ARO
Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

Released: 12–8–95
Revised:

"2200" SERIES POWER MOTOR REVERSE ROTATION

Model 8596
350 R.P.M.

⚠ WARNING

READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

Pneumatic tools should always be installed and used in accordance with A.N.S.I. B186.1 "Safety Code For Portable Air Tools."

⚠WARNING

- Operate this tool at 90 p.s.i.g. (6.2 bar) maximum air pressure at the air inlet of the tool.
- Disconnect air supply from tool before removing/installing bit, socket or device attached to tool or performing maintenance procedures.
- Keep hands, clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Never exceed rated r.p.m. of tool.
- Wear suitable eye and hearing protection while operating tool.
- Tool shaft can continue to rotate briefly after throttle is released.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.
- Use only accessories recommended by ARO.

NOTICE

- The use of other than genuine ARO replacement parts may result in safety hazards, decreased tool performance and increased maintenance and may invalidate all warranties.
- ARO is not responsible for customer modification of tools for applications on which ARO was not consulted.
- Tool maintenance and repair should be performed by authorized, trained, competent personnel. Consult your nearest ARO authorized servicenter.
- It is the responsibility of the employer to place the information in this manual into the hands of the operator.

For parts and service information, contact your local ARO distributor, or the Customer Service Dept. of the Ingersoll–Rand Distribution Center, White House, TN at PH: (615) 672–0321, FAX: (615) 672–0801.

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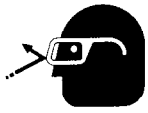
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ WARNING

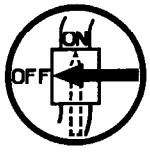


Wear eye protection when operating or performing maintenance on this tool.

⚠ WARNING

Wear hearing protection when operating this tool.

⚠ WARNING



Turn off air supply and disconnect air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

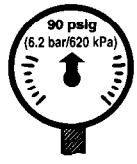
⚠ WARNING

Do not use damaged, frayed or deteriorated air hoses and fittings.

⚠ WARNING

Do not carry the tool by the hose.

⚠ WARNING



Operate at 90 p.s.i.g. (6.2 bar/620 kPa) maximum air pressure.

⚠ WARNING

Do not overreach when operating this tool. Keep body stance balanced and firm.

WARNING = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

CAUTION = Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTICE = Important installation, operation or maintenance information.

ROUTINE LUBRICATION REQUIREMENTS

Lack of or an excessive amount of lubrication will affect the performance and life of this tool. Use only recommended lubricants at below time intervals:

EVERY 8 HOURS OF TOOL OPERATION – Fill lubricator reservoir of recommended F.R.L. with spindle oil (29665). If an in line or air line lubricator is not used, apply several drops of spindle oil (29665) in air inlet.

EVERY 40 HOURS OF TOOL OPERATION – Flush tool with a solution of three parts cleaning solvent to one part light oil. After flushing, apply a small amount of spindle oil in air inlet and run free for one minute to insure proper lubrication.

EVERY 160 HOURS OF TOOL OPERATION – Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 1/4 oz. (7 g) of grease per reduction.

AIR SUPPLY REQUIREMENTS

For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- AIR PRESSURE – 90 p.s.i.g. (6.2 bar)
- AIR FILTRATION – 50 micron
- LUBRICATED AIR SUPPLY
- HOSE SIZE – 5/16" (8 mm) I.D.

An ARO® model C28231–810 air line FILTER/REGULATOR/LUBRICATOR (F.R.L.) is recommended to maintain the above air supply specifications.

RECOMMENDED LUBRICANTS

After disassembly is complete, all parts, except sealed or shielded bearings, should be washed with solvent. To relubricate parts, or for routine lubrication, use the following recommended lubricants:

Where Used	ARO Part #	Description
Air Motor	29665	1 qt Spindle Oil
"O" Rings & Lip Seals	36460	4 oz. Stringy Lubricant
Gears and Bearings	33153	5 lb. "EP" – NLGI #1 Grease

INSPECTION, MAINTENANCE AND INSTALLATION

Disconnect air supply from the tool or shut off air supply and exhaust (drain) line of compressed air before performing maintenance or service to the tool.

It is important that the tools be serviced and inspected at regular intervals for maintaining safe, trouble–free operation of the tool.

Be sure the tool is receiving adequate lubrication, as failure to lubricate can create hazardous operating conditions resulting from excessive wear.

Be sure that the air supply lines and connectors are of proper size to provide a sufficient quantity of air to the tool.

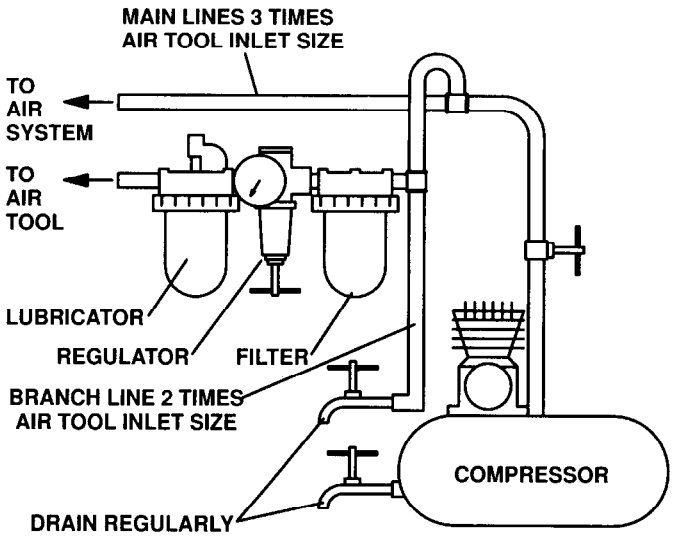
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. Maintenance and repair records should be maintained on all tools. Frequency of repair and the nature of the repairs can reveal unsafe application. Scheduled maintenance by competent authorized personnel should detect any mistreatment or abuse of the tool and worn parts. Corrective action should be taken before returning the tool for use.

Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded bearings should never be placed in solvent unless a good method of re–lubricating the bearing is available. Open bearings may be washed but should not be allowed to spin while being blown dry.

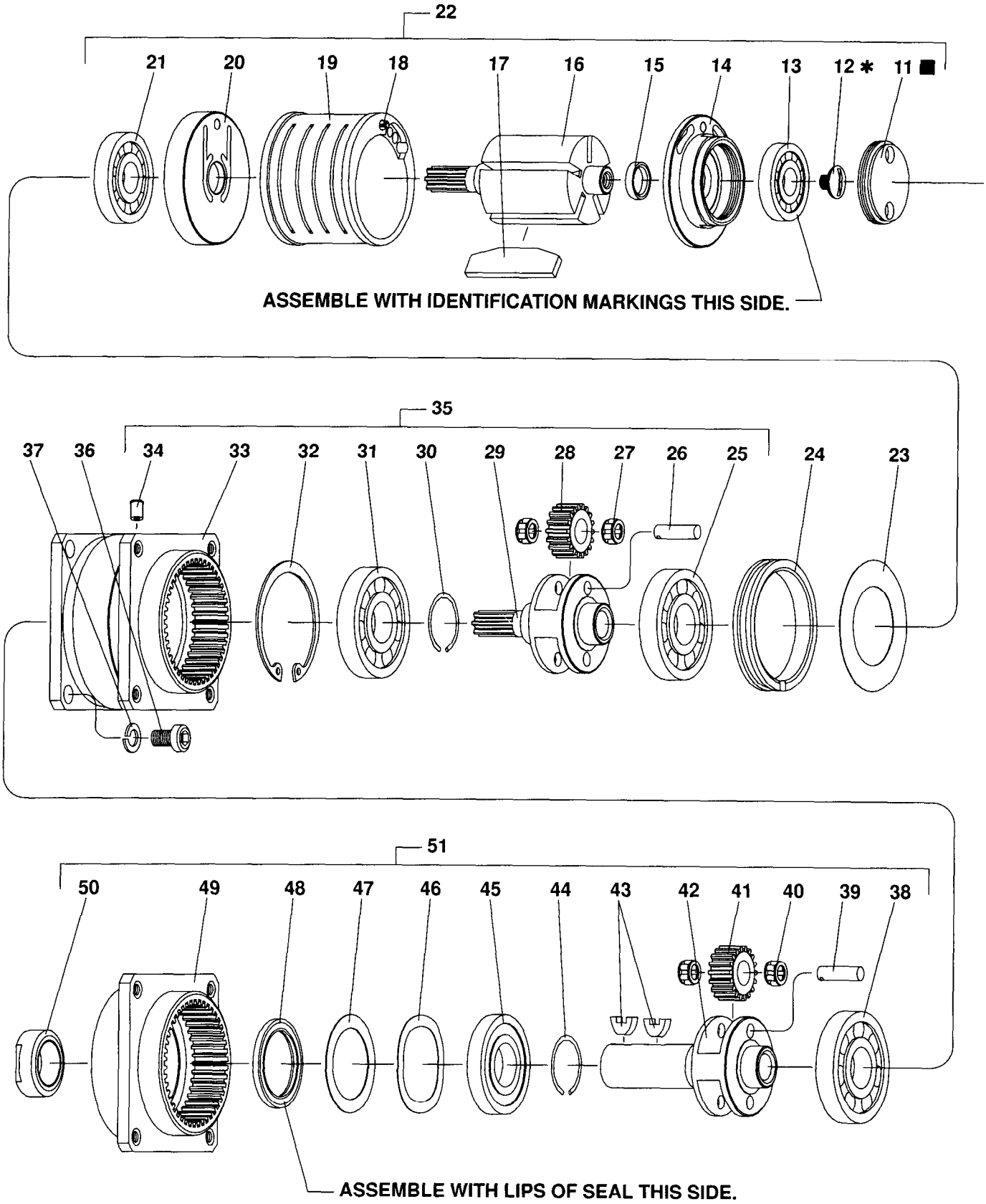
Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and other small parts in place while assembling.

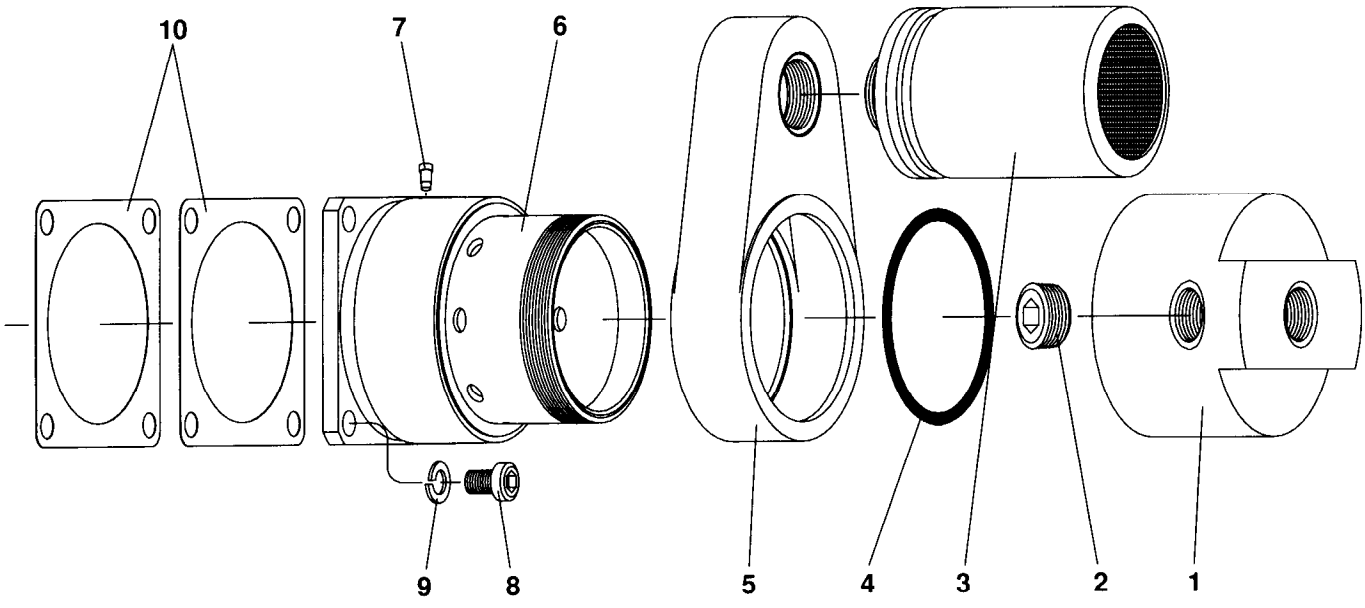
When replacement parts are necessary, consult drawing containing the part for identification.

Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes rust, scale, moisture and other debris from the air lines. Low air pressure (less than 90 p.s.i.g.) reduces the speed of the air tool. High air pressure (more than 90 p.s.i.g.) raises performance beyond the rated capacity of the tool and could cause injury. Shown below is a typical piping arrangement.



* TORQUE TO 28 IN. LBS.
■ TORQUE TO 9 – 12 FT LBS.





		PART NUMBER FOR ORDERING				PART NUMBER FOR ORDERING
1	Housing Cap	34498		27	Needle Bearing (4 req'd)	42271
2	Pipe Plug	Y227–3		28	Planet Gear (2 req'd) 18 teeth	46416
3	Muffler Assembly	43874–1		29	Spindle	40840
4	"O" Ring	Y325–129		30	Snap Ring	40843
5	Manifold	39855		31	Ball Bearing	33704
6	Housing Assembly (includes item 7)	37891		32	Retaining Ring	33708
7	Grease Fitting	35967		33	Housing Assembly (includes item 34)	37968
8	Screw (4 req'd)	Y154–52		34	Grease Fitting	35323
9	Washer (4 req'd)	Y14–10		35	Gearing Assembly (7.43:1)	40834
10	Gasket (2 req'd)	42338		36	Screw (4 req'd)	Y154–52
11	Nut	33694		37	Washer (4 req'd)	Y14–10
12	Sems Screw	33700		38	Ball Bearing	33704
13	Ball Bearing	33709		39	Shaft (2 req'd)	40841
14	Rear End Plate	34485		40	Needle Bearing (4 req'd)	42271
15	Spacer	33701		41	Planet Gear (2 req'd) 18 teeth	46416
16	Rotor	41521		42	Spindle	40838
17	Rotor Blade (5 req'd)	41520		43	Key (2 req'd)	41277
18	Roll Pin (2 req'd)	Y178–20		44	Snap Ring	40843
19	Cylinder Assembly (includes item 18)	35679		45	Ball Bearing	33706
20	Front End Plate	34486		46	Wave Washer	47589
21	Ball Bearing	33705		47	Washer	47590
22	Motor Assembly	42039–1		48	Seal	37389
23	Spacer	33699		49	Nose Housing	37878
24	Spacer	33711		50	Spacer	33697
25	Ball Bearing	33704		51	Gearing Assembly (7.43:1)	40831
26	Shaft (2 req'd)	40841				

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

NOTICE

- Never apply excessive pressure by a holding device which may cause distortion of a part.
- Apply pressure evenly to parts which have a press fit.
- Apply even pressure to the bearing race that will be press fitted to the mating part.
- Use correct tools and fixtures when servicing this tool.
- Don't damage "O" rings when servicing this tool.
- Use only genuine ARO replacement parts for this tool. When ordering, specify part number, description, tool model number and serial number.

DRIVE GEARING DISASSEMBLY

_ Remove keys (43) from spindle (42).

_ Remove screws (36) and washers (37), releasing drive gearing from tool.

_ Grasp nose housing (49) in one hand and tap drive end of spindle (42) with a soft face hammer; spindle and components will loosen from nose housing.

_ Gearing should not be disassembled further unless damage is evident, as Brinelling of the bearing races may occur, making replacement necessary.

_ To disassemble further, remove bearing (45).

_ Rotate snap ring (44) so the open portion will allow the removal of one shaft (39).

_ Remove shaft (39), releasing gear (41).

_ Repeat for removal of opposite shaft and gear.

_ To remove bearing (38), remove snap ring (44), insert shafts into spindle and alternately tap ends, loosening bearing.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

DRIVE GEARING ASSEMBLY

- _ Assemble snap ring (44) to spindle.
- _ Pack bearing (38) with ARO 33153 grease and assemble to spindle, pressing on inner race of bearing.
- _ Lubricate gears (41) and bearings (40) liberally with ARO 33153 grease and assemble one gear to spindle, securing with shaft (39).
- _ Repeat for assembly of opposite shaft and gear.
- _ Rotate opening of snap ring 90° from either shaft.
- _ Assemble bearing (45) to spindle, pressing on inner race of bearing.
- _ Lubricate seal (48) with ARO 36460 lube and assemble into nose housing (49). NOTE: Assemble seal with lips toward gearing.
- _ Assemble washer (47), wave washer (46) and spindle and components into nose housing.
- _ Assemble nose housing to tool and secure with screws (36) and washers (37).
- _ Assemble spacer (50) and keys (43) to spindle (42).

AUXILIARY GEARING DISASSEMBLY

- _ Remove drive gearing from tool.
- _ Remove screws (8) and washers (9), releasing auxiliary gearing from tool.
- _ Grasp housing (33) in one hand and tap drive end of spindle (29) with a soft face hammer; spindle and components will loosen from housing.
- _ Gearing should not be disassembled further unless damage is evident, as Brinelling of the bearing races may occur, making replacement necessary.
- _ To disassemble further, remove bearing (31).
- _ Rotate snap ring (30) so the open portion will allow the removal of one shaft (26).
- _ Remove shaft (26), releasing gear (28).
- _ Repeat for removal of opposite shaft and gear.
- _ To remove bearing (25), remove snap ring (30), insert shafts into spindle and alternately tap ends, loosening bearing.

AUXILIARY GEARING ASSEMBLY

- _ Assemble snap ring (30) to tool.
- _ Pack bearings (25 and 31) with ARO 33153 grease and assemble bearing (25) to spindle, pressing on inner race of bearing.
- _ Lubricate gears (28) and bearings (27) liberally with ARO 33153 grease and assemble one gear to spindle, securing with shaft (26).
- _ Repeat for opposite shaft and gear.
- _ Rotate opening of snap ring 90° from either shaft.
- _ Assemble bearing (31) to spindle, pressing on inner race of bearing.
- _ Assemble spindle and components into housing (33).
- _ Assemble housing (33) and components to tool and secure with screws (8) and washers (9). NOTE: Align grease fitting (34) with grease fitting (7).
- _ Assemble drive gearing to tool.

MOTOR DISASSEMBLY

- _ NOTE: The motor assembly can be removed from either end of housing (6).
- _ Remove screws (8) and washers (9), releasing gearing from tool.
- _ Remove motor assembly from housing (6).
- _ Using a spanner wrench, unthread and remove nut (11).
- _ Remove sems screw (12).
- _ Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.
- _ Remove bearing (13) and end plate (14) from rotor.

MOTOR ASSEMBLY

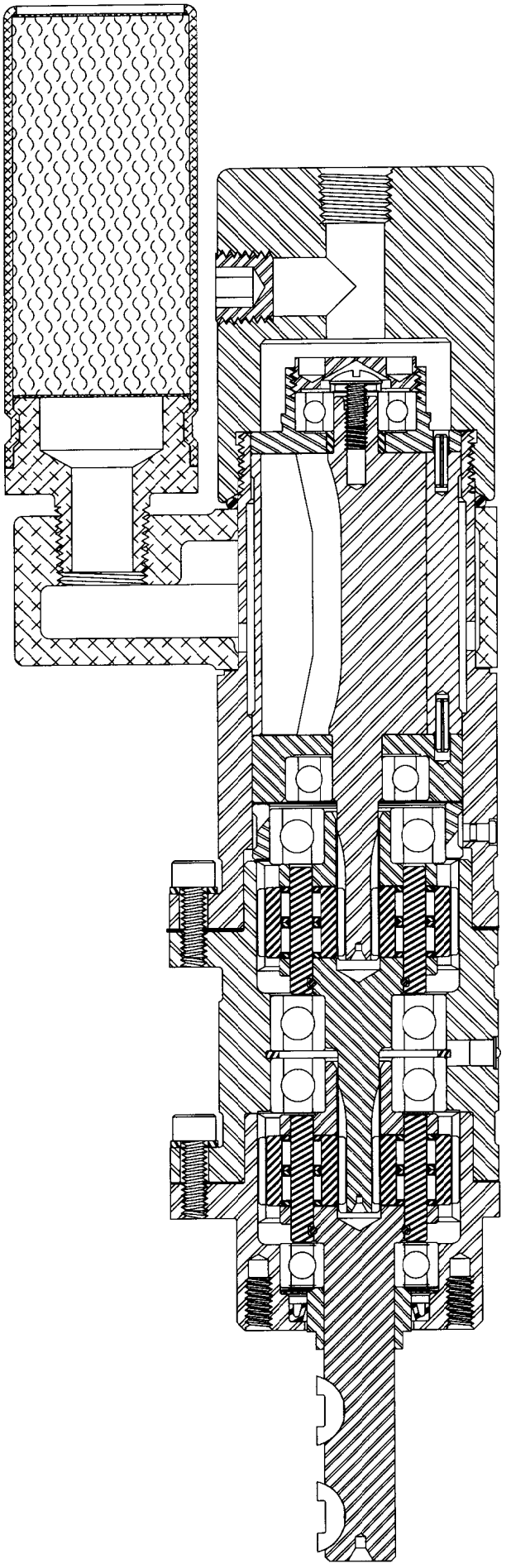
- _ Pack bearing (13) with ARO 33153 grease and assemble to end plate (14), pressing on outer race of bearing. NOTE: Assemble with bearing identification markings facing out.
- _ Assemble spacer (15) and end plate (14) to rotor, pressing on inner race of bearing.
- _ Assemble sems screw (12) to rotor, securing end plate. Torque screw to 28 in. lbs.
- _ Coat five rotor blades (17) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- _ Coat i.d. of cylinder (19) with ARO 29665 spindle oil and assemble over rotor, aligning roll pin (18) in end of cylinder with hole in end plate (14).
- _ Pack bearing (21) with ARO 33153 grease and assemble to end plate (20), pressing on outer race of bearing.
- _ Assemble end plate (20) to rotor, pressing on inner race of bearing. NOTE: Align hole in end plate with roll pin (18) in cylinder.
- _ Assemble nut (11) to end plate (14). Torque to 9 – 12 ft lbs. Be sure rotor turns without binding.
- _ Assemble motor assembly and spacers (23 and 24) into housing (6). NOTE: Assemble motor assembly with cylinder exhaust slots approximately 180° from muffler (3).
- _ Assemble two gaskets (10) and gearing to tool, securing with screws (8) and washers (9). NOTE: It may be necessary to use more gaskets (10) to prevent binding the motor assembly or less to prevent a loose motor assembly.

HEAD DISASSEMBLY

- _ Remove muffler (3) from manifold (5).
- _ Place housing cap (1) in a vise, clamping on flats.
- _ Unthread and remove housing (6).
- _ Remove "O" ring (4), releasing manifold (5).

HEAD ASSEMBLY

- _ Assemble manifold (5) to housing (6) and position so muffler (3) is approximately 180° from cylinder exhaust slots.
- _ Assemble "O" ring (4) to housing.
- _ Assemble housing cap (1) to tool and tighten.
- _ Assemble muffler (3) to manifold (5).



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