Wet Disc Brake with Dowel Pins

Model W3H (360 mm)

Maintenance Manual MM-20195
Before You Begin

This maintenance manual describes the correct service and repair procedures for AxleTech’s W3H 360 mm wet disc brake with dowel pins. While this manual cannot cover all possible wheel end combinations, it shows two typical wheel ends:

- A wheel end with the outer bearing assembled on the ring gear hub journal (such as the PRC 775 wheel end).
- A wheel end with the outer bearing assembled on the spindle journal (such as the PRC 425 wheel end).

The information contained in this manual was current at time of printing and is subject to change without notice or liability.

You must follow your company procedures when you service or repair equipment or components. You must understand all procedures and instructions before you begin to work on a unit. Some procedures require the use of special tools for safe and correct service. Failure to use special tools when required can cause serious personal injury to service personnel, as well as damage equipment and components.

The instructions contained in this Field Maintenance Manual are intended for use by skilled and experienced mechanics knowledgeable in the installation, repair and replacement of the AxleTech product described herein. Installation, maintenance and replacement of such products require a high degree of skill and experience. The consequences of improper installation, maintenance or replacement (including the use of inferior or substandard components) are grave and can result in product failure and resulting loss of control of the vehicle, possible injury to or death of persons and/or possible future or additional axle damage. AxleTech does not authorize anyone other than highly skilled and experienced individuals to attempt to utilize the instructions contained in this Manual for the installation, maintenance or replacement of the product described herein, and AxleTech shall have no liability of any kind for damages arising out of (or in connection with) any other use of the information contained in this Manual.

AxleTech International uses the following notations to warn the user of possible safety problems and to provide information that will prevent damage to equipment and components.

| ![WARNING] | A Warning indicates a procedure that you must follow exactly to avoid serious personal injury. |
| ![CAUTION] | A Caution indicates a procedure that you must follow exactly to avoid damaging equipment or components. Serious personal injury can also occur. |
| ![NOTE:] | This symbol indicates that fasteners must be tightened to a specific torque. |
| ![NOTE:] | A Note indicates an operation, procedure or instruction that is important for proper service. A NOTE can also supply information that will help to make service quicker and easier. |

How to Order

Order items from AxleTech International. Phone orders are also accepted by calling AxleTech International’s Customer Service Center at 877-547-3907 or send a fax to 866-547-3987.
Asbestos and Non-Asbestos Fibers Warnings

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- Wheel End with Outer Bearing on Ring Gear Hub Journal (PRC 775 W3H shown)
- Wheel End with Outer Bearing on Spindle Journal (PRC 425 W3H shown)
- Wheel End (PRC 1756 W3H shown)

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**Hazard Summary**

Because some brake linings contain asbestos, workers who service brakes must understand the potential hazards of asbestos and precautions for reducing risks. Exposure to airborne asbestos dust can cause serious and possibly fatal diseases, including asbestososis (a chronic lung disease) and cancer, particularly lung cancer and mesothelioma (a cancer of the lining of the chest or abdominal cavities). Some studies show that the risk of lung cancer among persons who smoke and who are exposed to asbestos is much greater than the risk for non-smokers. Symptoms of these diseases may not become apparent for 15, 20 or more years after the first exposure to asbestos.

Accordingly, workers must use caution to avoid creating and breathing dust when servicing brakes. Specific recommended work practices for reducing exposure to asbestos dust follow. Consult your employer for more details.

**Recommended Work Practices**

1. **Separate Work Areas.** Whenever feasible, service brakes in a separate area away from other operations to reduce risks to unprotected persons. OSHA has set a maximum allowable level of exposure for asbestos of 0.1 f/cc as an 8-hour time-weighted average and 0.5 f/cc averaged over a 30-minute period. OSHA does not disagree, however, to what extent adherence to the maximum allowable exposure levels will eliminate the risk of disease that can result from inhaling asbestos dust. OSHA requires that the following sign be posted at the entrance to areas where exposures exceed either of the maximum allowable levels:

   **DANGER: ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

2. **Respiratory Protection.** Wear a respirator equipped with a high-efficiency (HEPA) filter approved by NIOSH or MSHA for use with asbestos at all times when servicing brakes, beginning with the removal of the wheels.

3. **Procedures for Servicing Brakes.**
   a. Enclose the brake assembly within a negative pressure enclosure. The enclosure should be equipped with a HEPA vacuum and worker arm sleeves. With the enclosure in place, use the HEPA vacuum to loose and vacuum residue from the brake parts.
   b. As an alternative procedure, use a catch basin with water and a biodegradable, non-phosphate, water-based detergent to wash the brake drum or rotor and other brake parts. The solution should be applied with low pressure to prevent dust from becoming airborne. Allow the solution to flow between the brake drum and the brake support or the brake rotor and caliper. The wheel hub and brake assembly components should be thoroughly wetted to suppress dust before the brake shoes or brake pads are removed. Wet the brake parts clean with a cloth.
   c. If an enclosed vacuum system or brake washing equipment is not available, employers may adopt their own written procedures for servicing brakes, provided that the exposure levels associated with the employer’s procedures do not exceed the levels associated with the enclosed vacuum system or brake washing equipment. Consult OSHA regulations for more details.
   d. Wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA for use with asbestos when grinding or machining brake linings. In addition, do such work in an area with a local exhaust ventilation system equipped with a HEPA filter.
   e. **NEVER** use compressed air by itself, dry brushing, or a vacuum not equipped with a HEPA filter when cleaning brake parts or assemblies. **NEVER** use carcinogenic solvents, flammable solvents, or solvents that can damage brake components as wetting agents.

4. **Cleaning Work Areas.** Clean work areas with a vacuum equipped with a HEPA filter or by wet wiping. **NEVER** use compressed air or dry sweeping to clean work areas. When you empty vacuum cleaners and handle used bags, wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA for use with asbestos. When you replace a HEPA filter, wet the filter with a fine mist of water and dispose of the used filter with care.

5. **Worker Clean-Up.** After servicing brakes, wash your hands before you eat, drink or smoke. Shower after work. Do not wear work clothes home.

   **Use a vacuum equipped with a HEPA filter to vacuum work clothes after they are worn. Launder them separately. Do not shake or use compressed air to remove dust from work clothes.**

6. **Reuse Disposal.** Dispose of discarded linings, used rags, clothes and HEPA filters with care, such as in sealed plastic bags. Consult applicable EPA, state and local regulations on waste disposal.

**Regulatory Guidance**

References to OSHA, NIOSH, MSHA, and EPA, which are regulatory agencies in the United States, are made to provide further guidance to employers and workers employed within the United States. Employers and workers employed outside of the United States should consult the regulations that apply to them for further guidance.

**ASBESTOS FIBER WARNING**

The following procedures for servicing brakes are recommended to reduce exposure to asbestos fiber dust, a cancer and lung disease hazard. Material Safety Data Sheets are available from Meritor.

**NON-ASBESTOS FIBERS WARNING**

The following procedures for servicing brakes are recommended to reduce exposure to non-asbestos fiber dust, a potential cancer and lung disease hazard. Material Safety Data Sheets are available from Meritor.

**Hazard Summary**

Most recently manufactured brake linings do not contain asbestos fibers. These brake linings may contain one or more of a variety of ingredients, including glass fibers, mineral wool, aramide fibers, carbon fibers and silica that can be inhaled. Scientists disagree on the extent of the risks from exposure to these substances. Nonetheless, exposure to silica dust can cause silicosis, a non-cancerous lung disease. Silicosis gradually reduces lung capacity and efficiency and can result in serious breathing difficulty. Some scientists believe other types of non-asbestos fibers, when inhaled, can cause similar diseases of the lung. In addition, silica dust and ceramic fiber dust are known to the State of California to cause lung cancer. U.S. and international agencies have also determined that dust from mineral wool, ceramic fibers and silica are potential causes of cancer.

Accordingly, workers must use caution to avoid creating and breathing dust when servicing brakes. Specific recommended work practices for reducing exposure to non-asbestos dust follow. Consult your employer for more details.

**Recommended Work Practices**

1. **Separate Work Areas.** Whenever feasible, service brakes in a separate area away from other operations to reduce risks to unprotected persons. OSHA has set a maximum allowable level of exposure for silica of 0.1 mg/m³ as an 8-hour time-weighted average. Some manufacturers of non-asbestos brake linings recommend that exposure to other ingredients found in non-asbestos brake linings be kept below 1.0 f/cc as an 8-hour time-weighted average. Scientists disagree, however, to what extent adherence to these maximum allowable exposure levels will eliminate the risk of disease that can result from inhaling non-asbestos dust.

   Therefore, wear respiratory protection at all times during brake servicing, beginning with the removal of the wheels. Wear a respirator equipped with a high-efficiency (HEPA) filter approved by NIOSH or MSHA, if the exposures levels may exceed OSHA or manufacturer’s recommended maximum levels. Even when exposures are expected to be below the maximum allowable levels, wearing such a respirator at all times during brake servicing will help minimize exposure.

2. **Respiratory Protection.** OSHA has set a maximum allowable level of exposure for silica of 0.1 mg/m³ as an 8-hour time-weighted average. Some manufacturers of non-asbestos brake linings recommend that exposure to other ingredients found in non-asbestos brake linings be kept below 1.0 f/cc as an 8-hour time-weighted average. Scientists disagree, however, to what extent adherence to these maximum allowable exposure levels will eliminate the risk of disease that can result from inhaling non-asbestos dust.

   Therefore, wear respiratory protection at all times during brake servicing, beginning with the removal of the wheels. Wear a respirator equipped with a high-efficiency (HEPA) filter approved by NIOSH or MSHA, if the exposures levels may exceed OSHA or manufacturer’s recommended maximum levels. Even when exposures are expected to be below the maximum allowable levels, wearing such a respirator at all times during brake servicing will help minimize exposure.

3. **Procedures for Servicing Brakes.**
   a. Enclose the brake assembly within a negative pressure enclosure. The enclosure should be equipped with a HEPA vacuum and worker arm sleeves. With the enclosure in place, use the HEPA vacuum to loose and vacuum residue from the brake parts.
   b. As an alternative procedure, use a catch basin with water and a biodegradable, non-phosphate, water-based detergent to wash the brake drum or rotor and other brake parts. The solution should be applied with low pressure to prevent dust from becoming airborne. Allow the solution to flow between the brake drum and the brake support or the brake rotor and caliper. The wheel hub and brake assembly components should be thoroughly wetted to suppress dust before the brake shoes or brake pads are removed. Wet the brake parts clean with a cloth.
   c. If an enclosed vacuum system or brake washing equipment is not available, employers may adopt their own written procedures for servicing brakes, provided that the exposure levels associated with the employer’s procedures do not exceed the levels associated with the enclosed vacuum system or brake washing equipment. Consult OSHA regulations for more details.
   d. Wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA for use with asbestos when grinding or machining brake linings. In addition, do such work in an area with a local exhaust ventilation system equipped with a HEPA filter.
   e. **NEVER** use compressed air by itself, dry brushing, or a vacuum not equipped with a HEPA filter when cleaning brake parts or assemblies. **NEVER** use carcinogenic solvents, flammable solvents, or solvents that can damage brake components as wetting agents.

4. **Cleaning Work Areas.** Clean work areas with a vacuum equipped with a HEPA filter or by wet wiping. **NEVER** use compressed air or dry sweeping to clean work areas. When you empty vacuum cleaners and handle used bags, wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA for use with asbestos. When you replace a HEPA filter, wet the filter with a fine mist of water and dispose of the used filter with care.

5. **Worker Clean-Up.** After servicing brakes, wash your hands before you eat, drink or smoke. Shower after work. Do not wear work clothes home.

   **Use a vacuum equipped with a HEPA filter to vacuum work clothes after they are worn. Launder them separately. Do not shake or use compressed air to remove dust from work clothes.**

6. **Reuse Disposal.** Dispose of discarded linings, used rags, clothes and HEPA filters with care, such as in sealed plastic bags. Consult applicable EPA, state and local regulations on waste disposal.

**Regulatory Guidance**

References to OSHA, NIOSH, MSHA, and EPA, which are regulatory agencies in the United States, are made to provide further guidance to employers and workers employed within the United States. Employers and workers employed outside of the United States should consult the regulations that apply to them for further guidance.
W3H – 360mm Wet Disc Brake with Dowel Pins
(Typical PRC 425 and PRC 725 except disc stack per Bill of Materials)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Housing, Brake Disc</td>
<td>13</td>
<td>Screw, Brake Bleeder</td>
</tr>
<tr>
<td>2</td>
<td>Piston</td>
<td>14</td>
<td>Plug Assembly, Forced Cooling Inlet</td>
</tr>
<tr>
<td>3</td>
<td>Seal, Piston Outer (large)</td>
<td>15</td>
<td>Housing, Piston</td>
</tr>
<tr>
<td>4</td>
<td>Seal, Piston Inner (small)</td>
<td>16</td>
<td>Spring, Piston Return</td>
</tr>
<tr>
<td>5</td>
<td>Screw, Brake Adjuster</td>
<td>17</td>
<td>Bolt, Shoulder</td>
</tr>
<tr>
<td>6</td>
<td>Jam Nut, Brake Adjuster</td>
<td>18</td>
<td>Washer, Hardened</td>
</tr>
<tr>
<td>7</td>
<td>Plug Assembly, Service Brake Inlet</td>
<td>19</td>
<td>Disc, Stationary</td>
</tr>
<tr>
<td>8</td>
<td>Capscrew</td>
<td>20</td>
<td>Disc Assembly, Friction</td>
</tr>
<tr>
<td>9</td>
<td>Washer, Hardened</td>
<td>21</td>
<td>Dowel Pin, Stationary Disc Locking</td>
</tr>
<tr>
<td>10</td>
<td>Plug, Magnetic Drain</td>
<td>22</td>
<td>Toric Seal Ring</td>
</tr>
<tr>
<td>11</td>
<td>Plug Assembly, Air Evacuation</td>
<td>23</td>
<td>Toric Ring Face Seal Half</td>
</tr>
<tr>
<td>12</td>
<td>Plug Assembly, Forced Cooling Outlet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Wheel End with Outer Bearing on Ring Gear Hub Journal  
(PRC 775 W3H shown as example)
ITEM | DESCRIPTION
--- | ---
1 | Magnetic Drain/Fill Plug
2 | Setscrew
3 | Planetary Spider
4 | Thrust Button
5 | Snap Ring
6 | Planetary Sun Gear
7 | Thrust Washer
8 | Planetary Ring Gear
9 | Pin
10 | Adjusting Nut
11 | Flat Washer
12 | Capscrew
13 | Snap Ring
14 | Inner Thrust Washer
15 | Planetary Pinion Gear
16 | Outer Thrust Washer
17 | Planetary Pinion Shaft
18 | Outer Bearing Cone
19 | Outer Bearing Cup
20 | O-Ring
21 | Wheel Nut
22 | Hub
23 | Wheel Stud
24 | Face Seal Assembly
25 | Inner Bearing Cup
26 | Inner Bearing Cone
27 | Oil Seal Assembly
28 | Spindle
29 | Wet Disc Brake Assembly
See MM-9G for further information on PRC 1756 W3H wheel-end.
Description

Wheel End with Outer Bearing on Ring Gear Hub Journal

The W3H – 360 mm Dura-Disc wet disc brake is a hydraulically actuated friction brake. Figure 2.1 shows the wet disc brake installed on the PRC 775 axle, which has a wheel end with outer bearing installed on the ring gear hub journal.

Four friction discs and four stationary discs are used in the wet disc brake for this type of wheel end.

- Friction discs rotate with the wheel hub.
- Stationary discs are locked to the brake housing with dowel pins.

The W3H – 360 mm wet disc brake uses a two-piece housing. The outer brake housing contains the discs, while the inner brake housing contains the piston and the piston seals.

Cooling Systems

![CAUTION](image)

The operating temperature of the coolant must never reach or exceed 250°F (120°C). If the operating temperature of the coolant reaches or exceeds 250°F (120°C), the internal components of the brake will be damaged. A forced cooling system may be required to assure that the coolant temperature remains below 250°F (120°C).

A forced cooling system is used. The forced cooling system removes more heat from the discs than a sump cooling system. An external pump moves hydraulic fluid from a reservoir to the brake housing and back to the reservoir.

Hub seals on forced cooling systems separate the brake’s coolant from the lubricant in the planetary wheel end.
Cross Section – Wheel End with Outer Bearing on Spindle Journal (PRC 425 shown as example)

Figure 2.2

Wheel End with Outer Bearing on Spindle Journal

The W3H – 360 mm Dura-Disc wet disc brake is a hydraulically actuated friction brake. Figure 2.2 shows the wet disc brake installed on the PRC 425 axle, which has a wheel end with the outer bearing installed on the spindle journal.

Three friction discs and three stationary discs are used in the wet disc brake for this type of wheel end.

- Friction discs rotate with the wheel hub.
- Stationary discs are locked to the brake housing with dowel pins.

The W3H – 360 mm wet disc brake uses a two-piece housing. The outer brake housing contains the discs, while the inner brake housing contains the piston and the piston seals.

Cooling Systems

**CAUTION**

The operating temperature of the coolant must never reach or exceed 250°F (120°C). If the operating temperature of the coolant reaches or exceeds 250°F (120°C), the internal components of the brake will be damaged. A forced cooling system may be required to assure that the coolant temperature remains below 250°F (120°C).

A forced cooling system is used. The forced cooling system removes more heat from the discs than a sump cooling system. An external pump moves hydraulic fluid from a reservoir to the brake housing and back to the reservoir.

Hub seals on forced cooling systems separate the brake’s coolant from the lubricant in the planetary wheel end.
How to Identify the Brake Model

A tag on the planetary axle housing identifies the brake model. Figure 2.3.

You can also identify the brake assembly from the axle’s Bill of Material. The 360 mm (14.17 inch) wet disc brake has slots and dowel pins that lock the stationary discs to the brake housing.

WARNING
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Removal
Wet Disc Brake

WARNING
Allow the brakes to cool to ambient temperature (cool to the touch) before draining fluid. Wear protective gloves. Personal injury can result.

Use only the type of fluid specified by the equipment manufacturer. Do not use or mix different types of fluid. An incorrect fluid can damage the rubber parts of the assemblies, which could cause loss of braking and serious personal injury.

Do not reuse hydraulic fluid or coolant. Used fluid may be contaminated and can cause incorrect operation, which can result in serious personal injury and damage to components.

Remove the wet disc brake assembly from the typical wheel ends as described below.

Drain Fluids from Wheel Ends

Disassembly of the wet disc brake is required to replace a leaky seal or worn brake disc pack. Use the following procedure:

WARNING
Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle that is supported only by jacks. Jacks can slip or fall over. Serious personal injury can result.

1. Make sure the vehicle is on a level surface.
2. Place blocks under the wheels not being serviced to keep the vehicle from moving.
3. Raise the vehicle so that the wheels of the axle to be serviced are off the ground. Support the vehicle with safety stands. Refer to the vehicle manufacturer's maintenance manual for instructions on raising the vehicle.
4. Remove the wheel nuts and dual tire/rim assemblies from both wheel ends.
5. Rotate the wheel ends so the magnetic drain plug in the planetary spider is at the bottom.

WARNING
Allow the brakes to cool to ambient temperature (cool to the touch) before draining fluid. Wear protective gloves. Personal injury can result.

6. Place a suitable container under the wheel end, remove the magnetic drain/fill plug from the spider, and drain the lubricant. Dispose of the lubricant according to state and/or federal (EPA) recommendations.
7. If necessary, remove the magnetic drain plug from the bottom of the axle housing. Drain and dispose of the lubricant from the carrier center section.
8. If equipped with coolant shutoff valves, close the shutoff valves to prevent draining the brake lines and to make sure coolant does not flow into the brake housing during disassembly. Remove the forced coolant inlet and outlet lines from the brake piston housing assembly. Cap the lines to prevent possible contamination of the coolant.
9. Place a suitable container under the brake piston housing to catch the drained fluid.

**CAUTION**

To properly adjust brakes, remove or install the bottom adjuster screw and jam nut as outlined below. Improperly adjusted brakes can lead to uneven brake disc wear and accelerate brake disc wearout.

10. Matchmark the bottom adjuster screw position to the piston housing. The bottom adjuster screw must be repositioned to the same depth when reinstalled in order to ensure correct brake adjustment. Figure 3.1.

![Figure 3.1: Plug and Screw Locations on Brake Piston Housing](image)

<table>
<thead>
<tr>
<th>1. Plug, Magnetic Drain (1)</th>
</tr>
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<tbody>
<tr>
<td>2. Adjuster Screw with Jam Nut (3)</td>
</tr>
<tr>
<td>3. Plug, Actuation Fluid Inlet (2)</td>
</tr>
<tr>
<td>4. Plug, Forced Cooling Outlet (2)</td>
</tr>
<tr>
<td>5. Screw, Actuation Fluid Bleeder (1)</td>
</tr>
<tr>
<td>6. Plug, Forced Cooling Inlet (1)</td>
</tr>
<tr>
<td>7. Plug, Air Evacuation (1)</td>
</tr>
<tr>
<td>8. Housing, Brake Piston (1)</td>
</tr>
<tr>
<td>9. Capscrew, Brake Piston Housing to Disc Housing (16)</td>
</tr>
</tbody>
</table>

11. With the adjuster screw matchmarked to the piston housing, place a suitable wrench on the bottom adjuster screw to keep it from rotating. While holding this wrench, use a second wrench to loosen the jam nut. The adjuster screw must not turn while the jam nut is being loosened.

12. Remove only the bottom adjuster screw to permit draining of the coolant from the brake housing. Do not remove the other two adjuster screws. Remove the bottom adjuster screw from the housing as follows:
   A. Rotate the screw COUNTERCLOCKWISE and count the number of turns required to remove it.
   B. Record this number.

13. When you have removed the adjuster screw, remove the recessed Allen-head drain plug from the brake housing. Allow the coolant to drain into the container.

14. Dispose of the used fluid in an environmentally responsible manner, according to state and/or federal (EPA) recommendations.

15. Install the bottom adjuster screw with the same number of turns and lined up with the matchmark on the piston housing to bring the brake to the original adjustment position.

**NOTE:** For more detailed Disassembly and Assembly of the model PRC 1756 W3H wheel-end, see Maintenance Manual MM-9G.
Wheel End with Outer Bearing on Ring Gear Hub Journal

**WARNING**

Support the planetary spider with a lifting strap before you remove the planetary spider from the wheel hub. A planetary spider that is not supported correctly can fall. Serious personal injury and damage to components can result.

1. With a lifting device, remove the planetary spider assembly from the wheel hub and set it on a workbench. See Figure 3.2.

2. If the planetary ring gear did not remain with the planetary spider assembly during the assembly’s removal, remove the ring gear from the planetary ring gear hub.

**WARNING**

Observe all warnings and cautions provided by the press manufacturer to avoid damage to components and serious personal injury.

Use a brass or leather mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

**CAUTION**

To avoid damage to the pinion shaft, provide a soft cushioned area to receive the pinion shaft when it is removed from the spider.

If it is necessary to service the planetary spider assembly, refer to Maintenance Manual 9K.

3. Remove the axle shaft, planetary sun gear and snap ring assembly.
Section 3
Disassembly

NOTE: The sun gear thrust washer may come out with the axle shaft and sun gear assembly.

4. Remove the sun gear thrust washer from the end of the spindle.

5. Remove the two lock plate capscrews. Remove the lock plate from the planetary ring gear hub.

6. Matchmark the position of the wheel bearing adjusting nut to the ring gear hub and spindle. Remove the wheel bearing adjusting nut.

7. Remove the planetary ring gear hub. The outer wheel bearing cone will remain on the ring gear hub. If it is damaged, remove it from the hub.

8. Remove the wheel hub with brake driver splines from friction discs. The hub oil seal and inner bearing assembly will remain in the hub.

⚠️ CAUTION

One-half of the Toric Ring face seal comes off with the hub. The other half will remain in the brake disc housing. Do not set the hub down onto the face seal. Damage to the face seal can result.

NOTE: Wrap and label the face seal halves separately. Store them in a safe place to prevent damage and reassemble them later in the same positions.

9. Remove the face seal half from the hub assembly.

10. Remove the rest of face seal from the brake housing assembly.

⚠️ CAUTION

Do not damage the hub oil seal bore surface in the wheel hub. Damage to this surface will result in oil leakage after assembly.

NOTE: If it is necessary to replace the hub oil seal and bearings, refer to Maintenance Manual 9K.

11. Refer to Brake Piston Housing and Wheel Spindle for disassembly of brake disc housing assembly.
Wheel End with Outer Bearing on Spindle Journal

**WARNING**

Support the planetary spider with a lifting strap before you remove the planetary spider from the wheel hub. A planetary spider that is not supported correctly can fall. Serious personal injury and damage to components can result.

1. With a lifting device, remove the planetary spider from the wheel hub. Set it on a workbench. See Figure 3.3.

**CAUTION**

To avoid damage to the pinion shaft, provide a soft cushioned area to receive the pinion shaft if it is removed from the spider.

2. If it is necessary to service the planetary spider assembly, refer to Maintenance Manual 9K.
NOTE: The sun gear thrust washer may come out with the axle shaft and sun gear assembly.

3. Remove the axle shaft, planetary sun gear and snap ring assembly.

4. If necessary, remove the snap ring from the axle shaft to allow for the removal of the sun gear and sun gear thrust washer.

5. Remove the planetary ring gear.

6. Matchmark the position of the wheel bearing adjusting nut to the spindle. Remove the wheel bearing adjusting nut.

**CAUTION**

The outer bearing cone will be loose as you pass it over the end of the spindle. Hold the cone securely to avoid dropping it and damaging the cone.

7. Remove the outer bearing cone and wheel hub assembly with brake driver splines from the friction discs. The wheel bearings and oil seal will come off with the wheel hub.

**CAUTION**

One-half of the Toric Ring face seal comes off with the hub. The other half will remain in the brake disc housing. Do not set the hub down onto the face seal. Damage to the face seal can result.

NOTE: Wrap and label the face seal halves separately. Store them in a safe place to prevent damage and reassemble them later in the same positions.

8. Remove the face seal half from the hub assembly.

9. Remove the rest of the face seal from the brake housing assembly.

**CAUTION**

Do not damage the hub oil seal bore surface in the wheel hub. Damage to this surface will result in oil leakage after assembly.

NOTE: If it is necessary to replace the hub oil seal and bearing, refer to Maintenance Manual 9K.

### Brake Disc Housing Assembly – Wheel End

**WARNING**

When you remove the 16 capscrews and washers from the perimeter of the brake piston housing, the brake disc housing can separate from the piston housing. Support the brake housing assembly with a lifting strap before you install the assembly onto the piston housing assembly. The discs in the brake housing assembly are loose and can fall. Serious personal injury and damage to components can result.

Disassemble the brake disc housing assembly from the wheel end as follows:

NOTE: Store the face seal with the O-ring in a safe, clean package to prevent damage.

1. If not previously removed, carefully remove, wrap and label the Toric Ring face seal with O-ring from the outboard face of the brake disc housing and store in a safe place to prevent damage.

2. Loosen the sixteen M16 x 1.5 threaded capscrews on the back of the piston housing. Figure 3.1. Hit threaded capscrew heads with a mallet to separate wet disc brake housing.

3. Remove all but two capscrews at the eleven o’clock and one o’clock positions.
A. Start by marking the top stationary disc as Disc 1 on the left top tang that engages the dowel pin. Remove the stationary disc, flip it over and place it on a clean towel.

B. Mark the first friction disc at the inner diameter spline as Disc 1, remove it, flip it over, and place it on top of the first stationary disc.

C. Mark the second stationary disc as Disc 2, remove it, flip it over, and place it on top of the friction disc.

D. Continue marking, removing, flipping, and stacking until all discs are removed from the brake housing and stacked in the same order as removed.

Brake Piston Housing Assembly

Disassemble the brake piston housing assembly as follows:

1. Remove the four shoulder bolts with washers and springs from the piston and housing assembly. Remove the washers and springs from the four shoulder bolts.

2. Remove the piston by using one of the following methods:
   - Apply low air pressure to the back of the piston housing. Do not exceed 20 psi (1.38 bar or 138 kPa).
   - Turn the three brake adjuster screws CLOCKWISE and evenly until the piston is pushed out.

3. Place the piston on the workbench.

NOTE: Stack the stationary discs and friction discs separately outside the brake housing. Do not mix up the mating surfaces while inspecting and measuring the thickness. Component damage can result.

CAUTION
To avoid damaging the spindle seal journal, a protective pad (such as a clean, folded shop cloth) should be placed on the spindle seal journal before the brake disc housing is removed.

CAUTION
To avoid damaging the spindle seal journal, a protective pad (such as a clean, folded shop cloth) should be placed on the spindle seal journal before the piston and piston housing are removed.
CAUTION
Be careful to avoid scratching the piston seal grooves while removing the “D” seals, since this can result in actuation fluid leakage past the seals.

4. Carefully remove the “D” seals from the grooves in the piston and discard. “D” seals are not reusable and must be replaced with new seals.

Brake Piston Housing and Wheel Spindle

WARNING
Removal of the thirteen 20 mm capscrews from the inside of the piston housing allows the spindle and piston housing to separate. Support the piston housing with a lifting strap before you remove the capscrews. A piston housing that is not supported correctly can fall. Serious personal injury and damage to components can result.

1. To prevent the spindle and brake piston housing from falling after all the mounting capscrews are removed, perform the following procedures:
   A. Use a lifting strap to support the piston housing and the spindle before disassembly.
   B. Remove only two of the 13 capscrews holding the piston housing and spindle to the axle housing, one from the eleven o’clock position and one from the one o’clock position.
   C. Replace the capscrews with temporary M20-2.5 threaded support studs 4 inches (102 mm) long. Figure 3.4.

   2. With the two support studs in place, remove the remaining 11 capscrews and washers that secure the piston housing and spindle to the axle housing.

   CAUTION
To avoid damaging the spindle seal journal, a protective pad (such as a clean, folded shop cloth) should be placed on the spindle seal journal before the piston housing is removed. Be careful not to bump the spindle seal journal while removing the piston housing, since this can damage the seal journal. A spindle with a damaged seal journal will leak and must be replaced.

3. With the piston housing held by the lifting strap, remove the piston housing from the spindle by sliding it off of the support studs. Place the piston housing open end up on the workbench.

4. If necessary, to remove the spindle, support the spindle with a lifting strap.

5. Remove the spindle from the axle housing by sliding it off of the support studs.

WARNING
Use a brass or leather mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

6. If required, tap the spindle lightly to loosen the pilot fit and overcome adhesion from the cured gasket material in the flange joint. Place the spindle on the workbench.
NOTE: Disassembly of the PRC 1756 W3H planetary axle wheelends with coverless planetary spider design is covered in more detail in Maintenance Manual9G.

On the PRC 1756 W3H wheel-end, O-rings replace sealant at locations shown in Figure 3.5.
Section 3
Disassembly

Figure 3.6
W3H - 360mm Wet Disc Brake with Dowel Pins for PRC 1756 (6 Disc)

Figure 3.7
W3H - 360mm Wet Disc Brake with Dowel Pins for PRC 1756 (5 Disc)
WARNING
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Inspection

Inspect removed components as follows:

1. Inspect brake piston bores in the housing for wear or rough spots. Polish out roughness with fine crocus cloth. Clean housing to remove metal particles.

2. Inspect “D” seal grooves in the piston for rough spots. Polish out roughness with fine crocus cloth. Clean the piston to remove metal particles.

WARNING
Replace all the brake discs at one time to avoid uneven brake disc wear. Uneven brake disc wear can result in component damage and serious personal injury.

Keep used brake discs in the correct order with mating surfaces together. Installing the discs in an incorrect order can result in component damage and serious personal injury.

3. Inspect stationary discs and friction discs for flatness and wear. Measure the thickness of the discs. Overall thickness should not be less than that shown in Table 1. Replace the entire disc pack if one disc needs replacing.

<table>
<thead>
<tr>
<th>Disc Type</th>
<th>Part Number</th>
<th>Minimum Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction</td>
<td>A-3281-Z-1196</td>
<td>0.192 Inch (4.87 mm)</td>
</tr>
<tr>
<td>Stationary</td>
<td>3281-F-1203</td>
<td>0.167 Inch (4.25 mm)</td>
</tr>
</tbody>
</table>

4. Inspect brake piston return springs for damage and replace, if required.

5. Inspect fastener and plug bores for thread damage in the piston and disc housings. Use the appropriate taps lubricated with light oil to remove minor thread damage.

6. Inspect fasteners and plugs for obvious signs of damage, such as distorted (brinelled) threads or damaged hex corners. Replace any fastener or plug with thread damage that cannot be repaired by running it through the appropriate die.

7. Inspect O-rings on plugs and replace any damaged O-ring.

8. Inspect Toric Ring face seals and O-rings as follows:

CAUTION
Install face seal halves in the same positions where they were located prior to disassembly. Mixing up face seal halves can cause component damage.

- Look for obvious signs of damage. Replace any damaged face seal or O-ring. Replace any O-ring that is stuck to the seal or brake housing or any that has taken a “set” or cannot be pulled and “snapped” into position on the seal ring retaining lip.

- Toric Ring formed face seals are more flexible than cast ring seals and, as a result, produce a wear pattern different than cast ring designs. Typically, formed seals wear in an axial rather than radial direction, as depicted below, due to their increased flexibility. Figure 4.1.
• The total thickness of the flange is the usable wear material on the formed seal rings, and good seal performance can generally be expected until the flange is completely worn away. Estimate the remaining service life of the seal ring by measuring the ring flange thickness and comparing that measurement to those listed in Table 2. The minimum flange thickness required for seal ring usability is 1.27 mm (0.050 in.).

• With formed seal rings, the measured parameter used to check the remaining seal ring life is the flange thickness at the outer edge. Measure carefully, since the shoulder is only 1.52 mm (0.060 in.) from the edge of the flange.

Table 2. Formed Seal Wear Chart

<table>
<thead>
<tr>
<th>Flange Thickness mm (inch)</th>
<th>Seal Wear % Worn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.91 (0.075)</td>
<td>0</td>
</tr>
<tr>
<td>1.59 (0.062)</td>
<td>25</td>
</tr>
<tr>
<td>1.27 (0.050)</td>
<td>50</td>
</tr>
<tr>
<td>0.95 (0.038)*</td>
<td>75</td>
</tr>
<tr>
<td>0.64 (0.025)*</td>
<td>100</td>
</tr>
<tr>
<td>0.32 (0.012)*</td>
<td>125</td>
</tr>
<tr>
<td>0.00 (0.000)*</td>
<td>150</td>
</tr>
</tbody>
</table>

*Seal ring not usable. Replace seal ring.
WARNING
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Clean Components Prior to Assembly

WARNING
To avoid personal injury when cleaning parts, work in a well-ventilated area, wear protective clothing (face shield or safety glasses and protective gloves) and follow chemical manufacturer’s recommendations for safe usage.

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, emulsion-type cleaners and petroleum-base cleaners. To avoid serious personal injury when you use solvent cleaners, you must carefully follow the manufacturer’s instructions and these procedures:

• Wear safe eye protection.
• Wear clothing that protects your skin.
• Work in a well-ventilated area.
• Do not use gasoline or solvents that contain gasoline. Gasoline can explode.
• You must use hot solution tanks or alkaline solutions correctly. Carefully follow the manufacturer’s instructions.

CAUTION
Use only solvent cleaners to clean ground or polished metal parts. Hot solution tanks or water and alkaline solutions will damage these parts. Isopropyl alcohol can be used for this purpose.

If required, use a sharp knife to remove gasket material from parts. Be careful not to damage the ground or polished surfaces.

CAUTION
Keep used brake discs in the correct order with mating surfaces together. Install discs and face seal halves in the same positions where they were located prior to disassembly. Mixed up face seals and discs can cause component damage.

WARNING
Wear a faceplate or safety glasses when using compressed air. Do not exceed 40 psi (276 kPa). Serious personal injury can result.

1. Clean all metal components in pure isopropyl alcohol or commercial parts cleaner. Make sure all sealing surfaces are free of sealant or gasket material. Use a soft-bristled brush on these surfaces, if required. Blow dry with compressed air.

CAUTION
Clean friction discs in fresh brake coolant. Wipe dry with clean, lint-free cloths or blow dry with compressed air. Do not use solvent. Solvent can weaken the disc material and damage to components can result.

2. Clean friction discs in fresh brake coolant only. Wipe dry with clean, lint-free cloths or blow dry with compressed air.

3. Inspect the Toric Ring face seal tapered ramps in the wheel hub and brake disc housing that contact the O-rings. To avoid seal damage, these areas must be free of oil, grease, dirt, and other contamination before the seals with O-rings are installed. Clean as necessary.

4. Clean the brake disc housings and the metal face seals for the O-rings using isopropyl alcohol and a lint-free wipe. Dry with a clean wipe or compressed air.

5. Using a lint-free wipe, clean the O-rings in non-petroleum-based solvent. Dry with a clean wipe or compressed air.

6. Inspect cleaned components thoroughly to make sure any contaminants are removed.

7. Scrape all bolted joint surfaces to remove sealant prior to reassembly.
WARNING
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

NOTE: Assembly of the PRC 1756 W3H planetary axle wheelends with coverless planetary spider design is covered in more detail in Maintenance Manual 9G.

Installation
Wheel Spindle

WARNING
Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, emulsion-type cleaners and petroleum-base cleaners. To avoid serious personal injury when you use solvent cleaners, you must carefully follow the manufacturer's instructions and these procedures:

• Wear safe eye protection.
• Wear clothing that protects your skin.
• Work in a well-ventilated area.
• Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
• You must use hot solution tanks or alkaline solutions correctly. Carefully follow the manufacturer's instructions.

1. Clean the face of the axle housing and both sides of the spindle flange with solvent to remove any remaining gasket material and blow dry.

2. If previously removed, install two temporary studs (M20-2.5 threads, approximately four inches long) into the axle housing flange. Install the studs at the eleven o’clock and one o’clock positions. Figure 6.1.

3. Apply a 0.125 inch (3.18 mm) diameter continuous bead of silicone gasket material around the flange mounting face of either the axle housing or the spindle. Also apply the gasket material around the edge of all the fastener holes on that surface. Figure 6.2.

4. Support the axle spindle with a lifting strap before you install the spindle onto the axle housing. A spindle that is not supported correctly can fall. Serious personal injury and damage to components can result.

5. Support the spindle with a lifting strap. Align the missing hole locations on the spindle and axle housing. Install the spindle onto the two support studs and against the axle housing. Figure 6.2.

6. Remove the lifting strap.
Brake Piston Housing

**WARNING**

When you apply some silicone gasket materials, small amounts of acid vapor are present. To prevent possible serious injury, the work area must be well ventilated. If the silicone gasket material gets into your eyes, flush them with water for 15 minutes. Have your eyes checked by a doctor as soon as possible.

1. Apply a 0.125 inch (3.18 mm) diameter continuous bead of silicone gasket material around the flange face of the spindle. Also apply a continuous bead of the gasket material around the edge of all the fastener holes on that surface.

**CAUTION**

Place a protective pad, such as a clean, folded shop cloth, on the spindle seal journal before you install the piston housing to prevent damage to the seal journal.

**WARNING**

Support the piston housing with a lifting strap before you install the piston housing onto the spindle. A piston housing that is not supported correctly can fall. Serious personal injury and damage to components can result.

NOTE: The piston housing has TOP identified by a raised lug.

2. Support the piston housing with a lifting strap. Install the piston housing onto the two support studs and against the spindle.

3. Install the thirteen M20 x 2.5 thread capscrews and washers that secure the piston housing and spindle to the axle housing and tighten securely. Remove the lifting strap.

4. Remove the two temporary support studs and install the remaining two capscrews and washers. Tighten the capscrews in two stages:
   A. Using an “X” torquing pattern, tighten to 150 lb-ft (203 N•m) initial torque. 
   B. Using an “X” torquing pattern, tighten to 370-480 lb-ft (500-650 N•m) final torque.

**CAUTION**

You must install the adjuster screw and jam nut into the piston housing when you assemble the brakes to ensure correct brake adjustment and avoid damage to components.

NOTE: Brakes with new disc packs require adjustment after the wheel end assembly is complete.

5. If the adjuster screws were used to push the piston out of the piston housing or if you replaced the brake disc pack, perform the following operations:
   A. Clean and install the three disc brake adjuster screws in the piston housing.
   B. Turn the adjuster screws in halfway.
   C. Proceed to Step 7.

NOTE: Do not install the jam nuts at this time.

6. Clean the previously removed bottom adjuster screw, and install the screw in the piston housing as follows:
   A. Install the screw with the same number of turns and lined up with the matchmark on the piston housing to bring the brake to the original adjustment position.
   B. Insert the bottom adjuster screw into the piston housing (Figure 6.4).
   C. Slowly rotate it CLOCKWISE the same number or turns used for removal.

**CAUTION**

Hold the adjuster screw in place to ensure that the brakes are adjusted correctly. Do not allow the adjuster screw to turn. If the adjuster screw turns, damage to components can result.

D. Apply silicone sealant to the interface between the base of the adjuster screw and the housing and install the jam nut lightly onto the screw. Do not allow the screw to turn.

E. Using a suitable wrench to prevent movement of the screw, tighten the jam nut to 25-35 lb-ft (34-47 N•m).
Section 6
Assembly

Piston Assembly

1. Clean and inspect the piston for damage. Inspect the piston grooves to ensure no contaminants remain in the grooves.

2. Apply an oil lubricant to the “D” seals and assemble the “D” seals into the appropriate grooves in the piston.

3. Fabricate four M8 X 1.25 threaded assembly studs like the piston spring shoulder bolts, but without the heads.

**NOTE:** The piston slightly sticks out of the piston housing.

4. Install the four fabricated assembly studs into the piston return spring shoulder bolt holes in the piston housing.

**CAUTION**

*Place a protective pad, such as a clean, folded shop cloth, on the spindle seal journal before you install the piston housing to prevent damage to the seal journal.*

5. Apply an oil film coating on the piston housing bores. Use “C” clamps to assemble the piston over the assembly studs and push the piston into the piston housing until it bottoms out.

6. Remove and store the four assembly studs.

7. Install washers and springs on the four shoulder bolts.

**WARNING**

*Take care when using Loctite® to avoid serious personal injury. Follow the manufacturer’s instructions to prevent irritation to the eyes and skin. If Loctite gets into your eyes, flush them with water for 15 minutes. Have your eyes checked by a doctor as soon as possible.*

8. Apply a small bead of Loctite 518 sealant to the four shoulder bolt threads and install the four shoulder bolts into the piston and piston housing. Tighten the four shoulder bolts to 22-30 lb-ft (30-40 N·m).
Brake Disc Housing

**WARNING**

Replace all the brake discs at one time to avoid uneven brake disc wear. Uneven brake disc wear can result in component damage and serious personal injury.

Install used brake discs in the correct order with mating surfaces together. Installing the discs in an incorrect order can result in component damage and serious personal injury.

**NOTE:** The brake housing has TOP identified with a raised lug.

1. Clean and inspect the brake housing, stationary plates and dowels for damage.
   - **If all of the friction discs and stationary discs can be reused:** Reinstall them into the cleaned brake disc housing by stacking the discs in the same order and wear surface orientation as prior to disassembly.
   - **If all discs are being replaced:** Line up all the friction disc splines and grooves in a stack so that they can be assembled this way inside the brake housing.

**WARNING**

Support the brake housing assembly with a lifting strap before you install the assembly onto the piston housing assembly. The discs in the brake housing assembly are loose and can fall. Serious personal injury and damage to components can result.

**CAUTION**

Do not reuse a damaged friction disc or stationary disc. Damage to components can result.

Do not mix discs and their mating surfaces, which can result in uneven brake disc wear after parts are reassembled. Damage to components can result.

Do not lubricate brake discs prior to assembly. Lubricant can run onto the brake disc housing and mix with Loctite® sealant, which will cause the sealing joint to leak. Damage to components can result.

2. Place the brake housing on an assembly bench. If previously removed, assemble the eight dowel pins into the slots in the brake housing.

3. Place a friction disc inside the brake housing. Place a stationary disc into the brake housing while engaging all the dowels in the disc’s slots.

4. Alternate in this manner (friction disc/stationary disc) until all discs are installed. Realign all the friction disc splines and grooves.

**WARNING**

Take care when using Loctite® to avoid serious personal injury. Follow the manufacturer’s instructions to prevent irritation to the eyes and skin. If Loctite gets into your eyes, flush them with water for 15 minutes. Have your eyes checked by a doctor as soon as possible.

5. Apply a continuous, two millimeter diameter bead of Loctite® 518 sealant onto the mounting face of the brake housing. Sealant must be on the inner side (inboard) of the bolt holes to keep fluid from reaching bolts. See Figure 6.5.
Section 6
Assembly

⚠️ **CAUTION**
Place a protective pad, such as a clean, folded shop cloth, on the spindle seal journal before you install the disc housing assembly to prevent damage to the seal journal.

⚠️ **WARNING**
The discs in the brake disc housing assembly are loose. The discs must be correctly supported when the assembly is raised to a vertical position and lifted for installation onto the piston housing assembly. A falling disc can result in disc damage and serious personal injury. A damaged disc cannot be reused.

6. Carefully lift the brake housing assembly (lug on TOP) and install it onto the piston housing that is already mounted on the axle.

7. Tighten sixteen M16 x 1.5 threaded capscrews in two stages:
   A. Using an “X” tightening pattern, tighten to 150 lb-ft (203 N•m).
   B. Using an “X” tightening pattern, tighten to 200-258 lb-ft (270-350 N•m).

**Toric Ring Face Seal into Brake Disc Housing and into Hub**

⚠️ **CAUTION**
Install face seal halves in the same positions where they were located prior to disassembly. Mixing up face seal halves can cause component damage.

The Toric Ring face seal half with the O-ring must be installed in the brake disc housing and into the hub before the hub can be assembled to the housing. **Figure 6.6.** Install the Toric Ring face seal in the brake disc housing and in the hub as follows:

---

**Figure 6.6**

<table>
<thead>
<tr>
<th>1. Seal Ring</th>
<th>6. Seal Ring Face</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. O-Ring</td>
<td>7. Seal Ring Ramp</td>
</tr>
<tr>
<td>3. Housing Retainer Lip</td>
<td>8. Seal Ring Retaining Lip</td>
</tr>
<tr>
<td>4. Housing Ramp</td>
<td>9. Installation Tool</td>
</tr>
<tr>
<td>5. Seal Ring Housing</td>
<td></td>
</tr>
</tbody>
</table>
**WARNING**

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, emulsion-type cleaners and petroleum-base cleaners. To avoid serious personal injury when you use solvent cleaners, you must carefully follow the manufacturer’s instructions and these procedures:

- **Wear safe eye protection.**
- **Wear clothing that protects your skin.**
- **Work in a well-ventilated area.**
- **Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.**
- **You must use hot solution tanks or alkaline solutions correctly. Carefully follow the manufacturer’s instructions.**

**CAUTION**

Check for solvent residue on all seating surfaces. Solvents that leave a residue on the O-ring, metal face seal or brake disc housing seal seating surface can cause the O-ring to roll into the seal, rather than slide. Damage to the seal can result.

1. Make sure the formed seal ring, O-ring and brake disc housing are clean and free of any oil or other contaminants. If required, use a solvent that evaporates quickly, leaves no residue, and is compatible with the O-rings.

**CAUTION**

Install the O-ring into the seal ring and make sure it is flat. Do not twist the O-ring when installing onto the seal ring. A twisted O-ring will not seal correctly, allowing leakage of lubricant and pumping of debris past the ring. Damage to components can result.

2. Install the O-ring onto the formed seal ring so that it rests in the radius of the tail of the seal ring and is not twisted. Install the O-ring onto the seal ring as follows:

- **Wet the rubber O-ring with isopropyl alcohol and install it onto the formed seal ring so that it is seated at the bottom of the seal ring ramp and against the retaining lip.**

**Figure 6.7**

- **A.** Make sure the O-ring is not twisted by rapidly pulling it away from the seal ring and letting it snap back. Do this in a number of places until the seal is correctly seated. Be careful not to nick or cut the O-ring seal, as this will cause leaks. **Figure 6.8.**

**Figure 6.8**

- **B.** Make sure the O-ring is not twisted by rapidly pulling it away from the seal ring and letting it snap back. Do this in a number of places until the seal is correctly seated. Be careful not to nick or cut the O-ring seal, as this will cause leaks. **Figure 6.8.**
CAUTION

Do not use Stanosol® or any other liquid that leaves an oily film and does not evaporate quickly, since this may result in incorrect seating of the O-ring in the housing, resulting in seal leakage.

3. Coat the O-ring with isopropyl alcohol so that it slides easily past the retainer lip in the disc housing and installs correctly on the housing ramp (see Figure 6.5).


5. Wipe the O-ring with a lint-free towel or clean foam brush saturated with isopropyl alcohol.

6. Shake excess lubricant from the assembly. Immediately install (“pop”) the seal into the brake disc housing with a firm push of the installation tool. Figure 6.9.

7. Remove the installation tool.

8. Follow the same procedure to install the other half of the face seal assembly onto the wheel hub. Figure 6.10.

Check for Correct Installation of the Toric Ring Seal

Check the disc brake housing and wheel hub for correct installation of the duo-cone face seal before the hub can be installed onto the housing.

1. Check assembled height variation (A) in at least four places, 90 degrees apart, using a caliper, toolmaker’s rule, or other accurately calibrated measuring device. The difference in height around the ring must not be more than 0.5 mm (0.02 inch). Figure 6.11.
2. If required, adjust the seal standout height by using the following methods.

- **If the standout height cannot be brought into specification:** Remove the seal and repeat the installation procedure.

⚠️ **CAUTION**

*Push or pull the O-ring and face seal only. Do not push or pull directly on the seal ring. This can cause component damage.*

A. Use the installation tool to push down on the O-ring and face seal.

B. With your fingers, pull up uniformly on the O-ring and face seal.

⚠️ **CAUTION**

*Apply isopropyl alcohol to the O-ring. Check the retaining lip of the seal seating area for burrs or fins, which can cause a seal to leak. Damage to components can result.*

3. Apply isopropyl alcohol as a lubricant to the O-ring and place in the seating area. If installation does not appear smooth, flat and correct, remove the seal from the brake disc housing and repeat the process.

⚠️ **CAUTION**

*To prevent slippage of the O-ring, allow sufficient evaporation time for the assembly lubricant before proceeding with further assembly. Damage to components can result.*

4. Seat O-ring correctly. Once correctly in place, the O-ring must roll on ramp only. See **Figure 6.12** for examples of incorrect installation.

---

## Wheel Hub to Brake Disc Housing

**NOTE:** Complete the assembly of the wheel hub to the brake housing. Before installing the wheel hub onto the brake disc housing, however, keep the following points in mind to ensure correct sealing between the faces of the duo-cone seals:

1. Check both sealing faces carefully to make sure they are clean and free of any dirt, debris, lint, and even human hair.

⚠️ **CAUTION**

*Bring the housings together slowly. High impact can result in component damage. Remove protective pad from the spindle’s seal journal.*

2. Remove the protective pad from the spindle’s seal journal.

- When installing the hub onto the spindle, both seal housings must be aligned correctly.
- Slowly bring the two housings together as the spindle adjustment nut is tightened. See **Figure 6.13**.

---

![Figure 6.12](image1)

![Figure 6.13](image2)
Adjustment

Wheel Bearing Preload – Wheel End with Outer Bearing on Ring Gear Hub Journal (PRC 775, for example). For PRC 1756 W3H Instructions Refer To MM-9G.

NOTE: To adjust the wheel bearing preload, the bearings must be correctly seated and the rollers correctly aligned.

1. Install the wheel bearing adjusting nut. Tighten the nut to 400 lb-ft (542 N•m).

WARNING
Use a brass or leather mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

2. Rotate the hub in both directions. At the same time, tap the hub several times with a brass or plastic mallet.

3. Tighten the nut to 400 lb-ft (542 N•m) again.

4. Back off the nut approximately 1/4 turn to relieve the preload produced in Step 3.

5. Tighten the nut to 200 lb-ft (271 N•m).

NOTE: If you move the adjusting nut to align the lock plate mounting holes, tighten the nut. Do not loosen or back off the nut.

6. Install the lock plate.

WARNING
Take care when using Loctite® to avoid serious personal injury. Follow the manufacturer’s instructions to prevent irritation to the eyes and skin. If Loctite gets into your eyes, flush them with water for 15 minutes. Have your eyes checked by a doctor as soon as possible.

7. Install the lock plate mounting screws. Tighten the mounting screws to 20-30 lb-ft (27-41 N•m).

A. The new lock plate mounting screw threads come equipped with a pre-applied locking agent.

CAUTION
Do not apply lubricant to the O-ring. The O-ring can leak. Damage to components can result.

3. Apply a light coating of Dow Corning GN molybdenum assembly paste lubricant to the two mating surfaces of the face seal’s steel rings only. Do not allow this lubricant to contact the O-ring. The O-ring can leak.

Figure 6.13.

NOTE: If not previously removed, remove the protective cloth or pad from the spindle seal journal before installing the hub.

4. Install the hub with brake driver splines through the friction discs.

5. Install the outer bearing cone on the ring gear hub. Install the spindle nut on the spindle. Rotate the hub while tightening the nut as defined in wheel bearing adjustment procedure.
B. If you use the original lock plate mounting screws, apply two or three drops of Loctite 277 or equivalent to the internal threads of the ring gear hub.

8. Apply axle grease to the inner face of the sun gear thrust washer to help secure the washer to the nut.

9. Install the sun gear thrust washer so that the washer tangs engage the slots in the bearing adjusting nut.

10. Install the planetary sun gear and snap ring onto the axle shaft.

11. Install the axle shaft and sun gear assembly. For correct installation, the following situations must occur:

• The axle shaft contacts the differential side gear.
• The sun gear contacts the thrust washer.
• The thrust washer tangs are correctly installed in the bearing adjusting nut slots.

Wheel Bearing Preload – Wheel End with Outer Bearing on Spindle Journal (PRC 425, for example)

NOTE: To adjust the wheel bearing preload, verify that the bearings are seated and the rollers are aligned correctly.

1. Install the wheel bearing adjusting nut. Tighten the nut to 400 lb-ft (542 N•m).

WARNING

Use a brass or leather mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

2. Rotate the hub in both directions. At the same time, tap the hub several times with a brass or plastic mallet.

3. Tighten the nut to 400 lb-ft (542 N•m) again.

4. Back off the nut approximately 1/4 turn to relieve the preload produced in Step 3.

5. Tighten the nut to 200 lb-ft (271 N•m).
Section 6
Assembly

Fill Wet Brake Assembly with Required Coolant

After completing the wheel end assembly, fill the brakes with the required coolant as follows:

1. Fill the brakes with the specified coolant until the coolant flows from the outlet plug opening (see Figure 6.3) on the piston housing. See Section 9 for required coolant.
2. Fill planetary wheel end and axle housing with required lubricants according to vehicle manufacturer’s recommendations.
3. Attach forced coolant inlet and forced coolant outlet lines to the piston housing.
4. Reconnect electrical starting power to the engine. Place the transmission in neutral and start the engine. When the level in the reservoir goes down, add coolant to adjust the level to the specified position.
5. Check for leaks, bleed brake lines, and check for correct brake operation. Refer to “Remove Air from System (“Bleed” the Brakes).”

Adjust Brake with New Disc Pack

If adjuster screws were used to push the piston out of the piston housing, or the disc pack was replaced by a new disc pack, use the following procedure to adjust the brakes.

1. Ensure the three adjuster screws are installed in the piston housing and turn in halfway. Do not install jam nuts at this time. Figure 6.3.
2. Start the engine and remove the air from the hydraulic brake system (bleed the brakes).

CAUTION

Only install the specified petroleum-base brake actuation fluid. Do not install glycol-base automotive fluid. Damage to components can result.

3. If required, add brake actuation hydraulic fluid to bring it to the required level.
4. With the engine running, apply the brakes to build up hydraulic pressure in the brakes.

NOTE: Keep brakes applied until all three screws are adjusted.

5. With brake applied, turn the brake adjuster screws CLOCKWISE until they stop turning. The screws are now bottomed on the piston.
6. With the brakes still applied, turn each adjuster screw counter clockwise (back off the brake). See Table 3.
7. Matchmark each screw to the housing. Do not allow the screws to turn after marking.
8. Release the brakes.
9. Apply silicone sealant to the interface between the piston housing and each adjuster screw. Do not apply to the jam nuts.
10. Install the jam nuts onto the adjuster screws. Using a suitable wrench to prevent the screws from turning, tighten each jam nut to 25-35 lb-ft (34-47 N•m).

Table 3. Adjust Brake with New Disc Pack

<table>
<thead>
<tr>
<th>Number Of Friction Plates</th>
<th>Number Of Turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3/4</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1 1/4</td>
</tr>
</tbody>
</table>
Remove Air from the System ("Bleed" the Brakes)

**WARNING**
You must bleed the brakes to remove all air from the system when you loosen any brake system hydraulic connection. Air can prevent hydraulic pressure from applying the brakes correctly and can increase stopping distance. Serious personal injury and damage to components can result.

Use only the type of hydraulic fluid specified by the equipment manufacturer. Do not use or mix different types of hydraulic fluid. Using incorrect hydraulic fluid will damage the rubber parts of the brake. Loss of braking control, serious personal injury and damage to components can result.

**CAUTION**
Do not reuse hydraulic fluid or coolant. Used fluid can be contaminated and can cause incorrect operation. Damage to components can result.

Only install the specified petroleum-base brake actuation fluid. Do not install glycol-base automotive fluid. Damage to components can result.

**NOTE:** Always start at the point in the system that is farthest from the master cylinder and work back toward the master cylinder.

1. Put a clear tube on the bleeder screw. Submerge the opposite end of the tube into a clear container of the specified hydraulic fluid.
2. When you complete a wheel, go to the bleeder screw on the next closest wheel.
3. Use the following instructions to bleed the brakes.

Air/Hydraulic or Mechanical Actuator Systems

**NOTE:** Always start at the point in the system that is farthest from the master cylinder and work back toward the master cylinder.

1. Check that the master cylinder is filled to the correct level with hydraulic fluid specified by the component manufacturer. Keep the master cylinder filled when you bleed the brakes, so air does not enter the system through the master cylinder.
2. Apply the brake pedal.
3. Loosen the bleeder screw.
4. Tighten the bleeder screw before you release the brake pedal so that air does not enter the system.
5. Repeat until there are no air bubbles in the hydraulic fluid when you apply the brake pedal and loosen the bleeder screw.
6. Check for fluid leaks.
7. When you have finished bleeding the brakes, check that the master cylinder is filled to the correct level.

Full Hydraulic Systems

**NOTE:** Always start at the point in the system that is farthest from the master cylinder and work back toward the master cylinder.

1. Slowly apply low hydraulic pressure to the brake. Loosen the bleeder screw.
2. Continue to apply pressure until no air bubbles appear in the container of fluid.
3. Tighten the bleeder screw 15-20 lb-ft (20-27 N·m), then release the pressure to the brake.
4. Check for fluid leaks.
5. When you have finished bleeding the brakes, check that the master cylinder is filled to the correct level.
WARNING
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Coolant Change Intervals

WARNING
To avoid injury from the hydraulic fluid, allow the brakes to cool to ambient temperature (cool to the touch) before draining fluid. Wear protective gloves.

Use only the type of fluid specified by the equipment manufacturer. Do not use or mix different types of fluid. An incorrect fluid can damage the rubber parts of the assemblies, which could cause loss of braking and serious personal injury.

Do not reuse hydraulic fluid or coolant. Used fluid may be contaminated and can cause incorrect operation, which can result in serious personal injury and damage to components.

Hydraulic disc brake assemblies with forced cooling systems use a pump to move coolant in and out of the housings. Coolant is supplied from a reservoir. The movement of coolant removes heat from the discs. At specified times the coolant must be changed in the complete brake cooling system.

Change brake coolant at the following intervals:

- First Coolant Change: Change coolant after the first month or after the first 200-250 hours of operation, whichever comes first.
- Regular Periodic Maintenance: Change coolant every six months or every 3,000 hours of operation, whichever comes first.

Coolant Draining and Filling

Hub seals are used in each wheel end assembly to retain the TOU (tractor oil universal) fluid that cools the brake discs. Refer to Section 9 for fluid recommendations. At the specified intervals, change the coolant in each brake assembly. Use the following procedure:

1. Make sure the axle and brake assembly are in a level position.
2. Place a suitable container under the brake to catch the drained coolant.

CAUTION
Matchmark the brake disc adjuster screw position before loosening the jam nut. Hold the adjuster screw in place to prevent its movement. Loosening the jam nut may result in improperly adjusted brakes when the screw and jam nut are reinstalled. This can lead to uneven brake disc wear and accelerate brake disc wearout.

3. Matchmark the bottom adjuster screw to the brake piston housing. Figure 7.1. Reinstall the bottom adjuster screw to the same depth in the piston housing to ensure correct brake adjustment and even brake disc wear.

CAUTION
Hold adjuster screw in place. Do not allow adjuster screw to turn. If adjuster screw turns, damage to components can result.

4. Place a suitable wrench onto the bottom adjuster screw. Hold the screw in position to keep it from moving. With the screw held securely, turn the jam nut COUNTERCLOCKWISE to loosen.
5. Remove the bottom adjuster screw from the piston housing. Count the number of rotations required to remove the screw and record this number.

NOTE: Install the screw with the same number of turns used to remove it. Line it up with the matchmark line on the housing to bring the brake to the original adjustment.

6. Remove the recessed Allen-head magnetic drain plug directly below the adjusting screw opening. Allow the coolant to drain from the housing into the container.

7. Dispose of the used fluid in a manner according to state and/or federal (EPA) recommendations.

8. Clean the magnetic drain plug. Apply silicone sealant to the threads of the plug, install in the piston housing, and tighten to 25-35 lb-ft (34-47 N•m).

9. Clean the adjuster screw and then apply sealant to middle of screw threads. Install it in the piston housing as follows:
   A. Insert the screw in the housing.

   NOTE: Install the screw with the same number of turns used to remove it. Line it up with the matchmark line on the housing to bring the brake to the original adjustment position.

   B. Slowly rotate it CLOCKWISE the same number or turns used for removal.

10. Apply silicone sealant to the interface between the base of the adjuster screw and the housing. Install the jam nut lightly onto the screw.

   ! CAUTION
   Hold the adjuster screw in place. Do not allow the adjuster screw to turn. If the adjuster screw turns, damage to components can result.

11. Use a suitable wrench to prevent movement of the screw. Use a torque wrench to tighten the jam nut to 25-35 lb-ft (34-47 N•m).

12. Remove the hex-head air evacuation plug and the plug from the unused forced cooling outlet opening. Figure 7.1.

13. Fill the brake with the specified coolant until the coolant flows from the forced cooling outlet plug opening. Refer to Section 9.

14. Install the air evacuation plug and the forced cooling outlet plug in the housing, and tighten to 60-75 lb-ft (81-102 N•m).

15. Place the transmission in Neutral and start the engine. When the level in the reservoir goes down, add coolant to adjust the level to the specified position. Operate the brakes.

16. Check for leaks.

   ! CAUTION
   Do not use automotive (glycol-base) brake fluid in place of required petroleum-base brake actuation fluid, since this can result in seal damage (swelling).

17. Bleed the brakes and check for correct brake operation.
## Section 8
### Troubleshooting

### Brake Does Not Apply

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
</table>
| Low or no pressure to brake. | 1. Empty fluid reservoir.  
2. Damaged hydraulic system  
3. Leakage of brake actuation fluid. | 1. Fill reservoir to correct level with specified fluid.  
2. Repair the hydraulic system.  
3. Refer to “Brake Leaks Actuation Fluid” in this section. |

### Brake Does Not Release

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle does not move.</td>
<td>Damaged hydraulic system.</td>
<td>Repair hydraulic system.</td>
</tr>
</tbody>
</table>
| Brakes dragging. | 1. More than 1.1 bar (16 psi) pressure applied when brakes released.  
2. Damaged piston return spring assembly.  
3. Piston not returning.  
4. Wrong cooling and/or actuation fluid used.  
5. Parking brake not adjusted correctly. | 1. Repair hydraulic system so pressure is less than 1.1 bar (16 psi) when brakes released and while machine is operating in any mode.  
2. Repair or replace piston return spring assembly.  
3. Check piston seals for swelling or damage. Replace as necessary.  
4. Check piston seals for swelling or damage. Replace as necessary. Purge system and use specified fluid.  
5. Adjust parking brake. |

### Braking Performance

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
</table>
| Noticeable change or decrease in stopping performance. | 1. Inadequate actuation fluid supply to brakes.  
2. Inadequate pressure to apply brakes.  
3. Worn or damaged discs.  
4. Overheated seals and/or discs  
5. Dirty or contaminated cooling fluid. | 1. Replenish fluid in brake system. Check for leakage and correct cause.  
2. Check brake apply system. Check for leakage in brake system or brakes, and correct cause.  
3. Inspect and replace discs if necessary.  
**NOTE:** As disc wear occurs, make sure brake system can supply adequate fluid to fully apply brakes.  
4. Inspect and replace discs and seals if necessary.  
5. Drain and flush cooling fluid from brakes and entire brake system. Replace with approved fluid. In some cases, it may be necessary to replace discs. Clean or replace filter. |
| Brake does not fully apply. | 1. Empty fluid reservoir.  
2. Damaged hydraulic system.  
3. Leakage of brake actuation fluid. | 1. Fill reservoir to correct level with specified fluid.  
2. Repair hydraulic system.  
3. Refer to “Brake Leaks Actuation Fluid” in this section. |
| Brakes feel spongy/soft. | Brakes or brake system not correctly bled. | Bleed brakes and brake system. |
## Brake Leaks Actuation Fluid

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal leak: Fluid bypasses seals into axle and fills axle with fluid and blows out breather or empties brake fluid reservoir.</td>
<td>1. Worn or damaged piston seal. 2. Melted or extruded piston seals. 3. Corrosion, pitting, wear or other damage, marks, scratches to piston and/or brake housing bore in area of seal/sealing lips. 4. Incorrect brake actuation fluid.</td>
<td>1. Replace piston seals. 2. Correct cause of overheating and replace seals. 3. Clean, smooth, rework or replace affected parts. 4. Check piston seals for swelling or damage. Replace as necessary. Purge system and use specified fluid.</td>
</tr>
</tbody>
</table>

| External leak | 1. Loose bleeder screw. 2. Loose inlet fitting or plugs 3. Damaged inlet fitting or plugs or damaged seats | 1. Tighten bleeder screw to 20-27 N•m (15-20 lb-ft). 2. Tighten inlet fitting to 34-47 N•m (25-35 lb-ft). 3. Replace inlet fitting or plug and O-ring if used. Repair or resurface area; or replace as necessary. |

## Brake Cooling Fluid Leakage

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant leaking out of brake housing.</td>
<td>1. Face seal damaged, worn or incorrectly installed. 2. Loose drain plug, fill plug, or forced cooling plug. 3. Damaged plug. 4. Deteriorated or inadequate sealant used at joint. 5. Maximum brake cavity pressure exceeded.</td>
<td>1. Reinstall and/or replace face seal. 2. Tighten plug. 3. Replace plug and O-ring, if used. 4. Disassemble, clean, re-seal and reassemble joint. 5. Check to make sure maximum brake cavity pressure is: • Normal operation 15 psi (1 bar) • Infrequent spikes limited to 20 psi (1.4 bar)</td>
</tr>
</tbody>
</table>

| Axle housing filling with oil (forced cooling systems only) and may be forced out the breather. | 1. Worn or damaged spindle to hub seal. 2. Brush hair lodged in grease under hub-to-spindle seal lip. 3. Maximum brake cavity pressure exceeded. | 1. Replace spindle to hub seal and check seal journals. 2. Do not use brush to apply grease to seal areas. 3. Check to make sure maximum brake cavity pressure is: • Normal operation 15 psi (1 bar) • Infrequent spikes limited to 20 psi (1.4 bar) |

## Brake Noise and Vibration

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brakes produce noise, chatter, vibration</td>
<td>Incorrect axle fluid and/or friction material used.</td>
<td>1. Use only Meritor specified or approved materials. 2. Drain and flush fluid from axle. Replace with approved fluid. 3. Replace all friction discs. Thoroughly clean or replace stationary discs.</td>
</tr>
</tbody>
</table>
# Section 8
## Troubleshooting

### Brake Overheats

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Causes</th>
<th>Correction</th>
</tr>
</thead>
</table>
| Overheating due to excessive duty cycle.       | Inadequate coolant flow or heat exchange.                                        | 1. Install brake cooling system if not already installed on vehicle.  
2. Re-analyze and re-size brake cooling system if necessary. |
| Inadequate coolant flow.                       | Low pump output, blocked filter or coolant lines.                                | Check pump output at different operating modes. Replace filter and check lines.                  |
| Low or no coolant                              | 1. Incorrect fill or leaks                                                      | 1. Replace or reinstall face seal assembly.                                                     |
|                                                | 2. Leaking face seal.                                                           | 2. Replace or reinstall face seal assembly.                                                     |
|                                                | 3. Loose or damaged plugs.                                                     | 3. Tighten drain, fill or forced cooling plug. Replace if damaged.                              |
|                                                | 4. Deteriorated or inadequate sealant used at joint.                           | 4. Disassemble, clean, re-seal and re-assemble brake housing joint.                              |
| Brake drags.                                   | 1. More than 1.1 bar (16 psi) pressure applies when brakes released.           | 1. Repair hydraulic system so pressure is less than 1.1 bar (16 psi) when brakes released and while machine is operating in any mode. |
|                                                | 2. Damaged piston return spring assembly.                                      | 2. Repair or replace piston return spring assembly.                                             |
|                                                | 3. Piston not returning.                                                       | 3. Check piston seals for swelling or damage. Replace as required.                              |
|                                                | 4. Wrong cooling and/or actuation fluid                                        | 4. Check piston seals for swelling or damage. Replace as required. Purge system and use correct fluid. |
|                                                | 5. Tight or damaged splines (eg., friction disc-to-hub driver.)                | 5. Repair or replace parts.                                                                    |
Plug and Screw Torque on Brake Piston Housing (PRC 425 and PRC 775)

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plug, Magnetic Drain (1)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>2</td>
<td>Adjuster Screw with Jam Nut (3)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>3</td>
<td>Plug, Actuation Fluid Inlet (2)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>4</td>
<td>Plug, Forced Cooling Outlet (2)</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
<tr>
<td>5</td>
<td>Screw, Actuation Fluid Bleeder (1)</td>
<td>15-20 lb-ft (20-27 N•m)</td>
</tr>
<tr>
<td>6</td>
<td>Plug, Forced Cooling Inlet 1</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
<tr>
<td>7</td>
<td>Plug, Air Evacuation (1)</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
<tr>
<td>8</td>
<td>Capscrew, Brake Piston Housing to Disc Housing (16)</td>
<td>Initial: 150 lb-ft (203 N•m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final: 200-258 lb-ft (270-350 N•m)</td>
</tr>
</tbody>
</table>
W3H Wheel End Torque Chart for the PRC 775

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wheel rim nut</td>
<td>Per OEM specification</td>
</tr>
<tr>
<td>2</td>
<td>Lock plate screw</td>
<td>20-30 lb-ft (27-41 N•m)</td>
</tr>
<tr>
<td>3</td>
<td>Wheel bearing adjusting nut</td>
<td>Initial = 400 lb-ft (542 N•m)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final = 200 lb-ft (271 N•m)*</td>
</tr>
<tr>
<td>4</td>
<td>Spindle and wet disc brake mounting</td>
<td>370-480 lb-ft (500-650 N•m)</td>
</tr>
<tr>
<td>5</td>
<td>Brake housing capscrews</td>
<td>200-258 lb-ft (270-350 N•m)</td>
</tr>
<tr>
<td>6</td>
<td>Oil fill/drain plug</td>
<td>35 lb-ft (47 N•m)</td>
</tr>
<tr>
<td>7</td>
<td>Piston return spring shoulder bolts</td>
<td>22-30 lb-ft (30-40 N•m)</td>
</tr>
<tr>
<td>8</td>
<td>Actuation fluid inlet fitting</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
</tbody>
</table>

*Refer to instructions in Section 5 of Maintenance Manual 9K.
## W3H Wheel End Torque Chart for the PRC 425

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wheel rim nut</td>
<td>Per OEM specification</td>
</tr>
<tr>
<td>2</td>
<td>Spindle and wet disc brake housing mounting</td>
<td>370-480 lb-ft (500-650 N•m)</td>
</tr>
<tr>
<td>3</td>
<td>Wheel bearing adjusting nut</td>
<td>Initial = 400 lb-ft (542 N•m)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final = 200 lb-ft (271 N•m)*</td>
</tr>
<tr>
<td>4</td>
<td>Brake housing capscrews</td>
<td>200-258 lb-ft (270-350 N•m)</td>
</tr>
<tr>
<td>5</td>
<td>Pinion shaft setscrew</td>
<td>35 lb-ft (47 N•m)</td>
</tr>
<tr>
<td>6</td>
<td>Oil fill/drain plug (not shown)</td>
<td>35 lb-ft (47 N•m)</td>
</tr>
<tr>
<td>7</td>
<td>Piston return spring shoulder bolts</td>
<td>22-30 lb-ft (30-40 N•m)</td>
</tr>
<tr>
<td>8</td>
<td>Actuation fluid inlet fitting</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
</tbody>
</table>

*Refer to instructions in Section 3 of Maintenance Manual 9K.
**W3H Wheel End Torque Chart for the PRC 1756 W3H**

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wheel Rim Nut (Not Shown)</td>
<td>Per OEM Specification</td>
</tr>
<tr>
<td>2</td>
<td>Wheel bearing adjusting nut</td>
<td>Initial - 400 lb-ft (542 N•m)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final = 200 lb-ft (271 N•m)*</td>
</tr>
<tr>
<td>3</td>
<td>Wheel bearing nut lock screw (Not Shown)</td>
<td>20-30 lb-ft (27-41 N•m)</td>
</tr>
<tr>
<td>4</td>
<td>Spindle and wet disk brake mounting</td>
<td>625-810 lb-ft (850-1100 N•m)</td>
</tr>
<tr>
<td>5</td>
<td>Oil fill/drain plug (Not Shown)</td>
<td>35 lb-ft (30-40 N•m)</td>
</tr>
<tr>
<td>6</td>
<td>Brake housing to piston housing screw</td>
<td>200-258 lb-ft (270-350 N•m)</td>
</tr>
<tr>
<td>7</td>
<td>Piston return spring screw (Not Shown)</td>
<td>22-30 lb-ft (34-37 N•m)</td>
</tr>
<tr>
<td>8</td>
<td>Capscrew, driver to hub</td>
<td>200-258 lb-ft (270-350 N•m)</td>
</tr>
<tr>
<td>9</td>
<td>Brake bleeder screw</td>
<td>15-20 lb-ft (20-27 N•m)</td>
</tr>
<tr>
<td>10</td>
<td>Cooling inlet plug</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
</tbody>
</table>

*Refer to instructions in Section 3 of Maintenance Manual 9G.*
# W3H Wheel End Torque Chart for the PRC 1756 W3H (Continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plug, coolant drain</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>2</td>
<td>Brake bleeder screw</td>
<td>15-20 lb-ft (20-27 N•m)</td>
</tr>
<tr>
<td>3</td>
<td>Plug, air evacuation bleeder – forced cooling</td>
<td>15-20 lb-ft (20-27 N•m)</td>
</tr>
<tr>
<td>4</td>
<td>Optional brake inlet plug (service brake actuation)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>5</td>
<td>Brake inlet fitting (service brake actuation)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
<tr>
<td>6</td>
<td>Plug, forced cooling inlet</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
<tr>
<td>7</td>
<td>Plug, forced cooling outlet (not shown)</td>
<td>60-75 lb-ft (81-102 N•m)</td>
</tr>
<tr>
<td>8</td>
<td>Brake adjuster screw jam nut (3 places)</td>
<td>25-35 lb-ft (34-47 N•m)</td>
</tr>
</tbody>
</table>
Section 9
Specifications

Minimum Brake Disc Thickness

<table>
<thead>
<tr>
<th>Disc Type</th>
<th>Part Number</th>
<th>Minimum Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friction</td>
<td>A-3281-Z-1196</td>
<td>0.192 Inch (4.87 mm)</td>
</tr>
<tr>
<td>Stationary</td>
<td>3281-F-1203</td>
<td>0.167 Inch (4.25 mm)</td>
</tr>
</tbody>
</table>

Hydraulic Fluid for Brake Actuation*

**CAUTION**

*Do not use automotive (glycol-base) brake fluid in place of required petroleum-base brake actuation fluid, since this can result in seal damage (swelling).*

<table>
<thead>
<tr>
<th>Component</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Base Hydraulic Fluid (Mineral Oil)</td>
<td>Meets MIL-H-5606 specifications</td>
</tr>
</tbody>
</table>

*See fluid and specification recommendations of equipment manufacturer.

Brake Coolant Specifications: Sump and Forced Cooling Systems with Hub Seals

<table>
<thead>
<tr>
<th>Coolant</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Base SAE 10W, SAE 20W or SAE 10W30</td>
<td>See the recommendations of the vehicle manufacturer.</td>
</tr>
</tbody>
</table>

**CAUTION**

*The operating temperature of the coolant must never reach or exceed 250°F (120°C). If the operating temperature of the coolant reaches or exceeds 250°F (120°C), the internal components of the brake will be damaged. A forced cooling system may be required to assure the coolant temperature remains below 250°F (120°C).*

Tractor oil universal fluid, “TOU” types formulated for wet disc brakes is recommended for use in the wet disc brake housing. Make sure that the specifications of the tractor fluid are the same as the recommended specifications of the vehicle manufacturer.

Coolant Change Intervals

<table>
<thead>
<tr>
<th>Break-In Interval:</th>
<th>Change the fluid in the brake housing after the first month or the first 200-250 hours of operation, whichever comes first.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Maintenance Interval:</td>
<td>Change the fluid every 6 months or every 3000 hours of operation, whichever comes first.</td>
</tr>
</tbody>
</table>

Hydraulic Fluid Specifications

Use only the brake hydraulic fluid specified by the manufacturer of the vehicle. Do not use different hydraulic fluids. The wrong fluid will damage the seals on the piston.