1974-79 EXHAUST EMISSION SYSTEMS
Datsun Air Injection System

All 1979 Models (Exc. 280ZX & 810)

NOTE: For 1974-78 models, see AIR INJECTION SYSTEMS article in this section. A pulse-air type air injection system is used on 1979 5-speed transmission equipped 210 Hatchbacks. For information on this system see DATSUN AIR INDUCTION SYSTEM article in this section.

DESCRIPTION

The air injection system is designed to reduce the hydrocarbon (HC) and carbon monoxide (CO) content of exhaust gases by injecting a controlled amount of compressed air into the exhaust gas stream as it leaves the combustion chamber. *See Fig. 1.* The system consists of a belt-driven air pump, air pump air cleaner, a check valve, various connecting hoses and pipes, and either a combined air control valve (Calif. models) or an air pump relief valve (Federal models).

OPERATION

Inlet air to the air pump is drawn through the pump air cleaner. The pump then supplies air under pressure to either the exhaust ports on the cylinder head (210 and 310) or the exhaust manifold (all other models). The oxygen in this fresh air, plus the heat of the exhaust gases, causes further oxidation (burning), which converts the exhaust gases into carbon dioxide and water.

AIR PUMP

The air pump is a belt-driven, rotary vane type pump. The pump receives clean air through a hose connected to the air pump air cleaner. The compressed air from the pump is routed through the check valve to the injection nozzles where it is injected into exhaust ports near the exhaust valves.

ANTI-BACKFIRE VALVE

The anti-backfire valve is used to prevent backfire in the exhaust system during deceleration. At the start of deceleration, the air/fuel mixture in the intake manifold becomes too rich to ignite and burn in the combustion chamber. The anti-backfire valve provides additional air to the intake manifold to make the air/fuel mixture leaner and prevent backfire.

CHECK VALVE

The check valve, located in the pump discharge line, prevents the backflow of exhaust gas into the air pump in the even that exhaust manifold pressure exceeds air injection pressure, or the air pump fails.

COMBINED AIR CONTROL VALVE

Used on California models, this valve regulates the supply of compressed air from the air pump according to engine load condition. The combined air control valve also aids in the prevention of catalytic converter overheating by venting the compressed air to the atmosphere during certain engine operating conditions.

AIR PUMP RELIEF VALVE

Used on Federal models, the air pump relief valve controls the injection of secondary air into the exhaust system when the engine is running at high speeds under a heavy load. The relief valve is designed to minimize horsepower loss resulting from air injection into the exhaust system, and to protect the air pump from excessive back pressure.

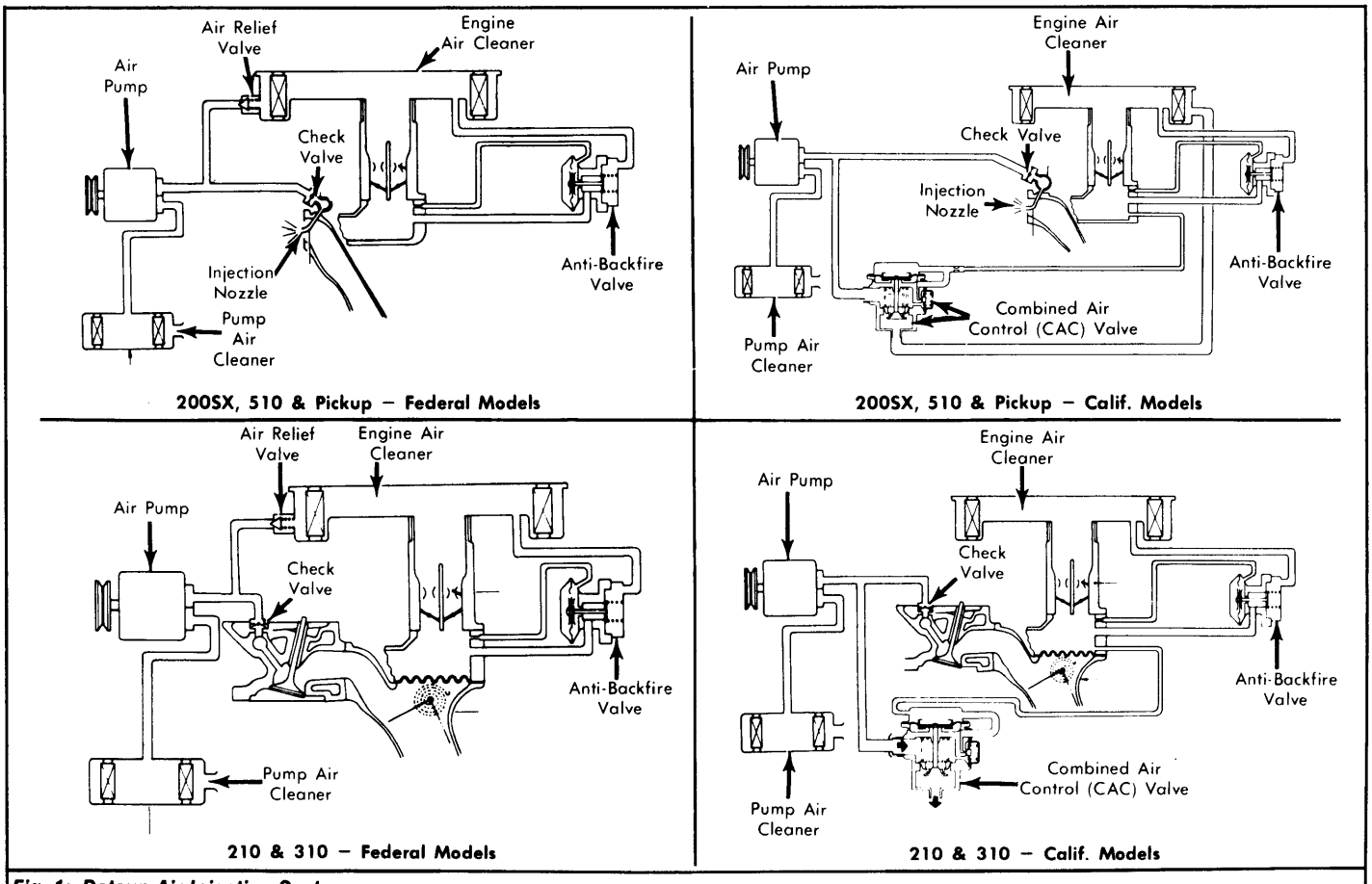

Fig. 1: Datsun Air Injection System

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

TESTING

AIR PUMP

1) With engine at normal operating temperature, inspect all air injection system hoses, hose connections and air gallery for leaks and damage. Check air pump drive belt tension and adjust as required.
2) On California models, disconnect and plug air pump discharge hose at Combined Air Control (CAC) valve. On all models, disconnect air supply hose at check valve and connect air pump test gauge and Adapter (ST19870000) to hose. Tighten hose clamp securely.

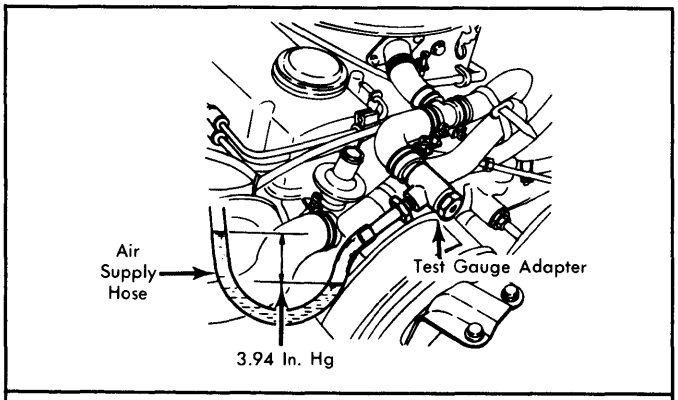

Fig. 2: Connecting Air Pump Gauge & Adapter

3) Position adapter and test gauge so that air emitted through drilled pipe plug will be harmlessly dissipated. Connect a tachometer to engine.
4) Start engine and check air pump pressure with engine at 2600 RPM. Pump pressure should be at least 3.94 in. Hg.
5) On California models, repair or replace air pump if pressure is not as specified. If pressure is not as specified, on all other models, go to next step.
6) With engine speed at 1500 RPM, disconnect tube from test gauge adapter and cover hole of test gauge with finger.
7) If a leaking sound is heard, or leaking air is felt by finger at air pump relief valve, relief valve is faulty and should be replaced. If no air leak is noticeable, repair or replace air pump as necessary.

CHECK VALVE

1) With engine at normal operating temperature, disconnect hose from check valve and check hose opening for any sign of exhaust gas leakage. If leakage is detected, replace check valve.
2) Increase engine speed to 2000 RPM and allow it to return to idle. As engine returns to idle, check hose for any sign of leakage. If leakage is detected, replace check valve.

ANTI-BACKFIRE VALVE

1) With engine at normal operating temperature, disconnect anti-backfire valve hose at air cleaner and place finger over end of hose.
2) Increase engine speed to 3000 RPM and allow it to return to idle. If suction is felt at end of hose, anti-backfire valve is functioning properly. If not, replace valve.

AIR PUMP RELIEF VALVE

Federal Models - 1) With engine at normal operating temperature, disconnect hoses to check valve and relief valve from air hose connector and cap off connector. *See Fig. 3.*
2) Increase engine speed to 3000 RPM and place hand over air outlet of relief valve to check for discharged air. If no air is felt, replace relief valve.

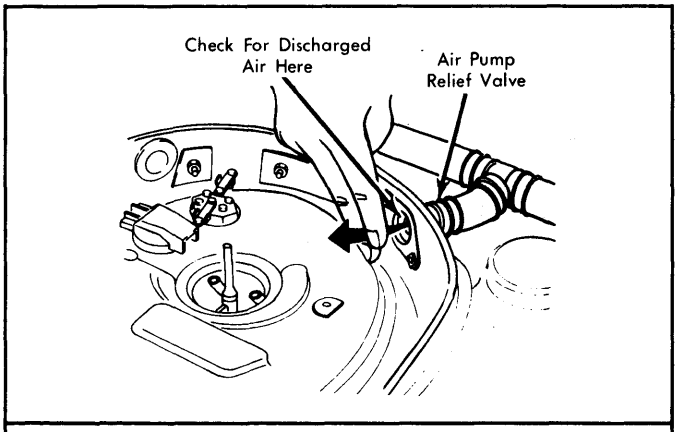

Fig. 3: Checking Air Pump Relief Valve

COMBINED AIR CONTROL VALVE

California Models - 1) With engine at normal operating temperature and idling, place finger over relief air opening in air cleaner and check for presence of air.
2) Disconnect vacuum hose from Combined Air Control (CAC) valve and plug hose to prevent engine from stalling. Air should now be discharged from CAC valve if valve is functioning properly.
3) Next, connect a hand-held vacuum pump to CAC valve. *See Fig. 4.* Apply 7.9-9.8 in. Hg to valve, then increase engine speed to 3000 RPM. Make sure no air leaks from CAC valve.
4) With vacuum applied and engine at 3000 RPM, disconnect and plug air hose at check valve. Air should now leak from CAC valve. If not, replace CAC valve.

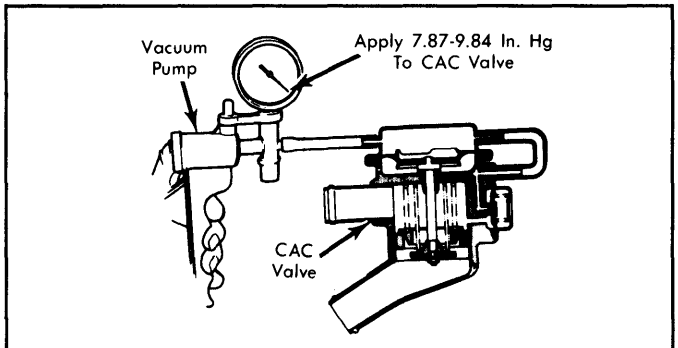

Fig. 4: Checking Combined Air Control Valve