DESCRIPTION
RG 225 ENGINE

Introduction

The fuel system consists of the fuel tank, in-line filter, fuel pump, carburettor and fuel lines. In addition the following systems designed to assist emission control are considered part of the fuel system.

- Electric assist choke system
- Orifice spark advance control (OSAC)
- Vacuum throttle positioner
- Automatic air control
- Crankcase ventilation system

Description

Fuel is drawn from the chassis bracket mounted fuel tank through an in-line filter mounted on the chassis frame, and pumped to the carburettor by a fuel lift pump, secured to the right hand side of the engine cylinder block. The pump is a sealed unit and no servicing is required except for an occasional check for security or leakage.

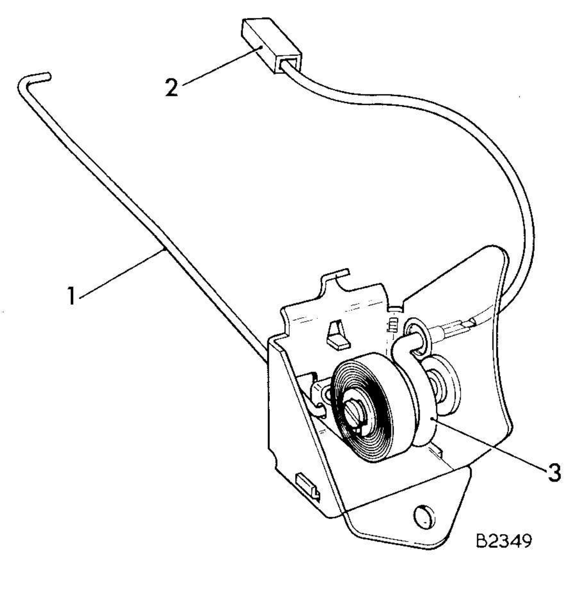
The fuel lift pump is driven by an eccentric cam machined on the camshaft. As the camshaft rotates, the eccentric cam presses on the pump rocker arm. This action lifts the pull rod and diaphragm against the fuel pump main spring, creating a vacuum in the valve housing and opens the inlet valve to draw fuel into the valve housing chamber. On the return stroke the main spring forces the diaphragm to the down position, which closes the inlet valve and expels the fuel in the valve housing chamber through the outlet valve, to the carburettor.

The following systems control crankcase, exhaust and evaporative emissions.

Electric Assist Choke System (fig. 1)

The electric assist choke system reduces HC and CO emissions during engine starting and warm up.

The system comprises a choke assembly, mounted between two of the ports of the inlet manifold and a control switch mounted on the engine lifting bar. The choke assembly consists of a thermostatic coil spring which reacts to engine temperature, and an electrical heating element adjacent to the coil spring to assist engine heat during both summer and winter operations to shorten choke duration. The choke assembly is designed to give a more rapid choke opening at temperatures of about 15.6°C (60°F) – 26.7°C (80°F) or greater, and a slower choke opening at temperatures of about 15.6°C (60°F) or below. A wire from the choke heater is connected to a thermostatic control switch energised by the ignition switch. Above 15.6°C (60°F) – 26.7°C (80°F) the control switch will energise the choke heater. The electric assist choke system does not change any carburettor or choke system procedures and cannot be adjusted. An electric short in the wiring to the choke assembly or within the assembly will be a short in the ignition system.



1. CHOKE ROD
2. TO CHOKE CONTROL SWITCH
3. ELECTRIC ASSIST HEATING ELEMENT

Fig. 1 *Electric assist choke unit*

Orifice Spark Advance Control (OSAC)

The 'OSAC' system is used to control the emission of oxides of nitrogen (NOx). The device controls the vacuum, from the carburettor, to the vacuum advance capsule of the distributor, and is fitted to

DESCRIPTION AND MODIFICATIONS

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the side of the rocker cover. A small orifice is incorporated in the 'OSAC' valve which delays vacuum control at the distributor by approximately 20 seconds, when moving from idle speed to part throttle.

When moving from part throttle to idle speed the vacuum change is immediate. Vacuum is obtained by a vacuum drilling on the body of the carburettor. This creates no vacuum at idle speed, but creates manifold vacuum as the throttle is opened.

Correct operation of the 'OSAC' valve depends on airtight fittings, freedom of deposits in the hoses, and the correct connections to the valve. The valve is marked 'CARB' on the Black plastic side, and 'DIST' on the White plastic side, to enable the vacuum hoses to be correctly fitted.

Vacuum Throttle Positioner (fig. 2)

The systems function is to prevent unburned hydrocarbons being emitted through the exhaust system to atmosphere, when the vehicle is decelerated from a high speed.

It consists of an electronic speed switch, an electrically controlled vacuum solenoid valve, and a vacuum operated throttle positioner.

The electronic speed switch, is mounted on the engine compartment scuttle panel, and receives its electrical supply from the auxiliary ballast resistor of the electronic ignition circuit; the harness is connected to the speed switch with a three pin socket, which is handed to prevent incorrect fitting.

A 12 volt feed from the input of the auxiliary ballast resistor connects to the centre pin of the plug (white wire).

A 1½–3 volt feed from the output of the auxiliary (5 ohm) ballast resistor connects to the left hand side pin of the plug (green wire).

12 volts are taken from the right hand pin of the plug (black/green wire) through to the vacuum solenoid valve, and thence to earth.

The electronic speed switch receives ignition pulses from the five ohm auxiliary ballast resistor terminal. It senses when the engine speed exceeds 1850 R.P.M., and passes the 12 volt supply of the switch to the vacuum solenoid valve, which opens allowing vacuum to pass to the throttle positioner.

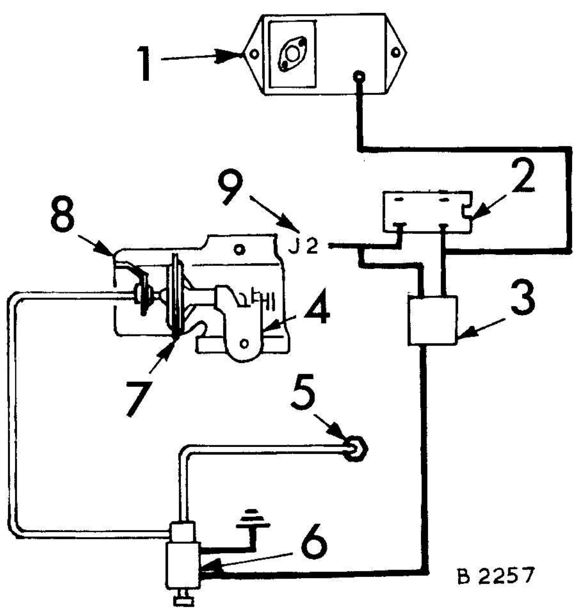
When the throttle positioner is energised it moves forward creating a new throttle stop position inhibiting the throttle from returning to the idle position.

As the throttle is released it will return to the new stop position (positioner energised). This provides sufficient air flow through the carburettor to dilute the air/fuel mixture, and burn off excessive hydrocarbons.

Whilst the engine is decelerating, the electronic speed switch senses the engine speed, when the speed drops below 1850 R.P.M., the switch de-energises and releases the throttle positioner.

The throttle now returns to its normal idle stop position.

Vacuum is taken from the induction manifold, through the vacuum solenoid valve to the vacuum throttle positioner.



1. ELECTRONIC IGNITION CONTROL UNIT
2. BALLAST RESISTOR
3. ELECTRONIC SPEED SWITCH
4. THROTTLE LEVER
5. MANIFOLD VACUUM
6. VACUUM SOLENOID VALVE
7. VACUUM THROTTLE POSITIONER
8. CARBURETTOR
9. TO IGNITION SWITCH TERMINAL

Fig. 2 *Vacuum throttle positioner system*

Automatic Air Control (fig. 3)

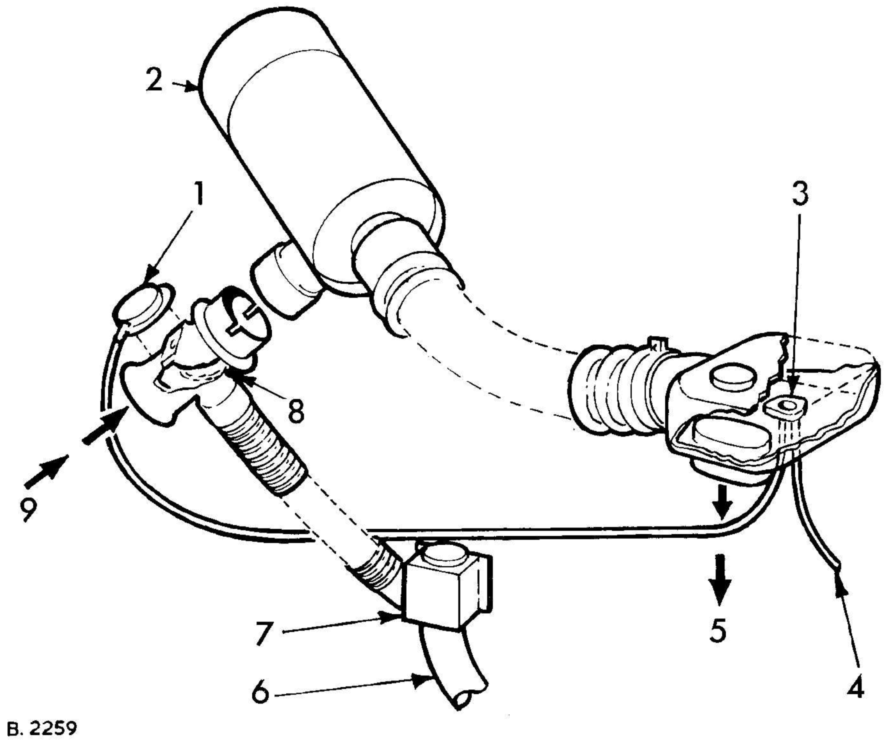
This device is part of the air cleaner and keeps the temperature of the air entering the carburettor at about 23.9°C (75°F) during warm up. By maintaining 23.9°C (75°F) or more, the carburettor can be calibrated much leaner to reduce hydrocarbon emissions, improve engine warm-up characteristics and minimise carburettor icing.

The system has three main components as follows:

1. A hot air pick-up, fitted around the exhaust down pipe, supplies hot air through a metallised tube to the air cleaner intake.
2. A temperature sensing valve mounted in the air feed intake box situated on the carburettor has two pipe connections. One pipe is connected to the inlet manifold and the other to the diaphragm motor.
3. A spring loaded diaphragm motor controlled by the temperature sensing valve is mounted directly on the air cleaner intake, with a pull rod that controls the position of the double flap valve in the air intake tube.

With the engine stopped the diaphragm motor will extend the pull rod to move the double flap valve to fully close the hot air intake and open the cold. When the engine is started the high manifold vacuum is transferred to the diaphragm motor via the temperature sensing valve. The pull rod will be retracted to move the double flap valve and fully open the hot air intake and close the cold.

As the temperature in the air feed intake box increases, it is monitored by the temperature sensing valve. The reducing vacuum in the diaphragm motor produces a mixture of hot and cold air until eventually the hot air intake is fully closed and the cold fully open.



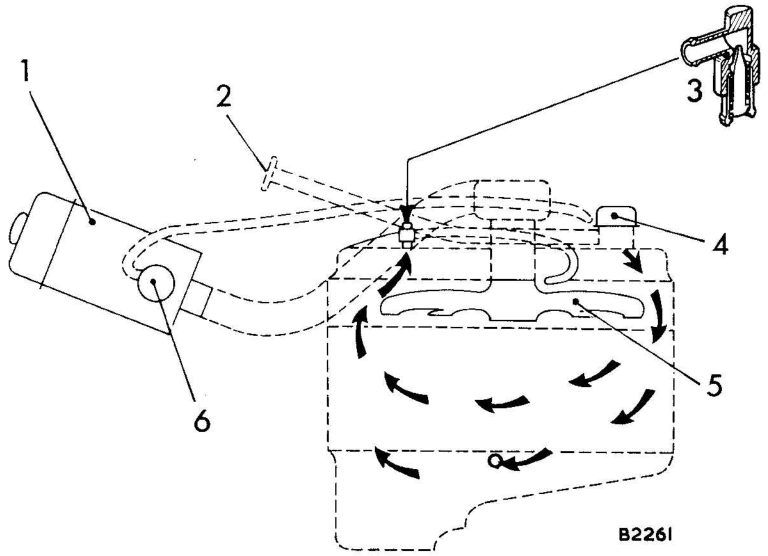
1. DIAPHRAGM MOTOR
2. AIR CLEANER
3. TEMPERATURE SENSING VALVE
4. TO INTAKE MANIFOLD
5. HOT/COLD AIR TO CARBURETTOR
6. EXHAUST DOWN PIPE
7. HOT AIR PICK-UP
8. FLAP VALVE
9. AIR INTAKE

Fig. 3 *Automatic air control*

Crankcase Ventilation System (fig. 4)

The crankcase ventilation system is designed to eliminate emission of residual fumes and vapours from the crankcase by directing these fumes back through the combustion chambers.

When the engine is running, air is drawn by manifold vacuum from the air cleaner through a hose, to the crankcase inlet air cleaner. From the crankcase inlet air cleaner, the air mixes with the vapours in the rocker arm chamber and crankcase, and is then drawn up through a ventilator (P.C.V.) valve in the rocker cover to a hose connected to the carburettor base, and recirculated through the combustion chambers.



1. AIR CLEANER
2. OIL FILLER CAP
3. P.C.V. VALVE
4. CRANKCASE INLET AIR CLEANER
5. INTAKE MANIFOLD
6. AIR INLET TO CLEANER

Fig. 4 *Crankcase ventilation system*