

GENERAL MOTORS DIESEL EXHAUST GAS RECIRCULATION (EGR) SYSTEM

DESCRIPTION

The Exhaust Gas Recirculation (EGR) system used on diesel engines is designed to lower oxides of nitrogen (NOx) emissions. Exhaust gas is introduced into the intake manifold and enters the combustion chambers. This recirculation lowers combustion chamber temperatures and NOx emissions.

An EGR valve is mounted in the intake crossover manifold and allows EGR flow at all engines speeds except wide open throttle. EGR valve operation is controlled by a vacuum switch, vacuum solenoid valve, and vacuum regulator valve.

OPERATION

The amount of EGR is controlled by a fixed orifice located where the EGR pipe enters the exhaust manifold. The orifice size will vary with engine applications. The EGR valve mounted in the crossover manifold shuts EGR off. It is an on-off type valve and does not provide a controlled, varying amount of gas flow.

Throttle position is sensed by a vacuum regulator valve mounted on the injection pump throttle shaft. The valve regulates vacuum proportional to throttle travel. When vacuum drops below a predetermined level, or throttle is in wide-open position, the EGR vacuum switch de-energizes the vacuum solenoid valve. The solenoid valve closes and cuts off vacuum to the EGR valve, causing it to close and stop EGR flow.

VACUUM REGULATOR VALVE

The vacuum regulator valve is attached to the side of the injection pump and regulates vacuum in proportion to the throttle angle. Vacuum is supplied to port 1 and regulated through

port 2. At closed throttle 15 in. Hg is available; at wide open throttle, zero vacuum is supplied. The regulated vacuum is supplied to the EGR system and to the transmission modulator and converter clutch (if used).

NOTE — For Vacuum Regulator Valve adjustment procedure, see the General Motors Diesel Mechanical Fuel Injection article in the FUEL SYSTEMS section.

TROUBLE SHOOTING

EGR VALVE WILL NOT OPEN

Binding or stuck valve — replace. No vacuum to EGR valve — check hoses and vacuum switches.

HEAVY SMOKE ON ACCELERATION EGR VALVE WILL NOT CLOSE

Binding or stuck valve — replace. Vacuum to EGR valve at wide open throttle — check solenoid and vacuum valve.

EGR VALVE CLOSSES EARLY

Vacuum switch opening above 8 in. Hg — replace switch. Vacuum regulator misadjusted — adjust.

SMOKE ON MEDIUM ACCELERATION EGR VALVE CLOSSES LATE

Vacuum switch opening below 8 in. Hg — replace switch. Vacuum regulator misadjusted — adjust.

LOSS OF PERFORMANCE, SMOKEY EXHAUST

Exhaust or air cleaner restriction — clean or replace.

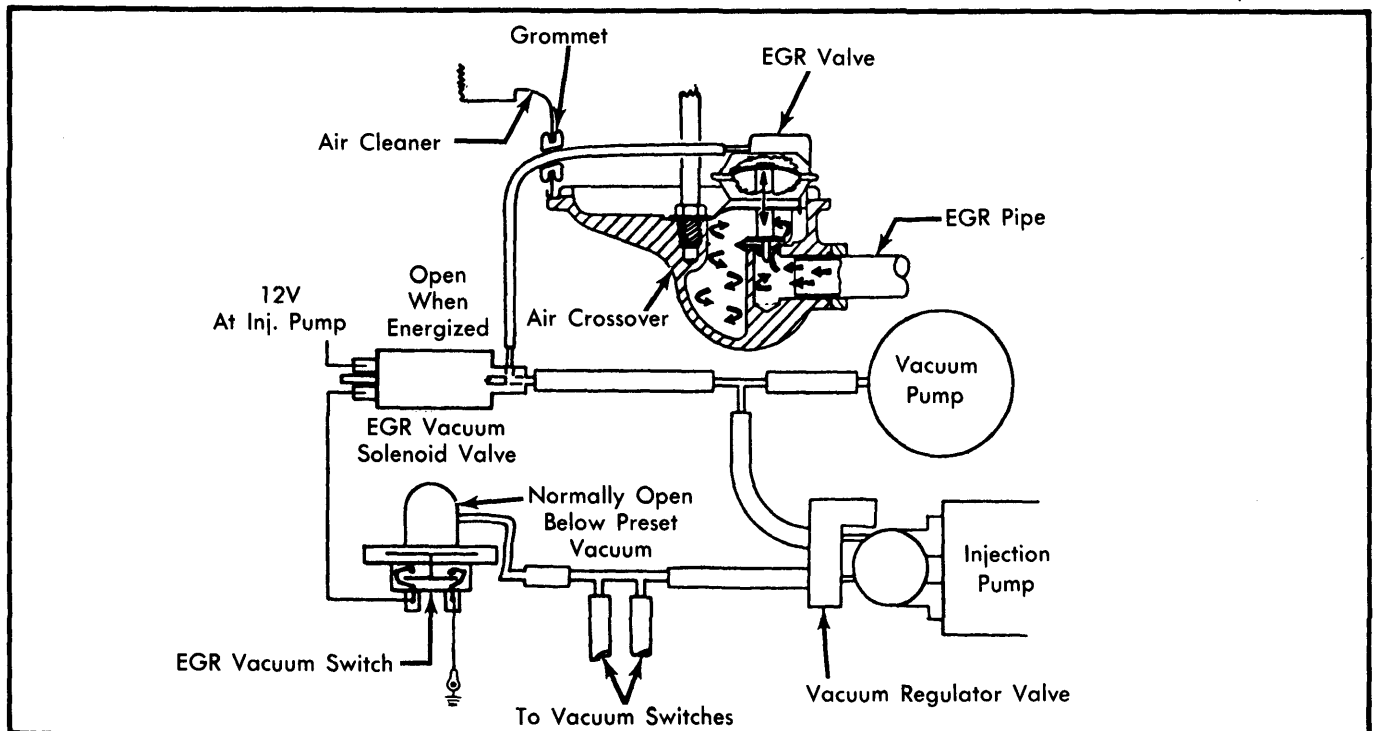


Fig. 1 Diesel Engine EGR System