

SECTION D

THE COOLING SYSTEM (1½ and 2½ LITRE)

General Description.

Section No. D.1	Draining and filling the cooling system.
Section No. D.2	Removal and replacement of the radiator.
Section No. D.3	Fan belt adjustment.
Section No. D.4	Water pump and dynamo drive belt adjustment (early 2½ litre engines).
Section No. D.5	Conversion to pressure cooling.
Section No. D.6	Pressurised cooling filler cap.

GENERAL DESCRIPTION

The cooling of the engine is by thermo-siphon action assisted by pump and fan. The pump is bolted to the front of the engine and circulation is controlled by a thermostat.

On early 2½ litre engines the pump is driven by a V-belt from the crankshaft whilst another shorter belt drives the fan, from an extension of the water pump drive pulley.

On 1½ litre engines and the Series RMF engines a single belt drives both the dynamo and the fan.

The thermostat restricts the flow of water until the engine has reached its normal operating temperature. This is done by by-passing the water from the top of the thermostat to the suction side of the pump. The main valve of the thermostat opens and the by-pass shuts when the water temperature reaches 72° C. (160° F.).

The flow of cooling water is taken from the pump outlet, via an external pipe, direct to the exhaust valve seats, thence round the head and out at the thermostat. The circulation in the cylinder block is by thermo-siphon action and this combination maintains a very even temperature throughout the cooling system.

Section D.1

DRAINING AND FILLING THE COOLING SYSTEM

Remove the radiator filler cap.

There are three draining taps on the 2½ litre car. One is located at the base of the radiator on the right-

hand side, the next is on the left-hand side of the cylinder block and just above the starter motor, while the third is on the forward end of the induction manifold.

On the 1½ litre car there are two drain taps. One at the base of the radiator on the right-hand side and the other on the forward end of the cylinder block, also on the right-hand side.

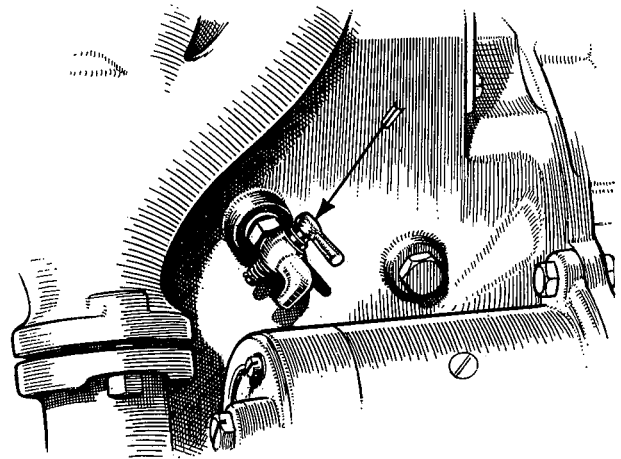


Fig. D.1.

The 2½ litre engine cylinder block drain tap.

It is essential to open all taps to drain the cooling water completely.

If anti-freeze mixture is used it should be drained into a suitable clean container and kept for future use.

To fill the system, close the drain taps and fill through the header tank filler orifice until the water is just

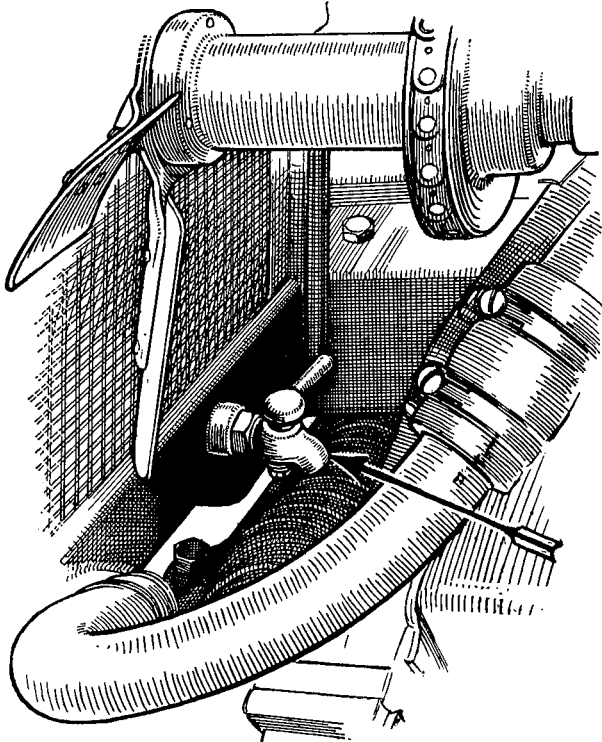


Fig. D.2.

The 2½ litre radiator drain tap is located on the right-hand side.

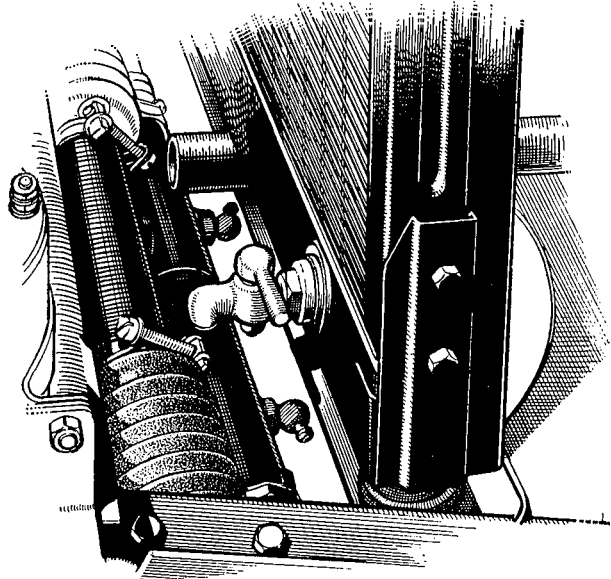


Fig. D.4.

The 1½ litre radiator drain tap.

below the top of the filler neck. When possible, rain-water should be used for filling the system.

Avoid over-filling when anti-freeze is in use to prevent unnecessary loss on expansion.

Screw the filler cap firmly into position.

It is possible that after the engine has been run for a short time more water will be required. This is because the initial flow round the water pump by-pass will be rather slow.

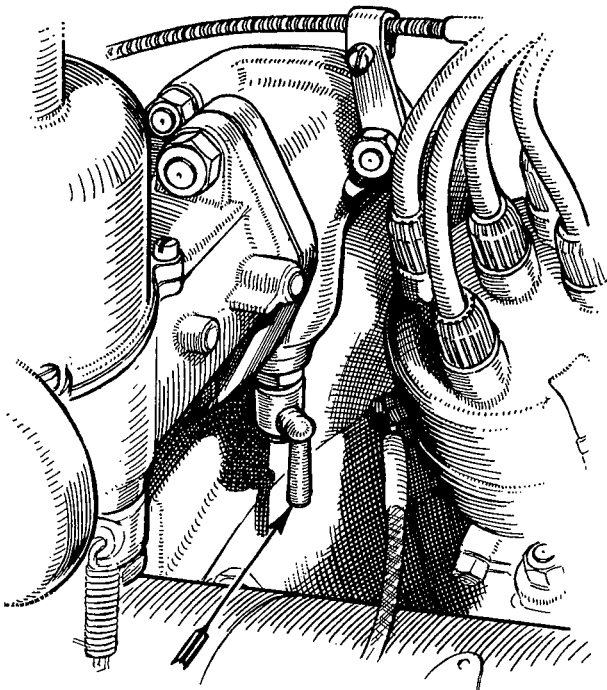


Fig. D.3.

There is an induction manifold drain tap on the 2½ litre engine located at the forward end of the manifold.

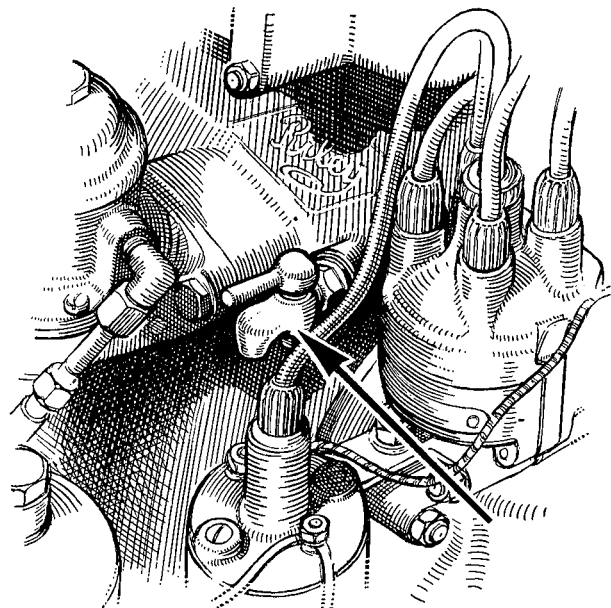


Fig. D.5.

The engine cylinder block drain tap on the 1½ litre.

Section D.2

REMOVAL AND REPLACEMENT OF THE RADIATOR

Take off the bonnet top by removing the two fixing nuts and washers at the rear end of the hinge panel and slackening off the two nuts at the front. The front end of the bonnet may then be raised and pulled forward.

Detach the front ends of the radiator steady rods and undo the two bolts (one either side) holding the shell to the radiator.

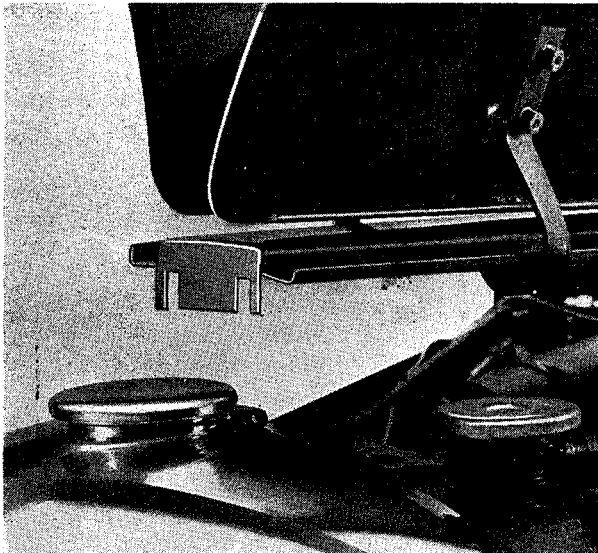


Fig. D.6.
The front end of the bonnet raised to show the forward bonnet fixing.

Undo the two nuts on the under side of the shell, together with two small nuts and bolts half-way up the bonnet side. Lift the shell away.

Drain the cooling system as explained in Section D.1.

Disconnect the water hoses at the radiator and undo the two Simmonds nuts below the radiator on the underside of the frame extension. It will then be possible to lift the radiator up and away.

Take care to replace the rubber buffer washers under the radiator correctly. The thick washers must be above the bracket and the thin ones below. Tighten the Simmonds nuts just sufficiently to nip the rubber.

Important.—Do not invert the radiator or lay it flat, as this will allow any accumulated sediment in the bottom tank to pass into the cooling ducts and become lodged there, thus impeding the circulation. Always store the radiator in its normal upright position.



Fig. D.7.
The rear bonnet fixing.

Section D.3

FAN BELT ADJUSTMENT

Adjustment of the fan belt for tension on the earlier 2½ litre engine is obtained by slackening the pinch bolt on the engine mounting bracket and rotating the fan hub by means of a small bar inserted in the holes that are provided.

On the 1½ litre and the Series RMF 2½ litre engines there is no separate fan belt, the fan being driven from the dynamo belt. See Sections AA.28 and AAA.28 for this belt adjustment.

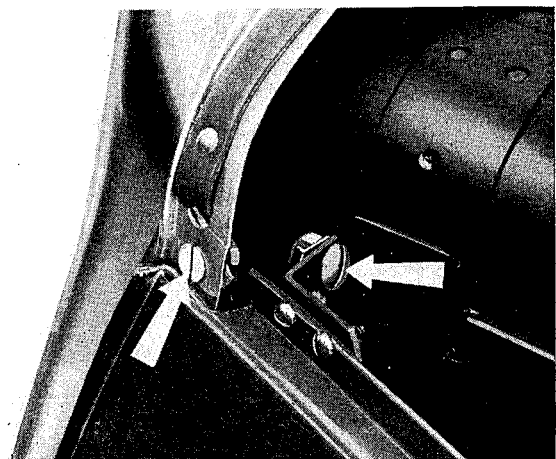


Fig. D.8.
The fixings at the top of the radiator and shell.

Section D.4

WATER PUMP AND DYNAMO DRIVE BELT ADJUSTMENT (EARLY 2½ LITRE ENGINES)

Slacken the lower dynamo fixing bolts and undo the Simmonds nut on the swinging arm at the top. The dynamo may then be moved away from or towards the engine as required.

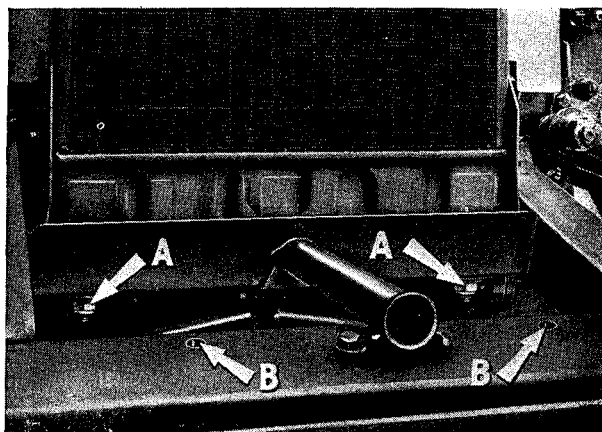


Fig. D.9.

The radiator fixing nuts (A) and the holes (B) for the shell.

Avoid overtightening of the belt as this produces unnecessary wear of the pump and dynamo bearings. When correctly adjusted there should be ½ in. (13 mm.) of slack at the centre of the long belt run when finger pressure is applied at the centre.

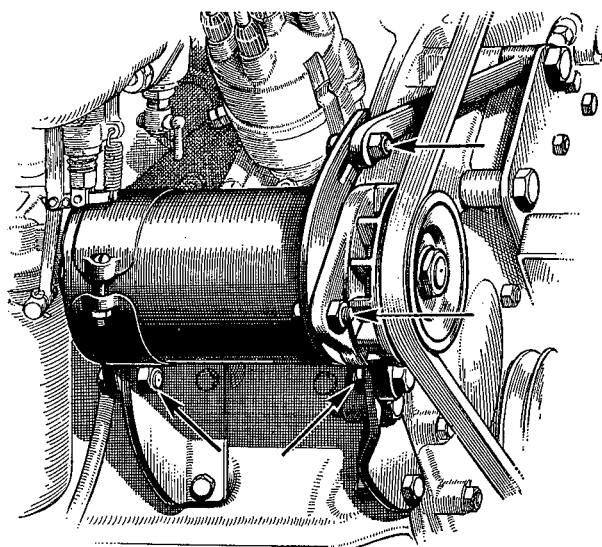


Fig. D.10.

The 2½ litre water pump belt adjustment bolts.

Section D.5

CONVERSION TO PRESSURE COOLING

The pressure cooling system can be applied equally to the 1½ litre and 2½ litre cars and converts the old-type radiators to the latest pressure-cooled type.

When making this alteration it is advisable to fit the modified type of top water hose which is reinforced with a layer of canvas (Part No. H.6255).

The procedure to adopt is as follows:—

1. Unsolder the pipe and cap to the spill tank.
2. Remove the spill tank, cap and overflow pipe after unsoldering.
3. Pull the overflow pipe out of the clips on the side of the radiator and retain it for further use.
4. Take out the filler cap and unsolder the filler neck.

(Items 1 to 4 shown in Fig. D.11.)

5. Fit a brass 2 B.A. bolt in the hole in the header tank left by the removal of item 1. Fit a nut on the bolt and solder round the bolt head.

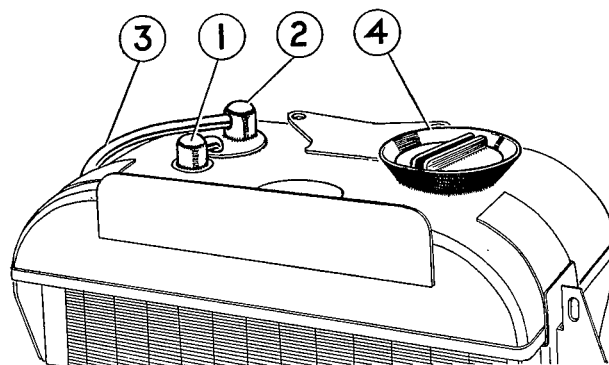


Fig. D.11.

The components of the non-pressure cooling system which must be removed for conversion to pressure cooling.

6. Seal up the spill tank hole by obtaining a disc of 20-gauge brass sheet, 2-³/₁₆ in. diameter. Solder this sheet in position.
7. Prepare a 20-gauge brass patch to the dimensions shown in Fig. D.12 (7), and tin it on both sides. The hole to be cut must be 1-⁵/₈ in. diameter.
8. Enlarge the existing hole in the header tank to coincide with the patch.
9. Solder the new filler neck to the patch and then solder the assembly to the header tank. Make sure that the hole for the overflow pipe is facing the left-hand side of the car.
10. Make up two clips to hold the overflow pipe to the radiator side. Solder the overflow pipe to the filler neck and solder the clips to the radiator side.

Note.—All joints must be pressure-tight.

Section D.6

PRESSURISED COOLING FILLER CAP

The radiator filler cap used with the pressure cooling system introduced on 2½ litre cars commencing with Chassis No. 60S/6064 is of a special type incorporating relief valves for both pressure and vacuum produced in the system.

The cap is shown in Fig. D.13, which indicates the double-seated valve and its operating pressures.

The cap *must* be screwed down tightly to ensure correct functioning of the valve and it must be remembered that pressure exists in the cooling system when it is hot. It is therefore essential to remove the filler cap gradually when the system is hot and allow the hot air to escape before the cap is finally removed.

It is also advisable to protect your hand with a cloth wrapping when undoing the cap.

Commencing with Chassis No. 8785, a simplified type of cap is employed as shown in Fig. D.14.

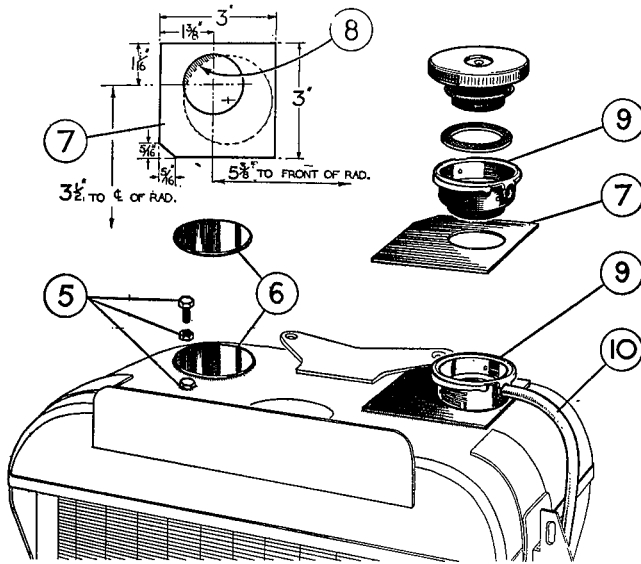
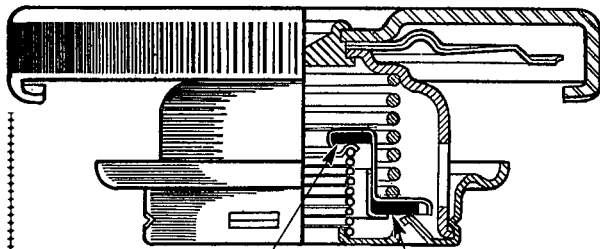


Fig. D.12.

The modifications to be carried out when converting the cooling system to pressure cooling.



Vacuum release valve opens at 1 lb./in.² maximum.

Pressure release valve starts to open between 6½ and 7½ lb./in.².

Fig. D.13.

The construction and operating pressures of the radiator filler cap used on the early pressurised cooling system. On later models a modified filler is used, as illustrated in Fig. D.14.

Fig. D.14.

The filler cap used on later models employing a pressurised cooling system.

