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Air Grinder
Series 77H

Maintenance Information

Save These Instructions

Ingersoll Rand

Product Safety Information

WARNING

- Failure to observe the following warnings, and to avoid these potentially hazardous situations, could result in death or serious injury.
- Read and understand this and all other supplied manuals before installing, operating, repairing, maintaining, changing accessories on, or working near this product.
- Always wear eye protection when operating or performing maintenance on this tool. The grade of protection required should be assessed for each use and may include impact-resistant glasses with side shields, goggles, or a full face shield over those glasses.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose when not in use, before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.
- Do not use this tool if the actual free speed exceeds the rated rpm. Check the free speed of this tool before mounting any accessories, after all tool repairs, before each job and after every 8 hours of use. Check speed with a calibrated tachometer, without the abrasive product installed.

Note: *When reading the instructions, refer to exploded diagrams in Parts Information Manuals when applicable (see under Related Documentation for form numbers).*

Disassembly

General Instructions

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 tool unless you have a complete set of new gaskets and O-rings for replacement.

Disassembly of the Arbor

1. **For Models 77H120H63, 77H120H63-EU, 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU,** 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.
9. **For Models 77H90L10, 77H90L10-EU, 77H120L10 and 7H120L10-EU,** grasp the Arbor Housing (22) in a vise, cone wheel up.
10. Using a No. 7RAQT-254 Cone Wheel Arbor Wrench to hold the arbor, unscrew the cone wheel and remove it from the arbor.
11. 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.
12. Grasp the flats on the Arbor (37) in a vise, spline end up.
13. Using pliers, straighten the tangs of the Bearing Lock Washer (58). Unscrew the Bearing Locknut (57) and remove the Bearing Lock Washer.
14. Press the Arbor Bearing (59) from the Arbor Shaft.
15. Remove the Wheel Bearing Cap, Cap Spring (60A) and Dust Washer (60B).
16. **For Model 77H90G6,** grasp the Arbor Housing (22) in a vise, collet end up.
17. Use a No. DG120-69 Collet Arbor Wrench to hold the Arbor. Using a No. DG120-69 Collet Nut Wrench, remove the Collet Nut (65).
18. Remove the Collet (66) from the end of the arbor.
19. Using a wrench on the flats, remove the Wheel Bearing Cap (64) in the direction of the arrow on the face of the Cap. Remove the Dust Washer (64B) and Cap Spring (64A).
20. Lift the Arbor (38) and the Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling from the Arbor.
21. Grasp the Arbor (38) in a vise, spline end up.
22. Using pliers, straighten the tangs of the Bearing Lock Washer (62). Unscrew the Bearing Locknut (61) and remove the Bearing Lock Washer.
23. If the Arbor Bearing (63) needs to be replaced, press it from the Arbor Shaft.
24. **For Models 77H30B106, 77H30B106-EU, 77H50B106 and 77H50B106-EU,** grasp the Arbor Housing (22) in a vise, wire brush up.
25. Use the 7RAQT-254 Wrench on the flats of the Wheel End Bearing Nut to hold the arbor. Using the 7S60-24818 Wrench, remove the Wire Brush Nut (78).
26. 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).
27. Use a wrench on the flats at the end of the arbor to hold the arbor. Using the 7RAQT4-254 Wrench, remove the Wheel End Bearing Nut (75).
28. 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).
29. Remove the Wheel End Bearing (73).

Disassembly of the Throttle Lever and Inlet

1. Grasp the flats of the Throttle Handle (1) in a vise, 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 a vise.
2. Using No. 77H-281 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 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. 77H-950 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. 77H-154 Valve Seat Support Retainer Pliers, remove the Throttle Valve Seat Support Retainer (15).
15. Grasp the Throttle Handle (1) horizontally in a vise. 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 the 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.

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. 77H-154 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 light 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" (38.5 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.

* Registered trademark of ND Industries.

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 that 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).
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 **Ingersoll Rand** Lubricant No. 68 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 I-R logo on the exterior of the Arbor Housing (22).

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

⚠ CAUTION

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 a vise, 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.

** Registered trademark of ND Industries.

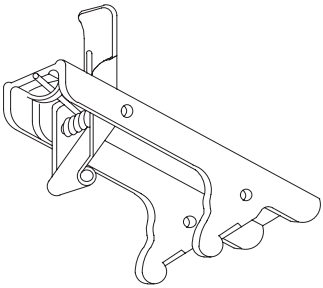
NOTICE

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. 77H-281 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 in Dwg. TPD662.



(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 a vise, 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 oil to the threads before assembly.

5. Clean the face of the Inlet Bushing (4) and the Inlet Bushing Screen (5) in a 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 40 ± 5 ft-lb (54 ± 7 Nm) torque.
6. Fill the Oil Chamber with the recommended oil and install the Oil Chamber Plug (7). Tighten to 4 ft-lb (5.4 Nm) torque.

Assembly of the Arbor

1. **For Models 77H120H63, 77H120H63-EU, 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU,** press the Wheel End Bearing (42 or 51) onto the Arbor (35 or 36).
2. Grasp the Arbor (35 or 36) in a vise, 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 a vise, guard end up. Install the Dust Seal (36B) on the Arbor Housing.
6. Lubricate with 3 to 4 cc of **Ingersoll Rand** No. 68 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 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU,** 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 Models 77H120H63, 77H120H63-EU, 77H150H63 and 77H150H63-EU, install a Wheel Flange (53) so the pin in the Arbor (36) enters the hole in the side of the 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.
10. **For Models 77H90L10, 77H90L10-EU, 77H120L10 and 77H120L10-EU,** install the Wheel Bearing Cap (60), Dust Washer (60B) and Cap Spring (60A) on the Arbor (37). Press the Wheel End Bearing (59) on the end of the Arbor.
11. Grasp the Arbor (37) in a vise, spline end up.
12. 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.
13. Remove the Arbor from the vise.
14. Grasp the Arbor Housing (22) in a vise, threaded end up.
15. Lubricate with 3 to 4 cc of **Ingersoll Rand** No. 68 Grease and install the Arbor Coupling (34) into the Arbor Housing and onto the spline of the rotor shaft.
16. 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.
17. Using a No. 74RAQT4-254 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.
18. **For Model 77H90G6,** press the Wheel End Bearing (63) onto the Arbor (38).
19. Grasp the Arbor (38) in a vise, spline end up.
20. Install the Bearing Lock Washer (62) and Bearing Locknut (61) onto the Arbor (38). Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
21. Remove the Arbor from the vise.
22. Grasp the Arbor Housing (22) in a vise, threaded end up.
23. Lubricate with 3 to 4 cc of **Ingersoll Rand** No. 68 Grease and install the Arbor Coupling (34) into the Arbor Housing and onto the spline of the rotor shaft. Slide the spline of the Arbor (38) into the Arbor Coupling (34).
24. Install the Wheel Bearing Cap (64), Cap Spring (64A) and Dust Washer (64B). Tighten the Cap to 25 to 30 ft-lb (34 to 41 Nm) torque.
25. Install the Collet (66) into the end of the Arbor.
26. Use a No. DG120-69 Collet Arbor Wrench to hold the Arbor. Use a No. DG120-69 Collet Nut Wrench to tighten the Collet Nut (65). Remove the Arbor Housing from the vise.
27. **For Models 77H30B106, 77H30B106-EU, 77H50B106 and 77H50B106-EU,** press the Wheel End Bearing (73) into the Arbor Housing (22) and onto the Arbor (39).
28. Grasp the Arbor Housing (22) in a vise, threaded end up.
29. 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.
30. Install the Wheel End Bearing Nut and tighten snugly.
31. 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 a **complete** set of new Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it appears cracked or if the bore is wavy or scored.
	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, clean and inspect 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 if worn or damaged.
	Bent Arbor	Mount the Arbor on centers. Check bearing diameter runout with an indicator. Replace the Arbor if runout exceeds 0.002" (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.
	Oil Chamber Plug and Oiler Plug Washer not tight	Tighten the Plug. If the problem persists, replace the Plug.
Excessive runout (exceeds TIR at a point one inch from the end of the Collet)	Check for worn or damaged Collet. Examine the Front Rotor Bearing for wear, damage or excessive play.	Replace the Collet and Collet Nut. Replace the Front Rotor Bearing.

Related Documentation

For additional information refer to:
Product Safety Information Manual 04584959.
Product Information Manual 16573214 and 16576100.
Parts Information Manual 16573271.

Manuals can be downloaded from ingersollrandproducts.com

Notes

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