HEATING AND VENTILATION

CONTENTS

HEATING AND VENTILATION

These instructions apply only to the Rapier Series III and IV heater.

(Sunbeam Rapier Series III, IIIA, and Series IV—*These kits are not suitable for Series II or earlier vehicles. The adjustments given below apply to Series III, IIIA and Series IV only. No adjustments were provided for on the earlier heaters*).

GENERAL DESCRIPTION

The new 4 kw. heater embodies a number of improvements, one advantage being that the "Car" control lever does not pass through the "Hot" position when moving from "Cold" to "Off".

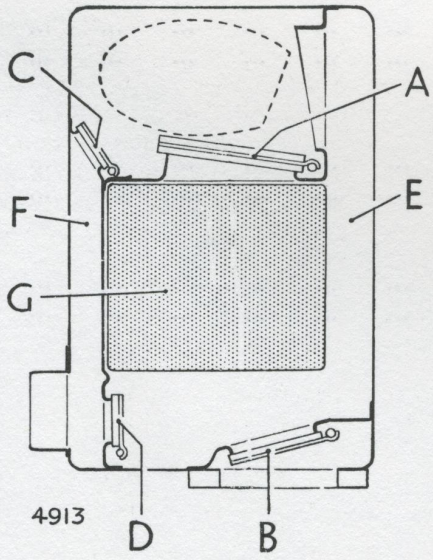
The heater casing is made in two halves to facilitate assembly. However, it is not necessary to open up the heater in order to carry out adjustments.

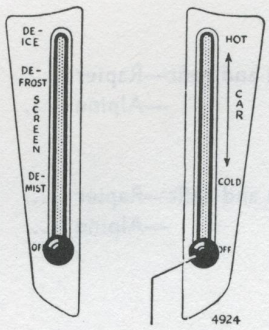
Fresh air enters the heater by ram effect via the blower-ventilator air hose and is boosted by the action of the blower (if fitted) when required.

There are four flap-valves within the heater as follows:— (See Fig. 1)

A. Air Mixing Valve.
B. Air Outlet Valve.
C. Cold Demist Valve.
D. Hot Demist Valve.

These valves are controlled by interconnected rods, cams and levers actuated by the dashboard "Car" and "Screen" controls which are connected by means of flexible cables to the water control valve lever (H) and the flap-valve (J) Figs. 6 and 7 respectively.



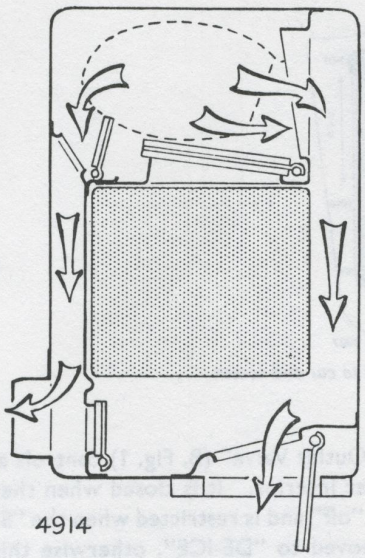


Blower Switch
Pull—"ON"
Push—"OFF"

(Series I-III, IIIA.
Separate blower switch on Series IV.)

Fig. 1. *Schematic internal view*

A. Air mixing valve
B. Air outlet valve
C. Cold demist valve
D. Hot demist valve
E. Car cold air passage
F. Demist cold air passage
G. Heater matrix



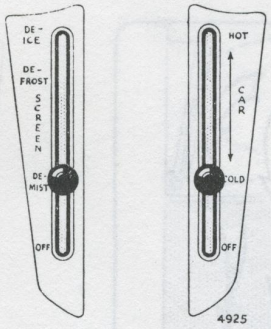
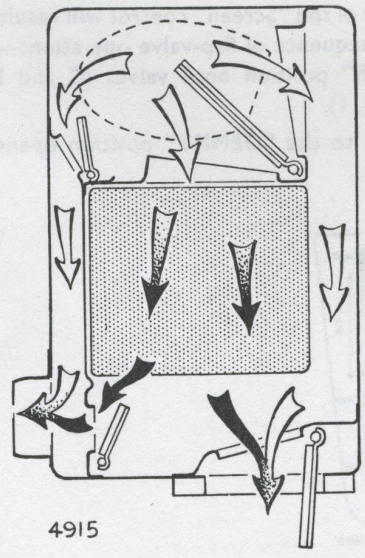


Fig. 2. *Ventilation*

The "Air Mixing Valve" (A, Fig. 1) controls the mixing of the hot and cold air. When this valve is in the horizontal position all the air by-passes the heater matrix through the "Cold Air Passages" (Fig. 1) and the "Water Control Valve" is closed. (See also Fig. 2).

"Car" Control

When the "Car" control lever is moved from the "Cold" positon towards "Hot" the "Air Mixing Valve" (A) progressively approaches the vertical position, (See Fig. 3). First the hot water commences to flow through the heater matrix, and secondly an increasing air flow passes through the heater matrix until the valve is vertical when the "Cold Air Passage" is closed off. Full heating is then obtained. (See Fig. 4).



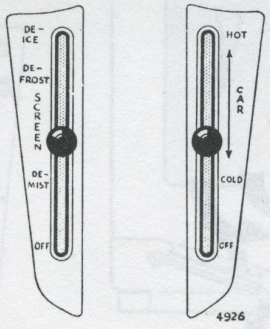
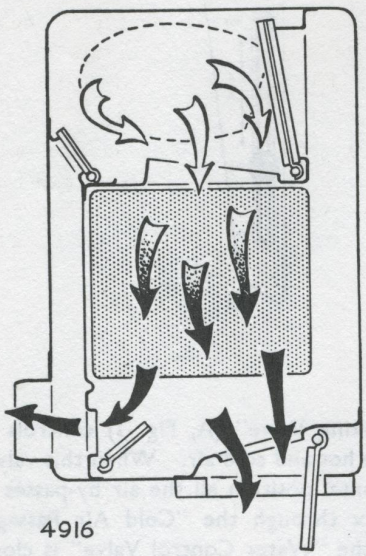


Fig. 3. *General heating to car and screen*



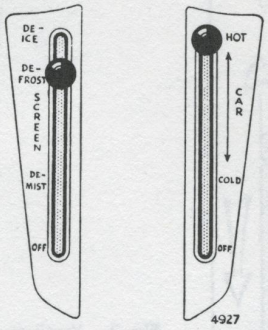


Fig. 4. *Increased heating to car and screen*

The "Air Outlet Valve" (B, Fig. 1) controls air flow Into the car interior. It is closed when the "Car" lever is at "off" and is restricted when the "Screen" lever is moved to "DE-ICE", otherwise this valve remains fully open.

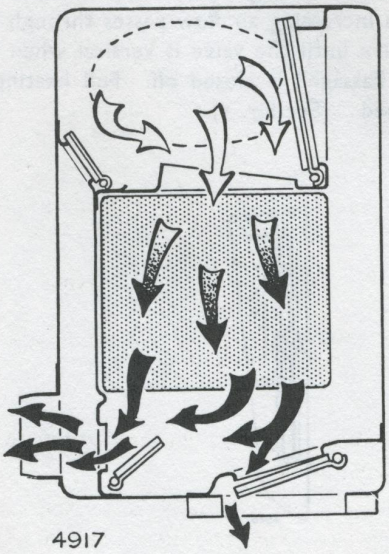
The "Cold Demist Valve" (C, Fig. 1) controls the amount of cold air entering the "Demist" Cold Air Passage (F, Fig. 1) and is interconnected with the "Hot" Demist Valve (D, Fig. 1) which controls the warmed air directed to the windscreen.

"Screen" Control

Movement of the "Screen" control will result in the following sequence of flap-valve operation:—

In the "off" position both valves (C and D) are closed (Fig. 1).

Movement to the "DEMIST" position opens valve



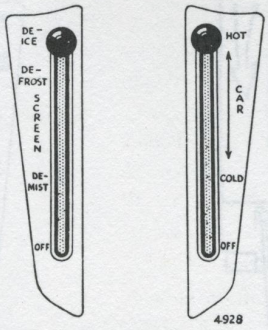


Fig. 5. *Maximum air flow to screen*

(C) and cold air only is directed to the windscreen. (Fig. 2).

Further movement towards the "DEFROST" position gradually closes valve (C) and opens valve (D) allowing warmed air to enter the Demist Chamber (Fig. 3) until at the "DEFROST" position valve (C) is fully closed and valve (D) is fully open (Fig. 4). The demist air temperature is now the same as that entering the car.

Movement of the "Screen" lever to the "DE-ICE" position restricts the "Car" air outlet and so increases the "SCREEN" air flow to maximum (See Fig. 5).

N.B.—The water control valve is not interconnected between the "Car" and "Screen" controls. Therefore, it is necessary to set the "Car" control lever between the "Cold" and "Hot" positions to obtain heated air at the windscreen.

ADJUSTMENTS

All the interconnected mechanism is outside the heater, therefore, all the adjustments are made externally.

In the event of malfunction it is imperative that a check be made to ensure that the cable run, fitting and adjustment of the control cables is normal, and that full movement is achieved without slack. Adjust the cables at the heater unit end.

If normal function is not restored or derangement of the linkages has inadvertently occurred, proceed as follows:—

1. **"CAR" Control** (See Fig. 6)
   (a) Move the "Car" lever to the "off" position, the water control valve lever should now be in its fully anti-clockwise position (valve closed). If this is not so, slacken screw "K", set the lever fully anti-clockwise and re-tighten screw "K".
   (b) The water valve lever is interconnected with the air mixing valve and the air outlet valve. When the water valve lever is fully anti-clockwise the air mixing valve should be at rest in the horizontal position; to check this slacken screw (L) (this will allow the valve to drop should it be out of position) and now retighten screw (L).
   (c) If the air outlet valve is not fully closed, move the "Car" lever away from the "off" position until the water valve lever (H) $\frac{1}{8}$" is (3·2 mm.) from the end of its slot (as shown in Fig. 6).

   Slacken screw (M), fully close the air outlet valve by finger pressure on cam (X) and retighten screw (M).

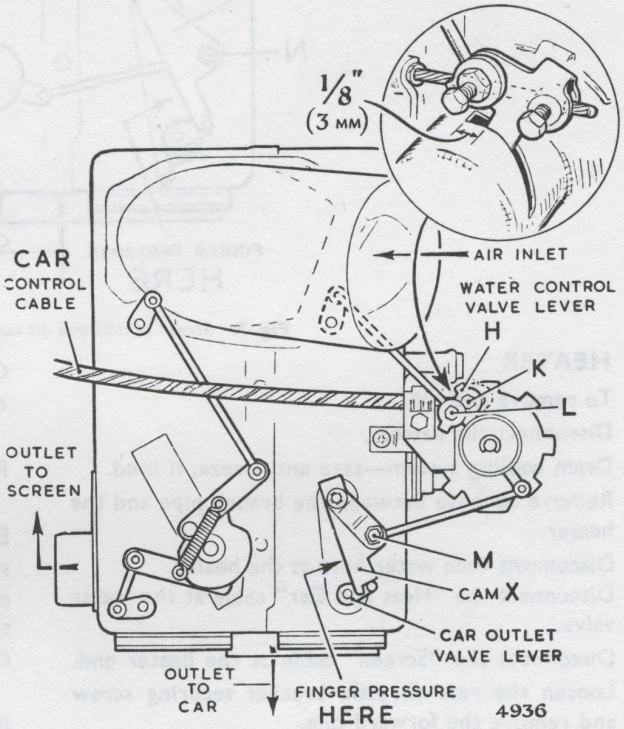


Fig. 6. *Car control, water valve, air mixing valve and air outlet valve adjustment details*

2. "SCREEN" Control (See Fig. 7)

It is also necessary to ensure that the air outlet valve is in its correct position when the "Screen" control lever is in the "DE-ICE" position, proceed as follows:—

Move the screen lever to the "DE-ICE" position.

Slacken screw (N), fully close the air outlet valve by finger pressure on cam (Y) and re-tighten screw (N).

Check to ensure that both controls have full movement without slack.

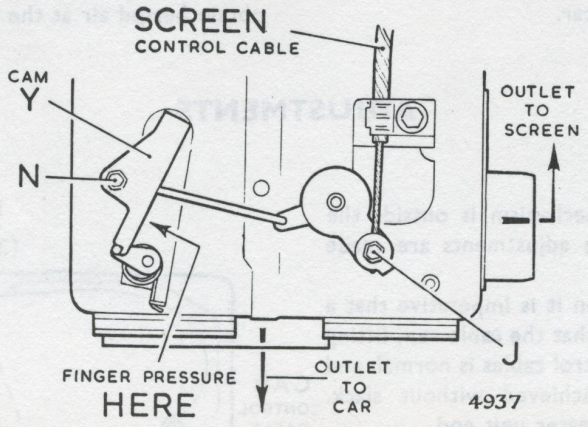


Fig. 7. *Screen control and air outlet valve adjustment details*

HEATER

To remove and refit.

Disconnect the battery.

Drain cooling system—save anti-freeze, if used.

Remove air hose between the branch pipe and the heater.

Disconnect each water hose at the heater.

Disconnect the "Heat and Car" cable at the water valve.

Disconnect the "Screen" cable at the heater end.

Loosen the rear throttle bracket securing screw and remove the forward one.

Remove the right-hand heater securing screw and the two upper screws which anchor the heater to the bulkhead.

Fully close the water valve and wire the lever in this position (to prevent damage to the car air outlet valve).

Note: This wire must not be removed until the heater is re-positioned and finally tightened down.

Carefully ease the heater away from the bulkhead and remove from the car.

Refitting is a reversal of the above operations.

Ensure that the car air outlet seal and both the sponge collars are in good condition and properly positioned. Enter the left-hand lug under the throttle bracket, push the heater firmly towards the bulkhead securely tighten all fixings.

Release the wired up water valve lever and check to ensure that the car air outlet valve has un-obstructed movement.

Re-couple the control cables, water and air hoses (See also "ADJUSTMENTS").

Re-connect battery start clock (if fitted) and test equipment.

BLOWER—To remove and refit.

Disconnect the battery.

Release the branch pipe at the wing valance and remove air hose between branch pipe and blower.

Disconnect blower cable at the snap tube connector.

Remove blower securing screws and withdraw blower complete with the rubber elbow.

Refitting is a reversal of the above operations, reconnect battery, start clock (if fitted) and test blower.

CONTROLS—To remove and refit (see Sections "N and O").

Disconnect battery.

Remove control lever knobs (screw off).

Remove console and filler panel (Series IV only).

Release the lower facia panel.

Release control, disconnect cable and withdraw control. On those models with the blower switch incorporated in the control, disconnect the cables at the snap connector and the in-line fuse.

Refitting is a reversal of the above operations. It is important when refitting the cable that the outer cable end is flush with its clamp and that the inner cable protrudes $\frac{1}{8}$ in. (3 mm.) through its trunnion.

(See also "ADJUSTMENTS".)

Re-connect battery and start clock (if fitted).

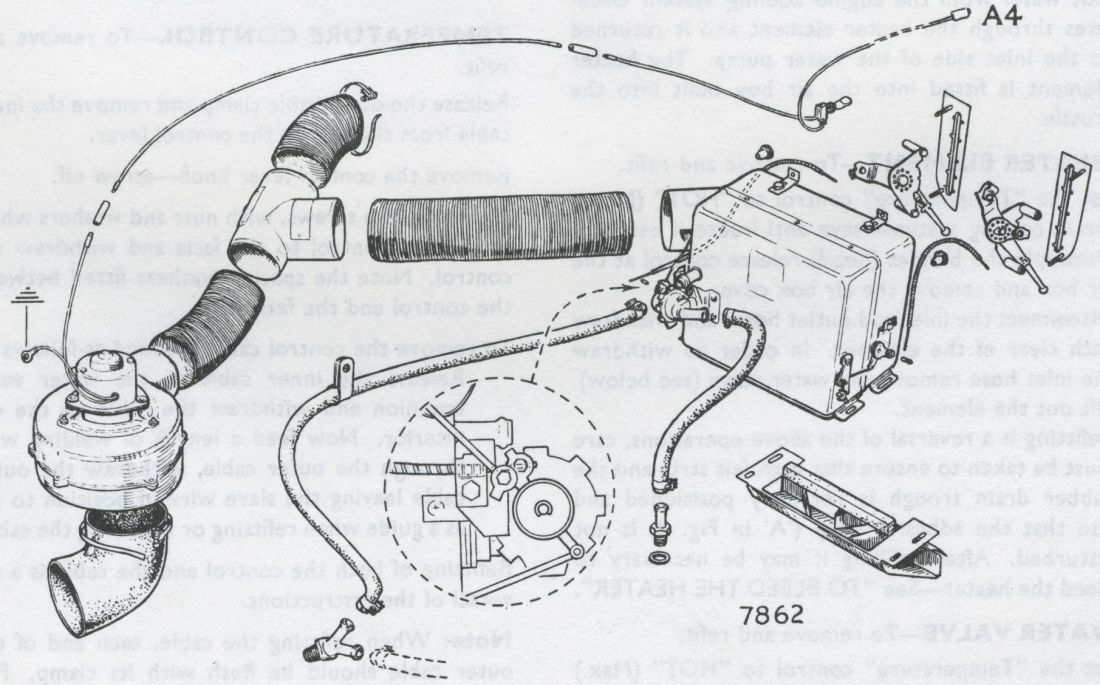


Fig. 8. *Heater—general arrangement (Rapier III-IV)*

ALPINE

(Series I-IV)

GENERAL DESCRIPTION

The heater element and its associated control, supplement the fresh air system built into the car. The temperature of the fresh air, directed to either car or screen, is regulated by means of the "Temperature" control. Use of the blower increases the volume of air.

On Series I-III a single-speed blower is fitted, and the switch is incorporated in the air control lever—pull to switch "ON" and push to switch "OFF". The switch supply cable has an "in-line" fuse (10 amp) "B" in Fig 9.

On Series IV a two-speed blower of increased power is fitted. A three-position switch "C" in Fig. 9, is fitted at the outer end of the facia panel:

UP ... ... OFF
CENTRE ... SLOW
DOWN ... FAST

Hot water from the engine cooling system circulates through the heater element and is returned to the inlet side of the water pump. The heater element is fitted into the air box built into the scuttle.

HEATER ELEMENT—To remove and refit.

Set the "Temperature" control to "HOT" (Max.).

Drain cooling system—save anti-freeze if used.

Uncouple the bonnet (hood) release control at the air box and remove the air box cover.

Disconnect the inlet and outlet hoses and withdraw each clear of the element. In order to withdraw the inlet hose remove the water valve (see below). Lift out the element.

Refitting is a reversal of the above operations, care must be taken to ensure that each felt strip and the rubber drain trough is correctly positioned and also that the adhesive strip ('A' in Fig. 9) is not disturbed. After refilling it may be necessary to bleed the heater—See "TO BLEED THE HEATER".

WATER VALVE—To remove and refit.

Set the "Temperature" control to "HOT" (Max.) and drain the cooling system—save anti-freeze if used.

Release the control cable.

Disconnect each hose at the water valve.

Undo the retaining screws and remove the water valve complete with bracket.

Refitting is a reversal of the above operations.

After refilling it may be necessary to bleed the heater—See "TO BLEED THE HEATER".

TO BLEED THE HEATER

As the heater element is above the level of the radiator it may be necessary to bleed the heater after refilling the cooling system:

Release the inlet hose (between the water valve and the element) at the highest point and, with the engine idling, dispel the air and re-secure hose. Top up cooling system as required.

TEMPERATURE CONTROL—To remove and refit.

Release the outer cable clamp and remove the inner cable from the peg on the control lever.

Remove the control lever knob—screw off.

Undo the two screws, with nuts and washers which secure the control to the facia and withdraw the control. Note the spacing washers fitted between the control and the facia lugs.

To remove the control cable proceed as follows:—

Release the inner cable at the water valve trunnion and withdraw the cable to the car interior. Now feed a length of welding wire through the outer cable, withdraw the outer cable leaving the slave wire in position to act as a guide when refitting or renewing the cable.

Refitting of both the control and the cable is a reversal of the instructions.

Note: When refitting the cable, each end of the outer cable should be flush with its clamp. Full movement of the control lever should be obtained without slack.

BLOWER—To remove and refit.

Disconnect the battery.

Disconnect the blower:—

(a) Single-speed unit at the snap connector.

(b) Two-speed unit at the switch and release the cable where taped to facia harness.

Remove the air deflector housing secured to the tunnel by four screws, and release the left-hand de-mist hose.

Remove the four nuts and washers, one of which also secures the blower earth lead and carefully withdraw the blower.

Refitting is a reversal of the above operations.

When refitting the blower ensure that the upper sponge collar is in position and also that the blower outlet enters the rubber at the air box inlet.

When reconnecting the two-speed blower, connect the green cable to terminal 6 on the switch and the brown cable to terminal 8. (See "C" in Fig. 9.)

Re-connect the battery, start clock (if fitted) and test the blower.

ANTI-FREEZE AND FROST PRECAUTIONS

—See Section "A".

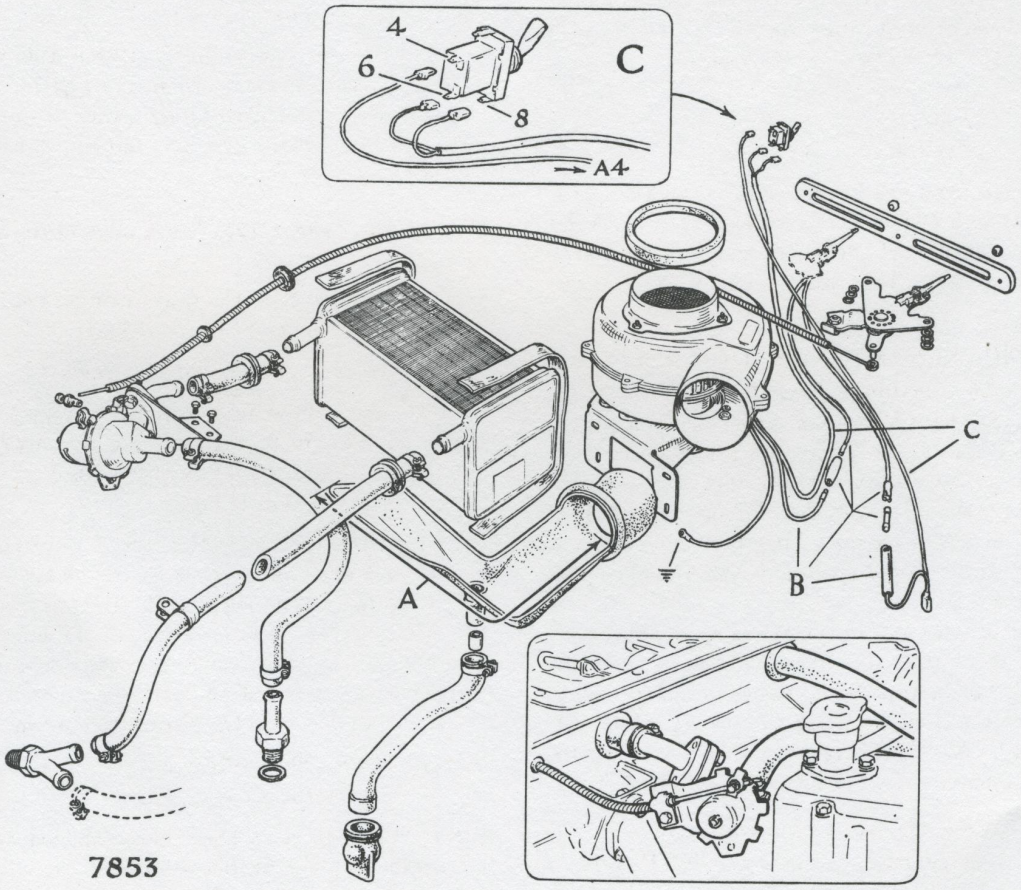


Fig. 9. *Heater—Alpine (Series I-IV)*