



45587011
Edition 2
May 2014

Air Drill

QP1S Tapper

Maintenance Information



Save These Instructions

IR *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.

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

Lubrication

Each time a Series QP15 Tapper is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. Coat all exposed gears with **Ingersoll Rand** No. 67 Grease and work some of the Grease into the gearing of the Spindle Assembly (49).

2. Use **Ingersoll Rand** No. 10 Oil to lubricate the motor. Inject approximately 1 to 2 cc of oil into the air inlet before attaching the air hose to the tool.

Changing Inlet Location

Series QP15 Tappers with the Top Inlet feature are shipped from the factory with the air connection attached to the bottom of the handle. To use the Top Inlet connection on these tools, proceed as follows:

1. Shut off the air supply and disconnect the air supply hose, if the tool is in use.
2. Using a 3/16" hex wrench, unscrew and remove the Inlet Plug Assembly (15) from the top of the Housing (1).
3. Using a 3/4" wrench on the flats of the Inlet Bushing Assembly (27), unscrew and remove the Assembly.
4. Transfer the Wave Washer (25) and Inlet Bushing Bezel (26) from the threads of the Inlet Bushing to the threads of the Inlet Plug. Make certain the Washer is against the Grip End Cap (23) and the smaller end of the Bezel is against the Inlet Plug Seal (16).

5. Thread the assembled Inlet Plug into the bottom of the Handle and tighten it between 15 and 20 ft-lbs. (20 and 27 Nm) torque.
6. Thread the Inlet Bushing with Inlet Bushing Seal (28) into the top of the Handle and tighten it between 15 and 20 ft-lbs. (20 and 27 Nm) torque.
7. Connect the air supply hose to the Inlet Bushing and turn on the air supply.

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 vice 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 gaskets and O-rings for replacement.

3. For **Series QP1505**, lightly rap the motor end of the Gear Case on a wooden work bench top to remove the three Planet Gears (46), the Planet Gear Head Assembly (45), the two Planet Gear Head Spacers (48) and the three Spindle Planet Gears (50).

For **Series QP1510**, lightly rap the motor end of the Gear Case on a wooden work bench top to remove the three Planet Gears (46), the Rotor Pinion (47), the Planet Gear Head Assembly (45), the two Planet Gear Head Spacers (48) and the three Spindle Planet Gears (50).

NOTICE

If the Spindle Assembly is being removed or replaced, the Rear Spindle Bearing and the Front Spindle Bearing may be damaged during the removal process. We recommend that new replacement bearings be available for installation when the tool is reassembled.

4. Stand the Gear Case on the table of an arbor press with the output end of the Spindle Assembly upward. Using a rod slightly smaller than the spindle shaft, press the Spindle Assembly out of the Front Spindle Bearing (55) and Rear Spindle Bearing (52).
5. Insert a long, small drift through the central opening of the Rear Spindle Bearing and push the Spindle Bearing Spacer (53) off to one side. Using a hammer with the drift, tap the inner ring of the Front Spindle Bearing. Repeat the process at several points until the Bearing is free from the Gear Case. Remove the Bearing Spacer from the Gear Case.
6. Using snap ring pliers, remove the two Bearing Stops (54).
7. Stand the Gear Case on the table of an arbor press with the threaded end upward, and press the Rear Spindle Bearing out of the Gear Case.

Disassembly of the Tool

Each Series QP15 Tapper is made using three modules or units including a motor housing unit, a motor unit and a combined gearing and spindle unit. The tool can be disassembled for repairs to each individual unit without disturbing the other units. To separate the modules, proceed as follows:

1. Using a 1-1/16" wrench on the flats of the Gear Case (51), loosen and remove the assembled Gear Case from the Motor Housing (1).
2. Remove the Motor Clamp Washer (42) and Motor Seal (41) from the Motor Housing.
3. Tap the motor end of the Motor Housing on a wooden block to remove the assembled motor from the Housing.

Disassembly of the Gearing and Spindle

1. Insert the Tapping Chuck Removal Wedges (Part No. R000AR2TM-200) between the Gear Case (51) and the rear of the Tap Chuck (57) and pry the Chuck off the taper of the Spindle Assembly (49).
2. Using snap ring pliers, remove the Gear Retainer (43) from inside the Gear Case and remove the Gear Head Spacer (44).

Disassembly of the Motor

1. Using snap ring pliers, remove the Rear End Plate Assembly Retainer (32) from the shaft of the Rotor (36).
2. Pull the Rear End Plate Face Plate (31) and Rear End Plate Assembly (30) off the hub of the Rotor.
3. Lift the Cylinder (33) from the Rotor.
4. Remove the Vanes (37) from the Rotor.
5. Support the Front End Plate Assembly (38), as near the rotor body as possible, on the table of an arbor press and press the Rotor from the Front Rotor Bearing (40). Remove the Bearing from the Front End Plate.

Disassembly of the Housing

1. Use a wrench to unscrew and remove the Inlet Bushing Assembly (27) from the Motor Housing Assembly (1). Remove the Inlet Bushing Bezel (26) and the Wave Washer (25).
 2. Pull the Housing Grip (21) off the Motor Housing.
 3. Pull or carefully pry the Grip End Cap (23) off the inlet end of the Grip and remove the two End Cap Muffler Elements (24).
 4. Pull the Grip Muffler Element (22) out of the inlet end of the Grip and the two Housing Muffler Elements (20) out of the trigger end of the Grip.
 5. **For Top Inlet Models**, use a 3/16" hex wrench to unscrew and
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- remove the Inlet Plug Assembly (15).
 6. Using a 1/4" hex wrench, unscrew and remove the Rear Housing Cap Assembly (9).
 7. Remove the Throttle Valve Spring (19) and the Throttle Valve (18) from the rear of the Housing.
 8. If the Throttle Valve Seat (17) must be replaced, insert a hooked tool through the central opening of the Seat and pull it from the Motor Housing.
 9. Use a #2 Phillips Head Screwdriver, to unscrew and remove the Reverse Lever Screw (8) and lift the Reverse Lever (7) out of the Motor Housing.
 10. Insert a 5/16" wooden dowel between 6 and 8 inches long, into the Rear Housing Cap opening and push the Reverse Valve Front O-ring (6B), Reverse Valve Assembly (5) and Wave Washer (6A) out the motor end of the Housing.
 11. Use a hooked tool to pull the Housing O-ring (4) out of the Motor Housing.
 12. Use a 1/16" pin punch to drift the Trigger Retaining Pin (13) out of the Motor Housing and pull the Trigger Assembly (11) out of the Housing.
 13. **For Models having a memory chip**, if the chip must be replaced, pry the Memory Chip Holder Assembly (14) out of the Motor Housing in the area above the trigger location.

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 into 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. Except for bearings, always clean every part and wipe every part with a thin film of oil before installation.
5. Apply O-ring lubricant to all O-rings before final assembly.
6. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a clean, suitable cleaning solution and dry with a clean cloth. **Sealed or shielded bearings should never be cleaned.** Work grease into every open bearing before installation.

Assembly of the Housing

1. **For Models having a memory chip**, if the Memory Chip Holder Assembly (14) is being replaced, insert the memory chip into the Holder with the contact ends leading. Position the Assembly at the slot in the exterior wall of the Motor Housing (1) above the trigger hole with the exposed contacts away from the Housing and pointing toward the spindle end of the tool. Press the Assembly into the slot.
2. Lubricate a new Trigger Shaft O-ring (12) and install it in the groove on the shaft of the Trigger Assembly (11).
3. Insert the shaft of the Trigger Assembly into the hole in the Motor Housing (1) until the flat on the shaft is aligned with the hole in the Housing for the Trigger Retaining Pin (13). Tap the pin into the Housing to capture the Trigger Assembly.
4. Lubricate the Housing O-ring (4) with O-ring lubricant and install it at the bottom of the cylinder bore in the Motor Housing.
5. Inspect the face on the hub of the Reverse Valve Assembly (5) for nicks or damage. Replace the Assembly if damage is evident. Examine the Reverse Valve Seals (6) and (6B) for nicks or cuts and replace the Seals if damaged.
6. Lubricate the Reverse Valve Seals (6) and (6B) with O-ring lubricant. Insert O-Ring (6B) over front end of Reverse Valve Assembly (5). Insert Reverse Valve Assembly (5), small seal end and Wave Washer (6A), and load into the cylinder bore of the Motor Housing. Push the Assembly toward the bottom of the cylinder and seat in its proper location making sure all Seals are correctly positioned.
7. Rotate the Valve inside the Housing until the threaded hole into the side of the Valve for the Reverse Lever Screw (8) is centered radially in the slot in the top of the Housing for the Reverse Lever (7).
8. Install the Reverse Lever in the slot and use a #2 Phillips Head Screwdriver to secure the Lever to the Valve with the Reverse Lever Screw.
9. Install the Throttle Valve Seat (17) in the bottom of the housing cap opening. Use a rod with a flat end and no sharp edges to push the Seat flat at the bottom face of the opening.
10. Install the Throttle Valve (18), flat face leading, in the opening against the Valve Seat. Place the Throttle Valve Spring (19), small end leading, into the Housing against the Valve. Encircle the hub on the Valve with the Spring opening.
11. Examine the Rear Housing Cap Seal (10) for nicks or cuts. If damaged, carefully install a new Seal over the threads of the Rear Housing Cap Assembly (9).
12. Using a 1/4" hex wrench, thread the Assembly into the rear of the Motor Housing. Tighten the Assembly between 15 and 20 ft-lbs. (20 and 27 Nm) torque.
13. **For Top Inlet Models**, examine the Inlet Plug Seal (16) for nicks or cuts. If damaged, carefully install a new Seal over the threads of the Inlet Plug Assembly (15).
14. **For Top Inlet Models**, use a 3/16" hex wrench to thread the Assembly into the top of the Motor Housing. Tighten the Assembly between 15 and 20 ft-lbs. (20 and 27 Nm) torque.
15. Lay a Housing Muffler Element (20) on each side of the handle rib and use a non-pointed probe to fully push the end of each Element into the recess near the body of the Housing.
16. Install the Housing Grip (21) over the Elements and onto the inlet end of the Motor Housing. Make certain the Grip is fully seated against the Housing and the Trigger Assembly works freely.
17. Fold the Grip Muffler Element (22) in half and then fold each half equally again and insert it into the bottom of the Grip.
18. Stack the two End Cap Muffler Elements (24) inside the Grip and push the Grip End Cap (23) onto the inlet end of the Grip.
19. If the Inlet Screen (29) requires replacement, use a wooden dowel to carefully push a new one into the Inlet Bushing (27).
20. If the Inlet Pushing Seal (28) is nicked or damaged, carefully install a new one over the threads of the Inlet Bushing.
21. Install the Inlet Bushing Bezel (26), small end leading, followed by the Wave Washer (25) onto the threads of the Inlet Bushing against the Seal.
22. Thread the assembled Inlet Bushing through the Grip End Cap into the handle of the Motor Housing and tighten the Bushing between 15 and 20 ft-lbs. (20 and 27 Nm) torque.

23. Assembly of the Motor

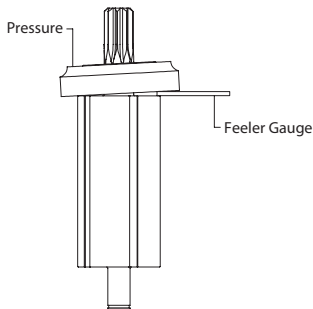
- Place the Front End Plate (38) on the splined shaft of the Rotor (36) with the bearing recess away from the rotor body.
- Place the Front Rotor Bearing (40) onto the shaft and using a sleeve or piece of tubing that contacts the inner race of the Bearing, press the Bearing onto the shaft until the Front End Plate nearly contacts the rotor body.

NOTICE

In the following step, the measurement must be made at the end corner of the large rotor body.

- The clearance between the Front End Plate and Rotor is critical. While pressing down with your finger on the outer edge of the Front End Plate on the bearing side, insert a 0.004" (0.1 mm) feeler gauge between the face of the rotor body and the face of the End Plate at a point that is 180 degrees from where the pressure is applied. Refer to Dwg. TPA1740. To increase the gap, support the End Plate and lightly tap the rotor shaft with a plastic hammer; to decrease the gap, press the Bearing farther onto the rotor shaft.

Measurement of Front End Plate Clearance



(Dwg.TPA1740)

- Wipe each Vane (37) with a light film of **Ingersoll Rand** No.10 Oil and place a Vane in each slot in the Rotor.
- One end of the Cylinder Assembly (33) has a notch that breaks the outer wall and end face of the Cylinder. With that end trailing, install the Cylinder Assembly over the Rotor and Vanes against the Front End Plate. Make certain the Cylinder Front Alignment Pin (35) enters the hole in the Front End Plate.
- Install the Rear End Plate Assembly (30), flat face leading, on the rear hub of the Rotor. Make certain the Cylinder Rear Alignment Pin (34) enters the hole in the Rear End Plate.
- Examine the Rear End Plate Face Plate (31) for scratches. If it is scratched, replace it. If it is not, slide it onto the rear hub of the Rotor and onto the Cylinder Rear Alignment Pin against the Rear End Plate. Some pressure may be required to fit the hole in the Plate onto the Alignment Pin.
- Using snap ring pliers, install the Rear End Plate Assembly Retainer (32) in the annular groove on the rear rotor hub to secure the assembly in position.
- Set the assembled motor aside.

Assembly of the Gearing and Spindle

- Insert the output end of the Spindle Assembly (49) into the threaded end of the Gear Case (51).
- While leaving clearance for the Gear Case, support the pin end of the Spindle Assembly on the table of an arbor press. Using a piece of tubing that will clear the shaft of the Spindle and will contact the inner ring of the Rear Spindle Bearing (52), press the Bearing onto the shaft of the Spindle until it contacts the gear hub.
- Using snap ring pliers, install one of the Bearing Stops (54) in the internal groove nearest the Bearing.

- Apply some **Ingersoll Rand** No. 67 Grease to the Bearing Spacer (53) and slide it onto the shaft of the Spindle with the smaller end trailing.
- Using snap ring pliers, install the second Bearing Stop in the internal groove in the Gear Case nearest the output end of the Spindle.
- Stand the assembled Gear Case on the table of an arbor press with the output end of the Spindle upward. Install the Front Spindle Bearing (55) over the output shaft, and using a piece of tubing that contacts the outer ring of the Bearing, press the Bearing into the Gear Case against the Bearing Stop.
- Using snap ring pliers, install the Bearing retainer (56) in the external groove on the shaft of the Spindle.
- Apply **Ingersoll Rand** No. 67 Grease to the three Spindle Planet Gears (50) and install them on the shafts of the Spindle Assembly located inside the Gear Case.
- Insert the two Planet Gear Head Spacers (48) and Planet Gear Head Assembly (45), spline hub leading, into the open end of the Gear Case.
- Apply **Ingersoll Rand** No. 67 Grease to the three Planet Gears (46) and install them on the shafts of the Planet Gear Head Assembly.
- For Series QP1510, apply **Ingersoll Rand** No. 67 Grease to the Gear Head Pinion (47) and while meshing the gear teeth, insert it in the opening between the three Planet Gears.
- Place the Gear Head Spacer (44) in the Gear Case and secure the assembly by using snap ring pliers to install the Gear Retainer (43) in the annular groove inside the Gear Case.

Assembly of the Tool

- Grasp the spline of the Rotor (36) in the assembled motor and after aligning the End Plate Alignment Pin (39) with the internal notch in the motor end of the housing bore, insert the assembled motor into the Motor Housing (1). Make certain the motor is far enough into the Housing to have the undercut below the internal housing thread visible.
- Lubricate the Motor Seal (41) with O-ring lubricant and install it around the Front End Plate (38) and into the undercut in the Housing.
- Align the tab of the Motor Clamp Washer (42) with the internal notch in the Housing and install it over the rotor hub and End Plate Alignment Pin against the Motor Seal. Make certain the Pin enters the hole in the Washer and the Washer is flat against the Seal.
- Apply some **Ingersoll Rand** No. 67 Grease to the spline on the rotor shaft.
- Thread the assembled Gear Case (51), output spindle trailing, into the Motor Housing and using a 1-1/16" wrench, tighten the joint between 15 and 20 ft-lbs. (20 and 27 Nm) torque.
- Install the Tap Chuck (57) onto the output shaft of the Spindle Assembly (49).

Troubleshooting Guide

Trouble	Probable Cause	Solution
Loss of Power	Low air pressure	Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar/620 kPa) at the inlet.
	Plugged Inlet Bushing Screen	Clean the Inlet Bushing Screen using a clean, suitable cleaning solution. If the Screen cannot be cleaned, replace it.
	Worn or broken Vanes	Replace a complete set of Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it is cracked or if the bore appears wavy or scored.
Motor won't run	Motor Clamp Washer binding	Remove the Gear Case make certain the Washer is flat and the Motor Seal is properly positioned.
	Gears binding	Clean and inspect all gearing. Replace any worn or damaged gearing.
Leaky Throttle Valve	Worn Throttle Valve and/or Throttle Valve Seat	Replace the Throttle Valve and/or Throttle Valve Seat.
	Dirt accumulation on Throttle Valve and/or Throttle Valve Seat	Pour about 3 cc of a clean, suitable, cleaning solution into the air inlet and operate the tool for about 30 seconds. Immediately pour 3 cc of light oil into the air inlet and operate the tool for 30 seconds to lubricate all the cleaned parts.
Gear Case gets hot	Excessive grease	Clean and inspect Gear Case and gearing parts and lubricate as instructed.
	Worn or damaged parts	Clean and inspect the gear Case and Gearing. Replace worn or broken components.

Related Documentation

For additional information refer to:

Air Drill Product Safety Information Manual 04580353.

Air Drill Product Information Manual 45587003.

Air Drill Parts Information Manual 04577842.

Manuals can be downloaded from ingersollrandproducts.com

Notes:

Notes:

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