ARO Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M30
MANUAL 14
Released: 4–2–90
Revised: 10–30–95
Form: 3644–2

20 SERIES "QRT" SCREWDRIVERS

Models: SQ024C–( )–( )

⚠ 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.

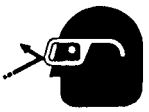
For parts and service information, contact your local ARO distributor, or the Customer Service Dept. of the Ingersoll–Rand Distribution Center, White House, TN at PH: (615) 672–0321, FAX: (615) 672–0801.

ARO Tool Products
Ingersoll–Rand Company
1725 U.S. No. 1 North • P.O. Box 8000 • Southern Pines, NC 28388–8000

ARO®
Part of worldwide Ingersoll-Rand

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ WARNING

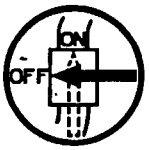


Wear eye protection when operating or performing maintenance on this tool.

⚠ 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.

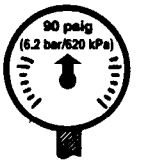
⚠ WARNING

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

⚠ WARNING

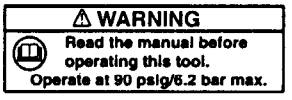
Do not overreach when operating this tool. Keep body stance balanced and firm.

⚠ WARNING



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

NOTICE



PN 48176–1 LABEL
(NON–EU MODELS)

PN 49883 LABEL
(–EU MODELS)

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 molybdenum grease (40036–1). Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 1/32 oz. (.9 g) of grease for single reduction and 3/64 oz. (1.3 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.

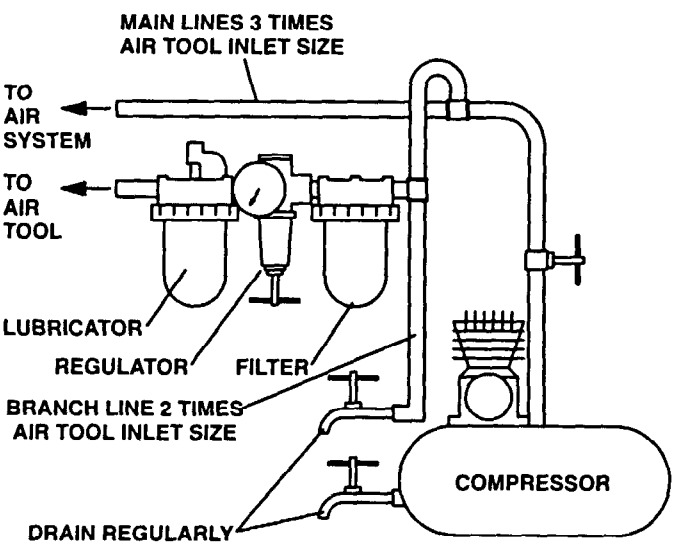
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

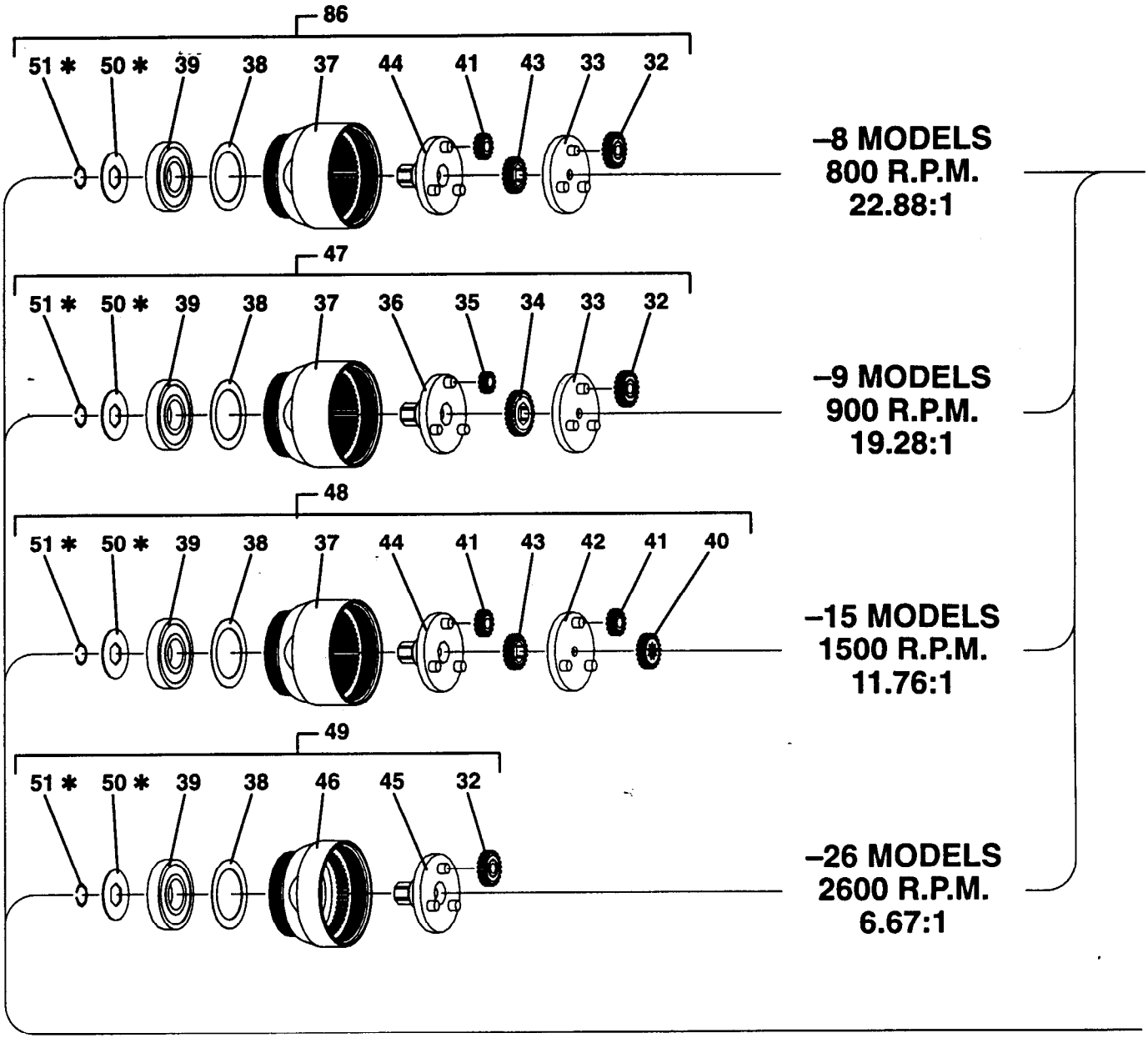
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded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

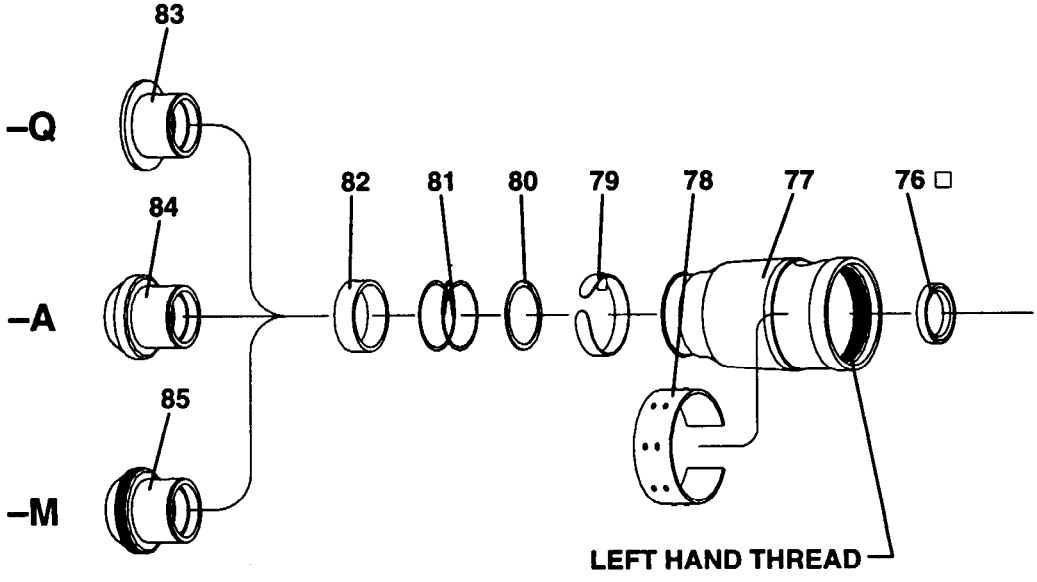
Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually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

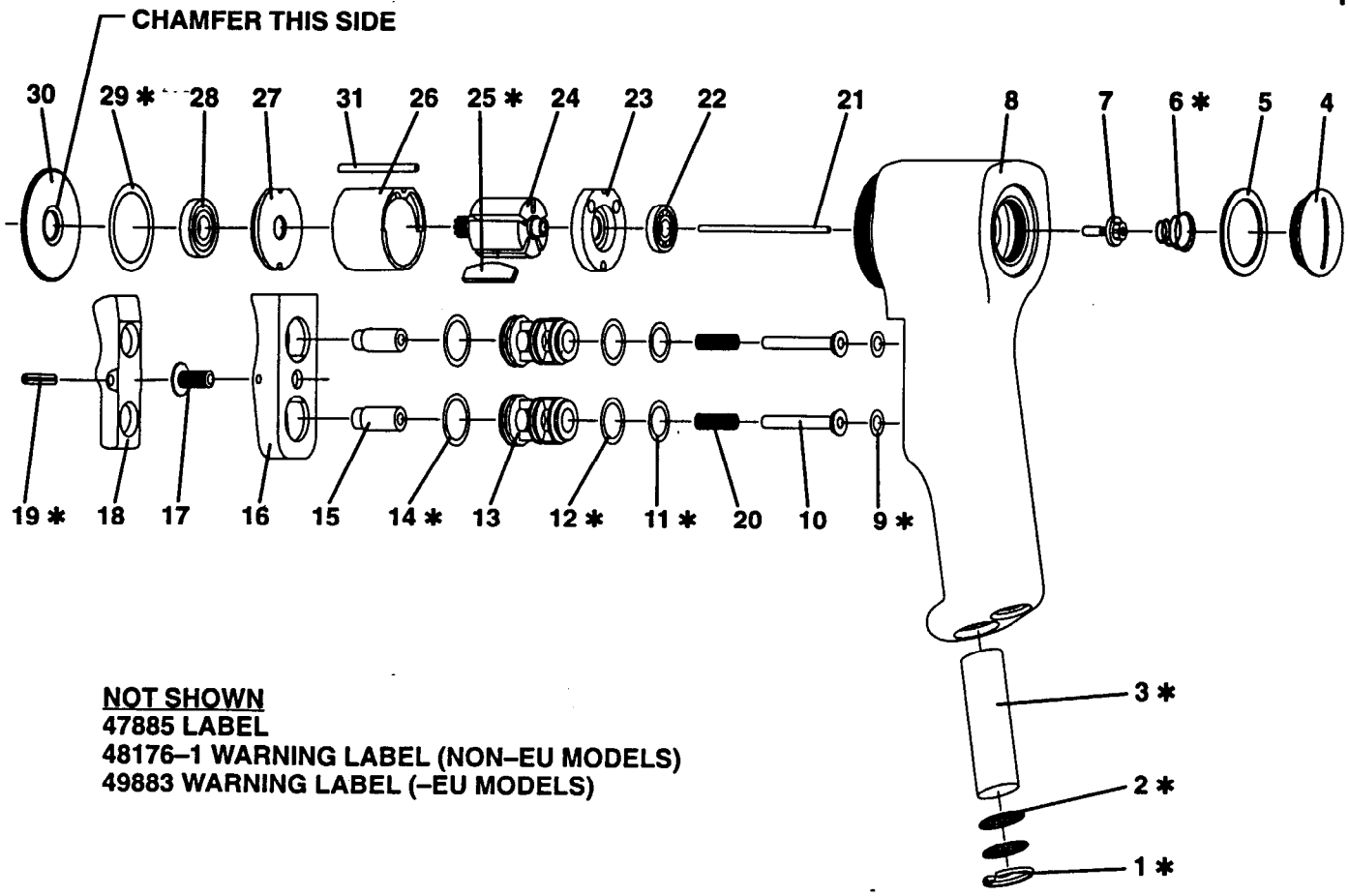
When replacement parts are necessary, consult drawing containing the part for identification.

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.




86
51 * 50 * 39 38 37 44 41 43 33 32
–8 MODELS
800 R.P.M.
22.88:1
47
51 * 50 * 39 38 37 36 35 34 33 32
–9 MODELS
900 R.P.M.
19.28:1
48
51 * 50 * 39 38 37 44 41 43 42 41 40
–15 MODELS
1500 R.P.M.
11.76:1
49
51 * 50 * 39 38 46 45 32
–26 MODELS
2600 R.P.M.
6.67:1

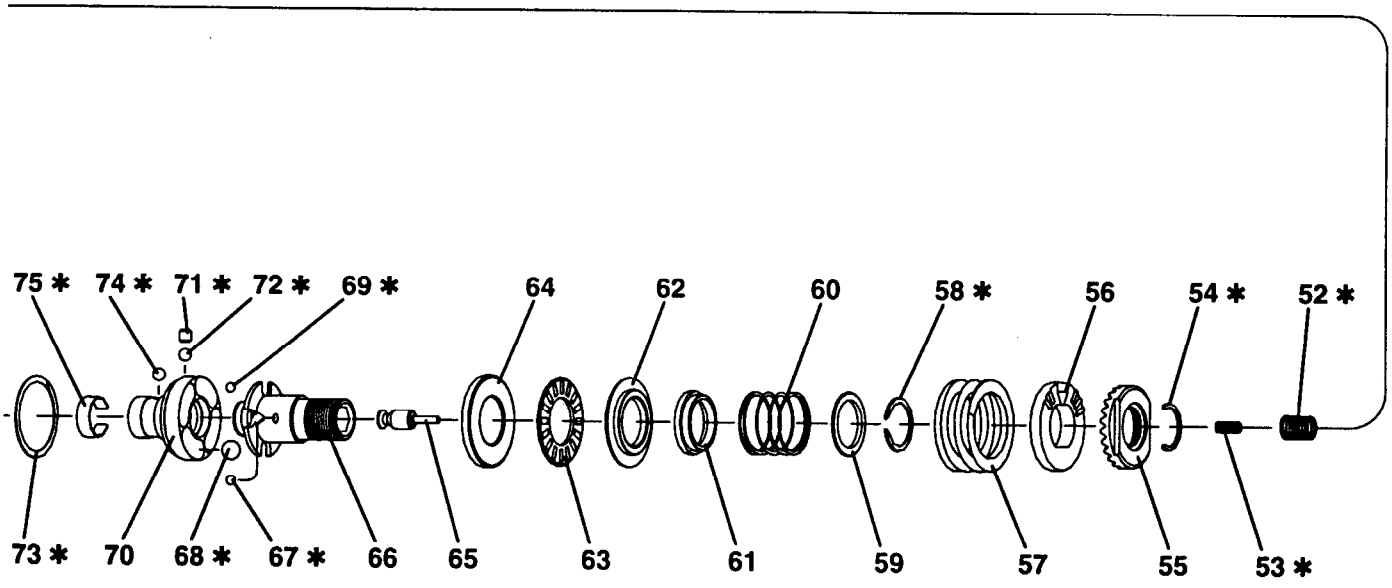

83
–Q
84
–A
85
–M
82 81 80 79 78 77 76 □
LEFT HAND THREAD



NOT SHOWN
47885 LABEL
48176–1 WARNING LABEL (NON–EU MODELS)
49883 WARNING LABEL (–EU MODELS)

* ITEMS INCLUDED IN SERVICE KIT NO. 48817–1.

□ 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	47984-1
4	Screw	34793
5	Washer	31842
6	Spring	41654
7	Valve Assembly	47887
8	Housing and Bushing Assembly	47888
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	41643
23	Rear End Plate	46245
24	Rotor	46338-1
25	Blade (5 req'd)	46301
26	Cylinder	46244
27	Front End Plate	47718
28	Ball Bearing	Y65-10
	MOTOR ASSEMBLY (includes items 22 thru 28)	47720
29	"O" Ring	Y325-116
30	Spacer	47632
31	Locating Pin	47719-1
32	Planet Gear (3 req'd) 6.67:1 ratio (21 teeth)	46875
33	Carrier Assembly 6.67:1 ratio	46336
34	Sun Gear 2.89:1 ratio (27 teeth)	46320
35	Planet Gear (3 req'd) 2.89:1 ratio (12 teeth)	46318
36	Spindle Assembly 2.89:1 ratio	47743
37	Ring Gear (double reduction)	47634
38	Spacer	46496
39	Ball Bearing	Y65-13
40	Sun Gear 3.43:1 ratio (21 teeth)	46561
41	Planet Gear (3 or 6 req'd) 3.43:1 ratio (15 teeth)	46904
42	Carrier Assembly 3.43:1 ratio	46493
43	Sun Gear 3.43:1 ratio (21 teeth)	46560
44	Spindle Assembly 3.43:1 ratio	47742
45	Spindle Assembly 6.67:1 ratio	47741
46	Ring Gear (single reduction)	47633
47	Gearing Assembly (900 r.p.m.)	46891-7
48	Gearing Assembly (1500 r.p.m.)	46891-8
49	Gearing Assembly (2600 r.p.m.)	46891-9

		PART NUMBER FOR ORDERING
50	Washer	47694
51	Snap Ring	Y142-2
52	Spring	47709
53	Spring	48333-1
54	Snap Ring	Y110-105
55	Adjustment Nut	46294
56	Adjustment Washer	48089
57	Clutch Spring	See chart
58	Snap Ring	48480-1
59	Guide	48295-1
60	Spring	47064
61	Ball Sleeve	48294-1
62	Thrust Race	48085
63	Thrust Bearing	42363
64	Thrust Race	48297-1
65	Plunger	48293-1
66	Spindle	48288-1
67	Ball (6 req'd)	Y16-203
68	Ball (4 req'd)	Y16-206
69	Ball (10 req'd)	Y16-203
70	Bit Holder	See chart
71	Pin	48080
72	Ball (9 req'd)	Y16-204
73	Retaining Ring	48084
74	Ball	Y16-204
75	Retaining Clip	47695
	AUTO SHUT-OFF CLUTCH ASSEMBLY (includes items 52 thru 75)	See chart
76	Bushing	46360
77	Clutch Housing (includes items 76 and 78)	48897
78	External Adjustment Sleeve	46390
79	Retaining Clip and Pin	47782
80	Retaining Ring	47779
81	Spring	47778
82	Bushing	47775
83	Sleeve	47702
84	Magnetic Guide	47776
85	Magnetic Guide	47777
	GUIDE ASSEMBLY	
	Quick-Change Sleeve Assembly (includes items 80 thru 83)	46884
	Apex Magnetic Bit Holder Guide Assembly (includes items 80, 81, 82 and 84)	46885
	Magna Bit Magnetic Bit Holder Guide Assembly (includes items 80, 81, 82 and 85)	46886
86	Gearing Assembly (800 r.p.m.)	46891-23
	SERVICE KIT: includes items 1, 2, 3, 6, 9, 11, 12, 14, 19, 25, 29, 50, 51, 52, 53, 54, 58, 67, 68, 69, 71, 72, 73, 74 and 75	48817-1

MODEL NUMBER	R.P.M.	THROTTLE ROD (ITEM 21)	LENGTH	CLUTCH SPRING (ITEM 57)	TORQUE RANGE	BIT HOLDER (ITEM 70)	CLUTCH ASSEMBLY
SQ024C-8-( )	800	46511-315	3.154"	48291-1 (BROWN)	12 - 40 IN. LBS	49051	49093-1
SQ024C-9-( )-( )	900	46511-315	3.154"	48291-1 (BROWN)	10 - 30 IN. LBS	48287-1	48302-1
SQ024C-15-( )	1500	46511-315	3.154"	48290-1 (GREEN)	8 - 20 IN. LBS	48287-1	48302-2
SQ024C-26-( )	2600	46511-275	2.759"	48289-1 (RED)	5 - 10 IN. LBS	48287-1	48302-3

MODELS WITH -EU SUFFIX ARE "EC" COMPLIANT MODELS.

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 (70) and clutch assembly on it.
_ Remove snap ring (54).
_ Remove adjustment nut (55) using a 5/8" wrench.
_ Remove adjustment washer (56) and clutch spring (57).
_ Remove snap ring (58).
_ Slide off guide (59), spring (60), ball sleeve (61), thrust race (62) and thrust bearing (63). NOTE: Removal of ball sleeve (61) releases six balls (67).
_ Remove thrust race (64), releasing four balls (68).
_ Remove retaining ring (73) and pin (71), then rotate bit holder to remove nine balls (72). Separate bit holder (70) and spindle (66), releasing ten balls (69).

CLUTCH ASSEMBLY

_ For clutch part lubrication, use ARO 40036–1 grease on parts as pointed out in this section.
_ Lubricate ball grooves of clutch spindle (66).
_ Install ten balls (69) into groove.
_ Slide spindle into bit holder, securing balls.
_ Assemble nine balls (72) and pin (71) into bit holder, then secure with retaining ring (73).
_ Lubricate ball pockets of bit holder and install four balls (68) into pockets, securing with thrust race (64).
_ Lubricate and assemble thrust bearing (63) and thrust race (62) to spindle.
_ Coat plunger (65) with spindle oil 29665 and assemble spring (53) to plunger. Assemble plunger and spring to spindle, securing with balls (67). NOTE: Assemble two balls per hole.
_ Secure balls with ball sleeve (61).
_ Assemble spring (60) and guide (59) to spindle, securing with snap ring (58).
_ Install clutch spring (57).
_ Lubricate face of adjustment washer (56) and install on spindle.
_ Thread adjustment nut (55) onto spindle, securing with snap ring (54).
_ Lubricate ball (74) of bit holder.
_ Assemble spring (52) into spindle. NOTE: Assemble spring with large diameter into spindle first.
_ Assemble clutch assembly to tool.
_ Assemble clutch housing (77) to tool – LEFT HAND THREADS.

CLUTCH ADJUSTMENT

CAUTION: DISCONNECT AIR SUPPLY BEFORE ADJUSTING CLUTCH.

EXTERNAL:

_ Rotate sleeve (78) until opening in housing is visible.
_ Depress bit to engage clutch, then rotate until notch in adjustment washer (56) is visible.
_ Insert a No. 1 Phillips screwdriver in notch to turn gear teeth on nut (55).
_ 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 (55), using a 5/8" wrench.

GEARING DISASSEMBLY

_ Remove clutch from tool (see "Clutch Disassembly").
_ Remove ring gear (37 or 46), using a strap wrench.
_ Remove snap ring (51) and washer (50).
_ Remove spindle(s) and gears from ring gear. NOTE: Keep gears grouped with mating spindle when disassembling 800, 900 and 1500 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 (34 or 43) 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 to shafts of mating spindle.
_ Assemble carrier assembly to spindle assembly of 800, 900 and 1500 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 (50) and snap ring (51) to spindle.
_ Thread ring gear to tool and tighten, using a strap wrench.
_ Assemble clutch to tool.

MOTOR DISASSEMBLY

_ Remove clutch and gearing from tool.
_ Remove spacer (30), "O" ring (29) 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 (24) with a soft face hammer; motor will come apart. NOTE: Bearings are light press fit in end plates. Bearing (22) is 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 (25) 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.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

- _ Assemble end plate (27) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- _ Insert locating pin (31) into .081" 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, with chamfered side of i.d. assembled towards motor.
- _ 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 screens (2) to tool, securing with retaining ring (1).