



OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M30
MANUAL 50

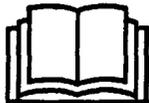
Released: 11-1-90

Revised: 11-10-95

Form: 3581-2

20 SERIES SCREWDRIVER

Models: AG024A-()-(), AG027A-()-(),
AG028A-()-() and AS028A-()-().



⚠ 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 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

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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



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>⚠ WARNING Read the manual before operating this tool. Operate at 90 psig/6.2 bar max.</p>	
<p>PN 48176-1 LABEL (NON-EU MODELS)</p>	<p>PN 49883 LABEL (-EU MODELS)</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.

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. Clutch should contain approximately 1/16 oz. (1.8 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 – 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

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.

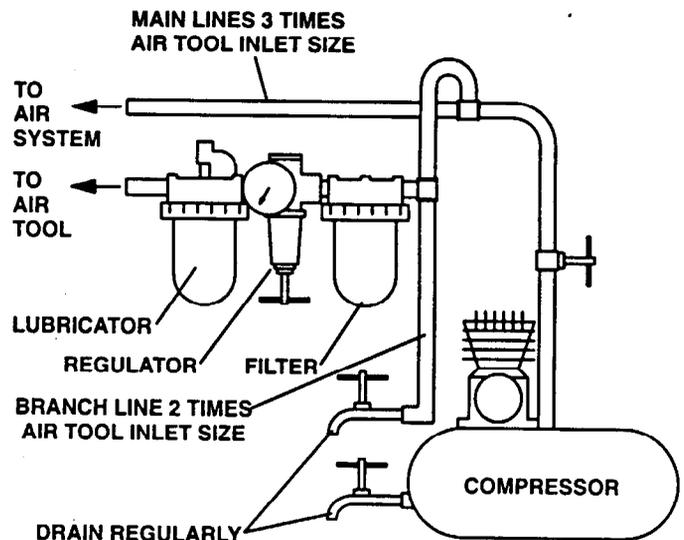
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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



MODEL IDENTIFICATION

MODEL NUMBER	R.P.M.	THROTTLE ROD (ITEMS 24 AND 48) AND LENGTH	MOTOR ASSEMBLY	CLUTCH ASSEMBLY
AG024A-8-()-()	900	46511-1 (2.791")	48157-1	49093-1
AG024A-9-()-()	900	46511-1 (2.791")	48157-1	48302-1
AG024A-15-()-()	1500	46511-1 (2.791")	48157-1	48302-2
AG024A-26-()-()	2600	46511-241 (2.410")	48157-1	48302-3
AG027A-8-()-()	800	46511-1 (2.791")	48157-1	49093-2
AG027A-9-()-()	900	46511-1 (2.791")	48157-1	48302-4
AG027A-15-()-()	1500	46511-1 (2.791")	48157-1	48302-5
AG027A-26-()-()	2600	46511-241 (2.410")	48157-1	48302-6
AG028A-8-()-()	800	46511-1 (2.791")	48157-1	49093-1
AG028A-9-()-()	900	46511-1 (2.791")	48157-1	48302-1
AG028A-15-()-()	1500	46511-1 (2.791")	48157-1	48302-2
AG028A-26-()-()	2600	46511-241 (2.410")	48157-1	48302-3
AS028A-8-()-()	800	46511-327 (3.275")	47720	49093-1
AS028A-9-()-()	900	46511-327 (3.275")	47720	48302-1
AS028A-15-()-()	1500	46511-327 (3.275")	47720	48302-2
AS028A-26-()-()	2600	46511-15 (2.910")	47720	48302-3

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

A – APEX MAGNETIC BIT HOLDER
F – FINDER
M – MAGNA BIT MAGNETIC BIT HOLDER
Q – QUICK-CHANGE SLEEVE

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.

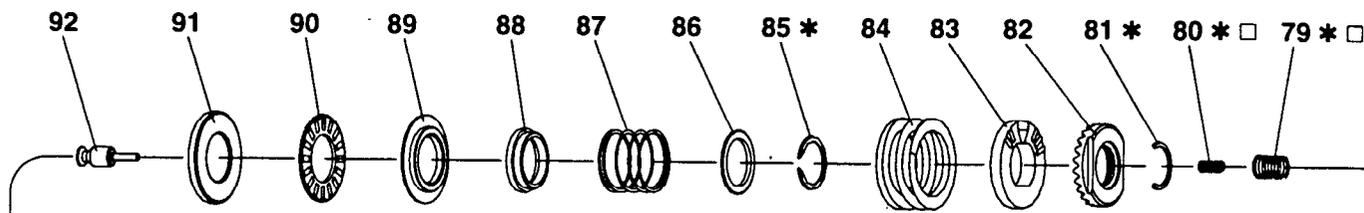
CLUTCH DISASSEMBLY

- Clamp tool in a smooth face vise – pistol grip models, clamp on handle (28) – straight models, clamp on inlet adapter (2).
- Using a strap type wrench, remove clutch housing (104) – LEFT HAND THREADS.
- Remove clutch assembly from tool. NOTE: Springs (79 and 80) are loose parts and may fall out.
- Clamp a 1/4" hex wrench in a vise then place bit holder (97) and clutch assembly on it.
- Remove snap ring (81).
- Using a 5/8" wrench, remove adjustment nut (82).
- Remove adjustment washer (83) and clutch spring (84).
- Remove snap ring (85).
- Slide off guide (86), spring (87), ball sleeve (88), thrust race (89) and thrust bearing (90). NOTE: Removal of ball sleeve (88) releases six balls (94) and plunger (92).
- Remove thrust race (91), releasing four balls (95).
- Remove retaining ring (102) and pin (99), then rotate bit holder (97) to remove nine balls (98). Separate bit holder (97) and spindle (93), releasing ten balls (96).

CLUTCH ASSEMBLY

- For clutch part lubrication, use ARO 40036-1 grease on parts as pointed out in this section.
- MODELS AG027A-(): Assemble thrust race (114) and wave washer (113) into clutch housing (104).
- Lubricate ball grooves of clutch spindle (93).
- Install ten balls (96) into groove.
- Slide spindle (93) into bit holder (97), securing balls.
- Assemble nine balls (98) and pin (99) into bit holder, then secure with retaining ring (102).
- Lubricate ball pockets of bit holder and install four balls (95) into pockets, securing with thrust race (91).
- Lubricate and assemble thrust bearing (90) and thrust race (89) to spindle.
- Coat plunger (92) with spindle oil 29665 and assemble spring (80) to plunger. Assemble plunger and spring to spindle, securing with balls (94). NOTE: Assemble two balls per hole.
- Secure balls with ball sleeve (88).
- Assemble spring (87) and guide (86) to spindle, securing with snap ring (85).
- Install clutch spring (84).
- Lubricate face of adjustment washer (83) and install on spindle.
- Thread adjustment nut (82) onto spindle, securing with snap ring (81).
- Lubricate ball (100) of bit holder.
- Assemble spring (79) into spindle (where applicable). NOTE: Assemble spring (79) with large diameter into spindle first.
- Assemble clutch assembly to tool.
- Assemble clutch housing (104) to tool – LEFT HAND THREADS.
- See "Clutch Adjustment".

(CONTINUED ON PAGE 8)

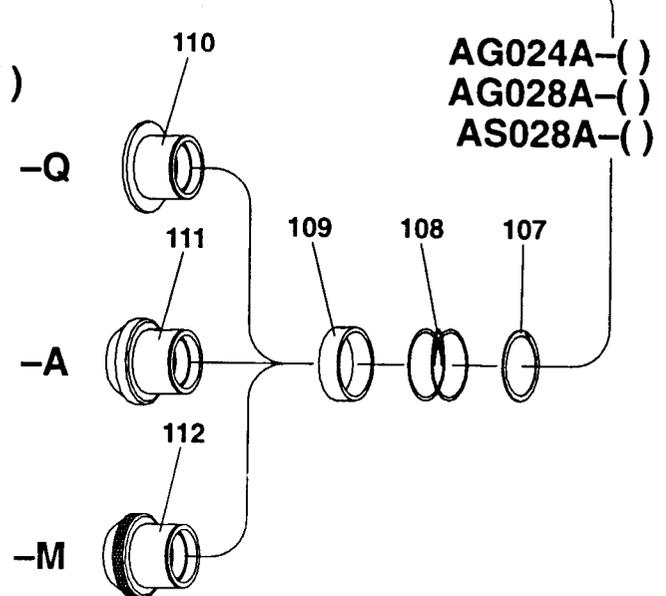
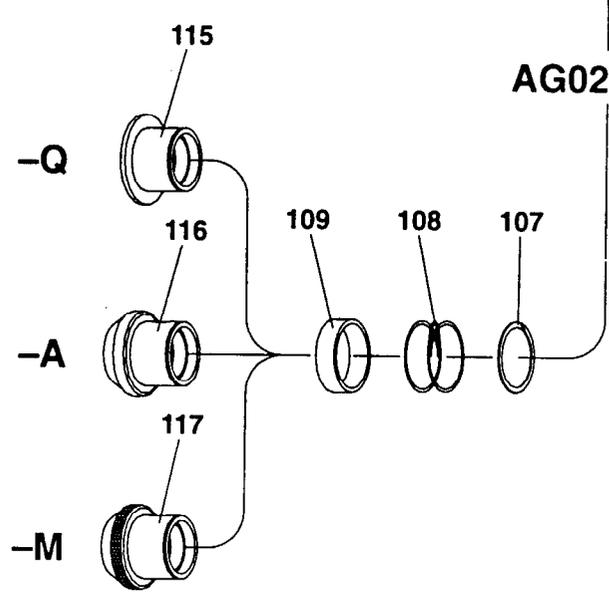
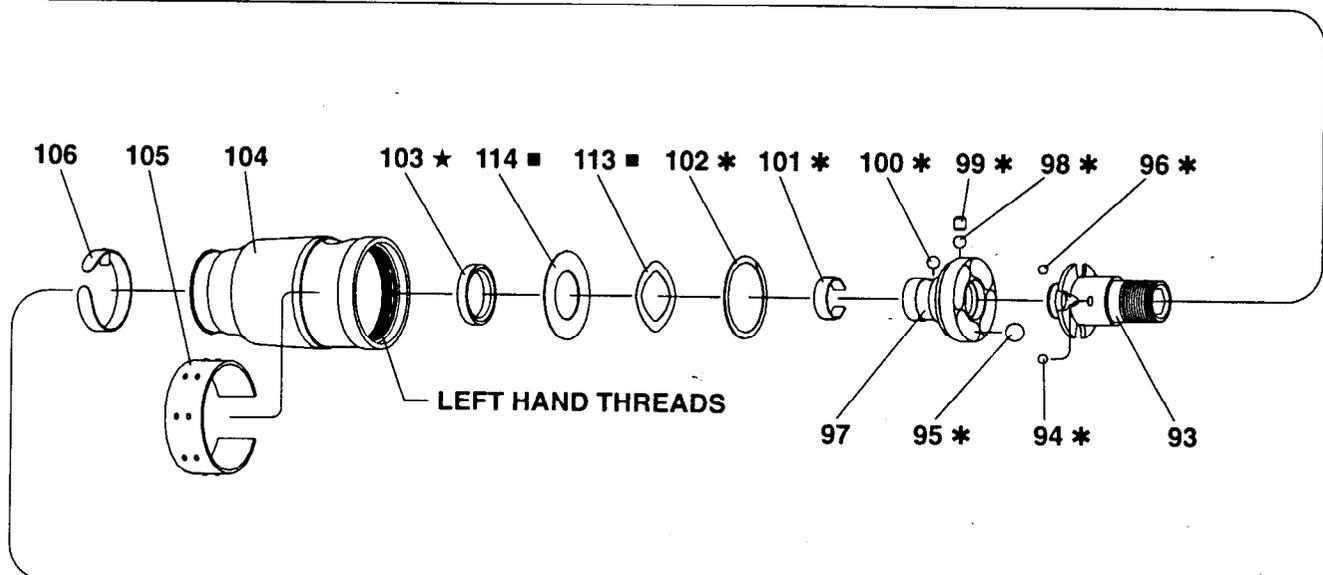


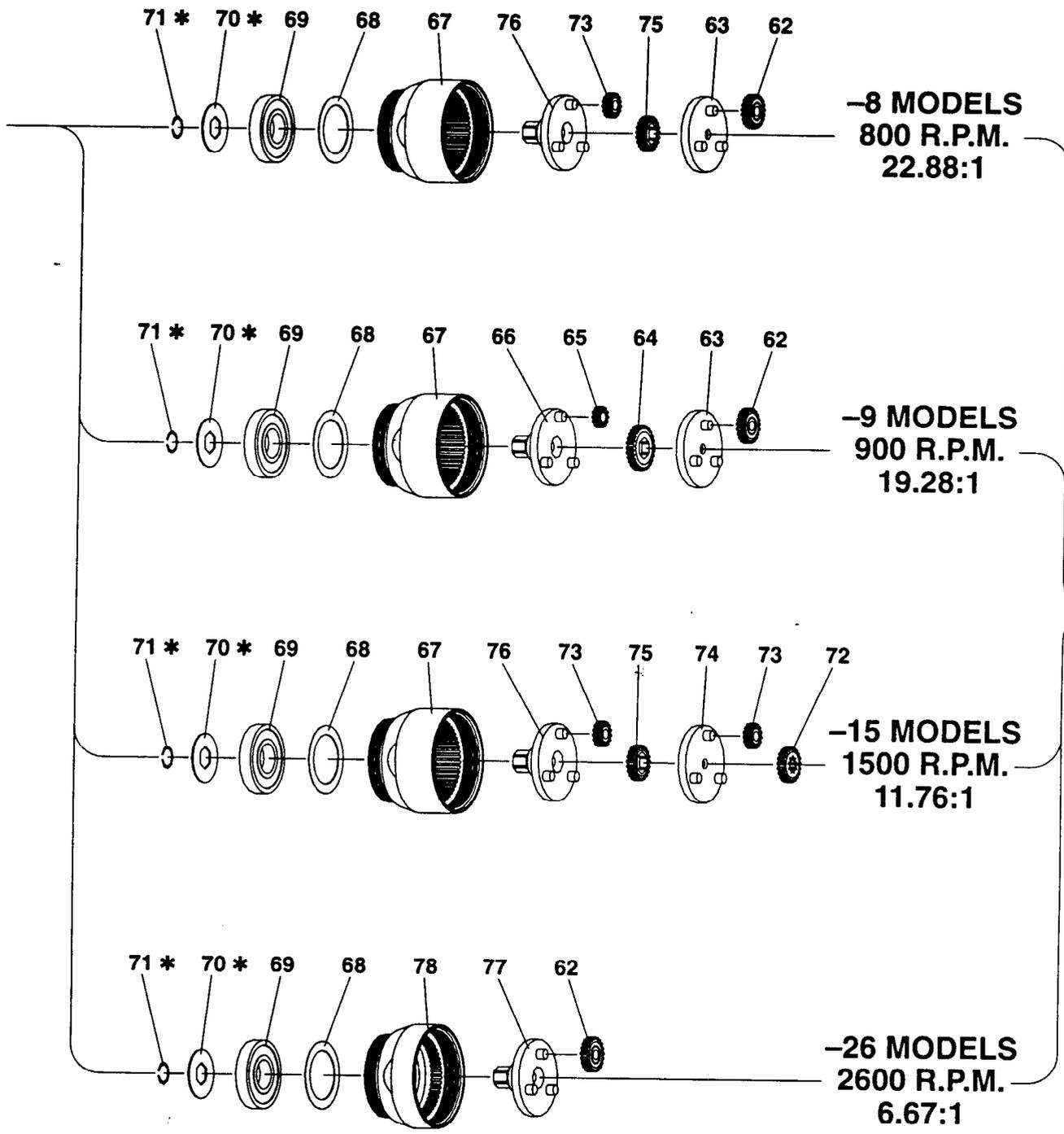
* ITEMS INCLUDED IN SERVICE KIT NO. 48846.

□ NOT USED ON MODELS AG027A-().

■ USED ON MODELS AG027A-().

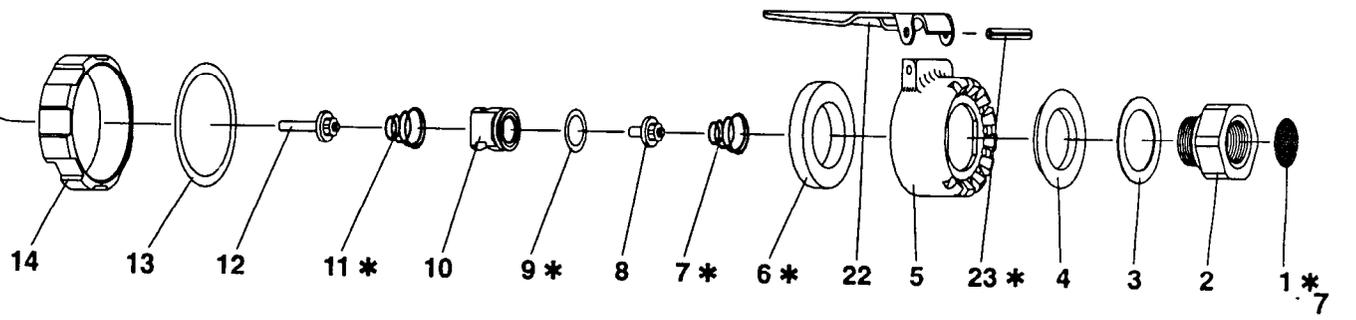
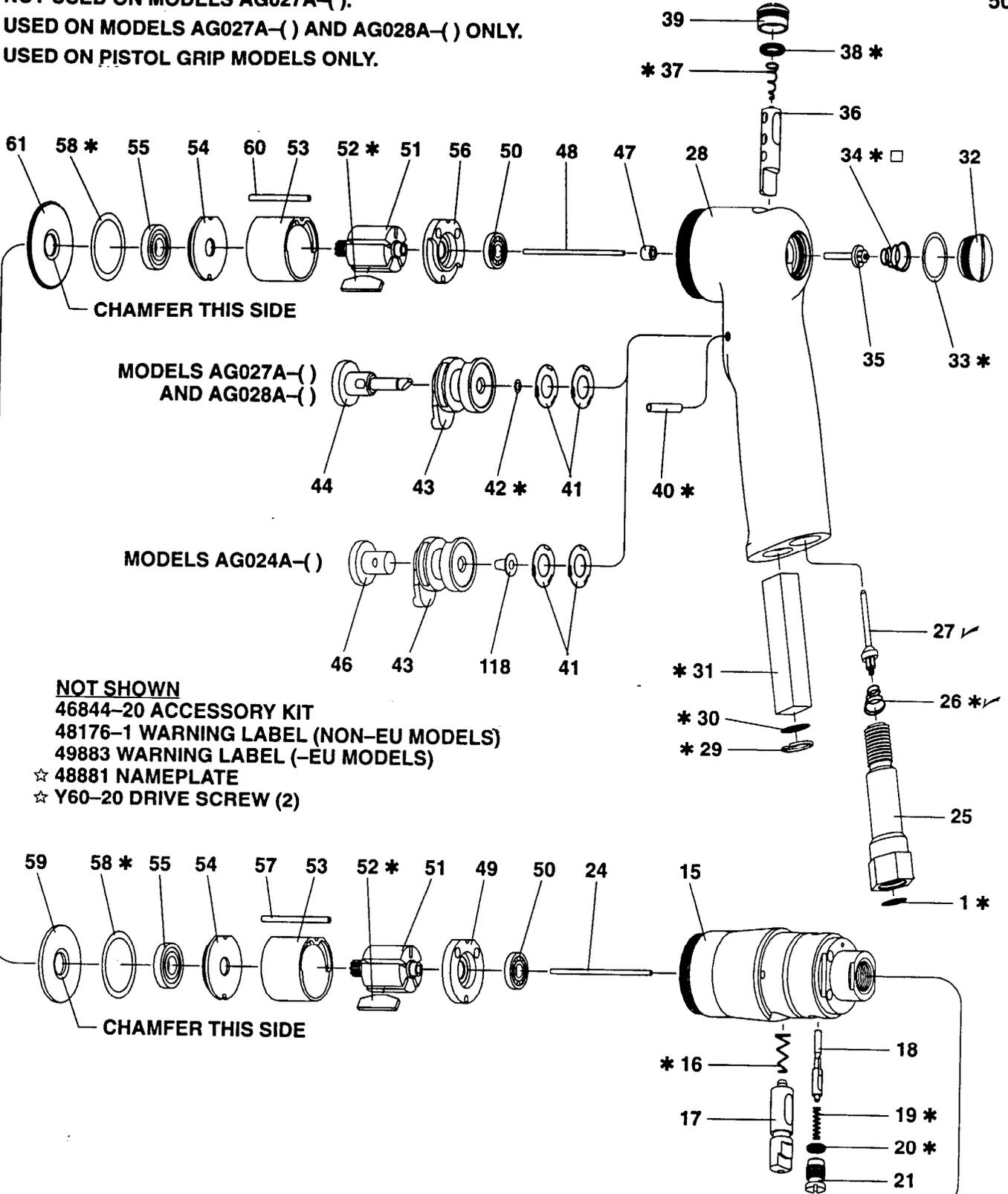
★ OIL IMPREGNATED BRONZE BUSHING, DO NOT WASH, WIPE CLEAN ONLY.





* ITEMS INCLUDED IN SERVICE KIT NO. 48846.

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- NOT USED ON MODELS AG027A-(-).
- ✓ USED ON MODELS AG027A-(-) AND AG028A-(-) ONLY.
- ☆ USED ON PISTOL GRIP MODELS ONLY.



DISASSEMBLY/ASSEMBLY INSTRUCTIONS

CLUTCH ADJUSTMENT

EXTERNAL:

- Rotate sleeve (105) until opening in housing is visible.
- Depress bit to engage clutch, then rotate until notch in adjustment washer (83) is visible.
- Insert a no. 1 Phillips screwdriver in notch to turn gear teeth on nut (82).
- 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 (82) with 5/8" wrench.

GEARING DISASSEMBLY

- Remove clutch from tool (see "Clutch Disassembly").
- Using a wrench on flats, remove ring gear (67 or 78).
- Remove snap ring (71) and washer (70).
- Remove spindle(s) and gears from ring gear (67 or 78). NOTE: Keep gears grouped with mating spindle when disassembling 800, 900 and 1500 r.p.m. gearing.
- Do not remove bearing (69) and spacer (68) unless damage is evident.
- To remove bearing (69) and spacer (68) from ring gear, press on spacer (68) from inside splined end of ring gear.
- Do not remove gears (64 or 75) from carrier assembly unless damage is evident. Gears are press fit onto carrier assembly.

GEARING ASSEMBLY

- Assemble spacer (68) into ring gear.
- Press bearing (69) into ring gear. NOTE: Press on outer race of bearing and press to shoulder of ring gear.
- Coat shafts of spindle 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.
- Thread ring gear (67 or 78) to tool and tighten with a wrench on flats.
- Assemble clutch to tool.

MOTOR DISASSEMBLY

- Remove clutch and gearing from tool.
- Remove spacer (59 or 61) and "O" ring (58).
- Tap front edge of housing to remove motor assembly. Locating pin (57 or 60) should also come out.
- Tap drive end of rotor (51) with a soft face hammer; motor will come apart. NOTE: Bearings are light press fit in end plates. Bearing (50) is press fit on rotor.
- Remove end plate (49 or 56) and bearing (50) from rotor.

MOTOR ASSEMBLY

- Lubricate bearing (50) with ARO 33153 grease and assemble to end plate (49 or 56), pressing on outer race of bearing.
- Assemble end plate (49 or 56) to rotor, pressing on inner race of bearing.
- Coat five rotor blades (52) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.

- Coat i.d. of cylinder (53) with ARO 29665 spindle oil and assemble over rotor, aligning air inlet slots of cylinder with air inlet slots in end plate (49 or 56).
- Assemble bearing (55) to end plate (54), pressing on outer race of bearing.
- Assemble end plate (54) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Insert locating pin (57 or 60) 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 (57 or 60).
- Grease and assemble "O" ring (58) to end plate.
- Assemble spacer (59 or 61) to motor.
- Assemble gearing and clutch to tool.

THROTTLE HOUSING DISASSEMBLY

- Clamp air inlet adapter (2) in a smooth face vise.
- Using a strap type wrench, unthread housing (15).
- Remove spacer (3), diffuser washer (4), exhaust cap (5), filler (6), spring (7) and valve assembly (8).
- Remove cap (21) and spring (19), releasing valve stem (18).
- Remove valve block (10) and spring (11), releasing valve assembly (12). CAUTION: Do not remove or adjust rubber portion of valve assemblies (8 and 12), as they are preset at the factory.
- Remove "O" ring (13) and reverse sleeve (14), releasing valve body (17) and spring (16).

THROTTLE HOUSING ASSEMBLY

- Assemble spring (16) to housing, securing with valve body (17).
- Assemble reverse sleeve (14) and "O" ring (13) to housing, securing valve body.
- Grease and assemble "O" ring (9) to valve block (10).
- Assemble valve assembly (12) and spring (11) to housing, securing with valve block (10). NOTE: Assemble valve block (10) with counterbore towards cap (21).
- Grease and assemble "O" ring (20) to cap (21).
- Assemble valve stem (18) and spring (19) to housing, securing with cap (21). NOTE: Assemble valve stem (18) with slot turned to accept valve assembly (8).
- Assemble filler (6) and exhaust cap (5) to housing, aligning lever with valve stem (18).
- Assemble valve assembly (8) to housing, being certain valve assembly seats in slot in valve stem (18).
- Assemble spring (7) to housing, securing with diffuser washer (4), spacer (3) and inlet adapter (2).
- Clean and install screen (1) in inlet adapter.

PISTOL GRIP HOUSING DISASSEMBLY

- Unthread and remove end cap (32) and "O" ring (33), releasing spring (34)(where applicable) and valve rod (35).
- Unthread and remove top cap (39) and "O" ring (38), releasing spring (37).
- Do not remove reverse valve (36) unless damage is evident.
- To remove reverse valve (36), press bushing (47) thru, into reverse valve, releasing reverse valve.
- To remove trigger (44) or button (46), drive pin (40) out left side of housing, releasing trigger or button.
- To remove reverse cam (43), reverse valve (36) must be positioned clear of reverse cam. Hold housing upside down and tap housing, allowing reverse valve (36) to slide clear of reverse cam (43). Pull reverse cam and springs (41) from housing.
- Remove retaining ring (29), releasing screen (30) and muffler pad (31).
- Remove inlet adapter (25) and screen (1).
- MODELS AG027A-() and AG028A-(): Removal of inlet adapter (25) releases spring (26) and valve rod (27).

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

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PISTOL GRIP HOUSING ASSEMBLY

- MODELS AG027A-() and AG028A-(): Coat valve rod (27) with ARO 29665 spindle oil and assemble into housing. Assemble spring (26) into housing.
- Assemble inlet adapter (25) to housing.
- Clean and replace screen (1) in inlet adapter.
- Assemble muffler pad (31) and screen (30) to housing, securing with retaining ring (29).
- Coat trigger (44) or button (46) with ARO 29665 spindle oil and assemble to reverse cam (43), aligning hole in trigger or button with slot thru side of reverse cam.
- MODELS AG027A-() and AG028A-(): Grease and assemble "O" ring (42) to trigger (44).
- MODELS AG024A-(): Assemble plug (118) to reverse cam (43).
- Assemble springs (41) to reverse cam, flat sides away from reverse cam, and assemble reverse cam and components to

- housing, aligning holes in trigger and housing.
- Assemble pin (40) to housing, securing reverse cam and trigger.
- Coat reverse valve (36) with ARO 29665 spindle oil and assemble into housing, securing with bushing (47). NOTE: Press bushing flush with counterbore in bottom of motor cavity.
- Assemble spring (37) into housing.
- Grease and assemble "O" ring (38) to cap (39) and assemble cap to housing.
- Coat valve rod (35) with ARO 29665 spindle oil and assemble into housing.
- Assemble spring (34) into housing (where applicable).
- Grease and assemble "O" ring (33) to end cap (32) and assemble end cap to housing, securing valve rod and spring.

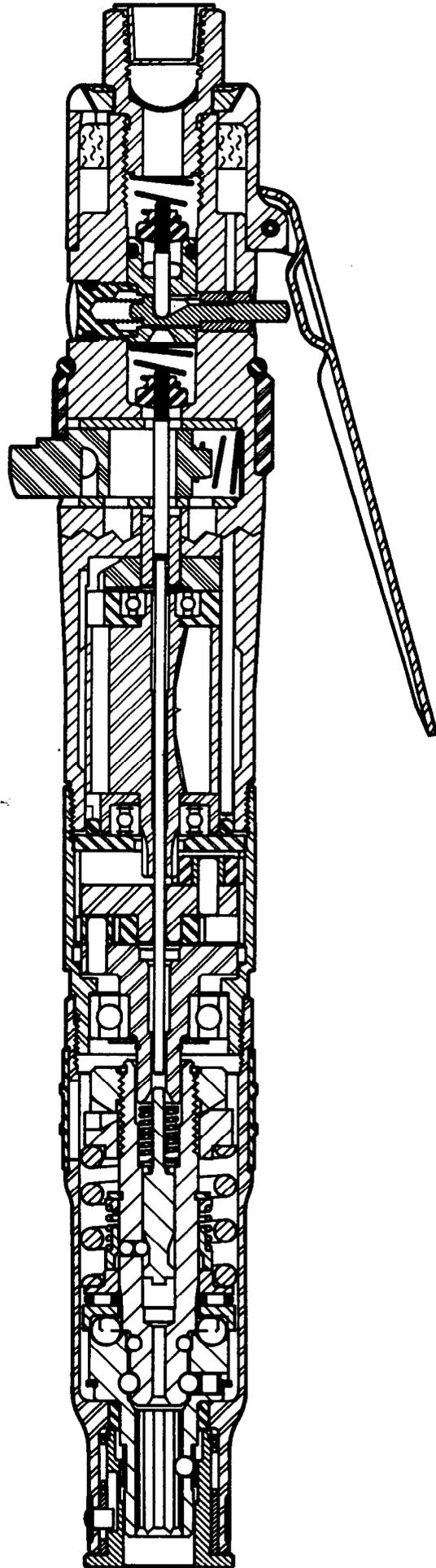
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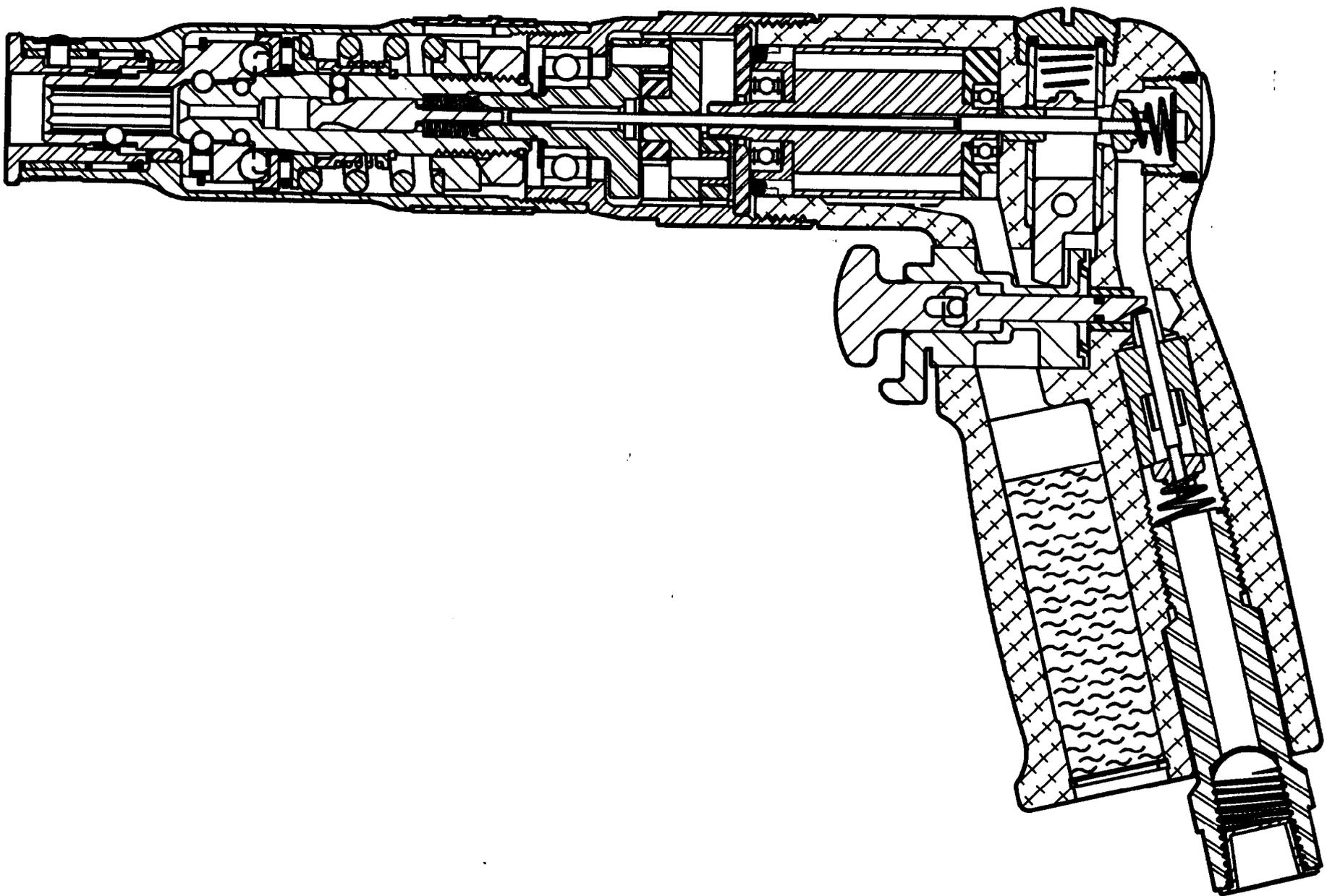
PART NUMBER FOR ORDERING

1	Screen	33911		50	Bearing	41643
2	Inlet Adapter	46377		51	Rotor	46338-1
3	Spacer	47205		52	Blade (5 req'd)	46301
4	Diffuser Washer	46371		53	Cylinder	46244
5	Exhaust Cap	46366-1		54	Front End Plate	47718
6	Filler	48199-1		55	Bearing	Y65-10
7	Spring	41654		56	Rear End Plate	48161-1
8	Valve Assembly	46354-2			MOTOR ASSEMBLY	
9	"O" Ring	Y325-11			for lever throttle models (includes items 49 thru 55)	47720
10	Valve Block	48335-1			for pistol grip models (includes items 50 thru 56)	48157-1
11	Spring	41654		57	Locating Pin	47719-2
12	Valve Assembly	46354		58	"O" Ring	Y325-116
13	"O" Ring	48346-1		59	Spacer	46305
14	Reverse Sleeve	48337-1		60	Locating Pin	47719-1
15	Head and Bushing Assembly	48350-1		61	Spacer	47632
16	Spring	41654		62	Planet Gear (3 req'd) 6.67:1 ratio (21 teeth)	46875
17	Valve Body	48348-2		63	Carrier Assembly 6.67:1 ratio	46336
18	Valve Stem	48342-1		64	Sun Gear 2.89:1 ratio (27 teeth)	46320
19	Spring	31058		65	Planet Gear (3 req'd) 2.89:1 ratio (12 teeth)	46318
20	"O" Ring	Y325-10		66	Spindle Assembly 2.89:1 ratio	47743
21	Cap	48338-1		67	Ring Gear (double reduction)	
22	Lever	48246-1			for lever throttle models	46323
23	Roll Pin	Y178-28			for pistol grip models	47634
24	Throttle Rod	See chart		68	Spacer	46496
25	Inlet Adapter	46385		69	Bearing	Y65-13
26	Spring	41654		70	Washer	47694
27	Valve Rod Assembly	46354		71	Snap Ring	Y142-2
28	Housing			72	Sun Gear 3.43:1 ratio (21 teeth)	46561
	for models AG024A-()	48155-1		73	Planet Gear (3 or 6 req'd) 3.43:1 ratio (15 teeth)	46904
	for models AG027A-() and AG028A-()	48153-1		74	Carrier Assembly 3.43:1 ratio	46493
29	Retaining Ring	Y147-56		75	Sun Gear 3.43:1 ratio (21 teeth)	46560
30	Screen	48808-1		76	Spindle Assembly 3.43:1 ratio	47742
31	Muffler Pad	48807-1		77	Spindle Assembly 6.67:1 ratio	47741
32	End Cap	48146-1		78	Ring Gear (single reduction)	
33	"O" Ring	Y325-15			for lever throttle models	46322
34	Spring	41654			for pistol grip models	47633
35	Valve Rod Assembly	46354		79	Spring	47709
36	Reverse Valve	48143-1		80	Spring	48333-1
37	Spring	47691-1		81	Snap Ring	Y110-105
38	"O" Ring	Y325-12		82	Adjustment Nut	46294
39	Top Cap	48145-1		83	Adjustment Washer	48089
40	Pin	49754		84	Clutch Spring	
41	Spring (2 req'd)	48138-1			800 r.p.m. models (Brown, 12 - 40 in. lbs)	48291-1
42	"O" Ring	48139-1			900 r.p.m. models (Brown, 10 - 30 in. lbs)	48291-1
43	Reverse Cam	48132-1			1500 r.p.m. models (Green, 8 - 20 in. lbs)	48290-1
44	Trigger	48148-1			2600 r.p.m. models (Red, 5 - 10 in. lbs)	48289-1
46	Button	48149-1		85	Snap Ring	48480-1
47	Bushing	48361-1		86	Guide	48295-1
48	Throttle Rod	See chart		87	Spring	47064
49	Rear End Plate	46245				

PART NUMBER FOR ORDERING

88	Ball Guide	48294-1
89	Thrust Race	48085
90	Thrust Bearing	42363
91	Thrust Race	48297-1
92	Plunger	48293-1
93	Spindle	48288-1
94	Ball (6 req'd)	Y16-203
95	Ball (4 req'd)	Y16-206
96	Ball (10 req'd)	Y16-203
97	Bit Holder for 800 r.p.m. models	49051
	for 900, 1500 and 2600 r.p.m. models ..	48287-1
98	Ball (9 req'd)	Y16-204
99	Pin	48080
100	Ball	Y16-204
101	Retaining Clip	47695
102	Retainer Ring	48084
	AUTO SHUT-OFF CLUTCH ASSEMBLY (includes items 79 thru 102) (models AG027A-) do not include items 79 and 80)	See chart
103	Bushing	46360
104	Clutch Housing (includes items 103 and 105) for -A, -M and -Q models lever throttle models	47744
	pistol grip models	48897
	for -F models lever throttle models	47783
	pistol grip models	48898
105	External Adjustment Sleeve	46390
106	Retaining Clip and Pin	47782
107	Retaining Ring	47779
108	Spring	47778
109	Bushing	47775
110	Sleeve	47702
111	Magnetic Guide	47776
112	Magnetic Guide	47777
	GUIDE ASSEMBLY Quick-Change Sleeve Assembly (includes items 107 thru 110)	46884
	Apex Magnetic Bit Holder Guide Assembly (includes items 107, 108, 109 and 111)	46885
	Magna Bit Magnetic Bit Holder Guide Assembly (includes items 107, 108, 109 and 112)	46886
113	Wave Washer	45645
114	Thrust Bearing Race	42364
115	Sleeve	47702-1
116	Magnetic Guide	47776-1
117	Magnetic Guide	47777-1
	GUIDE ASSEMBLY Quick-Change Sleeve Assembly (includes items 107, 108, 109 and 115)	46884-1
	Apex Magnetic Bit Holder Guide Assembly (includes items 107, 108, 109 and 116)	46885-1
	Magna Bit Magnetic Bit Holder Guide Assembly (includes items 107, 108, 109 and 117)	46886-1
118	Plug	11481-1
	SERVICE KIT: includes items 1, 6, 7, 9, 11, 16, 19, 20, 23, 26, 29, 30, 31, 33, 34, 37, 38, 40, 42, 52, 58, 70, 71, 79, 80, 81, 85, 94, 95, 96, 98, 99, 100, 101 and 102 ...	48846







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