



OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M40
MANUAL 11
Released: 4/73
Revised: 12-22-95
Form: 268-2

"0000" SERIES POWER MOTORS

Models: 861()-A



⚠ 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 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.
- 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 servicer.
- 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.

ARO Tool Products

Ingersoll-Rand Company

1725 U.S. No. 1 North • P.O. Box 8000 • Southern Pines, NC 28388-8000
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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



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



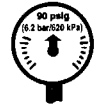
Wear hearing protection when operating this tool.

⚠ 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.

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.

MODEL IDENTIFICATION

MODEL NUMBER	TOTAL RED.	R.P.M.	ROTATION	HEAD ASSEMBLY	MOTOR ASSEMBLY	AUXILIARY GEARING	DRIVE GEARING	DRIVE SPINDLE
8610-A	25:1	1000	FORWARD	41051	40385	41049	41048	3/8" KEYED
8611-A	5:1	5000	FORWARD	41051	40385		41048	3/8" KEYED
8612-A	1:1	25,000	FORWARD	41051	40385		41050	3/8" KEYED
8613-A	25:1	1000	REVERSIBLE	41052	40371	41049	41048	3/8" KEYED
8614-A	5:1	5000	REVERSIBLE	41052	40371		41048	3/8" KEYED
8615-A	1:1	25,000	REVERSIBLE	41052	40371		41050	3/8" KEYED
8616-A	25:1	1000	FORWARD	41051	40385	41049	41062	3/8" THREADED
8617-A	5:1	5000	FORWARD	41051	40385		41062	3/8" THREADED
8618-A	1:1	25,000	FORWARD	41051	40385		41063	3/8" THREADED

 CANCELLED MODELS

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 (3) parts cleaning solvent to one (1) part spindle oil (or use kerosene). After flushing, apply a small amount of spindle oil in the 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 1/16 oz. (1.8 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.

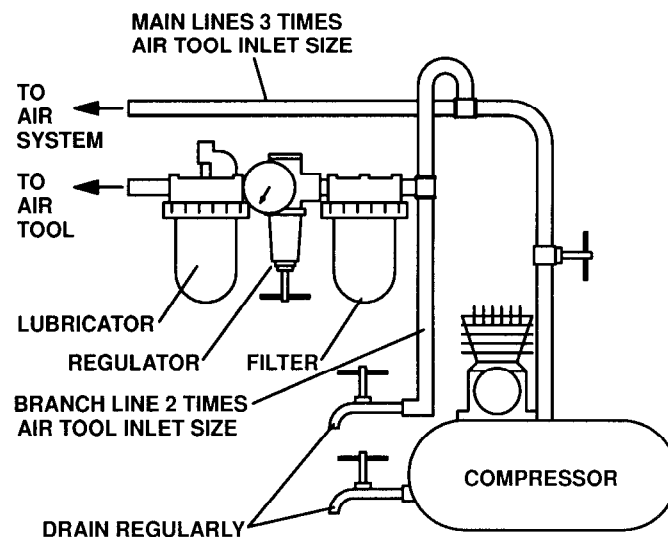
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

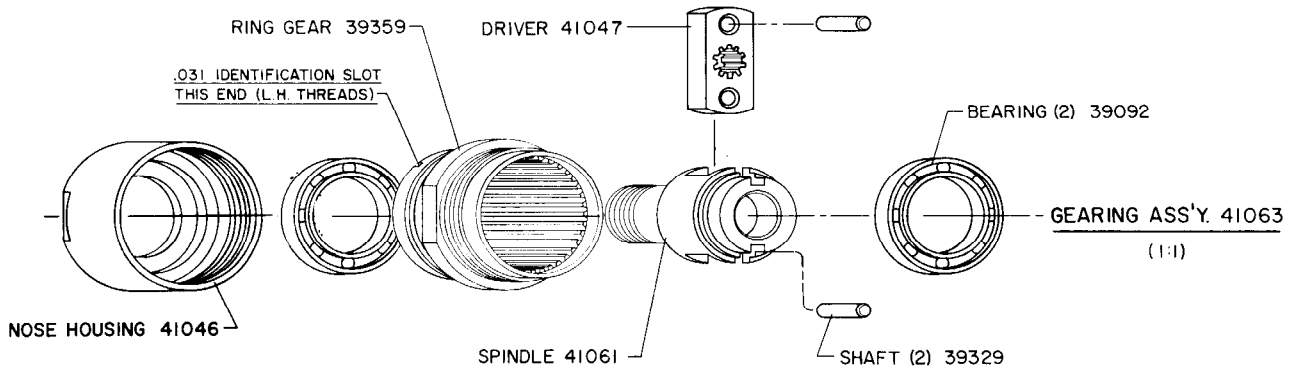
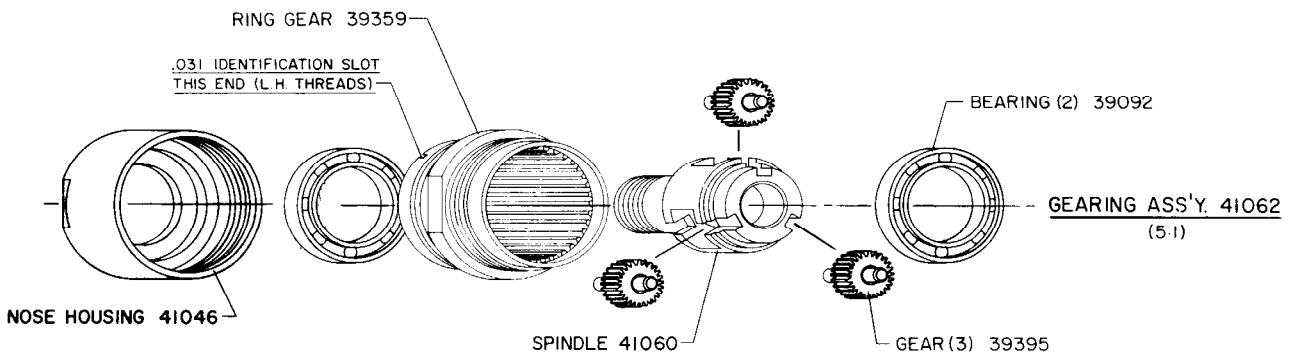
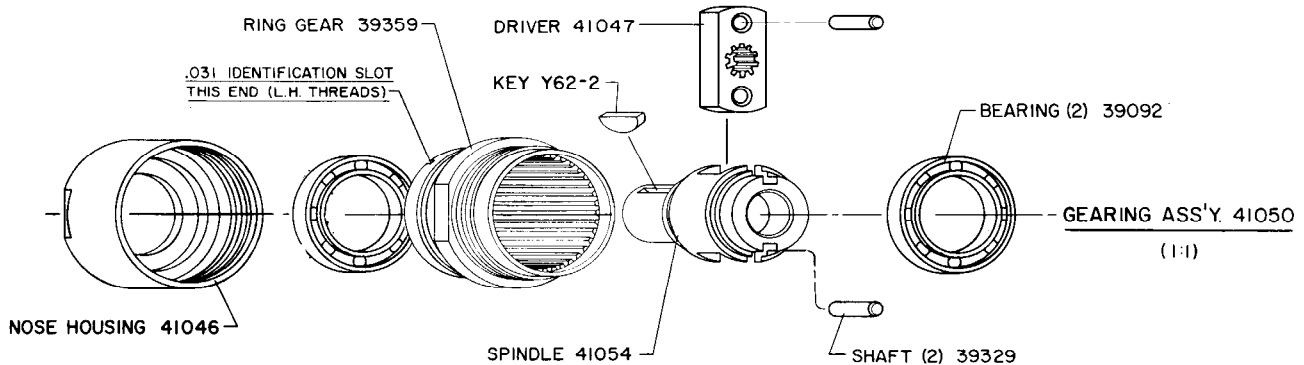
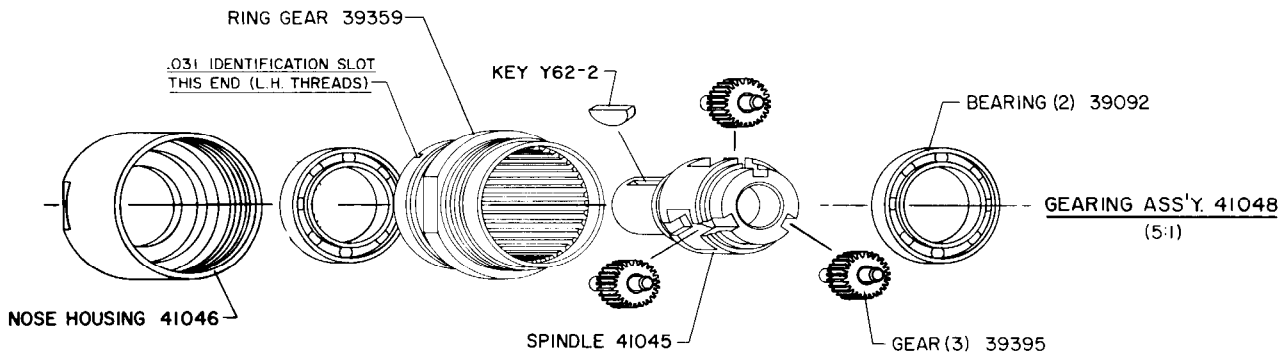
Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for “O” ring assembly. When assembling “O” rings or parts adjacent “O” rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually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



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

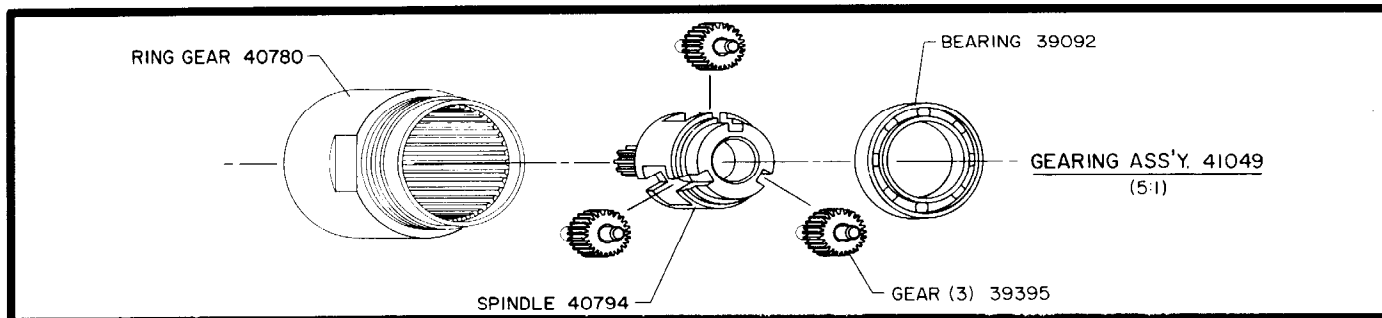
- Remove key (Y62-2).
- Using wrenches on flats of ring gear (39359) and ring gear (40780) or motor housing (41044), unthread and remove drive gearing.
- Unthread and remove nose housing (41046) from ring gear (39359), using wrenches on flats. NOTE: Nose housing has LEFT HAND THREADS.
- Grasp ring gear in one hand and tap drive end of spindle with a soft face hammer; spindle and components will loosen from ring gear.
- Gears (39395) may now be removed from the spindle.

- To remove driver (41047), remove shafts (39329).
- Do not remove bearings (39092) unless damage is evident.

DRIVE GEARING ASSEMBLY

- Pack bearings (39092) with ARO 33153 grease and assemble one bearing to "motor" end of spindle, pressing on inner race of bearing.
- Assemble other bearing (39092) to ring gear (39359), pressing on outer race of bearing. NOTE: Assemble bearing to the end of ring gear with the identification slot ("nose housing")

- end).
- Lubricate gears liberally with ARO 33153 grease and assemble to spindle. Gearing should contain approximately 1/16 oz. (1.8 g) of grease.
- Direct drive gearing: Assemble driver (41047) to spindle and secure with shafts (39329).
- Assemble spindle and components into ring gear (39359), pressing on outer race of bearing (39092).
- Assemble nose housing (41046) to ring gear (39359) – LEFT HAND THREADS – using wrenches on flats to tighten.



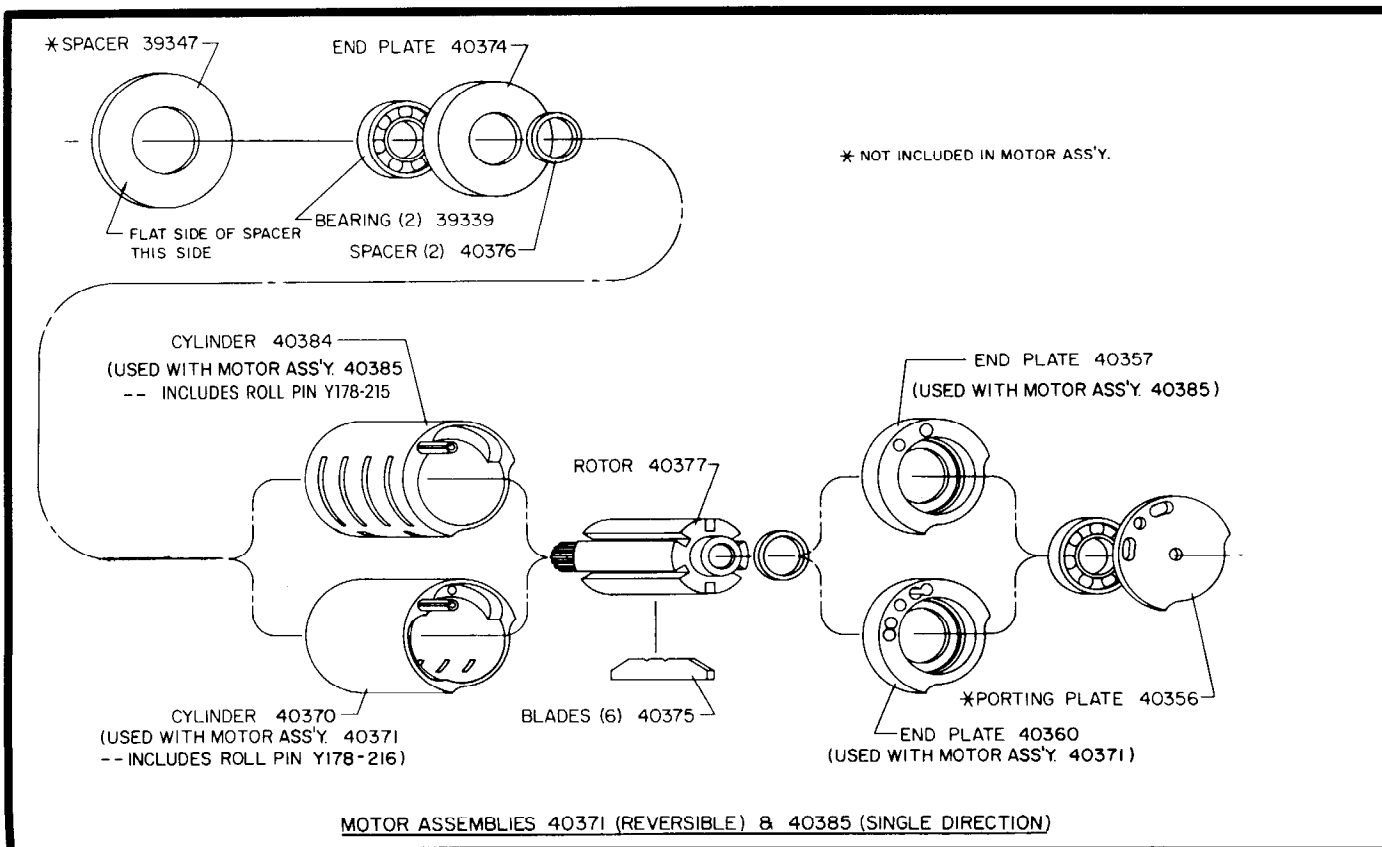
AUXILIARY GEARING DISASSEMBLY

- Remove drive gearing from tool.
- Using wrenches on flats of ring gear (40780) and motor housing (41044), unthread and remove auxiliary gearing from tool.
- Grasp ring gear in one hand and tap splined end of spindle with a soft face hammer; spindle and components will loosen from ring gear.
- Gears (39395) may now be removed from the spindle.
- Do not remove bearing (39092) unless damage is evident.

- to spindle, pressing on inner race of bearing.
- Lubricate gears (39395) liberally with ARO 33153 grease and assemble to spindle. Gearing should contain approximately 1/16 oz. (1.8 g) of grease.
- Assemble spindle and components into ring gear (40780), pressing on outer race of bearing.
- Assemble auxiliary gearing assembly to tool, using wrenches on flats of ring gear (40780) and motor housing (41044) to tighten.
- Assemble drive gearing to tool.

AUXILIARY GEARING ASSEMBLY

- Pack bearing (39092) with ARO 33153 grease and assemble



MOTOR ASSEMBLIES 40371 (REVERSIBLE) & 40385 (SINGLE DIRECTION)

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

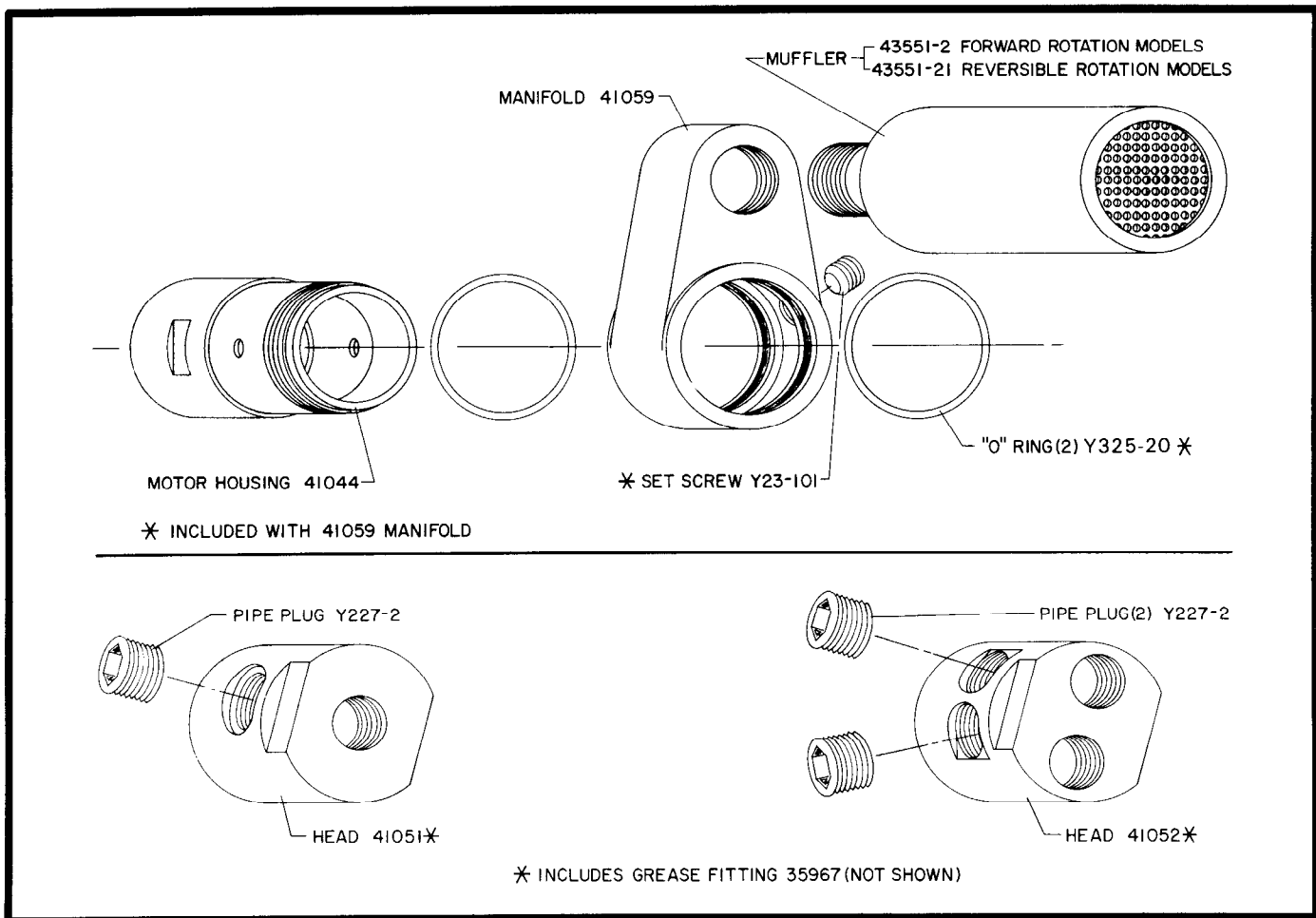
MOTOR DISASSEMBLY

- The motor assembly can be removed from either end of motor housing (41044).
- To remove from "gearing" end, remove gearing and spacer (39347) from tool.
- Tap front edge of motor housing to remove motor assembly.
- Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.
- Remove bearing (39339), rear end plate and spacer (40376) from rotor.

MOTOR ASSEMBLY

- Pack bearings (39339) with ARO 33153 grease and assemble to end plates, pressing on outer race of bearings.
- Assemble spacer (40376) and rear end plate (40357 or 40360) to rotor, pressing on inner race of bearing.
- Coat six rotor blades (40375) with ARO 29665 spindle oil and assemble to rotor slots — straight side out.

- Coat i.d. of cylinder with ARO 29665 spindle oil and assemble over rotor, aligning roll pin in cylinder with .086" diameter hole in end plate.
- Assemble spacer (40376) and front end plate (40374) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Assemble porting plate (40356) to motor, aligning roll pin in cylinder with hole in porting plate.
- Remove head from motor housing (41044) and place head in a vise, with the "motor" end in an upright position.
- Single Direction Models: Place motor on head, aligning air inlet holes of porting plate and end plate with .125" diameter (largest) hole of head. Align roll pin of cylinder with the 5/64" diameter hole to the right of the .125" diameter hole.
- Reversible Models: Place motor on head, aligning roll pin of cylinder with 5/64" diameter (smallest) hole of head.
- Assemble motor housing (41044), with manifold attached, to head and tighten, using wrenches on flats.
- Assemble spacer (39347) and gearing to tool. NOTE: Assemble spacer (39347) with counterbore toward gearing.



DISASSEMBLY/ASSEMBLY INSTRUCTIONS

HEAD AND MANIFOLD DISASSEMBLY

- Unthread and remove head, using wrenches on flats of head and motor housing (41044).
- Loosen set screw (Y23-101) and slide manifold off motor housing, allowing removal of "O" rings (Y325-20).

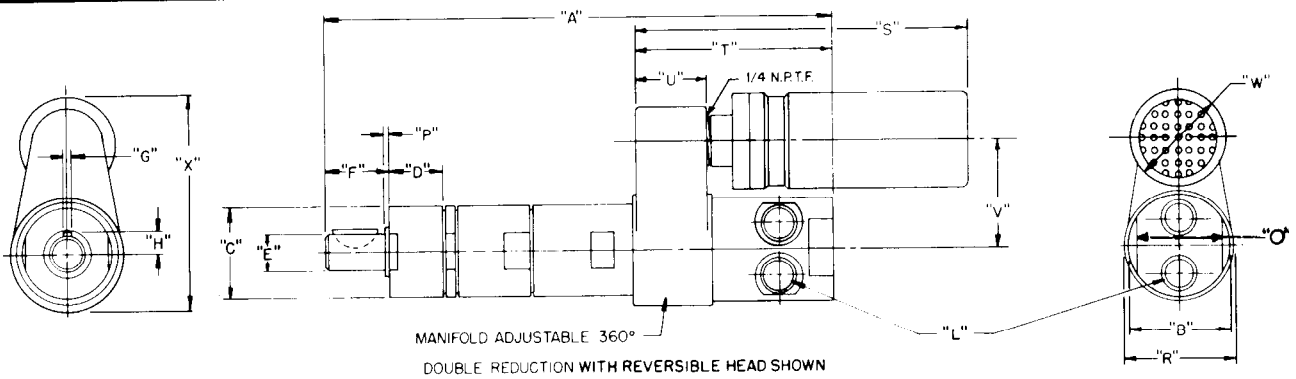
HEAD AND MANIFOLD ASSEMBLY

- Grease "O" rings (Y325-20) with ARO 36460 lube and assemble to grooves in manifold (41059).

- Assemble manifold to motor housing (41044), securing with set screw (Y23-101).
- Place head in a vise, with "motor" end in an upright position.
- Place porting plate (40356) and motor assembly on head, aligning roll pin in cylinder with hole in head (see "MOTOR ASSEMBLY").
- Assemble motor housing (41044) over motor assembly and secure to head, using wrenches on flats to tighten.
- Assemble spacer (39347) and gearing to tool. NOTE: Assemble spacer (39347) with counterbore toward gearing.

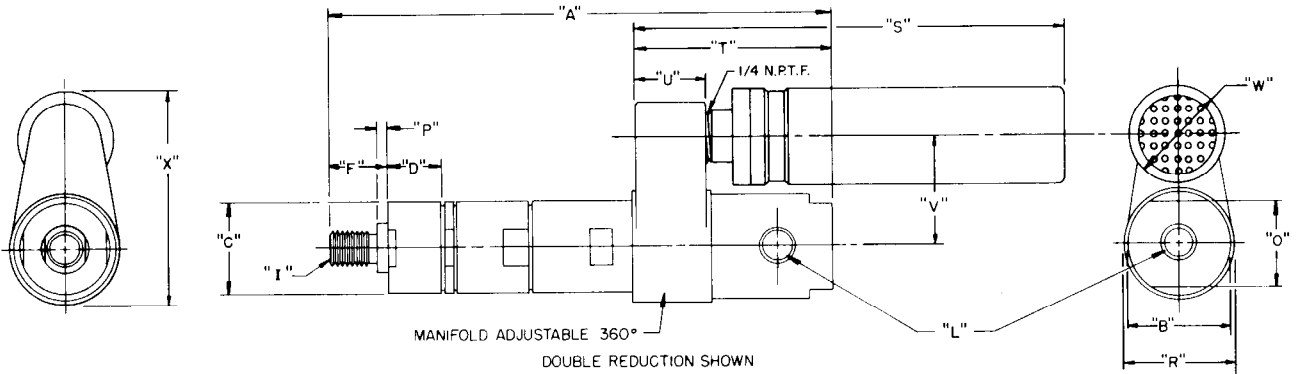
DIMENSIONAL DATA

M40
11



MODELS	GEAR REDUCTION	A
8611 A, 8612-A, 8614-A, 8615-A	SINGLE	4 1/2 114 MM
8610-A, 8613-A	DOUBLE	5-9/32 134 MM

	B	C	D	E	F	G	H	L	O	P	R	S	REVERSIBLE ROTATION	T	U	V	W	X
INCHES	1-1/16	.936 .937	.580 .590	.374 .375	.644 .691	.0938 .0948	.228 .238	1/8 NPTF	7/8	.024 .061	1-1/8	4-7/16	3-7/16	2-1/32	3/4	1-1/8	1	2 3/16
MM	27	23.774 23.799	14.732 14.986	9.499 9.525	16.357 17.551	2.3825 2.4079	5.791 6.045	AIR INLET	22	.609 1.549	28	113	87	51	19	28	25	55



MODELS	GEAR REDUCTION	A
8617-A, 8618-A	SINGLE	4-7/16 113 MM
8616-A	DOUBLE	5-7/32 132 MM

	B	C	D	F	I	L	O	P	R	S	T	U	V	W	X
INCHES	1 1/16	.936 .937	.580 .590	.581 .628	3/8-24 UNF-2A	1/8 NPTF AIR INLET	7/8	.149 .186	1-1/8	4-7/16	2 1/32	3/4	1-1/8	1	2 3/16
MM	27	23.774 23.799	14.732 14.986	14.757 15.951	TH'D.		22	3.784 4.724	28	113	51	19	28	25	55

TROUBLE SHOOTING

LISTED BELOW ARE SOME OF THE MOST COMMON CAUSES FOR THE POWER MOTOR TO MALFUNCTION. MALFUNCTIONS BEYOND THE SCOPE OF THIS MANUAL SHOULD BE BROUGHT TO THE ATTENTION OF YOUR ARO REPRESENTATIVE OR RETURN THE TOOL TO THE FACTORY FOR REPAIR.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
LOW SPEED OR FAILURE TO OPERATE.	1. INADEQUATE AIR SUPPLY.	1. CHECK AIR SUPPLY FOR CORRECT REGULATOR ADJUSTMENT (90 P.S.I.G. MAX. WHEN TOOL IS OPERATING).
	2. MOTOR AND/OR GEARING NOT BEING PROPERLY LUBRICATED.	2. REFER TO AIR AND LUBE REQUIREMENTS, PAGE 3.
	3. CLOGGED MUFFLER.	3. REPLACE MUFFLER.
	4. CLOGGED AIR INLET(S) TO MOTOR. STICKING, BADLY WORN OR BROKEN ROTOR BLADES OR BEARING IN MOTOR.	4. DISASSEMBLE, CLEAN, INSPECT. REPLACE BADLY WORN OR BROKEN ROTOR BLADES OR BEARINGS. REFER TO MOTOR DISASSEMBLY/ASSEMBLY, PAGES 5 AND 6.
	5. BADLY WORN BEARINGS OR GEARS IN GEARING SECTION.	5. DISASSEMBLE, CLEAN, INSPECT. REPLACE WORN OR DAMAGED PARTS. LUBRICATE. REFER TO GEARING DISASSEMBLY/ASSEMBLY, PAGES 4 AND 5.

TYPICAL CROSS SECTION OF TOOLS

