



Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M32

MANUAL 3

Released: 5-13-94

Revised: 11-10-95

20 SERIES RIGHT-ANGLE SCREWDRIVER

Models: SRB21A-()-()



⚠ 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

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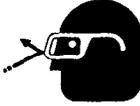
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FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ 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</p> <p>Read the manual before operating this tool. Operate at 90 psig/6.2 bar max.</p>	<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.</p>
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PN 48176-1 LABEL

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 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 3/32 oz. (2.7 g) of grease for double reduction. Right-angle assembly 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

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.

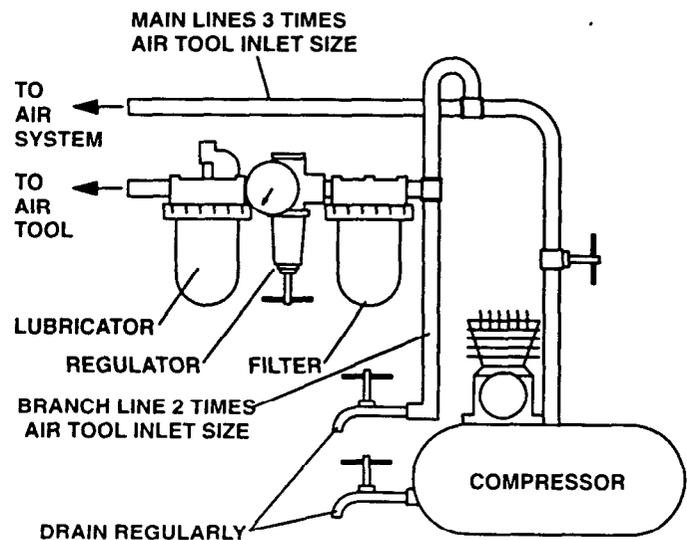
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

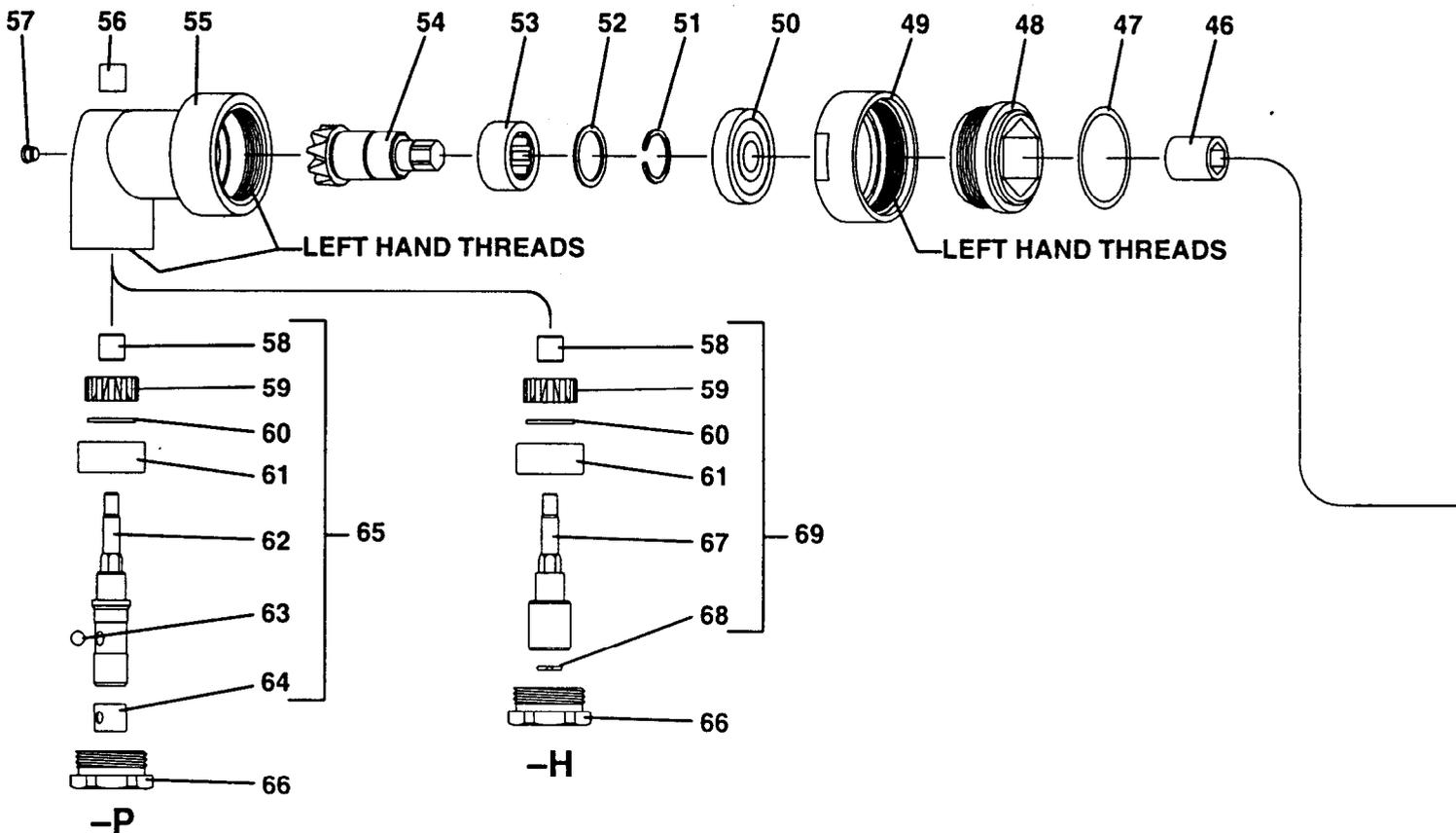
Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes rust, scale, moisture and other debris from the air lines. Low air pressure (less than 90 p.s.i.g.) reduces 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.

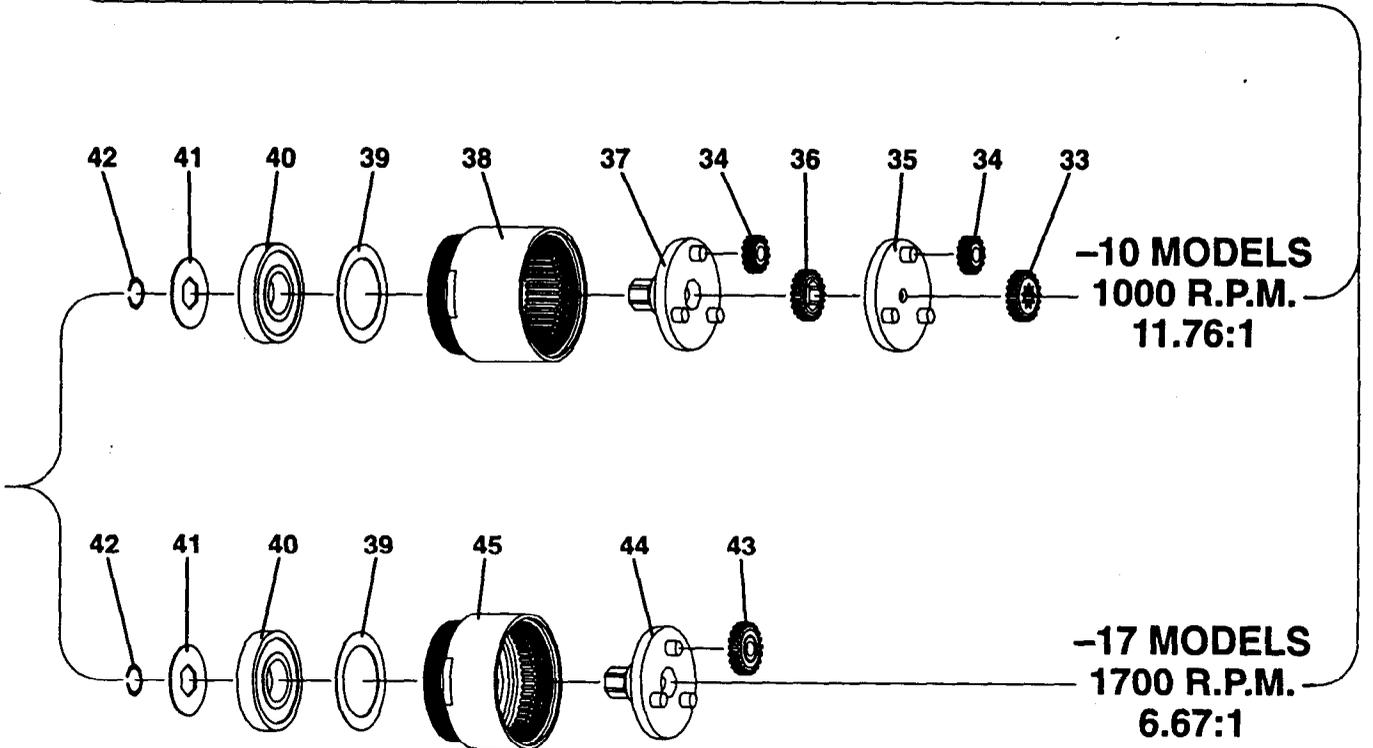
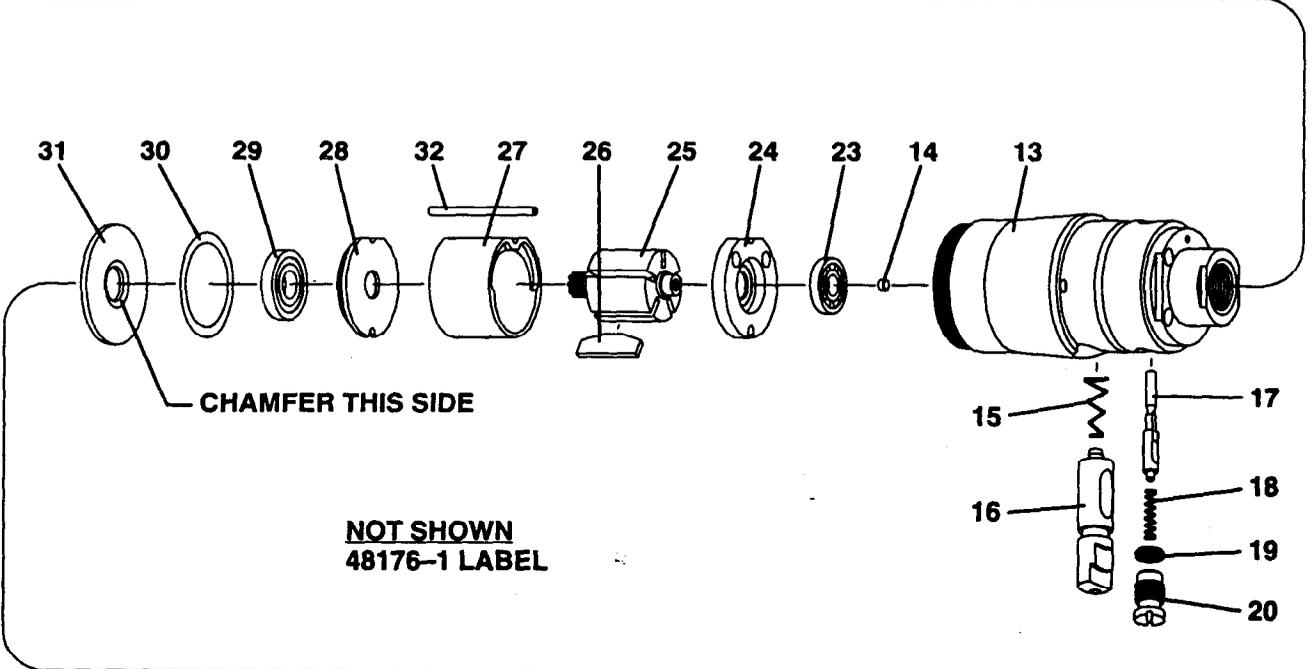
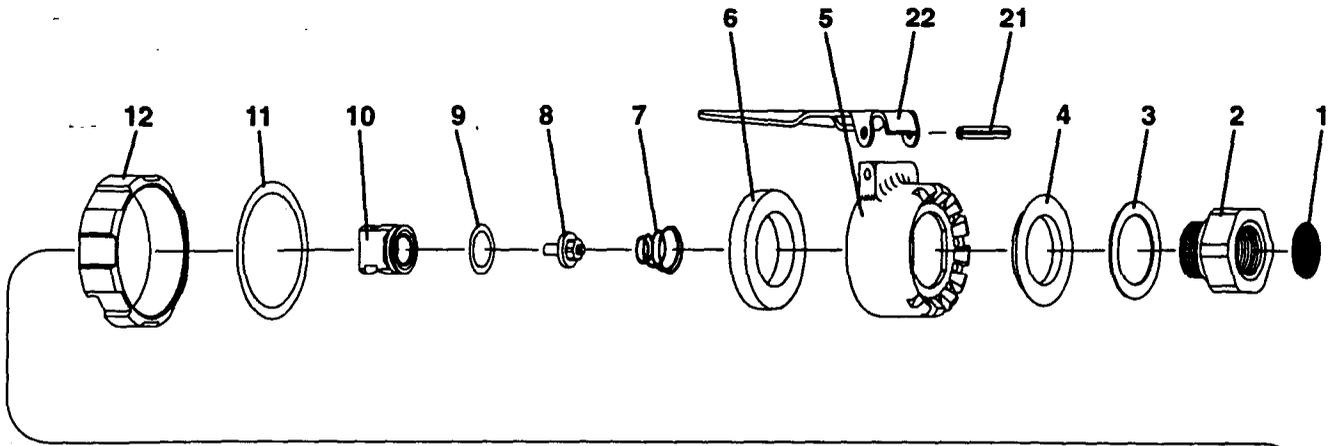


PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

1	Screen	33911	35	Carrier Assembly 3.43:1 ratio	46493
2	Inlet Adapter	46377	36	Sun Gear 3.43:1 ratio (21 teeth)	46560
3	Spacer	47205	37	Spindle Assembly 3.43:1 ratio	47742
4	Diffuser Washer	46371	38	Ring Gear (double reduction)	46323
5	Exhaust Cap	46366-1	39	Spacer	46496
6	Filler	48199-1	40	Ball Bearing	Y65-13
7	Spring	41654	41	Washer	47694
8	Valve Assembly	46354-2	42	Snap Ring	Y142-2
9	"O" Ring	Y325-11	43	Planet Gear (3 req'd) 6.67:1 ratio (21 teeth)	46875
10	Valve Block	48335-1	44	Spindle Assembly 6.67:1 ratio	47741
11	"O" Ring	48346-1	45	Ring Gear (single reduction)	46322
12	Reverse Sleeve	48337-1	46	Coupling	48184-1
13	Head and Bushing Assembly	48350-1	47	"O" Ring	Y325-19
14	Plug	49266	48	Adapter	48186-1
15	Spring	41654	49	Lock Nut	48185-1
16	Valve Body	48348-2	50	Ball Bearing	Y65-8
17	Valve Stem	48342-1	51	Snap Ring	Y110-5
18	Spring	31058	52	Spacer	46742
19	"O" Ring	Y325-10	53	Needle Bearing	48202-1
20	Cap	48338-1	54	Pinion	48181-1
21	Roll Pin	Y178-28	55	Right-Angle Housing	48203-1
22	Lever	48246-1	56	Needle Bearing	46750
23	Ball Bearing	41643	57	Grease Fitting	35967
24	Rear End Plate	46245	58	Sleeve	47600
25	Rotor	46338-2	59	Bevel Gear	46735
26	Blade (5 req'd)	46301	60	Washer	47694
27	Cylinder	46244	61	Ball Bearing	Y65-13
28	Front End Plate	47718	62	Spindle	48238-1
29	Ball Bearing	Y65-10	63	Ball	Y16-204
	MOTOR ASSEMBLY (includes items 23 thru 29)	47721	64	Ball Clip	47695
30	"O" Ring	Y325-116	65	Spindle Assembly	48236-1
31	Spacer	46305	66	Lock Nut	48187-1
32	Locating Pin	47719-2	67	Spindle (1/4" hex drive)	48231-1
33	Sun Gear 3.43:1 ratio (21 teeth)	46561	68	Retaining Ring	38790
34	Planet Gear (6 req'd) 3.43:1 ratio (15 teeth)	46904	69	Spindle Assembly (1/4" hex drive)	48232-1





DISASSEMBLY/ASSEMBLY INSTRUCTIONS

NOTICE

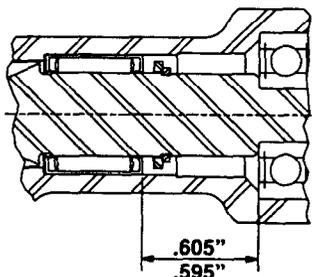
- Never apply excessive pressure by a holding device which may cause distortion of a part.
- Apply pressure evenly to parts which have a press fit.
- Apply even pressure to the bearing race that will be press fitted to the mating part.
- Use correct tools and fixtures when servicing this tool.
- Don't 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.

RIGHT-ANGLE DISASSEMBLY

- Using wrenches on flats of ring gear (38 or 45) and lock nut (49), unthread and remove right-angle section from the tool – LEFT HAND THREADS.
- To-disassemble drive assembly, unthread and remove lock nut (66) from housing (55) – LEFT HAND THREADS.
- Remove adapter (48) – LEFT HAND THREADS.
- Do not disassemble further unless damage is evident. To disassemble, pull pinion (54) from housing.
- Remove bearing (50), snap ring (51) and spacer (52), releasing needle bearing (53).

RIGHT-ANGLE ASSEMBLY

- Lubricate bearings with ARO 33153 grease before assembly.
- Assemble bearing (53) and spacer (52) to pinion (54), securing with snap ring (51). NOTE: Bearing (53) is to be located .600" from shoulder on pinion (see illustration below).



- Assemble bearing (50) to pinion, pressing on inner race of bearing.
- Assemble pinion (54) and components to housing (55), pressing on outer race of bearing (50).
- Assemble lock nut (49) to adapter (48) and assemble adapter to housing, securing pinion – LEFT HAND THREADS.
- Apply approximately 1/16 oz. of grease to right-angle gearing upon assembly.
- Assemble drive assembly (65 or 69) to lock nut (66).
- Assemble lock nut (66) and components to housing (55) – LEFT HAND THREADS.
- Assemble "O" ring (47) to adapter (48). NOTE: "O" ring and adjacent surfaces are to be free of oil and grease.
- Assemble coupling (46) to pinion and assemble right-angle housing and components to tool, securing with lock nut (49) – LEFT HAND THREADS.

GEARING DISASSEMBLY

- Remove right-angle section from the tool.
- Using a wrench on flats, unthread and remove ring gear (38 or 45).
- Remove snap ring (42) and washer (41).
- Remove spindle(s) and gears from ring gear. NOTE: Keep gears grouped with mating spindle when disassembling double reduction gearing.

- Do not remove bearing (40) or spacer (39) unless damage is evident.
- To remove bearing (40) and spacer (39) from ring gear, press on spacer (39) from inside splined end of ring gear.
- Do not remove gear (36) from carrier assembly (35) unless damage is evident. Gear (36) is press fit onto carrier assembly (35).

GEARING ASSEMBLY

- Assemble spacer (39) into ring gear (38 or 45).
- Assemble bearing (40) into ring gear, pressing on outer race of bearing.
- Coat shafts of spindle with ARO 33153 grease.
- Assemble gears to shafts of mating spindle.
- Assemble carrier assembly (35) to spindle assembly (37) for models with double reduction gearing.
- Lubricate sets of gears liberally with ARO 33153 grease (see "Routine Lubrication Requirements", page 3).
- Assemble spindle(s) and gearing into ring gear. Rotate spindle and gears to align gear teeth with splines of ring gear.
- Assemble washer (41) to spindle, securing with snap ring (42).
- Thread ring gear (38 or 45) to tool, tightening with a wrench on flats.
- Assemble right-angle section to tool.

MOTOR DISASSEMBLY

- Remove right-angle section and gearing from the tool.
- Remove spacer (31) and "O" ring (30).
- Tap front edge of housing to remove motor assembly. Locating pin (32) should also come out.
- Tap splined end of rotor (25) with a soft face hammer; motor will come apart. NOTE: Bearings are light press fit in end plates. Bearing (23) is press fit on rotor.
- Remove end plate (24) and bearing (23) from rotor.

MOTOR ASSEMBLY

- Lubricate bearing (23) with ARO 33153 grease and assemble to end plate (24), pressing on outer race of bearing.
- Assemble end plate (24) to rotor (25), pressing on inner race of bearing.
- Coat five rotor blades (26) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- Coat i.d. of cylinder (27) with ARO 29665 spindle oil and assemble over rotor, aligning air inlet slots of cylinder with air inlet slots in end plate (24).
- Assemble bearing (29) to end plate (28), pressing on outer race of bearing.
- Assemble end plate (28) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Insert locating pin (32) into .081" diameter blind hole at bottom of motor cavity in housing.
- Align notches of end plates and cylinder and install motor into housing (13), aligning notches with locating pin (32).
- Grease and assemble "O" ring (30) to end plate.
- Assemble spacer (31) to motor, with chamfered side of i.d. toward the motor.
- Assemble gearing and right-angle section to tool.

HOUSING DISASSEMBLY

- Clamp inlet adapter (2) in a smooth face vise.
- Using a strap type wrench, unthread housing (13).
- Remove spacer (3), diffuser washer (4), exhaust cap (5), filler (6), spring (7) and valve assembly (8). NOTE: Do not remove or adjust rubber portion of valve assembly (8), as it is preset at the factory.
- Remove cap (20) and spring (18), releasing valve stem (17).
- Remove valve block (10).

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

M32

3

- Remove "O" ring (11) and reverse sleeve (12), releasing valve body (16) and spring (15).

...HOUSING ASSEMBLY

- Assemble spring (15) to housing, securing with valve body (16).
- Assemble reverse sleeve (12) and "O" ring (11) to housing, securing valve body (16).
- Grease and assemble "O" ring (9) to valve block (10) and assemble valve block to housing. NOTE: Assemble with counterbore towards cap (20).
- Grease and assemble "O" ring (19) to cap (20).
- Assemble valve stem (17) and spring (18) to housing, securing with cap (20). NOTE: Assemble valve stem (17) with slot turned to accept valve assembly (8).
- Assemble filler (6) and exhaust cap (5) to housing, aligning lever (22) with valve stem (17).
- Assemble valve assembly (8) to housing, being certain valve assembly seats in slot in valve stem (17).
- Assemble spring (7) to housing, securing with diffuser washer (4), spacer (3) and inlet adapter (2).
- Clean and install screen (1) in inlet adapter.

MODEL NUMBER	R.P.M.	GEARING REDUCTION	DRIVE ASSEMBLY (ITEM 65 OR 69)
SRB21A-10-H	1000	11.76:1	48232-1 (69)
SRB21A-10-P	1000	11.76:1	48236-1 (65)
SRB21A-17-H	1700	6.67:1	48232-1 (69)
SRB21A-17-P	1700	6.67:1	48236-1 (65)



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