



Tool & Hoist Products

# OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

Released: 5-20-94

Revised:

## 2 H.P. POWER MOTOR

Models: 7786-( )



### **⚠ 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.

#### **⚠ WARNING**

Repeated prolonged operator exposure to vibrations which may be generated in the use of certain hand-held tools may produce Raynaud's phenomenon, commonly referred to as Whitefinger disease. The phenomenon produces numbness and burning sensations in the hand and may cause circulation and nerve damage as well as tissue necrosis. Repetitive users of hand-held tools who experience vibrations should closely monitor duration of use and their physical condition.

#### **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) 672-0601.

**ARO Tool & Hoist Products**

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**INGERSOLL-RAND®**  
**PROFESSIONAL TOOLS**

**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**



Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.

**⚠ WARNING**



Do not carry the tool by the hose.

**⚠ WARNING**



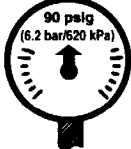
Do not use damaged, frayed or deteriorated air hoses and fittings.

**⚠ WARNING**



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

**⚠ WARNING**



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

**NOTICE**

<p><b>⚠ WARNING</b></p> <p>Read the manual before operating this tool. Operate at 90 psig/6.2 bar max.</p>	<p>This label must appear on the tool at all times. If it is lost or damaged, a replacement label is available at no cost.</p>
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PN 48176-1 LABEL

**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 160 HOURS OF TOOL OPERATION** – Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 “EP” grease (33153). Gearing should contain approximately 1/8 oz. (3.5 g) of grease per reduction. Right angle assembly should contain approximately 1/8 oz. (3.5 g) of grease.

## 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 – 3/4” (19 mm) I.D.

An ARO® model C28241–810 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.

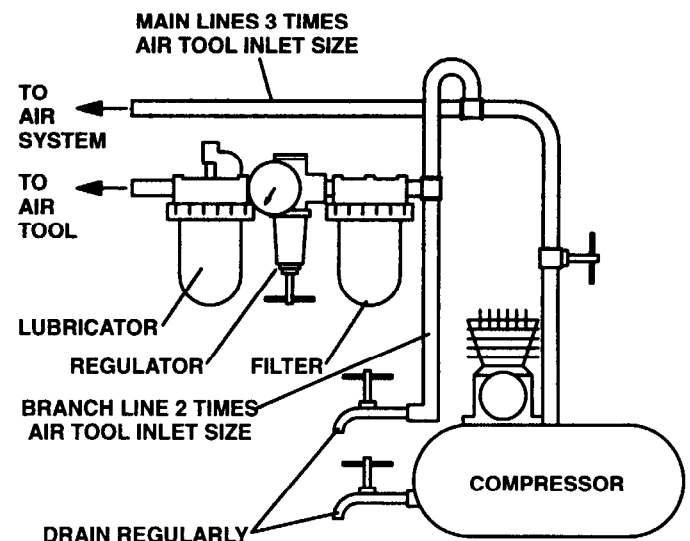
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. 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.



# DISASSEMBLY/ASSEMBLY INSTRUCTIONS

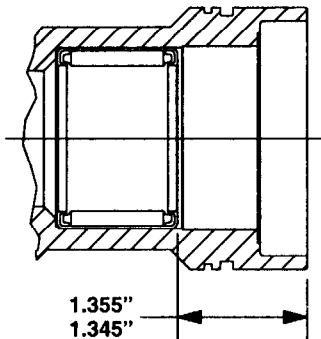
- Never apply excessive pressure by a holding device which may cause distortion of a part.
- Apply pressure evenly to parts which have a press fit.
- Apply even pressure to the bearing race that will be press fitted to the mating part.
- Use correct tools and fixtures when servicing this tool.
- Don't 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.

## CLUTCH DISASSEMBLY

- Using wrenches on flats of adapter (59) and lock nut (62), unthread lock nut (62) – LEFT HAND THREADS – releasing right angle assembly from tool.
- Clamp right angle housing (68) in a smooth face vise, with square drive "upright".
- Loosen set screws (67).
- Using a wrench on flats of lock nut (75), unthread lock nut (75) – LEFT HAND THREADS – releasing drive assembly.
- Do not disassemble further unless damage is evident. To disassemble, pull pinion (65) and components from housing (68).
- Remove retaining ring (63), releasing bearing (64).
- Do not remove bearing (66) unless damage is evident.

## RIGHT ANGLE ASSEMBLY

- Lubricate bearings with ARO 33153 grease before assembly.
- Assemble bearing (69) to housing, pressing flush with top of housing.
- Assemble bearing (66) to housing. NOTE: Bearing is to be located 1.345" from back edge of housing (68)(see illustration below).



- Assemble bearing (64) to pinion assembly (65), pressing on inner race of bearing.
- Assemble retaining ring (63) to pinion assembly, securing bearing.
- Coat the 1.500" outside diameter of pinion assembly (65) with ARO 33153 grease and assemble, with components, into housing, pressing on outer race of bearing (64).
- Assemble seal (74) to lock nut (75), with lips of seal toward bearing (73).
- Assemble bearing (73) to gear assembly (72 or 77), pressing on inner race of bearing.
- Assemble gear assembly into lock nut (75).
- Apply approximately 1/8 oz. (3.5 g) of ARO 33153 grease to gear teeth.
- Coat surface of pin of gear assembly (72 or 77) with ARO 33153 grease and assemble drive assembly into housing, securing with lock nut (75) – LEFT HAND THREADS. NOTE: Tighten lock nut to 165 – 185 ft lbs.
- Assemble set screws (67) to housing and tighten securely.
- Assemble lock nut (62) over housing.
- Assemble "O" ring (61) and snap ring (60) to housing.
- Assemble right angle assembly to tool, securing with lock nut (62) – LEFT HAND THREADS. NOTE: Tighten lock nut to 155

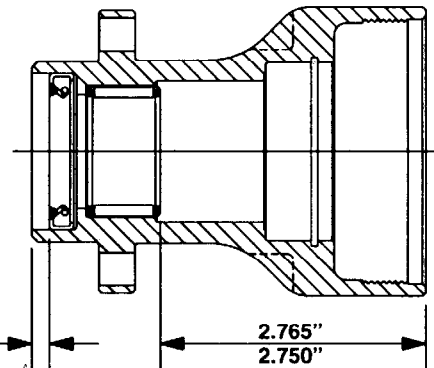
– 175 ft lbs.

## EXTENSION DISASSEMBLY

- Using wrenches on flats of front housing (56) and ring gear (38), unthread front housing – LEFT HAND THREADS – and pull housing and components from tool.
- Remove retaining ring (51).
- Push spindle (53) and components out rear of housing.
- Remove spacer (54) and bearing (52) from spindle (53).
- Do not remove bearing (55) or seal (57) unless damage is evident.

## EXTENSION ASSEMBLY

- Lubricate bearing (55) with ARO 33153 grease and press into housing (56). NOTE: Bearing is to be located 2.750" from back edge of housing (56)(see illustration below).
- Assemble seal (57) to housing, assembling to a depth of .180" from front edge of housing (56)(see illustration below). NOTE: Assemble seal with lips facing inward.



- Assemble bearing (52) to spindle (53), pressing on inner race of bearing.
- Coat spacer (54) with ARO 33153 grease and assemble to spindle.
- Coat the 1.125" outside diameter of spindle (53) with ARO 33153 grease and assemble into housing, pressing on outer race of bearing.
- Assemble retaining ring (51) to housing, securing spindle and components.
- Assemble housing (56) and components to tool, tightening housing to 145 – 165 ft lbs. – LEFT HAND THREADS.

## GEARING DISASSEMBLY

- Using wrenches on flats of ring gear (38) and front housing (56) or adapter (59), remove extension assembly or right angle assembly.
- Using wrenches on flats of ring gear (38) and housing (13), unthread and remove ring gear and components from tool.
- To remove front gearing, clamp spindle (45) in a vise and tap ring gear (38) away from spindle.
- To remove rear gearing, press spindle and components out rear end of ring gear.
- Remove retaining ring (36), releasing bearing (35).
- To remove gears (31 or 47), remove retaining ring (30 or 46), releasing pins (33).
- To remove bearing (40), alternately tap ends of pins (42).
- After removal of bearing (40), remove spacer (41) and pins (42), releasing gears (44).

## GEARING ASSEMBLY

- Lubricate bearings (43) with ARO 33153 grease and assemble two bearings to each gear (44).
- Lubricate teeth of gears (44) with ARO 33153 grease and assemble to spindle (45), securing with pins (42).

## DISASSEMBLY/ASSEMBLY INSTRUCTIONS

- Lubricate bearing (40) with ARO 33153 grease and assemble spacer (41) and bearing (40) to spindle, pressing on inner race of bearing.
- Be sure gearing contains approximately 1/8 oz. (3.5 g) of ARO 33153 grease and assemble spindle (45) and components into ring gear.
- Lubricate bearings (34) with ARO 33153 grease and assemble two bearings to each gear (31 or 47).
- Lubricate teeth of gears with ARO 33153 grease and assemble to spindle (32 or 48), securing with pins (33).
- Assemble retaining ring (30 or 46) to spindle, securing pins (33).
- Assemble bearing (35) to spindle, securing with retaining ring (36). NOTE: Press on inner race of bearing.
- Be sure gearing contains approximately 1/8 oz. (3.5 g) of ARO 33153 grease and assemble spindle and components into ring gear (38).
- Lubricate “O” ring (37) with ARO 36460 lubricant and assemble to groove in ring gear (38).
- Assemble ring gear (38) and components to tool, tightening ring gear to 145 – 165 ft lbs.
- Coat the .664” outside diameter of spindle (45) with ARO 33153 grease and assemble extension assembly or right angle assembly to tool.
- Lubricate bearing (29) with ARO 33153 grease and assemble into end plate (28), pressing on outer race of bearing. NOTE: Assemble bearing with shielded side out.
- Assemble end plate (28) to rotor, pressing on inner race of bearing.
- Assemble bearing retainer (20) to end plate (22), tightening to 110 – 130 ft lbs.
- Coat teeth of rotor (24) with ARO 33153 grease and assemble motor assembly into housing (13).
- Assemble gearing and extension assembly or right angle assembly to tool.

### HANDLE DISASSEMBLY

- Remove adapter (1) and “O” ring (2), releasing screen (3), spring (4) and valve assembly (5). NOTE: Do not remove seat (6) unless damage is evident.
- To remove valve stem (14), remove roll pin (15), releasing lever assembly.
- To remove screens (9 and 11), remove “O” ring (7) and exhaust sleeve (8) from housing (13).
- Remove screens (9 and 11), pad (10) and “O” rings (12) from exhaust sleeve (8).

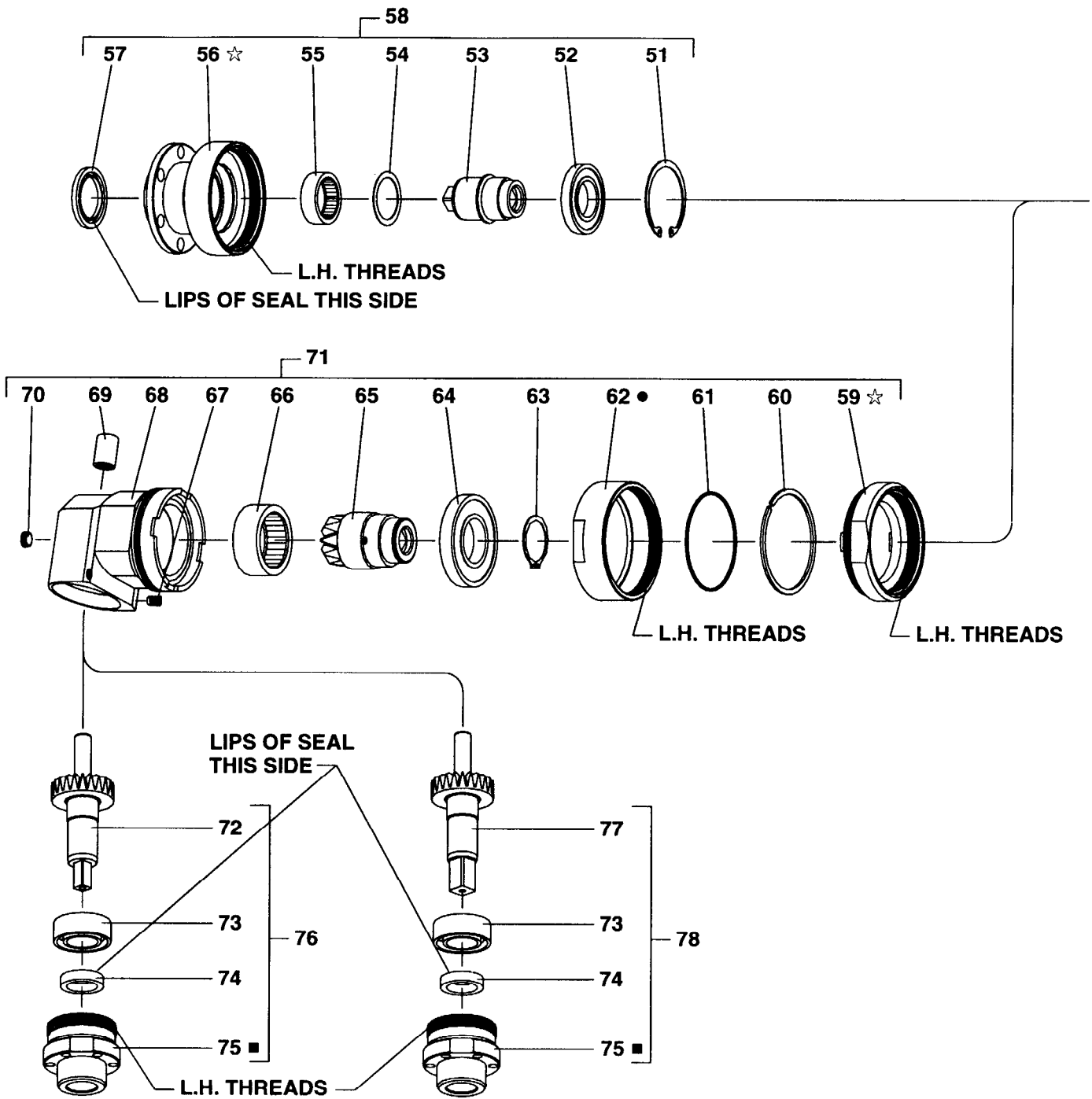
### HANDLE ASSEMBLY

- #### MOTOR DISASSEMBLY
- Remove extension assembly or right angle assembly and gearing from tool.
  - Tap front edge of housing (13) to remove motor assembly.
  - Unthread and remove bearing retainer (20).
  - Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.
  - Remove end plate (22) and bearing (21) from rotor.

#### MOTOR ASSEMBLY

- Lubricate bearing (21) with ARO 33153 grease and assemble into end plate (22), pressing on outer race of bearing. NOTE: Assemble bearing with the identification markings on the bearing facing out.
- Assemble spacer (23) and end plate (22) to rotor, pressing on inner race of bearing.
- Coat five rotor blades (25) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- Coat inside diameter of cylinder (27) with ARO 29665 spindle oil and assemble over rotor, aligning roll pin (26) with hole in end plate (22).

- Lubricate “O” rings (12) with ARO 36460 lubricant and assemble to grooves in exhaust sleeve (8).
- Assemble screen (11), exhaust pad (10) and screen (9) into exhaust sleeve (8).
- Assemble exhaust sleeve (8) and components to housing (13), securing with “O” ring (7).
- Assemble seat (6) into housing, with rounded corners into housing first.
- Coat valve stem (14) with ARO 29665 spindle oil and assemble into housing, with hole in valve stem in line with housing to accept valve assembly (5).
- Coat valve assembly (5) with ARO 29665 spindle oil and drop into housing. NOTE: Stem of valve assembly (5) must pass thru hole of valve stem (14). This can be checked by viewing thru motor end of housing.
- Assemble spring (4) and screen (3) into housing. NOTE: Assemble small end of spring into housing first.
- Lubricate “O” ring (2) with ARO 36460 lubricant and assemble to adapter (1).
- Assemble adapter (1) to housing, securing valve assembly (5) and components.
- Assemble lever assembly to housing, securing with roll pin (15).

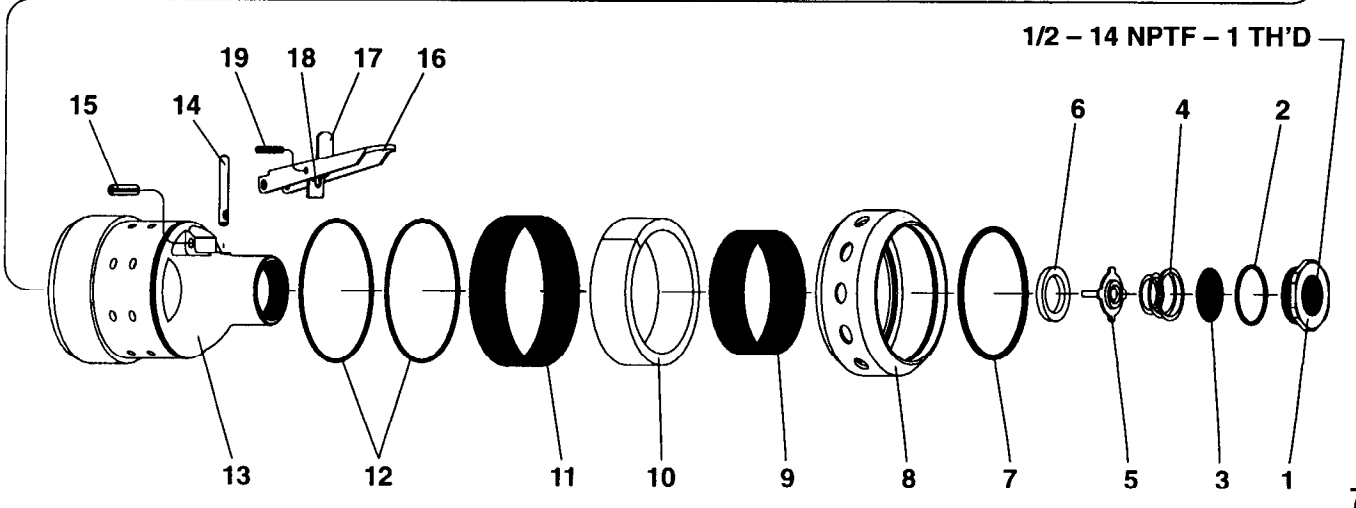
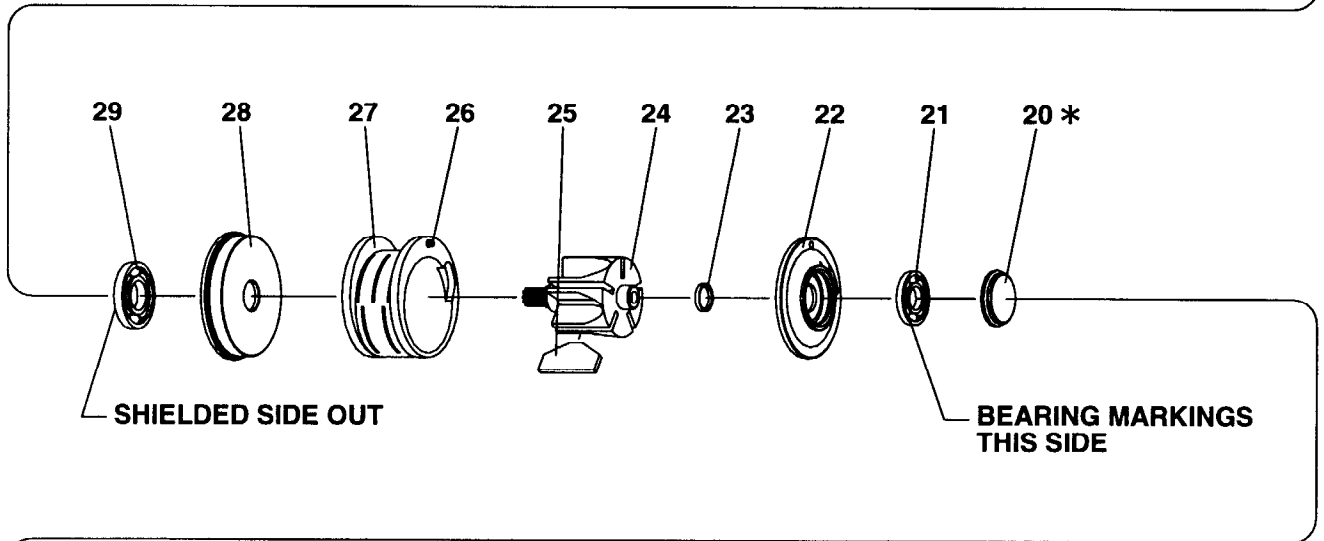
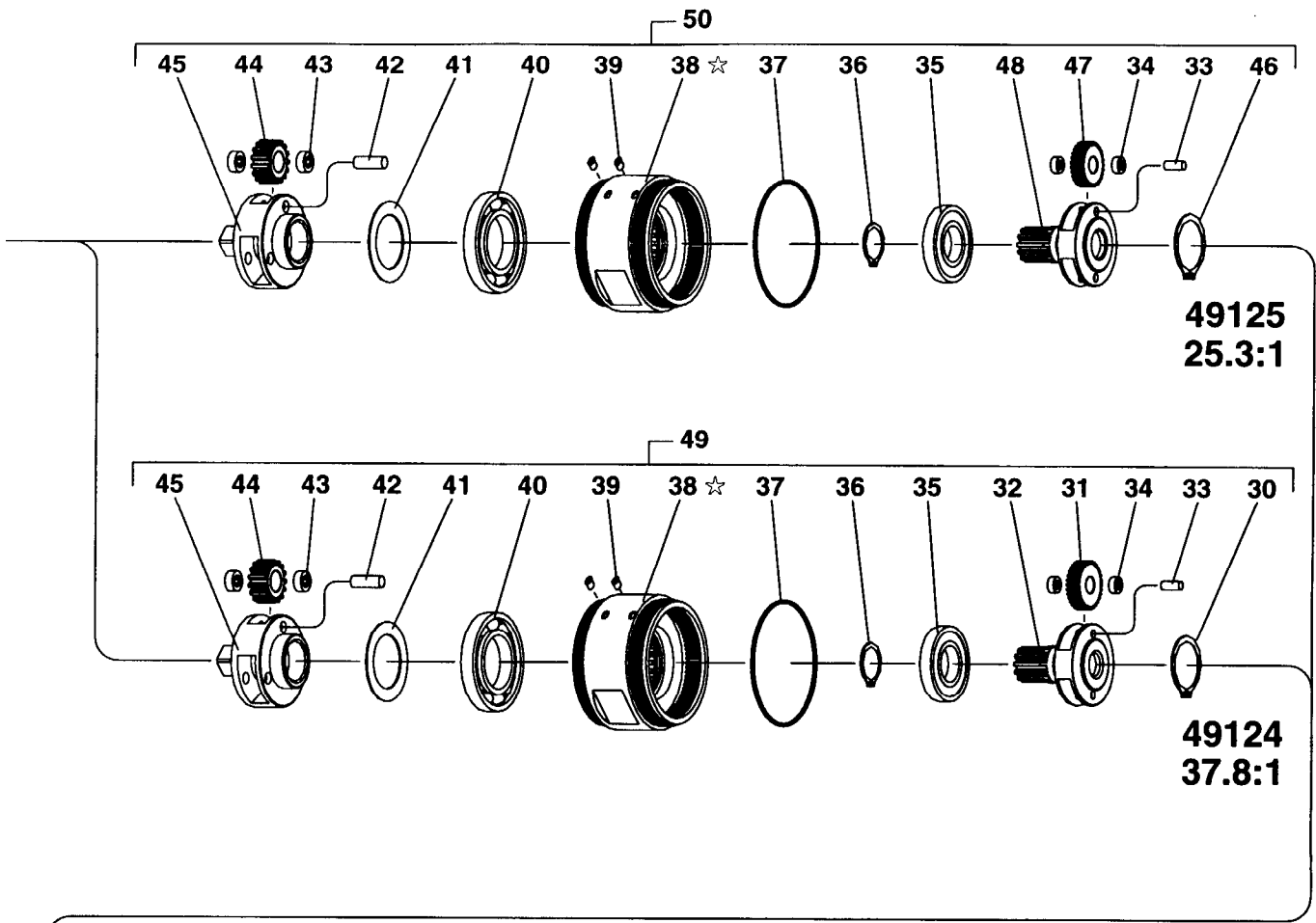


\* TORQUE TO 110 – 130 FT LBS.

☆ TORQUE TO 145 – 165 FT LBS.

● TORQUE TO 155 – 175 FT LBS.

■ TORQUE TO 165 – 185 FT LBS.



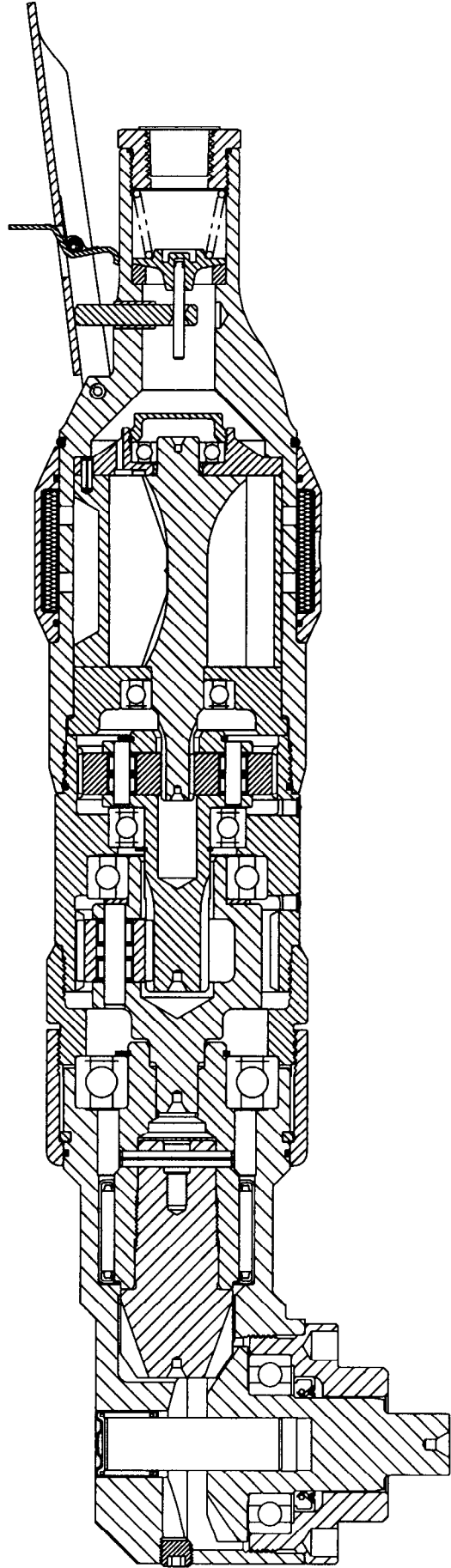
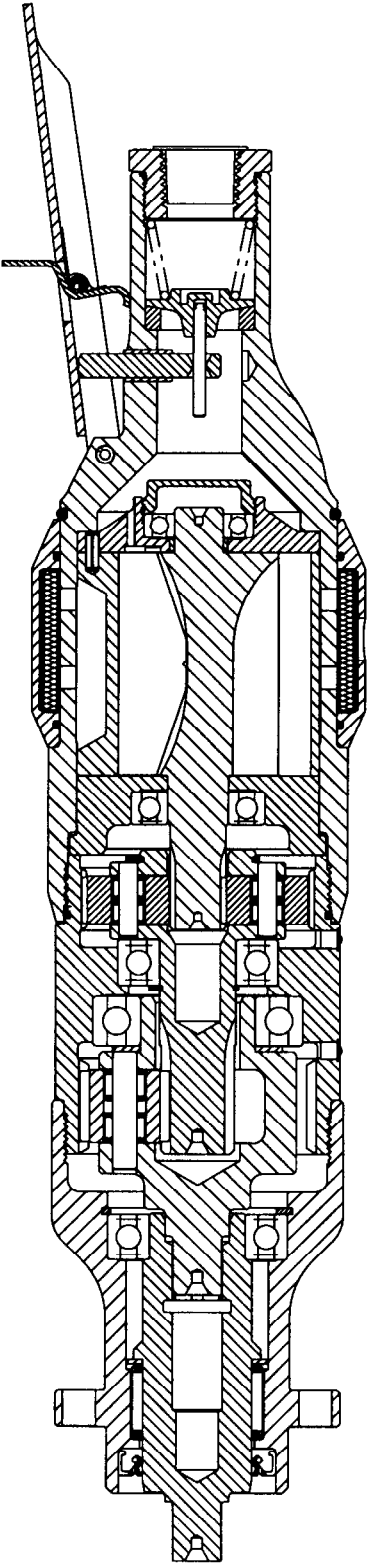
PART NUMBER FOR ORDERING

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1	Adapter .....	48975	39	Grease Fitting (2 req'd) .....	35323
2	"O" Ring .....	Y325-24	40	Ball Bearing .....	90444
3	Screen .....	46149	41	Spacer .....	49112
4	Spring .....	46834	42	Pin (3 req'd) .....	49114
5	Valve Assembly .....	48979	43	Needle Bearing (6 req'd) .....	49108
6	Seat .....	48973	44	Planet Gear (3 req'd) 4.5:1 ratio (15 teeth)	49111
7	"O" Ring .....	Y325-145	45	Spindle .....	49153
8	Exhaust Sleeve .....	49145	46	Retaining Ring .....	Y145-33
9	Exhaust Screen .....	49150	47	Planet Gear (2 req'd) 5.625:1 ratio (29 teeth) ...	49141
10	Exhaust Pad .....	49146	48	Spindle 5.625:1 ratio .....	49139
11	Exhaust Screen .....	49147	49	Gearing Assembly 37.8:1 ratio .....	49124
12	"O" Ring (2 req'd) .....	Y325-40	50	Gearing Assembly 25.3:1 ratio .....	49125
13	Housing Assembly .....	49118	51	Retaining Ring .....	Y147-18
14	Valve Stem .....	46198	52	Ball Bearing .....	43734
15	Roll Pin .....	Y178-78	53	Extension Spindle (1/2" square drive) ...	49154
16	Lever .....	48983	54	Spacer .....	49109
17	Arm .....	47474	55	Needle Bearing .....	49013
18	Spring .....	46291-1	56	Front Housing .....	49156
19	Roll Pin .....	46548	57	Seal .....	39582
	LEVER ASSEMBLY (includes items 16 thru 19) .	48984	58	Extension Assembly .....	49128
	HANDLE ASSEMBLY (includes items 1 thru 19) .	49123	59	Adapter .....	49152
20	Bearing Retainer .....	45189	60	Snap Ring .....	49155
21	Ball Bearing .....	48305-1	61	"O" Ring .....	Y325-37
22	Rear End Plate .....	49115	62	Lock Nut .....	49151
23	Spacer .....	49165	63	Retaining Ring .....	Y145-33
24	Rotor .....	See table	64	Ball Bearing .....	49149
25	Blade (5 req'd) .....	49144	65	Pinion Assembly .....	49130
26	Roll Pin .....	Y178-35	66	Needle Bearing .....	49148
27	Cylinder (includes item 26) .....	49116	67	Set Screw (2 req'd) .....	Y29-44
28	End Plate .....	49143	68	Right Angle Housing .....	49133
29	Ball Bearing .....	42086	69	Needle Bearing .....	49110
	MOTOR ASSEMBLY (includes items 20 thru 29) .	See table	70	Pipe Plug .....	Y227-2
30	Retaining Ring .....	Y145-1	71	Right Angle Assembly .....	49129
31	Planet Gear (2 req'd) 8.4:1 ratio (32 teeth)	49140	72	Gear Assembly (1/2" square drive) .....	49119
32	Spindle 8.4:1 ratio .....	49138	73	Ball Bearing .....	90444
33	Pin (2 req'd) .....	49113	74	Seal .....	39582
34	Needle Bearing (4 req'd) .....	33544	75	Lock Nut .....	49107
35	Ball Bearing .....	46926	76	Right Angle Gear Assembly (1/2" square drive) ..	49126
36	Retaining Ring .....	Y145-27	77	Gear Assembly (3/4" square drive) .....	49120
37	"O" Ring .....	Y325-38	78	Right Angle Gear Assembly (3/4" square drive) ..	49127
38	Ring Gear (includes item 39) .....	49122			

MODEL NUMBER	R.P.M.	ROTOR (ITEM 24)	MOTOR ASSEMBLY	GEARING ASSEMBLY	EXTENSION OR R.A. ASSEMBLY	R.A. GEAR ASSEMBLY
7786-1	200	49135	49121	49125	49129 (R.A.)	49126
7786-2	145	49134	49117	49124	49129 (R.A.)	49126
7786-3	145	49134	49117	49124	49129 (R.A.)	49127
7786-4	410	49135	49121	49125	49128 (EXT.)	
7786-5	310	49134	49117	49124	49128 (EXT.)	











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