INSTALLATION AND SERVICE INSTRUCTIONS

NOTICE

DISASSEMBLY OF THIS PRODUCT WILL VOID WARRANTY

ORTMAN
Series “101” Air/Hydraulic Cylinders

WARNING
READ INSTALLATION SERVICE INSTRUCTIONS AND GENERAL PARTS BREAKDOWN BEFORE INSTALLATION, OPERATION, OR SERVICING

CAUTION
CHECK MAXIMUM OPERATING PRESSURE ON CYLINDER END CAP STAMPING BEFORE APPLYING PRESSURE TO CYLINDER. EXCEEDING PRESSURE RATING AS SHOWN ON THE SERIAL NUMBER STAMPING ON THE CYLINDER MAY CAUSE FAILURE WHICH WILL ENDANGER EQUIPMENT AND PERSONNEL.

1.50 to 20.00 Bores

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INSTALLATION AND SERVICE INSTRUCTIONS
FOR SERIES 101K AND 101L CYLINDERS

1. GENERAL: The parts drawing illustrated gives a complete listing of parts and is applicable to the standard Series 101K Air / 101L Hydraulic cylinders. This parts drawing, when used in conjunction with the parts kits listed, should facilitate the ordering of replacement parts/kit by specifying part name/kits type required.

2. INSTALLATION OF CYLINDER: The seals and packings furnish as standard in the air/hydraulic cylinders operate most satisfactorily within the temperature range of -40°F to 200°F.

   For unusually high or low temperatures, or fluids other than petroleum base, different seal materials may have been used. (Reference 101KT [High Temperature], 101LT [High Temperature], 101LW [Water], and 101LG [Water Glycol]).

   For the cylinder to perform well, it must be properly installed. Alignment of the cylinder with the load is most important. Forcing rod, clevis pin, or mounting bolts into position indicates that the cylinder is not properly aligned and permanent damage may result from such installation.

   Protective port covers should not be removed before installation as dirt and other foreign particles may enter the cylinder. All pipe and fittings must be clean before making final connections.

3. PROCEDURE FOR REPLACEMENT OF ROD SEALS AND BEARINGS: The rod seal, bearing, cartridge O-ring, and wiper may be removed from the cylinder without disturbing the rest of the cylinder assembly.

   (I) Disconnect air/hydraulic lines from cylinder end cover ports and drain as applicable.

   (II) Remove rod gland retaining ring (14).

   (III) With both ports open, push piston rod (10) all the way in; block the head port, and with a jerking motion pull the rod out. Repeat until rod scraper (28), and bearing (9), with cartridge O-ring (31) and rod packing (29), come out of the head housing.

   (IV) Any defective parts should be replaced.

   (V) Reassemble with the replacement parts, cleaning them thoroughly.

   (VI) Prior to installation, rubber parts must be well coated with a compatible lubricant.

   (VII) Carefully guide the rod bearing and packing assembly onto the rod with a twisting motion and insert it into the head end cover. Replace scraper (28) and retaining ring (14).

4. PROCEDURE FOR REPACKING CYLINDERS: An eighteen- to twenty-four inch length of standard pipe of the same thread as the end cover port is required to facilitate end cover removal.

   (I) Disconnect air/hydraulic lines from the head and cap end ports of cylinder.

   (II) Clamp cylinder tube to prevent tube rotation, with slot in tube up, being careful not to squeeze or dent tube.

   (IV) Thread clean pipe into port of head end cover (1) or cap end cover (2) to remove and cover, by rotating either end cover in a counter-clockwise direction until beveled edge of internal key (13) appears at the milled opening in the tube (11). Insert a screwdriver under this beveled edge to start the internal key through the opening and continue to turn end cover counter-clockwise until internal key is removed.

   (V) Carefully pull end covers from tube using a slightly rotary motion.

   (VI) To disassemble cap end cover (2):

   A. Remove end cover O-ring (33) and as required, non-ext. ring (34).

   B. Remove ball check plug (53), spring (61), and ball (63).

   C. Remove cushioned needle (57) and O-ring (65).

   (VII) To disassemble head end cover (1):

   A. Remove rod gland retaining ring (14), rod scraper (28), and bearing (9), with cartridge O-ring (31) and rod packing (29) from housing bore.

   B. Remove end cover O-ring (33) and as required, non-ext. ring (34).

   C. Remove ball check plug (43), spring (46) and ball (48).

   (VIII) To disassemble piston rod (10) from tube (11), carefully push piston rod assembly to extreme end, as cylinder would be fully retracted, to obtain access to rear of piston.

   NOTE: Piston disassembly is required in all cases to remove piston rod and pistons (5) and (6) from tube except when SCR piston packing (26) is installed.

   A. 1.50 through 4.00 inch bores — non-cushioned:

   (1) Remove piston retaining nut (38), rear piston plate (6), and one piston packing U-cup (24).

   NOTE: At this point carefully push remaining piston assembly on through and out of tube (11) in the retracted movement direction.

   Pistons with SCR packing (26) can be removed, as noted above, without piston disassembly, by carefully pushing piston and piston rod assembly through the tube until removal is obtained.

   (2) Continue by removing piston support bearing (7), piston packing U-cup (24), forward piston plate (5), and piston seal O-rings (35).

   B. 5.00 through 8.00 inch bores — non-cushioned:

   (1) Remove piston cap screws (18), rear piston plate (6), and one piston packing U-cup (24). Remove piston rod from tube (11) per note above.

   (2) Remove piston support bearing (7), driver ring (16), piston packing U-cup (24), forward piston plate (5), and piston seal O-rings (35).

   C. 1.50 through 4.00 inch bores—cushioned both ends:

   (1) Remove cap cushion nut lock pin (55), cap cushion nut (38), cap cushion shim (59), cap cushion nose (60), cap cushion O-ring (64), rear piston plate (6), and one piston packing U-cup (24).

   NOTE: At this point carefully push remaining piston assembly on through and out of tube (11) in retracted movement direction.

   (2) Continue by removing piston support bearing (7), piston packing U-cup (24), forward piston plate (5), piston seal O-rings (35), head cushion O-ring (50), head cushion nose (41), head cushion shim (44), and head cushion ret. ring (47).

   D. 5.00 through 8.00 inch bores—cushioned both ends:

   (1) Remove cap cushion ret. ring (62), cap cushion shim (59), cap cushion nose (60), cap cushion O-ring (64), piston cap screws (18), rear piston plate (6), and one piston packing U-cup (24). Remove piston rod from tube (11) per note above.

   (2) Remove piston support bearing (7), driver ring (16), piston packing U-cup (24), forward piston plate (5), piston seal O-rings (35), head cushion O-ring (50), head cushion nose (41), head cushion shim (44), and head cushion ret. ring (47).

   NOTE: Removal of piston rod components for cushioned cap end and cushioned head end cylinders is a relative combination of non-cushioned and cushioned both end procedures.

Only genuine Orman Fluid Power replacement parts are to be used in this product.
CLEANING: Clean all parts thoroughly. The packings and seals are compatible with hydraulic oils, air and neutral fluids. The cleaning agent must also be compatible to avoid packing and seal damage.

6. INSPECTION:
   (i) Inspect all packings and seals for swelling, shrinking, wear, nicks, cuts and indentations. Discard all damaged packings and seals.
   (ii) Inspect bore of tube for excessive wear and any other defect that might damage piston packing or cause piston bypass.
   (iii) Inspect piston rod for signs of wear or any defect that may damage rod packing or rod bearing. Excessive wear on one side of piston rod or rod bearing usually indicates misalignment in the installation and should be corrected.
   (iv) Inspect all remaining items for evidence of damage or wear. In most cases, a little polishing of the various parts will restore them to like-new condition.

7. REPLACEMENT: Replace all damaged packings, seals and cylinder components.

8. REASSEMBLY: The procedure for reassembly is essentially the reverse of disassembly. The following should also be completed at reassembly:
   (i) All seals should be well coated with a compatible lubricant before and after they are installed in their respective grooves and prior to reassembly with the mating part.
   (ii) In assembly, care must be taken not to damage the seals, as this will cause leaking.
   (iii) Proper torque is required for the piston retaining nut (38), (1.50 through 4.00 inch bores)/piston cap screws (18), (5.00 through 8.00 inch bores).

NOTE: Lubricate all threads prior to installation.

9. TESTING:
   (i) After the cylinder has been completely reassembled, it should be tested, either on a test bench or in the installation. Watch for the following as the cylinder is cycled at normal operating pressure:
       A. Rod gland leakage
       B. Leakage at end cover seals
       C. Leakage at cushion, adjusting needle and ball checks

10. PRESSURE RATING:
    (i) LIGHT DUTY
        (Models: a,b,c,d,e,f,g)
        AIR: 150 PSI
        HYDRAULIC: 500 PSI
    (ii) HEAVY DUTY
         (Models: ah, bh, ch, dh, eh, fh, gh)
         AIR: 500 PSI
         HYDRAULIC: 1500 PSI

NOTE: If cylinders are to be stored for prolonged periods, contact Ortman Fluid Power for instructions.

NOTE: This product is not to be modified in any fashion without prior written approval from Ortman Fluid Power, or an authorized representative thereof.

WARRANTY
Seller warrants that any product of its manufacture, which upon examination is found by a Seller's representative to be defective in either workmanship or material under normal use and service, will, at Seller's option, be repaired or replaced free of charge including lowest transportation charges but not cost of installation or removal or have the purchase price refunded, provided that SELLER receives written claim specifying the defect within (2) years or 4,000 hours of use in normal service applications, whichever arrives first after Seller ships the product. Modified or special products shall be subject to special written warranty depending upon application of products. In no event shall Seller be liable for any claims, whether arising from breach of contract or warranty or claims of negligence or negligent manufacture, in excess of the purchase price. ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY WARRANTIES ON MERCHANTABILITY AND FITNESS FOR PARTICULAR USE ARE HEREBY DISCLAIMED. The foregoing expresses all of Seller's obligations and liabilities with respect to the quality of items furnished by it and it shall under no circumstances be liable for consequential, collateral or special losses or damages.

NOTE: DISASSEMBLY OF THIS PRODUCT voids WARRANTY

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