GENERAL MOTORS PULSE AIR INJECTION

General Motors (250" Engines)

DESCRIPTION

The Pulse Air Injection Reaction (PAIR) system is used on General Motors models with 250" 6 cylinder engines. It is a nonpump type air injection system which uses engine exhaust pulses to draw fresh air into the exhaust system. This helps to further oxidize HC and CO emissions. System consists of a grouping of check valves in 2 plenum chambers (located on valve covers) and related tubing.

OPERATION

Each one of the check valves in plenum chambers is connected to an exhaust port. The firing of the engine creates a pulsating flow of exhaust gases. When positive exhaust pressure is felt, the check valve will be forced closed and no exhaust gas will flow past the valve into the fresh air supply line. With negative exhaust pressure (vacuum), the check valve will open and fresh air will be drawn and mixed with exhaust gases. During high engine RPM, the check valve will remain closed (such as under heavy acceleration).

TESTING

FUNCTIONAL TEST

1) Remove air cleaner-to-plenum pipe hose from plenum pipe. Slide a length of tight-fitting 3/4" hose onto plenum pipe and, using an adapter, connect a hand vacuum pump to hose.

2) Apply 17 in. Hg. Note time required for vacuum level to drop from 17 in. Hg to 6 in. Hg. If less than 2 seconds, remove check valves and test individually. Replace check valve(s) which fail leak-down test.

NOTE – *If system fails leak-down test, ensure that failure is not due to a leaking test hose or connection.*

TROUBLE SHOOTING

FAILURE DIAGNOSIS

Short Hissing Noise – May indicate a defective check valve or improper torque at manifold. Inspect check valves.

Surge or Poor Performance – May be caused by failure of one or more check valves. Exhaust gas will enter carburetor through air cleaner and cause poor driveability.

Excessive Heat; Paint Burned Off of Valve – Exhaust gas passing through pulse air valve, sending heat to valve body. Rubber hose will also be damaged. A short hissing noise may also be noticed. Repair plenum chamber-to-valve cover seals, and replace grommets and hose as required.

Poor Driveability – Rubber hose deteriorated. Hose particles entering carburetor causing poor driveability. Clean carburetor, and remove particles from plenum chambers and connecting pipe.

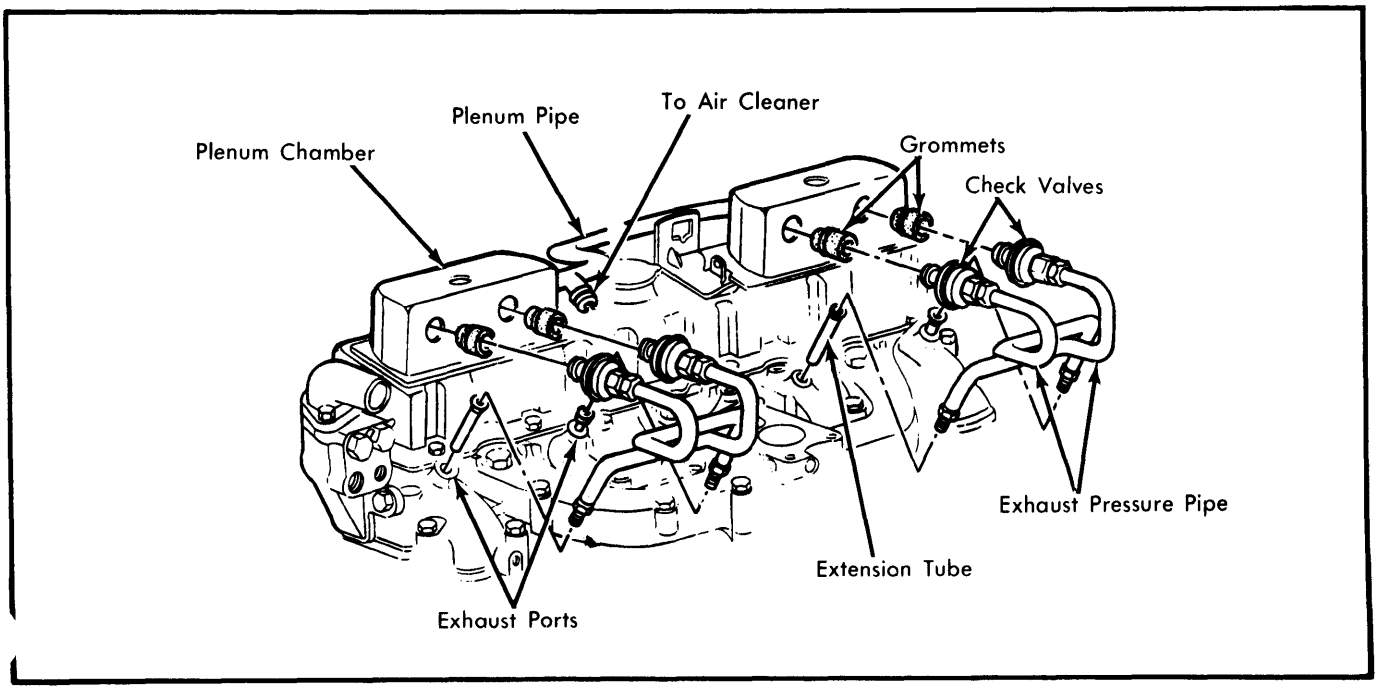

Fig. 1 Pulse Air Injection Reactor (PAIR) System Components