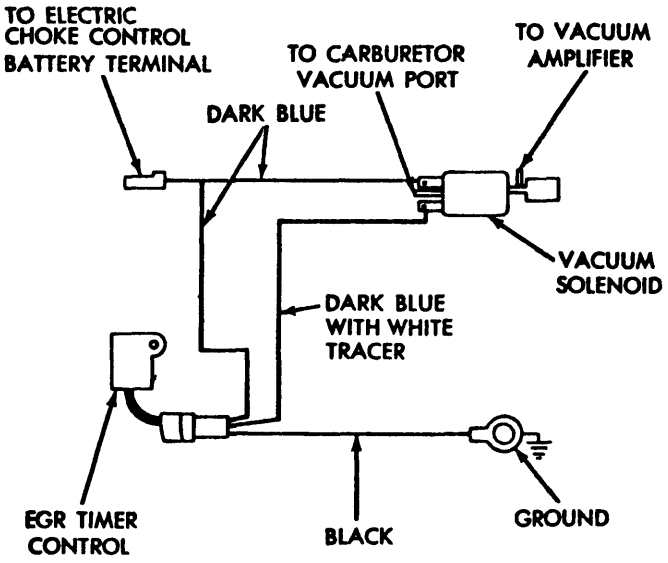
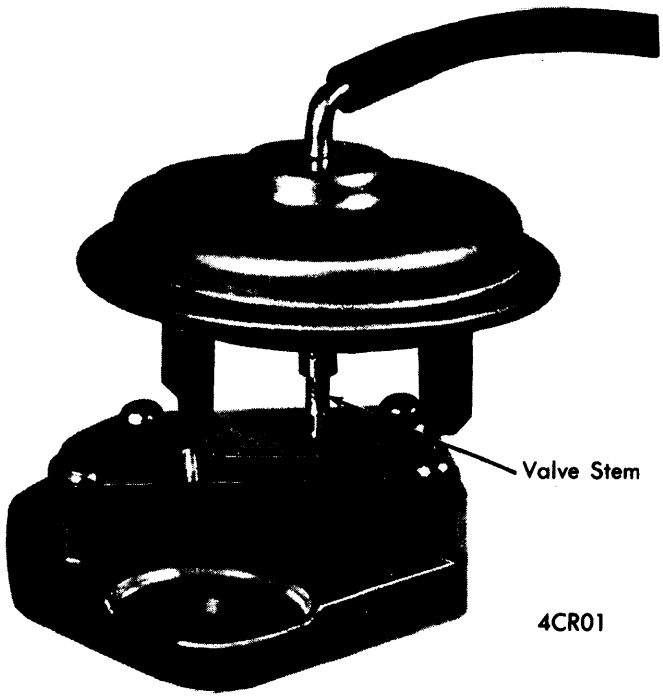
EXHAUST GAS RECIRCULATION (VENTURI SYSTEM)

EGR Delay Timer – Some vehicles are equipped with EGR delay system having an electrical timer mounted on dash panel in engine compartment which controls an engine mounted solenoid. Solenoid is connected by vacuum hoses between carburetor venturi signal nipple and vacuum amplifier. Purpose of system is to prevent exhaust gas recirculation for approximately 35 seconds after ignition is turned "ON".

CHRYSLER CORP. EXHAUST GAS RECIRCULATION (Cont.)



E.G.R. TIME DELAY SYSTEM



E.G.R. CONTROL VALVE

TESTING

Every 12,000 miles or 12 months, complete E.G.R. system should be inspected and tested. Check all hoses for damage or air leaks. All moving parts must be free from plugging or sticking as a result of deposits. With air temperature at 68°F or above, allow engine to idle in neutral, with carburetor throttle closed; then, abruptly accelerate engine to approximately 2000 RPM, but not over 3000 RPM. Visible movement of E.G.R. valve stem should occur. To determine movement of E.G.R. stem, watch for movement of groove on valve stem. Repeat test several times to assure system is operating properly. If engine is equipped with a delay system, perform following test:

E.G.R. Delay Test – Stop engine, then restart and immediately increase engine speed to 1000 RPM; observe E.G.R. valve motion. If valve moves during first 30 seconds after starting, the E.G.R. time delay system is defective. *NOTE – Timing begins when key is turned to "START" position.* Check hoses to delay solenoid valve; if good, disconnect solenoid valve electric plug. Energize solenoid by connecting either terminal to ground and opposite terminal to battery positive terminal. If E.G.R. valve stem moves on this test, solenoid valve is defective. If valve stem does not move after 30 seconds, E.G.R. timer control is defective. Check wiring and color codes for proper connections.

E.G.R. Control Valve Flow Test – If control system is operating, inspect valve and passages for exhaust gas flow by applying a vacuum of at least 10 in. Hg to E.G.R. control valve. Idle speed should drop 150 RPM or more, with engine warm and idling in neutral. If no change or less than 150 RPM occurs, exhaust deposits in E.G.R. valve or intake manifold are indicated. Remove valve and clean deposits.

NOTE – When cleaning valve, do not allow cleaning solvents on diaphragm. Do not push on diaphragm to operate valve, use vacuum only.

TROUBLE SHOOTING

E.G.R. valve stem does not move on system test:

1) Check for correct hose connections and leak check to confirm all hoses are in good condition.

2) Check E.G.R. valve for ruptured diaphragm or frozen valve stem by connecting external vacuum source of 10 in. Hg or greater to valve diaphragm. If no valve movement occurs, replace valve. If valve opens 1/8", pinch off supply hose to check for diaphragm leakage. Valve should remain open 30 seconds or longer. If leakage occurs, replace valve.

E.G.R. valve stem does not move on system test, operates normally on external vacuum source:

1) On vehicles built prior to March 15, 1973, with temperature in area of vehicle 68°F or above, or on vehicles built after March 15, with engine at normal operating temperature, proceed as follows: Check temperature control valve by disconnecting and plugging vacuum hose. If normal operation is restored, replace temperature control valve.

2) In Ported Vacuum Control System, remove carburetor and inspect port (slot type) in throttle bore and associated vacuum passages including limiting orifice at hose end of passages. Clean with suitable solvent and clear air passages with light air pressure.

3) In Venturi Vacuum Control System, remove venturi vacuum hose from carburetor nipple. With engine at idle, apply two in. Hg vacuum to hose. Engine speed should drop 150 RPM or more and E.G.R. valve stem should move 1/8" or more. If this does not occur, replace vacuum control valve.

CHRYSLER CORP. EXHAUST GAS RECIRCULATION (Cont.)

4) If vacuum control amplifier operates normally in previous test, plugged vacuum tap to carburetor is indicated. Use suitable carburetor solvent to remove deposits from passage and clear with light air pressure.

NOTE — Do not use drills or wires to clear carburetor control passages for either type of control system as calibration of precision orifices may be altered resulting in unsatisfactory vehicle operation.

Engine will not idle, dies out on return to idle or idle is very rough or slow:

1) Disconnect hose from E.G.R. valve and plug hose, recheck idle. If satisfactory, replace vacuum control amplifier.

2) If vacuum hose removal does not correct, remove E.G.R. valve and inspect to insure poppet is seated. Clean poppet seat, replace if poppet does not seat correctly.

Poor engine driveability and response at road speeds in temperatures below 55°F:

Disconnect hose from E.G.R. or C.C.E.G.R. valve and allow to vent. Test vehicle, if performance is improved, replace temperature control valve.

Weak wide open throttle performance:

Disconnect hose from E.G.R. valve and plug hose. Road test vehicle, if performance is restored, replace vacuum control amplifier.

On starting, engine runs up, then stalls on return to idle:

Connect hoses properly as shown in appropriate hose routing illustration.

Vehicle surges, or stalls after start, with one to three hour cool down:

Test delay system (if equipped); if defective, replace appropriate component.