MAZDA PISTON ENGINE EXHAUST GAS RECIRCULATION

GLC
626
B2000

DESCRIPTION

The Exhaust Gas Recirculation (EGR) system is designed to lower the burning temperature of gases in the combustion chamber, thereby reducing formation of NOx. A metered amount of exhaust gas is introduced at the intake manifold to dilute the air/fuel mixture to lower combustion temperatures. The EGR system consists of EGR control valve (2 on 626 models), vacuum amplifier, water thermo valve, water thermo switch (626 models), EGR solenoid valve (Calif. B2000 models), 3-way solenoid valves (626 models), engine speed switch (Calif. B2000 and manual transmission 626 models) and connecting hoses and pipes.

OPERATION

Exhaust gases flow out of exhaust manifold, through EGR tubes and into EGR control valve(s). The EGR control valve(s) controls EGR flow in response to vacuum signals received from the vacuum amplifier. The vacuum amplifier monitors carburetor ported vacuum and controls vacuum applied at EGR control valve(s). The water thermo valve, water thermo switch (626 models), solenoid valve(s) and speed switch (if equipped) allow recirculation of exhaust gases under various engine operating conditions.

NOTE – *Refer to "Mazda Piston Engine Vacuum Diagrams" article in this section for components used by model application.*

TESTING

EGR CONTROL VALVES

1) Warm engine to normal operating temperature. Stop engine. Detach EGR vacuum sensing tube from EGR valve and apply intake manifold vacuum directly to EGR valve.

2) Pinch off intake manifold vacuum hose while engine is restarted. Release hose. If EGR valve is okay, engine will idle very rough or stall. If idle quality does not change, replace EGR valve.

VACUUM AMPLIFIER

1) Remove air cleaner and disconnect vacuum line from thermo valve (vacuum amplifier-to-EGR solenoid line from solenoid valve on Calif. B2000). Connect vacuum gauge to disconnected hose. Run engine at idle and disconnect vacuum amplifier-to-carburetor vacuum line at carburetor. Gauge reading should be 1.6-2.4 in. Hg on 626 models and 1.8-2.2 in. Hg on all other models.

2) Slowly increase engine speed to 3500 RPM. Gauge should read 3.6 in. Hg. If vacuum amplifier does not respond as outlined, replace vacuum amplifier.

WATER THERMO VALVES

B2000 Models – **1)** Drain radiator until coolant level is below intake manifold. Disconnect vacuum hoses from water thermo valve and remove valve from intake manifold. Attach a hose to each port of valve and place valve in container of water with thermometer. Suspend valve in water so it does not touch container.

2) Gradually heat water and blow into vacuum hose. Air should pass through valve when temperature is 122°F (50°C). If valve does not respond as outlined, replace water thermo valve.

All Other Models – **1)** From a cold engine, disconnect vacuum amplifier-to-thermo valve vacuum tube. Disconnect No. 1 purge control valve-to-thermo valve vacuum tube from thermo valve (under intake manifold). Start engine and run at 2000 RPM (1500 RPM for GLC Wagon and 626). No vacuum should be felt at either port. See *Fig. 1*.

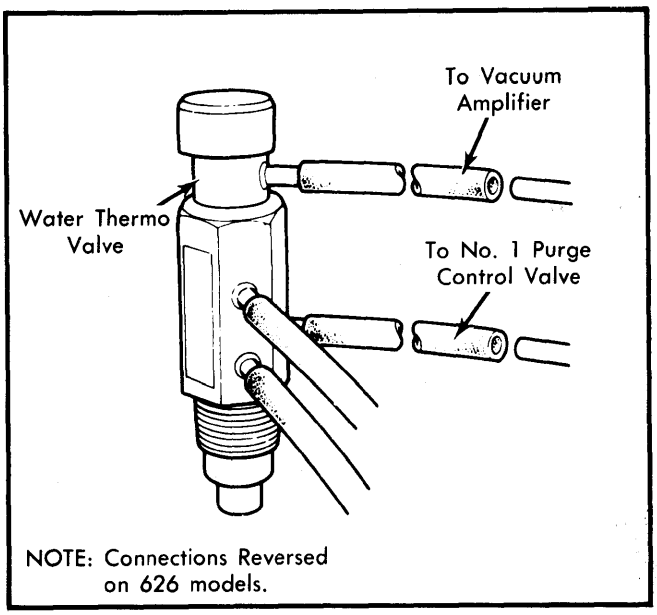

Fig. 1 Testing Water Thermo Valve (Exc. Mazda B2000 Models)

2) Warm engine until coolant temperature is 131°F (55°C) on GLC, 138°F (59°C) on GLC Wagon or 114-129°F (46-54°C) on 626. With engine at proper temperature, vacuum should be felt. If valve does not respond as outlined, replace water thermo valve.

NOTE – *Testing of Mazda 626 thermo switch is explained in "Mazda Piston Engine Air Pump Air Injection" article in this section.*

EGR SOLENOID VALVE (CALIF. B2000 ONLY)

1) Disconnect EGR solenoid valve-to-water thermo valve vacuum tube from solenoid valve and connect an additional piece of tubing. Disconnect vacuum amplifier-to-solenoid valve vacuum tube from solenoid valve. Disconnect electrical connector from solenoid valve.

2) Blow through additional tube connected in step **1)**. Air should pass through valve and escape at amplifier-to-solenoid valve port. Connect battery power to solenoid valve terminals and blow through hose again; air should pass through valve and escape through solenoid valve air filter. If valve does not respond as outlined, replace EGR solenoid valve.

MAZDA PISTON ENGINE EXHAUST GAS RECIRCULATION (Cont.)

3-WAY SOLENOID VALVES (626 ONLY)

NOTE – *Test procedure is the same for each EGR valve. Test each valve separately.*

1) Disconnect vacuum sensing tubes from solenoid valve and vacuum pipe. Blow through tube "B" shown in *Fig. 2*. Air should pass through valve and escape through port "A".

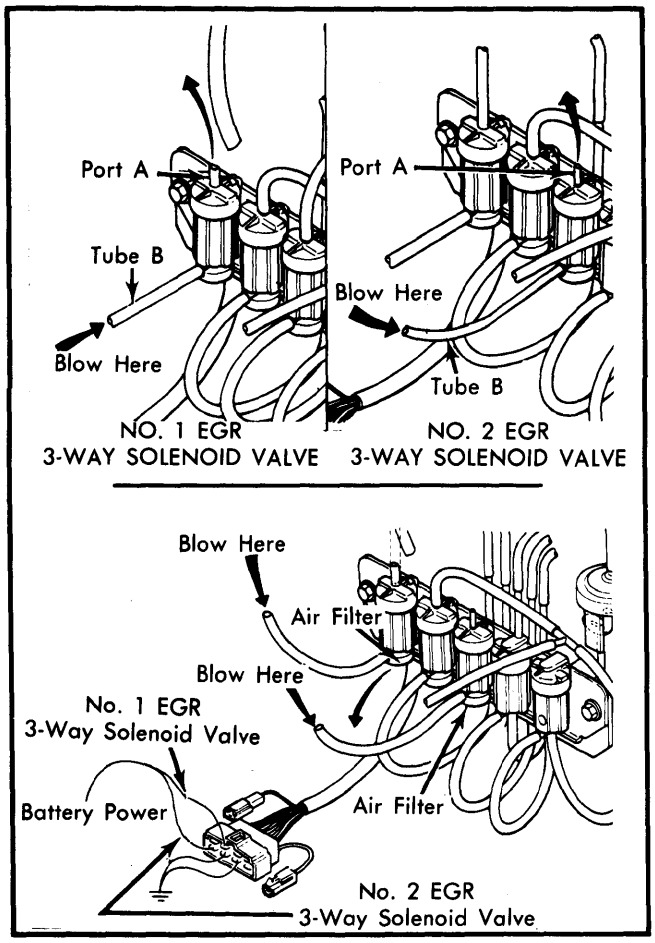

Fig. 2 Testing Mazda 626 Three-Way Solenoid Valves

2) Disconnect electrical connector and apply battery power to terminals in connector as shown in *Fig. 2*. Blow through hose again; air should pass through valve and escape at solenoid valve air filter. If valve does not respond as outlined, replace 3-way solenoid valve.

ENGINE SPEED SWITCH (CALIF. B2000 ONLY)

NOTE – *Testing of Mazda 626 engine speed switch (manual transmission) is explained in "Mazda Piston Engine Air Pump Air Injection" article in this section.*

1) Warm engine to normal operating temperature. Connect voltmeter to electrical connectors as shown in *Fig. 3*. Increase engine speed to 1500 RPM, then slowly decrease engine speed. Record speed at which current flows to circuit.

2) Slowly increase engine speed and record speed at which current stops flowing to circuit. The difference between recorded engine speeds should be 50-120 RPM. If not, replace engine speed switch.

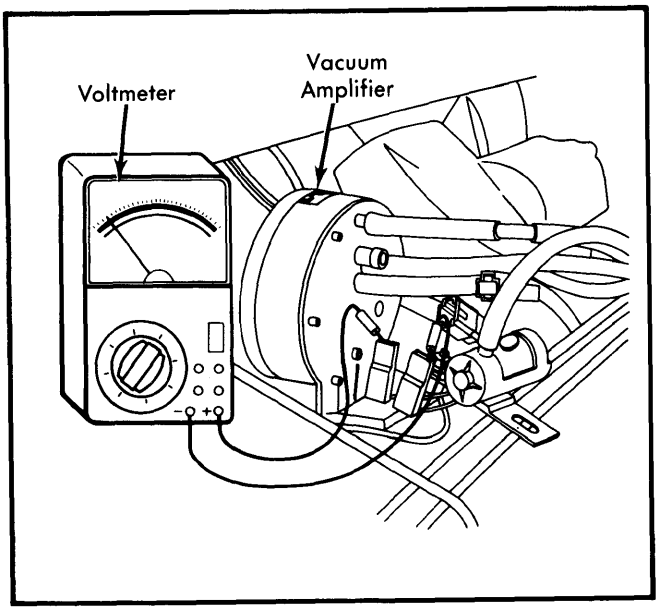

Fig. 3 Testing Calif. B2000 Engine Speed Switch