1982 Exhaust Emission Systems

MERCEDES-BENZ AIR INJECTION SYSTEM

380 Series

DESCRIPTION

All models are fuel injected and use an oxygen sensor and feedback system to reduce emissions. The air injection system works with the feedback system to reduce exhaust emissions and improve driveability.

System consists of an air pump, relief valve, diverter valve, air filter, check valve, delay valve, 2 thermal vacuum valves and connecting hoses. The air is injected through ports in cylinder head. The air injection relay is located behind glove box, underneath instrument panel.

OPERATION

The air injection system is used to improve catalyst operation when the engine is warming up. Air is injected only if engine coolant temperature is below 108°F (42°C), oil temperature is above 61°F (18°C) and the oxygen sensor is not operating. When these conditions are present, the air injection relay provides power to the air pump clutch and the switch-over valve.

When the switch-over valve is activated, it provides vacuum to open the air injection shut-off valve, allowing air from the pump to pass through the check valve into the exhaust manifold.

TESTING

SYSTEM CHECK

1) Start engine and warm to normal operating temperature. Air pump clutch should be disengaged and pump should be stopped.

2) Disconnect plug from coolant switch and insert jumper wire into connector terminals. Turn ignition "OFF" and then "ON" without starting engine. Clutch and switch-over valve should operate.

3) Connect negative lead of voltmeter to terminal 3 of diagnostic plug (on fenderwell). Connect positive lead of voltmeter to battery. With engine running at operating temperature, voltage should be present. Mark voltmeter dial to indicate needle position, then stop engine.

4) Remove connector from magnetic clutch on air pump. Use jumper wires to connect clutch terminals to ground and battery voltage. Start engine and observe voltmeter.

5) Reading should be as previously marked. Disconnect vacuum lines from switch-over valve and connect them together. Voltmeter reading should increase. If not, proceed to component testing.

COMPONENT TESTING

1) If air pump clutch operated with engine at normal operating temperature, check coolant temperature switch with ohmmeter. If zero resistance is shown, replace switch. If infinite resistance is shown, replace relay.

2) Coolant must be about 212°F (100°C). With engine idling, unplug oxygen sensor (plug is near exhaust pipe bracket under engine) and coolant temperature switch. Connect a jumper wire across terminals in coolant switch connector.

3) Clutch should operate. If not, check for voltage at temperature switch connector. Repair wiring as necessary.

4) Reconnect temperature switch. With oxygen sensor still disconnected, remove vacuum line from air shut-off valve and connect a vacuum gauge to the line. No vacuum should be present. If vacuum is noted, unplug temerature switch connector.

5) If vacuum drops, replace coolant temperature switch. If vacuum does not drop, repair or replace wiring, relay or switch-over valve.

6) Connect a jumper wire across temperature switch connector terminals. Vacuum should be present on gauge. If not, check and repair vacuum lines as necessary. Check shut-off valve for leaks.

7) Pull hose from air cleaner that leads to air pump. If strong suction is present, system testing is complete. If no air is drawn in, check hose condition or replace air pump. If a slight amount of air is drawn in, pull Purple/Blue vacuum line from air switch-over valve. If vacuum is present at valve, replace it.

Fig. 1: 380 Series Air Injection System