Barring Motor
B006 Series

Maintenance Information

Save These Instructions
Lubrication

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.

Maintenance

Disassembly

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. 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.

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).
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 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 installed toward rear of Motor Housing.
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 with a film of light oil and place a Vane in each vane slot in the Rotor.
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).

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 installed toward rear of Motor Housing.

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 with a film of light oil and place a Vane in each vane slot in the Rotor.

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.

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.

13. Using care to prevent unnecessary distortion, pry the Spindle Bearing Retainer (61) from the wall of the Auxiliary Gear Case and slide out the Spindle (65) and the assembled components.
14. Remove Gear Head Planet Gears if worn. See paragraph “12”.
15. Using a thin blade screwdriver, pry one of the Coupling Nut Retainers (43) out of the groove in the Gear Case and slide the two Coupling Nuts off the Gear Case.
16. Grasp the shaft of the Rotor (35) in copper-covered vise jaws and pull the Motor Housing (27) off the assembled motor unit.
17. Pull the Front End Plate (37) off the Rotor.
18. Remove the Front Rotor Bearing Retainer (41), Rotor Bearing Housing Assembly (40), Front Rotor Bearing Spring Washers (39), Front Rotor Bearing (38) and Front End Plate (37). Remove the Rotor Bearing Housing Seals (52) from the Rotor Bearing Housing.
19. Push the Front Rotor Bearing out of the Front End Plate.
20. Separate Cylinder (34), Vanes (36) and Cylinder Dowel (32) from the Rotor. Remove the Rear End Plate Gasket from inside the Motor Housing.
21. Remove the Rear End Plate Retainer (30) and Rear End Plate (33) from the Rotor.

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 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.

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.
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 Head Planet Gears binding due to improper installation. Solution same as above.
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.

Troubleshooting Guide

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<th>Solution</th>
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<td>Rotor shaft and Gear Frame Planet Gears binding due to improper installation.</td>
<td>Disassemble and correct as necessary.</td>
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<td></td>
<td>Spline in shaft of Gear Head and Planet Gears binding due to improper installation</td>
<td>Solution same as above.</td>
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<td>Loss of power</td>
<td>Low air pressure at Motor</td>
<td>Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar) at the inlet to the motor.</td>
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<td>Worn Vanes</td>
<td>Install a new set of Vanes.</td>
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<td></td>
<td>Inadequate Motor lubrication</td>
<td>Check air line lubricator. Refer to the Lubrication Section for Lubrication Specifications.</td>
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<td></td>
<td>Worn or damaged parts</td>
<td>Disassemble the Motors and examine parts.</td>
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<tr>
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<td>Replace any worn or damaged parts.</td>
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<td>Motor heats up</td>
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<td>Gear case heats up</td>
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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.

Related Documentation
For additional information refer to:
Product Safety Information Manual 45526654.
Product Information Manual 80238041.
Parts Information Manual 45526662.
Manuels can be downloaded from www.irtools.com.