



Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

.70 AND 1.0 H.P. RIGHT ANGLE SANDER

SECTION M10
MANUAL 165

Released: 8-2-93

Revised: 2-17-95

Models: GRS07A-0()T-5 and GRS10A-0()T-5.

IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

AIR SUPPLY REQUIREMENTS

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

- AIR PRESSURE – 90 PSIG (6 bar)
- AIR FILTRATION – 50 micron
- LUBRICATED AIR SUPPLY
- HOSE SIZE – Models GRS07A-0()T-5 – 5/16" (8 mm) I.D.
- HOSE SIZE – Models GRS10A-0()T-5 – 3/8" (10 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.

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 2 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 40 HOURS OF TOOL OPERATION – Flush tool with a solution of three (3) parts cleaning solvent to one (1) part spindle oil (or use Kerosene).

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:

<u>Where Used</u>	<u>ARO Part #</u>	<u>Description</u>
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

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) 672-0601.

ARO Tool Products

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OPERATING AND SAFETY PRECAUTIONS

Safe and efficient operation of the ARO sander can be best attained by observing proper operating, inspection and maintenance procedures. Allow only competent and qualified people to operate the sander and subject each tool to a regular inspection and maintenance procedure. The qualified tool operator must be carefully instructed in the safe operation and use of the sander, including a study of the manufacturer's literature. The tool operator should have a good attitude regarding safety.

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 moni-

tor duration of use and their physical condition.

- These angle sanders will operate at the free speed specified on the nameplate if the air supply line furnishes 90 psig (6.2 bar) air pressure at the tool. Operation at a higher air pressure will result in excessive speed.
- Use only a sanding pad, buffing wheel or polishing bonnet with these tools. Do not use any grinding wheel, bur or metal removing accessory other than a sanding pad with these tools. Never use an accessory having a maximum operating speed less than the free speed of the sander in which it is being used.
- Always insert the tool shank to full depth in the collet. Tighten the collet nut securely to prevent the accessory from working out during operation of the sander. Check the tightness of the collet nut before operating a sander.
- Always wear protective eyewear when operating a sander.

INSPECTION AND MAINTENANCE

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.

PART NUMBER FOR ORDERING

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1	Inlet Assembly (includes items 2 and 3)	49450-1	42	Ball Bearing	49450-71
2	Inlet Seal	49450-3	43	Bearing Cup	49440-62
3	Inlet Screen	49440-2	44	Rotor Pinion	49460-91
4	Spring Seat	49450-23	45	Wick	49460-30
5	Spring	49460-5	46	Sleeve	49460-31
6	Throttle Valve	49460-6	47	Retaining Ring	49460-32
7	Valve Seat	49460-7	48	Gear Case Adapter	49460-33
8	Valve Cartridge	49450-4	49	Ring Gear	49460-83
9	Pin	49440-7	50	Clamp	49450-20
10	Motor Housing	See chart	51	Spindle	49460-88
11	Plunger	49450-8	52	Planet Gear (3 req'd)(includes item 53)	49460-89
12	Lever	49450-6	53	Bearing (3 req'd)	49460-90
13	Spacer (2 req'd)	49450-10	54	Seal	49460-79
14	Retaining Ring	49440-11	55	Ball Bearing	49460-38
15	Ball Bearing	49450-9	56	Extension Housing (includes item 57)	49460-87
16	Rotor	See chart	57	Grease Fitting	49440-57
17	Blade (4 req'd)	See chart	58	Plug	49460-41
18	Front End Plate	49450-14	59	Cap Wrench	49460-81
19	Spacer	49450-15	60	Rotor Pinion	49460-82
20	Seal Cup	49450-16	61	Spindle	49460-84
21	Ball Bearing	49450-17	62	Planet Gear (3 req'd)(includes item 63)	49460-85
22	Flow Ring	See chart	63	Bearing (3 req'd)	49460-86
23	Flange	49450-19	64	Rotor Pinion	49460-72
24	Clamp	49450-20	65	Gear Frame	49460-73
25	Retaining Ring (2 req'd)	49450-84	66	Spindle	49460-74
26	Nut (2 req'd)	49450-83	67	Bearing (6 req'd)	49460-76
27	Coupling	49450-81	68	Bushing (6 req'd)	49460-78
28	Sleeve	49450-82	69	Pin Assembly (3 req'd)	49460-77
29	Extension Housing	49460-3	70	Spur Gear (3 req'd)	49460-75
30	Washer (2 req'd)	49460-10	71	Extension Housing (includes item 57)	49460-80
31	Ball Bearing	49460-9	72	Arbor	49460-26
32	Spindle	49460-11	73	Exhaust Hose (available at extra cost)	49440-82
33	Ball Bearing	49450-17	74	Hose Retainer (available at extra cost)	49450-50
34	Bevel Pinion and Gear (sold only as a matched set)	See chart	75	Hose Adapter (available at extra cost)	49450-18
35	Angle Housing (includes items 36 thru 40)	49450-66	76	Warning Label (not shown)	49386
36	Spacer	49450-67	77	Nameplate (not shown)	See chart
37	Nut	49450-22	78	5/8" and 3/4" Wrench	49450-38
38	Bearing	49440-58	79	1/2" and 9/16" Wrench	49450-37
39	Grease Fitting	49440-57	80	1-1/2" Wrench	49450-78
40	Wick	See chart	81	7" Back-up Pad Kit (not shown)(not available on 9000 r.p.m. models)	49615
41	Nut	49450-70			

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.

ANGLE HEAD DISASSEMBLY

- Unthread and remove cap (43) – LEFT HAND THREADS.
- Loosen nut (37) – LEFT HAND THREADS – and pull angle housing (35) and components away from extension housing. Do not rotate angle housing when removing.
- Remove arbor (72) and components from housing (35).
- If wick (40) needs replacing, remove from housing.
- If bearing (38) needs replacing, press out arbor end of housing (35).
- Remove nut (41), releasing bevel gear.
- If bearing (42) needs replacing, press arbor from bearing.
- If nut (37) must be removed, pry spacer (36) off housing, releasing nut.

ANGLE HEAD ASSEMBLY

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble bearing (38) to angle housing (35), pressing flush with top of housing.
- Assemble bearing (42) to arbor, pressing on inner race of bearing. NOTE: Assemble bearing with black stain or hash mark side of bearing going on arbor first.
- Assemble bevel gear to arbor.
- Apply a thin coat of Loctite 271 W/T Primer* to the threads of arbor (72) and nut (41) and assemble nut to arbor, tightening to 8 – 9 ft lbs.
- Assemble wick (40) into the "U" shaped cavity in housing. Saturate wick with 3/64 oz. of ARO 29665 spindle oil.
- Inject 3/32 oz. of ARO 33153 grease into bearing (38) and wick cavity in housing.
- Assemble nut (37) and spacer (36) to housing. NOTE: Threaded end of nut and beveled end of spacer to be facing away from housing.
- Assemble angle housing and components to tool, securing with nut (37) – LEFT HAND THREADS. Tighten to 20 – 25 ft lbs.
- Assemble arbor (72) and components into angle housing, aligning teeth on bevel gear and bevel pinion.
- Apply a uniform coat of Vibra-Tite VC3 No. 205** to the threads of cap (43). Allow to cure for 12 – 15 minutes.
- Assemble cap (43) to housing – LEFT HAND THREADS – and tighten to 12 – 15 ft lbs.

GEARING DISASSEMBLY

1800, 3000 and 3200 R.P.M. GEARING

- Remove angle housing (35) and components from tool.
- Unthread and remove extension housing (56) and components from gear case adapter (48) – LEFT HAND THREADS.
- Remove gears (52 or 62) from spindle (51 or 61).
- Remove ring gear (49) and clamp (50) from extension housing.
- Remove plug (58) and rotate spindle to align cross hole in spindle with opening in housing (56).
- Insert a 5/32" diameter rod into the cross hole to keep spindle from turning and unthread and remove bevel pinion (34).
- Push spindle out large end of housing (56).
- Remove bearing (55) and seal (54).

- Remove bearing (33) from housing.
- Unthread and remove adapter (48) from motor housing (10) – LEFT HAND THREADS – releasing sleeve (46) and wick (45).

6000 R.P.M. GEARING

- Remove angle housing (35) and components from tool.
- Unthread and remove extension housing (71) and components from gear case adapter (48) – LEFT HAND THREADS.
- Remove gear frame (65) from spindle (66).
- Do not remove gears (70), bearings (67), bushings (68) or pins (69) unless damage is evident. To remove, press on pin (69) until bearing (67) is released from gear frame.
- Remove pin (69) and bushings (68) from gear (70), releasing gear. Repeat for the remaining two gears.
- Press the remaining bearings (67) from the gear frame.
- Remove clamp (50) from housing (71).
- Remove plug (58) and rotate spindle (66) to align cross hole in spindle with opening in housing (71).
- Insert a 5/32" diameter rod into the cross hole to keep spindle from turning and unthread and remove bevel pinion (34).
- Push spindle out large end of housing (71).
- Remove bearing (55) and seal (54).
- Remove bearing (33) from housing.
- Unthread and remove adapter (48) from motor housing (10) – LEFT HAND THREADS – releasing sleeve (46) and wick (45).

9000 R.P.M. GEARING

- Remove angle housing (35) and components from tool.
- Unthread and remove extension housing (29) and components from motor housing (10) – LEFT HAND THREADS.
- Remove coupling (27) and sleeve (28).
- Pull spindle (32) and components from small end of housing (29).
- Remove two washers (30) from housing.
- Remove retaining ring (25) from nut (26) on spindle.
- Remove nut (26) from spindle.
- Remove bevel pinion (34).
- Remove bearings (31 and 33) from spindle.

GEARING ASSEMBLY

1800, 3000 and 3200 R.P.M. GEARING

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble wick (45) into sleeve and against retaining ring (47). Saturate wick with approximately 3/64 oz. of ARO 29665 spindle oil.
- Assemble sleeve (46) over rotor pinion on rotor.
- Assemble adapter (48) to motor housing – LEFT HAND THREADS – and tighten to 20 – 25 ft lbs.
- Grease seal (54) with ARO 36460 "O" ring lube and assemble to groove on spindle (51 or 61).
- Slide bearing (55) onto spindle.
- Assemble spindle into large end of housing (56).
- Press bearing (33) onto spindle until it bottoms out in housing (56).
- Assemble bevel pinion (34) to spindle and tighten to 14 – 19 ft lbs.
- Assemble clamp (50) into large end of housing, so it encircles bearing (55).
- Assemble ring gear (49) into housing, against bearing (55), until bearing bottoms out in housing.
- Assemble gears (52 or 62), with bearings, to spindle.
- Assemble housing (56) to gear case adapter (48) – LEFT HAND THREADS – and tighten to 20 – 25 ft lbs.
- Assemble plug (58) to housing.
- Inject approximately 3/32 oz. of ARO 33153 grease into grease fitting (57).
- Assemble angle housing and components to tool.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

6000 R.P.M. GEARING

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble wick (45) into sleeve (46) and against retaining ring (47). Saturate wick with approximately 3/64 oz. of ARO 29665 spindle oil.
- Assemble sleeve (46) over rotor pinion on rotor.
- Grease seal (54) with ARO 36460 "O" ring lube and assemble to groove on spindle (66).
- Slide bearing (55) onto spindle.
- Assemble spindle into large end of housing (71).
- Press bearing (33) onto spindle until it bottoms out in housing (71).
- Assemble bevel pinion (34) to spindle and tighten to 14 – 19 ft lbs.
- Assemble clamp (50) into large end of housing, so it encircles bearing (55).
- Press bearings (67), identification markings facing out, into holes in notched face of gear frame (65), one bearing per hole. NOTE: Press bearings flush with counterbored face of gear frame.
- Assemble one bushing (68) to each end of pin (69) and slide up against spacer in middle of pin. NOTE: Do not move spacer.
- Assemble gear (70) to gear frame and assemble pin (69) and components into gear frame, retaining gear.
- Press bearing (67), identification markings facing out, into hole of gear frame, pressing flush with counterbored face.
- Repeat procedure for remaining gears.
- Assemble gear frame and components into housing (71), against bearing (55), until bearing bottoms out in housing.
- Assemble adapter (48) to housing (71) – LEFT HAND THREADS – and tighten to 20 – 25 ft lbs.
- Assemble extension housing (71) and components to motor housing (10) – LEFT HAND THREADS – and tighten to 20 – 25 ft lbs.
- Assemble plug (58) to housing (71).
- Inject approximately 3/32 oz. of ARO 33153 grease into grease fitting (57).
- Assemble angle housing and components to tool.

9000 R.P.M. GEARING

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble bearing (31) to spindle (32), pressing on inner race of bearing.
- Assemble bearing (33) to spindle (32), pressing on inner race of bearing. Assemble bearing with stained or marked side facing away from the spindle.
- Assemble bevel pinion (34) to spindle, tightening to 14 – 19 ft lbs.
- Assemble nut (26), with retaining ring (25), to spindle and tighten to 14 – 19 ft lbs.
- Assemble two washers (30) into extension housing.
- Assemble spindle (32) and components into small end of housing (29).
- Coat the inside of coupling (27) with approximately 1/32 oz. of ARO 33153 grease and assemble over nut (26).
- Assemble sleeve (28) over coupling.
- Assemble housing (29) and components to motor housing – LEFT HAND THREADS – and tighten to 20 – 25 ft lbs.
- Assemble angle housing and components to tool.

MOTOR DISASSEMBLY

- Remove angle housing and gearing from tool.

- Remove clamp (24), releasing flange (23) and flow ring (22).
- Remove the motor assembly from the motor housing (10).
- Remove two spacers (13) from housing (10).
- Remove blades (17) from rotor (16).
- Unthread and remove nut (26) or rotor pinion (44, 60 or 64) from rotor.
- To remove bearing (21), press rotor (16) from bearing (21), releasing seal cup (20), spacer (19) and end plate (18).
- Remove retaining ring (14), releasing bearing (15).

MOTOR ASSEMBLY

- Lubricate bearings with ARO 33153 grease upon assembly.
- Assemble bearing (15) to rotor (16), pressing on inner race of bearing.
- Assemble retaining ring (14) to rotor, securing bearing.
- Assemble end plate (18) to rotor, with counterbored side facing away from rotor.
- Assemble seal cup (20) onto end of spacer (19) without beveled i.d. NOTE: Press onto spacer until the felt end of seal cup is flush with the end of spacer. Saturate the felt with ARO 29665 spindle oil.
- Assemble spacer and seal cup to rotor.
- Assemble bearing (21) to rotor, pressing on inner race of bearing. NOTE: The side of bearing with black stain or hash marks must face away from end plate.
- Assemble nut (26) or rotor pinion (44, 60 or 64) to rotor, tightening to 14 – 19 ft lbs.
- Assemble retaining ring (25) to nut (26), where applicable.
- Inject approximately 1/32 oz. of ARO 33153 grease into the recess at the bottom of the motor housing cavity. Assemble two spacers (13) into motor housing.
- Coat rotor blades (17) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- Assemble motor assembly into motor housing.
- Assemble flow ring (22) to flange (23). Align notched projection on edge of flow ring (22) with the letter on the housing designating front or rear exhaust.
- Assemble flange (23) and flow ring onto motor housing, securing with clamp (24).
- Assemble gearing and angle housing to tool.

THROTTLE DISASSEMBLY

- Unthread and remove inlet assembly (1).
- Remove seal (2) and screen (3).
- Remove seat (40), spring (5) and throttle valve (6) from motor housing. Do not remove valve seat (7) unless damage is evident. To remove, pull from housing.
- Remove pin (9), releasing lever (12) and plunger (11).

THROTTLE ASSEMBLY

- Assemble seat (7) into motor housing. Assemble small end of spring (5) to throttle valve (6) and assemble seat (4) to large end of spring. Assemble throttle valve (6) and components into motor housing.
- Assemble screen (3), closed end first, into inlet (1).
- Grease seal (2) with ARO 36460 "O" ring lube and assemble to inlet (1).
- Assemble inlet (1) to housing, tightening to 20 – 25 ft lbs.
- Coat plunger (11) with ARO 29665 spindle oil and assemble into motor housing.
- Assemble lever (12) to motor housing, securing with pin (9).
- Apply several drops of ARO 29665 spindle oil into inlet assembly (1).

LISTED BELOW ARE SOME OF THE MOST COMMON CAUSES FOR TOOL MALFUNCTION. MALFUNCTIONS BEYOND THE SCOPE OF THIS MANUAL SHOULD BE BROUGHT TO THE ATTENTION OF YOUR ARO REPRESENTATIVE OR RETURN THE TOOL TO THE FACTORY FOR REPAIR.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
Low power or low free speed.	1. Insufficient air pressure.	1. Check air line pressure at the inlet of the tool. It must be 90 p.s.i.g.
	2. Clogged muffler elements.	2. Disassemble the tool and agitate the bare motor housing and flange in clean kerosene. Back flush the muffler elements by blowing into the exhaust ports with an air gun until all contaminants and obstructions are removed. If the elements cannot be cleaned, replace the motor housing and/or flange.
	3. Plugged inlet screen (3).	3. Clean the inlet screen with a stream of air or replace screen.
	4. Worn or broken blades (17).	4. Install a complete set of new blades.
	5. Loose extension housing.	5. Tighten housing to 20 - 25 ft lbs.
	6. Worn or broken motor housing (10).	6. Replace the motor housing.
	7. Internal air leakage in the motor housing indicated by high air consumption/low speed.	7. Replace the motor housing.
	8. Grit buildup under the lever (12), restricting full plunger (11) movement.	8. Remove the lever and clean the groove in the motor housing.
	9. Bent stem on throttle valve (6).	9. Replace the throttle valve.
	10. Front seal cup (20) dragging against the shield of bearing (21).	10. Reposition or replace the seal cup.
Rough operation or vibration.	1. Improper lubrication or dirt buildup.	1. Inject 3/32 oz. of clean kerosene into the inlet, operate the tool for 30 seconds and immediately inject 3/32 oz. of the recommended oil into the inlet and run the tool long enough to coat the internal parts with oil.
	2. Worn or broken bearings (15 or 21).	2. Replace the worn or broken bearings. Examine the front end plate (18), spacer (19), seal cup (20) and spacers (13) and replace any damaged parts. If the attached rotor plate is damaged, replace the rotor (16).
	3. Worn or broken bearings (38 or 42).	3. Replace the worn or broken bearings.
	4. Worn or broken bevel gear or bevel pinion (34).	4. Examine the bevel gear and bevel pinion. If either is worn or damaged, replace both the gear and pinion because they are a matched set and must not be used separately.
Excessive runout	1. Bent arbor (72).	1. Replace the arbor.
	2. Worn or damaged bearings (38 or 42).	2. Replace the damaged bearing.
Scoring.	1. Worn spacer (19) or front end plate.	1. Install a new spacer and front end plate.
	2. Worn bearing (21).	2. Install a new bearing.
Leaky throttle valve.	1. Dirt accumulation on throttle valve or valve seat.	1. Inject 3/32 oz. of clean kerosene into the inlet, operate the tool for 30 seconds and immediately inject 3/32 oz. of the recommended oil into the inlet and run the tool long enough to coat the internal parts with oil.
	2. Worn throttle valve or valve seat.	2. Replace the throttle valve and/or valve seat.
Exhausts at wrong location.	1. Incorrect orientation of the flow ring (22).	1. Reverse the face of the flow ring against the motor housing.
Bearing (21) runs hot.	1. Incorrect installation of seal cup (20).	1. Reposition the seal cup flush with the face of spacer (19).
	2. Spacer (19) rubbing the bore of front end plate (18).	2. Replace the front end plate and spacer combination.
	3. Incorrect bearing (21) installation orientation.	3. If a black stain or black hashmarks are not visible on the face of the bearing when it is assembled with the end plate and rotor, the bearing is backwards. If possible, remove the bearing and install it correctly or replace the bearing.
Slow tool idle.	1. Bent or leaky throttle valve.	1. Replace the throttle valve.
Air leakage around flow ring (22).	1. Damaged, mutilated or missing flange clamp (24).	1. Replace the flange clamp.
	2. Damaged flow ring (22).	2. Replace the flow ring.



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