1974-79 EXHAUST EMISSION SYSTEMS
BMW Air Injection System

All 1979 Models

NOTE: For 1974-78 models, see AIR INJECTION SYSTEMS article in this section.

DESCRIPTION

The air injection system is used to reduce hydrocarbon (HC) and carbon monoxide (CO) emissions. The system adds a controlled amount of fresh air to exhaust gases at the exhaust ports causing oxidation of gases. On all models except Federal 320i, air injection is used in conjunction with a thermal reactor. *See Fig. 1.* The air injection system consists of a belt-driven air pump, a diverter valve, a check valve, electromagnetic switch (Blue), speed relay switch (also used by EGR system), and various connecting hoses and pipes.

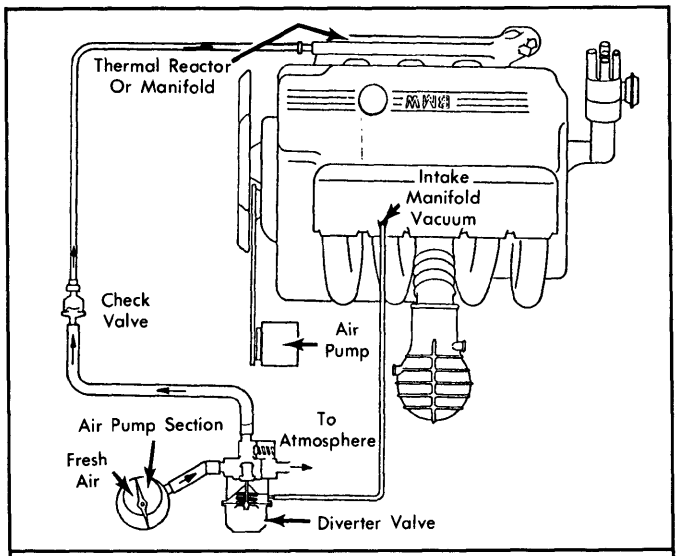

Fig. 1: 320i Air Injection System

OPERATION

Inlet air to the air pump is drawn in through a centrifugal fan filter at front of pump. Pressurized air leaving the pump is routed through the diverter valve, check valve and distribution pipe (above thermal reactor or manifold) into the exhaust ports behind the exhaust valves. The fresh air ignites and burns the unburned portion of exhaust gases in the exhaust system, thus reducing HC and CO emissions.

AIR PUMP

The air pump is belt driven and mounted on the front of the engine with power take-off at the crankshaft pulley. Intake air passes through the filtering device and is delivered to the exhaust ports by a rubber hose.

DIVERTER VALVE

The diverter valve prevents backfire in the exhaust system during sudden deceleration. The valve senses sudden increase in intake manifold vacuum, causing valve to open and allowing air from air pump to vent to the atmosphere. A pressure relief valve is incorporated into the diverter valve to prevent overloading the air pump.

On 633CSi and 733i, diverter valve operation is also controlled by an electromagnetic switching valve. The switching valve opens the diverter valve when engine speed exceeds 3750 RPM, this interrupts the air injection and vents the air to the atmosphere.

NOTE: The 633CSi and 733i are equipped with two or three electromagnetic switching valves. The switching valve for the air injection system can be identified by a Blue cap.

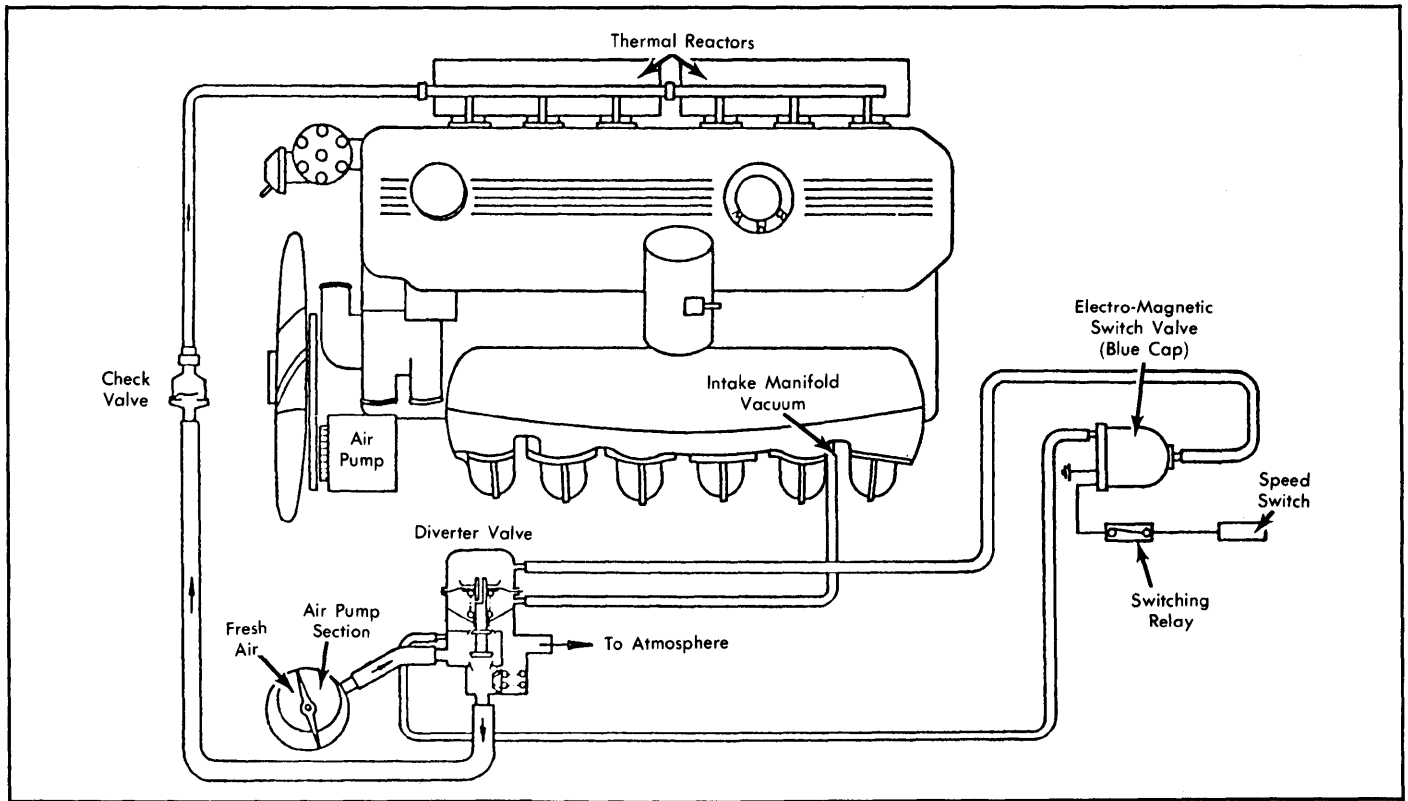

Fig. 2: 633CSi & 733i Air Injection System

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

CHECK VALVE

This valve has a one-way diaphragm which prevents hot exhaust gases from backing up into the hoses and air pump. This protects the air injection system in case of pump belt failure, high exhaust system back-pressure, or air hose ruptures.

TESTING

AIR PUMP

1) Disconnect air output hose from rear of air pump. Start engine and run at idle. Place hand near output fitting on pump.
2) Slowly increase engine speed. Air pump output pressure should increase with engine speed. If not check drive belt tension and air pump installation. If these are okay, air pump is defective.

DIVERTER VALVE

1) Check all hoses to diverter valve for cracks, bends or improper routing. Repair or replace hoses as necessary. Pull vacuum hose from diverter valve. With engine running, vacuum must be felt at end of hose.
2) Reattach hose to diverter valve. At idle, no air should be coming from diverter valve atmospheric outlet. Open and close throttle quickly. Air should escape from atmospheric outlet for 1-3 seconds. If not, diverter valve is defective.

CHECK VALVE

1) Inspect hoses for traces of exhaust gas leakage. This will indicate a defective check valve if exhaust traces are found on hoses.
2) Slowly increase engine speed. Air pump output pressure should increase with engine speed. If not, check drive belt tension and air pump installation. If these are okay, air pump is defective.

ELECTROMAGNETIC SWITCH & SPEED SWITCH

633CSi & 733i – 1) With engine at idle, disconnect electrical connector from electromagnetic switch (with Blue cap). Connect a test lamp between connector terminals. Test lamp should not come on. If test lamp comes on, speed switch is defective.
2) Next, increase engine speed. Test lamp should come on when engine speed reaches approximately 3750 RPM. If not, connect test lamp directly to ground.
3) If test lamp now lights, power supply line to switching valve is not grounded. Repair as necessary and retest. If lamp still does not come on, speed switch is defective.

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