

SMITHS MOTOR ACCESSORIES LTD

CRICKLEWOOD WORKS



LONDON N.W.2, ENGLAND

Service Instructions for Circular Type Car Heaters

— SERVICE —

SMITHS MOTOR ACCESSORIES LTD.

The Service Technical Department of Smiths Motor Accessories Ltd. will be pleased to advise on any functional problem relating to instruments and equipment described in this brochure.

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THE MOTOR ACCESSORY DIVISION OF



S. SMITH & SONS (ENGLAND) LTD



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CIRCULAR TYPE CAR HEATERS

DESCRIPTION

THE Smiths circular type car heater is manufactured in a number of variations to suit different applications—the main variation being that of output, which affects the size of radiator and electric motor fitted. The general construction,

however, remains basically the same and consists essentially of a Front Cover Assembly, Radiator, Electric Motor and axial flow fan (or centrifugal blower), and a back cover plate, with or without mounting pillars.

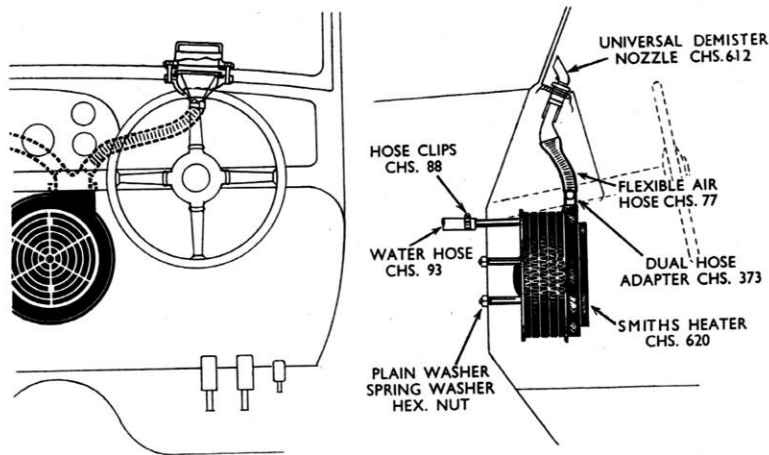


Fig. 1. Typical Installation.

O P E R A T I O N

The circular type heater is designed as a "recirculator," i.e., air is drawn from the car interior through the periphery of the radiator and distributed through the front grille by means of the axial flow fan. In certain applications the circular type heater is used to supply fresh heated air to the vehicle interior, but in such cases a special enclosed housing is provided by the car manufacturers to which a fresh air feed is taken.

In all cases when the axial flow fan is fitted, the front cover assembly makes provision for the additional supply of air for windscreen demisting. This air is led through flexible ducting to the screen demister nozzles which are fitted to ensure correct air distribution over the essential parts of the windscreen, keeping this clear of mist and assisting in the prevention of ice and frost formation in severe weather conditions.

The radiator unit consists of a series of flat annular water tubes separated by corrugated strips of heat transfer material, through which air is drawn by the action of the fan. The radiator derives its heat supply from the engine cooling system (direct in the case of pump cooled engines, or assisted by an auxiliary water pump, specially fitted, on thermo-syphon cooled engines). Air passing through the air passages of the radiator is thus heated and re-distributed by the fan through the front grille into the car, and via the demister port to the screen. Unless provision is made by the car manufacturer, it is not possible for interior heating or screen demisting to be operated separately from each other.

A variation of the circular heater is fitted with a centrifugal blower unit only. Another variation has this blower fitted in addition to the axial flow fan, thus enabling a separate supply of air to be distributed to another part of the car interior.

TREATMENT OF FAULTS

Lack of Heat

This fault is caused by lack of water circulation through the car heater radiator. Water circulation is interfered with in two ways, viz., an air lock in the system or a blockage in the heater radiator.

Removal of Air Lock

Should it be apparent that hot water from the engine cooling system is not circulating through the car heater, first make sure that there is no air lock in the circuit.

To do this, start up the engine and allow to run at a fast tick over. Loosen hose clip retaining the heater water return hose to its connection on the suction side of the water pump (or the lower water hose, as the case may be), and pull off hose, placing thumb over open connector to prevent the pump sucking air. Immediately a full bore flow of water issues from this hose it can safely be assumed that there is no air lock in the circuit, and the hose should be quickly replaced on its connection.

If by this means it is not found possible to obtain a satisfactory water flow, then it is likely that foreign matter in the cooling system is choking the water tubes of the car heater radiator.

Choked Radiator

In some cases the lodging of sediment and foreign matter in the radiator is not very serious, and can be removed provided sufficient water pressure can be applied to the heater radiator.

This is done in the following manner. Empty cooling system and detach the two water hoses from the heater radiator pipes. Connect up a hose from a mains water tap to the heater *return* pipe, and a

further hose from the other heater pipe to waste. By this means an attempt is made to pass water through the radiator in the reverse direction to normal. If a full bore flow is obtained from the waste pipe, the radiator can be considered satisfactory, but should the mains pressure not clear the blockage in the radiator, the radiator should be replaced.

Water Leak from Heater

This fault is indicated either by water actually dripping from the heater unit or by moisture in the air flow to the screen. In the latter case the screen will appear to mist temporarily, rather than demist immediately the heater unit is switched on, and in both cases the radiator should be replaced.

Should circumstances dictate the desirability of effecting a repair, it will first be necessary to locate the leak. Remove the radiator from the heater unit (see Disassembly of Heater), and locate the leak by applying by a pressure test of 10 lbs./sq. in. either by water applied internally, or air applied internally with the radiator immersed in water—the latter method being preferable.

If the leak appears on an exposed surface of the radiator matrix, an attempt may be made to repair by soldering provided a skilled mechanic is available. Should the leak prove to be located internally, it will be very difficult indeed to effect repairs and a replacement radiator must be fitted.

Fan Failing to Rotate

Should the fan (or centrifugal blower rotor) fail to rotate when the heater is switched on either by the Rheostat or On-off switch, firstly check the wiring of the electrical circuit to make sure that all con-

nections are intact and the supply is "live." Should this check fail to locate a fault, see if the fan will rotate freely in the heater if pushed with a screwdriver or other pointed instrument. Should this test indicate that the fan is free to rotate, a faulty motor is indicated. (See Motor Faults : Diagnosis and Treatment Chart.)

Adjustment of Fan

Correct positioning of the fan is such that the blades should clear the radiator end plate by $\frac{1}{8}$ in., and adjustment can be carried out without removal of the car heater unit from its location in the car.

It is only necessary to detach the adaptor from the demister port on the heater front, and if space permits, the adjustment of the fan can be carried out by loosening the grub screw in the fan boss with a screwdriver fed through the demister port.

Should lack of space prevent this operation, then remove the three spring clips located round the periphery of the heater by levering them outwards from the back. The clips removed, the heater front assembly is detached from the unit and the fan is fully exposed. Adjust to the figure given above after checking that the four blades are not running out of true.

DISSEMBLY OF HEATER UNIT

Should it be necessary to dissemble the car heater unit, it must first of all be removed from the vehicle. Drain the cooling system, and remove the hose pipes from the car heater radiator con-

nections. Detach the adaptor from the demister port, and then unscrew the three locking nuts on the heater rear pillars. It will then be possible to lift the car heater from the car.

Dismantle heater in the following order :

- (a) Remove three external spring clips by levering outwards from the back.
- (b) Remove front cover assembly.
- (c) Loosen fan grub screw and pull fan off motor spindle.
- (d) Remove radiator unit from back plate.
- (e) Remove motor by detaching three Simmonds lock nuts from inside of back plate, and pull motor through plate.

- (f) Detach distance pieces, rubber bushes and screws from motor.

NOTE : When re-assembling heater unit, the rubber bushes located either side of motor flange should always be replaced by new ones.

Electric Motor Faults : Diagnosis and Treatment

See page No. LB 9.

Car Heating Equipment Data Sheet

CIRCULAR TYPES

Make	Model	Heater Code	Blower Code	Accessories Code	Additional Parts
1¼ KW CIRCULAR TYPE					
Austin ...	A.40	CHS. 550/2A	—	—	Connector CHS. 75/31
Invicta	CHS. 620/17	—	—	—
Jowett ...	Javelin	CHS. 620/20	—	—	Water Valve CHS. 78/3 D/M Hoses CHS. 77/21
Morris ...	Oxford	CHS. 620/8	—	—	Tap CHS. 78/4 Hose CHS. 77/15 Connector CHS. 92 Adapter CHS. 734/2
Standard ...	Vanguard 1948 ...	CHS. 600/1	—	—	—
1¼ KW CIRCULAR TYPE WITH DOORS					
Lancia	CHS. 620/30	—	—	—
Jaguar ...	Mk. V (Late Models)	CHS. 620/29	—	—	—
Wolseley ...	6/80 and 4/50 ...	CHS. 620/11	—	—	—
Rolls Royce	Silver Wraith ...	CHS. 620/28	CHS. 1640	—	Silencer CHS. 230
— ...	Optional Fitment ...	CHS. 620/24	—	—	—
2 KW CIRCULAR TYPE					
Morris ...	Oxford	CHS. 880/2	—	—	Tap CHS. 78/4 Hose CHS. 77/15 Connector CHS. 92 Adapter CHS. 734/2
Wolseley ...	6/80 and 4/50 ...	CHS. 880/5	—	—	Hose CHS. 77/15 Connector CHS. 92 Adapter CHS. 734/2
Morris ...	Minor	CHS. 880/6	—	CHS. 75/28	Pump CHS. 635/7
Morris ...	Minor	CHS. 880/6	—	CHS. 75/41	Pump CHS. 635/7
CIRCULAR TYPE WITH SPECIAL FEATURES					
Austin ...	Sheerline and Princess	CHS. 380/1	—	—	Valves CHS. 380-381
Austin ...	A.70 and A.90 ...	CHS. 650	—	—	Water Valve CHS. 78/2
Hillman ...	Minx Mk. III ...	CHS. 710	—	CHS. 75/8	Flap Valve CHS. 695 Pump CHS. 635/5
Hillman ...	Minx Mk. IV ...	CHS. 710/1	—	CHS. 75/13	Flap Valve CHS. 695
Hillman ...	Minx Mk. IV ...	CHS. 710/2	—	CHS. 75/13	Flap Valve CHS. 695
Rolls Royce	Bentley Mk. VI ...	CHS. 850	CHS. 1640	—	Silencer CHS. 230

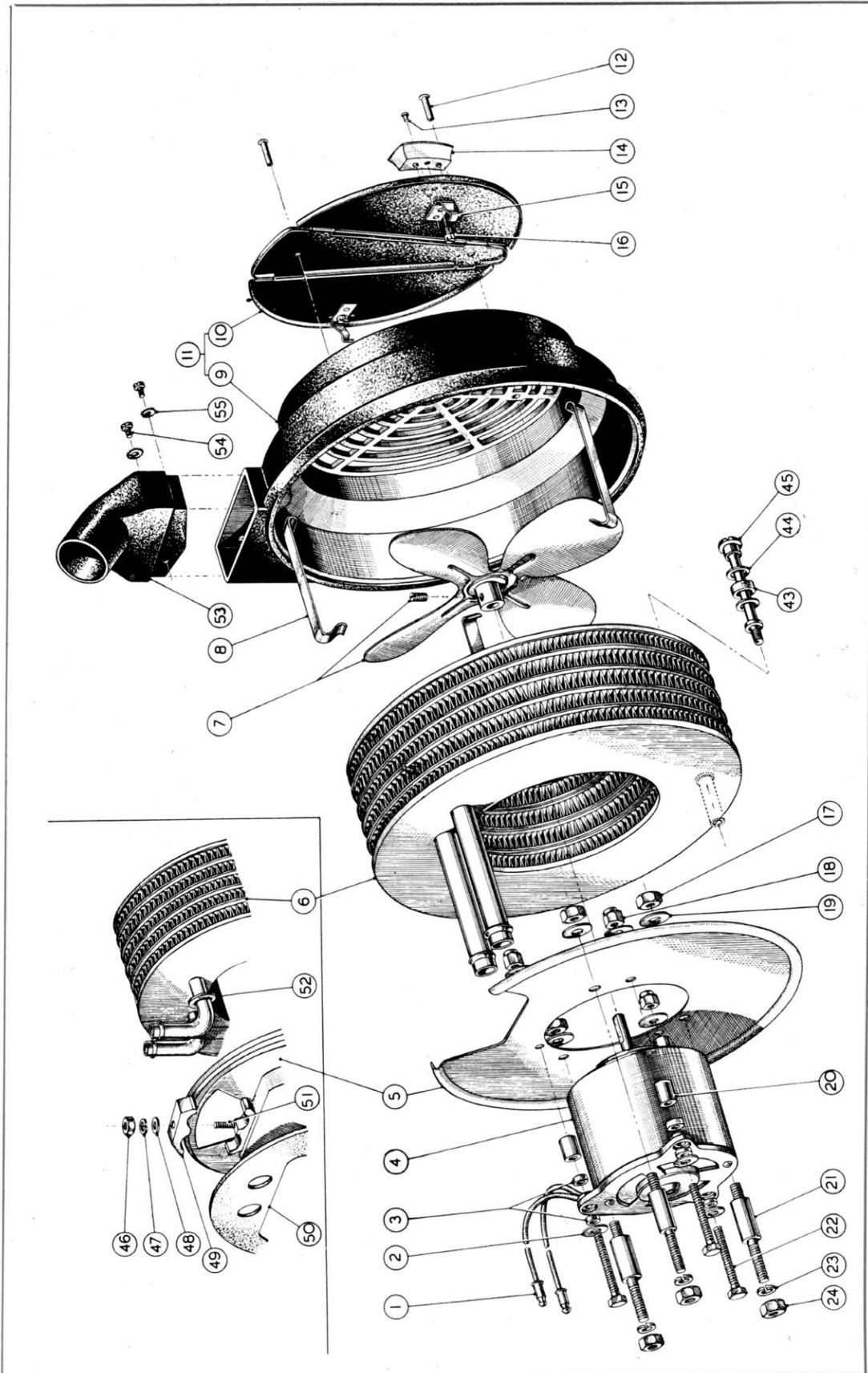


Fig. 2. Small Type Circular Heater.
Showing Alternative Doors, Radiator and Motor Plate Assemblies.

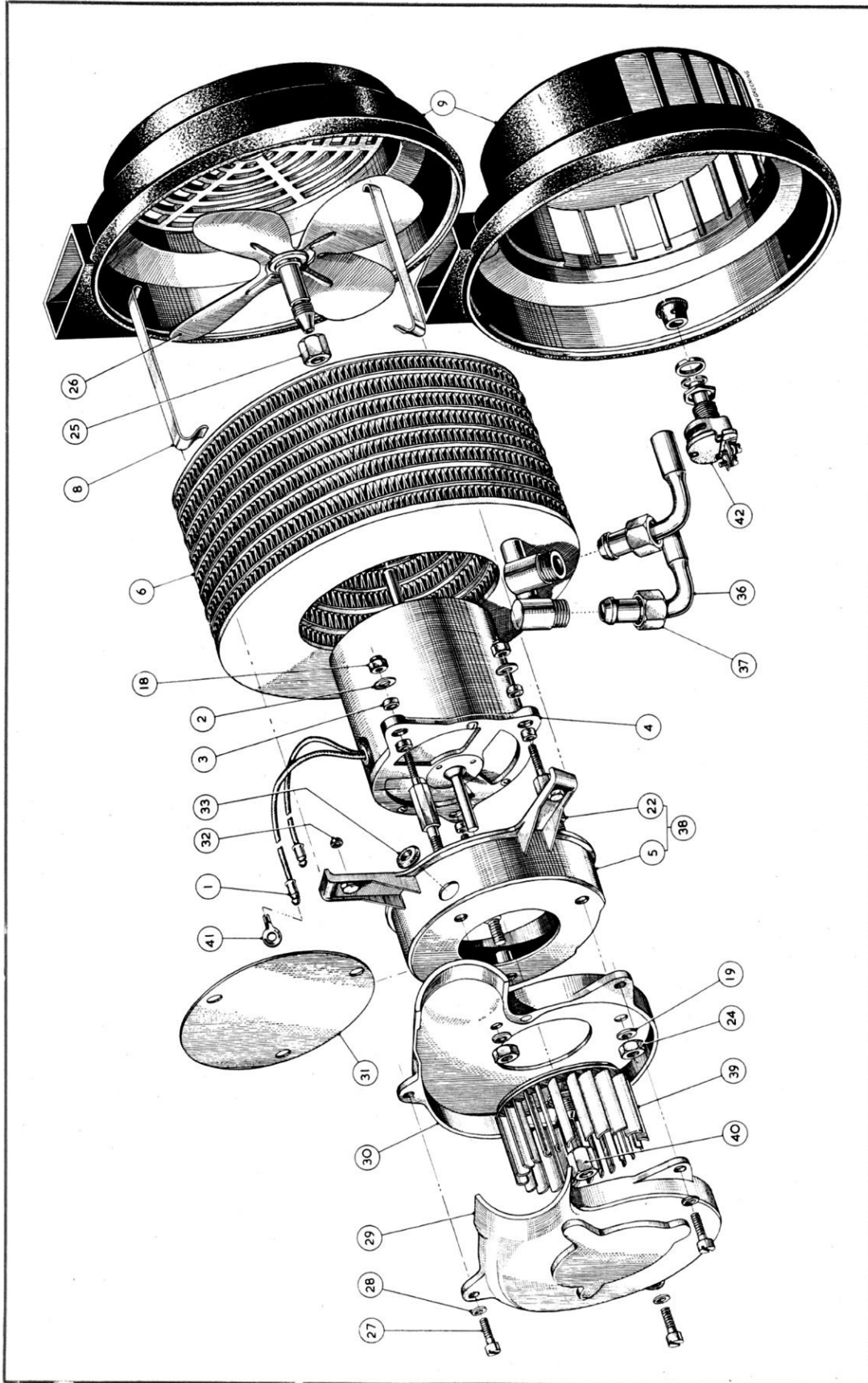


Fig. 3. Large Type Circular Heater.
Showing Alternative Front Cover and Rear Blower Assemblies.

CIRCULAR HEATER

Spare Parts List

Illustration

No.

- 1 Snap Connector
- 2 Heater Motor Washers
- 3 Heater Motor Rubber Bushes
- 4 Heater Motor
- 5 Back Plate
- 6 Radiator complete
- 7 Fan complete
- 8 Heater Spring Clips
- 9 Front Cover complete
- 10 Doors Assembly
- 11 Front Cover and Doors Assembly
- 12 Rivet for Door Centre
- 13 Rivet for Door Clip
- 14 Door Handle
- 15 Door Clip
- 16 Door Clip Screw
- 17 Pillar Nuts
- 18 Heater Motor Nuts
- 19 Mounting Pillar Washer
- 20 Motor Distance Piece
- 21 Mounting Pillar
- 22 Heater Motor Screws
- 23 Mounting Pillar Spring Washer
- 24 Mounting Pillar Nuts
- 25 Fan Collet Nut
- 26 Fan complete
- 27 Blower Body Screws

Illustration

No.

- 28 Blower Body Washers
- 29 Blower Body Solid Half
- 30 Blower Body Motor Half
- 31 Motor Plate Back Cover
- 32 Motor Plate Rubber Bush
- 33 Grommet for Motor Leads
- 36 Connecting Pipe complete
- 37 Connecting Pipe Union Nut
- 38 Back Plate and Screw
- 39 Blower Rotor complete
- 40 Blower Rotor Collet Nut
- 41 Tag
- 42 Rheostat Switch complete
- 43 Radiator Rubber Washer
- 44 Radiator Drain Washer
- 45 Radiator Drain Screw
- 46 Water Pipe Clamp Nut
- 47 Water Pipe Clamp Washer
- 48 Water Pipe Clamp Washer
- 49 Water Pipe Clamp
- 50 Cork Seating Ring
- 51 Water Pipe Clamp Screw
- 52 Radiator Pipe Washer
- 53 Demister Outlet
- 54 Demister Outlet Screws
- 55 Demister Outlet Washer

Coded List of Spare Parts for 1 $\frac{1}{4}$ KW Circular Type Car Heater

Illus. No.	Description of Part	Complete Code Numbers				
		CHS. 550/2A	CHS. 600/1	CHS. 620/8	CHS. 620/17	CHS. 620/20
1	Snap Connector ...	P. 47394/2	P. 47394/2	—	—	—
2	Heater Motor Washers	W. 5006	W. 5006	W. 5006	W. 5006	W. 5006
3	Heater Motor Rubber Bushes ...	CHS. 358	CHS. 358	CHS. 358	CHS. 358	CHS. 358
4	Heater Motor ...	CHS. 364	CHS. 364/1	CHS. 364	CHS. 364	CHS. 364
5	Back Plate ...	CHS. 609	CHS. 609	CHS. 609	CHS. 609	CHS. 609
6	Radiator complete ...	CHS. 551/E	CHS. 574/E	CHS. 270/E	CHS. 551/E	CHS. 270/E
7	Fan complete ...	CHS. 629/1	CHS. 629/1	CHS. 629/1	CHS. 629/1	CHS. 629/1
8	Heater Spring Clips ...	CHS. 587	CHS. 587	CHS. 587	CHS. 587	CHS. 587
9	Front Cover complete	CHS. 627	—	CHS. 627	CHS. 669	CHS. 668
18	Heater Motor Nuts ...	BP. 2519	BP. 2519	BP. 2519	BP. 2519	BP. 2519
19	Mounting Pillar Washer	—	—	W. 7221	W. 7221	W. 7221
20	Motor Distance Piece...	CHS. 608	CHS. 608	CHS. 608	CHS. 608	CHS. 608
21	Mounting Pillar ...	—	—	CHS. 569	CHS. 492	CHS. 569
22	Heater Motor Screws...	S. 6113	S. 6113	S. 6113	S. 6113	S. 6113
23	Mounting Pillar Spring Washer ...	—	—	W. 7082	W. 7082	W. 7082
24	Mounting Pillar Nuts...	—	—	N. 1276	N. 1276	N. 1276
36	Connecting Pipe complete ...	CHS. 560	—	—	—	—
37	Connecting Pipe Union Nut ...	BP. 232/2	—	—	—	—
41	Tag ...	—	P. 59038	—	—	—

Coded List of Spare Parts for 1 $\frac{1}{4}$ KW Circular Type Car Heater with Doors

Illus. No.	Description of Part	Complete Code Numbers				
		CHS. 620/11	CHS. 620/24	CHS. 620/28	CHS. 620/29	CHS. 620/30
1	Snap Connector ...	—	—	—	P. 47394/2	—
2	Heater Motor Washers	W. 5006	W. 5006	W. 5006	W. 5006	W. 5006
3	Heater Motor Rubber Bushes ...	CHS. 358	CHS. 358	CHS. 358	CHS. 358	CHS. 358
4	Heater Motor ...	CHS. 364	CHS. 364	CHS. 364/4	CHS. 530	CHS. 364
5	Back Plate ...	CHS. 609	CHS. 609	CHS. 609/2	CHS. 609/4	CHS. 609
6	Radiator complete ...	CHS. 270/E	CHS. 270/E	CHS. 317	CHS. 1414	CHS. 270/E
7	Fan complete ...	CHS. 629/1	CHS. 629/1	CHS. 629	CHS. 629/2	CHS. 629/1
8	Heater Spring Clips ...	CHS. 587	CHS. 587	CHS. 587	CHS. 587/1	CHS. 587
9	Front Cover complete	CHS. 625	CHS. 625	CHS. 997	CHS. 625/3	—
10	Doors Assembly ...	CHS. 277/4	CHS. 277/1	CHS. 277/1	CHS. 277/2	CHS. 277/3
12	Rivet for Door Centre	R. 344	R. 344	R. 344	R. 344	R. 344
13	Rivet for Door Clip ...	R. 366	R. 366	R. 366	R. 366	R. 366
14	Door Handle ...	CHS. 256	CHS. 256	CHS. 256	CHS. 256	CHS. 256
15	Door Clip ...	CHS. 621	CHS. 621	CHS. 621	CHS. 621	CHS. 621
16	Door Clip Screw ...	S. 5144	S. 5144	S. 5144	S. 5144	S. 5144
18	Heater Motor Nuts ...	BP. 2519	BP. 2519	BP. 2519	BP. 2519	BP. 2519
19	Mounting Pillar Washer	W. 7221	W. 7221	W. 7221	W. 7221	W. 7221
20	Motor Distance Piece...	CHS. 608	CHS. 608	—	CHS. 608	CHS. 608
21	Mounting Pillar ...	CHS. 569	CHS. 569	CHS. 492	CHS. 1435	CHS. 569
22	Heater Motor Screws...	S. 6113	S. 6113	S. 6113	S. 6113	S. 6113
23	Mounting Pillar Spring Washer ...	W. 7082	W. 7082	W. 7082	W. 7082	W. 7082
24	Mounting Pillar Nuts...	N. 1276	N. 1276	N. 1276	N. 1276	N. 1276
41	Tag ...	—	—	—	P. 59038	—

Coded List of Spare Parts for 2 KW Circular Type Car Heater

Illus. No.	Description of Part	Complete Code Numbers		
		CHS. 880/2	CHS. 880/5	CHS. 880/6
2	Heater Motor Washers	W. 5006	W. 5006	W. 5006
3	Heater Motor Rubber Bushes	CHS. 358	CHS. 358	CHS. 358
4	Heater Motor	CHS. 364	CHS. 364	CHS. 364
5	Back Plate	CHS. 653/1	CHS. 653/2	CHS. 653/1
6	Radiator complete	CHS. 872	CHS. 872/2	CHS. 651
8	Heater Spring Clips	CHS. 661	CHS. 661/2	CHS. 661
9	Front Cover complete	CHS. 627/2	CHS. 625/4	CHS. 1420
10	Doors Assembly	—	CHS. 277/4	—
12	Rivet for Door Centre	—	CHS. 344	—
13	Rivet for Door Clip	—	R. 366	—
14	Door Handle	—	CHS. 256	—
15	Door Clip	—	CHS. 621	—
16	Door Clip Screw	—	S. 5144	—
18	Heater Motor Nuts	BP. 2519	BP. 2519	BP. 2519
22	Heater Motor Screws	CHS. 873	CHS. 873	CHS. 1422
23	Mounting Pillar Spring Washer	7082	7082	7082
24	Mounting Pillar Nuts	N. 1276	N. 1276	N. 1276
25	Fan Collet Nut	CHS. 527	CHS. 527	CHS. 527
26	Fan complete	CHS. 654	CHS. 654	CHS. 654
31	Motor Plate Back Cover	CHS. 938/1	CHS. 938/2	CHS. 938/1
32	Motor Plate Rubber Bush	CHS. 40	CHS. 40	CHS. 40
33	Grommet for Motor Leads	CHS. 351	CHS. 351	CHS. 351
36	Connecting Pipe complete	—	—	CHS. 560
37	Connecting Pipe Union Nut	—	—	BP. 232/2
42	Rheostat Switch complete	—	—	CHS. 1440

Coded List of Spare Parts for Circular Type Car Heater with special features

Illus. No.	Description of Part	Complete Code Numbers		
		CHS. 380/1	CHS. 650	CHS. 850
1	Snap Connector	—	P. 47394/2	—
2	Heater Motor Washers	—	W. 5006	W. 5006
3	Heater Motor Rubber Bushes	—	—	CHS. 358
4	Heater Motor	CHS. 352/1	CHS. 600	CHS. 364/B
5	Back Plate	—	—	CHS. 844
6	Radiator complete	CHS. 282/E	CHS. 651	CHS. 838
8	Heater Spring Clips	—	CHS. 661	—
9	Front Cover complete	—	CHS. 627	—
18	Heater Motor Nuts	BP. 2519	BP. 2519	BP. 2519
19	Mounting Pillar Washer, Spring " " " Plain	P. 57489 W. 7074	— —	— —
20	Motor Distance Piece	—	—	CHS. 966
21	Mounting Pillar	CHS. 386	—	—
22	Heater Motor Screws	—	—	S. 7080
24	Mounting Pillar Lock Nuts " " Nuts	N. 1020 N. 1021	— —	— —
25	Fan Collet Nut	—	CHS. 527	—
26	Fan complete	—	CHS. 654	CHS. 842
27	Blower Body Screws	S. 4044	S. 6147	—
28	Blower Body Washers	W. 7006	W. 7077	—
29	Blower Body Solid Half	CHS. 384	CHS. 658	—
30	Blower Body Motor Half	CHS. 383	CHS. 659	—
32	Motor Plate Rubber Bush	—	CHS. 40	—
33	Grommet for Motor Leads	—	CHS. 351	CHS. 351
36	Connecting Pipe " "	— —	CHS. 663 CHS. 665	— —
37	Connecting Pipe Union Nut	—	BP. 232/2	—
39	Blower Rotor complete	CHS. 528/1	CHS. 523	—
46	Water Pipe Clamp Nut	—	—	N. 1021
47	Water Pipe Clamp Washer	—	—	W. 7215
48	Water Pipe Clamp Washer	—	—	W. 7073
49	Water Pipe Clamp	—	—	CHS. 671
50	Cork Seating Ring	—	—	CHS. 315
51	Water Pipe Clamp Screw	—	—	S. 6169
52	Radiator Pipe Washer	—	CHS. 347	—

Coded List of Spare Parts for Circular Type Car Heater with special features

Illus. No.	Description of Part	Complete Code Numbers		
		CHS. 710/1	CHS. 710	CHS. 710/2
2	Heater Motor Washers	W. 7074	W. 7074	W. 7074
3	Heater Motor Rubber Bushes	CHS. 358	CHS. 358	CHS. 358
4	Heater Motor	CHS. 364/2	CHS. 364/2	CHS. 530/2
6	Radiator complete	CHS. 711	CHS. 711	CHS. 711
11	Front Cover and Doors Assembly	CHS. 625	CHS. 627/5	CHS. 625
12	Rivet for Door Centre	R. 344	—	R. 344
13	Rivet for Door Clip	R. 366	—	R. 366
14	Door Handle	CHS. 256	—	CHS. 256
15	Door Clip	CHS. 621	—	CHS. 621
16	Door Clip Screw	S. 5144	—	S. 5144
18	Heater Motor Nuts	BP. 2519	BP. 2519	BP. 2519
25	Fan Collet Nut	CHS. 527	CHS. 527	CHS. 527
26	Fan complete	CHS. 654	CHS. 654	CHS. 654
33	Grommet for Motor Leads	CHS. 351	CHS. 351	CHS. 351
36	Connecting Pipe complete (Shaped)	CHS. 748	CHS. 748	CHS. 748
	" " " (Straight)	CHS. 749	CHS. 749	CHS. 749
37	Connecting Pipe Union Nut	BP. 232/2	BP. 232/2	BP. 232/2
41	Tag, $\frac{1}{4}$ " (Motor Lead)	CHS. 898	CHS. 898	CHS. 898
	" 4 BA (Motor to Rheo Lead)	CHS. 899	CHS. 899	CHS. 899
47	Water Pipe Clamp Washer	W. 7326	W. 7326	W. 7326
49	Water Pipe Clamp	CHS. 671	CHS. 671	CHS. 671
51	Water Pipe Clamp Screw	S. 6167	S. 6167	S. 6167
52	Radiator Pipe Washer	CHS. 715	CHS. 715	CHS. 715
53	Demister Outlet	CHS. 761	CHS. 761	CHS. 761

For details of special items used on Hillman Minx Car Heaters see page LA 17

Special Items for Hillman Minx

Circular Type Car Heater

(Not illustrated.)

Description of Part	Code No.
Body Heater Assembly	CHS. 712
Styling Band	CHS. 691
Fastening Clips (Styling Band)	CHS. 981
Grommet (Mounting)	CRE. 35
Bottom Cover Plate Assembly	CHS. 1055
Styling Band	CHS. 691
Sleeve Nut	CHS. 719
Washers Spring S.C. Steel, $\frac{3}{8}$ "	W. 7235
Collar (Water Con. Unions)	CHS. 1008
Flap Valve Assembly complete	CHS. 704
Frame Hinge Assembly complete	CHS. 703
Hex. Nut, 2 BA Steel Lock	N. 1086
Cable Anchor	CHS. 701
Plain Washer, $\frac{3}{16}$ " Steel (as required)	W. 7356
Spring Washer, $\frac{3}{16}$ " Steel S.C.	W. 7206
Hex. Nut, 2 BA Steel	N. 1085
Flap Valve Spring Support	CHS. 779
Hinge Pin	CHS. 757
Cushion Strip	CHS. 997
Nail, No. 14 \times 1 $\frac{1}{2}$ " LG.	CHS. 1338
Push-Pull Control complete	CHS. 500/6
Grill	CHS. 764
Rheostat 12 v.	CHS. 131/3
Wiring Assembly	CHS. 1909

DUCT AND ADAPTOR PLATE COMPLETE

Duct and Adaptor Plate Assembly ...	CHS. 970
Washers (Plain), $\frac{3}{16}$ " Steel	W. 7356
Washers, Spring, $\frac{3}{16}$ " Steel S.C.	W. 7206
Hex. Nut, 2 BA Steel	N. 1085