Removal,Overhaul and Fitting of Components (Mechanical)

Circular facia outlet - To remove

1. Remove the facia panel (see Chapter S).
2. Remove the top roll (see Chapter S).
3. Remove the demister panel (see Chapter S).
4. Unscrew the two small Pozidrive self-tapping screws retaining the illumination panel above the assembly; remove the illumination panel.
5. Unscrew and remove the four Pozidrive screws that retain the facia outlet assembly.
6. Unscrew the nut and remove the washer (see Fig. C21) from the end of the actuating linkage/control rod joint.
7. Withdraw the complete circular facia outlet (including the grille assembly) through the top roll aperature.
8. Collect a second washer from the actuating linkage/control rod lock-nut.

Circular facia outlet - To fit

Fit the assembly by reversing the procedure given for removal, noting the following points.

1. Ensure that the ducting and convoluted feed hose are correctly positioned relative to the distribution box and instrument panel.
2. Check the operation of the assembly when fitted to ensure freedom of movement for the linkage.

Circular facia outlet control rod and linkage - To remove

(a) Control rod

1. Remove the facia panel (see Chapter S).
2. Remove the top roll (see Chapter S).
3. Unscrew and remove the nut and washer (see Fig. C21) from the end of the actuating linkage/control rod joint.
4. Withdraw the control rod through the actuating link and collect the washer from behind the lock-nut.
5. Unscrew the nut securing the control rod to the instrument panel.
6. Withdraw the control rod through the top roll aperature.

(b) Control linkage and flap

1. Remove the circular facia outlet assembly.
2. Remove the actuating link by disconnecting the swivel pin.
3. Slacken the small screws that retain the flap to the cross-shaft.
4. Remove the spire nut that retains the cross-shaft in position.
5. Slide the cross-shaft from the circular facia duct and collect the flap.

Circular facia outlet control rod and linkage - To fit

Fit the control rod, linkage and flap by reversing the procedure given for removal, noting the following points.

1. Always fit a new spire nut to the cross-shaft and ensure that the legs of the spire nut are correctly located in the cross-shaft slot.
2. Ensure that the lock-nut connecting the control rod to the linkage is set 'flush' with the end of the control rod thread.
3. Ensure that when assembled and fitted, the flap closes and opens correctly in relation to the position of the control rod handle. The flap should be completely closed with approximately 3,17 mm. (0.125 in.) travel of the control rod remaining; the two small screws that retain the flap to the cross-shaft can be used for adjustment.

Circular facia outlet grille - To remove

The circular facia outlet grille can be removed independently of the complete assembly as follows.

1. Remove the facia panel (see Chapter S).
2. Unscrew and remove the two small Pozidrive self tapping screws retaining the illumination panel above the circular facia outlet, remove the illumination panel.
3. Unscrew and remove the three Pozidrive screws that secure the grille retaining/swivel ring, collect the three tension adjusting springs.
4. Remove the ring and carefully withdraw the grille.

Circular facia outlet grille - To fit

Fit the grille by reversing the procedure given for removal, noting the following points.

1. Fit the tension adjusting spring between the lugs on the retainer and housing, hold in place with the three Pozidrive screws. Tighten the screws until the grille will just move under a torque of 0,18 kg. cm. to 0,36 kg. cm. (1 lb. in. to 2 lb. in.).

Condenser matrix - To remove

When removing the condenser, care must be taken not to damage either the matrix or the sensor assembly fitted in front of the matrix.

1. Discharge the refrigerant from the system (see Section C5).
2. Remove the radiator grille (see Chapter S).
3. Unscrew the four 7/16 in. A/F nuts securing the air deflector panel that carries the outside temperature sensor. Ease the panel from its position, taking care not to damage the sensor. Access can now be gained to the two refrigeration pipe connections situated above the matrix.
4. Disconnect both these refrigeration pipe connections (the high pressure vapour line from the compressor to the condenser and the high pressure liquid line to the receiver/drier).
5. Unscrew and remove the two 7/16 in. A/F setscrews from the bottom mountings of the condenser matrix. Collect the washer from under the head of each setscrew.
6. Unscrew and remove the two 7/16 in. A/F setscrews from the condenser matrix top mountings, one on each side of the matrix. Collect the washer from under the head of each setscrew.

Note Carefully support the condenser matrix before finally removing the setscrews from the top mountings.

7. Withdraw the matrix forwards.

Condenser matrix - To fit

Fit the condenser matrix by reversing the procedure given for removal, noting the following points.

1. When fitting the two 7/16 in. A/F setscrews to the bottom mountings it may be necessary to slacken the mountings securing setscrews to assist alignment. The setscrews should be tightened again after alignment.

Coolant pump

Refer to Chapter L.

Coolant tap - To remove

The coolant tap (see Fig. C23) is situated beneath the hydraulic reservoir and should be removed as follows.

1. Ensure that the lower servo is in the full cold position.
2. Drain the engine coolant (see Chapter L).
3. Unscrew the two worm drive clips from the two coolant hose clips. Withdraw the hoses.
4. Unscrew the two 7/16 in. A/F setscrews securing the tap assembly to the rear hydraulic reservoir bracket.
5. Turn the assembly over and slacken the clamping screw retaining the inner wire of the actuating cable to the tap.
6. Unscrew and remove the nut securing the outer cable to the tap bracket. Release the clamp assembly from the tap.
7. Withdraw the coolant tap assembly.

Coolant tap - To fit

Fit the coolant tap by reversing the procedure given for removal, noting the following point.

1. Ensure that the coolant tap actuating cable is set as described in Coolant tap cable - To fit.

Coolant tap actuating cable - To remove

1. Ensure that the lower servo is set in the full cold position.
2. Release the servo end of the inner and outer cable, collect the distance piece from behind the outer cable clamp.
3. Remove the coolant tap and release the tap end of the cable.
4. Withdraw the actuating cable.

Coolant tap actuating cable - To fit

1. Ensure that the lower servo is set in the full cold position.
2. Fit the rubber sleeves to the outer cable as shown in Diagram A, Figure C24.
3. Fit the cable assembly to the coolant tap as shown in Diagram B, Figure C24.
4. Feed the cable through the grommet to the inside of the car, the cable should pass over the right-hand coolant pipe (and the steering column on left-hand drive cars).
5. Fit the coolant tap (see Coolant tap - To fit).
6. Attach the servo end of the outer cable as shown in Diagram C, Figure C24, with the distance piece behind the clip.
7. Slide the crank lever onto the servo output shaft but do not tighten. Set the crank lever with the pinch bolt in the vertical position.
8. Fit the inner cable through the crank lever trunnion and secure at the dimension shown in Diagram C, Figure C24.
9. Move the crank lever by hand over the full travel range to ensure freedom of movement, adjust the angle of the outer cable retaining clips to obtain this movement.
10. Pull the crank lever fully back and tighten the pinch bolt.

Demister duct - To remove

1. Remove the facia panel (see Chapter S).
2. Remove the top roll (see Chapter S).
3. Remove the demister panel (see Chapter S).
4. Remove the appropriate knee roll panel (see Chapter S).
5. Carefully release the rubber retaining ring (see Fig. C25) situated on the outer side of the demister duct assembly.
6. Collect the rubber retaining ring and withdraw the demister duct through the demister panel/top roll aperature.

Demister duct - To fit

Fit the demister outlet duct by reversing the procedure given for the removal, noting the following points.

1. Ensure that the demister duct seals situated on the inner lip of the outlet duct and on the distribution box, are in a good condition.
2. Ensure that the duct locating lug on the inner side of the assembly is correctly positioned.
3. Ensure that the duct seal on the distribution box has not been disturbed during the fitting of the duct.

Note On early cars it may be necessary to withdraw the tape play unit slightly to facilitate the fitting of the duct without disturbing the seal.

Demister outlet grille - To remove

The two demister outlet grilles are retained in position by eight small clips moulded as an integral part of each outlet grille.

1. Position a small thin tool (e.g. a steel rule) between the demister outlet grille and the demister body panel (see Fig. C26).
2. Prise the rear of the demister grille towards its centre in an upwards direction. This action will release the retaining clips.
3. Carefully work around the demister grille as described in Operation 2, until the grille can be lifted out of position.

Demister outlet grille - To fit
Fit the demister outlet grille by reversing the procedure given for removal, noting the following points.

1. Ensure that the outlet grille, is fitted the correct way round (with the vanes sloping upwards towards the rear), otherwise windscreen demisting will be impaired.
2. Ensure that the demister metering panel situated below the outlet grille is positioned correctly (see Demister outlet meter panel - To fit).

Demister outlet metering panel - To remove
The demister outlet metering panels are situated one below each of the two demister outlets. To remove a panel proceed as follows.

1. Remove the demister outlet grille (see Demister outlet grille - To remove).
2. Note the position of the metering aperture as this is essential for correct assembly.
3. Lift out the metering panel.

Demister outlet metering panel - To fit
Fit the demister outlet meter panel by reversing the procedure given for removal.

The distribution box assembly - To remove
The distribution box assembly (see Fig. C27) carries the mode flap and the adapter duct (which in turn carries the facia outlet ducts). It is situated directly behind the centre of the instrument panel and forms the rear section of the automatic air conditioning control box (see Fig. C28).

The distribution box assembly can be removed with the control box assembly either fitted to or removed from the car.

If the distribution box assembly is to be dismantled when removed from the vehicle it will be necessary to carry out the following operations.

1. Remove the facia panel (see Chapter S).
2. Remove the top roll (see Chapter S).
3. Remove the demister panel (see Chapter S).
4. Remove the knee roll panels (see Chapter S).
5. Remove the instrument panel (see Chapter S).
6. Disconnect the convoluted ducting to the circular facia outlets.
7. Remove the demister outlet ducts (refer to Demister outlet ducts - To remove).
8. Unscrew and remove the Pozidrive screws surrounding the distribution box assembly.
9. Withdraw the assembly.

Distribution box assembly - To dismantle
To dismantle the distribution box assembly reverse the procedure given for assembly.

Distribution box assembly - To assemble
1. Ensure that the heater and control box to distribution box seal is in good condition and securely bonded to the distribution box.
2. Assemble the mode flap into the distribution box by passing the long end of the mode flap through the bearing hole in the end plate of the distribution box and sliding the other end into the bearing hole in the opposite end of the distribution box (see Fig. C29, Diagram A).

Note The long end of the mode flap spindle should be positioned towards the right on right-hand drive cars and towards the left on left-hand drive cars.

3. Place a spacer over each end of the mode flap spindle and then press a bearing bush into position from either end of the spindle (see Fig. C29, Diagram B).
4. Locate the crank lever with the pinch bolt fitted onto the mode flap spindle. Position the crank lever in line with the mode flap and tighten the pinch bolt (see Fig. C29, Diagram C).
5. Position the adapter duct onto the distribution box and secure with two long thin self tapping screws (positioned one either side of the centre duct) fitted with spring anchorages under their heads, four shorter thin self tapping screws and five, short thick self tapping screws (see Fig. C29, Diagram D).
6. Hold the rectangular outlet flap, insert the foam washer under head of the pivot bush and fix the bush into the outlet flap bracket (see Fig. C29, Diagram E).
7. Hold the outlet flap link rod and screw on the lock-nut, screw the outlet flap link rod into the adjusting piece (see Fig. C29, Diagram F).
8. Snap the cross pin on the adjusting piece into the pivot bush on the rectangular outlet duct flap.
9. Hold the rectangular outlet housing and fit the flap assembly into position, inserting a lever and pivot assembly from each end and securing the flap assembly with one Allen screw at each end (see Fig. C29, Diagram G).
10. Ensure the flap housing to instrument panel seal is in good condition and is securely bonded into the seal holder (see Fig. C29, Diagram H).
11. Fasten the seal holder to the outlet duct flap housing using four self tapping screws (see Fig. C29, Diagram H).
12. Apply a small amount of rubber lubricant to the tapered seal of the outlet flap housing. Press the housing into position on the adapter duct and fasten with six self tapping screws. Fit the toggle spring between the spring anchorage and the toggle lever (see Fig. C29, Diagram I).

Distribution box assembly - To fit
Fit the distribution box assembly to the heater and control box by reversing the procedure given for removal.

Evaporator box - To remove
1. Disconnect the battery.
2. Discharge the refrigeration system (see Section C5).
3. Remove the bonnet release mechanism (see Chapter S).
4. Detach the straps securing the ducting to the evaporator box.
5. Peel back the rubber sleeve connecting the ducting to each fan motor assembly.

6. Withdraw the ducting.
7. Detach the electrical leads from the refrigeration compressor ambient switch.
8. Unscrew and detach the two refrigeration pipes which pass into the evaporator box to the rear of 'B' bank cylinder head.
9. Remove the nuts and washers and the four self tapping screws securing the evaporator box in position. The self tapping screws are situated on either side of the evaporator at the bottom and are partially hidden from view, they can however be unscrewed with a long screwdriver.
10. Withdraw the evaporator assembly from the bulkhead (see Fig. C30).

Evaporator box - To dismantle
To dismantle the evaporator box reverse the procedure given for assembly.

Evaporator box - To assemble
1. Seal the water drain bottom panel to the bottom of the evaporator box along the spot welded flange from inside the evaporator box (see Fig. C31, Diagram A).
2. Ensure that the seals are in a good condition and securely bonded to the flange wing (see Fig. C31, Diagram B).
3. Fit the evaporator matrix loosely into the evaporator box passing the union connections through the holes in the evaporator box end plate first.
4. Fit both upper mounting brackets into position and fix each with three 2 B.A. setscrews and washers. Do not tighten the setscrews (see Fig. C31, Diagram C).
5. Slide the evaporator tray into position (see Fig. C31, Diagram C).
6. Assemble the evaporator tray to the evaporator matrix using two 2 B.A. setscrews and washers (see Fig. C31, Diagram D).
7. Assemble the evaporator tray to the evaporator box using two 2 B.A. setscrews and washers (see Fig. C31, Diagram E).
8. Fit the sealing washers, washers and nuts to the vapour and suction line connectors (see Fig. C31, Diagram F).
9. Tighten all 2 B.A. setscrews.
10. Seal the evaporator tray to the evaporator box and water test (see Fig. C31, Diagram G).

Evaporator box - To fit
Fit the evaporator box by reversing the procedure given for removal.

Expansion valve - To remove
1. Disconnect the battery.
2. Discharge the refrigeration system (see Section C5).
3. Unscrew the connection on the expansion valve that secures the pipe from the receiver/drier (see Fig. C32).
4. Unscrew the equaliser line from the suction throttling valve.
5. Slacken the clamp which secures the expansion valve phial to the low pressure vapour line that runs from the evaporator matrix to the suction throttling valve. Withdraw the phial.
6. At the base of the expansion valve, unscrew the connection securing the pipe that runs to the evaporator matrix.
7. Remove the expansion valve.

Expansion valve - To fit
Fit the expansion valve by reversing the procedure given for removal.

Front compartment lower outlets - To remove
The front compartment lower outlets are small moulded ducts designed to direct the flow of heated air to the lower areas of the front compartment.
1. Unscrew the three self tapping screws from around the duct and withdraw the moulding.

Front compartment lower outlet - To fit
Fit the front compartment lower outlet by reversing the procedure given for removal, noting the following point.
1. The duct mouldings are right and left-hand and therefore not interchangeable.

Heater and control box - To remove
The heater and control box is removed from inside the car, the assembly basically comprises the heater matrix, heater box with its various passages, flaps to fit the various passages and control rods to operate these flaps.
1. Drain the engine coolant (see Chapter L).
2. Remove the facia panel (see Chapter S).
3. Remove the top roll (see Chapter S).
4. Remove the demister panel (see Chapter S).
5. Remove the knee roll panels (see Chapter S).
6. Remove the instrument panel (see Chapter S).
7. Remove the servo assembly (see Section C8).
8. Remove the demister outlet ducts (see Demister outlet ducts - To remove).
9. Disconnect the mode flap linkage.
10. Unclip the rubber clip securing the electrical wiring looms to the heater and control box assembly.
11. Disconnect the coolant inlet and outlet pipes from the matrix.
12. Unscrew the small nuts and washers securing the heater and control box to the bulkhead, these nuts and washers are situated down either side of the assembly. Carefully withdraw the heater and control box assembly from the bulkhead aperture.

Heater and control box - To fit
To fit the heater and control box reverse the procedure given for removal.

Heater and control box - To dismantle
To dismantle the heater and control box reverse the procedure given for assembly.

Heater and control box - To assemble
1. Apply sealer to all edges and spot weld flanges surrounding the drain channel and in the heater box (see Fig. C33, Diagram A).
Fill the channel with water until the level reaches the flap apertures and check for leaks.
2. Ensure that the seals fitted into the seal retainers (through which the link rods pass) are in a good condition (see Fig. C33, Diagram B).

3. Fit a seal retainer and seal at the rear of each of the three holes and fix each with two pop rivets (see Fig. C33, Diagram C).
4. Slit the seal in each seal retainer with a sharp knife to allow a link rod to pass through. The direction of the slits is shown in Figure C33, Diagram C.
5. Fit the two bearing bushes to the two upper system blanking plates with the pointed end of the bushes towards the same side as the small flange (see Fig. C33, Diagram D).
6. Fit the two bearing bushes to the two inner pivots of the upper temperature flap, pointed end of the bushes outwards (see Fig. C33, Diagram E).
7. Press a pivot bush into the lever (see Fig. C33, Diagram F) and repeat for the other hand. Fit a pinch bolt to each lever.
8. Fit a grommet to the upper system link rod (see Fig. C33, Diagram G). Press the link pin through the grommet and place one washer on either side of the link pin (see Fig. C33, Diagram H). Press the lever into the position illustrated one on each end of the assembly.
9. Position the upper temperature flaps into the heater box, one from either end, long end of the spindle inwards locating in the inner bearing bushes (see Fig. C33, Diagram I).
10. Slide the levers over the ends of the upper temperature flap spindles (see Fig. C33, Diagram J) and fit the centre support bearing to the inner ends of the two spindles. The link rod for the upper temperature flaps should pass through the two seal retainers (see Fig. C33, Diagram K).
11. Fit the washer onto the short end of the spindle protruding from the flap (see Fig. C33, Diagram I).
12. Fit the upper system blanking plate together, with the appropriate seal, to each end of the heater box, in order to locate the upper temperature flap and to seal the end of the heater box. Secure the blanking plate with self tapping screws (see Fig. C33, Diagram I).
13. Fit the metering plates to each of the upper temperature flaps, use three self tapping screws to secure each plate (see Fig. C33, Diagram L).
14. Set the upper temperature flaps by tensioning both flaps against the sealing face (hot air position) (see Fig. C33, Diagram M). Tighten the locking screws of both levers using the setting piece to determine the relative position of the levers (see Fig. C33, Diagram N).
15. Fit the bearing bush to the lower system temperature flap pivot, pointed inwards, to the end opposite the blanking plate (see Fig. C33, Diagram O).
16. Fit the pivot bush into the bracket on the lower temperature flap (see Fig. C33, Diagram P).
17. Fit the lower temperature flap through the bearing bush (see Fig. C33, Diagram Q).
18. Place the spindle of the lower temperature flap into its correct position and fit the remaining bearing bush (see Fig. C33, Diagram R).
19. Fit the blanking plate with its seal using the self tapping screws (see Fig. C33, Diagram R).
20. Position the link rod and snap into the pivot bush (see Fig .C33, Diagram S).
21. Ensure that the bottom seal and two side seals, situated at the base and either side of the heater matrix, are in a good condition and securely bonded to the matrix (see Fig. C33, Diagram S).
22. Insert the heater matrix into position through the aperture in the heater and control box (see Fig. C33, Diagram T).
23. Secure the heater matrix with the setscrews, washers and spacers as illustrated in Figure C33, Diagram U.
24. Ensure that the flange seal around the heater matrix cover and the foam seal in the well of the cover, are both in a good condition and securely bonded into position.
25. Fit the matrix cover and secure in position with self tapping screws.

Heater Matrix - To remove

The heater matrix can be removed from the heater and control box with the heater and control box situated in the car.
1. Drain the engine coolant (see Chapter L).
2. Remove the facia panel (see Chapter S).
3. Remove the top roll (see Chapter S).
4. Remove the demister panel (see Chapter S).
5. Remove the knee roll panels (see Chapter S).
6. Unclip the rubber clips that secure the electrical wiring looms to the heater and control box.
7. Unscrew the nuts that retain the tape play rear support bracket to the heater and control box. Withdraw the bracket.
8. Unscrew the self tapping screws from the heater matrix cover and withdraw the cover.
9. Unscrew and remove the setscrews, washers and spacers that secure the heater matrix in the heater and control box.
10. Carefully withdraw the heater matrix.

Heater matrix - To fit

Fit the heater matrix to the heater and control box by reversing the procedure given for removal, noting the following point.
1. Carry out Operations 21 to 25 inclusive (refer to Heater and control box - To assemble).

Lower quantity flap - To fit

The lower quantity flap can be fitted with the heater and control box either fitted to, or removed from, the car.
1. Assemble the torque tube into the bearing mounting bracket on the car body (see Fig. C34, Diagram A) by placing the spindle at the right-hand end of the torque tube, through the hole in the bearing bracket and then, swinging the assembly upwards so that the left-hand spindle can be pushed through the hole in the opposite bracket. When both ends are located, fit the spacer tube to the right-hand spindle and the bearing bushes to both ends by pushing them onto the spindles, tapered ends inwards, until the groove in each bearing bush locates in its bracket.
2. Locate the lower quantity flap assembly into position through either of the front heater apertures with the narrow side forward and the seal to the top.
3. Fit the pins (see Fig. C34, Diagram B) through the holes in the end of the flap extension arms and

also through the holes in the torque arm, taking care to ensure that the inward turned tags on the torque arm fit over the buffer rubbers and do not push them to one side.

4. Fit the retaining clips onto the pins (see Fig. C34, Diagram B), ensuring that the legs of the clips fit into the grooves on the pins.

5. If the heater and control box are already fitted to the car and the lower quantity flap has been fitted through the front compartment lower outlets, fit the outlet ducts.

Lower quantity flap - To remove

To remove the lower quantity flap reverse the procedure given for fitting.

Lower quantity flap linkage - To fit and set (see Fig. C35)

1. Fit a grommet to the round eye of the straight link rod.
2. Fit the spacer and distance piece into the grommet and bolt to the actuator crank lever.
3. Fit the pinch bolt to the crank.
4. Fit one lock-nut to the link rod (see Fig. C36, Diagram A).
5. Fit the crank assembly to the lower quantity flap actuator. Position the crank on the actuator spindle as shown in Figure C36, Diagram B and tighten the crank lever pinch bolt.
6. Fit the actuator to the centre support bracket (see Section C8).
7. The lower quantity flap extension arm should be pressed downwards ensuring that the link rod passes through the hole in the bridge plate and then through the extension arm pivot block.
8. Screw down the lock-nut on the link rod until it maintains the flap in the closed position.
9. Screw the second lock-nut onto the end of the link rod and tighten against the pivot block.
10. A protective cap should be fitted to the threaded end of the link rod.

Lower system temperature (blend) flap

To dismantle and assemble this component see Operations 15 to 20 inclusive in Heater and control box - To assemble.

Mode flap

To dismantle and assemble this component see Operations 2 to 4 inclusive in Distribution box assembly - To assemble.

Mode flap linkage - To fit and set (see Fig. C35)

1. Fit the mode flap actuator (see Section C8).
2. Assemble a grommet to the round eye of the shaped link rod.
3. Fit the spacer and distance piece into the grommet, Bolt the assembly to the crank lever (see Fig. C37, Diagram A).
4. Fit a pinch bolt to the crank lever.
5. Fit the crank lever assembly to the spindle of the mode flap actuator.
6. Set the position of the crank lever and link rod as shown in Figure C37, Diagram B.
7. Tighten the pinch bolt on the crank lever.
8. Screw a lock-nut onto the link rod.
9. Carefully thread the link rod through the pivot block attached to the mode flap assembly.
10. Press the mode flap assembly so that the mode flap sits firmly against its seat on the front of the distribution box (see Fig. C37, Diagram C).
11. Screw the lock-nut down the link rod until it contacts the pivot block.
12. Screw a second lock-nut onto the end of the link rod and tighten against the pivot block.
13. Fit a protective cap to the threaded end of the link rod.

Radiator assembly

Refer to Chapter L.

Rear compartment outlet - To remove

Two rear compartment outlets are fitted to the car, one between each front seat and the transmission tunnel. The outlets are an extension of the body ducts and held in position by pop rivets along the lower edge.

1. Remove the appropriate front seat (see Chapter S).
2. Raise the carpet between the front seat and transmission tunnel.
3. Drill out the pop rivets that secure the outlet duct in position.

Note Ensure that the area of the body below the ducts is clear when drilling out the pop rivets.

Rear compartment outlet - To fit

Fit the rear compartment outlet by reversing the procedure given for removal.

Receiver/Drier - To remove

1. Discharge the refrigeration system (see Section C5).
2. Disconnect the high pressure liquid inlet and outlet pipes (see Fig. C38).
3. Slacken the worm drive clip securing the receiver/drier, withdraw the unit.

Receiver/Drier - To fit

Fit the receiver/drier by reversing the procedure given for removal.

Recirculation flap - To remove

To remove a recirculation flap assembly reverse the procedure given for fitting.

Recirculation flap - To dismantle

To dismantle a recirculation flap assembly reverse the procedure given for assembly.

Recirculation flap - To assemble

1. Hold the torque tube assembly and place with the inwards turned flange of the side plates downwards (see Fig. C39, Diagram A). The flap assembly should then be placed between the side plates with the bracket on the flap upwards.
2. Fasten the flap to the torque tube assembly by pushing the pin (see Fig. C39, Diagram A) through the hole in the end plate (i.e. from the inside to the outside). Hold the pin in place with the retainer.

Note It is essential that the legs of the retainer engage in the pin groove correctly. To ensure this, a pair of pliers with a 4,0 mm. (0.156 in.) diameter hole in one leg, is required.

3. Place the hinge bracket assembly flat so that the weld nuts face upwards and the end tags are towards you. Fit the flap assembly with the linkage bracket downwards between the hinge brackets (see Fig. C39, Diagram B).
4. Press the bearing bushes into place from the outer ends by sliding them along the spindle of the torque tube (see Fig. C39, Diagram B).
5. Take the link rod and fit the grommet into the circular end. Fit the swivel tube into the grommet and insert the distance piece (see Fig. C39, Diagram C).
6. Fit the assembly to the linkage bracket and secure with the bolt, washer and nut (see Fig. C39, Diagram C).

Recirculation flap - To fit

1. To fit the recirculation flap assembly to the car, place the assembly into the aperture from inside the car body with the hinge at the top and the link rod towards the inside of the car. The left-hand and right-hand flap assemblies are distinguished by the position of the link rod (the left-hand flap has the rod offset to the left and the right-hand flap to the right).
2. With the flap placed against its upper seat, the hinge brackets can be placed in line with the holes in the body and the retaining screws fitted.
3. Place the grille in position by threading the link rod through the outer slot in the grille. Secure the grille in position with the four self-tapping screws.
4. To fit the actuator onto its mounting bracket commence, by fitting the square bifurcated end of the nuts through the square holes of the bracket from the raised side (see Fig. C39, Diagram D).
5. Position the piece of 12,7 mm. (0.5 in.) thick Hardura (the size of the flat portion of the bracket) over the nuts with the plastic side against the bracket.
6. The actuator should be mounted onto the nuts with the motor side of the actuator downwards (i.e. the spindle away from the bracket) and secured in position with the cheese head self-tapping screws and washers.
7. Mount this complete actuator assembly onto the car body, using the tapping blocks provided.
8. Fit the lever assembly (see Fig. C39, Diagram D) to the actuator spindle. Screw two nuts 5,08 cm. (2.0 in.) along the thread of the link rod, followed by one plain washer, one spring and a second plain washer. Place the rod through the hole in the swivel pin on the end of the lever and screw two nuts along the thread of the link rod to secure in position.

Recirculation flap - To set

1. Ensure that the pinch bolt retaining the lever to actuator shaft has been slackened.
2. Ensure that the actuator is set in the fresh air position.
3. Rotate the lever on the actuator shaft until the lever and the link rod are parallel to each other (i.e. the link rod is in line with the eye of the lever and the spindle).
4. Tighten the pinch bolt to secure the lever to the actuator spindle.
5. The two nuts on the end of the link rod should be tightened against the swivel pin until the flap is firmly seated on its lower seat, the two nuts on the end of the link rod should be locked together.
6. The two nuts threaded part way along the link rod should be set so that the spring is compressed to a length of 22,23 mm. (0.875 in.) and 25,4 mm. (1.0 in.), the nuts should be then locked together.

Recirculation flap - To check

1. Energise the actuator and set in the recirculation position and check that the flap seats on the upper seat.
2. When correctly seated the spring should be compressed a further 3,18 mm. (0.125 in.) to 6,35 mm. (0.250 in.) as seen by the distance from the swivel pin to the lower lock-nuts.

Rectangular facia outlet

To dismantle and assemble this component see Operations 5 to 12 inclusive in Distribution box assembly - To assemble.

Refrigeration compressor - To remove

1. Discharge the refrigerant (see Section C5).
2. Disconnect the battery.
3. Disconnect the two 'Lucar' terminals from the compressor clutch.
4. Unscrew and remove the setscrew that secures the clamp plate to the rear face of the compressor.
5. Withdraw the clamp plate and refrigeration pipes from the rear face of the compressor.
6. Slacken the compressor drive belts.
7. Remove the belts.
8. Unscrew and remove the three nuts securing the compressor rear mounting to the inlet manifold.
9. Unscrew and remove the nut from each of the two front mounting points. Withdraw the bolts from the mountings, collect a washer from between the compressor and mounting bracket on one side and a distance piece from the mounting on the other side.
10. Lift the compressor from the engine and lay it, sump downwards, on a bench.

Refrigeration compressor - To fit

To fit the compressor, reverse the procedure given for its removal noting the following points.

1. Fit new rubber 'O' rings between the rear face of the compressor and the unions of the refrigeration pipes.
2. After fitting the compressor the full procedure of evacuation and sweeping must be carried out before the system is charged.

Refrigeration compressor - Overhaul

Whenever a major overhaul or rebuild is carried out it is recommended that an adequate stock of service parts be made available which should include the following:

(a) Standard size piston drive balls.
(b) Shoe discs - total of eleven sizes, including the ZERO shoe.
(c) Thrust races- total of sixteen sizes, including the ZERO race.
(d) Piston and rings.
(e) Main shaft needle bearings.

(f) Thrust bearings.
(g) Compressor shaft, swash plate and Woodruff key assembly.
(h) Suction reed valve, front, rear.
(i) Gasket service kit - containing all gaskets, seals, 'O' rings, etc.
(j) Discharge valve assembly, front, rear.
(k) Shaft seal kit.
(l) Nuts, head to shell and shaft.
(m) Retainer rings.
(n) Cylinder locating dowels.
(o) Valve and head locating dowels.
(p) Service discharge cross-over tube kit.

All service parts are protected by a preservation process and packed in a manner that eliminates the necessity of cleaning or washing parts to be fitted.

Hub and drive assembly - To remove

1. Using the special clutch hub and holding tool RH 7798 (J-9403); remove and discard the compressor shaft lock-nut.
2. Withdraw the hub and drive-plate assembly using the special puller RH 7800 (J-9401); retain the key.

Note The puller must be screwed into its seat to prevent the hub and drive-plate assembly threads being damaged.

3. Remove the circlip and hub spacer washer.
4. Examine the clutch friction face for signs of wear or overheating, and check further for the underlying cause of the damage, e.g. low coil voltage or binding of the compressor internal mechanism.

Hub and drive assembly - To fit

1. When the hub is ready for installation, clean its friction face with suitable solvent cleaner. Locate the key in the compressor shaft key-way allowing it to project approximately 4,76 mm. (0.187 in.) from the end of the key-way. Locate the hub assembly on the key-way and, using the special hub and drive-plate fitting tool RH 7799 (J-9480) and a suitable distance piece, draw the hub and drive assembly onto the shaft until there is approximately 2,38 mm. (0.094 in.) space between the frictional surfaces of the drive-plate and pulley.

Remove tool RH 7799 (J-9480) and distance piece.

Note Do not hammer or force the assembly onto the shaft. Always use the correct tools when removing or replacing clutch parts or serious damage may result to the internal components of the compressor.

2. Fit the hub spacer washer and circlip with the convex side of the clip facing the washer.
3. Fit a new lock-nut and torque tighten to 2,07 kg.m. (15 lb. ft.). The air gap between the frictional faces should now be between 0,558 mm. and 1,447 mm. (0.022 in. and 0.057 in.).

Note The shoulder or circular projection on the lock-nut must face toward the circlip.

4. To 'bed-in' the clutch parts, run the engine and cycle the clutch assembly by switching the refrigeration system off and on 20 times at approximately 1 second intervals.

Pulley and bearing assembly - To remove

1. Remove the hub and drive assembly.
2. Remove the circlip retaining the pulley bearing and centre shaft key.
3. Fit the special puller pilot RH 7792 (J-9395) over the compressor shaft and using special puller RH 7791 (J-8433) withdraw the pulley assembly.
4. Check for excessive grooving in the clutch hub and drive-plate; fit new parts if necessary.

Bearing - To remove

1. With the pulley and bearing assembly removed from the compressor, use a sharp pointed instrument to remove the wire retainer ring.
2. Press the bearing out of the pulley housing using special bearing remover RH 7795 (J-9398) with handle RH 7794 (J-8092).

Bearing - To fit

1. Using the special tool RH 7796 (J-9481) and handle RH 7794 (J-8092), press the new bearing into the pulley.
2. Fit the bearing retainer ring.

Pulley and bearing assembly - To fit

1. Using special tools RH 7796 (J-9481) and RH 7794 (J-8092), press the pulley and bearing assembly onto the compressor shaft. Ensure that the pulley will rotate freely.
2. Fit the pulley retainer ring, the hub and drive-plate assembly and the retainer ring.

Coil housing - To remove

1. Following the removal of the hub and drive-plate assembly and the pulley bearing assembly, disconnect the two 'Lucar' terminals.
2. Scribe a mark on the coil housing and a corresponding mark on the compressor body.
3. Remove the circlip securing the coil to the compressor body.

Coil housing - To inspect

1. Examine the coil for loose terminals or cracked insulation.

Coil housing - To fit

1. Fit the coil housing in its correct position as indicated by the scribed marks.
2. Fit the circlip (flat face to coil housing).
3. Fit the hub and drive-plate assembly and the pulley bearing assembly.
4. Connect the 'Lucar' terminals and check the clutch for correct operation .

Compressor shaft seal assembly - To remove

1. Thoroughly clean the front head bore and fit a new 'O' ring in the bottom groove.
2. Immerse the shaft seal in clean compressor oil before fitting to prevent the shoulder from damaging the 'O' ring.
3. Using special seal installer RH 7793 (J-9392) fit the shaft seal over the flats on the compressor shaft with the carbon seal facing upwards; turn the seal installer anti-clockwise to release the seal.
4. Insert the seal seat into the front head bore

taking care not to dislodge the 'O' ring; use tool RH 7802 (J-9393).

Note The contact surface of the seal must be protected against any damage, such as scratches and nicks. Finger marks may cause surface damage.

5. Insert the retainer ring (flat side down) until the retainer rests on the seal seat. Using seal seat installer RH 7802 (J-9393), press the retainer ring until the spring pressure of the shaft seal is overcome and the retainer ring snaps into the groove in the casting bore.

Internal mechanism - To remove

1. Remove the clutch, the pulley assembly, the clutch coil and the shaft seal as previously instructed in this Section.
2. Invert the compressor and drain the oil into a measuring cup. This operation is necessary to ensure that, on assembly, the compressor is filled with the correct amount of oil.
3. Remove the four lock-nuts securing the rear head to the compressor shell then remove the compressor head.
4. Wipe any excess oil from the Teflon gasket surfaces on the rear head casting webs and examine for damage (see Fig. C41); renew the rear head if necessary.
5. Remove the suction filter and examine it for damage or obstruction; clean or renew if necessary.
6. Paint or etch suitable marks on the oil pump gears; this is to ensure that the gears, if used for assembly, will be fitted in their identical positions.
7. Remove and discard the rear head 'O' ring.
8. Carefully lift the rear discharge valve plate assembly by using two small screwdrivers under the valve reed retainers. Do not position the screwdrivers between the reeds and the reed seats.
9. Examine the valve reeds and seats for damage; fit new if necessary.
10. Withdraw the oil pick-up tube using a stiff piece of hooked wire (see Fig. C42); discard the 'O' ring.
11. Invert and rest the compressor assembly on support block RH 7803 (J-9521).
12. Lift off the compressor shell and front head assembly leaving the internal mechanism resting on the support block.

Note If the internal mechanism will not separate from the compressor case, tap the compressor head, not the end of the compressor shaft.

13. Wipe any excess oil from the Teflon gasket surfaces on the front head casting webs and examine for damage; fit a new front head if necessary.
14. Carefully lift the front discharge valve plate assembly by using two small screwdrivers under the valve reed retainers. Do not position the screwdrivers between the reeds and the reed seats.
15. Examine the valve reeds and seats for damage; fit new if necessary.
16. Remove the suction cross-over from the cylinder casting.

Cylinder assembly - To dismantle

1. Etch or mark by some suitable means, each piston and its respective bore to ensure correct assembly.
2. Using a wooden block and mallet separate the cylinder halves (see Fig. C43), taking care that the discharge cross-over tube does not foul the swash plate.

Important Under no circumstances should the compressor shaft be hit at either end in an effort to separate the cylinder halves.

3. Place the complete internal mechanism rear cylinder downwards on support block RH 7803 (J-9521); remove the front cylinder half.
4. Turn the compressor shaft until the piston marked 1 is fully raised; remove the piston.
5. Discard the piston shoe discs. Examine the piston drive balls for signs of pitting or surface cracking; fit new if necessary.
6. Remove and discard the piston rings. Place the piston with the drive balls in the parts tray RH 7801 (J-9402).
7. Repeat Operations 4 to 6 inclusive for No. 2 and 3 pistons ensuring that parts are kept with their respective pistons.
8. Remove and discard the front combination of thrust races and thrust bearings.
9. Remove the swash plate and shaft assembly from the rear cylinder half. It may be necessary to bend the discharge cross-over tube slightly to facilitate shaft removal.
10. Remove and discard the rear combination of thrust races and thrust bearings.
11. Examine the swash plate surface and shaft; fit a new assembly if necessary.

Note A certain amount of shoe disc wear on the swash plate together with marks indicating needle bearing load on the shaft are normal.

13. Examine the piston bores and needle bearings in the front and rear cylinder halves. Fit new front or rear cylinders if any cylinder bore is deeply scored or damaged.
14. Needle bearings may be removed if necessary by the use of a suitable punch. Fit the punch in the inner side of the cylinder head and drive the bearing out.
15. To fit the needle bearing, place the cylinder half on support block RH 7803 (J-9521).
16. Insert the bearing into the cylinder head with the bearing identification marks upward. Use the special needle bearing installer RH 7790 (J-9432) to drive the bearing into the cylinder head until the installer bottoms on the cylinder face.

Important All parts which are to be used again should be washed in 'Genklene', alcohol, or a similar solvent. Remove excess moisture with dry compressed air.

Compressor running clearances - To set

Before assembling the compressor, it is necessary to set the running clearances of the bearing surfaces in the following manner.

1. Place the compressing fixture RH 7789 (J-9397) on the bench (studs uppermost).
2. Place the front cylinder half in the compressing fixture, face downwards.
3. Fit a zero thrust race, thrust bearing and a second zero thrust race onto the front end of the compressor shaft. Lubricate the thrust races and

thrust bearing with petroleum jelly.

4. Fit the threaded end of the shaft through the needle bearing in the front cylinder half and rest the shaft on the cylinder hub.

5. Fit a zero thrust race onto the rear end of the compressor shaft so that it rests on the hub of the swash plate then fit a thrust bearing and a second zero thrust race. Lubricate the thrust races and thrust bearing with petroleum jelly.

6. Lubricate the ball pockets of No. 1 piston with compressor oil and place a ball in each socket. Use the balls previously removed if they are in suitable condition.

7. Lubricate the cavity of a zero shoe disc with compressor oil and place the shoe disc over the ball in the front end of the piston.

Note The front end of the piston has an identification mark on the casting web.

8. Rotate the compressor shaft and swash plate until the high point of the swash plate is above No. 1 cylinder bore.

9. Lift the shaft assembly to enable the piston (identification mark downwards) to be fitted over the swash plate above No. 1 cylinder bore.

Note Piston rings should not be fitted for this operation.

10. Repeat Operations 6 to 9 inclusive for No. 2 and No. 3 pistons.

11. Fit the rear cylinder half over the pistons, aligning the discharge cross-over tube hole with that of the front cylinder. Tap the cylinder into place with a soft headed mallet.

12. Position the compressor internal mechanism so that the discharge cross-over tube holes are mid-way between a pair of compressing fixture bolts.

13. Fit the top cover on the compressing fixture and torque tighten the four bolts to 2,07 kg.m. (15 lb. ft.).

Shoe disc - To select

1. Measure the clearance between the rear ball of No. 1 piston and the swash plate in the following manner.

2. Select a suitable combination of oiled feeler gauge leaves to fit neatly between the ball and swash plate.

3. Attach a spring scale,reading in one gramme (one ounce) increments, to the feeler gauge.

4. Adjust the thickness of the feeler gauge until a reading of 113,4 to 226,8 grammes (4 to 8 ounces) on the spring scale is necessary to withdraw the feeler gauge from between the swash plate and the piston ball; record the thickness of the feeler gauges.

5. Rotate the compressor shaft through 120° and repeat Operations 2 to 4 inclusive on the same parts. Rotate the compressor shaft through a further 120° and again repeat Operations 2 to 4 inclusive on the same parts.

6. Select a shoe disc corresponding to the minimum feeler gauge thickness recorded for the three checks on No. 1 piston.

7. Repeat Operations 1 to 6 inclusive for No. 2 and No. 3 pistons.

Compressor shaft thrust race - To select

1. Position a dial indicator on the rear end of the compressor shaft and adjust to zero. Push the shaft upwards and record the dial readings.

Note Dial indicator increments are 0,025 mm (0.001 in.), therefore the reading must be estimated to the nearest 0,013 mm (0.0005 in.).

2. Select an oversize thrust race equivalent to the dial gauge reading.

Note Fifteen thrust races are provided in increments of 0,013 mm. (0.0005 in.) above the zero washer size each with a tolerance of 0,013 mm. (0.0005 in.) to 0,038 mm. (0.0015 in.) to provide a running clearance between the hub surfaces of the swash plate and the front and rear hubs of the cylinder.

3. Dismantle the compressing fixture and remove the rear cylinder half, leaving the front cylinder half resting upon the compressing fixture.

4. Remove one piston at a time taking care not to lose the relationship of the front ball and shoe disc and the rear ball.

5. Remove the rear outer thrust race from the compressor shaft and replace it with the thrust race previously selected.

Compressor internal mechanism - To assemble

1. Fit a piston ring to each end of No. 1 piston with the scraper groove toward the swash plate.

2. Lubricate the piston ball pockets, the corresponding piston drive balls, the piston shoe discs and assemble them, place the zero shoe disc over the drive ball of the front piston.

3. Rotate the compressor shaft and swash plate until the high point of the swash plate is over No. 1 piston cylinder bore.

4. Lift the compressor shaft and place the piston over the swash plate with the identification mark toward the front cylinder head.

5. Position the piston ring with the gap toward the compressor shaft.

6. Repeat the procedure for pistons No. 2 and No. 3 taking care not to damage the piston rings.

7. Fit a new discharge cross-over tube in the front cylinder half with the flat surface facing the compressor shaft.

Note The service discharge cross-over tube is of similar design to that used on production except that an 'O' ring and bush are used at each end.

8. Position the rings on each piston so that the ring gaps are facing the compressor shaft, then push the rings outward.

9. Place the rear cylinder half over the compressor shaft and enter the pistons into their respective bores taking care not to break the piston rings.

10. When all the pistons and rings are located in their respective bores, align the end of the discharge cross-over tube with the hole in the rear cylinder half.

11. Ensure that the flat face of the discharge cross-over tube faces the compressor shaft and gently tap the rear cylinder half until it is seated on the front cylinder half.

12. Fit the suction cross-over cover into the grooves in the cylinder halves. Align the cover with the ends of the cylinder faces by gently tapping the end of the cover with a soft-headed mallet.

Compressor - To assemble

1. Place the internal assembly on to the support block RH 7803 (J-9521) with the oil pump drive in the block hole.
2. Fit a new 'O' ring and bush on to the front end of the discharge cross-over tube (see Fig. C44).
3. Fit new dowel pins to the cylinder head.
4. Fit the front suction reed plate and discharge valve plate assembly aligning the holes with the dowel pins and the correct openings (see Figs. C45 and C46).

Note The front discharge plate has a large diameter hole in the centre.

5. Coat the Teflon gasket surfaces with the approved compressor oil.
6. Determine the exact position of the front head casting in relation to the dowel pins of the internal mechanism and mark the positions of the dowel pins on the sides of the front head assembly with a soft pencil. Carefully lower the front head casting into position.
7. Ensure that the Teflon gasket around the cylinder head centre does not come into contact with the compressor shaft.
8. Do not rotate the head assembly to align it with the dowel pins as the Teflon gasket may contact the reed retainers.
9. Lubricate the angled groove at the lower edge of the front head casting with compressor oil.
10. Position the compressor shell over the front head and with the aid of a small screwdriver gently press in the 'O' ring around the circumference of the internal mechanism until the compressor shell will slide over the internal mechanism without damage to the 'O' ring.
11. Invert the compressor and fit new dowels and the oil pick-up 'O' ring in the cylinder head.
12. Lubricate the oil pick-up tube and fit it in the cylinder head passage; if necessary, rotate the internal mechanism to align the oil pick-up tube with the hole in the sump baffle.
13. Fit a new 'O' ring and bush on the discharge cross-over tube.
14. Fit the suction reed with the oil drain slot adjacent to the sump.
15. Fit the rear discharge plate.
16. Place the inner and outer oil pump gears over the compressor shaft (identification marks together).
17. Position the gears as shown in Figure C47.
18. Lubricate around the outer edge of the rear discharge valve plate, the valve reeds, pump gears and the area of the Teflon sealing surface which will contact on the rear discharge valve plate.
19. Lubricate the new head to shell 'O' ring and place on the discharge valve plate.
20. Fit the suction filter in the rear head casting and coat the Teflon sealing surface with compressor oil.
21. Place the rear head assembly over the studs on the compressor shell. The two lower, threaded compressor mounting holes should be in alignment with the compressor sump. Ensure that the suction filter does not drop out of place when lowering the cylinder head into position.
22. Fit nuts and torque tighten evenly to 1,41 kg. m. (20 lb. ft.).
23. Fit the shaft seal, clutch coil, compressor pulley and bearing assembly and compressor clutch plate and hub assembly as described earlier in this Section.
24. Add the approved compressor oil to the compressor, refer to Compressor oil level - To check.
25. Before operating the compressor, rotate the clutch hub (clockwise) several times to circulate compressor oil to the piston rings and oil seals.
26. Upon assembly of the refrigeration system the full process of evacuation and sweeping must be carried out before charging the system.

Scuttle intake grille - To remove

1. Position the windscreen wiper blades in the vertical position. To achieve this, switch on the ignition and operate the wash/wipe system. Switch off the ignition when the wiper blades are passing the vertical position.
2. Unscrew the seven setscrews securing the intake grille panel in position; the setscrews are situated along the forward edge of the panel.
3. Pull the intake grille panel forward until it is clear of the retaining pins situated along the rear edge, lift up the panel (see Fig. C48).
4. Pull the windscreen washer tubes from the jet connectors and remove the intake panel from the car.
5. Unscrew and remove the wing nut securing the jet assemblies to the intake grille.
6. Remove the nuts or screws securing the wire mesh grilles to the underside of the intake; these grilles are retained by screws on early cars and nuts on later cars.
7. Withdraw the foam elements.

Scuttle intake grille - To fit

Fit the scuttle intake grille by reversing the procedure given for removal.

Stale air outlet grilles - To remove

1. Unclip the rear window lower trim panel; withdraw the panel.
2. Unscrew the screws from the rear of the centre trim panel, carrying the stale air outlet grilles.
3. Lower the rear seat centre arm rest and push down the trim behind the armrest to reveal three screws which should be removed.
4. Lift the rear of the grille trim panel and slide out forwards.
5. Turn the grille panel over to reveal the 2 B.A. cheese-headed screws that retain the grilles in position.
6. Remove these retaining screws and withdraw the grilles.

Stale air outlet grilles - To fit

Fit the stale air outlet grilles by reversing the procedure given for removal.