AIR INJECTION SYSTEM

1986 Isuzu Trooper II

1986 Exhaust Emission Systems
ISUZU AIR INJECTION SYSTEM

P'UP, Trooper II

DESCRIPTION

The air injection system is used to add secondary air to exhaust ports for further burning of hot exhaust gases. System consists of an air pump with a built-in relief valve, a check valve, an air injection manifold with air injection nozzles, an air switching valve, and a mixture control valve.

The mixture control valve prevents backfiring in the exhaust system during deceleration. In addition, California models use an electrically controlled vacuum switching valve.

OPERATION

AIR PUMP

Air pump is belt driven on all models except Impulse. It draws fresh air in, pressurizes it and passes it along to the rest of the system. A built-in relief valve will bleed off any excess pressure occurring in the air pump. Normal pump pressure is 2.8-5.0 psi (0.2-0.4 kg/cm^2).

CHECK VALVE

This one-way valve is designed to allow air to flow into the air injection manifold. When exhaust system pressure is greater than air pump pressure, check valve closes to prevent exhaust gas from flowing back into air pump system and damaging components.

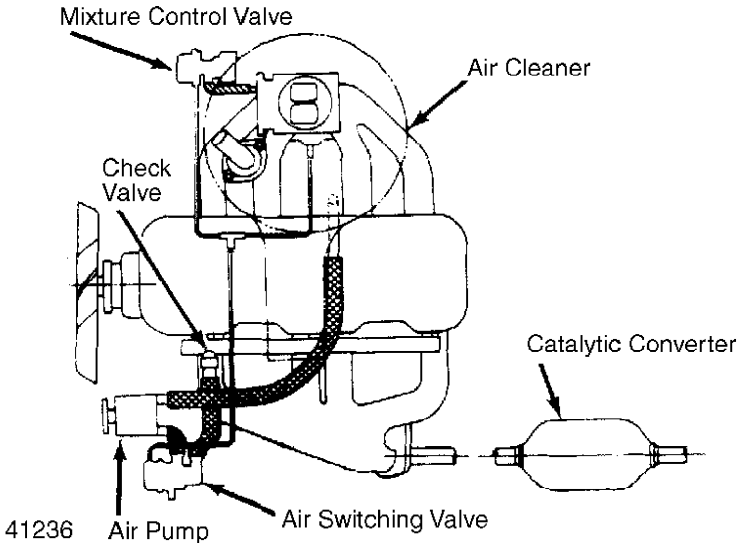

Fig. 1: Federal P'UP & Trooper II Air Injection System

VACUUM SWITCHING VALVE

All Models (Except Federal P'UP & Trooper II)

The vacuum switching valve (VSV) has 3 ports, 2 of which are opened or closed by a solenoid plunger. Solenoid plunger is energized when coolant temperature is under 122°F (50°C) or for 10 seconds after WOT switch is turned on (coolant temperature over 122°F).

The VSV reverses the application of manifold vacuum to the air switching valve. When energized, the VSV connects chamber "B" of air switching valve to intake manifold. When plunger is de-energized, it plugs chamber "B" and connects chamber "A" of air switching valve to intake manifold.

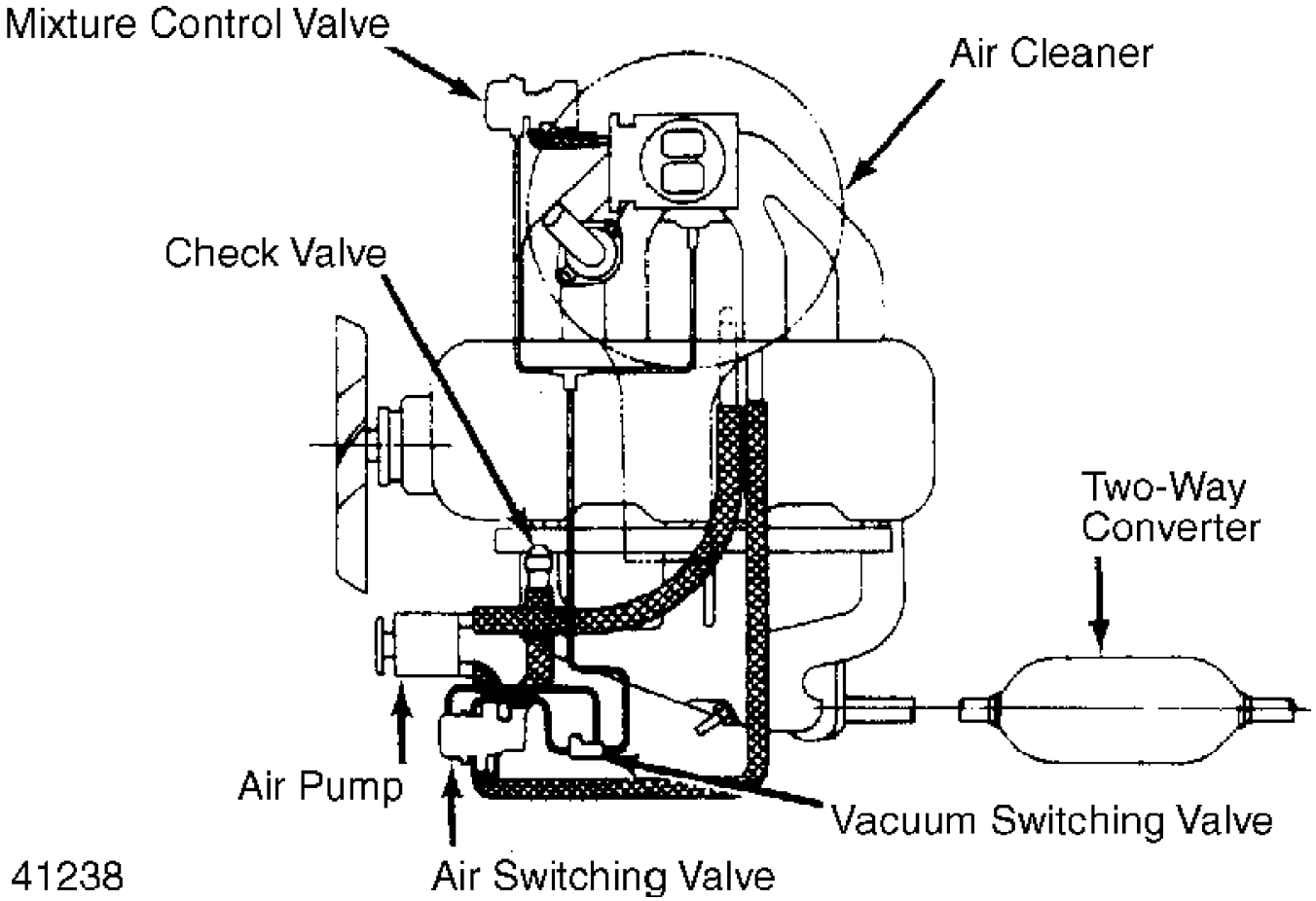

Fig. 2: California P'UP & Trooper II Air Injection System

AIR SWITCHING VALVE

Federal P'UP & Trooper II

The air switching valve (ASV) is designed to redirect air flow from the air pump to the check valve or to the atmosphere. When manifold pressure is higher than specified, the valve allows air to flow to the check valve.

When manifold pressure is lower than specified, the air valve shuts air flow to the check valve, and at the same time vents pressure to the atmosphere.

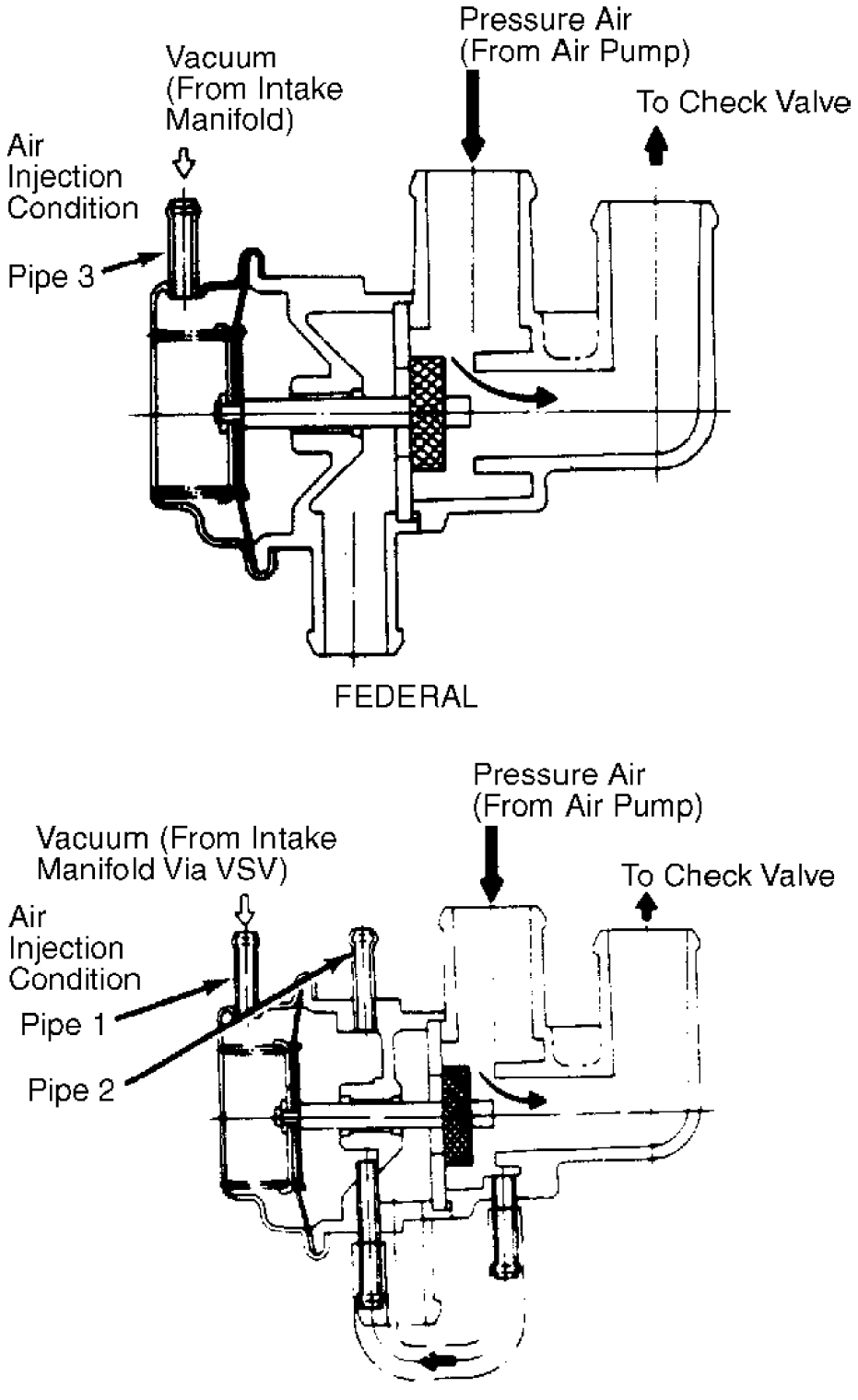

Fig. 3: Typical Isuzu Air Switching Valves
Normal operating position shown.

All Models
The ASV is operated by air pump pressure and by intake

manifold vacuum through the vacuum switching valve. The ASV redirects air flow from the air pump to either the check valve or to the atmosphere.

When manifold vacuum is applied to pipe 1, the ASV allows air to flow from air pump to the check valve. When the vacuum switching valve directs air pump pressure to pipe 1, the ASV shuts air flow to air injection manifold, and at the same time vents pressure to the atmosphere (air cleaner).

MIXTURE CONTROL VALVE

This normally closed valve prevents backfiring in the exhaust system on deceleration. The mixture control valve allows atmospheric air to enter the intake manifold during deceleration.

When high intake manifold vacuum is sensed, valve opens and atmospheric air is directed into intake manifold to combine with rich mixture caused by rapid closing of throttle valves.

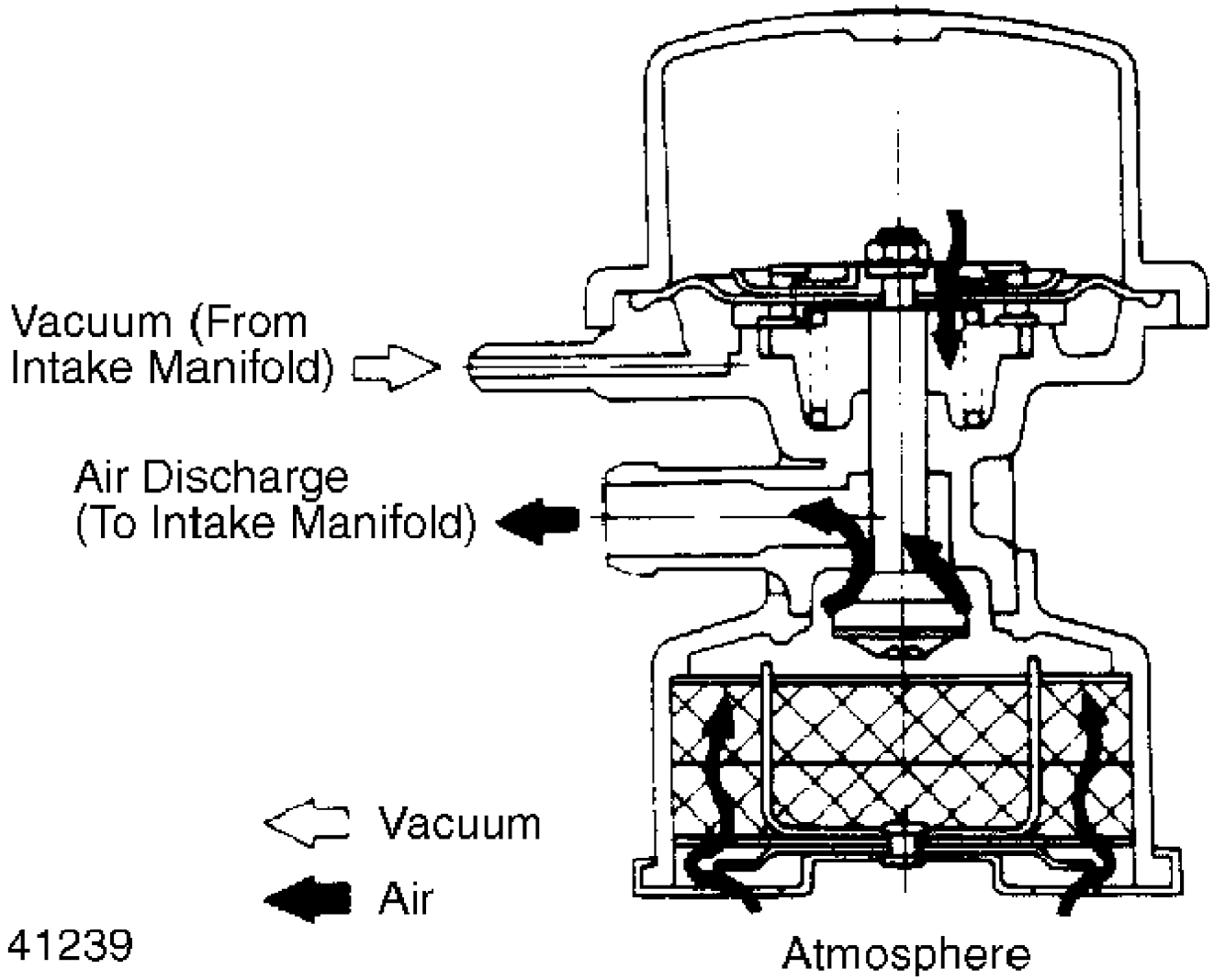

Fig. 4: Typical Isuzu Mixture Control Valve
Valve adds air to intake manifold during deceleration.

TESTING

AIR PUMP

All Models

If found to be excessively noisy or not producing any air pressure, pump must be replaced. Air pump is not serviceable.

AIR SWITCHING VALVE

All Models

Air switching valve is operating normally if secondary air continues to flow through valve for a few seconds after accelerator pedal is depressed to floor and quickly released. If secondary air continues to flow after 5 seconds, replace air switching valve.

CHECK VALVE

Remove check valve from air manifold. Blow air into valve from both sides. Air should only pass through from air pump side of valve. If air passes through from manifold side of valve, replace valve. A small amount of leakage is normal.

MIXTURE CONTROL VALVE

1) With engine running, disconnect rubber hose between mixture control valve and intake manifold. Plug intake manifold connection.

2) If valve is operating normally, air will flow through valve for a few seconds after accelerator pedal is depressed to floor and quickly released. If air continues to flow after 5 seconds, replace mixture control valve.

VACUUM SWITCHING VALVE

All Models

Connect jumper wires from valve connector terminals directly to battery. Plunger should "click" with battery voltage applied. If not, replace valve.