1973 FORD MOTOR CO.
EXHAUST GAS RECIRCULATION (EGR) SYSTEM

DESCRIPTION

Exhaust Gas Recirculation (EGR) is used on all models except Pinto. System dilutes air/fuel mixture with exhaust gases to lower combustion temperatures which acts to limit the formation of nitrogen oxides. A vacuum operated EGR flow control valve is attached to carburetor spacer. Exhaust gas is obtained from either exhaust crossover, or from choke stove directly from exhaust manifold. Vacuum signal for EGR valve originates at EGR port of carburetor. This signal is controlled by at least one, and in some cases two, series valves. A water temperature sensing valve (EGR PVS Valve) which is closed until water temperature reaches either 60°F or 125°F, depending on application, is always used. Some applications also use a high speed EGR modulator subsystem which consists of a speed sensor, an electronic module and a solenoid vacuum valve.

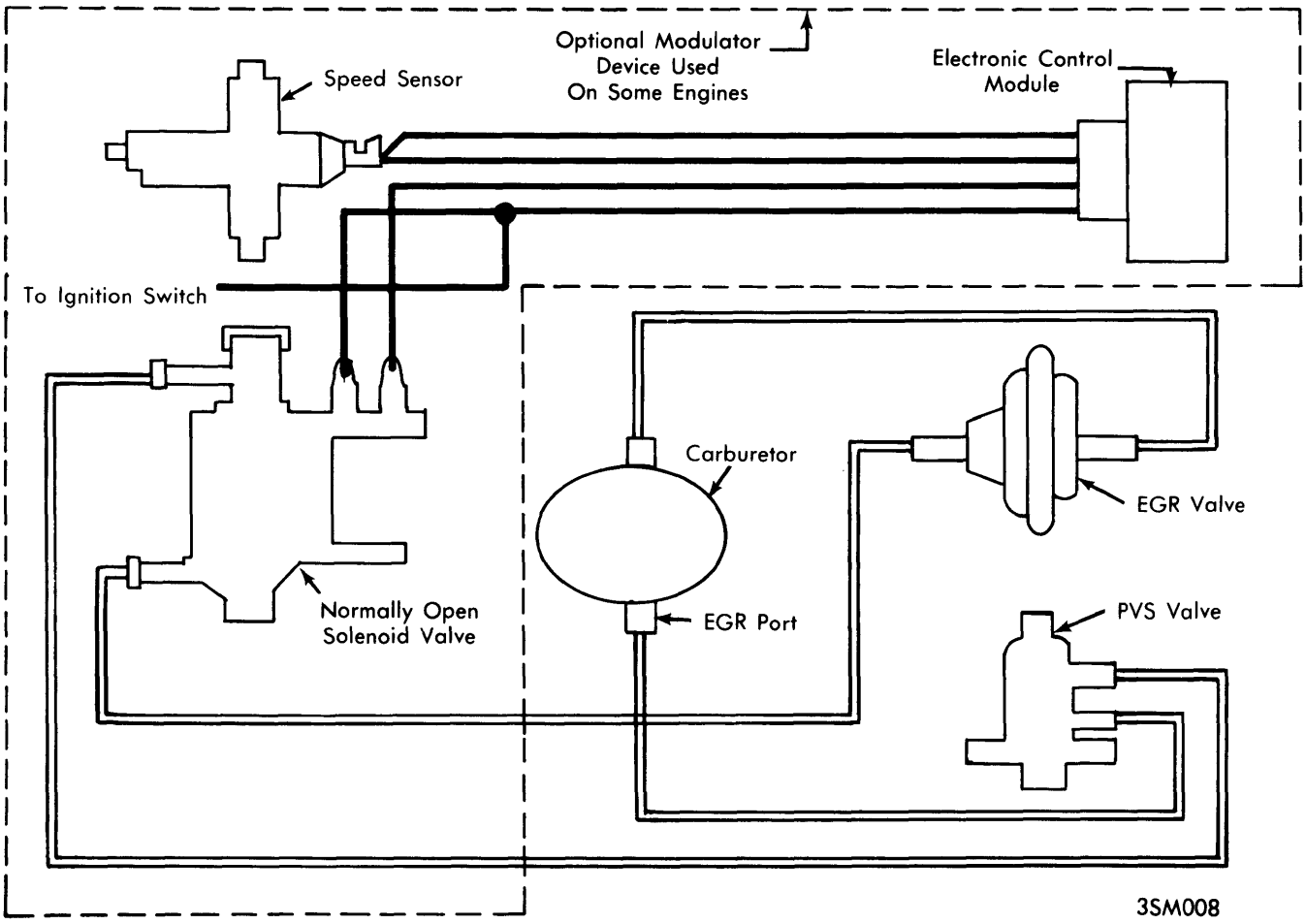
OPERATION

EGR valve is controlled by carburetor EGR port vacuum which allows valve to close during idle and low speed operation. As engine speed increases, amount of exhaust gas that is allowed to enter intake manifold is increased. To maintain engine driveability while engine is cold a water temperature sensing valve is used which cuts off vacuum to EGR valve, thus closing EGR valve, until engine coolant temperature obtains either 60°F or 125°F, depending on application. On some applications a high speed EGR modulator subsystem is used to limit EGR operation above a preset speed. A speed sensor, driven by speedometer cable, provides a speed signal to electronic module. When vehicle speed reaches a preset level, electronic module sends a signal to a solenoid valve which then closes, shutting off vacuum to EGR valve and closing valve. Solenoid vacuum valve has a continuous internal vacuum bleed to purge vacuum supply hose from carburetor of any gasoline vapor.

TESTING

SYSTEM OPERATIONAL TEST

"Tee" a vacuum gauge into vacuum hose at EGR valve, start engine and allow to idle until coolant temperature is above 125°F. Open throttle quickly but momentarily and check vacuum gauge. Vacuum reading should increase as engine speed increases. If vacuum does not increase, see "Vacuum Testing". *CAUTION — Avoid engine overspeed.* If vacuum increases, check that EGR valve stem moves outward, away from carburetor, as vacuum reading reaches three to four inches. Valve should be in wide open position at eight to ten inches of



EXHAUST GAS RECIRCULATION SYSTEM

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vacuum. If this action occurs, EGR system is functioning properly. If EGR valve stem does not move with a vacuum reading of three to four inches or more, EGR valve is not functioning and must be replaced. Next, check that EGR valve is not clogged by removing EGR vacuum hose from EGR carburetor port and connect it to manifold vacuum source. EGR valve stem should move outward and engine should idle roughly and engine speed decrease drastically or possibly stall. If this occurs, EGR valve is functional. If this does not occur, valve is clogged and should either be cleaned or replaced.

VACUUM TESTING

If in system test above, vacuum gauge showed either no vacuum or vacuum did not increase with engine speed, first check vacuum source at EGR port of carburetor. If no vacuum is present EGR port is plugged and must be corrected as necessary. If vacuum is correct at EGR port, check vacuum hose for improper routing, leaks and plugs and repair as necessary. If this is correct, check temperature controlled vacuum valve for proper operation. "Tee" in a vacuum gauge at top port of valve (EGR port) and once again open throttle quickly. If vacuum does not raise with engine speed, valve is defective and must be replaced. Finally check hose between vacuum valve and EGR valve.

DUAL DIAPHRAGM VACUUM ADVANCE TEST

On vehicles equipped with a dual diaphragm distributor it is necessary to check unit for proper vacuum hose routing and leaks. Test for leaks by applying 18" of vacuum to EGR valve connection of diaphragm. If unit will not hold 18" of vacuum it is defective and must be replaced.

TEMPERATURE CONTROLLED VACUUM VALVE TEST

Remove valve from vehicle. Connect a vacuum source to top port of valve and leave lower port open to atmosphere. Cool valve to below 60°F with cold water, ice or Freon. Apply 20" of vacuum to valve and check that valve retains at least 19" for five minutes. Next place valve, with vacuum source connected into water and heat water. Vacuum should drop to zero as water reaches valve's opening temperature. If valve fails either test it is defective and should be replaced.

HIGH SPEED MODULATOR TEST

"Tee" a vacuum gauge into vacuum hose at EGR valve, raise rear wheels of vehicle off floor, start engine and allow it to idle until coolant temperature is above 125°F. Engage transmission in third gear if manual or "D" if automatic. Observe speedometer and vacuum gauge. Vacuum should increase as speed increases. As speedometer indicates approximately 67 MPH, vacuum should drop to zero. This indicates system is functioning correctly. If test fails, check for power to system to check individual components as described below.

SPEED SENSOR TEST

Check that resistance between sensor leads is 40-60 ohms. Also check that all connects are tight and that unit is grounded at control module.

VACUUM VALVE TEST

Remove electrical leads from valve. *CAUTION — Never connect any jumper, test light or "hot screwdriver" to valve with valve connected to control module or control module could be damaged.* Apply 12 volts to valve terminal and ground other terminal. Operate engine at 1500 RPM and check that no vacuum is supplied to EGR valve. If vacuum is present replace valve.

CONTROL MODULE

Replace module if other tests indicate system is functioning correctly. There is no way to test module without damaging it.

SYSTEM CLEANING

If EGR valve is restricted or clogged, remove valve and unplug orifice with a .060" diameter wire or similar probe. If EGR valve cannot be cleaned, replace it.