1974-79 EXHAUST EMISSION SYSTEMS
Mazda Air Pump Air Injection System

1979 GLC (Calif. With Auto. Trans.)
1979 B2000 (Calif.)

NOTE: For 1974-78 models, see AIR INJECTION SYSTEMS article in this section. All other 1979 models use a reed valve type air injection system. See MAZDA REED VALVE AIR INJECTION article in this section.

DESCRIPTION

The air pump type air injection system injects additional air into the exhaust manifold to assist in burning of HC and CO emissions passing through the crankcase. On GLC models, the air injection system assists the 3-way catalytic converter in oxidizing NOx, HC and CO pollutants.

System consists of belt-driven air pump (with built-in relief valve), air control valve, air by-pass valve (B2000 only), check valve and air injection nozzles. *See Fig. 1.*

OPERATION

AIR PUMP

Air pump draws fresh air from air cleaner, pressurizes it and drives it into the system hoses. A built-in relief valve diverts excess air pressure back to the air cleaner should it build up in air pump.

AIR BY-PASS VALVE

B2000 - Air leaving air pump enters by-pass valve, where it is directed to air control valve, or back to air pump, depending on engine mode. Air by-pass valve is connected to intake manifold by a vacuum line. When intake manifold vacuum is high (deceleration), air pump air is diverted back to air pump, with some air being fed directly into intake manifold. This maintains proper air/fuel mixture under closed throttle and prevents backfiring which would be caused by addition of secondary air to exhaust manifold under this engine mode.

AIR CONTROL VALVE

This valve contains 2 relief valves to control passage of air to exhaust manifold. *See Fig. 2.* The No. 1 relief valve is closed during high load condition. As exhaust gases increase in exhaust system, part of air pump air is allowed into exhaust manifold to allow proper burning of emissions. Too much added air would create abnormally high exhaust temperatures.

The No. 2 relief valve modulates the addition of air according to operating conditions. It is directly controlled by intake manifold vacuum. When vacuum is high (deceleration) valve opens to divert part of air pump air back to air pump. This prevents afterburning caused by too much air in exhaust system.

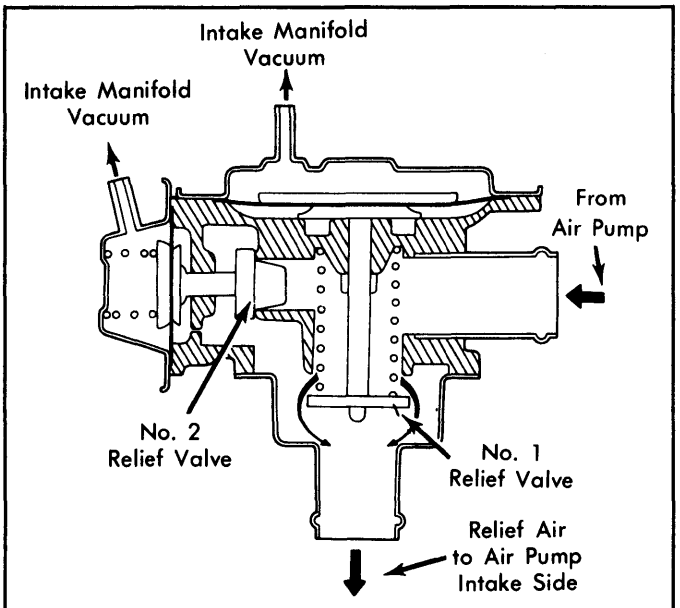

Fig. 2: Sectional View of Air Control Valve

CHECK VALVE

This is a one-way flow control valve. It allows air pump air to enter exhaust manifold, but will not let any exhaust back-pressure be forced into air pump system and ruin components.

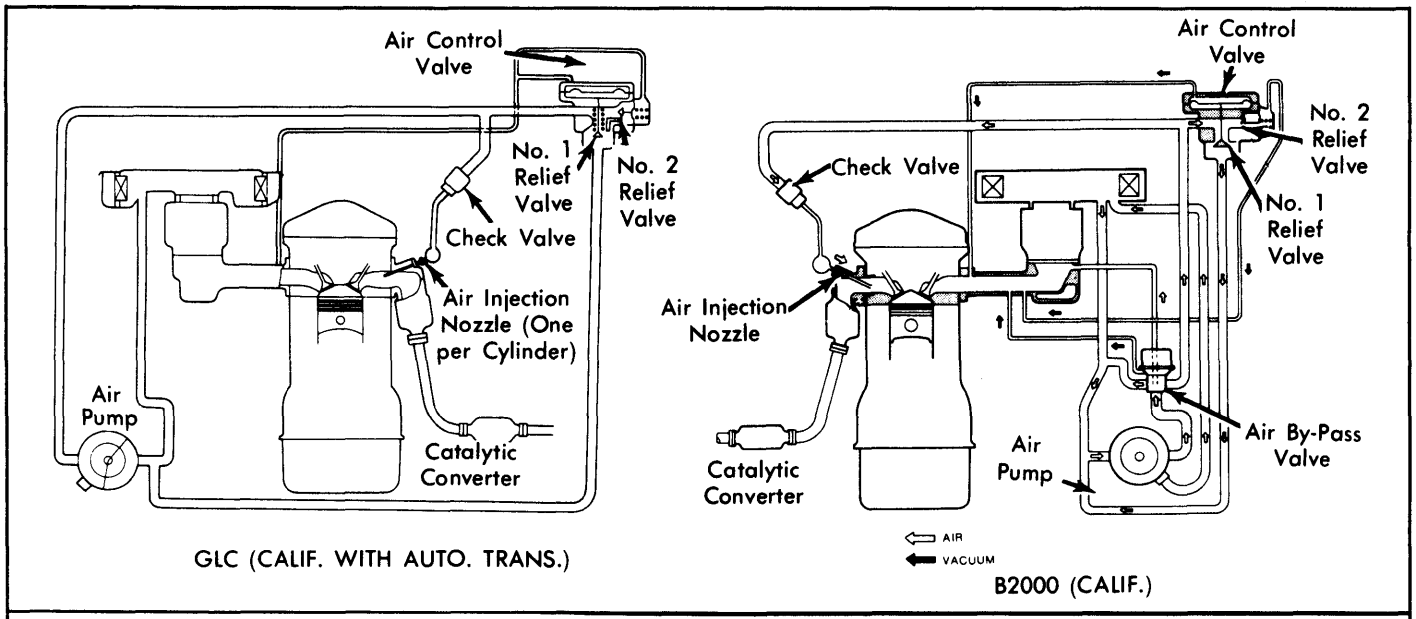

Fig. 1: Air Pump Type Air Injection Systems

Copyright (c) 2001 Mitchell Repair Information Company

1974-79 EXHAUST EMISSION SYSTEMS
Mazda Air Pump Air Injection System (Cont.)

TESTING

AIR PUMP

1) Start and run engine until normal operating temperature is reached. Check all hoses and connections for possible air leaks. Replace as necessary and/or tighten connections.
2) Listen for excessive noise at air pump. If noisy, check mounting bracket, retaining bolts and drive belt for proper tension.
3) Disconnect hose from air pump outlet and attach a suitable pressure gauge to outlet. Connect a tachometer to engine. *See Fig. 3.*
4) Run engine at 1500 RPM and note pressure gauge. Pump must show a pressure of at least 1.0 psi (.07 kg/cm²). If less, replace pump.

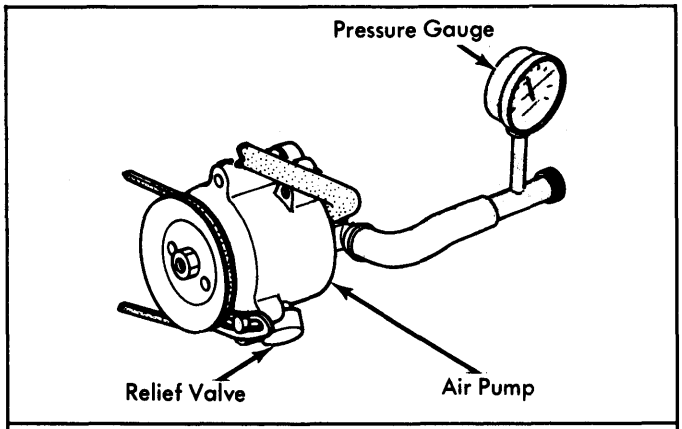

Fig. 3: Checking Air Pump Pressure Output

RELIEF VALVE

1) Run engine at idle speed. Hold hand near relief valve to be sure no air flows out of valve at idle speed.
2) Disconnect vacuum sensing tube from air control valve (Calif. only). Plug tube. Increase engine speed to 4000 RPM. Again, check relief valve. Air should now be flowing out of relief valve.

CHECK VALVE

1) Warm up engine until normal operating temperature is reached. Disconnect air pump outlet hose from check valve or from air by-pass valve.
2) Slowly increase engine speed to 1500 RPM while holding hand over open connection. Check for exhaust leak (back-pressure escaping through check valve). If there is exhaust gas leak at this point, replace check valve.

AIR CONTROL VALVE

1) Disconnect air hose from air control valve lower connection (outlet). Start and run engine at idle. Place finger over air control valve outlet and make sure that air is flowing out of outlet. If not, replace air control valve.
2) Now, disconnect vacuum sensing tube (hose leading to intake manifold from diaphragm unit) from air control valve. Plug hose. *See Fig. 4.*
3) With engine still running at idle, check for air flow from air control valve outlet (hose still disconnected). No air should be flowing from outlet. If it does, replace air control valve and repeat test.
4) Next, disconnect vacuum sensing tube from top connection on air control valve. Reconnect vacuum tube to diaphragm unit.
5) There should now be excessive flow from air control valve lower outlet (hose still disconnected). If not, replace air control valve and repeat test.

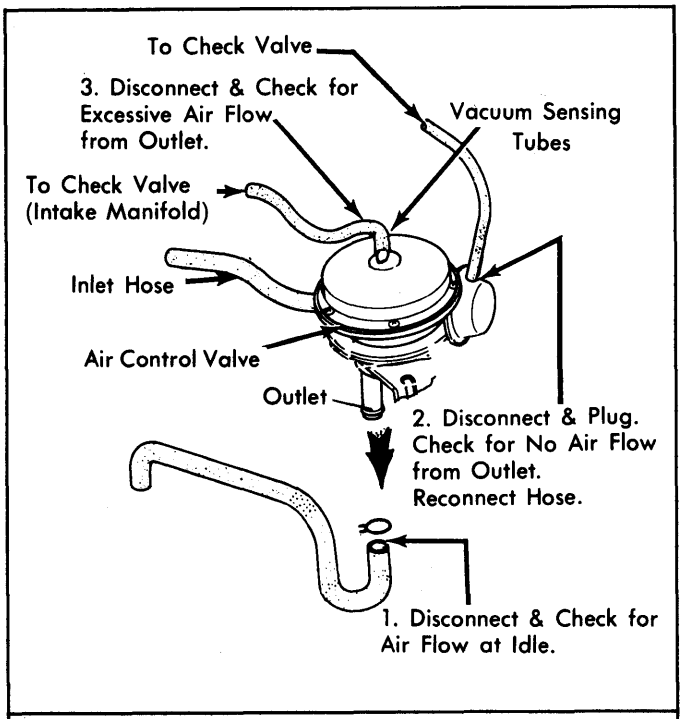

Fig. 4: Testing Air Control Valve

Copyright (c) 2001 Mitchell Repair Information Company