OPERATION

AND

MAINTENANCE

MANUAL

UNIT TYPE AIR COMPRESSORS

SERIES 20 THROUGH 80 — SINGLE STAGE

SERIES 100 THROUGH 900 — TWO STAGE

SERIES 440A THROUGH 990A — TWO STAGE

AIR COMPRESSORS

LeROI DRESSER

LeRoi Division,
Dresser Industries, Inc.
Sidney, Ohio 45365

WARRANTY

RECIPROCATING UNIT AIR COMPRESSORS

WARRANTY AND LIMITATION OF REMEDY AND LIABILITY

A. Seller warrants only that its products, when shipped, and its work, when performed, will meet all applicable specifications, and other specific product and work requirements (including those of performance), if any, of this agreement and will be free from defects in material and workmanship. All claims under this warranty must be made in writing immediately upon discovery and, in any event, within the following times:

Reciprocating unit air compressors of Seller's manufacture — eighteen (18) months from date of shipment to Buyer, or one (1) year from date of initial operation, whichever occurs first. Reciprocating unit air compressors include, but are not limited to:

- Two stage compressors, electric motor and engine driven
- Two stage basic compressors (pumps only)
- Single stage compressors, electric motor driven
- Single stage basic compressors (pumps only)
- Air receivers for reciprocating unit air compressors
- Accessories and parts for any of the above

The foregoing warranty applies only to products manufactured by the Seller. It does not include components or parts purchased by the Seller from other suppliers, and as to the latter, the warranties of the suppliers of the components or parts shall be applicable.

Defective and nonconforming items must be held for Seller's inspection and returned to the original f.o.b. point upon request. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

B. Upon Buyer's submission of a claim as provided above and its substantiation, Seller shall at its option either (i) repair or replace its product or work at the original f.o.b. point or (ii) refund an equitable portion of the purchase price.

C. THE FOREGOING IS SELLER'S ONLY OBLIGATION AND BUYER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY AND EXCEPT FOR GROSS NEGLIGENCE, WILLFUL MISCONDUCT AND REMEDIES PERMITTED UNDER THE PERFORMANCE, INSPECTION AND ACCEPTANCE AND THE PATENTS CLAUSES HEREOF, THE FOREGOING IS BUYER'S EXCLUSIVE REMEDY AGAINST SELLER FOR ALL CLAIMS ARISING HEREUNDER OR RELATING HERETO WHETHER SUCH CLAIMS ARE BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES. BUYER'S FAILURE TO SUBMIT A CLAIM AS PROVIDED ABOVE SHALL SPECIFICALLY WAIVE ALL CLAIMS FOR DAMAGES OR OTHER RELIEF, INCLUDING BUT NOT LIMITED TO CLAIMS BASED ON LATENT DEFECTS. IN NO EVENT SHALL BUYER BE ENTITLED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES. ANY ACTION BY BUYER ARISING HEREUNDER OR RELATING HERETO, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES, MUST BE COMMENCED WITHIN ONE (1) YEAR AFTER THE CAUSE OF ACTION ACCRUES OR IT SHALL BE BARRED.

LeROI DRESSER

LeROI DIVISION, DRESSER INDUSTRIES, INC., SIDNEY, OHIO 45365

Le ROI DRESSER

WARNING

DO NOT OPERATE THESE COMPRESSORS AT SPEEDS BELOW 400 R.P.M.

WHEN INSTALLING A COMPRESSOR THAT IS TO BE POWERED BY AN ELECTRIC MOTOR, BE SURE THAT ALL WIRING IS MADE BY A LICENSED ELECTRICIAN AND THAT THE INSTALLATION MEETS *ALL APPLICABLE CODES* INCLUDING THOSE OF LOCAL ORIGIN.

WHEN A COMPRESSOR IS TO BE POWERED BY AN ENGINE OR POWER TAKE-OFF DEVICE, BE SURE THAT INSTALLATION IS MADE BY A HIGHLY QUALIFIED MECHANIC AND THAT ALL SAFETY CODES ARE MET IN THE INSTALLATION.

INSTALLATION

1. INSTALLATION

When installing series 100-900 and 20-80 air compressors on existing installations as replacement compressors or on new installations, either bedplate or receiver mounted, air connections must be made as shown in figures 1 and 2.

Figure 1 is for start-stop operation only. Note the orifice located in the bottom port of the air control valve.

Figure 2 is for load-unload (continuous run) or dual (combination start-stop or load-unload) operation.

Connections must be made as shown to insure proper operation of the air control valve.

2. SAFETY

The air control valve is a safety device which prevents the compressor from pumping to rated pressure in the event the compressor oil pump does not provide adequate lubricating oil pressure.

CAUTION

MAKE CERTAIN THE AIR RECEIVER OR STORAGE TANK WHICH IS CONNECTED TO THE COMPRESSOR HAS A SAFETY VALVE, OF ADEQUATE SIZE, CORRECTLY INSTALLED.

MANUALLY OPERATE THE SAFETY VALVE TO INSURE PROPER OPERATION.

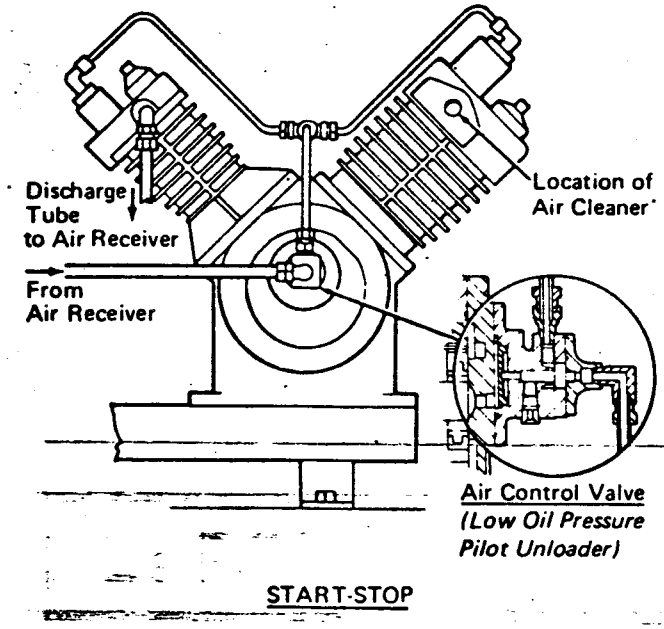


Figure 1

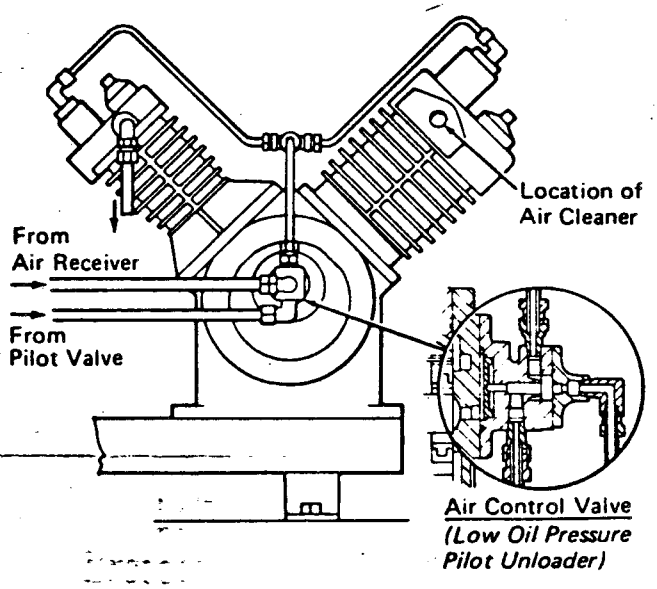


Figure 2

Form No. 21-901

OPERATION

1. Lubrication

Prior to initial operation, fill the crankcase with a single viscosity, non-detergent super refined oil with rust and oxidation inhibitor. Oil should be either a naphthenic base or a specially compounded type to minimize carbon formation and to produce carbon residue of a soft, fluffy nature. Oils having animal fat compounding are NOT recommended.

Above 32°F	SAE 20
0°F to 32°F	SAE 10W
Below 0 F	Auxiliary crankcase oil heaters are recommended

NOTE: For cold weather operation the lubricating oil should have a pour point of 20°F below the coldest expected operating temperature.

CAUTION: Do not use detergent oils.

SERIES	CAPACITY
20-100-200	7/8 qt.
40-300-400	1-1/8 qt.
60-500-600	2-1/2 qt.
80-700-800	4-1/2 qt.
900	4-1/2 qt.

2. Starting

a. Perform all scheduled preventive maintenance services as specified.

b. If a shutoff valve is used in the compressor-to-receiver discharge line, open the valve.

CAUTION: (SHUTOFF VALVES ARE NOT TO BE INSTALLED IN THIS LINE UNLESS A SAFETY VALVE IS LOCATED BETWEEN IT AND THE COMPRESSOR.)

3. Operation

As the compressor starts, check the rotation of the unit. Normal rotation is clockwise, viewing the compressor from the oil pump end. A rotation arrow, is placed on the oil pump cover at the factory. Should the rotation be incorrect, disengage the power supply and check the motor wiring.

After the compressor is started, it will operate automatically with any of the three types of controls.

NOTE: The compressor can be operated with "reverse rotation" by changing the unit as outlined in paragraph 6.

4. Stopping

a. Disconnect the power supply.

b. Open the air valve.

PREVENTIVE MAINTENANCE

The operation of your pneumatic system is dependent on this air compressor. The long trouble free life designed in each compressor will be assured when the few simple procedures listed below are followed.

1. Daily

Prior to initial operation, fill the crankcase with a single viscosity, non-detergent super refined oil with rust and oxidation inhibitor. Oil should be either a naphthenic base or a specially compounded type to minimize carbon formation and to produce carbon residue of a soft, fluffy nature. Oils having animal fat compounding are NOT recommended.

Above 32°F	SAE 20
0°F to 32°F	SAE 10W
Below 0°F	Auxiliary crankcase oil heaters are recommended.

CAUTION: Do not use detergent oils.

NOTE: For cold weather operation the lubricating oil should have a pour point at least 20°F lower than the coldest expected operating temperature.

a. Open draincock located in bottom of reservoir to drain condensate.

b. At end of each day's operation, disconnect power supply.

2. Weekly

With Power Supply Disengaged

a. Clean complete compressor and reservoir. Clean intercooler fins with compressed air.

NOTE

Series 700, 800, and 900

Proper dirt removal or cleanliness at flywheel side of intercooler can be determined with a suitable light source such as a flashlight. Intercoolers on these models are of the horseshoe design and can clog up externally from the fan side yet appear clean from casual inspection.

b. Clean air intake filter in accordance with the filter decal.

c. Check drive belts and adjust if necessary.

3. Monthly or 300 Hours Service

With Power Supply Diesengaged

a. Repeat weekly procedures.

b. Change compressor oil. Use as listed in paragraph 1.

c. Check for and correct air and oil leaks.

d. Tighten all hardware.

4. Six Months To One Year

With Power Supply Disengaged

a. Remove, clean and inspect compressor valves.

b. Repack suction valve unloader assemblies.

5. Preventive Maintenance For Heavy Duty Service

NOTE: Heavy duty service is whenever a compressor is operated continuously in excess of eight hours per calendar day.

a. DAILY. Check oil level. Add oil to bring up to level mark if indicator shows it to be low. Open drain cock at bottom of reservoir and drain condensate.

b. WEEKLY. Check complete compressor and reservoir. Clean out intercooler fins with compressed air. Clean drive belts and adjust if necessary.

c. EVERY 500 HOURS. Change crankcase oil.

d. EVERY 1000 HOURS. Install complete set of new or rebuilt valves. Repack suction valve unloader assemblies with silicone grease. Replace suction valve unloader "O" rings and felts if necessary.

6. Oil Pump — Reversing Rotation (See Figure 3)

Normal rotation of the oil pump is clockwise when viewing the compressor from the oil pump end. Should "reverse or counterclockwise rotation" be desired, proceed as follows:

a. Disconnect the air receiver tubing, and the unloader tubing.

b. Remove the screws that secure the oil pump cover to the crankcase and remove the cover.

c. Remove the oil pump rotor, vanes, and springs.

d. Remove the oil pump insert from the pin; turn the insert over so the arrow on the other side points counterclockwise; and reinstall insert over the pin.

e. Install the rotor, springs, and vanes.

f. Replace the oil pump cover and secure with the screws.

NOTE: When changing the rotation of 80, 700 800, 900 Series it will require installation of the correct fan and/or flywheel to insure proper cooling of the compressor. All other models use same flywheel for either rotation.

g. On units with unloaders, attach the unloader tubing air receiver tubing, and (if used) the pilot valve tubing.

h. Be certain the drive motor now turns the compressor counterclockwise.

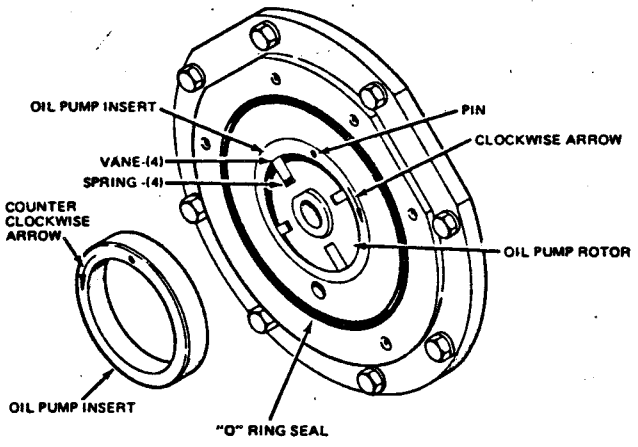


Figure 3

CLEARANCE – TOLERANCE – TORQUE

MODEL	20	40	60 66A	80 88A	99A	100 200	300	400 440A	500 550A	600 660A	700 770A	800 880A	900 990A
Piston Clearances:													
H. P. at Skirt						.002/.0035	.002/.0035	.002/.0035	.002/.0035	.003/.005	.0055/.0075	.0045/.0075	.0045/.0075
L. P. at Skirt	.0025/.0045	.0035/.0055	.0055/.0075	.0055/.0075	.0055/.0075	.0025/.0045	.0035/.0055	.0035/.0055	.0045/.0065	.0055/.0075	.0045/.0065	.0055/.0075	.0055/.0075
Piston Ring End Clearance													
H. P. Compression						.005/.013	.007/.015	.007/.017	.007/.017	.010/.020	.010/.020	.013/.023	.013/.023
L. P. Compression	.010/.020	.013/.023	.017/.027	.017/.027	.017/.027	.010/.020	.013/.023	.013/.023	.017/.027	.017/.027	.017/.027	.017/.027	.017/.027
H. P. Oil						.005/.013	.007/.015	.007/.015	.007/.015	.010/.018	.010/.018	.013/.023	.013/.023
L. P. Oil	.010/.020	.013/.025	.017/.027	.017/.027	.017/.027	.010/.020	.013/.025	.013/.023	.017/.027	.017/.027	.017/.027	.017/.027	.017/.027
Piston Ring Groove Clearance													
H. P. Compression Ring						.002/.0035	.002/.0035	.002/.0035	.002/.0035	.002/.0035	.002/.0035	.002/.0035	.002/.0035
H. P. Oil Control Ring						.0015/.003	.0015/.003	.0015/.003	.0015/.003	.0015/.003	.0015/.003	.0015/.003	.0015/.003
L. P. Compression Ring	.002/.0035	.002/.0035	.0025/.0045	.0025/.0045	.0025/.0045	.002/.0035	.002/.0035	.002/.0035	.0025/.0045	.0025/.0045	.0025/.0045	.0025/.0045	.0025/.0045
L. P. Oil Control Ring	.0015/.003	.0015/.003	.002/.004	.002/.004	.002/.004	.0015/.003	.0015/.003	.0015/.003	.002/.004	.002/.004	.002/.004	.002/.004	.002/.004
Top of Piston to Top of Cylinder Clearance	-.005+.018	-.003+.020	-.003+.025	-.001+.022	-.006+.026	-.005+.018	-.004+.019	-.003+.020	-.001+.022	-.003+.025	-.001+.022	-.001+.022	-.006+.026
Connecting Rod Bearing Running Clearance	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044	.0025/.0044
Crankshaft End Play	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005	.003/.005
Oil Pump Rotor End Clearance	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035	.0015/.0035
TORQUE DATA													
Valve Nut													
H. P.						150 In. Lbs.	150 In. Lbs.	150 In. Lbs.	150 In. Lbs.	150 In. Lbs.	200 In. Lbs.	200 In. Lbs.	200 In. Lbs.
L. P.	110 In. Lbs.	132 In. Lbs.	132 In. Lbs.	132 In. Lbs.	200 In. Lbs.	150 In. Lbs.	150 In. Lbs.	200 In. Lbs.	200 In. Lbs.	200 In. Lbs.	200 In. Lbs.	200 In. Lbs.	200 In. Lbs.
Connecting Rod Bolts	120 In. Lbs.	150 In. Lbs.	350 In. Lbs.	350 In. Lbs.	175 Ft. Lbs.	120 In. Lbs.	150 In. Lbs.	150 In. Lbs.	350 In. Lbs.	350 In. Lbs.	350 In. Lbs.	350 In. Lbs.	175 Ft. Lbs.
Piston Pin Bolt					79 Ft. Lbs.								79 Ft. Lbs.
Valve Plug or Unloader Sleeve													
L. P.	100 Ft. Lbs.	100 Ft. Lbs.	200 Ft. Lbs.	200 Ft. Lbs.	200 Ft. Lbs.	100 Ft. Lbs.	100 Ft. Lbs.	100 Ft. Lbs.	100 Ft. Lbs.	200 Ft. Lbs.	100 Ft. Lbs.	200 Ft. Lbs.	200 Ft. Lbs.
H. P.						70 Ft. Lbs.	70 Ft. Lbs.	70 Ft. Lbs.	70 Ft. Lbs.	70 Ft. Lbs.	100 Ft. Lbs.	100 Ft. Lbs.	100 Ft. Lbs.
Flywheel Retainer Bolt	47 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	250 Ft. Lbs.	250 Ft. Lbs.	47 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	250 Ft. Lbs.	250 Ft. Lbs.	250 Ft. Lbs.
Cylinder Flange Bolts	47 Ft. Lbs.	73 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.	47 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.	142 Ft. Lbs.
Cylinder Head Bolts L. P.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.
Cylinder Head Bolts H. P.								73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.	73 Ft. Lbs.
Oil Pump Cover Bolts	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.	8.8 Ft. Lbs.
Rear Retainer Bolts		29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.		29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.	29.7 Ft. Lbs.

NOTE: CLEARANCES AND TOLERANCES ARE IN INCHES.

INDEX to COMPOSITE GROUPS

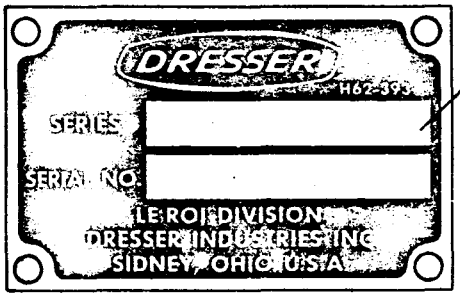
MODEL
Series
400
440A

June, 1980

GROUP NUMBER	GROUP NAME	GROUP NUMBER	GROUP NAME
1	CYLINDERS	9	REAR RETAINER AND OIL PUMP
2	CYLINDER HEAD Low Pressure (Without Unloaders)	10	FLYWHEEL
2A	CYLINDER HEAD Low Pressure (With Unloaders)	11	CRANKCASE
2B	CYLINDER HEAD Low Pressure "A" Series Only (With Unloaders)	12	CRANKCASE BREATHER
3	CYLINDER HEAD High Pressure (Without Unloaders)	13	UNLOADER TUBE
3A	CYLINDER HEAD High Pressure (With Unloaders)		
3B	CYLINDER HEAD High Pressure "A" Series Only (With Unloaders)		
4	AIR FILTER		
5	CRANKSHAFT		
6	PISTONS AND CONNECTING RODS		
7	INTERCOOLER		
8	OIL PUMP COVER (Without Unloaders)		
8A	OIL PUMP COVER (With Unloaders)		

WHEN CONSULTING YOUR DISTRIBUTOR OR THE FACTORY CONCERNING YOUR COMPRESSOR, OR WHEN ORDERING SERVICE LITERATURE OR SERVICE PARTS, ALWAYS FURNISH COMPLETE UNIT MODEL NUMBER AND SERIAL NUMBER.

THIS IS THE MODEL NUMBER



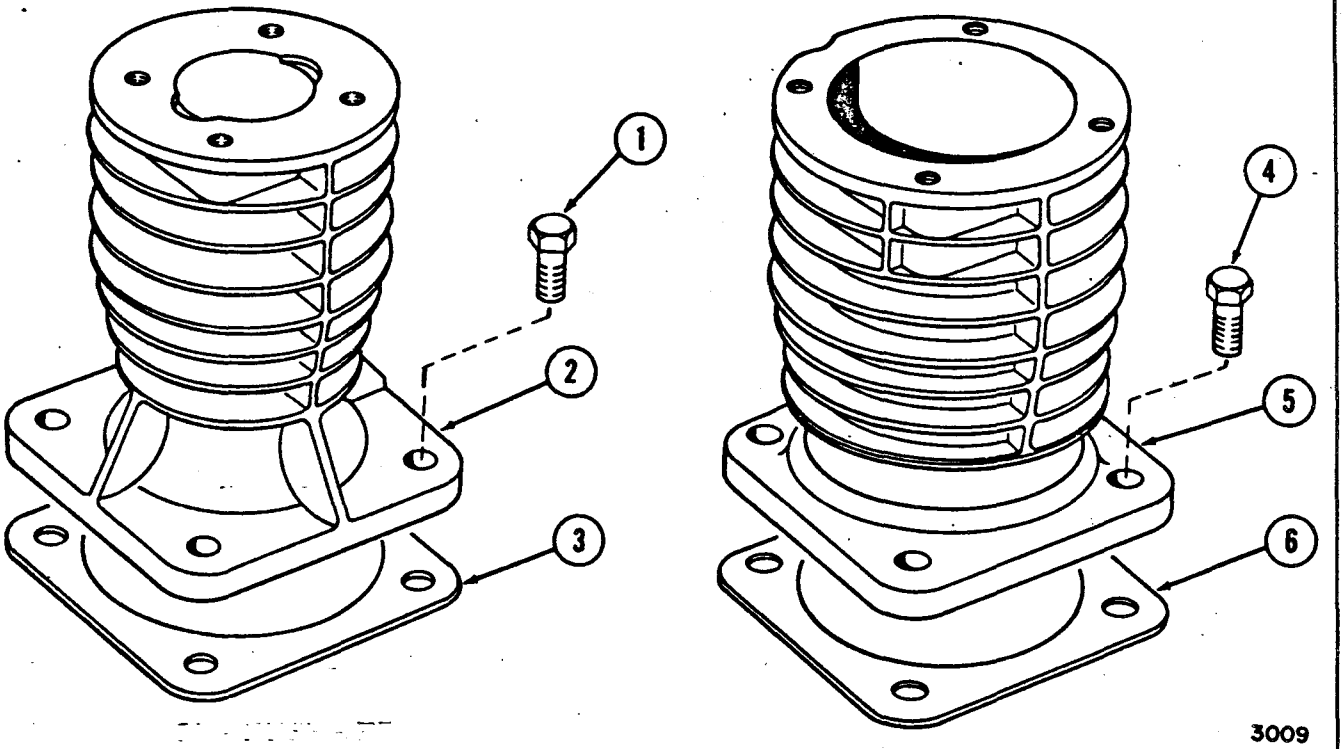
THIS PLATE IS LOCATED ON THE COMPRESSOR CRANKCASE

GROUPS AND COMPONENTS

Group No. 1 CYLINDER

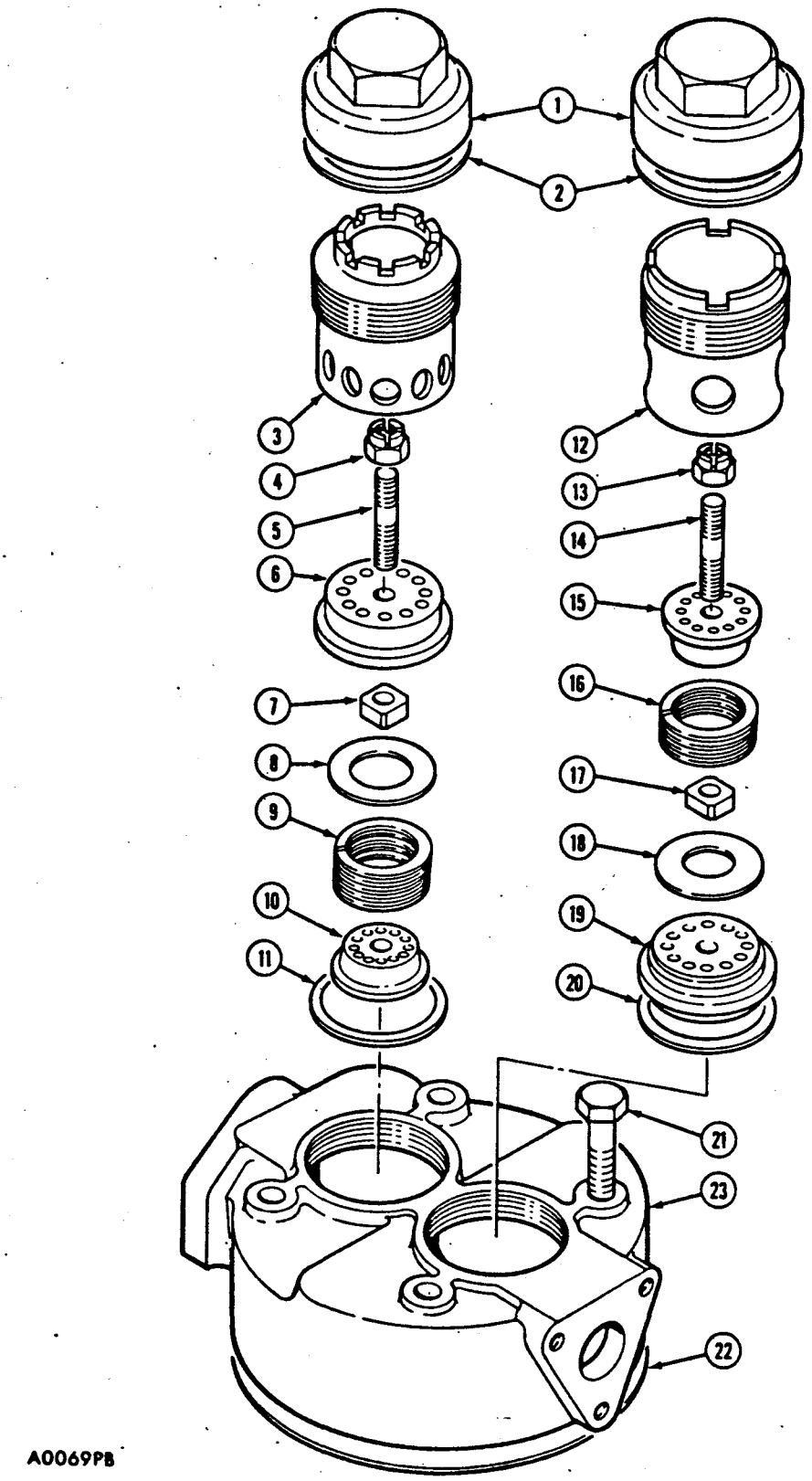
MODEL	PART NUMBERS				
Series 400 440A	STANDARD				
	GH1-321-1				

Ref.	Part Description	Qty.					
1	SCREW, Cap	4	02-69				
2	CYLINDER, High pressure	1	H1-321-1				
3	GASKET, High pressure cylinder	1	H16-1342				
4	SCREW, Cap	1	02-70				
4	SCREW, Cap	3	02-69				
5	CYLINDER, Low pressure	1	H1-322				
6	GASKET, Low pressure cylinder	1	H16-1367				



3009

• Part number is same as in



Group No. 2 Cylinder Head, Low Pressure

GROUPS AND COMPONENTS

(Without Unloaders)

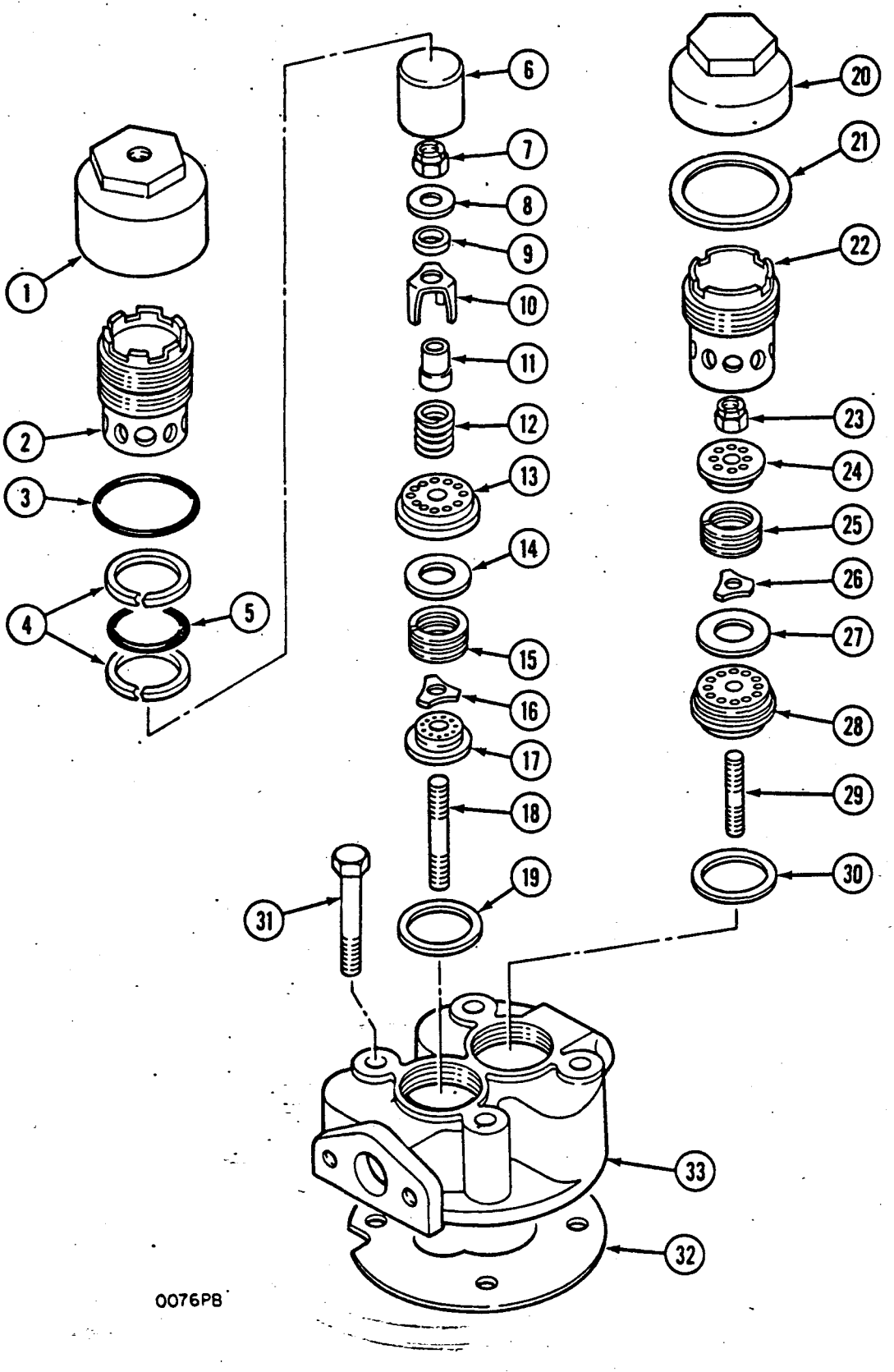
Group No. 2 CYLINDER HEAD, Low Pressure

MODEL

Series 400

Ref.	Part Description	Qty.	PART NUMBERS STANDARD 7GH2-274
	HEAD ASSY., Low pressure cylinder	1	6AH2-276-1 Inc. A to J
1	CAP, Suction valve	1	H4-264-2--A
2	GASKET, Cap	1	H16-1531-2
3	SLEEVE	1	H175-33-2
	VALVE ASSEMBLY, Suction	1	1AH15-1251-1 Inc. B to E
4	NUT	1	53-729--B
	RETAINER ASSY., Spring (Not Ser. Sep.)	1	1AH15-1252-1 Inc. C & D
5	STUD (Not Ser. Sep.)	1	H105-544--C
10	RETAINER, (Not Ser. Sep.)	1	H15-1252-1--D
7	GUIDE, Valve (Not Ser. Sep.)	1	H58-107-2
8	VALVE	1	H15-656
9	SPRING, Valve	1	H24-1066
6	SEAT, Valve (Not Ser. Sep.)	1	H15-1251-1
11	GASKET, Valve	1	H16-1467--E
1	CAP, Discharge valve	1	H2-264-2
2	GASKET, Cap	1	H16-1531-2
12	PLUG, Discharge valve	1	H175-34
	VALVE ASSEMBLY, Discharge	1	1AH15-1251 Inc. F to I
13	NUT	1	53-729--F
	VALVE SEAT ASSY., (Not Ser. Sep.)	1	AH15-1251 Inc. G & H
19	SEAT, Valve (Not Ser. Sep.)	1	H15-1251--G
14	STUD, (Not Ser. Sep.)	1	H105-544--H
16	SPRING, Valve	1	H24-1066
17	GUIDE, Valve (Not Ser. Sep.)	1	H58-107-2
18	VALVE	1	H15-656
15	RETAINER, Spring (Not Ser. Sep.)	1	H15-1252
20	GASKET, Discharge valve	1	H16-1466--I
21	SCREW, Cap	4	02-80
22	GASKET, Cylinder head	1	16-1969
23	HEAD, Cylinder	1	H2-276-1--J

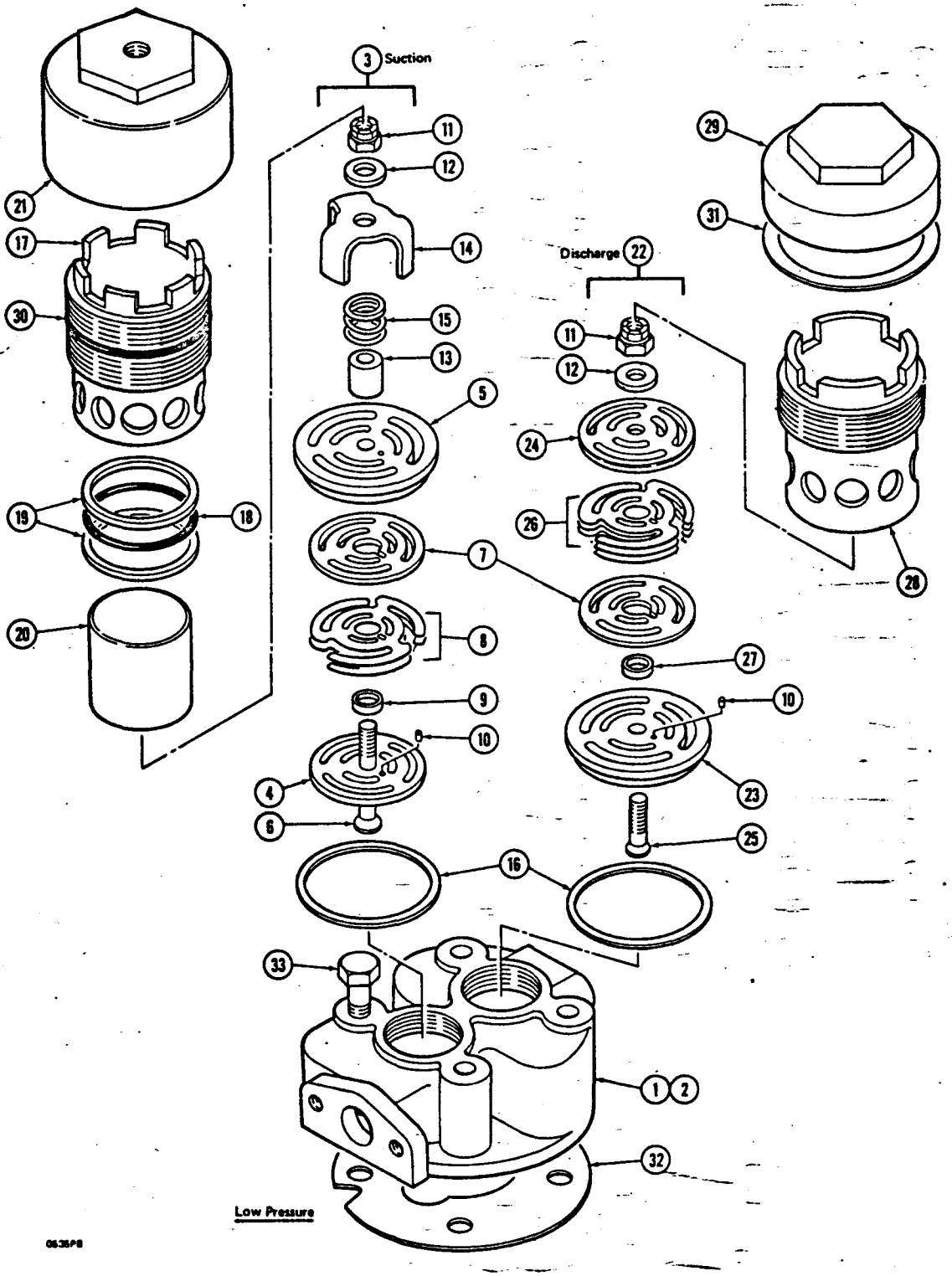
• Part number is same as in



Group No. 2A Cylinder Head, Low Pressure

Group No. 2A CYLINDER HEAD, Low Pressure

Ref.	Part Description	Qty.	MODEL Series 400 STANDARD 6GH2-274				
	HEAD ASSEMBLY, Low pressure cylinder	1	AH2-276-1 Inc. A to J				
1	CAP, Suction valve	1	H4-264--A				
2	SLEEVE, Holddown	1	175-33				
3	"O" Ring, Cap	1	H125-277				
4	SEAL, Felt	2	H125-256				
5	"O" Ring, Plunger to sleeve	1	H125-286				
6	PLUNGER	1	H8-369				
	VALVE ASSEMBLY, Suction	1	AH15-1251-1 Inc. B to E				
7	NUT	1	53-729--B				
8	WASHER	1	06-69				
9	SPACER, Push rod	1	H22-593				
10	ROD, Push	1	H99-110				
11	SPACER (Not Ser. Sep.)	1	H22-560				
12	SPRING, Plunger	1	H24-482				
13	SEAT, Valve (Not Ser. Sep.)	1	H15-1251-1				
14	VALVE, Inlet	1	H15-656				
15	SPRING, Valve	1	H24-1066				
16	GUIDE, Valve (Not Ser. Sep.)	1	H58-107-2				
	RETAINER ASSEMBLY (Not Ser. Sep.)	1	AH15-1252-1 Inc. C & D				
17	RETAINER (Not Ser. Sep.)	1	H15-1252-1--C				
18	STUD, (Not Ser. Sep.)	1	105-545--D				
19	GASKET, Suction valve	1	H16-1467--E				
20	CAP, Discharge valve	1	H4-264-2				
21	GASKET, Cap	1	H16-1531-2				
22	PLUG, Discharge valve	1	H175-34				
	VALVE ASSEMBLY, Discharge	1	1AH15-1251 Inc. F to I				
23	NUT	1	53-729--F				
24	RETAINER, Spring (Not Ser. Sep.)	1	H15-1252				
25	SPRING, Valve	1	H24-1066				
26	GUIDE, Valve (Not Ser. Sep.)	1	H58-107-2				
27	VALVE	1	H15-656				
	VALVE SEAT ASSY., (Not Ser. Sep.)	1	AH15-1251 Inc. G & H				
28	SEAT, Valve (Not Ser. Sep.)	1	H15-1251--G				
29	STUD, (Not Ser. Sep.)	1	H105-544--H				
30	GASKET, Discharge valve	1	H16-1466--I				
33	HEAD, Low pressure cylinder	1	H2-276-1--J				
32	GASKET, Cylinder head	1	16-1969				
31	SCREW, Cap	4	02-80				



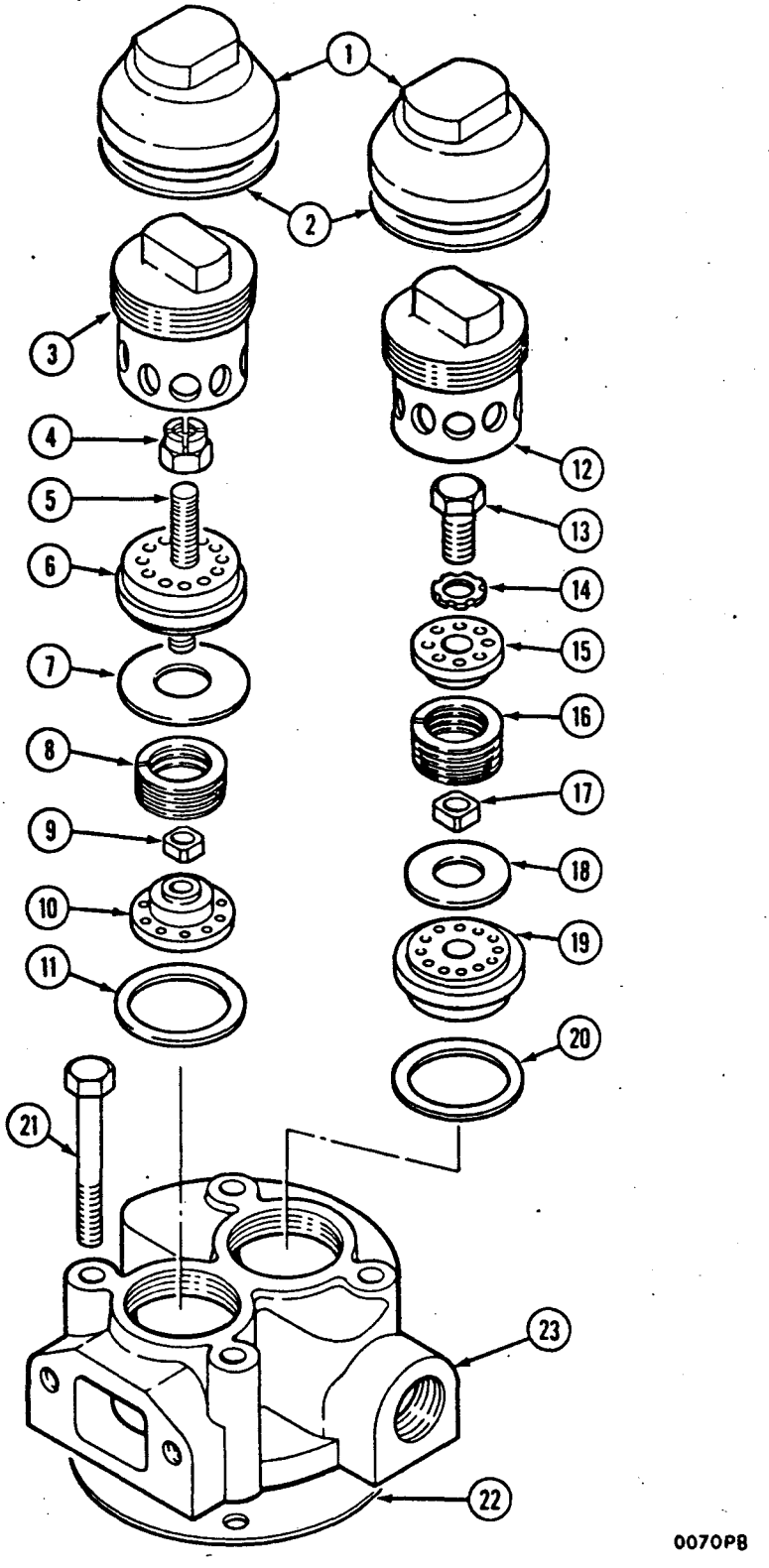
Group No. 2B Cylinder Head, Low Pressure

GROUPS AND COMPONENTS

Group No. 2B CYLINDER HEAD, Low Pressure

Ref.	Part Description	Qty.	MODEL Series 440A PART NUMBERS STANDARD G2-274-1
1	HEAD ASSEMBLY, L.P. Cylinder	1	A2-276-4 Inc. A to F
3	VALVE ASSEMBLY, Suction	1	15-1532--A Inc. B to C
5	SEAT, Valve	1	220-148-31--B
4	GUARD	1	220-148-32
6	BOLT, Center	1	220-148-33
7	PLATE, Valve	1	220-148-34
8	PLATE, Spring	2	220-148-35
9	RING, Guide	1	220-148-36
10	PIN, Locating	1	220-148-37
11	NUT, Lock	1	220-148-38
	PIN, Special, Nut	1	220-148-87
12	WASHER	1	220-148-34
13	SPACER	1	220-148-40
14	UNLOADER	1	220-148-41
15	SPRING	1	220-148-9--C
16	GASKET, Valve	1	H16-1466
17	SLEEVE, Holddown	1	175-33-3
18	O-RING	1	H125-286
19	SEAL, Felt	2	H125-256
20	PLUNGER	1	8-795
21	CAP	1	H4-264
22	VALVE ASSEMBLY, Discharge	1	15-1533 Inc. D to E
23	SEAT, Valve	1	220-148-43--D
24	GUARD	1	220-148-44
25	BOLT, Center	1	220-148-45
7	PLATE, Valve	1	220-148-34
26	PLATE, Spring	3	220-148-47
27	RING, Guide	1	220-148-48
10	PIN, Locating	1	220-148-37
11	NUT, Self-Lock	1	220-148-38
	PIN, Special Nut	1	220-148-87
12	WASHER	1	220-148-39--E
16	GASKET, Valve	1	H16-1466
28	PLUG	1	H175-34
29	CAP	1	H4-264-2
30	O-RING	1	H125-277
31	GASKET	1	H16-1531-2
2	HEAD, L.P. Cylinder	1	2-276-4--F
32	GASKET, L.P. Cylinder Head	1	16-1969
33	SCREW, Cap	4	02-80

• Part number is same as in



Group No. 3 Cylinder Head, High Pressure

GROUPS AND COMPONENTS (Without Unloaders)

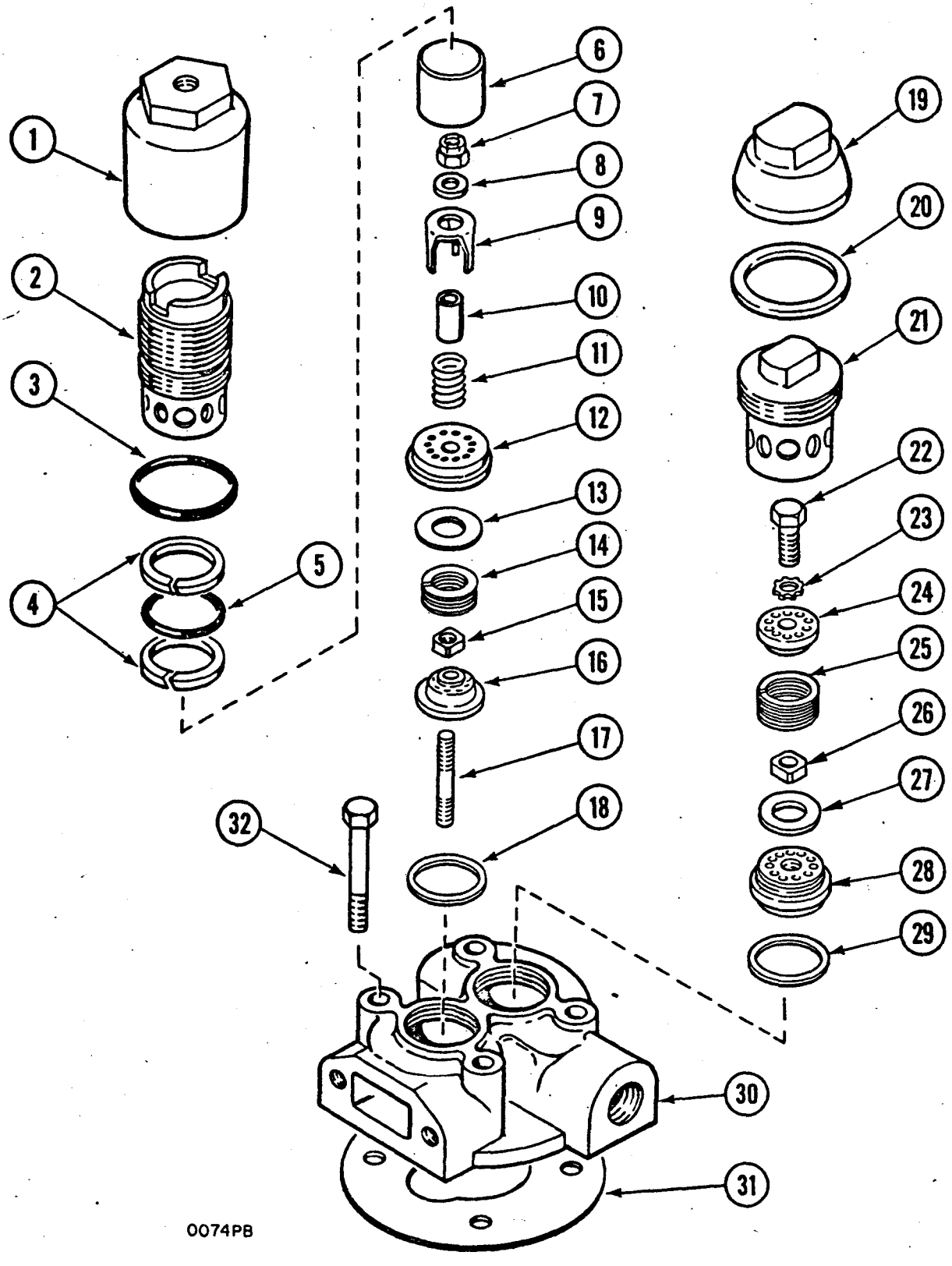
Group No. 3 CYLINDER HEAD, High Pressure

MODEL	PART NUMBERS				
Series 400	STANDARD				
	5GH2-274				

Ref.	Part Description	Qty.					
	HEAD ASSY., High pressure cylinder	1	3AH2-274 Inc. A to H				
1	CAP, Suction valve	1	H4-410--A				
2	GASKET, Cap	1	H16-1531-1				
3	PLUG, Suction valve	1	H19-260				
	VALVE ASSEMBLY, Suction	1	3AH15-1256-1 Inc. B to E				
4	NUT	1	53-729-1--B				
9	GUIDE, Valve (Not Ser. Sep.)	1	H58-81-1				
	RETAINER ASSY., Valve (Not Ser Sep)	1	2AH15-1256-1 Inc. C & D				
10	RETAINER, Valve (Not Ser. Sep.)	1	H15-1256-1--C				
5	STUD (Not Ser. Sep.)	1	H105-546--D				
7	VALVE, Suction	1	H15-604				
6	SEAT, Valve	1	H15-1255-1				
8	SPRING, Valve	1	H24-634				
11	GASKET, Suction valve	1	H16-1465--E				
1	CAP, Discharge valve	1	H4-410				
2	GASKET, Cap	1	H16-1531-1				
12	PLUG, Discharge valve	1	H19-259				
	VALVE ASSEMBLY, Discharge	1	AH15-1255 Inc. F to G				
13	SCREW, Cap	1	02-518--F				
14	WASHER, Lock	1	05-50				
15	RETAINER, Spring (Not Ser. Sep.)	1	H15-1256				
16	SPRING	1	H24-634				
17	GUIDE, Valve (Not Ser. Sep.)	1	H58-81-1				
18	VALVE, Discharge	1	H15-604				
19	SEAT, Valve (Not Ser. Sep.)	1	H15-1255				
20	GASKET, Valve	1	H16-1465--G				
23	HEAD, High pressure cylinder	1	H2-274--H				
22	GASKET, Cylinder head	1	H16-1380				
21	SCREW, Cap	4	02-44				

• Part number is same as in

3



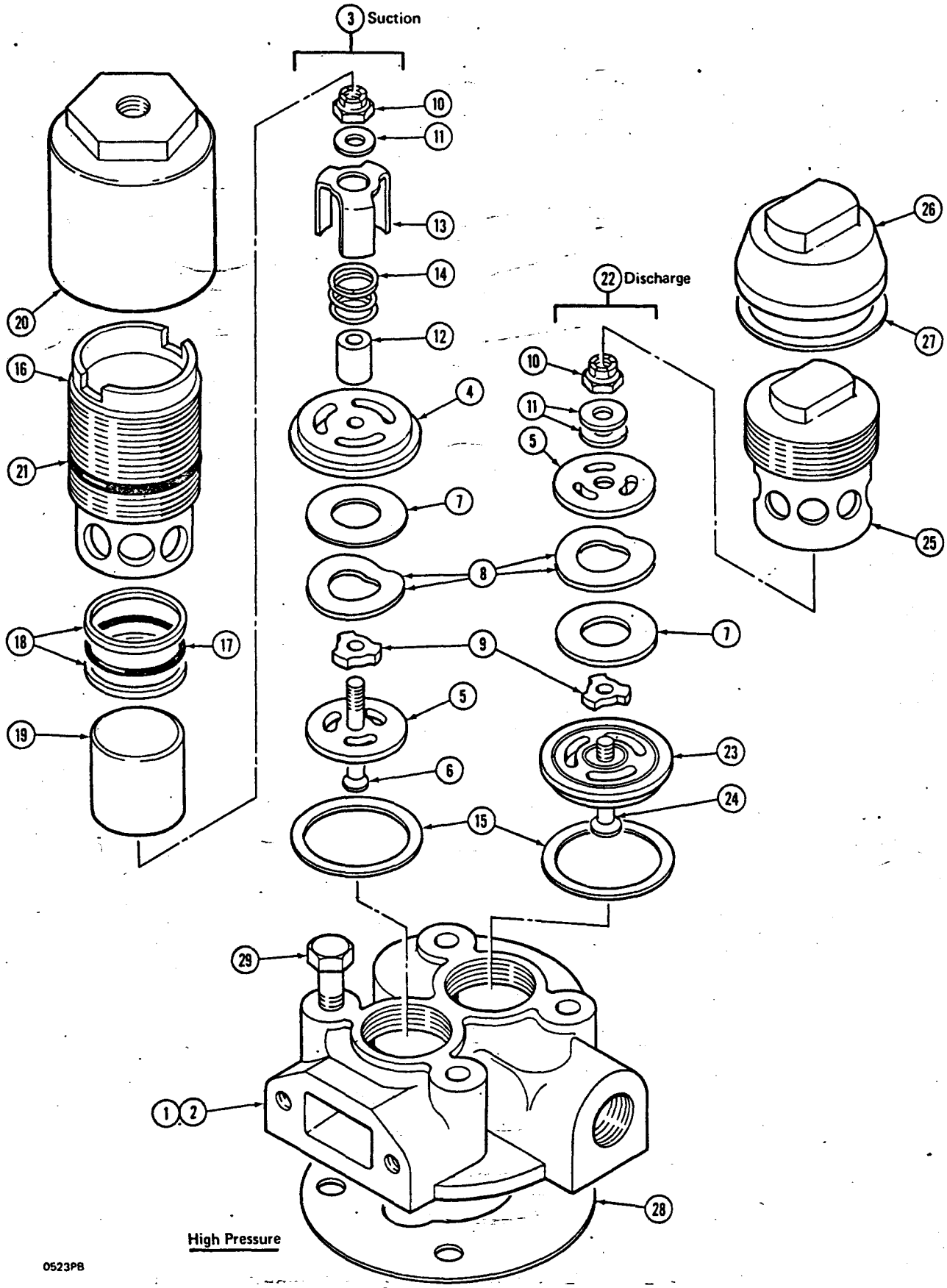
Group No. 3A Cylinder Head, High Pressure

GROUPS AND COMPONENTS

(With Unloaders)

Group No. 3A CYLINDER HEAD, High Pressure

Ref.	Part Description	Qty.	PART NUMBERS STANDARD 2GH2-274				
	HEAD ASSY., High pressure cylinder	1	1AH2-274 Inc. A to H				
1	CAP, Suction valve	1	H4-265-2--A				
2	SLEEVE, Holddown	1	H175-29-3				
3	"O" Ring, Cap	1	H125-263				
4	SEAL, Felt, plunger to sleeve	2	H125-259				
5	"O" Ring, Plunger to sleeve	1	H125-285				
6	PLUNGER	1	H8-359				
	VALVE ASSEMBLY, Suction	1	1AH15-1256-1 Inc. B to E				
7	NUT	1	53-729-1--B				
8	WASHER	1	06-68				
9	ROD, Push	1	H99-111				
10	SPACER, Plunger spring	1	H22-561-1				
11	SPRING, Plunger	1	H24-504				
12	SEAT, Valve (Not Ser. Sep.)	1	H15-1255-1				
13	VALVE	1	H15-604				
14	SPRING, Valve	1	H24-634				
15	GUIDE, Valve	1	H58-81-1				
	RETAINER ASSY., Spring (Not Ser. Sep.)	1	AH15-1256-1 Inc. C & D				
16	RETAINER, Spring (Not Ser. Sep.)	1	H15-1256-1--C				
17	STUD (Not Ser. Sep.)	1	H105-547--D				
18	GASKET, Valve	1	H16-1465--E				
19	CAP, Discharge valve	1	H4-410				
20	GASKET, Cap	1	H16-1531-1				
21	PLUG, Discharge valve	1	H19-259				
	VALVE ASSEMBLY, Discharge	1	AH15-1255 Inc. F to G				
22	SCREW, Cap	1	02-518--F				
23	WASHER, Lock	1	05-107				
24	RETAINER, Spring (Not Ser. Sep.)	1	H15-1256				
25	SPRING, Valve	1	H24-634				
26	GUIDE, Valve (Not Ser. Sep.)	1	H58-81-1				
27	VALVE	1	H15-604				
28	SEAT, Valve (Not Ser. Sep.)	1	H15-1255				
29	GASKET, Valve	1	H16-1465--G				
30	HEAD, High pressure cylinder	1	H2-274--H				
31	GASKET, Cylinder head	1	H16-1380				
32	SCREW, Cap	4	02-44				



Group No. 3B Cylinder Head, High Pressure

GROUPS AND COMPONENTS

Group No. 3B CYLINDER HEAD, High Pressure

Ref.	Part Description	Qty.	MODEL Series 440A	PART NUMBERS			
			STANDARD G2-274-1	STANDARD G2-274-1 S/N 4016 x 770 and Before			
1	HEAD ASSEMBLY, H.P. Cylinder	1	A2-274-1 Inc. A to F	• Inc. A to F			
3	VALVE ASSEMBLY, Suction	1	15-1534 --A Inc. B to C	• --A			
4	SEAT, Valve	1	229-148-78--B				
5	GUARD	1	220-148-79	Service these units with complete valve assemblies only.			
6	BOLT, Center	1	220-148-80				
7	RING, Valve	1	220-148-55				
8	SPRING	2	220-148-75				
9	RING, Guide	1	220-148-76				
10	NUT, Special self lock	1	220-148-77				
	PIN, Special, Nut	1	220-148-86				
11	WASHER	1	220-148-59				
12	SPACER	1	220-148-81				
13	UNLOADER	1	220-148-70				
14	SPRING	1	220-148-9--C				
15	GASKET, Valve	1	16-1878	•			
16	SLEEVE	1	175-29-9	•			
17	O-RING	1	H125-285	•			
18	SEAL, Felt	2	H125-259	•			
19	PLUNGER	1	8-796	•			
20	CAP	1	H4-265-2	•			
21	O-RING	1	H125-263	•			
22	VALVE ASSEMBLY, Discharge	1	15-1535 Inc. D to E	•			
23	SEAT, Valve	1	220-148-72--D				
	PIN, Special, Locating	1	220-148-84	Service these units with complete valve assemblies only.			
5	GUARD	1	220-148-73				
24	BOLT, Center	1	220-148-74				
7	RING, Valve	1	220-148-55				
8	SPRING	2	220-148-75				
9	RING, Guide	1	220-148-76				
10	NUT, Special, Self Lock	1	220-148-77				
	PIN, Special, Nut	1	220-148-86				
11	WASHER	2	220-148-59--E				
15	GASKET, Valve	1	16-1878	•			
25	PLUG	1	H19-259	•			
26	CAP	1	H4-410	•			
27	GASKET, Cap	1	H16-1531-1	•			
2	HEAD, High Pressure Cylinder	1	2-274-1--F	•--F			
28	GASKET, High Pressure Cylinder Head	1	H16-1380	•			
29	SCREW, Cap	4	02-44	•			

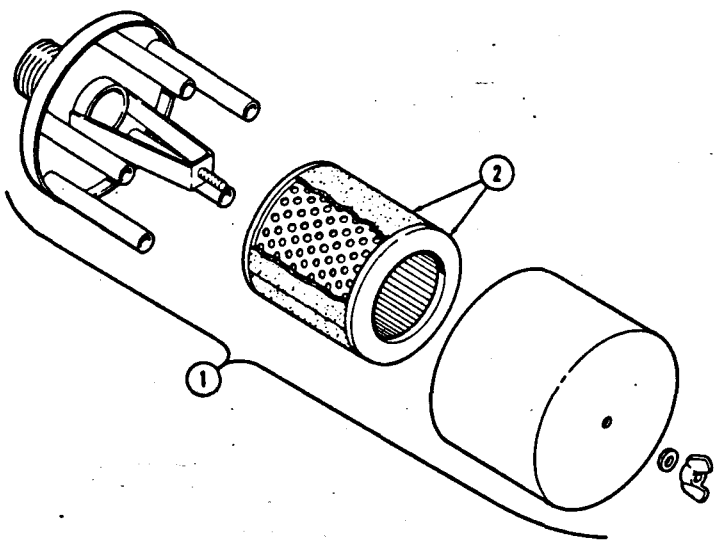
• Part number is same as in first column.

GROUPS AND COMPONENTS

Group No. 4 AIR FILTER

MODEL	PART NUMBERS				
Series 400 440A	STANDARD	OPTIONAL			
	GH43-660-1	G43-762-1			

Ref.	Part Description	Qty.				
1	FILTER ASSEMBLY, Air	1	H43-660-1 Inc. A & B	43-762-1 Inc. A		
2	ELEMENT	1	H43-651--A	43-763--A		
	LABEL	1	H62-590--B	62-802		



OPTIONAL: Polyester Element

NOTE: Group G43-762-1 Standard on gas units after S/N 4016X374

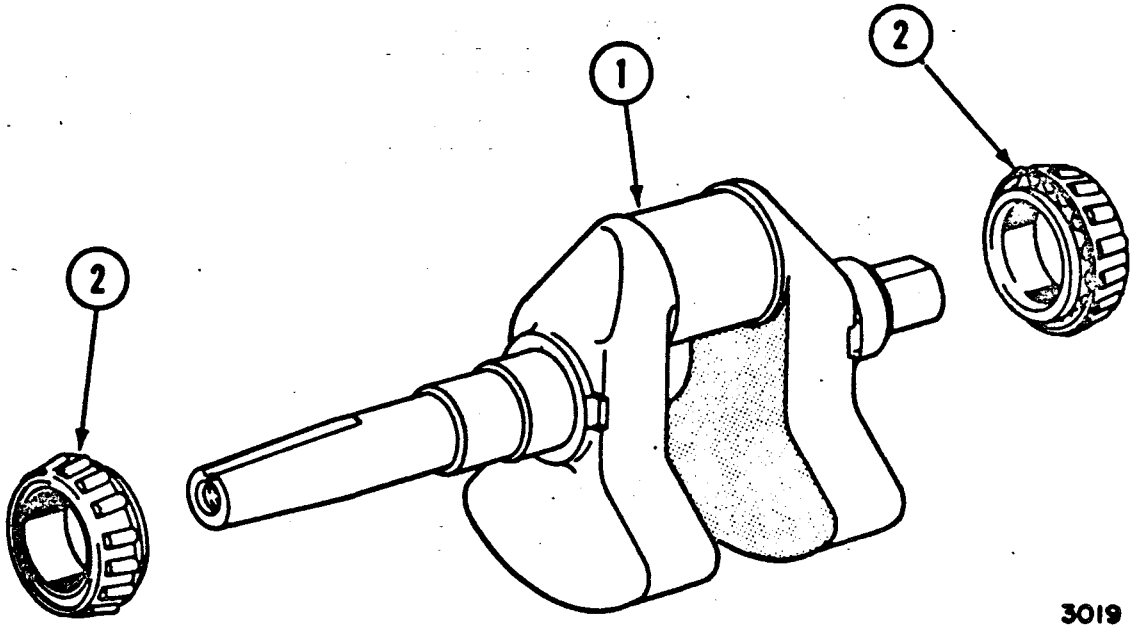
GROUPS AND COMPONENTS

Group No. 5 CRANKSHAFT

MODEL

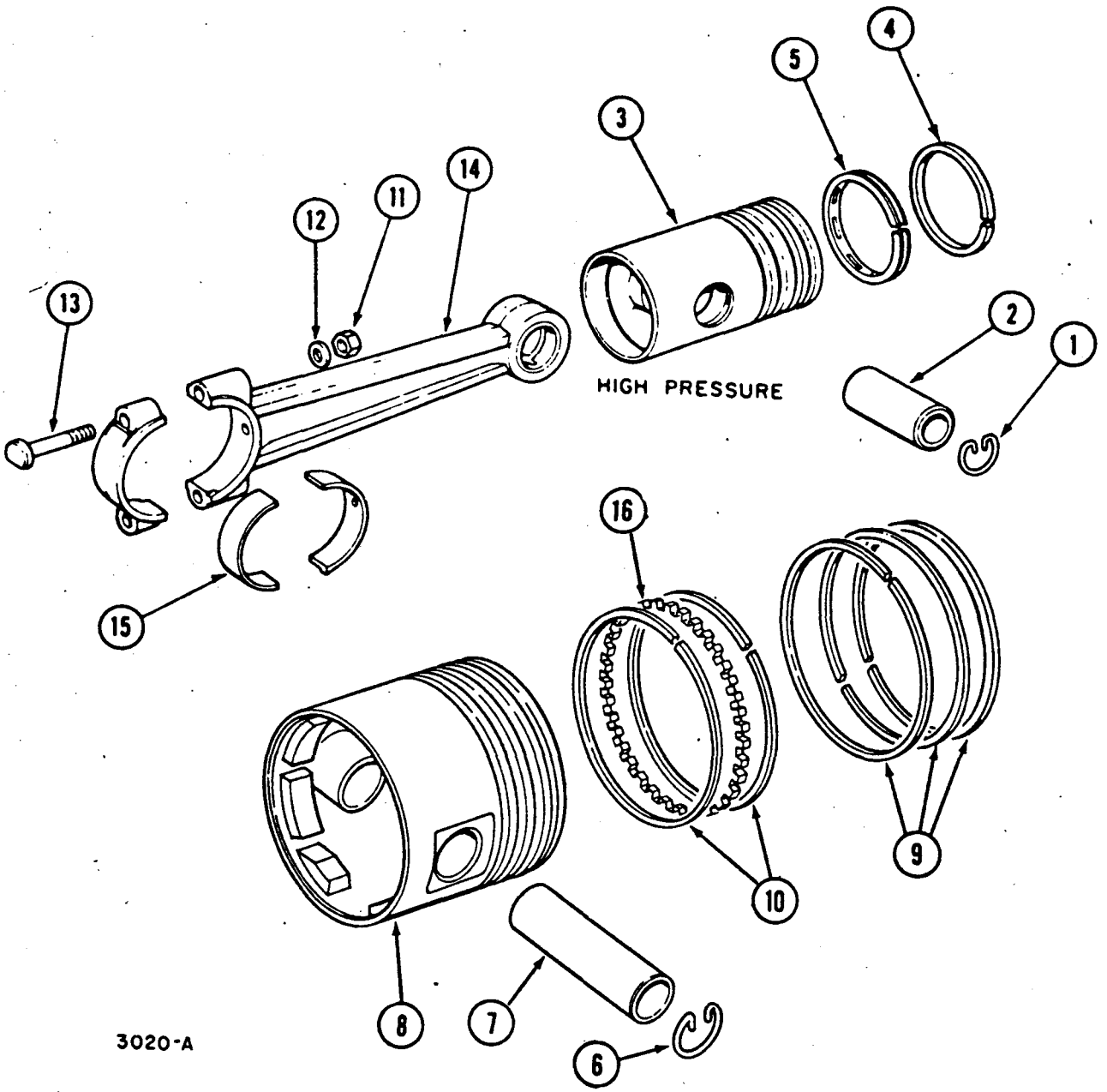
Series
400
440A

Ref.	Part Description	Qty.	PART NUMBERS STANDARD GH5-406-2
	CRANKSHAFT ASSEMBLY	1	AH5-406-2 Inc. A & B
1	CRANKSHAFT (Not Ser. Sep.)	1	H5-406-2--A
2	CONE, Bearing	2	H181-261--B



3019

• Part number is same as in



Group No. 6 Pistons And Connecting Rods

GROUPS AND COMPONENTS

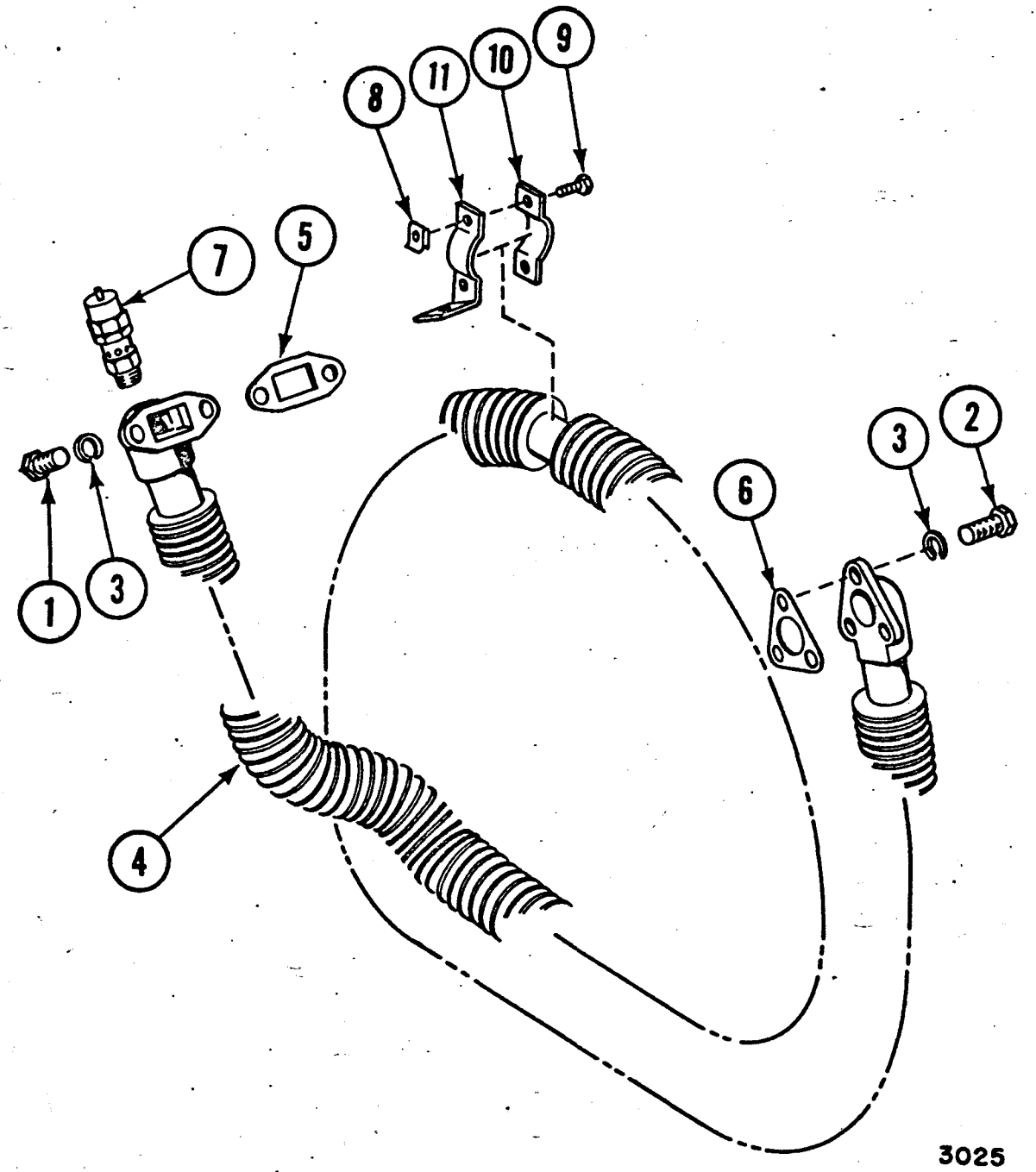
Group No. 6 PISTONS AND CONNECTING RODS

MODEL

Series
400
440A

Ref.	Part Description	Qty.	PART NUMBERS STANDARD				
			GH8-388-1				
1	RETAINER, Piston pin	2	H31-556				
	PISTON ASSEMBLY, High pressure	1	AH8-388-1 Inc. A & B				
2	PIN, Piston (Not Ser. Sep.)	1	H17-730--A				
3	PISTON (Not Ser. Sep.)	1	H8-388-1--B				
	RING KIT, H.P. piston	1	H204-290 Inc. C & D				
4	RING, Compression (Not Ser. Sep.)	3	H18-394--C				
5	RING, Oil (Not Ser. Sep.)	1	H18-395--D				
6	RETAINER, Piston pin	2	H31-556				
	PISTON ASSEMBLY, Low pressure	1	AH8-395 Inc. E & F				
7	PIN, Piston (Not Ser. Sep.)	1	H17-729--E				
8	PISTON (Not Ser. Sep.)	1	H8-395--F				
	RING KIT, L.P. piston	1	H204-388 Inc. G to H				
9	RING, Compression (Not Ser. Sep.)	3	H18-496--G				
10	RING, Oil (Not Ser. Sep.)	2	H18-497				
16	RING, Expander spacer (Not Ser. Sep.)	1	H18-498--H				
	ROD ASSEMBLY, Connecting	2	AH7-95-5 Inc. I to J				
11	LOCKNUT	4	H53-396--I				
12	WASHER	4	H20-572				
	BUSHING, Piston pin	2	H21-590				
13	BOLT, Connecting rod	4	H34-573				
14	ROD, Connecting (Not Ser. Sep.)	2	H7-95-5--J				
	BEARING KIT, Connecting rod	2	AH204-300 Inc. (2) K				
15	INSERT, Bearing, connecting rod	4	H21-527--K				

• Part number is same as in



Group No. 7 Intercooler

GROUPS AND COMPONENTS

Group No. 7 INTERCOOLER

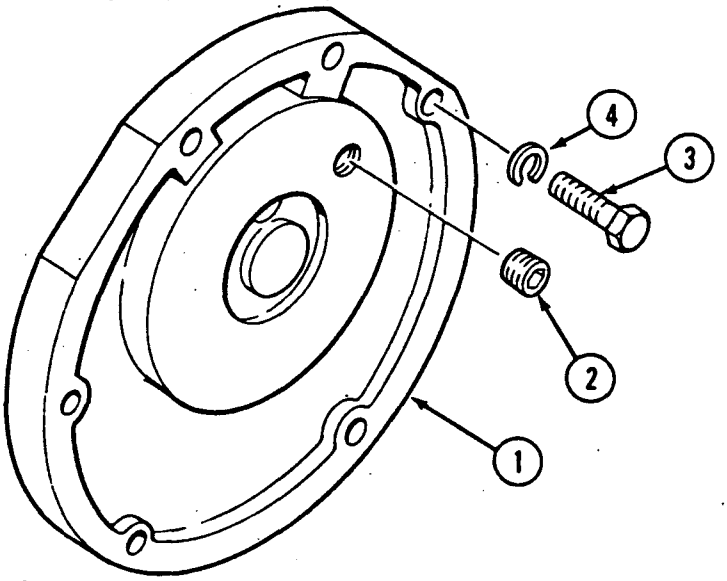
MODEL	PART NUMBERS				
Series 400 440A	STANDARD				
	GH55-2173				
Ref. / Part Description / Qty.					
1 SCREW, Cap 2	02-37				
2 SCREW, Cap 3	02-36				
3 WASHER, Lock 5	05-51				
4 TUBE, Intercooler 1	AH55-2173				
5 GASKET, High pressure 1	H16-1384				
6 GASKET, Low pressure 1	H16-1385				
7 VALVE, Safety 1	2AH15-646				
8 NUT, Speed 2	H53-394				
9 SCREW, Cap 2	02-2				
10 FASTENER 1	H83-401				
11 SUPPORT, Intercooler 1	H39-3305				
WASHER 1	06-71				
CLAMP 1	H83-488				
WASHER, Lock 2	05-49				
SCREW, Cap 1	02-6				

• Part number is same as in

Group No. 8 OIL PUMP COVER (Without Unloaders)

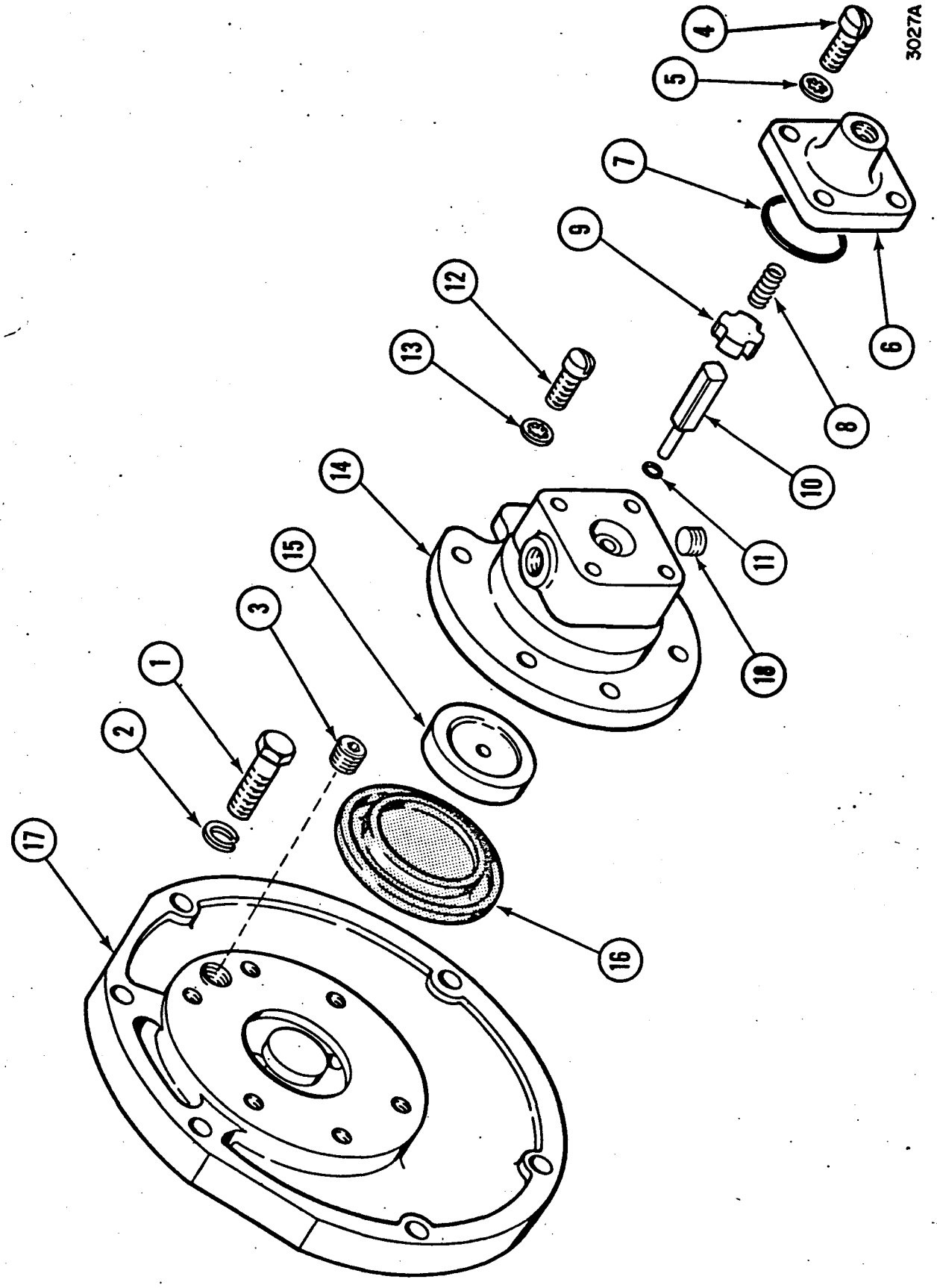
MODEL	PART NUMBERS				
Series 400	STANDARD				
	GH14-1153-1				

Ref.	Part Description	Qty.				
1	COVER, Oil pump	1	AH14-1153-1			
2	PLUG, Pipe	1	19-332			
3	SCREW, Cap	6	02-6			
4	WASHER, Lock	6	05-49			
	DECAL, Rotation	1	H62-404			



0071P8

• Part number is same as in

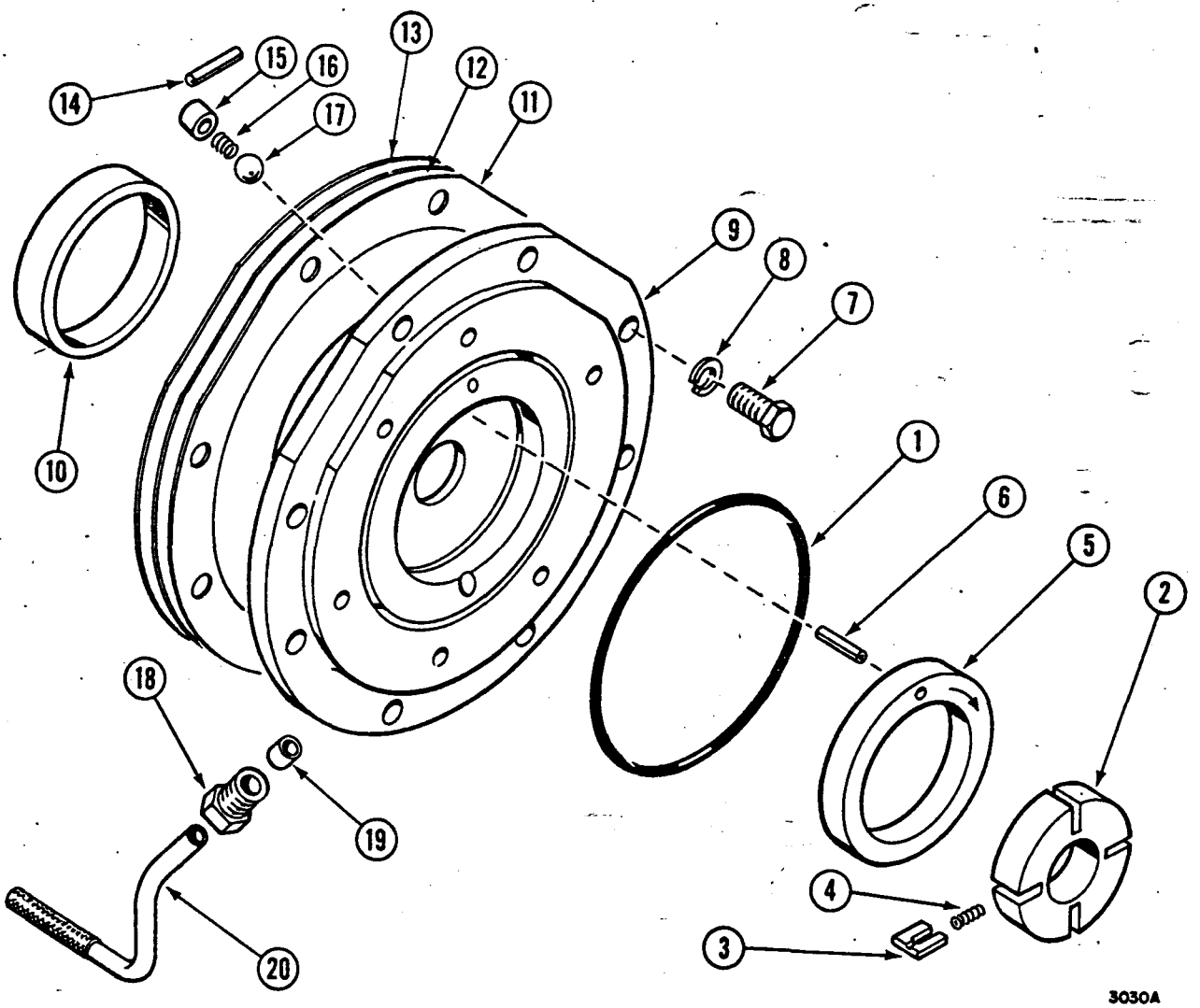


Group No. 8A Oil Pump Cover

GROUPS AND COMPONENTS

Group No. 8A OIL PUMP COVER (With Unloaders)

Ref.	Part Description	Qty.	MODEL Series 400 440A — PART NUMBERS: STANDARD				
			GH14-1153				
1	SCREW, Cap	6	02-6				
2	WASHER, Lock	6	05-49				
	VALVE ASSY., Air control	1	AH14-1153 Inc. A to B				
3	PLUG, Pipe	1	011-101--A				
4	SCREW, Machine	4	03-110				
5	WASHER, Lock	4	H20-584				
6	COVER, Valve	1	H14-1147				
7	SEAL, Cover	1	H125-279				
8	SPRING	1	H24-528				
9	VALVE, Check	1	H15-731-1				
10	PIN	1	H17-649				
11	SEAL, Pin	1	H125-280				
12	SCREW, Machine	6	03-110				
13	WASHER, Lock	6	H20-584				
14	BODY, Valve	1	H116-296				
15	PISTON	1	H8-381				
16	DIAPHRAGM	1	H186-31-3				
17	COVER, Oil pump	1	H14-1153				
18	PLUG, Orifice (start-stop only)	1	54-416--B				
	DECAL, Rotation	1	H62-404				



Group No. 9 Rear Retainer And Oil Pump

Group No. 9 REAR RETAINER AND OIL PUMP

MODEL	PART NUMBERS				
Series 400 440A	STANDARD				
	2GH31-541				
Ref. / Part Description / Qty.					
1 "O" Ring, Oil pump cover 1	125-186				
2 ROTOR, Oil pump 1	H101-73-1				
3 VANE, Oil pump 4	H42-184				
4 SPRING, Vane 4	H24-513				
5 INSERT 1	H81-237				
6 PIN, Roll 1	17-595				
7 SCREW, Cap 8	02-36				
8 WASHER, Lock 8	05-51				
RETAINER ASSEMBLY, Rear 1	AH31-541 Inc. A & B				
9 RETAINER, Rear 1	H31-541--A				
10 CUP, Bearing 1	H181-262--B				
11 SHIM, 0.005 in. thick 3	H22-573				
12 SHIM, 0.0075 in. thick 3	H22-573-1				
13 SHIM, 0.020 in. thick 1	H22-573-2				
14 PIN, Roll 1	17-593				
15 RETAINER, Oil relief spring 1	H31-550				
16 SPRING, Oil relief 1	H24-529				
17 BALL, Nylon, oil relief valve 1	H30-18				
18 FITTING, Oil intake tube 1	182-5				
19 SLEEVE, Rubber 1	63-179				
20 TUBE, Oil intake 1	AH55-1258				

• Part number is same as in

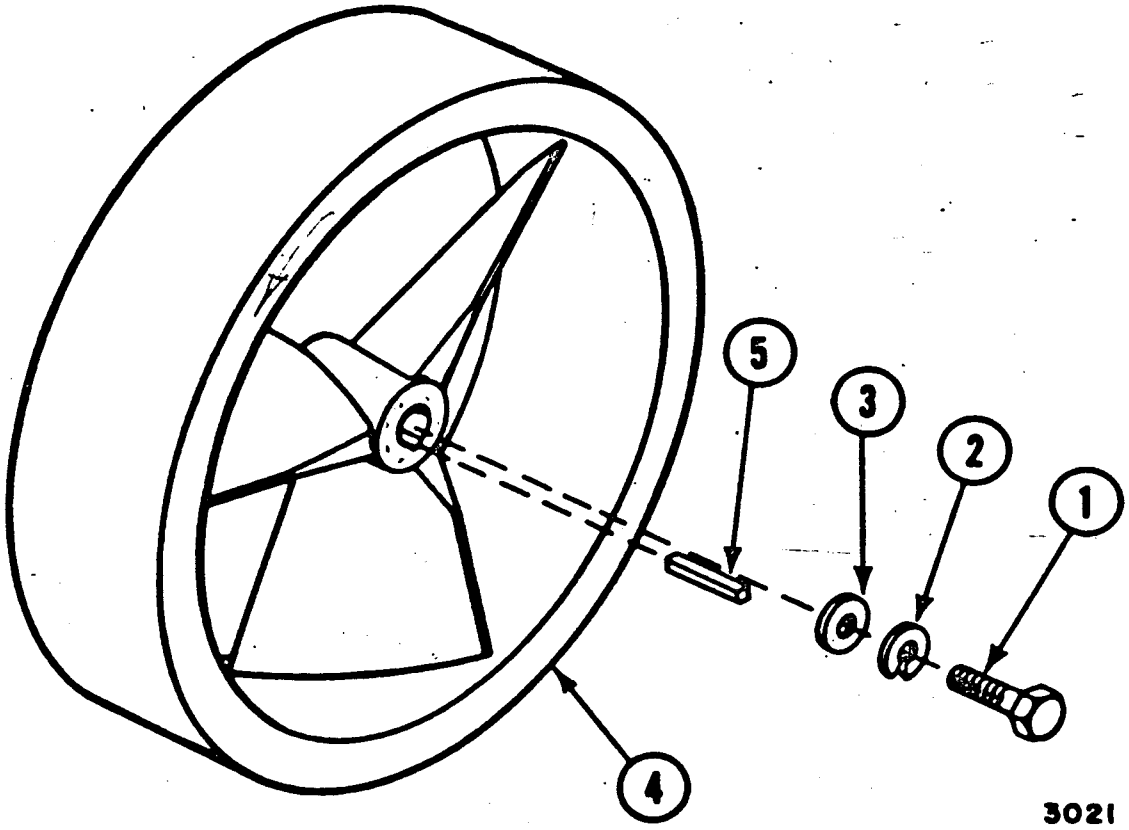
GROUPS AND COMPONENTS

Group No. 10 FLYWHEEL

MODEL

Series
400
440A

Ref.	Part Description	Qty.	PART NUMBERS				
			STANDARD				
			GH9-741				
1	SCREW, Cap	1	02-71				
2	WASHER, Lock	1	05-53				
3	WASHER, Flat	1	H20-585				
4	FLYWHEEL	1	H9-741				
5	KEY	1	09-130				
	DECAL, Rotation	1	H62-404				



3021

• Part number is same as in

10