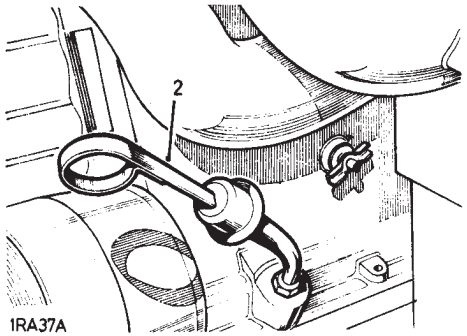
Engine oil level—All models
In addition to changing the oil and filter at the mileage intervals stated in the Maintenance Summary Chart, the oil level in the sump should be checked daily or weekly depending upon the conditions under which the vehicle is operating.

Proceed as follows:
1 Stand the vehicle on level ground and allow the oil to drain back into the sump.
2 Withdraw the dipstick, wipe it clean, re-insert to its full depth and remove a second time to take the reading. Add oil as necessary; never fill above the 'H' mark.
3 The oil level dipstick on 4-cylinder models carries three marks: 'H', 'L' and 'MIN L'. Under normal circumstances the oil level should not be allowed to fall below the minimum level mark 'MIN L'.
4 However, when the Land-Rover is being used at steep angles, the oil should not be allowed to fall below the intermediate mark 'L'. This will obviate any danger of oil pump starvation when the vehicle is facing downhill at a steep angle.

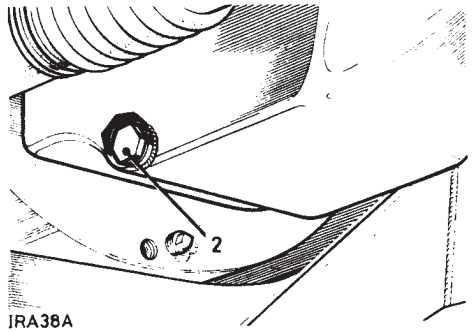


1RA37A

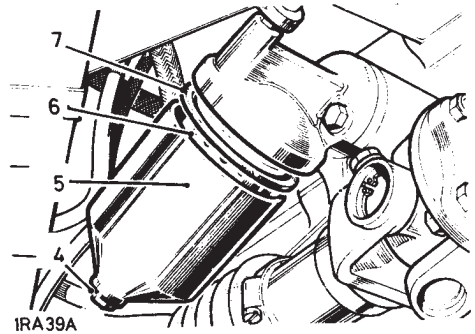
ENGINE

(1) Check for oil leaks in engine compartment; rectify as necessary

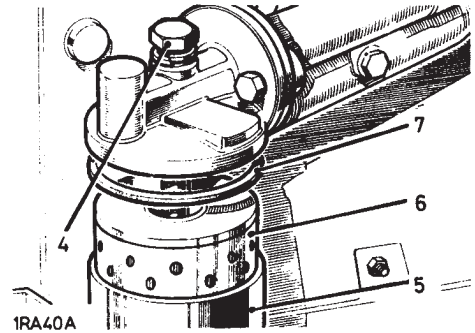
(2) & (3) Engine oil changes and filter replacement. Oil changes
To change the engine oil:
1 Run the engine to warm up the oil, then stop.
2 Remove the drain plug in the right-hand side of the sump. Allow oil to drain away completely and replace the plug.
To change filter located at right-hand side of engine on 4-cylinder models, left-hand side on 6-cylinder models.
3 Place oil tray under engine.
4 Unscrew the bolt from the filter adaptor.
5 Remove the container.
6 Remove the element.
7 Discard the used filter element and large rubber washer.
8 Wash the container in petrol.
9 Place the new filter element in the container and reassemble the unit, using the new large rubber washer supplied with the element.
10 Ensure that all the sealing washers are in position and intact, and that the container is correctly located in the adaptor.
Tighten the filter retaining bolt to 1,66 kgf m (12 lbf ft).
11 Refill with oil of the correct grade through the filler at the front of the engine; the total capacity including filter is: 4-cylinder models: 6,0 litres (11 Imperial pints) 12 US pints; 6-cylinder models: 5,5 litres (10 Imperial pints) 11 US pints.
12 Run engine and check for oil leaks at filter and drain plug.



1RA38A



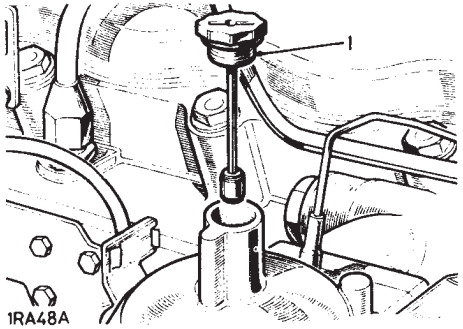
1RA39A



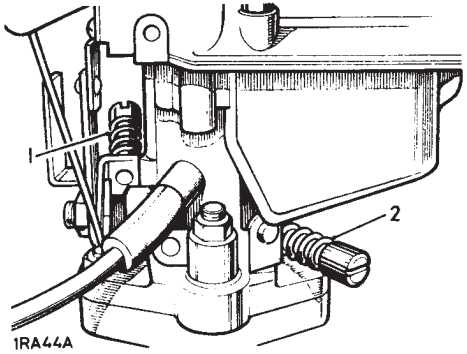
1RA40A

(4) Crankcase breathing system
Examine for leaks and change pipes or clips where necessary.

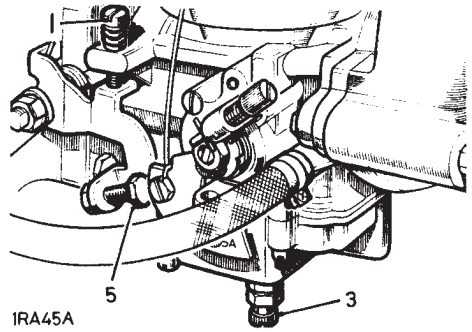
(5) Carburetter hydraulic damper—6-cylinder Petrol models
1 Unscrew the cap on top of the suction chamber, withdraw cap and hydraulic damper, replenish the damper reservoir as necessary with SAE 20 oil to within about 12 mm (0.5 in.) from the top of the tube. Then replace cap and hydraulic damper.

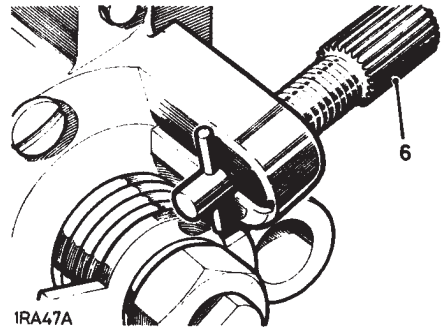


(6) Carburetter slow-running adjustment—4-cylinder Petrol models. (Basic Carburetters only)
The only adjustments provided at the carburetter are a throttle stop screw and a volume control screw.
Should the carburetter require adjustment for any reason, proceed as follows:
1 Run the engine until normal operating temperature is obtained. If necessary adjust the throttle stop screw to give the correct idling speed.
2 Adjust the volume control screw so that the engine will idle evenly with no tendency to stall on snap closure of the throttle.
3 Check that, as the throttle is opened slowly, there is a clear positive acceleration of the engine speed.
4 Finally, it may be necessary to re-adjust the throttle stop screw to give a satisfactory idle speed.

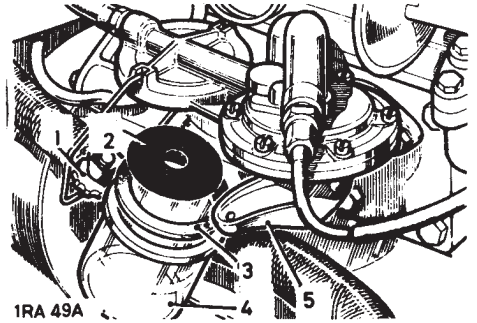


Carburetter slow-running adjustment—6-cylinder models. (Basic Carburetter only)
1 Run the engine until normal operating temperature is obtained. If necessary adjust slow-run screw to give the correct idling speed.
2 Lift the carburetter piston approximately 1 mm (0.031 in.)
3 If the engine speeds up immediately the mixture is too rich and the jet adjustment screw must be turned anti-clockwise, thus weakening the mixture; if the engine stops immediately, the mixture is too weak and the jet adjustment screw should be turned clockwise to enrich the mixture.
If the engine just falters and then continues to run evenly the adjustment is correct.
4 Finally adjust the slow-run screw to get a smooth idling speed.
5 The fast idle screw should not require adjustment.
6 For starting at temperatures down to −18°C (0°F) push and turn the spring-loaded choke adjustment screw so that the peg is at right-angles to the slot as illustrated. Leave in this position.
When starting at temperatures below −18°C (0°F) turn the screw until peg is recessed in slot.





(7) Fuel sediment bowl—4-cylinder petrol models
The fuel sediment bowl, located on the right-hand side of the engine provides additional filtration between the pump and carburetter.
Clean as follows:
1 Remove the bowl by slackening the thumb screw and swinging the retainer to one side.
2 Remove and clean the filter gauze in clean petrol.
3 Ensure that the sealing washer is in good condition.
4 Replace gauze and refit the bowl.
5 Prime the pump by operating the hand lever.

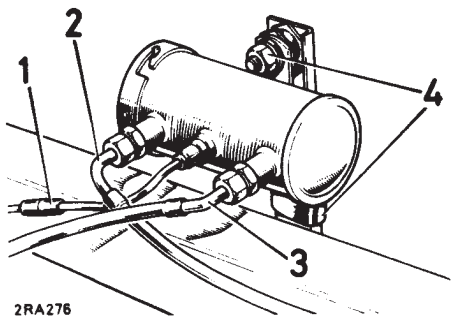


Fuel pump 6-cylinder petrol models—Clean filter

A single type electric fuel pump is fitted and is located above the right hand chassis member midway along the vehicle.

To remove the pump for filter cleaning, proceed as follows:

1 Disconnect the fuel pump feed lead at the snap connector.
2 Disconnect the fuel inlet pipe from the pump and block the end of the pipe by suitable means to prevent fuel draining from the tank.
3 Disconnect the outlet pipe.
4 Remove the two nuts securing the pump, earth braid and rubber mountings to the support bracket and remove the pump.

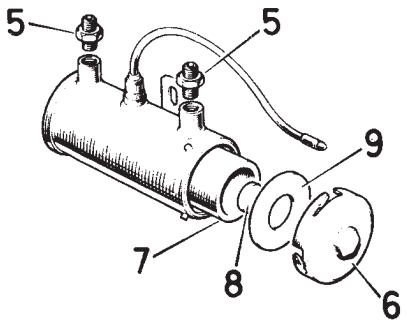


2RA276

Filter cleaning

5 Remove the inlet and outlet unions.
6 Release the end cover from the bayonet fixing.
7 Withdraw the filter and clean using a compressed air jet from the inside of the filter.
8 Remove the magnet from the end cover and clean. Replace the magnet in the centre of the end cover.
9 Reassemble the fuel pump and refit to the vehicle by reversing the removal procedure. Use a new gasket for the end cover if necessary. Ensure that the feed lead is reconnected and the earth braid fitted securely to the fixing points.

The inlet and outlet unions are at unequal distances from the feed lead. To ensure correct fuel pipe connections when refitting the pump, position the union nearest the feed lead connection towards the front of the vehicle.



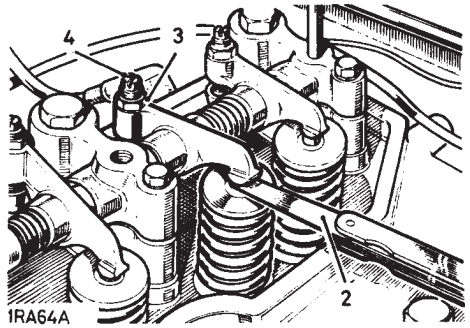
2RA277

(8) Tappet adjustment

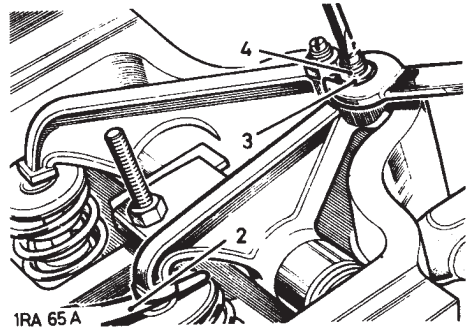
The correct clearance is: 4-cylinder models, inlet and exhaust, 0,25 mm (0.010 in.) engine hot. 6-cylinder models, inlet 0,15 mm (0.006 in.) engine hot and exhaust 0,25 mm (0.010 in.) with the engine hot or cold.

To carry out tappet adjustment, proceed as follows:

1 Rotate the engine in the running direction until the valve receiving attention is fully open and then rotate the engine one complete turn, to bring the tappet on to the back of the cam.
2 Check the tappet clearance with a feeler gauge.
3 If adjustment is required, slacken the locknut.
4 Rotate the tappet adjusting screw until the clearance is correct; re-tighten the locknut, taking care to ensure that this operation does not upset the clearance.
5 Repeat for the other valves in turn.



1RA64A



1RA 65 A

(9) Cooling system

Examine the cooling system for leaks and rectify as necessary. Renew hoses every 80,000 km (48,000 miles).

Frost precautions

In cold weather, when the temperature may drop to or below freezing point, precautions must be taken to prevent freezing of the water in the cooling system. As a thermostat is fitted in the system, it is possible for the radiator block to freeze in cold weather even though the engine running temperature is quite high; for this reason, the use of an anti-freezing mixture is essential.

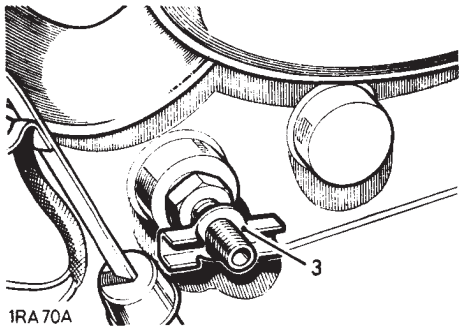
Only anti-freeze solutions recommended in Section 09 should be used.

Land-Rovers leaving the factory have the cooling system filled with 50% mixture of anti-freeze and water. This gives protection down to −20°C to −36°C.

When the temperature is between 0°C and minus 18°C (32°F and 0°F), use one part of anti-freeze to two parts of water.

Proceed as follows:

1 Ensure that the cooling system is leak-proof; anti-freeze solutions are far more 'searching' at joints than water.
2 Drain and flush the system. Drain plug under radiator at right-hand side.



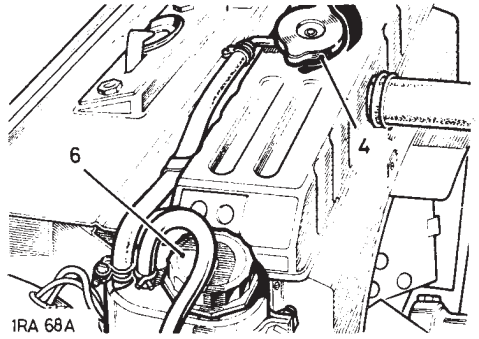
1RA 70A

3 Drain tap or plug for cylinder block 4-cylinder at left-hand side of engine adjacent to dipstick. 6-cylinder at right-hand side of engine adjacent to engine breather.
4 Pour in approximately 4,5 litres (one gallon) of water, add solution, then top up with water to within 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.
5 Run the engine to ensure a good circulation of the mixture.

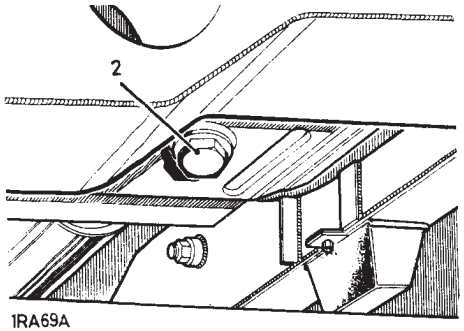
NOTE: When anti-freeze is not required the cooling system must be flushed out with clean water and refilled with a mixture one part Marstons SQ36 inhibitor to nine parts of water.

All models

3 The cooling system is pressurised and care must be taken when removing the radiator filler cap, especially when the engine is hot.
4 When removing the filler cap first turn it anti-clockwise to the stop and allow all pressure to escape, before pressing it down and turning further in the same direction to lift it off.
5 When replacing the filler cap, it is important that it is tightened down fully, not just to the first stop. Failure to tighten the filler cap properly may result in water loss, with possible damage to the engine through overheating.
6 All models have a semi-sealed cooling system, that is, an overflow bottle attached to the left-hand side of the radiator.
7 The water level in the cooling system is checked at the radiator only and topping-up is also carried out in the normal manner through the radiator filler. The pipe in the overflow bottle should always be submerged in water.
8 With a cold engine the correct water level is 12 to 19 mm (0.5 to 0.75 in.) below the bottom of the filler neck. For capacities see Division 09.
Use soft water wherever possible; if the local water supply is hard, rain-water should be used.



1RA 68A



1RA69A

(10) Radiator water level

1 The radiator filler cap is under the bonnet panel.

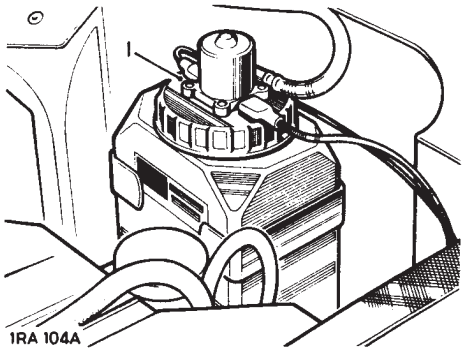
Diesel models

2 Never run the engine without water, not even for a very brief period, otherwise the injectors may be seriously damaged. This is due to the very high rate of heat transfer in the region of the injector nozzles.

(11) Water level, windscreen washer as applicable

The windscreen washer reservoir (optional equipment in some counties), is located on the right-hand bulkhead.

1 Remove reservoir cap by turning anti-clockwise.
2 Top up reservoir to within approximately 25 mm (1 in.) below bottom of filler neck.
3 Use Clearalex windscreen washer powder in the bottle; this will remove mud, flies and road film.
4 In cold weather, to prevent freezing of the water, add 'Isopropyl Alcohol'. Do NOT use methylated spirits, which has a detrimental effect on the screen-washer impeller.



1RA 104A

(12) Fan belt adjustment

4 cylinder models:

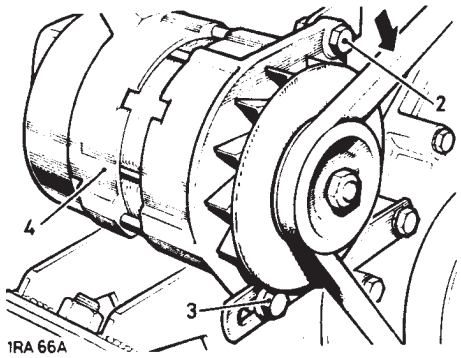
1 Check by thumb pressure between the fan and crankshaft pulleys. Movement should be 6,3 to 9,5 mm (0.25 to 0.375 in.)

If necessary adjust as follows:

2 Slacken the pivot bolt securing the alternator to the mounting bracket.
3 Slacken the adjusting bolt.
4 Pivot the alternator inwards or outwards as necessary and adjust until the correct belt tension is obtained.
5 Tighten adjusting and pivot bolts.

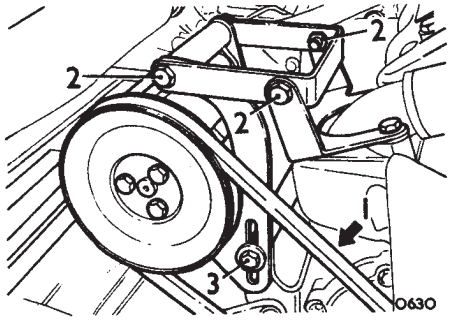
6-cylinder models:

6 Check by thumb pressure between the fan and crankshaft pulleys. Movement should be 8 to 11 mm (0.312 to 0.437 in.) Adjust as above.



Air pump drive belt adjustment, 6-cylinder models

1 Check by thumb pressure midway between the air pump and water pump pulleys. Movement should be 6,3 mm (0.25 in.). If necessary, adjust as follows:
2 Slacken the pivot bolts securing the air pump to the top mounting bracket.
3 Slacken the nut and bolt securing the air pump to the adjustment bracket.
4 Pivot the air pump as necessary and adjust until the correct belt tension is obtained.
5 Tighten the adjusting and pivot bolts and nuts.



(13) Accelerator linkage—all Models

1 Lubricate the accelerator linkage using clean engine oil paying particular attention to accelerator cross craft brackets, bell crank bushes and ball joint sockets on the control rods.
2 Check the linkage for correct operation and ensure that there is no tendency to stick.
Badly worn parts should be replaced as soon as possible.

(14) Engine mountings

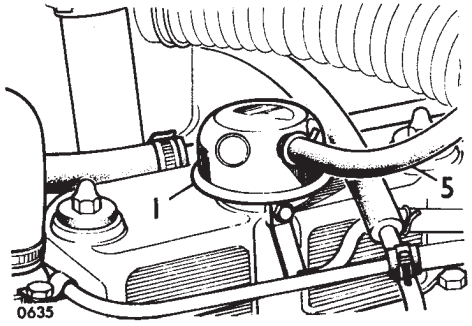
Check security of engine mountings; rectify as necessary.

Engine sump bolts, see operation 12.60.44.

(15) Engine breather filters—all Models

Clean as follows:

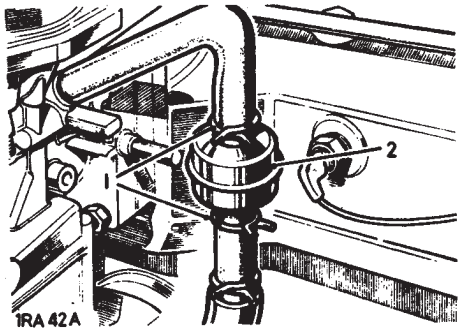
1 Remove the filters.
2 Wash the gauze thoroughly by swilling the units in petrol.
3 Re-wet the gauzes by dipping in clean engine oil and shake off the surplus; 4-cylinder models, replace the engine breather filter with the slot facing forward and the oil filler filter with the slot facing the rear of the vehicle.
4 Models with sealed engine breather system. Connect hose to top breather.



(16) Crankcase emission control, flame-trap type (as applicable)

Replace as follows:

1 Detach the rubber hoses from each side of the flame trap by compressing the clips.
2 Withdraw flame trap.
3 Fit new flame trap by reversing removal procedure.
4 Warm up engine and re-adjust carburetter if necessary.



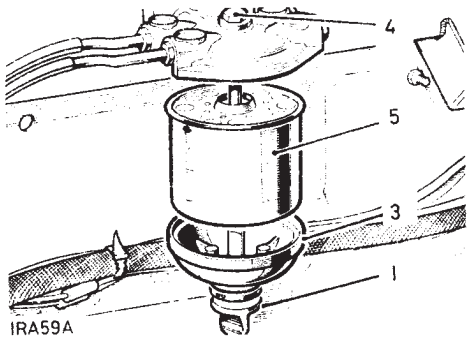
(17) Fuel filter, paper element type—Diesel models

Drain off water as follows:

1 Slacken off drain plug to allow water to run out.
2 When pure diesel fuel is emitted, tighten drain plug.

Change filter element as follows: In some instances it may be advantageous to remove the complete unit before attempting to change the filter element.

3 Support element holder.
4 Unscrew the special bolt on the top of the filter, the element holder can now be removed.
5 Remove and discard the used element.
6 Wash the element holder in petrol or fuel oil.
7 If necessary renew both the large rubber washer and the small rubber washer in the filter top, also renew the large rubber washer in the element holder.
8 Push the new element on to the filter top spigot with the perforated holes in the element to the top.
9 Fit the element holder to the bottom of the element, and secure with the special bolt.
10 Prime the system and check for fuel leaks.



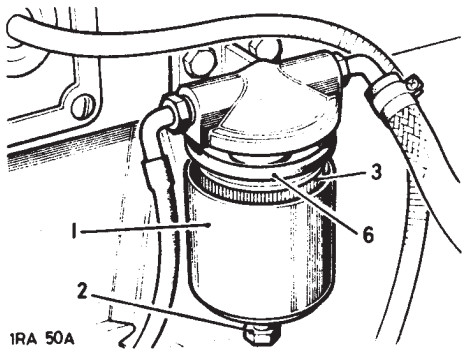
1RA59A

Fuel filter element, 6-cylinder models

The fuel filter element, located on the dash at the right-hand side of the engine compartment, provides additional filtration between pump and carburetter.

Replace element as follows:

1 Support element holder.
2 Unscrew the special bolt at bottom of filter. The element holder can now be removed.
3 Remove and discard the used element.
4 Thoroughly clean the element holder in petrol.
5 If necessary renew the upper and lower centre seals and also the seal for the centre bolt.
6 Fit the new element, large hole uppermost into the holder using the seal supplied with the element.
7 Place the element holder in position and secure with the special bolt.
8 Start the engine and check for fuel leaks.



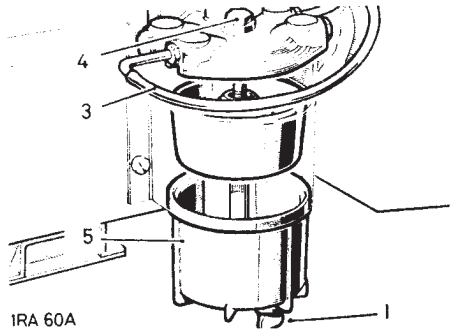
1RA 50A

(18) Fuel sedimenter—Diesel models

The sedimenter increases the working life of the fuel filter by removing the larger droplets of water and larger particles of foreign matter from the fuel.

Drain off water as follows:

1 Slacken off drain plug to allow water to run out.
2 When pure diesel fuel is emitted, tighten drain plug. Dismantle and clean as detailed below.
3 Disconnect fuel inlet pipe at sedimenter and raise pipe above level of fuel tank to prevent draining from tank. Support in this position.
4 Support sedimenter bowl and unscrew bolt on top of unit.
5 The lower bowl and element can now be removed.
6 Clean all parts in petrol.
7 Fit new oil seals and reverse removal procedure.
8 Slacken off the drain plug, when pure diesel fuel runs out tighten plug. Start engine and check for air leaks.



1RA 60A

(19) Air injection system—6-cylinder models models

The air pump driven by the engine, delivers air to the exhaust valves via the air rail. A check valve prevents damage to the pump should backfire or belt breakage occur. A relief valve, located in the air pump, is required to dump part of the air at high speeds to prevent pump damage.