1974-79 EXHAUST EMISSION SYSTEMS
General Motors Exhaust Gas Recirculation

LUV

DESCRIPTION

Exhaust gas recirculation system is used to reduce oxides of nitrogen (NOx) by recycling some exhaust gas back into the intake manifold to lower combustion temperatures. On 1976-78 models, system consists of EGR valve, thermal vacuum valve, steel pipe, and various vacuum lines. On 1979 Models, system consists of an EGR valve mounted under intake manifold, a back pressure transducer which monitors exhaust system pressure, a thermal vacuum valve which senses coolant temperature, and a vacuum control valve (if equipped).

OPERATION

EGR VALVE

1976-78 Models - As throttle valve is opened, vacuum is applied to EGR valve. When vacuum reaches about 3.5 in. Hg, diaphragm moves against spring pressure and allows exhaust gases to enter intake manifold. At about 8 in. Hg, EGR valve is fully opened. No vacuum is applied to EGR valve during idle.

1979 Models - Vacuum diaphragm chamber of EGR valve is connected to vacuum port in carburetor flange (through back pressure transducer and thermal valve). As throttle valve is opened, vacuum is applied to EGR valve. When enough vacuum overcomes EGR valve spring force, it opens EGR valve to allow recirculation.

BACK PRESSURE TRANSDUCER

1979 Models - The transducer responds to exhaust pressure. Under heavy throttle applications (heavy exhaust pressure), back pressure transducer closes vacuum passage to EGR valve and stops EGR action. Under normal operating conditions, EGR valve functions normally since back pressure transducer allows normal vacuum passage.

VACUUM CONTROL VALVE

1979 Federal Models - This valve is mounted in line between an intake manifold vacuum source and vacuum line of EGR system. When intake manifold vacuum exceeds 13.2-14.4 in. Hg, this valve will bleed off excess vacuum.

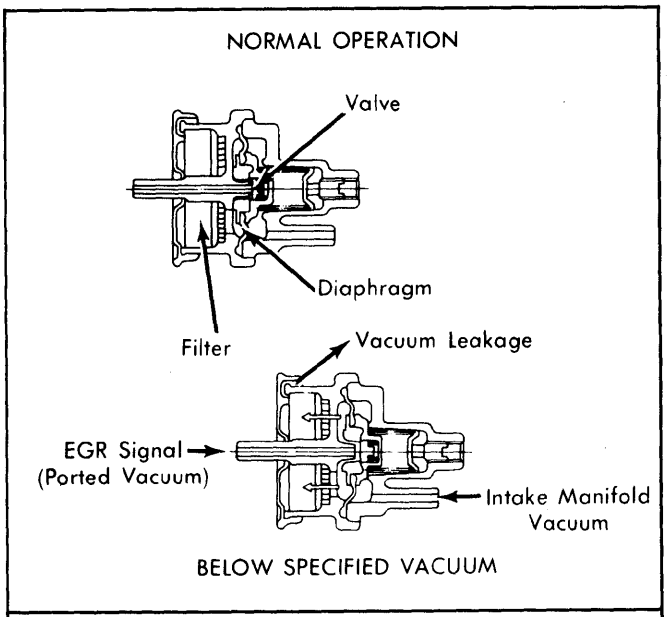

Fig. 2: Vacuum Control Valve Flow

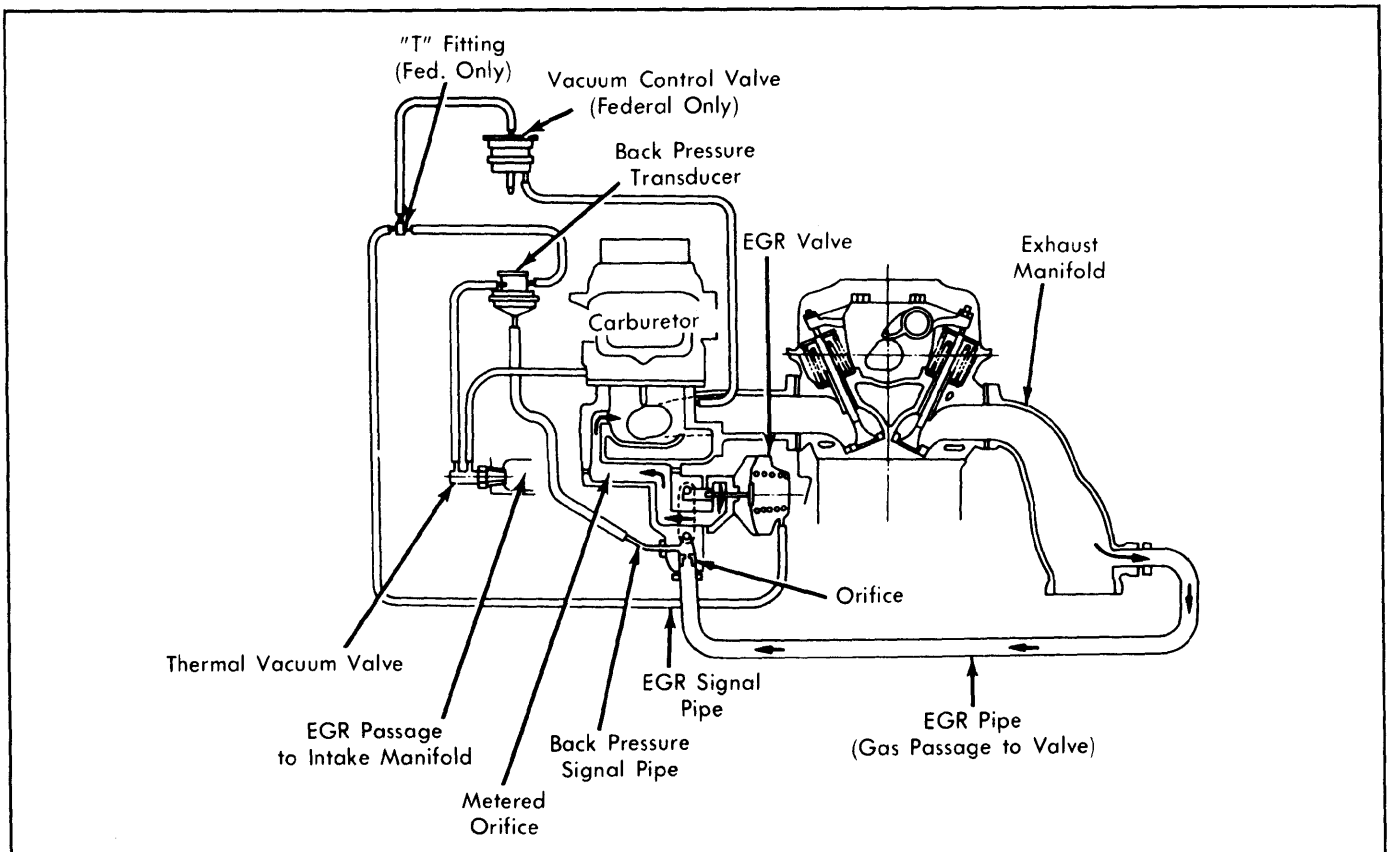

Fig. 1: Exhaust Gas Recirculation System (Typical)

1974-79 EXHAUST EMISSION SYSTEMS
General Motors Exhaust Gas Recirculation (Cont.)

THERMAL VACUUM VALVE

1976-78 Models - When engine coolant temperature is below 118-126°F (48-52°C), thermal vacuum valve is closed and EGR system does not operate. When coolant temperature is above specified range, thermal vacuum valve opens and allows exhaust gas recirculation to occur.

1979 Models - Mounted on intake manifold, this valve is in series with EGR valve and carburetor port. Below 115-120°F (46-54°C) coolant level, valve is closed. This stops vacuum passage to EGR valve. As coolant warms above this temperature, valve opens and normal EGR operation occurs.

TESTING

EGR VALVE

Start and run engine at 2000-2500 RPM. Valve stem should move upward. As engine returns to idle, valve should return to closed position. Detach vacuum hose from EGR valve. Connect a hand-held vacuum pump to valve and apply 8 in. Hg of vacuum. Vacuum should not leak down. While applying vacuum, observe movement of valve stem. At 8 in. Hg, stem should move to full open position. If valve does not respond as indicated, it must be replaced.

THERMAL VACUUM VALVE

Remove thermal vacuum valve from engine and place sensing portion in water 118°F (48°C) or warmer. Blow through hoses connected to valve. Air should pass, indicating valve is open. If not, replace valve.

BACK PRESSURE TRANSDUCER

1979 Models - Remove transducer from vehicle. Apply slight pressure to connection of exhaust sensing pipe to simulate exhaust pressure. Check for leakage, as transducer should close and not allow vacuum. If leak is noted, replace transducer.

VACUUM CONTROL VALVE

1979 Models - Detach hoses and apply 13.2-14.4 in. Hg to port connected to intake manifold and apply air force (such as blowing) to port which connects to EGR vacuum sensing line. Check for leakage through valve. If leak is noticed (which indicates vacuum is bleeding off properly), valve is okay. If no leak, replace valve.

MAINTENANCE

Inspect EGR system every 12 months or 15,000 miles.