BRITISH LEYLAND AIR INJECTION

Austin Marina (1973)
Austin America (1968-71)
Austin Healey Sprite (1968-69)
Austin Sprite (1970)
MG Midget (1968-73)
MGB & MGC (1968-73)
Jaguar XJ6 (1969-73)
Jaguar XJ12 (1973)
Jaguar V12 (1972-73)

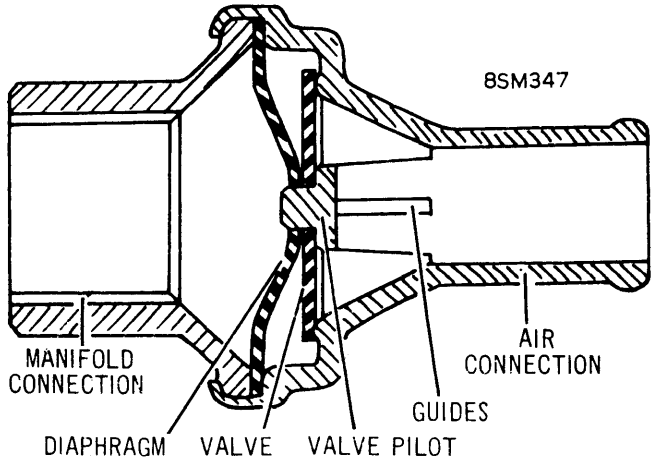
DESCRIPTION

The purpose of the Exhaust Port Air Injection System is to reduce the toxic content of the exhaust gas by injecting air into the exhaust ports. The system consists of a rotary twin vane air pump driven by the engine, an air intake filter, an air distribution manifold, a check valve and a gulp valve. Air is drawn through the filter into the pump. A consistent pump output pressure is maintained by a relief valve which allows excessive pressure at high engine speed to be discharged into the atmosphere. Limiting the pumps output maintains back pressure and temperature at an acceptable level in the exhaust system.

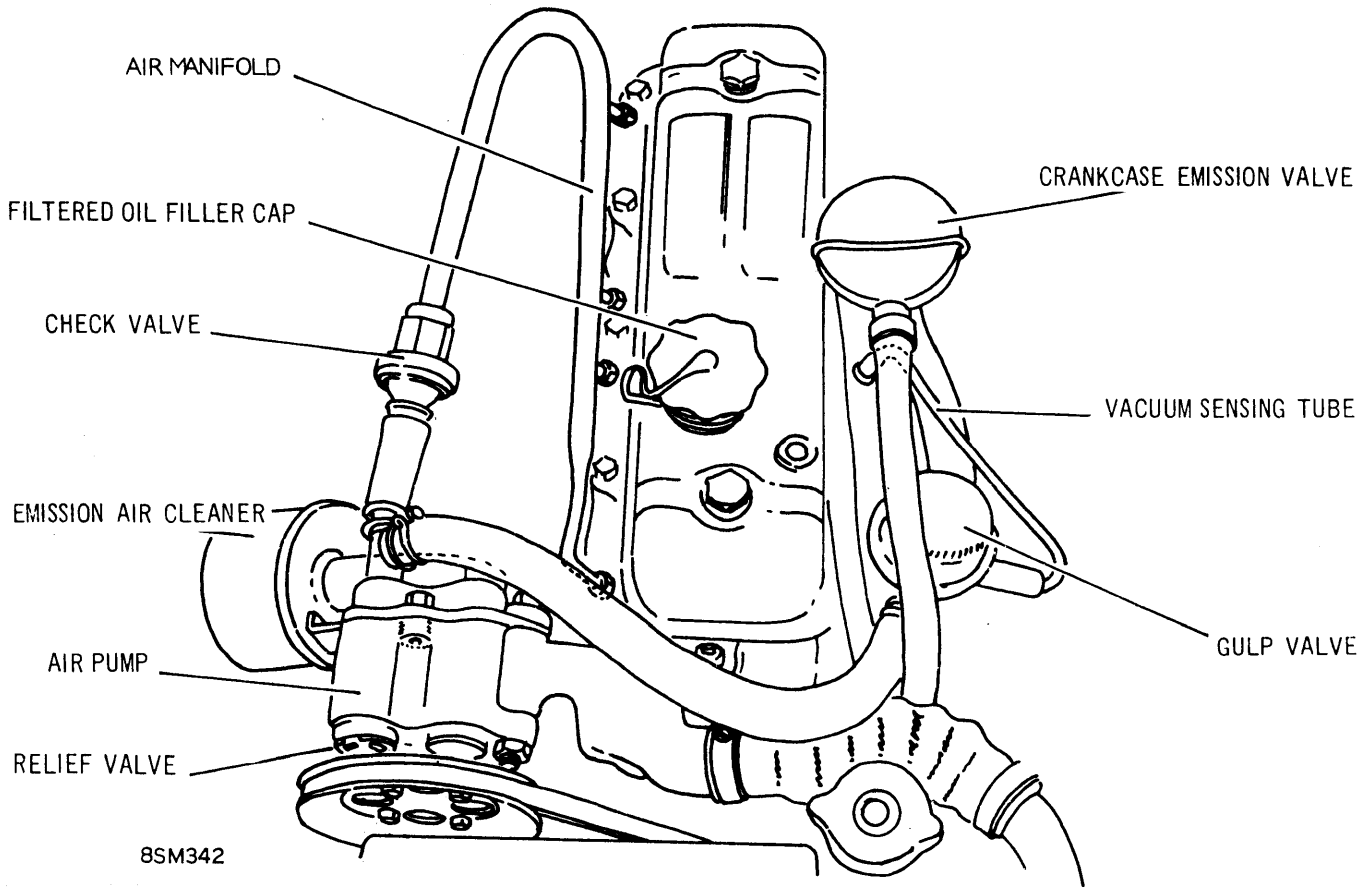
OPERATION

Air is pressure fed from the air pump through a one-way check valve into the injection manifold. The check valve protects the pump from a back-flow of exhaust gases should the exhaust pressure exceed the pump pressure due to pump drive failure or exhaust system restriction. The compressed air passes through the air injection manifold into the exhaust port of each cylinder (in the vicinity of the exhaust valve) at which point exhaust gases are still hot enough to be further oxidized.

NOTE — Efficient operation of this system is dependent on the engine being correctly tuned. Ignition and spark plug settings, valve clearances, and carburetor adjustments given for a particular engine must be strictly adhered to at all times.



CHECK VALVE



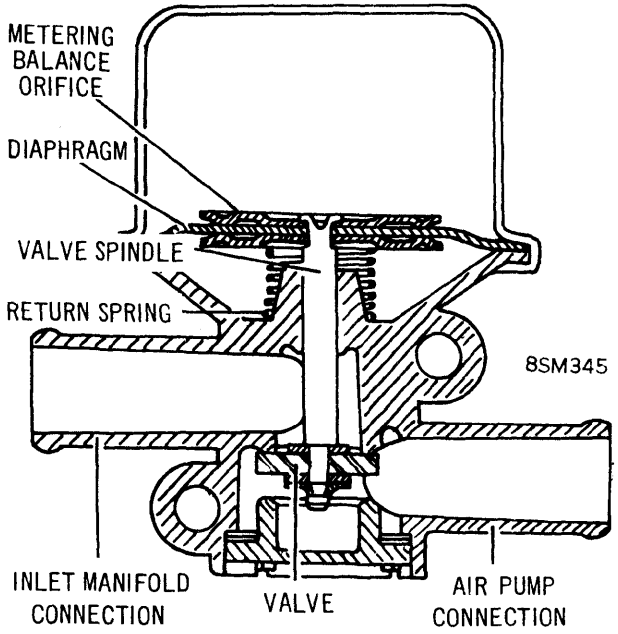
BRITISH LEYLAND AIR INJECTION SYSTEM (TYPICAL)

BRITISH LEYLAND AIR INJECTION (Cont.)

Air Pump – The rotary vane type air pump is mounted on the front of the engine and is belt driven. Air is drawn into the pump through a dry type renewable element filter. A relief valve in the pump discharge port allows excessive air pressure to be discharged into the atmosphere.

Check Valve – The check valve, fitted in the pump discharge line to the injection manifold, protects the pump from the back-flow of exhaust gases. Valve shuts off if the air pump pressure ceases while the engine is running.

Gulp Valve – The gulp valve, located in the pump discharge line (except Jaguar V-12 which draws air from carburetor air cleaner), controls the flow of supplementary air for leaning the rich air/fuel mixture which is present during deceleration. After sudden throttle closure, some fuel continues to flow from the carburetors. This produces intake manifold air/fuel ratios which are normally too rich to burn. The gulp valve supplies a gulp of air which mixes with the rich air/fuel mixture, making it combustible. The gulp valve, which is a spring loaded diaphragm, is actuated by high intake manifold vacuum.



GULP VALVE

TESTING

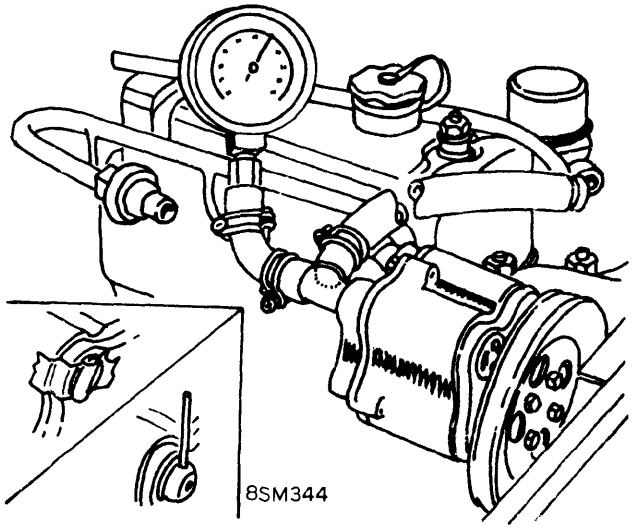
Air Pump & Relief Valve – Check belt tension. Connect tachometer. Disconnect and plug gulp valve air supply hose at gulp valve (except Jaguar V-12). Disconnect air manifold supply hose at check valve and connect a pressure gauge to hose. Run engine at specified speed and check pressure.

Application	Engine RPM	Min. Pressure (psi)
Austin Marina	900	2.75
Sprite & Midget	1200	2.75
MGB & MGC	1000	2.75
Austin America	1200	2.75

1) If a reading lower than specified is obtained, clean pump air cleaner and replace element, repeat test. If reading is still low, block off relief valve and repeat test. If reading is now correct, replace valve. If reading is still low, replace pump.

2) Stop engine and fit a temporary air duct over relief valve. This can be done by using a grommet and short length of metal brake tube or using adhesive tape to form a duct, see pressure gauge connection illustration. *NOTE – Do not attempt to check air flow from relief valve by placing a finger between valve and driving pulley.* Start engine and slowly increase speed until air flow is detected from relief valve, check gauge reading, if not as specified, replace valve.

Application	Gauge Reading (psi)
Sprite & Midget	4.5 to 6.5
MGB & MGC	4.5 to 6.5
Austin America	4.5 to 6.5



PRESSURE GAUGE CONNECTION

Check Valve – Hold air manifold connection to prevent it from twisting, unscrew check valve. Orally, blow through valve from each end. *NOTE – Do not use an air blast for this test.* Air should only pass through valve when blown from air supply hose connection. If air passes through valve when blown from air manifold connection side, replace check valve.

Air Manifold & Injectors – Disconnect air manifold from cylinder head connection. Slacken hose clip at check valve and rotate manifold about its axis until injector connections are accessible (on Jaguar V-12, crossover pipes must be removed first). Tighten hose clip at check valve. *NOTE – In some cases, injectors will be free in the head and care must be taken that they are not displaced during the following:*

1) Run engine at idle speed and observe flow of air from each manifold connecting tube. If flow is restricted at any tube, remove manifold and clear obstruction using an air blast.

2) With engine idling, check that exhaust gases blow from each of the cylinder head injectors, if not, clean injector bore as follows:

3) Crank engine until exhaust valve below injector is closed. Using a hand drill (NOT POWER DRIVEN), pass a drill of slightly smaller diameter than injector bore through the bore, making sure drill does not contact exhaust valve stem. Clean port with air blast.

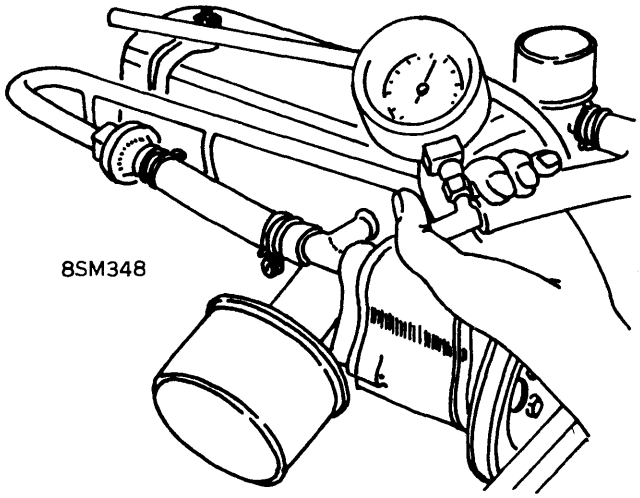
BRITISH LEYLAND AIR INJECTION (Cont.)

Gulp Valve – Disconnect gulp valve air supply hose. Connect a vacuum gauge with a tee connection to gulp valve. Start engine and run at idle speed. Temporarily seal connection on gauge tee and check that a zero gauge reading is maintained for 15 seconds. *NOTE – Do not increase engine speed above idle during test.* If a vacuum reading is registered, replace the gulp valve. With gauge tee temporarily sealed, rapidly open and close throttle. Gauge should show a vacuum reading, if not, replace valve.

MAINTENANCE

At 6,000 Mile or 6 Month Intervals – Check all drive belts, adjust if necessary. Check all hoses for condition and tightness.

At 12,000 Mile or 12 Month Intervals – Check all drive belts, adjust if necessary (replace all belts at 24,000 miles or 24 months). Check all hoses for condition and tightness. Replace air pump filter element (Austin & MG only). Check air injection manifold for damage, leaks and security. Replace gulp valve.



TESTING GULP VALVE