



**47140504**

Edition 2

May 2014

## **Air Drill**

**2X and 22 Series**

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# **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).

## 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.

### Maintenance Procedure

1. Keep the air strainer clean. Periodically, as experience indicates, unscrew the Air Strainer Body (94) from the Air Strainer Cap (91) and wash the Air Strainer Screen (92) in a clean, suitable, cleaning solution. Push the prongs on the Air Strainer Screen Support (93) into one end of the Screen and insert the Screen, support end first, into the Body when assembling the strainer.
2. For Reversible Tools, remove the throttle body set screw from the side of the Motor Housing (1 or 252) before attempting to pull the Throttle Body (84) from the Housing.
3. The thread on the Governor Assembly (21) is a left-hand thread; turn it clockwise to unscrew it from the Rotor (27).

### WARNING

#### Never clamp the Cylinder (32) in a vise.

4. When disassembling the motor, grasp the Cylinder in one hand. Insert a 5/16" diameter rod into the bore of the Rotor (27) and drive the rotor hub out of the Rear Rotor Bearing (29). Unscrew the Rotor Pinion (35) from the Rotor and screw a 3/8"-24 thread bolt in its place. Support the Front End Plate (33) and press the rotor front hub out of the Front Rotor Bearing (34).
5. The front hub of the Rotor contains a tapered socket. The rim of the Front End Plate is flatted, one flat on Series 2X; two on Series 22. When assembling the motor, slip the Front End Plate, crescent grooved side first, over the rotor front hub and retain it by pressing the Front Rotor Bearing shielded side first, onto the rotor hub as far as possible without binding the End Plate against the rotor face. Clean and dry the tapered surfaces of the Rotor and Rotor Pinion and screw the Pinion tightly into the Rotor. Insert a Vane (31) into each vane slot in the Rotor. Place the Cylinder over the Rotor and onto the End Plate. Align the air ports and dowel hole in the Cylinder and End Plate. If they cannot be aligned, invert the Cylinder. Install the Rear End Plate (30), crescent grooved side first, and Rear Rotor Bearing (29), shielded side first.
6. When applying the Backhead (12 or 260), draw it evenly against the Backhead Gasket (11) on the face of the Motor Housing (1 or 252) by turning each Backhead Cap Screw (36) a little at a time until all are tight.

#### For All Models Except 22N

1. Insert a small screwdriver through one of the holes in the Spindle Gear (62) and pry the Bearing Retainer (61) out of the groove in

the Gear Case (54) before attempting to withdraw the Spindle Assembly from the Gear Case.

2. Press the Spindle (55) out of the Spindle Gear and remove the Spindle Gear Key (63) from the Spindle before attempting to press the Spindle out of the Thrust Bearing (60), Spindle Bearing Spacer (59) and Spindle Bearing (58).
3. Press the Intermediate Gear Front Bearing (68) into the Gear Case before installing the Spindle Assembly.
4. In the order named, press the Spindle Bearing, sealed side first, Spindle Bearing Spacer and Thrust Bearing, shielded side first, onto the Spindle.
5. Lay the Bearing Retainer on the web of the recessed hub side of the Spindle Gear and press the Spindle into the Spindle Gear.
6. Slide the Spindle Assembly into the Gear Case and install the Bearing Retainer in the groove in the Gear Case with a small screwdriver inserted through one of the holes in the Spindle Gear.

#### For Model 22N

1. Rotate the Spindle Gear (71) until one of the holes in the gear web aligns with the notch in the gear case wall. Insert a small screwdriver into the notch and pry the Bearing Retainer (73) out of the groove in the Gear Case before attempting to remove the Spindle Gear Shaft (70) from the Gear Case.
2. Press the Spindle Gear Shaft out of the Spindle Gear and remove the Spindle Gear Key (72) from the Shaft before attempting to press the Shaft out of the Spindle Gear Bearing (69).
3. Support the short hub end of the Spindle (55 or 251) and press on the front end of the Planet Gear Shafts (64) when removing the Shafts from the spindle gear head. The Planet Gear Rollers (66) and Roller Retaining Plates (67) are free to drop out when the Gears are removed from the Spindle. Use care to prevent loss of these small parts.
4. When assembling the Spindle, coat the inner wall of the Planet Gears (65) with the recommended grease and insert a Planet Gear Shaft through each gear bore. Slide twenty-one Planet Gear Rollers into the space between the gear wall and Shaft. Slip a Roller Retaining Plate over each end of the Shaft and against the Rollers. Carefully withdraw the Shafts and insert the Gears into the gear frame on the Spindle.
5. Install the Spindle Bearing shielded side first on the Spindle. On the shielded side, the face of the bearing inner ring is slightly lower than that of the outer ring. On the opposite side of the Bearing the faces are flush.
6. Press the Intermediate Gear Front Bearing into the Gear Case before installing the assembled Spindle Gear Shaft.
7. Lay the Bearing Retainer on the web of the recessed hub side of the Spindle Gear and press the Spindle Gear Shaft into the Spindle Gear. Slide the assembled Spindle Gear Shaft into the Gear Case. Insert a small screwdriver through the holes in the Spindle Gear and install the Bearing Retainer in the gear case groove.

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## Troubleshooting Guide

| Trouble                     | Probable Cause                                                     | Solution                                                                                                                                                                    |
|-----------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low power or low free speed | Dirty Inlet Bushing or Air Strainer Screen and/or Exhaust Silencer | Using a clean, suitable, cleaning solution in a well-ventilated area, clean the Air Strainer Screen, Inlet Bushing and Exhaust Silencer. Allow to air dry.                  |
|                             | Worn or broken Vanes                                               | Replace complete set of Vanes.                                                                                                                                              |
|                             | Worn or broken Cylinder and/or scored End Plates.                  | Examine Cylinder and replace it if it is worn or broken or if bore is scored or wavy. Replace End Plates if they are scored.                                                |
|                             | Dirty motor parts.                                                 | Disassemble the tool and clean all parts with a clean, suitable, cleaning solution, in a well-ventilated area. Reassemble the tool.                                         |
|                             | Improper positioning of Reverse Valve.                             | Make certain Reverse Valve is fully engaged to left or right.                                                                                                               |
| Motor will not run          | Incorrect assembly of motor.                                       | Disassemble motor, replace worn or broken parts and reassemble as instructed.                                                                                               |
| Rough operation             | Worn or broken Rear Rotor Bearing Assembly or Front Rotor Bearing  | Examine each bearing. Replace if worn or damaged.                                                                                                                           |
|                             | Worn or broken Bevel Gear or Bevel Pinion                          | Examine the Bevel Gear and Bevel Pinion. If either is worn or damaged, replace both the Gear and the Pinion because they are a matched set and must not be used separately. |
| Air leaks                   | Worn Valve Face or Valve Face Cap                                  | Replace worn parts.                                                                                                                                                         |
|                             | Oil Chamber Plug worn or not tight                                 | Tighten the Plug. If the problem persists, replace the Plug.                                                                                                                |
| Gear Case gets hot          | Insufficient grease                                                | Clean and inspect the Gear Case gearing parts and lubricate as instructed in LUBRICATION.                                                                                   |
|                             | Worn or damaged parts                                              | Clean and inspect the Gear Case and gearing. Replace worn or broken components.                                                                                             |

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## Related Documentation

For additional information refer to:  
Product Safety Information Manual 04580353.  
Product Information Manual 03523024.  
Parts Information Manual 47140496.

Manuals can be downloaded from [ingersollrandproducts.com](http://ingersollrandproducts.com)

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