ARO®
Tool & Hoist Products

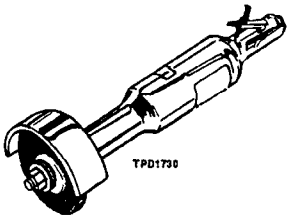
OPERATOR'S MANUAL

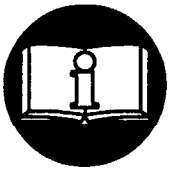
INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION MANUAL M10 177

Released: 4–30–94
Revised: 7–01–95

MODELS GH15A–12G–3, GH15A–12G–4, GH15A–09G–4 GH15A–12D–5 AND GH15A–09D–5 HORIZONTAL 1.5 H.P. GRINDERS AND MODELS GH15A–05L–5 AND GH15A–03L–5 HORIZONTAL 1.5 H.P. WIRE BRUSH MACHINES





⚠ WARNING

IMPORTANT SAFETY INFORMATION ENCLOSED.
READ THIS MANUAL BEFORE OPERATING TOOL.

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

- Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 1/2" (13 mm) inside diameter air supply hose.
- 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.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
- Keep hands, loose 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.
- Check for excessive speed and vibration before operating.
- Tool shaft may 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 accessories recommended by ARO Tool.
- This tool is not designed for working in explosive atmospheres.
- This tool is not insulated against electric shock.

NOTICE

The use of other than genuine ARO Tool replacement parts may result in safety hazards, decreased tool performance, and increased maintenance, and may invalidate all warranties.

ARO Tool is not responsible for customer modification of tools for applications on which ARO Tool was not consulted.

Repairs should be made only by authorized trained personnel. Consult your nearest ARO Tool 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) 672–0601

ARO Tool & Hoist Products
Ingersoll–Rand Company

Printed in U.S.A.

ARO®
Part of worldwide Ingersoll–Rand

WARNING LABEL IDENTIFICATION

⚠ WARNING

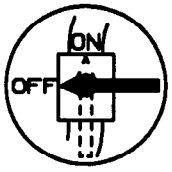
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ WARNING

Always wear eye protection when operating or performing maintenance on this tool.

⚠ WARNING

Always wear hearing protection when operating this tool.



⚠ WARNING

Always turn off the air supply and disconnect the 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

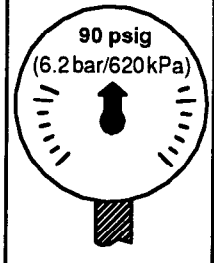
Do not carry the tool by the hose.

⚠ WARNING

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

⚠ WARNING

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



⚠ WARNING

Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.

GRINDER SPECIFIC WARNINGS

⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

- Do not use this tool if actual free speed exceeds the nameplate rpm.
- Before mounting a wheel, after any tool repair or whenever a Grinder is issued for use, check free speed of the tool with a tachometer to make certain its actual speed at 90 psig (6.2 bar/620 kPa) does not exceed rpm stamped or printed on the nameplate. Grinders in use on the job must be similarly checked at least once each shift.
- Always use the recommended ARO Tool Wheel Guard furnished with the Grinder.
- Do not use a Grinder without the recommended wheel guard. Do not use any wheel for which the operating speed listed on the blotter is lower than the actual free speed of the grinder in which it is being used. Always conform to maximum rpm on grinding wheel blotter.
- Inspect all grinding wheels for chips or cracks prior to mounting. Do not use a wheel that is chipped or cracked or otherwise damaged. Do not use a wheel that has been soaked in water or any other liquid.
- Make certain grinding wheel properly fits the arbor. Do not use reducing bushings to adapt a wheel to any arbor unless such bushings are supplied by or recommended by the wheel manufacturer.
- After mounting a new wheel, hold the Grinder under a steel workbench or inside a casting and run it for at least 60 seconds. Make certain no one is within the operating plane of the grinding wheel. If a wheel is defective, improperly mounted or the wrong size and speed, this is the time it will usually fail.
- When starting with a cold wheel, apply it to the work slowly until the wheel gradually warms up. Make smooth contact with the work and avoid any bumping action or excessive pressure.
- Always replace a damaged, bent or severly worn wheel guard. Do not use a wheel guard that has been subjected to a wheel failure.
- Make certain wheel flanges are at least 1/3 the diameter of grinding wheel, free of nicks, burrs and sharp edges. Always use wheel flanges furnished by the manufacturer; never use a makeshift flange or a plain washer. Tighten Flange Nut securely.
- Guard opening must face away from operator. Bottom of wheel must not project beyond guard.
- Always use a wheel blotter between each wheel flange and the wheel. The blotters must be at least as large in diameter as the wheel flanges.
- Do not attempt to disassemble the Controller. The Controller is available only as a unit and is guaranteed for the life of the tool if it is not abused.
- Before installing a new Arbor Housing Assembly, always select the correct Housing Assembly for the model you are repairing.
- Incorrect combinations of grinding wheel, wheel guard and tool speed could result in injury. Correct combinations are specified below:

Guard Part Number	Wheel Type	Wheel Diameter in. (mm)	Maximum Wheel Thickness in. (mm)	Maximum Speed (rpm)
49843–180	1	3 (76)	1/2 (13)	12 000
49843–168	1	4 (102)	1 (25)	12 000

PLACING TOOL IN SERVICE

LUBRICATION

IRAX No. 50P

IRAX No. 68 – 1LB

Always use an air line lubricator with this Tool.
We recommend the following Filer–Lubricator–Regulator Unit:

For USA – IRAX No. C11–03–G00
For International – IRAX No. C16–C3–A29

Before starting the tool, unless the air line lubricator is used, detach the air hose and inject about 2.5 cc of IRAX No. 50P Oil into the air inlet. Remove the Oil Chamber Plug (7) from the Throttle Handle (1) and fill the chamber.

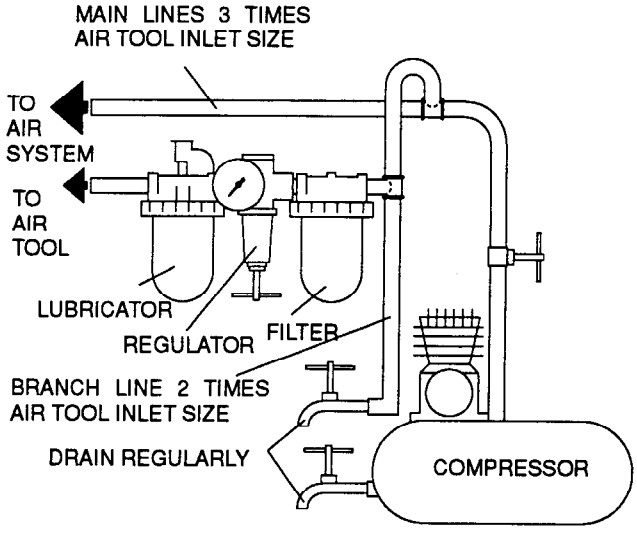
After each eight hours of operation, or as experience indicates, remove the Oil Chamber Plug from the Throttle Handle and fill the chamber.

INSTALLATION

Air Supply and Connections

Always use clean, dry air at 90 psig maximum air pressure. Dust–corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
An air line filter can greatly increase the life of an air tool. The filter removes dust and moisture.

Make sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for typical piping arrangement.



(Dwg. TPD905–1)

GH15A Grinders are designed for heavy duty grinding in confined areas such as small castings or inside larger castings.

HOW TO ORDER A GRINDER

TYPE 1 WHEEL HORIZONTAL GRINDERS

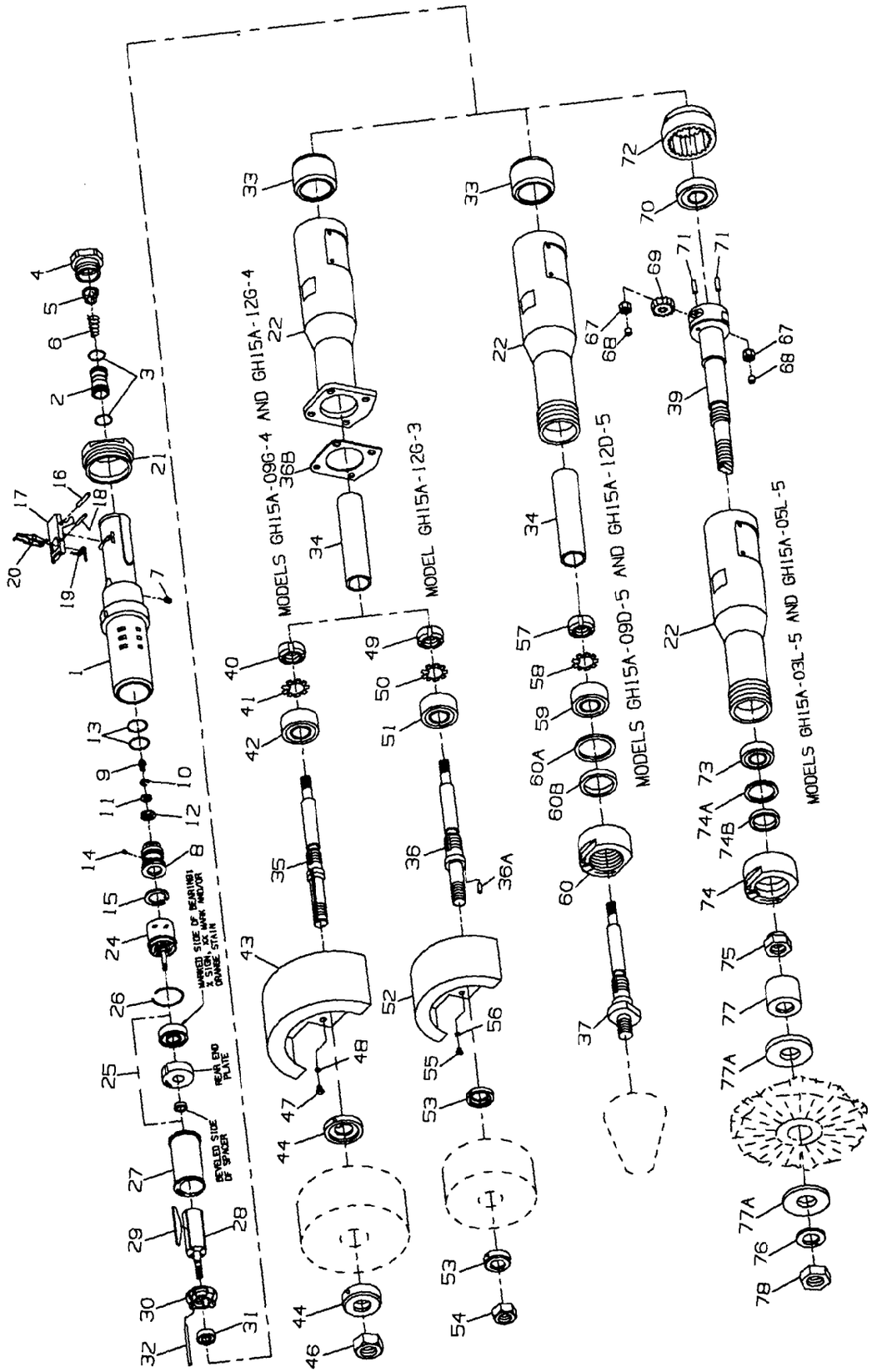
Model	Free Speed, rpm	Type 1 Wheel		Spindle and Guard
		inches	mm	
GH15A–09G–4	9 000	4	101.6	1/2"–13, 4"
GH15A–12G–3	12 000	3	76.2	3/8"–24, 3"
GH15A–12G–4	12 000	4	101.6	1/2"–13, 4"

CONE WHEEL HORIZONTAL GRINDERS

Model	Free Speed, rpm	Spindle
GH15A–09D–5	9 000	5/8"–11
GH15A–12D–5	12 000	5/8"–11

FLAP WHEEL AND WIRE BRUSH MACHINES

Model	Free Speed, rpm	Spindle
GH15A–03L–5	3 000	5/8"–11
GH51A–05L–5	5 000	5/8"–11



(Dwg. TPA1438-1)

		PART NUMBER FOR ORDERING
1	Throttle Handle Assembly	49843–116
2	Throttle Valve Assembly	49845–108
3	Seal (2)	49845–109
4	Inlet Bushing	49843–117
5	Inet Bushing Screen	49843–111
6	Throttle Valve Spring	49843–118
7	Oil Chamber Plug	49843–119
8	Throttle Valve Seat Support Assembly	49843–120
9	Valve Seat Screw	49845–118
10	Valve Seat Lock Washer	49845–117
11	Valve Seat Washer	49845–116
12	Valve Seat	49845–115
13	Valve Support Seal (2)	49843–121
14	Oiler Feeder Plug	49842–114
15	Throttle Valve Seat Support Retainer	49843–122
16	Throttle Lever Pin	49845–119
17	Throttle Lever Assembly	49843–123
18	Lever Lock Pin	49843–124
19	Lever Lock Spring	49843–125
20	Lever Lock	49843–126
21	Coupling Nut	49843–127
22	Arbor Housing Assembly	
	for model GH15A–12G–3	49843–101
	for model GH15A–12G–4	49843–102
	for model GH15A–09G–4	49843–103
	for model GH15A–12D–5	49843–104
	for model GH15A–09D–5	49843–105
	for model GH15A–03L–5	49843–106
	for model GH15A–05L–5	49843–107
*	Decal	49845–209
*	Grease Fitting	49440–57
*	Nameplate	
	for model GH15A–12G–3	49843–108
	for model GH15A–12G–4	49843–109
	for model GH15A–09G–4	49843–110
	for model GH15A–12D–5	49843–111
	for model GH15A–09D–5	49843–112
	for model GH15A–03L–5	49843–113
	for model GH15A–05L–5	49843–114
	Nameplate Screw (4)	49843–128
	Warning Label	
	for models GH15A–03L–5 and GH15A–05L–5	49843–129
	for all other models	49845–134
24	Controller Assembly (consists of Controller and Rear End Plate Assembly)	
	for models GH15A–09G–4, GH15A–09D–5 and GH15A–03L–5	49843–130A
	for models GH15A–12G–3, GH15A–12G–4 and GH15A–12D–5	49843–131A
	for model GH15A–05L–59	49843–132A
25	Rear End Plate Assembly (consists of rear end plate, rotor bearing and required spacers)	49843–134
26	Rear End Plate Gasket	49843–133
27	Cylinder	49843–135
28	Rotor	
	for models GH15A–03L–5 and GH15A–05L–5 (9 teeth)	49843–136
	for all other models (13 teeth)	49843–137

* Not illustrated.

		PART NUMBER FOR ORDERING
29	Vane Packet (set of 4 Vanes)	49843–138
30	Front End Plate	49843–139
31	Front Rotor Bearing	49843–140
32	Cylinder Dowel	49843–141
33	Motor Spacer	49843–142
34	Arbor Coupling	49843–143
*	Controller Wrench	49843–144
*	Bearing Clamp Assembly	49843–145
*	Valve Seat Support Retaining Pliers	49843–146
*	Coupling Nut Wrench	49843–147
*	1/2" Pipe Tap Inlet Bushing	49845–110
*	Vibra–Tite ®** (0.6 cc) (2)	49843–148
*	Adhesive Kit	49843–149
	THE FOLLOWING PARTS ARE USED IN MODELS GH15A–09G–4 AND GH15A–12G–4 TYPE 1 RADIAL WHEEL GRINDERS	
35	Arbor (13 teeth)	49843–151
36B	Dust Seal	49843–152
40	Bearing Locknut	49843–153
41	Bearing Lock Washer	49843–154
42	Wheel End Bearing	49843–155
43	Wheel Guard (4" x 1")	49843–168
44	Wheel Flange (2)	49843–157
46	Wheel Nut	49843–158
47	Wheel Guard Screw	
	M6 x 1–6g 14 mm long (2)	49843–159
	10–32 x 1/2" long (2)	49843–172
48	Wheel Guard Lock Washer (2) (for use with No. 49843–159)	49843–161
	THE FOLLOWING PARTS ARE USED IN MODEL GH15A–12G–3 TYPE 1 RADIAL WHEEL GRINDER	
36	Arbor (13 teeth)	49843–174
36A	Wheel Flange Pin	49843–175
36B	Dust Seal	49843–152
49	Bearing Locknut	49843–153
50	Bearing Lock Washer	49843–154
51	Wheel End Bearing	49843–155
52	Wheel Guard (3" x 1/2")	49843–180
53	Wheel Flange (2)	49843–181
54	Wheel Nut	49440–43
55	Wheel Guard Screw	
	M6 x 1–6g 14 mm long (2)	49843–159
	10–32 x 1/2" long (2)	49843–172
56	Wheel Guard Screw Lock Washer (2) (for use with 49843–159)	49843–161

* Not illustrated.

** Registered trademark of N.D. Industires.

		PART NUMBER FOR ORDERING
	THE FOLLOWING PARTS ARE USED IN MODELS GH15A–09D–5 AND GH15A–12D–5 CONE WHEEL GRINDERS	
37	Cone Wheel Arbor (13 teeth)	
	3/8"–24 thread	49843–182
	1/2"–13 thread	49843–183
	5/8"–11 thread	49843–184
57	Bearing Locknut	49843–153
58	Bearing Lock Washer	49843–154
59	Wheel End Bearing	49843–155
60	Wheel Bearing Cap	49843–189
60A	Cap Spring	49843–186
60B	Dust Washer	49843–187
*	Cone Wheel Arbor Wrench (1")	49845–191
	THE FOLLOWING PARTS ARE USED IN MODELS GH15A–03L–5 AND GH15A–05L–5 WIRE BRUSH MACHINES	
39	Wire Brush Arbor	49843–193
67	Planet Gear Assembly (2)	49842–125
65	Planet Gear Bearing (one for each Gear)	49843–194
69	Rotor Pinion (9 teeth)	49842–124
70	Gear Frame Bearing	49842–122
71	Planet Gear Shaft (2)	49842–123
72	Internal Gear	49842–121
73	Wheel End Bearing	49843–195
74	Wheel Bearing Cap	49843–189
74A	Cap Spring	49843–186
74B	Dust Washer	49843–187
75	Wheel End Bearing Nut	49843–199
76	Wire Brush Lock Washer	49460–68
77	Wire Brush Spacer (Long)	49460–66
77A	Wire Brush Spacer (Short) (2)	49845–182
78	Wire Brush Nut	49460–69
*	Wheel Bearing Nut Wrench (1")	49845–191
*	Wire Brush Nut Wrench (15/16")	49841–159

* Not illustrated.

MAINTENANCE SECTION

⚠ WARNING

Always wear eye protection when operating or performing maintenance on this tool.

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

DISASSEMBLY

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the Grinder unless you have a complete set of new gaskets and o–rings for replacement.

Disassembly of the Arbor

For Models GH15A–12G–3, GH15A–12G–4 and GH15A–09G–4:

1. Grasp the Arbor Housing (22) in a vise, guard up.
2. Use an applicable spanner wrench inserted into the pin hole of the flange to hold the arbor. Using an open–end wrench, remove the Wheel Nut (46 or 54).
3. Remove the Wheel Flanges (44 or 53) and Wheel Flange Pin (36A).
4. Unscrew and remove the Wheel Guard Screws (47 or 55). Remove the Wheel Guard Lock Washers (48 or 56), Wheel Guard (43 or 52), and Dust Seal (36B).
5. Lift the Arbor (35 or 36) and the Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling off the Arbor.
6. Grasp the Arbor (35 or 36) in a vise, spline end up.
7. Using pliers, straighten the tangs of the Bearing Lock Washer (41 or 50). Unscrew the Bearing Locknut (49 or 57) and remove the Bearing Lock Washer.
8. If the Arbor Bearing (42 or 51) needs to be replaced, press it from the Arbor Shaft.

For Models GH15A–09D–5 and GH15A–12D–5:

1. Grasp the Arbor Housing (22) in a vise, cone wheel up.
2. Using a No. 49845–191 Cone Wheel Arbor Wrench to hold the arbor, unscrew the cone wheel and remove it from the arbor.
3. Using a wrench on the flats, remove the Wheel Bearing Cap (60) in the direction of the arrow on the face of the Cap. Lift the Wheel Bearing Cap, Arbor Assembly (37) and Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling off the Arbor.
4. Grasp the flats on the Arbor (37) in a vise, spline end up.
5. Using pliers, straighten the tangs of the Bearing Lock Washer (58). Unscrew the Bearing Locknut (57) and remove the Bearing Lock Washer.
6. Press the Arbor Bearing (59) from the Arbor Shaft.
7. Remove the Wheel Bearing Cap, Cap Spring (60A) and Dust Washer (60B).

For Models GH15A–03L–5 and GH15A–05L–5

1. Grasp the Arbor Housing (22) in a vise, wire brush up.
2. Use the 49845–191 Wrench on the flats of the Wheel End Bearing Nut to hold the arbor. Using the 49841–159 Wrench, remove the Wire Brush Nut (78).
3. Remove the Wire Brush Lock Washer (76), Wire Brush Short Spacer (77A), Wire Brush, Wire Brush Short Spacer (77A) and Wire Brush Long Spacer (77).
4. Use a wrench on the flats at the end of the arbor to hold the arbor. Using the 49845–191 Wrench, remove the Wheel End Bearing Nut (75).
5. Using a wrench on the flats, remove the Wheel Bearing Cap (74) in the direction of the arrow on the face of the Cap. Remove the Dust Washer (74B) and Cap Spring (74A).
6. Remove the Wheel End Bearing (73).

Disassembly of the Throttle Lever and Inlet

1. Grasp the flats of the Throttle Handle (1) in leather–covered or copper–covered vise jaws, air inlet up.
2. Remove the Inlet Bushing (4), Inlet Bushing Screen (5) and the Throttle Valve Spring (6). The Bushing has an interference thread and is tightly fit.
3. Drive out the Throttle Lever Pin (16) to release the Throttle Lever Assembly.
4. Remove the Throttle Handle from the vise.
5. Using a soft hammer, tap the arbor end of the housing to release the Throttle Valve Assembly (2), or using lock ring pliers, pull the Assembly from the Throttle Handle. Remove the two Seals (3).

Disassembly of the Motor and Throttle

1. Grasp the Arbor Housing (22) horizontally in leather–covered or copper–covered vise jaws.
2. Using No. 49843–147 Coupling Nut Wrench, remove the Coupling Nut (21).
3. Grasp the Throttle Handle (1) and pull the handle from the Arbor Housing.
4. Grasp the splined end of the Rotor (28) and pull the motor from the Throttle Handle.
5. Remove the Cylinder Dowel (32).
6. Grasp the splined end of the Rotor in leather–covered or copper–covered vise jaws.
7. Remove the Front End Plate (30) and Front Rotor Bearing (31) from the Rotor.
8. If the Front Rotor Bearing needs to be replaced, press it from the Front End Plate.
9. Lift off the Cylinder (27).
10. Remove the Vanes (29).

NOTICE

Loctite®* No. 277 was applied to the threads of the Rotor during assembly to prevent the Controller Assembly (24) from loosening during operation. Before attempting to to unscrew the assembly from the Rotor, apply moderate heat from a propane torch to the middle of the rotor body to soften the Loctite. Do not overheat the Rotor. Heat it only long enough to allow the Controller Assembly to be unscrewed without using excessive force.

CAUTION

Use only the special Controller Wrench for removing the Controller Assembly. Do not attempt to disassemble the Controller. It is available only as a unit and is guaranteed for the life of the Grinder if it is not abused.

11. Using the No. 49843–144 Controller Wrench, unscrew and remove the Controller Assembly (24).

NOTICE

The Rear End Plate, Spacer and Bearing are a matched set. Do not mix the components with those of another set. The Rear Rotor Bearing is always damaged during the removal process, and a complete new Rear End Plate Assembly must be installed.

12. If the Rear End Plate Assembly (25) consisting of the Rear End Plate, Spacer and Bearing needs to be replaced, press it from the Controller.
13. Remove the Rear End Plate Gasket (26).
14. Using No. 49843–146 Valve Seat Support Retainer Pliers, remove the Throttle Valve Seat Support Retainer (15).
15. Grasp the Throttle Handle (1) horizontally in leather–covered or copper–covered vise jaws. Using a brass rod 8" (204 mm) long inserted into the air inlet end of the handle, lightly tap the brass rod with a soft hammer to release the Throttle Valve Seat Support Assembly (8).
16. Remove the Valve Seat Screw (9), Valve Seat Lock Washer (10), Valve Seat Washer (11), Valve Seat (12) and Valve Support Seals (13).
17. Check the Oiler Feeder Plug (14). Replace if necessary.
18. Place the Arbor Housing (22), arbor end up on a workbench. Lightly tap the end of the Arbor Housing with a soft hammer to release the Motor Spacer (33).
19. **For Wire Brush Machines**, lightly tap the protruding end of the arbor with a soft hammer to release the Wire Brush Arbor (39).
20. Remove the Internal Gear (72).
21. Remove the Gear Frame Bearing (70). This is a light press fit.
22. Check the Planet Gears (67) and Planet Gear Bearings (68) for wear. If they need to be replaced, proceed as follows:
    a. Using a pin punch and soft hammer, remove the Planet Gear Shaft (71).
    b. Remove the Planet Gear Assembly (67).
    c. Remove the Planet Gear Bearing (68) from inside the Planet Gear.
    d. Remove the Rotor Pinion (69).
    e. Remove the second Planet Gear as in steps (a) through (c).

NOTICE

Always replace both Planet Gears and the Rotor Pinion even if only one Gear shows wear. Carefully check the Internal Gear and replace if necessary.

* Registered trademark of Loctite Corporation.

ASSEMBLY

General Instructions

1. Always press on the **inner** ring of a ball–type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball–type bearing when pressing the bearing in a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
4. Always clean every part, and wipe every part with a thin film of oil before installation.
5. Apply a film of o–ring lubricant to all O–rings before final assembly.

Assembly of the Motor and Throttle

1. Assemble the Throttle Valve Seat Support Parts. Tighten the Valve Seat Screw (9) to 12 in–lb (1.4 Nm) torque. Apply o–ring lubricant to the new Valve Support Seals (13) before installing them on the Throttle Valve Seat Support.
2. Insert the Assembly in the large diameter of the handle, Valve Seat Screw end first.
3. Using No. 49843–146 Valve Seat Support Retainer Pliers, install the Throttle Valve Seat Support Retainer (15).
4. Press the Front Rotor Bearing (31) and the Front End Plate (30) onto the rotor shaft.
5. Grasp the Rotor (28) in a vise, splined end down.
6. Place the Cylinder (27) over the Rotor, aligning the dowel hole in the Cylinder with the dowel hole in the Front End Plate.
7. Apply a film of the recommended oil to each new Vane (29) and insert a Vane, straight edge out, into each vane slot in the Rotor. If new Vanes are required, replace the entire set.
8. Check the large inside diameter of the Rear End Plate Assembly (25) for wear. If the large inside diameter of the Rear End Plate is worn to 1.516" (38.506 mm) or larger, install a new Rear End Plate Assembly.

NOTICE

If the Controller Assembly must be replaced, it is furnished with a new Rear End Plate Assembly. Use only the End Plate Assembly furnished with the Controller Assembly. If the Controller is good but the Rear End Plate Assembly needs replacement, only install a new Rear End Plate Assembly. Do not use or interchange old parts with new Rear End Plate Assembly components. The End Plate, Spacer and Bearing are a matched set. Do not mix components with those of another set. The Rear Rotor Bearing is always damaged during removal and a new Rear End Plate Assembly must be installed.

9. Press the Rear End Plate Assembly onto the shaft of the Controller Body making certain that the marked end of the Rear Rotor Bearing faces toward the Controller or rear of the Grinder. Also make certain that the bevelled side of the Spacer faces the Cylinder or front of the Grinder.
10. Clean the threads on the Controller Assembly (24) and apply two or three drops of Loctite No. 277.

NOTICE

Thread the Controller onto the Rotor. Before tightening the Controller, be certain that the dowel holes in the Cylinder and End Plate are aligned. Tighten the Controller to 7.5 to 8.0 ft–lb (10.1 to 10.8 Nm) torque. Do not exceed 8 ft–lb (10.8 Nm) torque as the Controller could be damaged. Allow Loctite to cure for six hours before putting Grinder back in service.

⚠ WARNING

Always check the free speed of the Grinder after it has been reassembled and before it is put back into service. Never use a Grinder with a free speed which exceeds the maximum speed listed on the Nameplate.

11. Remove the Rotor from the vise.
12. Insert the Cylinder Dowel (32) so it is flush with the face of the Front End Plate and protrudes from the back of the Rear End Plate Assembly.

13. Install a new Rear End Plate Gasket (26) into the Throttle Handle (1).
14. Install the assembled motor into the Throttle Handle (1), making sure the Cylinder Dowel (32) aligns with the pin hole inside the Throttle Handle.
15. Install the Motor Spacer (33) into the large end of the Arbor Housing (22).

NOTICE

16. **For Wire Brush Machines,** install the Planet Gear Bearings (68) into the Planet Gears (67).
    a. Install one assembled Planet Gear (67) into one of the slots in the gear head. Make sure the shaft hole aligns in both the Planet Gear and the gear head.
    b. Press the Planet Gear Shaft (71) into the hole opposite the tapered shaft hole in the gear head until it is flush with the face of the gear head.
    c. Install the Rotor Pinion (69) making sure the teeth of the Planet Gear and Pinion mesh. Install the other assembled Planet Gear into the other slot of the gear head. Make sure the teeth of the Planet Gear and Pinion mesh and the shaft hole aligns in both the Planet Gear and the gear head.
    d. Press the other Planet Gear Shaft (71) into the hole opposite the tapered shaft hole in the gear head until it is flush with the face of the gear head.
    e. Press the Gear Frame Bearing (70) onto the gear head end of the Arbor (39).
    f. Install the Internal Gear (72) over the gear head end of the Arbor (39), making sure the splines of the Internal Gear mesh with the Planet Gear teeth.
    g. Lubricate the Gearing liberally with IRAX No. 68–1LB Grease and install the assembled Arbor into the Arbor Housing (22).

NOTICE

In the following step, make sure the Lever (17) on the Throttle Handle (1) aligns with the ARO Tool Decal on the exterior of the Arbor Housing (22).

17. Slide the assembled Throttle Handle (1) into the Arbor Housing (22).

NOTICE

For Wire Brush Machines, make sure the spline on the Rotor (28) properly engages the spline in the Rotor Pinion (69).

18. Grasp the Arbor Housing in leather–covered or copper–covered vise jaws, air inlet up.
19. Clean the Coupling Nut (21) threads and carefully apply a uniform coat of Vibra–Tite ®** VC3 No. 205 to at least the first three threads. Allow the Vibra–Tite to cure for ten to twenty minutes before assembly.

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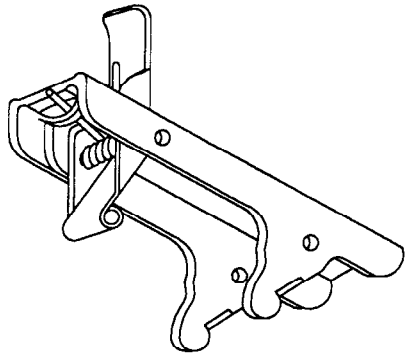
NOTICE

In the following step, do not exceed 52 ft–lb (70.5 Nm) torque. The motor may be damaged if this torque is exceeded.

20. Using No. 49843–147 Coupling Nut Wrench, install the Coupling Nut and tighten it to 50 to 52 ft–lb (68 to 70.5 Nm) torque.

Assembly of the Throttle Lever and Inlet

1. Assemble the Throttle Lever Assembly (17) as illustrated below.



Locking Lever Assembly

(Dwg. TPD662)

2. Align the holes in the Throttle Lever Assembly (17) with the slots in the Throttle Handle. Using a soft hammer, tap the Throttle Lever Pin (16) through the Throttle Lever Assembly. File off any sharp edges. Operate the mechanism to assure operation.
3. Grasp the flats of the Throttle Handle Assembly (1) in leather–covered or copper–covered vise jaws, air inlet up.
4. Insert the new Throttle Valve Spring (6), small end first.

NOTICE

The Inlet Bushing in the next step has an interference thread. Apply a light film of the recommended oil to the threads before assembly.

5. Clean the face of the Inlet Bushing (4) and the Inlet Bushing Screen (5) in a clean, suitable, cleaning solution before assembling into the tool. Insert the parts in the end of the Throttle Handle. Using a wrench, tighten the Inlet Bushing (4) to 125 ft–lb (170 + or – 35 Nm) torque.

6. Fill the Oil Chamber with the recommended oil and insert the Oil Chamber Plug (7). Tighten to 4 ft–lb (5.4 Nm) torque.

Assembly of the Arbor

For Models GH15A–12G–3, GH15A–12G–4, and GH15A–09G–4:

1. Press the Wheel End Bearing (42 or 51) onto the Arbor (35 or 36).
2. Grasp the Arbor (35 or 36) in leather–covered or copper–covered vise jaws, spline end up.
3. Install the Bearing Lock Washer (41 or 50) and Bearing Locknut (40 or 49) onto the Arbor. Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
4. Remove the Arbor from the vise.
5. Grasp the Arbor Housing (22) in leather–covered or copper–covered vise jaws, guard end up. Install the Dust Seal (36B) on the Arbor Housing
6. Lubricate with 3 to 4 cc of IRAX No. 68–1LB Grease and install the Arbor Coupling (34) into the Arbor Housing (22) and onto the spline of the rotor shaft. Slide the spline of the Arbor (35 or 36) into the Arbor Coupling (34).
7. Place the Wheel Guard (43 or 52) onto the Arbor Housing, keeping the Dust Seal (36B) in place and making sure the holes are aligned. Install the Guard Lock Washers (48 or 56) and Wheel Guard Screws (47 or 55). Tighten the two upper screws to 9.0 to 9.5 in–lb (10.25 to 10.75 Nm) torque. Tighten the two lower Screws to 4.2 to 4.3 in–lb (4.75 to 5.50 Nm) torque.
8. **For Models GH15A–12G–4 and GH15A–09G–4,** install a Wheel Flange (44), Wheel and the other Wheel Flange (44) onto the Arbor (35) so that the keys are opposite each other.

   For Model GH15A–12G–3, install a Wheel Flange (53) so the pin in the Arbor (36) enters the hole in the side of flange. Install the Wheel and the other Wheel Flange (53).
9. Using an applicable Spanner Wrench inserted into the pin hole of the inboard flange to hold the arbor, install the Wheel Nut (46 or 54) with an open–end wrench. Only tighten sufficiently to drive the wheel and prevent slippage. Remove the Arbor Housing from the vise.

For Models GH15A–12D–5 and GH15A–09D–5

1. Grasp the Arbor (37) in leather–covered or copper–covered vise jaws, spline end up.
2. Install the Bearing Lock Washer (58) and Bearing Locknut (57) onto the Arbor (37). Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
3. Remove the Arbor from the vise.
4. Grasp the Arbor Housing (22) in a vise, threaded end up.
5. Lubricate with 3 to 4 cc of IRAX No. 68–1LB Grease and install the Arbor Coupling (34) into the Arbor Housing and onto the spline of the rotor shaft.
6. Slide the spline of the Arbor (37) into the Arbor Coupling. Tighten the Wheel Bearing Cap to 25 to 30 ft–lb (34 to 41 Nm) torque.
7. Using a No. 49845–191 Cone Wheel Arbor Wrench to hold the Arbor (37), install the cone wheel turning clockwise until hand–tight. Remove the Arbor Housing from the vise.

For Models GH15A–05L–5 and GH15A–03L–5

1. Press the Wheel End Bearing (73) into the Arbor Housing (22) and onto the Arbor (39).
2. Grasp the Arbor Housing (22) in leather–covered or copper–covered vise jaws, threaded end up.
3. Install the Wheel Bearing Cap (74), Cap Spring (74A) and Dust Washer (74B). Tighten the Cap to 25 to 30 ft–lb (34 to 41 Nm) torque.
4. Install the Wheel End Bearing Nut and tighten snugly.
5. Install the Wire Brush Long Spacer (77), Wire Brush Short Spacer (77A), Wire Brush, Wire Brush Short Spacer (77A), Wire Brush Lock Washer (76) and Wire Brush Nut (78). Use a wrench on the flats of the Wheel End Bearing Nut (75) to hold the Arbor. Using an open–end wrench, tighten the Wire Brush Nut (78) securely. Remove the Arbor Housing from the vise.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Low air pressure at the Inlet	Check the air pressure at the Inlet. The pressure must not exceed 90 psig (6.2 bar/620 kPa).
	Plugged Inlet Bushing Screen	Clean the Screen in a clean, suitable, cleaning solution. If it cannot be cleaned, replace it. **⚠ WARNING** **Never operate a Grinder without an Inlet Screen. Ingestion of dirt into the Grinder can, in some cases, cause an unsafe condition.**
	Worn or broken Vanes	Replace the **complete** set of Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it is worn or broken or if the bore is scored or wavy.
	Improper lubrication or dirt build–up in the motor	Lubricate the Grinder as instructed in **LUBRICATION.** If lubrication does not result in satisfactory operation, disassemble the motor, inspect and clean all parts.
High free speed	Worn Rear End Plate Assembly and/or Controller Seal in Controller Assembly.	Replace the Rear End Plate Assembly and/or Controller Assembly.
Grinder will not run	Coupling Nut too tight	Loosen Coupling Nut and re–tighten to 50 to 52 ft–lb (68 to 70.5 Nm) torque. **⚠ WARNING** **Do not exceed 52 ft–lb (70.5 Nm) torque.**
Rough operation	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Examine each Bearing. Replace Front Rotor Bearing or Front End Plate Assembly if either Bearing is worn or damaged.
	Bent Arbor	Mount the Arbor on centers. Check bearing diameter runout with an indicator. Replace the Arbor if runout exceeds .002" (0.051 mm) Total Indicator Reading.
Scoring	Improper assembly	Make certain that all motor parts are properly aligned prior to clamping the Motor Assembly.
Air leaks	Worn Valve Seat or Valve Seat Washer	Replace worn parts
	Worn Throttle Valve Seals	Replace both Seals
	Oiler Plug and Oiler Plug Washer not tight	Tighten the Plug. If the problem persists, replace it.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

NOTES

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