# 1974-79 EXHAUST EMISSION SYSTEMS
# Opel Exhaust Gas Recirculation

## All Models

## 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 1975-79 models, system consists of an EGR valve, a backpressure transducer (if equipped), a thermal vacuum valve, and a vacuum control valve (if equipped).

In 1974 models, 2 different EGR systems are used. On non-California models, the EGR system consists of pipes connected to exhaust system and intake manifold, an EGR valve, and a vacuum hose connected between EGR valve and carburetor.

On 1974 California models, the EGR system consists of pipes connected to exhaust system and intake manifold, regulating valve, shut-off valve, and vacuum hoses connected to intake manifold and ported vacuum port on carburetor.

## OPERATION

### EGR VALVE

On 1974 non-California models, the EGR system does not receive sufficient vacuum to operate at idle. System operates during deceleration and part throttle. As a result, no exhaust gas recirculation occurs during idle and low intake manifold vacuum.

On 1974 California models, vacuum to shut-off valve varies with throttle opening and valve begins to open when 2.8 in. Hg of ported vacuum is applied. Regulating valve is operated by manifold vacuum and is fully open between 3.5-9.8 in. Hg of vacuum. The operation of these 2 valves provides no exhaust gas recirculation during idle, a little recirculation at low engine loads, and maximum exhaust gas recirculation at high engine loads.

On 1975-79 models, vacuum diaphragm chamber of EGR valve is connected to vacuum port in carburetor flange through backpressure transducer (if equipped) and thermal vacuum valve (if equipped). As throttle valve is open, vacuum is applied to EGR valve. When enough vacuum overcomes EGR valve spring force, it opens EGR valve to allow recirculation.

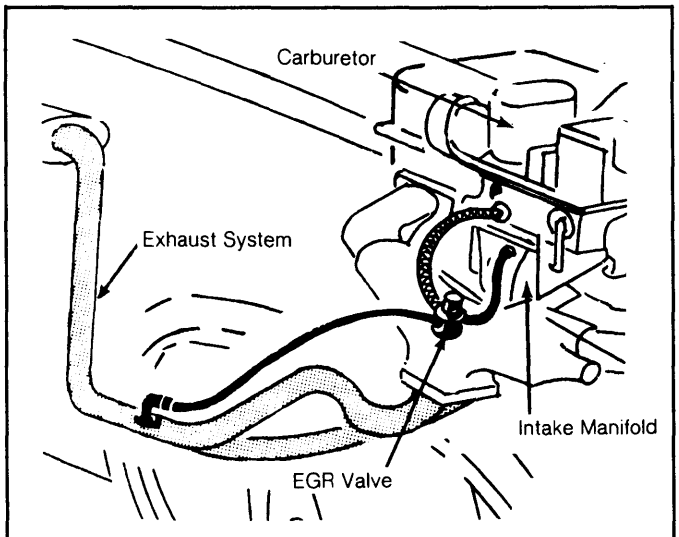


*Fig. 1: 1974 EGR System (Non-California)*

### BACKPRESSURE TRANSDUCER

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

### VACUUM CONTROL VALVE

Used only on some 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 13-14 in. Hg, this valve will bleed off excess vacuum.

### THERMAL VACUUM VALVE

Mounted on intake manifold, this valve is connected in series with EGR valve and carburetor port. When coolant temperature is below 115-120°F (46-49°C), the valve is closed. This stops vacuum passage to EGR valve. Above this temperature, valve opens and normal EGR operation occurs.

## TESTING

### EGR VALVE

**1974 Models** - **1)** With engine at normal operating temperature, connect tachometer to engine and note idle RPM. Disconnect vacuum hose that goes to air cleaner at intake manifold.
**2)** On non-California models, connect vacuum line from EGR valve to intake manifold fitting. On California models, leave regulating valve connected to intake manifold source but connect shut-off valve vacuum hose to intake manifold fitting.
**3)** When hose is connected to intake manifold, idle speed should decrease by at least 200 RPM. If not, remove EGR valve and clean EGR valve and exhaust gas recirculation passage. Repeat test procedure. If idle still does not drop, replace EGR valve.
**1975 Models** - **1)** With engine idling at normal operating temperature, disconnect vacuum line at EGR valve. Connect a known good vacuum hose between EGR valve and intake manifold.
**2)** Engine should run rough and idle drop at least 200 RPM. If not, clean EGR valve and exhaust gas recirculation passage. Repeat test procedure. If idle still does not drop, replace EGR valve.
**1976-78 Models** - Apply vacuum to EGR valve diaphragm. The diaphragm should move to full up position when 8 in. Hg of vacuum is applied and should not leak down. If not, replace EGR valve.
**1979 Models** - **1)** Detach vacuum hose from EGR valve and connect an outside vacuum source, such as hand pump with gauge. Apply about 4 in. Hg and hold this level. Vacuum should not leak down.
**2)** While applying vacuum, watch movement of valve stem. At 4-5 in. Hg, stem should move diaphragm to full up position. If valve does not respond as indicated, it must be replaced.

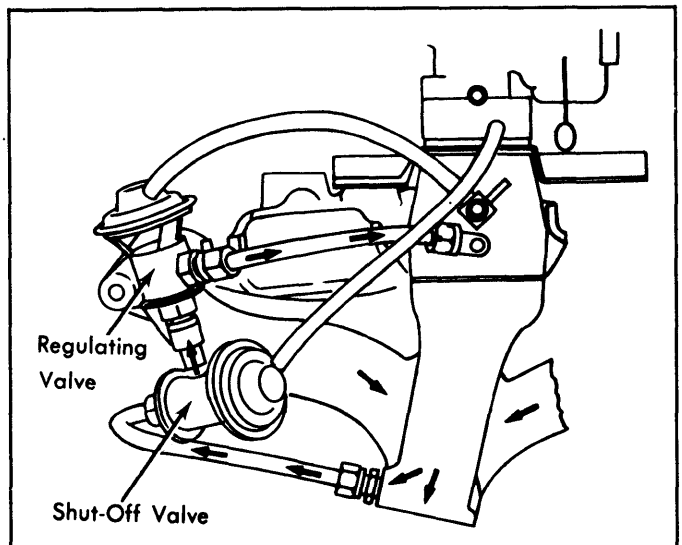


*Fig. 2: 1974 EGR System (California)*

# 1974-79 EXHAUST EMISSION SYSTEMS
# Opel Exhaust Gas Recirculation (Cont.)

## THERMAL VACUUM VALVE

Remove thermal vacuum valve from engine and place sensing portion in water heated to 120°F (49°C) or warmer. Blow through hoses connected to valve. Air should pass, indicating valve is open. If not, replace valve.

## BACKPRESSURE 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

Detach hoses and apply 13-14 in. Hg to port connected to intake manifold and apply air 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.

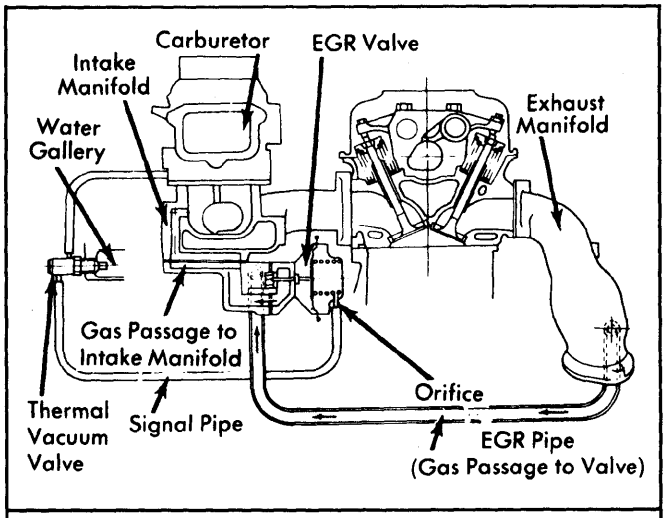


*Fig. 3: 1978 EGR System (Typical)*