



## **Barring Motor**

**B006 Series**

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# **Maintenance Information**



**Save These Instructions**

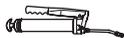
**⚠ WARNING**

**Always wear eye protection when operating or performing maintenance on this Barring Motor.**

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

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

### Lubrication



**Ingersoll Rand No. 28**



**Ingersoll Rand No. 10**

Whenever a B006 Barring Motor is disassembled for overhaul or replacement of parts lubricate as follows: We recommend the use of an air line lubricator in the air supply line. Attach the unit as close to the tool as practical. We recommend using an **Ingersoll Rand No. C28221-800 Filter-Regulator-Lubricator Unit**. After each forty hours of operation, or as experience indicates, remove the Gear Case Grease Screw (46) and inject 1.5 cc of the recommended grease into the opening. Do not grease excessively. Too much grease in the Gear Case (45) will cause heating.

Grease leakage from the spindle end is also an indication that an excessive amount of grease has accumulated within the Gear Case.

Whenever the gear end of the Motor is disassembled, lubricate the gear train as follows:

Work approximately 45 cc of the recommended grease into the gearing and around the Planet Gear Bearings (47), (58) and (64) and Spindle Bearings (50), (62) and (67).

#### For continuous operation:

Continuous operation of geared motors generates heat which can cause grease to dry out and cake. The addition of fresh grease temporarily rectifies this problem. However, a small amount of oil should be added to the grease to replace the oil which was lost during continuous operation. The oil creates a slurry which makes the grease less likely to dry out and cake. **After each eight hours of continuous operation or as experience indicates**, add ten drops of the recommended oil to the opening of each grease screw or grease fitting.

### Maintenance

#### Disassembly

**NOTICE**

**Always disconnect the air supply before doing any maintenance on this Barring Motor. Always use protective eyewear when performing maintenance on a tool or when operating a tool.**

#### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Do not disassemble the Motor unless you have a complete set of new gaskets and O-rings for replacement.
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 repair or replacement.
4. 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.
5. The modular construction of the Series B006 Barring Motors permits selective disassembly whereby gearing can be separated from the power unit and disassembled without removing the Multi-Vane Motor from the Motor Housing, or the Multi-Vane Motor can be removed and disassembled without removing the gear train from the gear chambers. This is especially true for the high torque ratios that use a Gear Case Adapter and Auxiliary Gear Case. Because of the modular construction, the steps in the following Disassembly Procedures can be sequentially changed to meet the particular situation.
6. When removing a Planet Gear Shaft, always support the rear (short hub end) of the Gear Head, Gear Frame or Spindle and press on the front end of the Shaft being removed. The shaft holes through the webs are slightly tapered so that the Shaft is a tighter fit in the front web.

#### Pinion Removal/Engagement Mechanism Disassembly

1. Place the Barring Motor on a workbench in a horizontal position, grasp pinion (2) in copper-covered, or leather-covered, vise jaws.

**NOTICE**

**Do not use excessive clamping force on the Drive Pinion. Grasp it just firmly enough to hold it. Make certain the Barring Motor is firmly supported on the workbench.**

2. Remove the Drive Pinion Screw (1).
3. Loosen the vise and remove the Drive Pinion from the Drive Shaft (10).
4. Separate the Drive Shaft (10) from the Air Motor Assembly (17).

**NOTICE**

**Removal of the Mounting Flange is not necessary for service.**

5. To remove the mounting flange, first remove the four mounting flange screws (3). Next, remove the center washer (4), and, finally, remove the mounting flange from the Barring Motor.
6. Remove the Plunger (7) from the Housing Assembly (6).
7. Extract the Air Motor (17) from the Housing Assembly (6).
8. Remove the three screws (11) that secure the Ring (13) to the Air Motor Assembly (17) and remove the Ring (13), O-ring (14), Quad-ring (9), and the Spacer (15).

#### Air Motor Disassembly

1. Clamp a large adjustable wrench in vise jaws with the adjustable opening upward.
2. Adjust the jaw of the wrench to clear the body of the Gear Case (45).
3. Roll the Motor in the wrench jaw until it stops against the Gear Case Screw (46) and, using a wrench on the flats of the Coupling Nut (44) at the motor end; loosen the Coupling Nut.
4. Roll the Motor in the opposite direction until it stops against the Grease Screw and, using a wrench on the flats of the Coupling Nut at the flange end of the Gear Case, loosen the Coupling Nut.
5. Holding the Motor horizontally over a workbench, unscrew the Coupling Nut at the motor end of the Gear Case and pull the motor from the Gear Case. Do not lose the Flange Key (28).

**NOTICE**

**If the Spindle is removed, the entire gear train must be disassembled to install the Spindle Planet Gear Assemblies (47) or Gear Head Planet Gear Assemblies (64).**

6. Loosen the Coupling Nut (44) at the front of the Gear Case (45) and separate the Gear Case from the Gear Case Adapter (53).
7. Pull the Spindle (48) from the front of the Gear Case. Pull the Spindle Planet Gear Assembly (47) from the Gear Case.
8. Using snap ring pliers, remove the Spindle Bearing Retaining Ring (49) and pull the two Spindle Bearings (50) and the Spindle Bearing Spacer (51) from the shaft of the Spindle. Remove the second Spindle Retaining Ring (49).
9. Remove the Gear Case Adapter Seal (52) from the Gear Case Adapter (53).
10. Remove the Auxiliary Gear Case Cap Screws (69) and Lock Washers (68) from the Auxiliary Gear Case and separate the Auxiliary Gear Case and components from Gear Case Adapter.
11. Withdraw the Gear Head (59) and the assembled components from the rear of the Auxiliary Gear Case.
12. Supporting the hub of the Gear Head, press on the front end of the Planet Gear Shaft to remove the Shaft and Planet Gears.

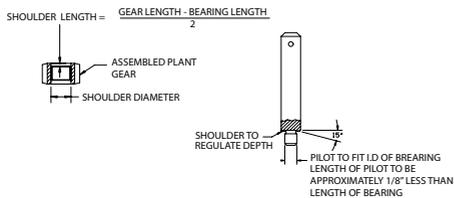
**Assembly**

**General Instructions**

1. Always use protective eyewear when performing maintenance on a tool or operating a tool.
2. Unless otherwise noted, always press on the stamped end of a needle bearing when installing the needle bearing in a recess.
3. Always press on the **inner** ring of a ball-type bearing when installing the bearing on a shaft.
4. Always press on the **outer** ring of a ball-type bearing when installing the bearing in a bearing recess.
5. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in clean solvent and dry with a clean cloth. Sealed or shielded bearings should never be cleaned. Work grease thoroughly into every open bearing before installation.
6. Except for bearings, always clean every part and wipe every part with a thin film of oil before installation.
7. When grasping a Motor or one of its parts in a vise, always use leather or copper vise jaw covers to protect the surface of the part and reduce the likelihood of damage. This is particularly important when clamping threaded members, shafts with splines, etc. Apply O-ring lubricant to each O-ring before assembly and use only new gaskets when reassembling the Motor.
8. When installing Planet Gears in a Spindle, Gear Head or Gear Frame, always support the front web and press in the shaft from rear to front. Shaft holes through the webs are slightly tapered so that shaft is tighter in front web. Always replace Planet Gears in sets.

**Assembly of the motor**

1. Using a bearing inserting tool, shown on Dwg. TPC488, press the Rear Rotor Bearing (29) into the recess in the rear of the Motor Housing (27).



**Needle Bearing Tool for Planet Gears**

(Dwg. TPC488)

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**NOTICE**

**Press on marked end of bearing only. Unmarked end of Bearing must be installed toward rear of Motor Housing.**

2. Install Rear End Plate Gasket (31) in Motor Housing. Make certain all hubs and porting align.
3. Slide the Front End Plate (37), flat side first, over the splined end of the Rotor (35).
4. Using a sleeve that contacts only the inner ring of the Front Rotor Bearing (38), press the Front Rotor Bearing onto the splined hub of the Rotor until it seats against the Front End Plate.
5. The clearance between the Front End Plate and the Rotor is critical. While holding the Front End Plate, gently tap the splined end of the Rotor until you can insert a 0.001" [0.025mm] feeler gauge or shim between the face of the Rotor and Front End Plate.
6. Grasp the splined end of the rotor in copper-covered vise jaws so that the short hub of the rotor is upward.
7. Wipe each Vane (36) with a film of light oil and place a Vane in each vane slot in the Rotor.
8. Align the cylinder dowel hole in the Cylinder (34) with the hole in the Rear End Plate and install the Cylinder over the Rotor and Vanes against the End Plate.
9. Place the Rear End Plate (33), flat side first, over the short hub of the Rotor.
10. Install the Rear End Plate Retainer (30) in the groove on the Rotor hub.
11. Align the cylinder dowel holes in the Front End Plate, Cylinder and Rear End Plate and insert an assembly dowel (3/32" [2.5 mm] diameter by 9" [230 mm] long) into the aligned dowel holes in the assembly.
12. Inject 2 cc of the recommended grease into the central recess at the bottom of the bore in the Motor Housing (27).
13. Insert the end of the assembly dowel nearest the Rear End Plate into the dowel hole at the bottom of the motor bore in the Housing. Slide the assembled motor along the assembly dowel until the motor stops against the bottom of the motor bore. Carefully withdraw the assembly dowel and install the Cylinder Dowel (32) in its place. Make certain the Dowel is below the face of the Front End Plate.
14. Install the Front Rotor Bearing Retainer (41) in the groove inside the Front Rotor Bearing Housing (40).
15. Install the two Rotor Bearing Housing Seals (52) in the annular grooves around the Rotor Bearing Housing.

16. Place the two Front Rotor Bearing Spring Washers (39) inside the Front Rotor Bearing Housing and against the Front Rotor Bearing Retainer.
17. Slide Front Rotor Bearing Housing over the Front Rotor Bearing.

### Assembly of the Gearing

1. Install a Coupling Nut Retainer (43) in one of the grooves encircling the Gear Case (45).
2. Position the non-threaded ends of the two Coupling Nuts (44) against each other and slide them onto the Gear Case from the end without the Retainer.
3. Install the second Retainer in the remaining groove encircling the Gear Case.
4. Using snap ring pliers, install one of the Spindle Retaining Rings (49) in the annular groove on the Spindle (48) adjacent to the large hub.
5. In the order named, install a Spindle Bearing (50), Spindle Bearing Spacer (51) and the remaining Spindle Bearing on the spindle shaft against the Spindle Retaining Ring. Secure the three parts by installing the remaining Ring in the groove on the shaft.
6. Insert the pin end of the Spindle Assembly (48, 49, 50, 51) into the un-splined end of the Gear Case (45) and push in until the rear most bearing stops against an internal shoulder in the Gear Case.
7. Position Planet Gear Assemblies (47) onto the Spindle (48) and mount the assembly onto the motor assembly.
8. Install the Gear Case Adapter Seal (52) on Gear Case Adapter (53).
9. Align a notch in the Gear Case Adapter with a notch in the Motor Housing (27) and maintain alignment by installing a Flange Key (28) in the notches.
10. Thread the Gear Case Grease Screw (46) into the Gear Case, if it was removed, and hand tighten it with a hex wrench.
11. Clamp a large adjustable wrench in vise jaws with the adjustable opening upward.
12. Adjust the jaw of the wrench to clear the body of the Gear Case.
13. Roll the Motor in the wrench jaw until it stops against the Gear Case Grease Screw and using a torque wrench on the flats of one Coupling Nuts, tighten the Nut between 45 to 50 ft-lb (61 to 68 Nm) torque.
14. Roll the Motor in the opposite direction until it stops against the Gear Case Grease Screw and using a torque wrench on the flats of the second Coupling Nut, tighten the Nut between 45 to 50 ft-lb (61 to 68 Nm) torque.

15. Install the Gear Head Bearing (55) in the recess in the Gear Case Adapter.
16. Install one Gear Head Planet Gear (58), one Planet Gear Bearing (57) and one Planet Gear Shaft (56) in the Gear Head (59), and then install the remaining Planet Gear, Planet Gear Bearing and Planet Gear Shaft.
17. Repeat for part numbers (63, 64, 65).
18. Press the Rear Spindle Bearing (62) on the rear of the Spindle (65) and Front Spindle Bearing (67) on the front of the Spindle.
19. Install the assembled Spindle in the Gear Case Assembly (70) meshing the Spindle Planet Gears with the integral ring gear.
20. Install the Spindle Bearing Retainer (61) in the annular groove in the wall of the Gear Case Assembly (70).
21. Mount the Gear Case Assembly and Spindle onto the motor and gearing assembly.
22. Insert the Auxiliary Gear Case Cap Screws (69) and Lock Washers (68) the holes in the Gear Case Assembly and tighten to a minimum of 120 in-lbs.

### Pinion Assembly/Engagement Mechanism Assembly

1. Slide, first, the Spacer (15) and, second, the Quad-ring (9) onto the assembled Air Motor Assembly (17) shaft.
2. Mount the Ring (13) onto the Air Motor Assembly (17) using the Screws (11) and O-Rings (12). Tighten to 40 in-lbs.
3. Mount O-ring (14) into groove between the Ring (13) and the Air Motor Assembly (17).
4. Mount the Drive Shaft (10) and Quad-ring (9) onto the Air Motor Assembly.
5. If necessary, press the Bushing (8) into the Housing Assembly (6) and slide over the Air Motor Assembly (17).
6. Place the Flange (5) onto the Barring Motor Assembly and secure with the Center Washer (4) and four Screws (3). Tighten to 20 ft-lbs of torque.
7. Assembly the Pinion (2) to the Drive Shaft (10) and secure with the Screw (1). Tighten to 50 ft-lbs.

### Troubleshooting Guide

Trouble	Probable Cause	Solution
Motor will not operate	Rotor shaft and Gear Frame Planet Gears binding due to improper installation.	Disassemble and correct as necessary.
	Spline in shaft of Gear Head and Planet Gears binding due to improper installation	Solution same as above.
Loss of power	Low air pressure at Motor	Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar) at the inlet to the motor.
	Worn Vanes	Install a new set of Vanes.
	Damaged Rear End Plate Gasket	Install a new Rear End Plate Gasket.
	Inadequate Motor lubrication	Check air line lubricator. Refer to the Lubrication Section for Lubrication Specifications.
	Worn or damaged parts	Disassemble the Motors and examine parts. Replace any worn or damaged parts.
Motor heats up	Inadequate lubrication	Refer to Lubrication Section.
Gear case heats up	Improper lubrication	Refer to Lubrication Section.
Grease leakage	Too much grease in the Gear case	Refer to Lubrication Section.

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### **Product Parts Information**

**The use of other than genuine Ingersoll Rand replacement parts may result in decreased barring motor performance and increased maintenance, and may invalidate all warranties. Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Servicenter.**

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

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### **Related Documentation**

For additional information refer to:

Product Safety Information Manual 45526654.

Product Information Manual 80238041.

Parts Information Manual 45526662.

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

Notes:

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