1975-79 EXHAUST EMISSION SYSTEMS
Chrysler Corp. Exhaust Gas Recirculation

DESCRIPTION

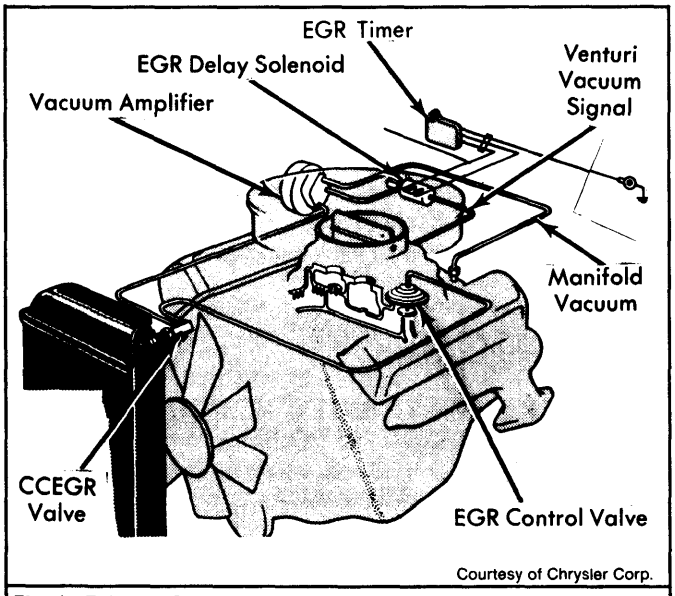
Exhaust Gas Recirculation (EGR) allows a predetermined amount of exhaust gases to recirculate and dilute air/fuel mixture. This diluting of air/fuel mixture reduces peak combustion temperature, reducing formation of oxides of nitrogen (NOx).

OPERATION

The EGR valve is a vacuum actuated poppet type valve used to control exhaust gas flow from manifold crossover into air/fuel mixture.

A vacuum tap at throat of carburetor venturi is used to provide control vacuum to the EGR amplifier. The vacuum amplifier is used to increase vacuum to the level required for EGR valve operation. Venturi vacuum signal opens EGR amplifier port, allowing manifold vacuum to operate EGR valve.

Elimination of EGR 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 EGR valve opening point. Opening point is set above manifold vacuum available at wide open throttle, allowing closure of EGR valve at wide open throttle.



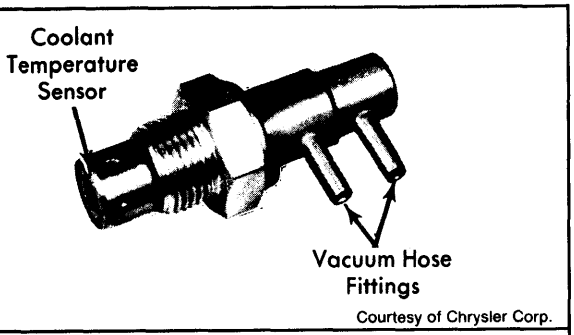
Courtesy of Chrysler Corp.

Fig. 1: Exhaust Gas Recirculation System Schematic

EGR TIMER

All Except "M" Models - The EGR timer is a delay system consisting of an electrical timer mounted on firewall in engine compartment. EGR timer controls an engine-mounted solenoid. Solenoid is connected by vacuum hoses between carburetor venturi signal port and vacuum amplifier. Purpose of timer system is to prevent EGR operation for a short period after engine start-up. Time interval is between 35 and 90 seconds, depending upon application. Timer operation is overridden by Coolant Control EGR (CCEGR) valve. On Charge Temperature Switch (CTS) systems, timing function for EGR begins after CTS opens.

NOTE: Although similar in appearance, timers used on CTS systems are not interchangeable with those used on CCEGR systems.



Courtesy of Chrysler Corp.

Fig. 2: CCEGR Valve (Heavy Duty Emissions Only)

COOLANT CONTROL EGR (CCEGR) VALVE

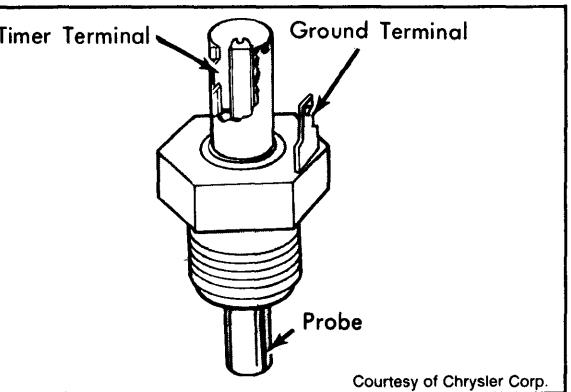
Heavy Duty Emissions - The CCEGR valve is used with the EGR system to delay EGR operation until engine warm-up is achieved. Valve location and opening temperature (to allow EGR operation) varies according to vehicle model and engine type. See CCEGR LOCATION & OPENING TEMPERATURE table.

CCEGR LOCATION & OPENING TEMPERATURE

Application	Location	Opening Temp. (°F)
"M" Models	Intake Manifold	95
	Water Pump	95
All Others	Rad. Top Tank	59
	Therm. Housing	108-125

CHARGE TEMPERATURE SWITCH (CTS)

Light Duty Emissions - A Charge Temperature Switch (CTS) is installed on a branch of the intake manifold. When air/fuel mixture temperature is low (below 60°F), as sensed by CTS, switch closes, allowing no EGR timer function and no EGR valve operation. Above 60°F air/fuel mixture temperature, timer and EGR switch operation are allowed.



Courtesy of Chrysler Corp.

Fig. 3: Charge Temperature Switch (Light Duty Emissions Only)

TESTING

EGR SYSTEM OPERATION

1) Place transmission in Neutral and set parking brake. Start engine and allow engine to reach normal operating temperature. Quickly accelerate engine to approximately 2,000 RPM while watching EGR valve stem. Stem should move when engine is accelerated. If not, refer to TROUBLE SHOOTING in this article.

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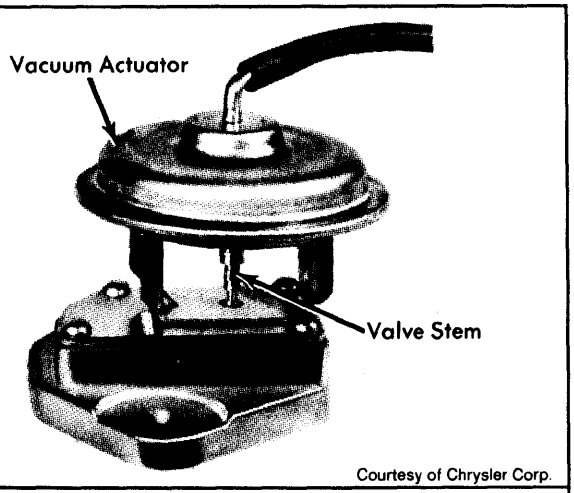
2) Once EGR valve movement has been obtained, it is necessary to determine if EGR is actually taking place. Disconnect vacuum hose at EGR valve. Using a length of vacuum hose and an external vacuum source, apply 10 in. Hg or greater vacuum to EGR valve while engine is idling. Engine idle speed should drop a minimum of 150 RPM or stall. This indicates EGR is flowing properly.
3) If speed does not change or change is less than minimum, exhaust deposits are in EGR valve or intake manifold passages. Remove valve for inspection and cleaning. Inspect manifold passages and clean as required.

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

EGR DELAY SYSTEM

1) If equipped with delay system, stop engine, then restart. Immediately open throttle to approximately 1,000 RPM and watch EGR valve stem for movement. If EGR moves during first 30 seconds after starting, EGR time delay system is defective.



Courtesy of Chrysler Corp.

Fig. 4: Chrysler Corp. EGR Valve

2) Check hose connections to time delay solenoid valve. If okay, detach electrical plug from solenoid valve and energize valve by grounding either terminal and connecting the other terminal to the positive battery post.
3) If EGR valve stem moves on this test, solenoid valve is defective and must be replaced. If EGR valve stem did not move, EGR timer control should be replaced.

TROUBLE SHOOTING

EGR 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 EGR 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.

EGR VALVE STEM DOES NOT MOVE ON TEST; OKAY WITH EXTERNAL VACUUM APPLIED

1) On CCEGR systems, by-pass CCEGR valve and connect vacuum amplifier directly to EGR valve. If EGR valve now operates normally, replace CCEGR valve.
2) On CTS systems, by-pass EGR solenoid and connect vacuum amplifier directly to EGR valve. If EGR valve operates normally, reconnect EGR solenoid hoses and remove wire from timer terminal of CTS. If EGR valve operates within 90 seconds, replace CTS.
3) On all models, remove venturi vacuum hose from carburetor nipple. With engine at idle, apply 2 in. Hg vacuum to hose. Engine speed should drop 150 RPM or more and EGR valve stem should move 1/8" or more. If this does not occur, replace vacuum amplifier.
4) If vacuum amplifier operates normally in previous test, plugged vacuum tap to carburetor is indicated. Use carburetor solvent to remove deposits from passage and clear passage with light air pressure.

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

ROUGH IDLE, SLOW IDLE, OR STALL ON RETURN TO IDLE

1) Disconnect hose from EGR valve and plug hose. Recheck idle. If satisfactory, replace vacuum amplifier.
2) If vacuum hose removal does not correct, remove EGR valve and inspect to insure poppet is seated. Clean poppet seat, replace if poppet does not seat correctly.

POOR COLD DRIVEABILITY, ROUGH IDLE OR STALLS ON RETURN TO IDLE

CCEGR valve or EGR control valve defective. Check by performing leak test and replace valves as necessary.

WEAK PERFORMANCE ON WIDE OPEN THROTTLE

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