ARO Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

50 SERIES "QRT" SCREWDRIVERS

SECTION M30
MANUAL 17
Released: 4–2–90
Revised: 10–30–95
Form: 3645–2

Models: SQ054C–( )–( )

⚠ 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) 672–0801.

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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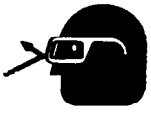
Part of worldwide Ingersoll-Rand

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.

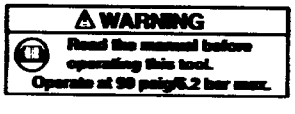
⚠ WARNING

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



PN 48176–1 LABEL

This label must appear on the tool at all times. If it is lost or damaged, a replacement label is available at no cost.

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 clutch parts with Molycote G–N grease (40036–1). Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 3/64 oz. (1.3 g) of grease for single reduction and 1/16 oz. (1.8 g) for double 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
Clutches	40036–1	1 lb. "EP" Molybdenum Disulfide and White Solid Lubricants in Mineral Oil

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.

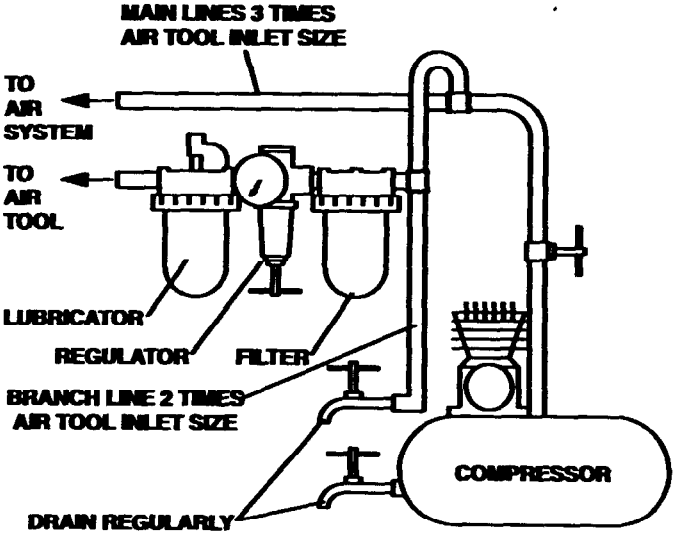
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

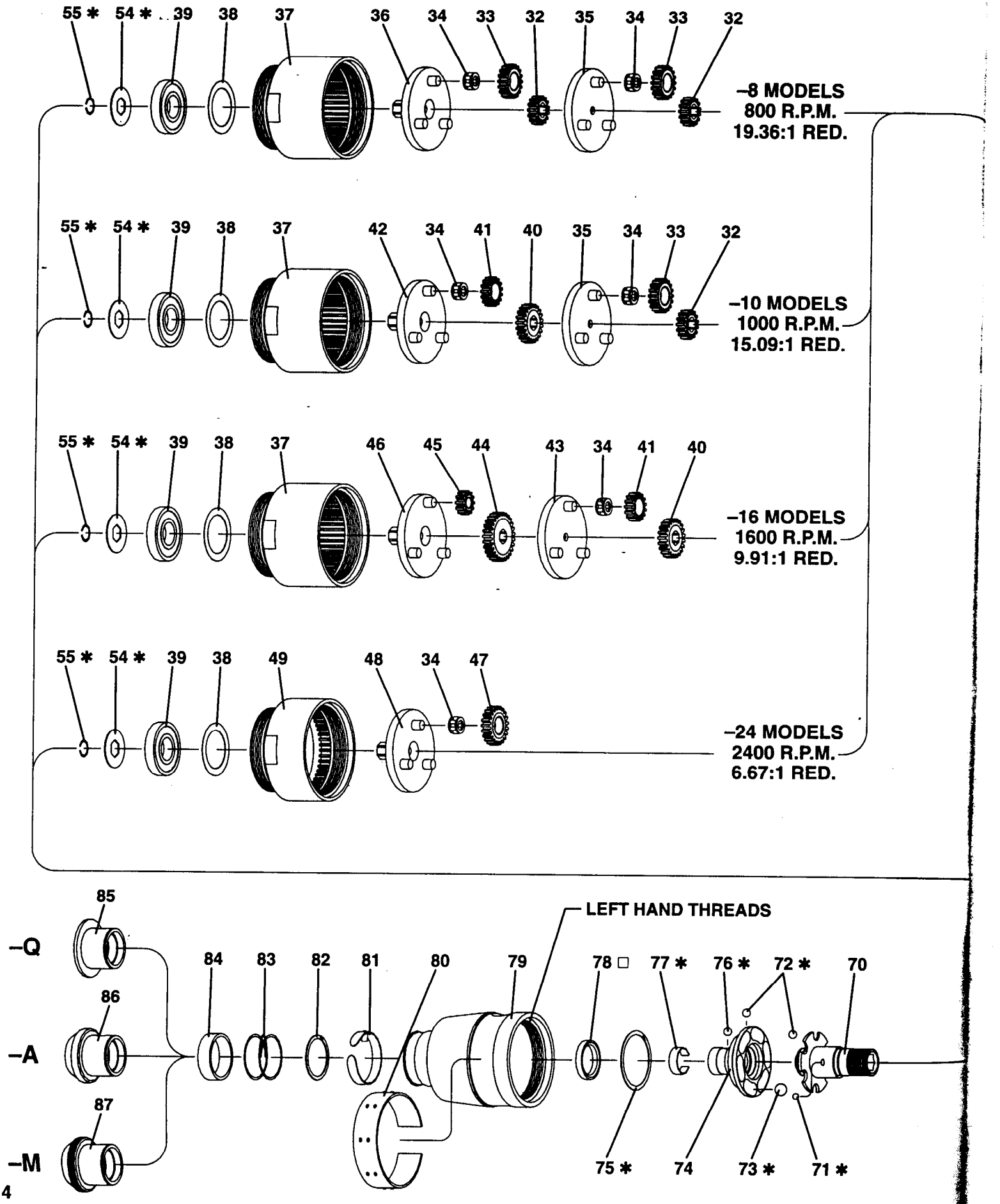
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded 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.

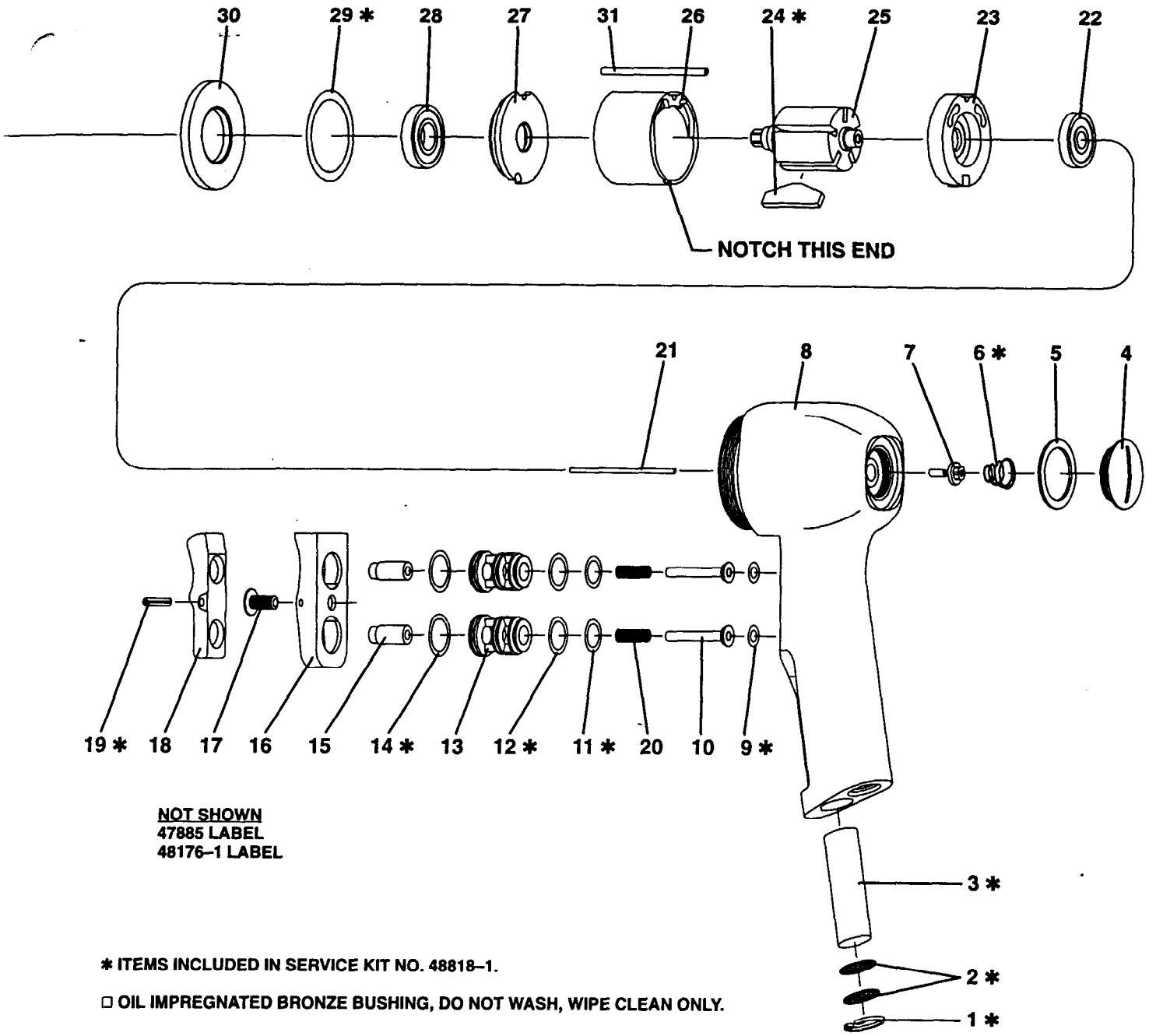
Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually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



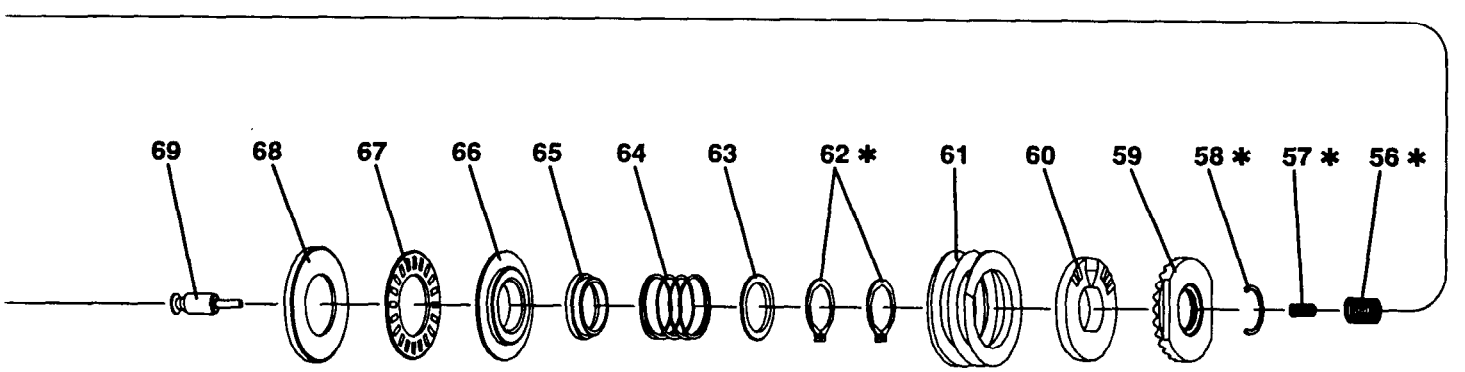

55 * 54 * 39 38 37 36 34 33 32 35 34 33 32
–8 MODELS
800 R.P.M.
19.36:1 RED.
55 * 54 * 39 38 37 42 34 41 40 35 34 33 32
–10 MODELS
1000 R.P.M.
15.09:1 RED.
55 * 54 * 39 38 37 46 45 44 43 34 41 40
–16 MODELS
1600 R.P.M.
9.91:1 RED.
55 * 54 * 39 38 49 48 34 47
–24 MODELS
2400 R.P.M.
6.67:1 RED.
LEFT HAND THREADS
–Q
–A
–M
85
86
87
84 83 82 81 80 79 78 □ 77 * 76 * 72 * 70
75 * 74 73 * 71 *



NOT SHOWN
47885 LABEL
48176–1 LABEL

* ITEMS INCLUDED IN SERVICE KIT NO. 48818–1.

□ OIL IMPREGNATED BRONZE BUSHING, DO NOT WASH, WIPE CLEAN ONLY.



		PART NUMBER FOR ORDERING
1	Retaining Ring	Y147–68
2	Screen (2 req'd)	42911
3	Muffler	47984–2
4	Screw	34793
5	Washer	31842
6	Spring	41654
7	Valve Assembly	47887
8	Housing and Bushing Assembly	47883
9	"O" Ring (2 req'd)	Y325–7
10	Valve Assembly (2 req'd)	47880
11	"O" Ring (2 req'd)	Y325–11
12	"O" Ring (2 req'd)	Y325–12
13	Bushing (2 req'd)	45465
14	"O" Ring (2 req'd)	Y325–13
15	Plunger (2 req'd)	47879
16	Shroud	45468
17	Screw	Y222–156–C
18	Trigger	45469
19	Roll Pin	Y178–25
20	Spring (2 req'd)	48806–1
21	Throttle Rod	See chart
22	Ball Bearing	47724
23	Rear End Plate	46312–1
24	Blade (5 req'd)	46413
25	Rotor	See chart
26	Cylinder	46311
27	Front End Plate	47722
28	Ball Bearing	Y65–13
	MOTOR ASSEMBLY (includes items 22 thru 28)	See chart
29	"O" Ring	Y325–214
30	Spacer	46412
31	Locating Pin	47723–1
32	Sun Gear (1 or 2 req'd) 4.4:1 ratio (15 teeth)	46466
33	Planet Gear (3 or 6 req'd) 4.4:1 ratio (18 teeth)	46900
34	Needle Bearing (3 or 6 req'd)	42315
35	Carrier Assembly 4.4:1 ratio	46522
36	Spindle Assembly 4.4:1 ratio	47753
37	Ring Gear (double reduction)	48904
38	Spacer	46496
39	Ball Bearing	Y65–13
40	Sun Gear 3.43:1 ratio (21 teeth)	46465
41	Planet Gear (3 req'd) 3.43:1 ratio (15 teeth)	46899
42	Spindle Assembly 3.43:1 ratio	47752
43	Carrier Assembly 3.43:1 ratio	46521
44	Sun Gear 2.89:1 ratio (27 teeth)	46464
45	Planet Gear (3 req'd) 2.89:1 ratio (12 teeth)	46460
46	Spindle Assembly 2.89:1 ratio	47751
47	Planet Gear (3 req'd) 6.67:1 ratio (21 teeth)	46901
48	Spindle Assembly 6.67:1 ratio	47750

		PART NUMBER FOR ORDERING
49	Ring Gear (single reduction)	48905
54	Washer	47694
55	Snap Ring	Y142–2
56	Spring	47709
57	Spring	48333–1
58	Snap Ring	Y110–105
59	Adjustment Nut	46895
60	Adjustment Washer	48093
61	Clutch Spring	See chart
62	Retaining Ring (2 req'd)	Y145–18
63	Guide	48295–1
64	Spring	47064
65	Ball Sleeve	48294–1
66	Thrust Race	48094
67	Thrust Bearing	38995
68	Thrust Race	48301–1
69	Plunger	48293–2
70	Spindle	48299–1
71	Ball (6 req'd)	Y16–203
72	Ball (23 req'd)	Y16–204
73	Ball (6 req'd)	Y16–206
74	Bit Holder	48298–1
75	Retaining Ring	48300–1
76	Ball	Y16–204
77	Retaining Clip	47695
	AUTO SHUT–OFF CLUTCH ASSEMBLY (includes items 56 thru 77)	See chart
78	Bushing	46360
79	Clutch Housing (includes items 78 and 80)	48901
80	External Adjustment Sleeve	46534
81	Retaining Clip and Pin	47782
82	Retaining Ring	47779
83	Spring	47778
84	Bushing	47775
85	Sleeve	47702
86	Magnetic Guide	47776
87	Magnetic Guide	47777
	GUIDE ASSEMBLY	
	Quick–Change Sleeve Assembly (includes items 82 thru 85)	46884
	Apex Magnetic Bit Holder Guide Assembly (includes items 82, 83, 84 and 86)	46885
	Magna Bit Magnetic Bit Holder Guide Assembly (includes items 82, 83, 84 and 87)	46886
	SERVICE KIT: includes items 1, 2, 3, 6, 9, 11, 12, 14, 19, 24, 29, 54, 55, 56, 57, 58, 62, 71, 72, 73, 75, 76, and 77	48818–1

MODEL NUMBER	R.P.M.	THROTTLE ROD (ITEM 21)	LENGTH	ROTOR (ITEM 25)	MOTOR ASSEMBLY	SPRING (ITEM 61)	TORQUE RANGE	CLUTCH ASSEMBLY
SQ054C–8–( )	800	46511–433	4.333"	46453	47726	48047 (YELLOW)	35 – 100 IN. LBS	48303–1
SQ054C–10–( )	1000	46511–433	4.333"	46453	47726	48047 (YELLOW)	35 – 80 IN. LBS	48303–1
SQ054C–16–( )	1600	46511–433	4.333"	46453	47726	48095 (BROWN)	25 – 60 IN. LBS	48303–2
SQ054C–24–( )	2400	46511–380	3.805"	46469	47725	48096 (GREEN)	15 – 40 IN. LBS	48303–3

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.

CLUTCH DISASSEMBLY

_ Clamp handle of tool in a smooth face vise.
_ Remove clutch housing, using a strap wrench – LEFT HAND THREADS.
_ Remove clutch assembly from tool.
_ Clamp 1/4" hex wrench in a vise, then place bit holder (74) and clutch assembly on it.
_ Remove snap ring (58).
_ Remove adjustment nut (59) using a 7/8" wrench.
_ Remove adjustment washer (60) and clutch spring (61).
_ Remove retaining rings (62).
_ Slide off guide (63), spring (64), ball sleeve (65), thrust race (66) and thrust bearing (67). NOTE: Removal of ball sleeve (65) releases six balls (71).
_ Remove thrust race (68), releasing six balls (73).
_ Remove retaining ring (75), then rotate bit holder to remove twelve balls (72). Separate bit holder (74) and spindle (70), releasing eleven balls (72).

CLUTCH ASSEMBLY

_ For clutch part lubrication, use ARO 40036–1 clutch lube type grease on parts as pointed out in this section.
_ Lubricate ball grooves of clutch spindle (70).
_ Install eleven balls (72) into groove.
_ Slide spindle into bit holder, securing balls.
_ Assemble twelve balls (72) into bit holder, then secure with retaining ring (75).
_ Lubricate ball pockets of bit holder and install six balls (73) into pockets, securing with thrust race (68).
_ Lubricate and assemble thrust bearing (67) and thrust race (66) to spindle.
_ Coat plunger (69) with spindle oil 29665 and assemble spring (57) to plunger. Assemble plunger and spring to spindle, securing with balls (71). NOTE: Assemble two balls per hole.
_ Secure balls with ball sleeve (65).
_ Assemble spring (64) and guide (63) to spindle, securing with retaining rings (62).
_ Install clutch spring (61).
_ Lubricate face of adjustment washer (60) and install on spindle.
_ Thread adjustment nut (59) onto spindle, securing with snap ring (58).
_ Lubricate ball (76) of bit holder.
_ Assemble spring (56) into spindle. NOTE: Assemble spring with large diameter into spindle first.
_ Assemble clutch assembly to tool.
_ Assemble clutch housing (79) to tool – LEFT HAND THREADS.

CLUTCH ADJUSTMENT

CAUTION: DISCONNECT AIR SUPPLY BEFORE ADJUSTING CLUTCH.

EXTERNAL:

_ Rotate sleeve (80) until opening in housing is visible.
_ Depress bit to engage clutch, then rotate until notch in adjustment washer (60) is visible.
_ Insert a No. 1 Phillips screwdriver in notch to turn gear teeth on nut (59).
_ Clockwise = decrease torque.
_ Counterclockwise = increase torque.

INTERNAL:

_ Remove clutch housing, bit holder and clutch assembly from tool. NOTE: Clutch housing has left hand threads.
_ With bit in bit holder, clamp bit in vise.
_ Place clutch assembly on bit holder.
_ Engage jaws, hold clutch assembly from turning, then rotate adjustment nut (59), using a 7/8" wrench.

GEARING DISASSEMBLY

_ Remove clutch from tool (see "Clutch Disassembly").
_ Remove ring gear (37 or 49), using a wrench on flats.
_ Remove snap ring (55) and washer (54).
_ Remove spindle(s) and gears from ring gear. NOTE: Keep gears grouped with mating spindle when disassembling 800, 1000 and 1600 r.p.m. gearing.
_ Do not remove bearing (39) or spacer (38) unless damage is evident.
_ To remove bearing (39) and spacer (38) from ring gear, press on spacer (38) inside ring gear from splined end.
_ Do not remove gears (32, 40 or 44) from carrier assemblies unless damage is evident. Gears are press fit onto carrier assemblies.

GEARING ASSEMBLY

_ Assemble spacer (38) into ring gear.
_ Press bearing (39) into ring gear. NOTE: Press on outer race of bearing and press to shoulder of ring gear.
_ Coat shafts of spindle(s) with ARO 33153 grease.
_ Assemble gears and bearings (34) to shafts of mating spindle.
_ Assemble carrier assembly to spindle assembly of 800, 1000 and 1600 r.p.m. gearing.
_ Assemble spindle(s) and gearing into ring gear. Rotate spindle and gears to align gear teeth with splines of ring gear.
_ Assemble washer (54) and snap ring (55) to spindle.
_ Thread ring gear to tool and tighten, using a wrench on flats.
_ Assemble clutch to tool.

MOTOR DISASSEMBLY

_ Remove clutch and gearing from tool.
_ Remove spacer (30) and throttle rod (21).
_ Tap front edge of housing to remove motor assembly. Locating pin (31) should also come out.
_ Tap drive end of rotor (25) with a soft face hammer; motor will come apart. NOTE: Bearings are press fit on rotor.
_ Remove end plate (23) and bearing (22) from rotor.

MOTOR ASSEMBLY

_ Lubricate bearing (22) with ARO 33153 grease and assemble into end plate (23), pressing on outer race of bearing.
_ Assemble end plate (23) to rotor, pressing on inner race of bearing.
_ Coat five rotor blades (24) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
_ Coat i.d. of cylinder (26) with ARO 29665 spindle oil and assemble over rotor. NOTE: Air inlet slots in end of cylinder must be aligned with two air inlet slots in end plate (23).
_ Assemble bearing (28) to end plate (27), pressing on outer race of bearing.
_ Assemble end plate (27) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

- Insert locating pin (31) into .096" diameter blind hole at bottom of motor cavity in housing.
- Align notches of end plates and cylinder and install motor into housing, aligning notches with pin (31).
- Grease and assemble "O" ring (29) to end plate.
- Assemble spacer (30) to tool.
- Coat throttle rod (21) with ARO 29665 spindle oil and insert into rotor.
- Assemble gearing and clutch to tool.

HOUSING DISASSEMBLY

- Remove roll pin (19), releasing trigger (18).
- Remove screw (17), releasing shroud (16).
- Grasp end of valve (10) and pull to remove valve assembly with bushing (13).
- Remove retaining ring (1) and screens (2) to remove muffler (3).
- Remove screw (4), washer (5), spring (6) and valve assembly (7).

HOUSING ASSEMBLY

NOTE: When a part containing "O" rings has been removed from tool, it is recommended the "O" rings be replaced upon assembly. Lubricate all "O" rings with ARO 36460 grease when assembling.

- Assemble "O" rings (14, 12 and 11) to bushing (13).
- Assemble "O" rings (9) to valves (10).
- Lubricate plungers (15) and valves (10) with ARO 29665 spindle oil.
- Assemble spring (20) to valve (10).
- Assemble plungers (15) and valves (10) to bushings (13).
- Assemble bushings and shroud (16) to tool, securing with screw (17). NOTE: Flats of bushings must be aligned with flats of shroud (16).
- Assemble trigger (18) to tool, securing with roll pin (19).
- Assemble valve assembly (7) and spring (6) to tool, securing with washer (5) and screw (4).
- Assemble muffler (3) and two screens (2) to tool, securing with retaining ring (1).