

1974-79 EXHAUST EMISSION SYSTEMS

Audi Exhaust Gas Recirculation

3-29

All Models

DESCRIPTION

The Exhaust Gas Recirculation (EGR) system is used to reduce NOx emissions by recycling metered amounts of exhaust gas back into the intake/combustion system. On 1974-75 models, system consists of an exhaust gas filter, a vacuum controlled EGR valve, and connecting hoses.

On 1976-77 Fox, a single stage EGR valve is used. The EGR valve operates off of venturi vacuum via vacuum booster and engine coolant (thermal) temperature control valve.

On 1978-79 models, exhaust gas recirculation is accomplished through a vacuum-controlled EGR valve which responds to a vacuum signal from the throttle housing. This signal is determined by the position of the throttle plate. System consists of an EGR valve, temperature control valve, vacuum amplifier, vacuum delay valve (auto. trans. only) and a vacuum reservoir.

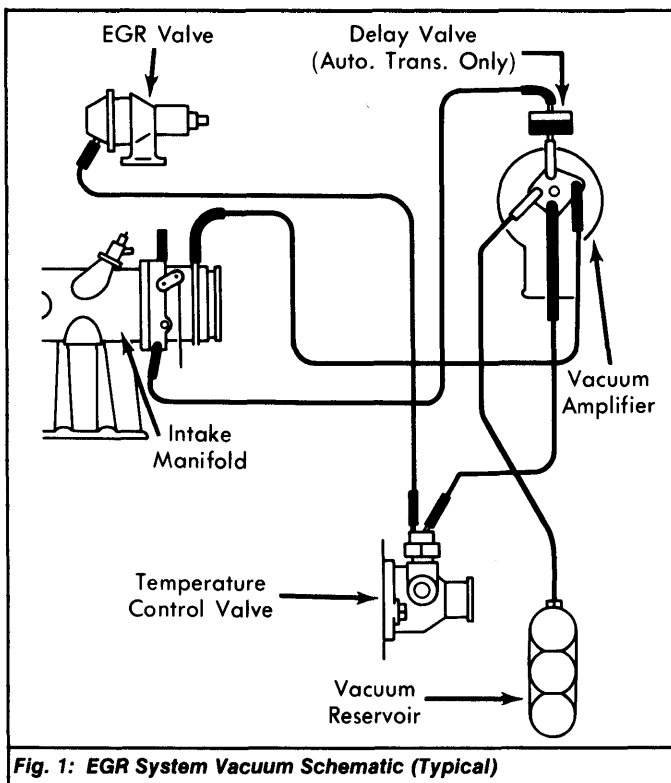


Fig. 1: EGR System Vacuum Schematic (Typical)

OPERATION

On 1974-75 models, vacuum connection on carburetor opens at throttle valve opening angle of 18 degrees. Vacuum operates EGR valve, allowing a controlled amount of exhaust gases to pass through filter, EGR valve, and into intake manifold. At full throttle, exhaust gas recirculation is eliminated as vacuum is not strong enough to keep EGR valve open.

On 1976-77 models, the EGR temperature control valve prevents vacuum from reaching EGR valve when engine is cold. When engine is warm, vacuum is supplied to EGR valve from throttle valve venturi of CIS injection system via a vacuum booster which amplifies this weak vacuum signal to a level which will operate the EGR valve. On California models, a vacuum accumulator is used to ensure an adequate supply of vacuum to vacuum booster.

On 1978-79 models, a vacuum signal is sensed by the vacuum amplifier as throttle plate opens to partial throttle. The vacuum amplifier strengthens the vacuum signal enough to allow the EGR valve to open. As the EGR valve opens, a controlled amount of exhaust gases are introduced into the intake manifold. At sustained low vacuum con-

ditions, such as during heavy acceleration, no EGR occurs since the vacuum level is too low. However, the vacuum reservoir will maintain an operable vacuum level to accommodate fluctuations in engine operation and vacuum levels.

TESTING

EGR VALVE

1974-75 Models - 1) Remove EGR valve and check for carbon deposits. Check that diaphragm plunger moves freely. Connect EGR valve to vacuum source and apply vacuum. Diaphragm plunger should lift off seat.

2) Disconnect vacuum line. Diaphragm plunger must return to seated position. Replace copper gasket and install EGR valve. Check vacuum lines, filter, and connections for leaks, deposits, or restrictions.

1976-77 Fox - 1) Ensure that line from EGR valve to front exhaust pipe is not leaking. With engine running at idle, disconnect vacuum hose from EGR valve.

2) Disconnect vacuum hose from distributor vacuum retard unit and connect hose to EGR valve. If engine speed drops or if engine stalls, EGR valve is operating properly. If not, vacuum line is plugged or EGR valve is defective.

1978-79 Models - 1) Check all vacuum lines for proper connections and damage. Replace if necessary. On Fox, connect distributor retard vacuum hose to EGR valve.

2) On 5000, disconnect Yellow EGR valve vacuum hose at temperature control valve. Connect Yellow hose to "T" connector of intake manifold vacuum hose.

3) On all models, if idle speed drops or engine stalls, EGR valve is okay. If idle speed does not change, EGR valve or line is dirty, blocked or damaged. Clean or replace as necessary.

VACUUM AMPLIFIER/BOOSTER

1976-77 Fox - 1) With engine idling at normal operating temperature, connect a vacuum gauge between vacuum booster and throttle valve port. Vacuum reading should be .2-.3 in. Hg. If vacuum reading is incorrect, check throttle plate for correct position and port for blockage.

2) With specified vacuum obtained, move vacuum gauge between vacuum booster and EGR temperature control valve. Vacuum booster is working properly if gauge reads 2-4 in. Hg. If not, replace vacuum booster.

1978-79 Fox - 1) Install "T" fitting between vacuum amplifier and throttle valve port. Connect open side of "T" fitting to vacuum gauge. Run engine at idle. Vacuum gauge should read 2-4 in. Hg. If not, replace vacuum amplifier.

2) Next, install "T" fitting in hose between amplifier and throttle valve housing. Connect open side of "T" to vacuum gauge. Run engine at idle and read vacuum gauge. Gauge should read .2-.3 in. Hg. If not, check throttle valve port for obstructions.

1978-79 5000 - 1) Install "T" fitting between vacuum amplifier and temperature control valve Blue hose. Connect open side of "T" fitting to vacuum gauge. Run engine at idle. Vacuum gauge should read 2.5-2.8 in. Hg. If not, replace vacuum amplifier.

2) Next, install "T" fitting in hose between amplifier and throttle valve housing. Connect open side of "T" to vacuum gauge. Run engine at idle and read vacuum gauge. Gauge should read .43 in. Hg. If not, check throttle valve port for obstructions.

EGR TEMPERATURE CONTROL VALVE

1976-79 Fox - With engine idling at normal operating temperature, connect a vacuum gauge between EGR valve and EGR temperature control valve. If gauge reads 2-4 in. Hg, temperature control valve is working properly. If vacuum reading is incorrect, replace EGR temperature control valve.

1978-79 5000 - Disconnect EGR valve-to-temperature control valve vacuum hose at EGR valve and blow through hose. Temperature control valve should be closed if coolant temperature is below 113-123°F (45-51°C) and open if coolant temperature is above 131-141°F (55-61°C). If not, replace temperature control valve.

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Audi Exhaust Gas Recirculation (Cont.)

MAINTENANCE

EGR MAINTENANCE REMINDER LIGHT

1974-75 Models - System should be checked for leaks and proper operation every 10,000 miles. Replace filter every 20,000 miles or every 2 years, whichever occurs first.

1976-79 Models - Every 15,000 miles, a light on the instrument cluster will come on. This is a reminder that the EGR system requires servicing. After maintenance is performed, indicator light must be turned off. Press button marked "EGR" on mileage switch. Mileage switch is mounted in speedometer cable, behind instrument panel.