



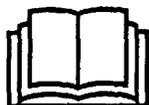
OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M32
MANUAL 70
Released: 5-18-84
Revised: 6-30-95
Form: 2604-2

50 SERIES RIGHT-ANGLE NUTSETTERS

Models: NA051A-()-() and NA054A-()-()



⚠ 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.
- Torque output adjustment is achieved by regulating the air pressure thru the regulator of the filter/regulator/lubricator (F-R-L) unit. Air pressure at the inlet of the tool should not be adjusted to less than 50 p.s.i. (3.5 bar) minimum or more than 90 p.s.i. (6.2 bar) maximum.

⚠ 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



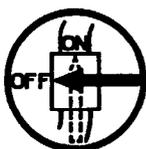
Wear eye protection when operating or performing maintenance on this tool.

⚠ 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

⚠ WARNING

Read the manual before operating this tool.
Operate at 90 psig/6.2 bar max.



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 – Flush tool with a solution of three (3) parts cleaning solvent to one (1) part spindle oil.

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. Right-angle assembly should contain approximately 3/32 oz. (2.7 g) of grease.

AIR SUPPLY REQUIREMENTS

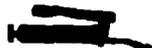
For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- 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 re-lubricate 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.

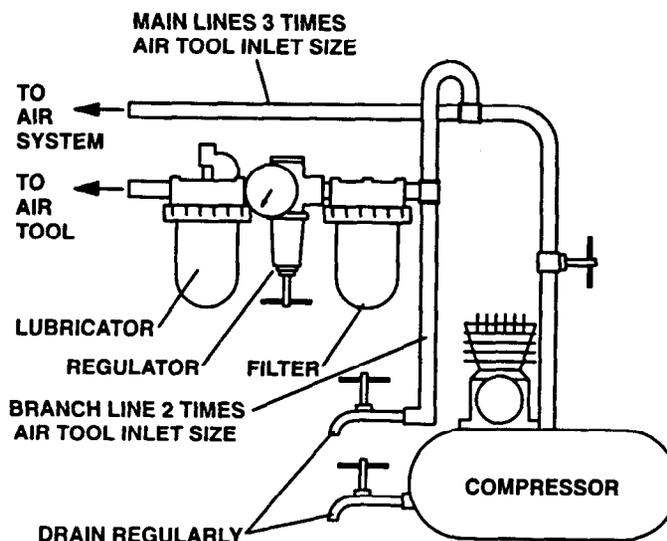
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

RIGHT-ANGLE DISASSEMBLY

- Using wrenches on flats of ring gear and lock nut (115), loosen nut completely and pull right-angle assembly from tool - LEFT HAND THREADS.
- Remove lock nut (127, 143 or 148), releasing drive assembly.
- To disassemble drive assembly, remove insert (130 or 151) and locking pin (129 or 150).
- Remove lock nut (108) from housing - LEFT HAND THREADS.
- Do not disassemble further unless damage is evident. To disassemble, pull bevel pinion (113 or 135) from housing.
- Remove bearing (109).
- Remove retaining ring (110 or 132) and spacer (111 or 133) to allow removal of needle bearing.

RIGHT-ANGLE ASSEMBLY

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble needle bearing (112 or 134), spacer (111 or 133), retaining ring (110 or 132) and bearing (109) to bevel pinion. NOTE: Press on inner race of bearing (109).
- Assemble bevel pinion and components into housing. NOTE: To properly seat needle bearing in housing, using a soft face hammer, tap pinion into housing until drive end of pinion bottoms out against shoulder in housing (this can be seen thru opening in housing). Pinion will not rotate when bottomed out. Secure with lock nut (108) - LEFT HAND THREADS. Insert a punch thru small hole in end of housing and tap pinion back until it contacts bearing (109) and rotates freely.
- Apply approximately 3/32 oz. (2.7 g) of ARO 33153 grease to right-angle gearing upon assembly.
- Assemble bevel gear and components to lock nut (127, 143 or 148) and secure with locking pin (129 or 150) and insert (130 or 151).
- Assemble lock nut and components to housing.
- Assemble right-angle housing and components to tool, securing with lock nut (115) - LEFT HAND THREADS.

GEARING DISASSEMBLY

- Remove right-angle section from tool.
- Remove ring gear (90 or 104), using a wrench on flats.
- Remove spindle(s) and gears from ring gear. NOTE: Keep gears grouped with mating spindle when disassembling double reduction gearing.
- Do not remove bearing (93), spacer (92) or "O" ring (89) unless damage is evident.
- To remove bearing (93) and spacer (92) from ring gear, press on spacer from splined end of ring gear.
- Remove "O" ring (89) from spindle.
- Do not remove gears (86 or 97) from carrier assemblies unless damage is evident. Gears are press fit on carrier assemblies.

GEARING ASSEMBLY

- Lubricate "O" ring (89) and assemble to spindle.
- Assemble spacer (92) and bearing (93) into ring gear, pressing on outer race of bearing.

- Coat shafts of spindle(s) with ARO 33153 grease.
- Assemble gears and bearings (84) to shafts of mating spindle.
- Lubricate gears with ARO 33153 grease (see "Routine Lubrication Requirements", page 3).
- Assemble carrier assembly to spindle assembly for models with double reduction gearing.
- Assemble spindle(s) and gearing into ring gear. Rotate spindle(s) and gears to align gear teeth with splines of ring gear.
- Thread ring gear to tool and tighten, using a wrench on flats.
- Assemble right-angle section to tool.

MOTOR DISASSEMBLY

- Remove right-angle section and gearing from tool.
- Remove spacer (81).
- Tap front edge of housing to remove motor assembly. Locating pin (80 or 82) should also come out. NOTE: Air Shut-Off models - retaining ring (55) must be removed to allow removal of rotor (see "Throttle Disassembly").
- Tap drive end of rotor (75) with a soft face hammer; motor will come apart. NOTE: Bearings are light press fit in end plates. Bearing (73) is press fit on rotor.
- Remove end plate (74) and bearing (73) from rotor.

MOTOR ASSEMBLY

- Lubricate bearing (73) with ARO 33153 grease and assemble to end plate (74), pressing on outer race of bearing.
- Assemble end plate (74) to rotor, pressing on inner race of bearing.
- Coat five rotor blades (76) with ARO 29665 spindle oil and assemble to rotor slots - straight side out.
- Coat i.d. of cylinder (77) 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 (74).
- Assemble bearing (79) to end plate (78), pressing on outer race of bearing.
- Assemble end plate (78) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Insert locating pin (80 or 82) 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 locating pin (80 or 82). NOTE: Air Shut-Off models - rotor must be secured with retaining ring (55) upon assembly (see "Throttle Assembly").
- Assemble spacer (81) to motor.
- Assemble gearing and right-angle section to tool.

STALL TYPE THROTTLE DISASSEMBLY

- Remove inlet adapter (19), washer (20), diffuser (21), two filters (22) and muffler housing (23).
- Remove spring (4) and valve rod (5), releasing throttle pin (12) and spring (11).
- Turn reversing sleeve (2) to the forward position (clockwise). Insert a punch thru small hole in sleeve and depress valve (17) while carefully sliding sleeve off tool. This releases ball (10) and insert (9).
- To remove valve (17), remove set screw (15), spring (14) and ball (13), releasing valve and spring (16).

STALL TYPE THROTTLE ASSEMBLY

- Lubricate "O" ring (3) and assemble to tool.
- Assemble spring (16) and valve (17) to housing, aligning groove in valve to accept ball (13).
- Secure valve (17) with ball (13), spring (14) and set screw (15). NOTE: Apply a thread adhesive (such as Loctite® 242) to threads of set screw and install below flush with housing.
- Assemble insert (9) and ball (10) to hole in housing.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

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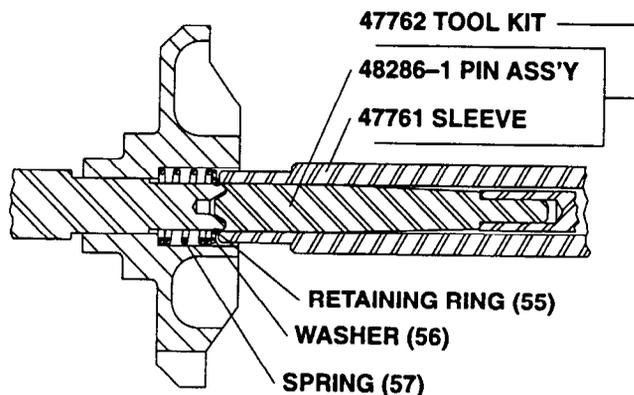
- Sleeve (2) is to be assembled with grooved side facing motor. To assemble, align groove with pin (8). While holding ball (10) in place, push valve (17) into housing and slide sleeve over valve.
- Coat throttle pin (12) with ARO 29665 spindle oil and assemble spring (11) and throttle pin into housing, being sure slot in throttle pin is in line with housing to accept valve rod (5).
- Coat valve rod (5) with ARO 29665 spindle oil and drop into housing. NOTE: Throttle pin (12) should not pull out when valve rod is seated properly.
- Assemble spring (4), muffler housing (23), two fillers (22), diffuser (21) and washer (20) to housing, securing with inlet adapter (19).
- Clean and replace screen (18) in inlet adapter.
- Assemble valve (64) to housing, aligning hole in valve with groove in housing and hole in sleeve and secure with screw (71).
- With the tool in an upright position, assemble front cam (63) to housing, with prongs fitting in holes in housing, and assemble rear cam (62) to valve (64), aligning tabs on cam with slots in valve.
- Assemble race (61), thrust bearing (60) and ball guide (59) to valve (64). Place pin (see figure below) against rotor and assemble spring (57), washer (56) and retaining ring (55) over end of pin. Assemble sleeve over pin and push retaining ring onto rotor (into groove), securing spring and washer.
- Drop five balls (58) into slots in ball guide and secure with actuator disc (54).
- Assemble spacer (53) and wavy washer (52) to valve (64).
- Lubricate "O" ring (51) and assemble to valve block (49).
- Assemble valve block (49) to valve (64), securing actuator disc (54).

AIR SHUT-OFF THROTTLE DISASSEMBLY

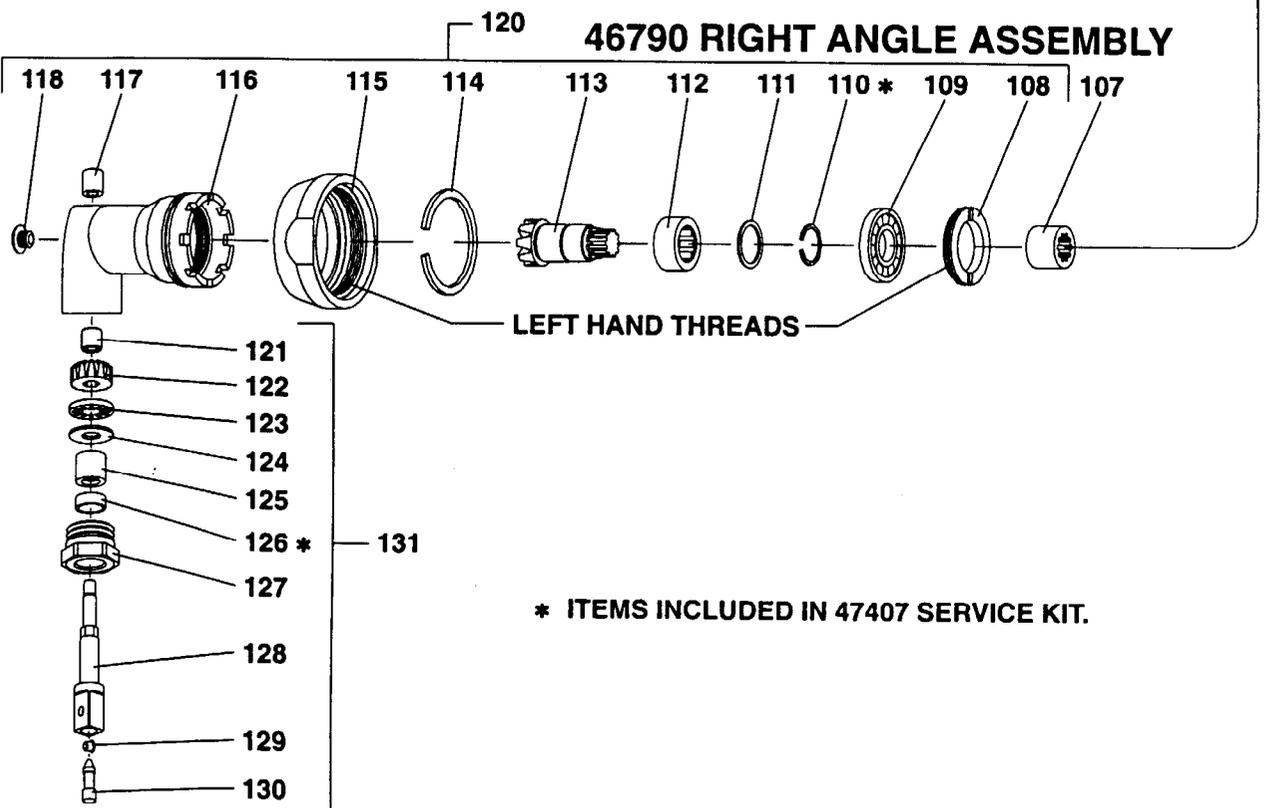
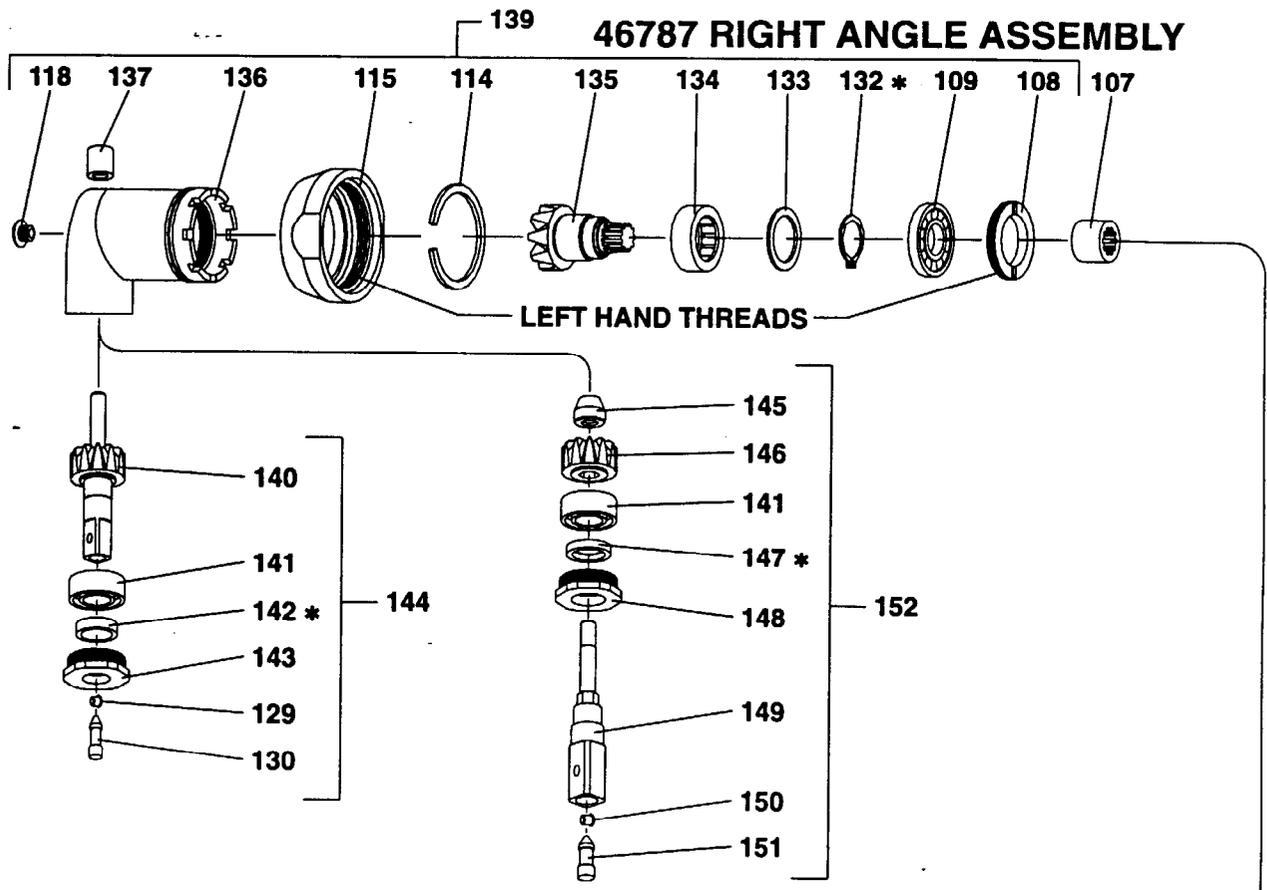
- Holding the tool in an upright position, with the air inlet adapter facing up, unthread and remove handle assembly from tool.
- Remove inlet adapter (19), washer (20), diffuser (21), two fillers (22) and muffler housing (23).
- Remove screw (32), releasing washer (31), spring (30) and valve stem (28) with "O" ring (29).
- Remove cap (42) with "O" ring (41), releasing piston (39) with "O" rings (40 and 38). NOTE: Do not remove bushing (36) unless damage is evident. Removal of bushing releases seat (34).
- Remove valve block (49), washer (52), spacer (53), actuator disc (54) and balls (58).
- Remove retaining ring (55), releasing washer (56), spring (57), ball guide (59), thrust bearing (60) and race (61).
- Do not remove valve (64) unless damage is evident. To remove valve (64), remove cams (62 and 63), then remove screw (71). This will allow removal of sleeve (70) and "O" rings (68 and 69).

AIR SHUT-OFF THROTTLE ASSEMBLY

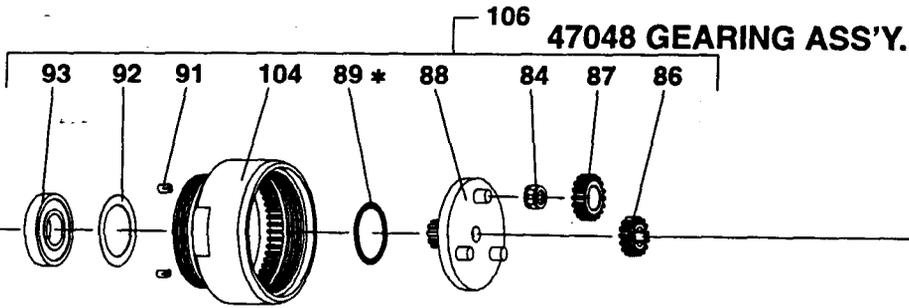
- Lubricate "O" rings (68 and 69) and assemble to housing.
- Assemble insert (66) and ball (67) to hole in housing, securing with sleeve (70).
- Lubricate "O" ring (48) and assemble to valve block (49).
- Assemble gasket (47) to valve block (49).
- Lubricate "O" rings (43 and 44) and assemble to head (26).
- Assemble spring (45) and disc (46) to head (26).
- To assemble head to motor housing, while holding disc (46) in place, align the .098" diameter hole in head (26) with roll pin (50) and assemble head to motor housing (65).
- Assemble spring (33) and seat (34) to head (26).
- Lubricate "O" rings (35 and 37) and assemble to bushing (36) and assemble bushing to head (insert end with .243" diameter hole into housing first).
- Lubricate "O" rings (38 and 40) and assemble to piston (39).
- Assemble piston (39) to bushing (36).
- Lubricate "O" ring (41) and assemble to cap (42) and assemble cap to head (26), securing valve components.
- Lubricate "O" ring (29) and assemble to valve stem (28).
- Coat valve stem (28) with ARO 29665 spindle oil and assemble to head (26).
- Assemble spring (30) to head, securing with washer (31) and screw (32).
- Assemble muffler housing (23), two fillers (22), diffuser (21) and washer (20) to head, securing with inlet adapter (19).
- Clean and replace screen (18) in inlet adapter.



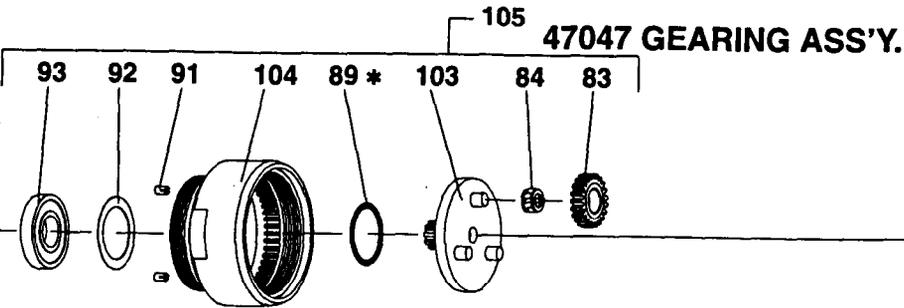
47762 TOOL KIT AVAILABLE AT EXTRA COST



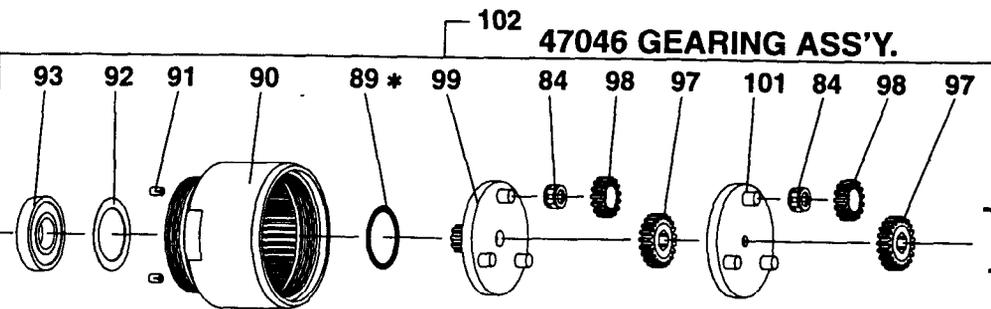
* ITEMS INCLUDED IN 47407 SERVICE KIT.



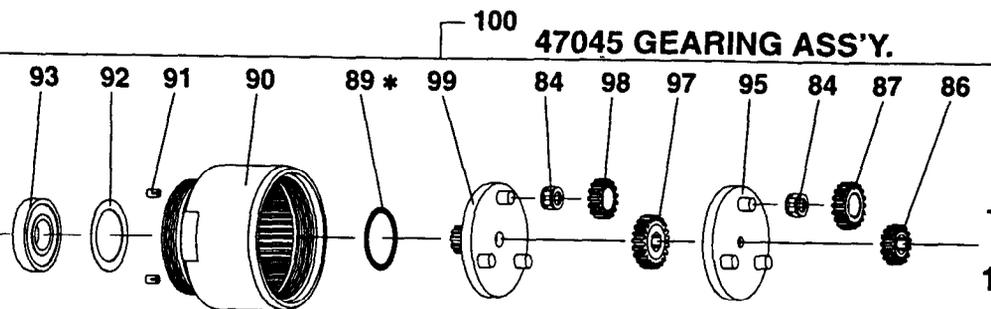
-24 MODELS
2400 R.P.M.
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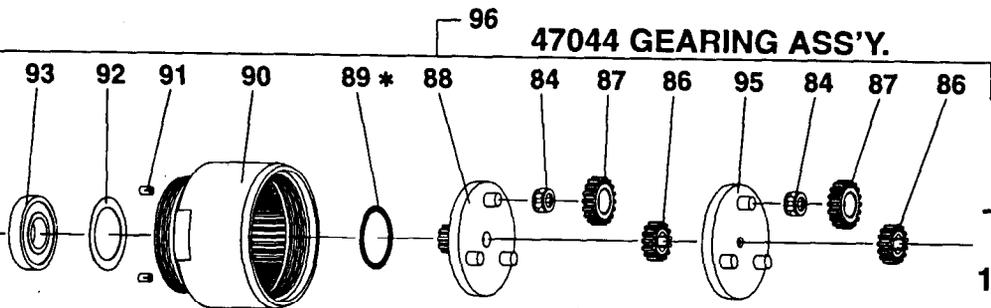
-16 MODELS
1600 R.P.M.
6.67:1 RED.



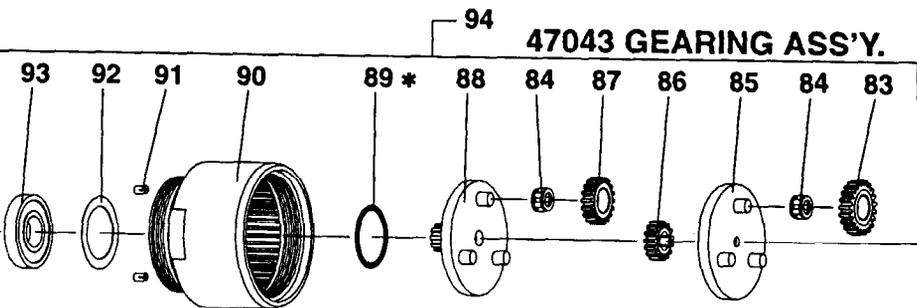
-10 MODELS
1000 R.P.M.
11.76:1 RED.



-8 MODELS
800 R.P.M.
15.09:1 RED.



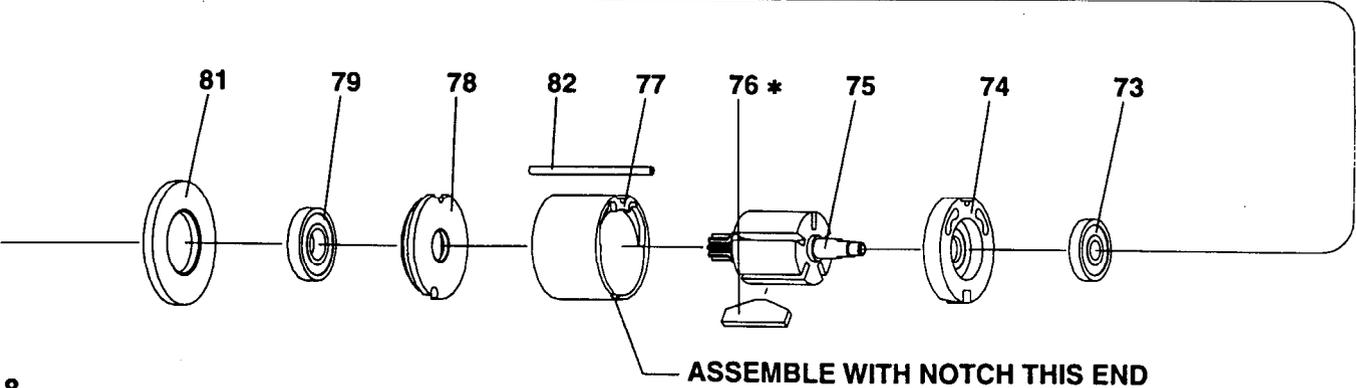
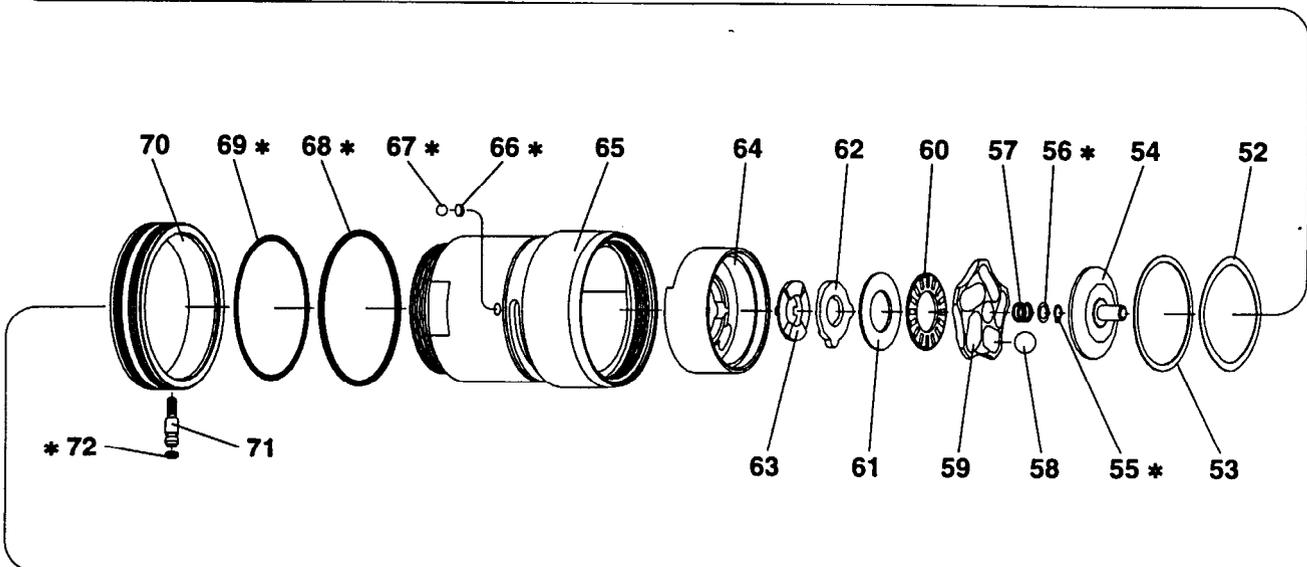
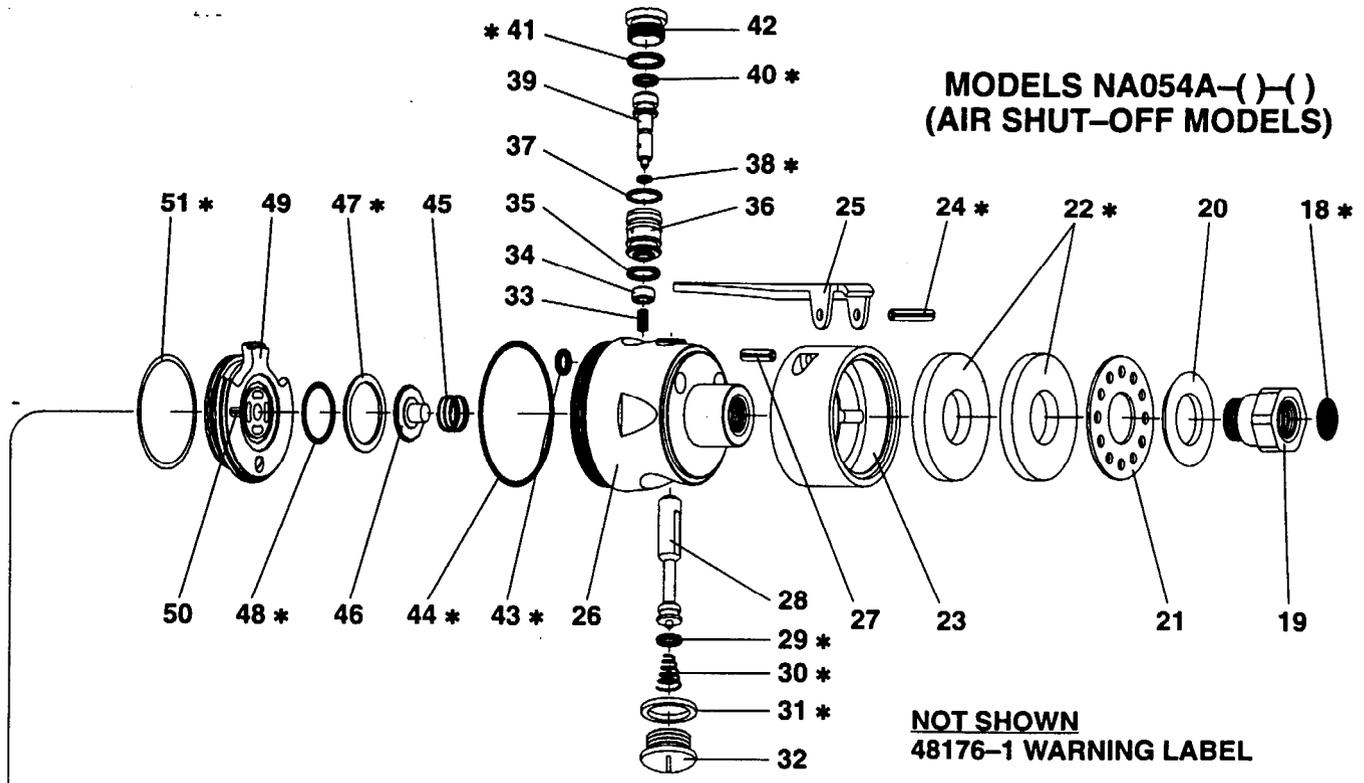
-6 MODELS
600 R.P.M.
19.36:1 RED.



-4 MODELS
400 R.P.M.
29.35:1 RED.

* ITEMS INCLUDED IN 47407 SERVICE KIT.

■ ASSEMBLE WITH THREAD ADHESIVE.



MODEL IDENTIFICATION CHART

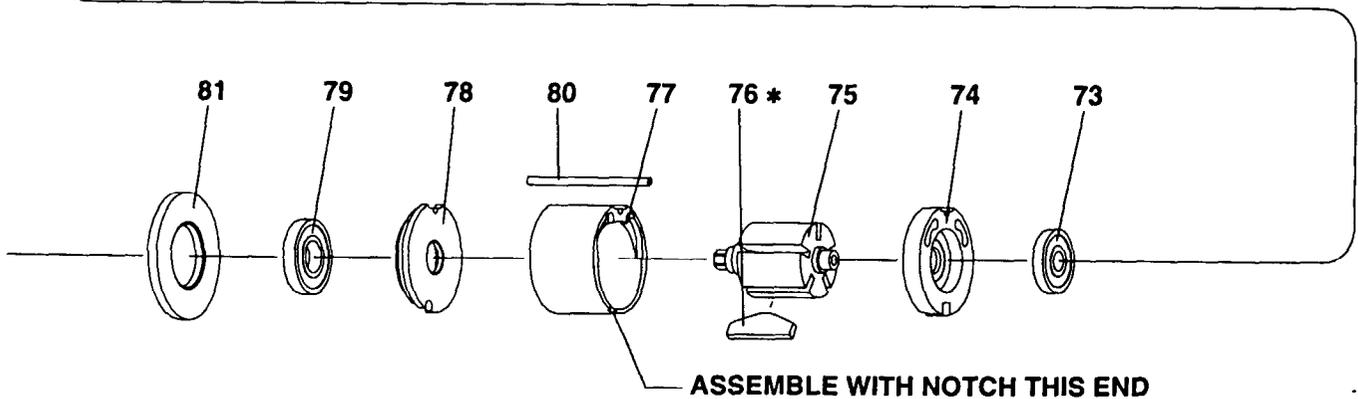
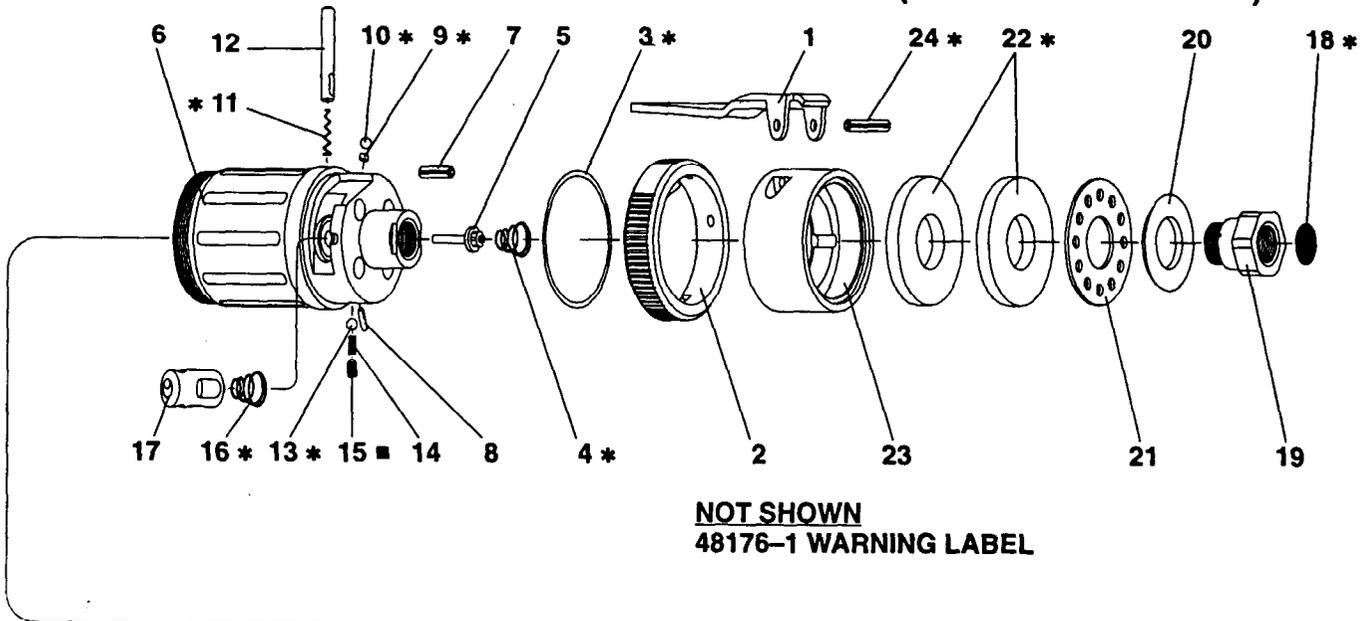
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MODEL NUMBER	R.P.M.	ROTOR (ITEM 75)	MOTOR ASSEMBLY	GEARING ASSEMBLY	RIGHT-ANGLE ASSEMBLY
NA051A-4-()	400	46470	47727	47043	46787
NA051A-6-()	600	46454	47728	47044	46787
NA051A-8-()	800	46454	47728	47045	46787
NA051A-10-()	1000	46454	47728	47046	46787
NA051A-16-()	1600	46470	47727	47047	46790
NA051A-24-()	2400	46454	47728	47048	46790
NA054A-4-()	400	46773	47729	47043	46787
NA054A-6-()	600	46774	47730	47044	46787
NA054A-8-()	800	46774	47730	47045	46787
NA054A-10-()	1000	46774	47730	47046	46787
NA054A-16-()	1600	46773	47729	47047	46790
NA054A-24-()	2400	46774	47730	47048	46790

DRIVE OPTION	TOOL R.P.M.	SQUARE DRIVE	DRIVE SPINDLE ASSEMBLY
-2	400, 600, 800 OR 1000	3/8"	47356 (ITEM 144)
-2	1600 OR 2400	3/8"	47214 (ITEM 131)
-3	400, 600, 800 OR 1000	1/2"	47357 (ITEM 152)

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

MODELS NA051A-()-() (STALL TYPE MODELS)



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

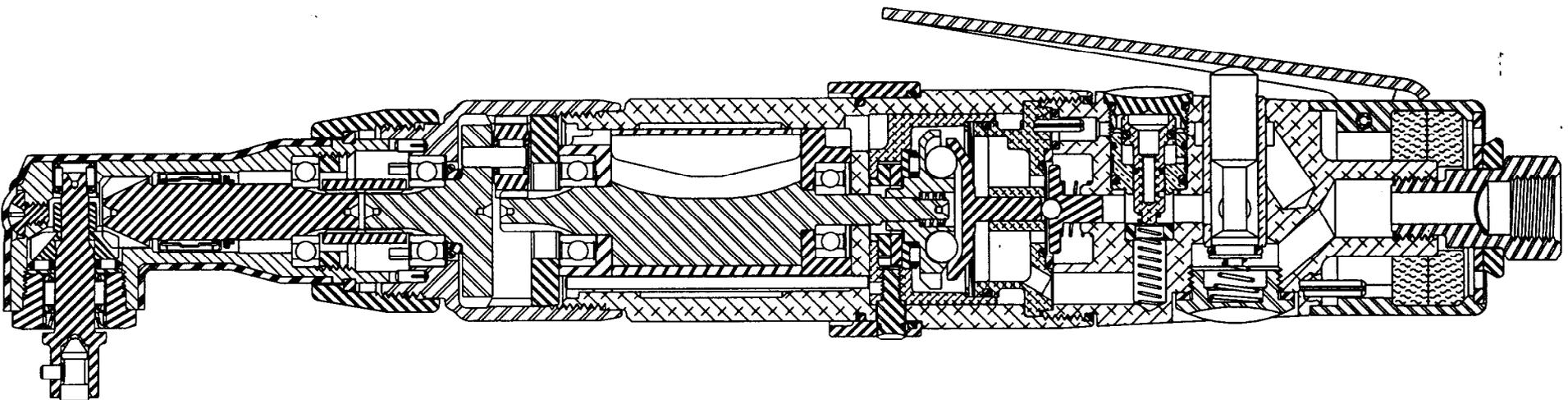
1	Lever	46754	69	"O" Ring	Y325-30
2	Reversing Sleeve	46757	70	Reversing Sleeve	46777
3	"O" Ring	Y325-29	71	Screw	47616
4	Spring	41654	72	"O" Ring	47615
5	Valve Rod Assembly	46354		Housing Assembly (includes items 64 thru 72)	46793
6	Housing Assembly (includes items 7 and 8)	46799		Head and Housing Assembly (includes items 18 thru 72)	46789
7	Roll Pin	Y178-41	73	Ball Bearing	47724
8	Pin	Y124-61	74	Rear End Plate	46312-1
9	Rubber Insert	47025	75	Rotor	See chart
10	Ball	Y16-204	76	Blade (5 req'd)	46413
11	Spring	46374	77	Cylinder	46311
12	Throttle Pin	46296-2	78	Front End Plate	47722
13	Ball	Y16-204	79	Ball Bearing	Y65-13
14	Spring	29108		Motor Assembly (includes items 73 thru 79)	See chart
15	Set Screw	Y23-81	80	Locating Pin	47723-2
16	Spring	41654	81	Spacer	46412
17	Valve Assembly	47058	82	Locating Pin	47723-3
18	Screen	33911	83	Planet Gear (3 req'd) 21 teeth	46901
19	Adapter	46778	84	Needle Bearing (3 or 6 req'd)	42315
20	Washer	47586	85	Carrier Assembly	46721
21	Diffuser	46751	86	Sun Gear (3 or 6 req'd) 15 teeth	46466
22	Filler (2 req'd)	46452	87	Planet Gear (3 or 6 req'd) 18 teeth	46900
23	Muffler Housing	46752	88	Spindle Assembly	47020
24	Roll Pin	Y178-45	89	"O" Ring	Y325-16
	Housing Assembly (includes items 1 thru 24)	47036	90	Ring Gear (includes item 91)	47042
25	Lever	46765	91	Pin (2 req'd)	Y124-61
26	Head Assembly (includes item 27)	46792	92	Spacer	46496
27	Roll Pin	Y178-41	93	Ball Bearing	Y65-13
28	Valve Stem	46772	94	Gearing Assembly (29.35:1 red.)	47043
29	"O" Ring	Y325-11	95	Carrier Assembly	46522
30	Spring	32858	96	Gearing Assembly (19.36:1 red.)	47044
31	Washer	31842	97	Sun Gear (1 or 2 req'd) 21 teeth	46465
32	Screw	34793	98	Planet Gear (3 or 6 req'd) 15 teeth	46899
33	Spring	46769	99	Spindle Assembly	47019
34	Seat	46783	100	Gearing Assembly (15.09:1 red.)	47045
35	"O" Ring	Y325-13	101	Carrier Assembly	46521
36	Bushing	46771	102	Gearing Assembly (11.76:1 red.)	47046
37	"O" Ring	47026	103	Spindle Assembly	47059
38	"O" Ring	47032	104	Ring Gear (includes item 91)	47050
39	Piston	46770	105	Gearing Assembly (6.67:1 red.)	47047
40	"O" Ring	Y327-11	106	Gearing Assembly (4.4:1 red.)	47048
41	"O" Ring	Y325-14	107	Coupling	46741
42	Cap	46697	108	Bearing Lock Nut	37105
	Head Assembly (includes items 18 thru 42)	47396	109	Ball Bearing	32850
43	"O" Ring	Y325-8	110	Snap Ring	Y110-5
44	"O" Ring	Y325-30	111	Spacer	46742
45	Spring	47034	112	Needle Bearing	48202-1
46	Disc Assembly	46780	113	Bevel Pinion	46733
47	Gasket	46768	114	Snap Ring	Y110-11
48	"O" Ring	Y325-16	115	Lock Nut	46745
49	Valve Block Assembly (includes item 50)	46791	116	Right-Angle Housing (includes items 117 and 118)	46788
50	Roll Pin	Y178-22	117	Needle Bearing	46750
51	"O" Ring	Y325-26	118	Machine Screw	Y134-103
52	Wavy Washer	47394	119	Sleeve (not shown)	46760
53	Spacer	47393	120	Right-Angle Assembly (1.44:1 red.) (includes item 119)	46790
54	Actuator Disc	46763	121	Sleeve	47600
55	Retaining Ring	43250	122	Bevel Gear	46735
56	Washer	47588	123	Thrust Bearing	46739
57	Spring	47587	124	Washer	46740-1
58	Ball (5 req'd)	Y16-208	125	Needle Bearing	31198
59	Ball Guide	46764	126	Seal	46782
60	Thrust Bearing	42363	127	Lock Nut	46744
61	Thrust Bearing Race	42384-1		Lock Nut Assembly (includes items 125, 126 and 127)	47405
62	Rear Cam	47024	128	Shaft	46779
63	Front Cam	47023	129	Locking Pin	30889
64	Reverse Valve	46766	130	Rubber Insert	30890
65	Motor Housing	46776	131	Spindle Assembly (3/8" square drive)	47214
66	Rubber Insert	47025	132	Retaining Ring	Y145-18
67	Ball	Y16-4			
68	"O" Ring	Y325-31			

PART NUMBER FOR ORDERING →

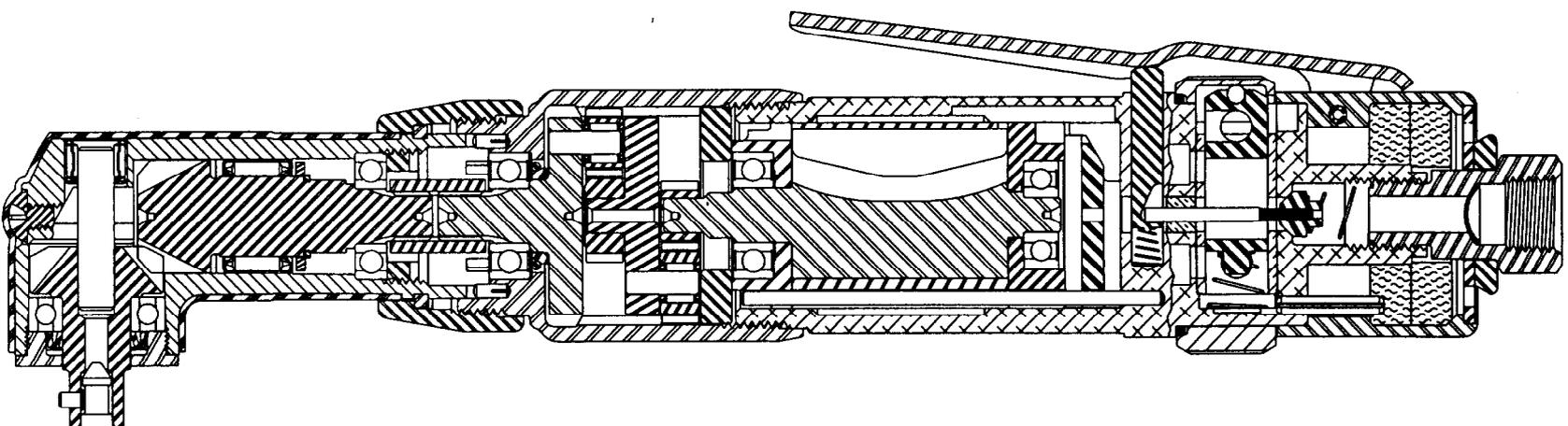
→ PART NUMBER FOR ORDERING

133	Spacer	46748			Lock Nut Assembly (includes items 142 and 143)	47406
134	Needle Bearing	46747		144	Spindle Assembly (3/8" square drive) ...	47356
135	Bevel Pinion	46738		145	Sleeve	47601
136	Right-Angle Housing (includes items 118 and 137)	46785		146	Bevel Gear	46736
137	Needle Bearing	37110		147	Seal	41447
138	Sleeve (not shown)	46759		148	Lock Nut	43909
139	Right-Angle Assembly (1.33:1 red.) (includes item 138)	46787		149	Lock Nut Assembly (includes items 147 and 148)	47410
140	Gear Assembly	46796		150	Shaft	47031
141	Ball Bearing	43750		151	Locking Pin	31565
142	Seal	46786		152	Rubber Insert	31566
143	Lock Nut	47027			Spindle Assembly (1/2" square drive) ...	47357

TYPICAL CROSS SECTION



NA054A-16-2



NA051A-8-2