
Operating maintenance and parts manual

**AC 35 & AC 41
WC35 & WC41
air compressors
ACV35 & ACV41
vacuum pumps**

BroomWade

LEADING PARTICULARS

Number of Cylinders	... ..	2
Cylinder Bore	... ..	4 in. (101.6 mm)
Piston Stroke	... ..	4 in. (101.6 mm)
Maximum Speed (AC35, WC35 & ACV35)	... ..	600 rev/min.
Maximum Speed (AC41, WC41 & ACV41)	... ..	710 rev/min.
Maximum Working Pressure	... ..	150 lbf/in ² (10.5 kgf/cm ²)
Crankcase Oil Sump Capacity	... ..	8 U.K. pints (4.55 litres)
Recommended Crankcase Oil	... ..	Shell Corena H68
Direction of Rotation	... ..	Either direction
Weight of Bare Compressor	... ..	249 lb. (113 kg)
Air Delivery	... ..	1½ in. (Rpl¼) Female

COOLING WATER

Flow Rate (nominal at 600 rev/min.) WC35	...	...	...	5.5 U.K. pints (3.12 litres) per min.
Flow Rate (nominal at 710 rev/min.) WC41	...	...	...	6.5 U.K. pints (3.69 litres) per min.
Thermo-Syphon Capacity	...	...	...	75 U.K. gallons (341 litres)

1.1 DESIGN CLEARANCES

Clearance	Minimum-Maximum (in.)	Minimum-Maximum (mm)
Crankshaft End Float	0.0050–0.0166	0.127–0.407
Main Bearing (Diametral)	0.0010–0.0028	0.025–0.071
Big End Bearing (Side)	0.0021–0.0061	0.053–0.155
Big End Bearing (Diametral)	0.0010–0.0028	0.025–0.071
Piston/Cylinder Head	0.026–0.044	0.660–1.118
Piston Ring Gap	0.004–0.012	0.102–0.305

1.2 TORQUES

Part No.	Description	Location	lbf.ft	kgf.m
A4325/7	Nut	Connecting Rod	62	8.57
A4322/6	Nut	Cylinder Head	31	4.28
A4322/6	Nut	Crankcase	31	4.28
A4315/52	Bolt	Small End	22	3.04

2.

DESCRIPTION

- 2.1 The AC35 and AC41 are single stage, single acting air cooled air compressors. They are identical in design. The WC35 and WC41 are fitted with water cooled cylinder heads.
- 2.2 For continuous duty an adjustable automatic air governor (see publication TP826) is fitted. For intermittent duty an automatic pressure switch control is fitted.
- 2.3 The ACV35 and ACV41 are single stage, single acting vacuum pumps.

3.

LUBRICATION

- 3.1 Oil is supplied to the main bearings (65) by a plunger type oil pump (52), driven direct from the crankshaft (43) by an eccentric (61). The plunger type pump supplies oil at a normal pressure of 10–15 lbf/in² (0.70–1.05 kgf/cm²). The big end bearings (39) are pressure fed from the main bearings through oilways drilled in the crankshaft. The pistons (28) and gudgeon pins (77) are splash lubricated from the crankshaft and big end bearings.

4.

OPERATION

- 4.1 Before starting for the first time ensure that the mains voltage is equal to that required to operate the motor. Remove the compressor air suction filter element. Dip in the recommended oil (Section 1). Allow all surplus oil to drain. Refit element. Remove the crankcase doors (35 and 73) and liberally coat the bearings, cylinder walls and all moving parts with the recommended lubricating oil (Section 1).
- 4.1.1 Refit the doors. Remove the crankcase breather (31) and pour the correct grade of lubricating oil (Section 1) into the crankcase until the maximum level mark is reached on the dipstick (45). Replace the crankcase breather.
- 4.1.2 Turn the flywheel by hand to ensure that the running gear is free.
- 4.1.3 If the rotation throws oil upwards towards the crankcase breather (31) the door (35) carrying the breather should be changed with door (73) on the opposite side of the crankcase.
- 4.1.4 Before starting a compressor fitted with hand unloaders move the cams (20) through 180° to allow the compressor to start against frictional load only. Return the cams to the original position when the compressor has attained normal running speed.

5.

SUGGESTED MAINTENANCE SCHEDULE

CHECK LIST	DAILY	WEEKLY	500 HOURS or 3 MONTHLY	2000 HOURS or 12 MONTHLY
Oil Level	*			
Air Suction Filter		*		
Suction Valves - Initial Examination			*	
Delivery Valves - Initial Examination			*	
Oil Change				*
Main Bearings				*
Big End Bearings				*
Pistons and Rings				*

6.

MAINTENANCE

- 6.1 BEFORE DISMANTLING ENSURE THAT THE ELECTRICAL MAINS SUPPLY IS ISOLATED AND ALL PRESSURISED AIR RELEASED FROM THE RECEIVER, COMPRESSOR AND PIPEWORK.
- 6.2 By keeping the compressor/vacuum pump clean internally and externally and arranging regular maintenance, maximum efficiency for the longest possible period will be ensured. A suggested maintenance schedule is provided in Section 5.
- 6.3 The crankcase should be drained initially after 50 hours running and filled with new oil (Section 1). Subsequent oil changes are recommended every 2,000 hours or 12 monthly.
- 6.4 Oil pump pressure is adjusted by the oil regulator screw (72). Unscrew the locknut (71) and turn the regulating screw clockwise to increase and anti-clockwise to decrease pressure. Tighten the locknut after adjustment.

- 6.4.1 If the desired oil pressure cannot be obtained by use of the regulating screw further investigations should include:-
- (1) Faulty pressure gauge.
 - (2) Insufficient oil in crankcase.
 - (3) Blocked oil filter.
 - (4) Regulator ball (68) not seating.
 - (5) Worn oil pump plunger (57) or ball valve seat.
 - (6) Excessive bearing clearance.
- 6.5 VALVES - Efficiency largely depends upon the condition of the valves. After the first 500 hours running the valves should be removed and examined. From the amount of attention required, subsequent intervals for inspection can be assessed.
- 6.5.1 To remove the delivery valves (4), unscrew the setscrews (7) lift off the delivery valve caps (6) and the joints (1 and 2) and remove delivery valve plugs (3). Lift out the delivery valve clamping tubes (5) and delivery valve assemblies.
- 6.5.2 To remove the suction valves (15), disconnect the unloading gear, remove the suction valve plugs (13) lift out the suction valve clamping tubes (14), unloader fork guides (17), unloader fork springs (16) and the unloader forks (17) and suction valve assemblies.
- 6.5.3 The suction and delivery valves being of riveted construction cannot be dismantled. Carefully clean all accessible carbon from the valve and examine the valve plate for signs of general wear, particularly on the sealing face and for side play. A small amount of side play 0.030 in. (0.76mm) maximum is permitted. Examine the springs. Signs of wear usually at the tongue, will not render the valve unserviceable, but the valve must be renewed if a valve spring or plate is chipped or broken.
- 6.5.4 To test for air leaks through the delivery valves, stop the compressor with pressure in the air receiver and unload the suction valves. If a delivery valve is leaking, air will blow back through the inlet of the compressor.
- 6.6 COMPRESSOR AIR SUCTION FILTER - The suction filter should be cleaned at regular intervals as suggested in the maintenance schedule Section 5 and at shorter intervals if the atmosphere is particularly dusty.
- 6.6.1 Clean the filter element and casing in detergent. Allow to dry. Oil the element (Section 4.1).

7. DISMANTLING

- 7.1 Remove the oil drain plug (44) and drain the crankcase (42). Remove the crankcase doors (35 and 73).
- 7.2 Unscrew the nuts (22) and lift off the cylinder head. Remove the delivery and suction valves (Sections 6.5.1 and 6.5.2).
- 7.3 Withdraw the key and take off the flywheel. Remove the oil seal (34) and end cover plate (60). Unscrew the nuts (37) and lift off the cylinder (30) from the crankcase (42). Remove the oil pipe assembly (46). Take off the palnuts and nuts. Remove the oil pump assembly (52), the bearing caps (48) and the main bearings (65).
- 7.3.1 Lift out the crankshaft (43) complete with connecting rods (29) and pistons (28). Remove the split pins, nuts (40) and big end bearing bolts (38). Remove the connecting rods complete with pistons.
- 7.3.2 To remove the pistons (28) straighten the tab washers. Remove the bolts (76) and push out the gudgeon pins (77). Take off the piston rings (75, 78 and 79).

8.

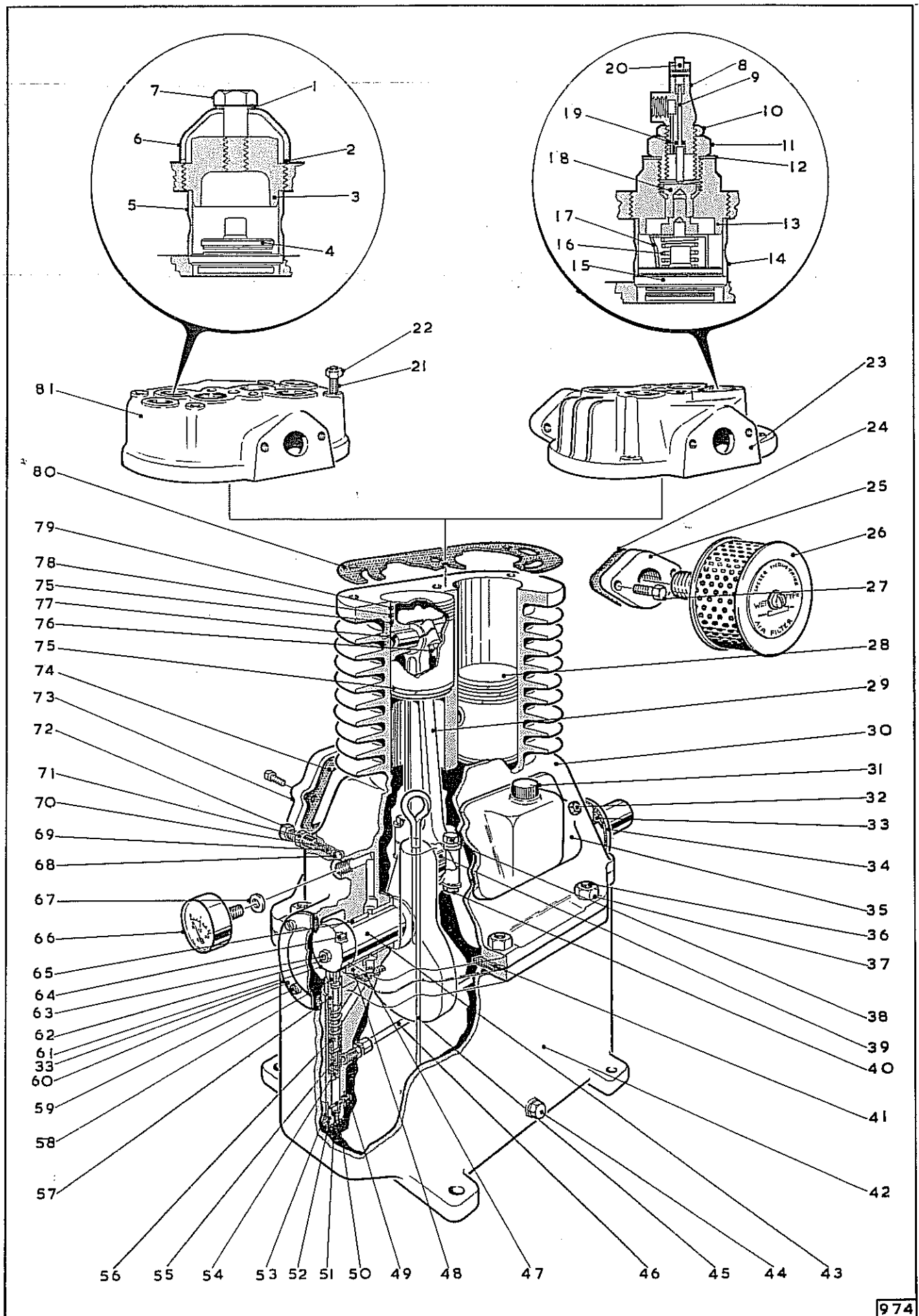
ASSEMBLY

- 8.1 Thoroughly clean, dry and examine all parts. Renew all joints, seals and any worn or damaged components. Refer to Sections 1.1 and 1.2 for clearances and torques. Assemble in the reverse order from dismantling.
- 8.2 CRANKSHAFT END FLOAT - This is obtained by scraping the thrust faces of the main bearings.
- 8.3 PISTON RING LOCATIONS - Piston ring - top groove, internal compression ring - second groove, slotted control rings - third and fourth grooves.
- 8.4 COMPRESSOR HAND UNLOADER ASSEMBLY (8) - When fitting the hand unloader assembly the plunger (9) must have 3/16 in. (4.76 mm) of free movement before starting to unload the compressor. This adjustment should be carried out with the compressor running.

9.

SPARES AND SERVICE

- 9.1 Always quote the model, serial and order numbers. These will be found on the nameplate fixed to the crankcase. Spares and Service requirements should be referred to BroomWade accredited agents or stockists. Where local facilities are not available the BroomWade Spares and Service Departments at High Wycombe may be called upon for assistance.



AC35 AND AC41, WC35 AND WC41 AIR COMPRESSORS

ACV35 AND ACV41 VACUUM PUMPS

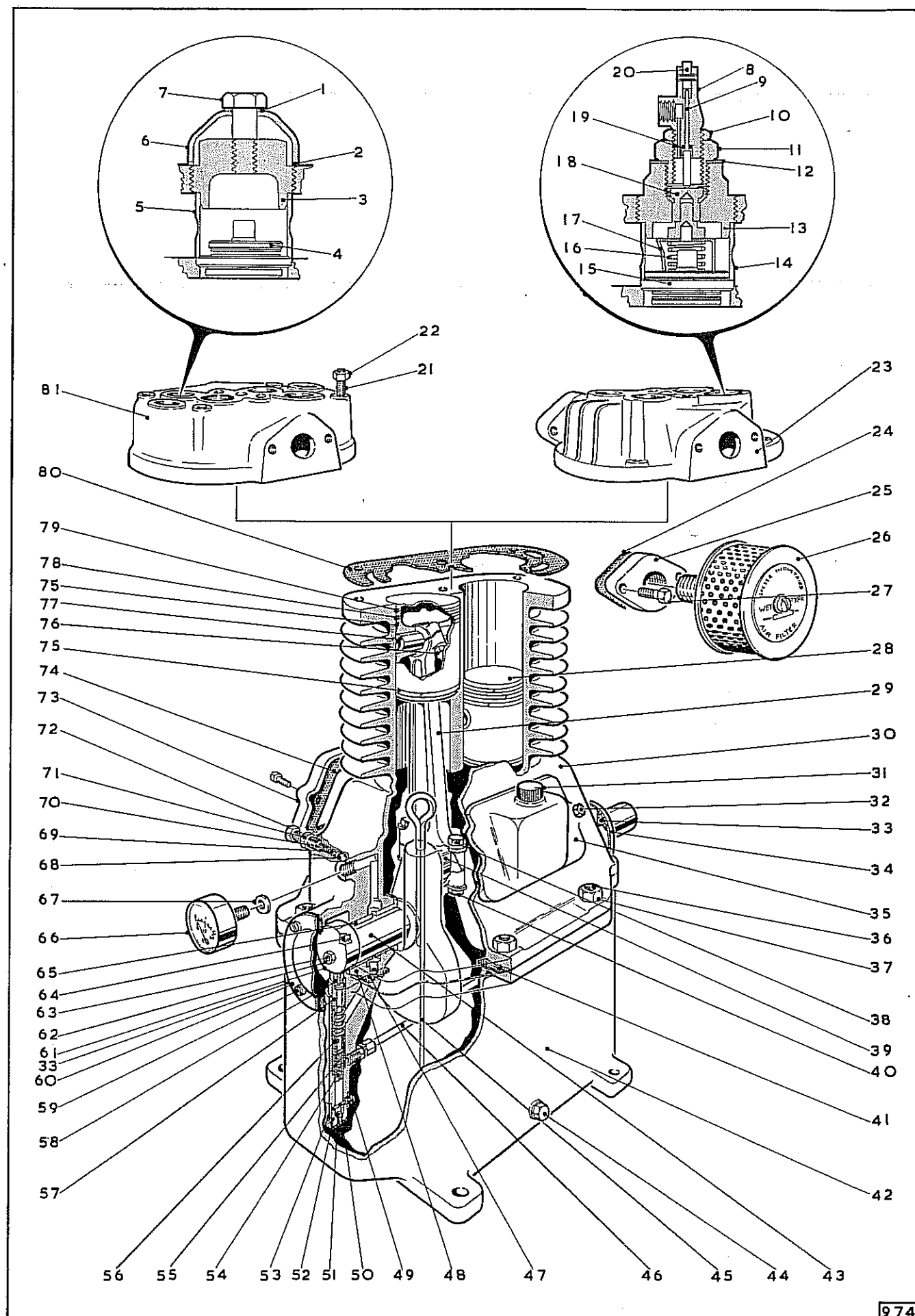
PARTS LIST

AC35 AND AC41, WC35 AND WC41 AIR COMPRESSORS

ACV35 AND ACV41 VACUUM PUMPS

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	C3615/9	Delivery Valve Cap Joint (Top)	2	30	C10730/33	Cylinder Assembly comprising items 48 & 65 plus:-	1
2	C3615/10	Delivery Valve Cap Joint (Bottom)	2	—	C10730/32	Cylinder	1
3	C10728/13	Delivery Valve Plug	2	—	C10728/23	Stud	2
4	C10002/16	Delivery Valve Assembly	2	—	C10728/19	Stud	2
5	C3615/4	Delivery Valve Clamp Tube	2	—	A4322/6	Nut	4
6	C3615/8	Delivery Valve Cap	2	—	A1413/745	Palnut	4
7	A4334/95	Setscrew	2	31	C4040	Crankcase Breather	1
8	C10728/21	Hand Unloader Assembly comprising items 9, 10, 19 & 20 plus:-	2	32	A4333/92	Setscrew	4
—	C10728/29	Unloader Body and Cam Assembly	2	33	C3464/31	Joint	2
9	C10728/20	Unloader Plunger	2	34	C3969/1	Oil Seal	1
10	A3768/3	Locknut	2	35	C3466/14	Crankcase Door - Oil Filler	1
11	C3727/11	Unloader Adaptor	2	36	A4330/52	Stud	8
12	C3505/44	Adaptor Joint Washer	2	37	A4322/6	Nut	8
13	C3812/107	Suction Valve Plug	2	38	A4316/15	Big End Bolt	4
14	C3615/106	Suction Valve Clamp Tube	2	39	C3464/4	Big End Bearing (Halves)	4
15	C10002/15	Suction Valve Assembly	2	40	A4325/7	Nut	4
16	C3615/109	Unloader Fork Spring	2	41	C3477/11	Crankcase Joint	2
17	C10725/32	Unloader Fork and Guide Assembly comprising:-	2	42	C10730/6	Crankcase Assembly comprising items 36 & 44 plus:-	1
—	C10725/30	Unloader Fork	2	—	C10730/5	Crankcase	1
—	C10725/31	Fork Guide	2	—	A1442/2	Washer	1
18	C3727/14	Unloader Plunger	2	43	C10730/4	Crankshaft Assembly comprising items 61-64 plus:-	1
19	A10347/6	'O' Ring	2	—	C10730/3	Crankshaft	1
20	C3615/23	Cam	2	44	C10589/1	Drain Plug	1
—	C10737/21	Spirol Pin	2	—	A1442/2	Drain Plug Washer	1
21	A4331/71	Stud (A.C.Cylinder Head)	2	45	C10730/31	Oil Dipstick	1
—	A4330/51	Stud (A.C.Cylinder Head)	3	46	C11353/162	Oil Pipe Assembly	1
—	A4330/55	Stud (A.C.Cylinder Head)	1	47	C3464/32	Oil Pump Joint	1
—	A4330/71	Stud (W.C.Cylinder Head)	5	48	C3464/5	Main Bearing Cap	2
—	A4330/75	Stud (W.C.Cylinder Head)	1	49	A4353/54	Screw	1
22	A4322/6	Nut	6	50	C3615/90	Pin-Ball Stop	1
23	C10730/1	Cylinder Head (See Note 1)	1	51	A3767/9	Ball	1
24	C3477/10	Flange Joint	2	52	C11158/5239	Oil Pump Assembly comprising items 49,53,54,56,57 plus:-	1
25	C2357/5	Flange	2	—	C10728/11	Oil Pump Body	1
26	A3970/3	Suction Filter	1	53	C3464/20	Oil Filter	1
27	A4334/95	Setscrew	4	54	A3767/9	Ball	1
*28	C3617/56	Piston Assembly comprising items 75, 77, 78 & 79 plus:-	2	55	C3464/22	Valve Spring	1
—	C10730/27	Piston (Not supplied separately)	2	56	C3464/23	Plunger Spring	1
29	C11158/5338	Connecting Rod Assembly comprising items 38-40 and 76 plus:-	2	57	C11158/5189	Plunger Assembly comprising items 50,51,55 & 58	1
—	C10728/9	Connecting Rod (Not sup. separately)	2	58	C3464/18A	Thrust Button	1
—	C3464/34/50	Shim .050 in. (1.27 mm)	2	59	A4354/93	Pan Head Screw	8
—	C3464/34/20	Shim .002 in. (0.05 mm)	10	60	C3464/9	End Cover Plate	1
—	A3762/6	Split Pin	4	61	C3464/62	Oil Pump Eccentric	1
—	C4184/17A	Tab Washer	2	62	A4371/21	Nut	1
				63	A4329/53	Stud	1
				64	C3464/48	Eccentric Peg	1
				65	C3464/3	Main Bearing (Halves)	4
				66	A3777/2	Oil Pressure Gauge	1

ALWAYS QUOTE PART NUMBERS WHEN ORDERING SPARES



AC35 AND AC41, WC35 AND WC41 AIR COMPRESSORS

ACV35 AND ACV41 VACUUM PUMPS

PARTS LIST (Continued)

AC35 AND AC41, WC35 AND WC41 AIR COMPRESSORS

ACV35 AND ACV41 VACUUM PUMPS

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
67	A1413/292	Washer	1	77	C3466/3	Gudgeon Pin	2
68	A3767/11	Ball	1	*78	C10730/29	Internal Compression Ring	2
69	C3464/24	Spring - Oil Regulator	1	*79	C10730/28	Piston Ring	2
70	C3464/26	Spring Guide Rod	1	80	C3659/20	Joint - Cylinder Head	1
71	A3768/2	Locknut	1	81	C10731/1	Cylinder Head (See Note 2)	1
72	C3464/25	Oil Regulator Screw	1				
73	C3464/129	Crankcase Door - Plain	1			NON-ILLUSTRATED ITEMS	
74	C3464/30	Joint - Crankcase Door	2		C3913/1K	Flywheel 4 x 'B' Grooves	1
*75	C10730/30	Slotted Control Ring	4		A3769/18	Gib Head Key	1
76	A4315/52	Bolt	2		95603/12	'O' Ring (for Ref 18)	2

* Available + 0.030 in. (0.76 mm) oversize under part numbers C3617/56/30, C10730/30/30, C10730/29/30 and C10730/28/30.

NOTE 1: Air Cooled Cylinder Head Assembly (C10730/2A) comprises items 1-8, 11 to 18, 23-25 and 27 plus:

A3763/3	Nipple (Hand Unloader)	2
C11353/355	Unloader Connecting Pipe	2
A10327/479	Tee	1
A10327/34	Coupling	1

NOTE 2: The Water Cooled Cylinder Head Assembly (C10731/2A) comprises items 1-8, 11-18, 24, 25, 27, 44 and 81 plus:

A1458/4	Expansion Plug	3
A3763/3	Nipple (Hand Unloader)	2
C11353/354	Unloader Connecting Pipe	2
A10327/479	Tee	1
A10327/34	Coupling	1

NOTE 3: For the Vacuum Pump Cylinder Head Assembly (C10730/22)
Delete items 8-13, 16 and 17. Add the following:-

C10728/13	Plug (Suction Valves)	2
C3615/8	Cap (Suction Valve Plugs)	2
C3615/9	Joint (Suction Valve Caps)	2
C3615/10	Joint (Suction Valve Caps)	2
A4337/51	Bolts (Flanges and Valve Caps)	8

NOTE 4: Items required for Automatic Governor Control

C10730/34/SU03	Automatic Air Governor Assembly comprising:-	1
C11600/0/SU03	Automatic Air Governor	1
C10728/36	Governor Bracket	1
C11353/342	Governor Pipe Assembly	1
A10327/34	Coupling M Stud (Receiver Connection)	2
A4334/3	Screw (Governor to Bracket)	2

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