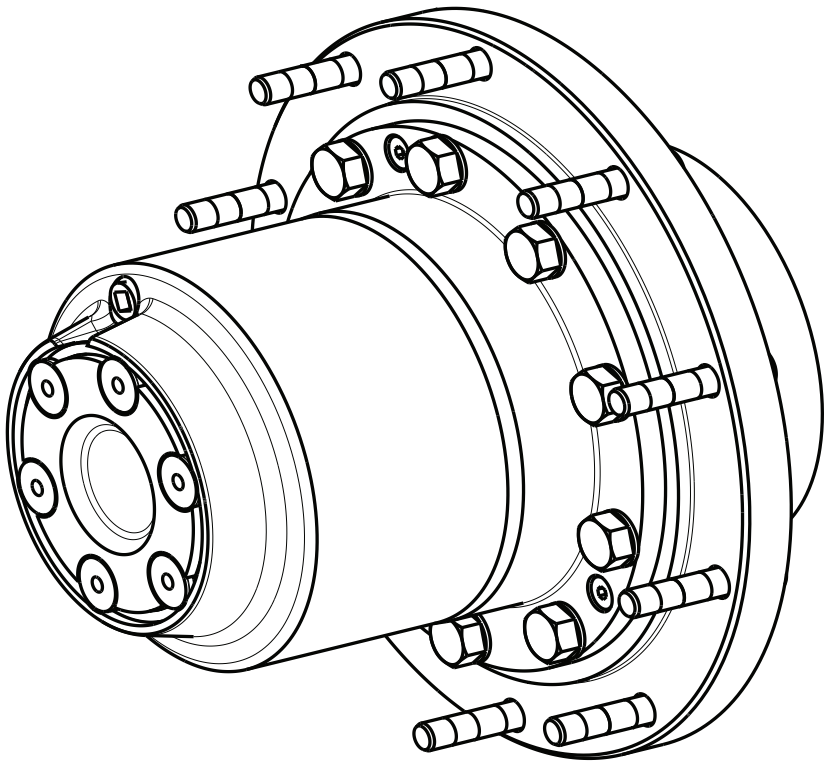
PRC & PRLC PLANETARY WHEEL ENDS



PRC485Q

PRC485W3H

PRC785P

PRC785Q

PRC785W3H

PRLC1015HDB

MM-20157 / Issued Feb 2021

About This Manual

This manual provides service and repair procedures for Meritor PRC & PRLC Planetary Wheel Ends.

How to Obtain Additional Maintenance and Service Information

Visit Literature on Demand at meritor.com to access and order additional information. Additional information is also available at meritorbullpen.com.

Contact the OnTrac™ Customer Call Center at 866-668-7221 (United States and Canada); 001-800-889-1834 (Mexico); or email OnTrac@meritor.com.

If Parts, Tools, and Supplies are Specified in this Manual

Contact Meritor's Commercial Vehicle Aftermarket at 888-725-9355.

For assistance with parts, you may also contact the Meritor Parts Center in Florence, KY at CustCareCntr.Florence@Meritor.com or 859-525-3500.

Table of Contents

Safety Information

Before You Begin Service Procedures

1. Read and understand all instructions and procedures before you begin to service components.
2. Read and observe all hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.
3. Follow your company's maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Hazard Alert Messages

Read and observe all hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠ DANGER

Indicates imminent danger. Failure to follow this instruction will result in death or serious injury.

⚠ WARNING

Indicates a possibly impending danger. Failure to follow this instruction can result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation or unsafe practice which, if not avoided, could result in injury or damage to components.

General Assembly Instructions

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use a jack stand can result in serious personal injury and damage to components.

⚠ DANGER

Take care when using lifting devices during service and maintenance procedures to avoid serious personal injury and damage to components. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading.

⚠ DANGER

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

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

1. Meritor recommends performing a visual system check of the following every 3,107 miles (5 000 km):
   - Housing leakage
   - Air connection
   - Oil connection
   - Functionality of the differential system (e.g. control switch)
   - Housing breather system (clean the breather, if contaminated)
   - Suspension of transfer case
2. If the transfer case is stored, follow the storing instructions provided in this publication.

3. During electrical welding work, ensure there is NO current flowing through the transfer case. Do not connect ground wires to the transfer case under any circumstances.

4. If you have any reason to suspect a transfer case failure (including unusual noise or vibration), safely stop the vehicle on a flat surface and block the wheels to prevent the vehicle from moving. The powertrain components must be checked and maintained/repaired by authorized and qualified personnel, if necessary. Operating the vehicle again without diagnosing and correcting the problem is prohibited.

5. Damage and any resulting consequences caused by improperly or unprofessionally performed maintenance through untrained personnel are excluded from any contractual liability and from warranty coverage.

6. In the case of technical failures, the customer must provide the unit serial number as shown on the identification tag.

7. Although Meritor does not recommend its use in transfer cases, if a formed-in-place gasket is used for repairs, extreme caution must be exercised to prevent the compound from entering the bearings and oil passages. All beads must be kept smaller than 1/8" in diameter.

⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

8. All used oil seals must be replaced and the new oil seals should be coated with Loctite 601 or equivalent on their outer diameter prior to being installed in their bores. The sealing lips should be coated with Lubriplate or the equivalent to provide initial lubrication.

9. Unless otherwise specified, any external capscrew, not installed in a blind hole, should have its threads coated with Permatex Form-A-Gasket #2 or an equivalent non-hardening sealer to prevent an oil leak.

10. All threaded fasteners should be tightened to the torque specified in the torque chart.

11. Any sharp edges on the seal diameter of the universal joint yoke or companion flanges should be removed with emery cloth and should be coated with Lubriplate or the equivalent on the seal operating area prior to installation.

12. In many of the procedures, when a part is assembled with a press fit, it is recommended that the part be heated prior to installation. The part should be placed in an oven and heated to no more than 300°F. Excessive heat may change the metallurgical properties of the part. Heated components should be allowed to cool to room temperature before end-float measurements are made.

1 Safety Information

Personal Safety Instructions

1. Keep your hands away from all transfer case parts while the transfer case is operating.
   - During operation, there is the threat of pinching because of moving components and the turning of powertrain parts
   - During operation, there is the threat of pinching at the longitudinal adjustment system.
2. During operation, high temperatures of up to 266°F (130°C) may occur. Before working near the transfer case, ensure that all parts have cooled down to a safe temperature.
3. When changing the oil, do not hold or remove the drain plugs by hand; the outflow of oil may be very hot.
4. Avoid direct contact with all used agents and fluids. If any contamination happens, the affected areas (e.g. skin, eyes) have to be cleaned carefully and immediately. If necessary, consult a doctor for advice.
5. The valid safety regulation and legal directives must be obeyed to avoid personal injury and component damage during maintenance and repair work. Use personal protective equipment when working on the vehicle, the transfer case or its components.
6. Always ensure professional and clean working conditions. Components should always be cleaned before disassembling or maintenance.
7. Inspection and maintenance work is only allowed when the vehicle and engine are stopped.

Environmental Safety Instructions

1. If contamination occurs, all parts should be decontaminated as soon as possible using a suitable cleaning agent.
2. Follow the cleaning instructions as directed.
3. Several greases, oils, etc. are used for transfer case operation. Lubricant types are specified in the Lubrication section.
4. Please use environmentally safe practices when handling and disposing of all agents. Usually, the dealers are legally obligated to take back empty canisters and containers.
5. Only use washing bays with oil separators.
6. Store all agents according to the manufacturer's safety instructions.
7. If there is a loss of oil in the transfer case, the transfer case must not be operated until the reasons are found and repaired by authorized and qualified personnel.

⚠ ASBESTOS FIBERS 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.

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 asbestosis (a chronic lung disease) and cancer, principally 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 1.0 f/cc averaged over a 30-minute period. Scientists 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 vaccum to loosen any 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. Wipe 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 rags, 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. **Waste Disposal.** Dispose of discarded linings, used rags, cloths 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.

⚠ NON-ASBESTOS FIBERS WARNING

The following procedures for servicing brakes are recommended to reduce exposure to non-asbestos fiber dust, a 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, aramid fibers, ceramic fibers and silica that can present health risks if 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.
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 exposures 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 exposure levels may exceed OSHA or manufacturers' recommended maximum levels. Even when exposures are expected to be within 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 loosen 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. Wipe the brake parts clean with a cloth.
   c. If an enclosed vacuum system or brake washing equipment is not available, carefully clean the brake parts in the open air. Wet the parts with a solution applied with a pump-spray bottle that creates a fine mist. Use a solution containing water, and, if available, a biodegradable, non-phosphate, water-based detergent. The wheel hub and brake assembly components should be thoroughly wetted to suppress dust before the brake shoes or brake pads are removed. Wipe the brake parts clean with a cloth.
   d. Wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA 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 rags, wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA, to minimize exposure. 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. **Waste Disposal.** Dispose of discarded linings, used rags, cloths 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.

Introduction

Description

The PRC485Q (with Q Plus™ cam brakes) and PRC785P planetary axles incorporate a single reduction carrier/differential assembly with hypoid gearing. They are equipped with the RS-145 carrier series. The final reduction is of planetary spur designed gearing built into the wheel hubs. The axles have only cast housings.

These planetary axles permit the hypoid gearing of the carrier and the axle shafts to carry only a nominal torsional load. At the same time, they provide the highest practical numerical gear reduction at the wheels.

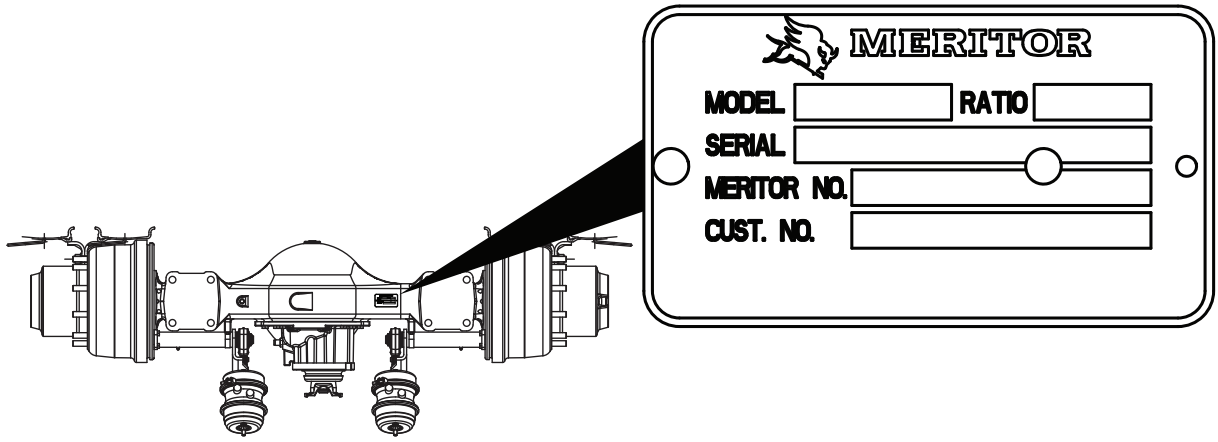
- The hypoid pinion and differential assembly of the first reduction is supported by tapered roller bearings.
- A hardened precision spacer between the inner and outer pinion bearings adjusts and maintains the pinion bearing preload.
- The positioning of the threaded adjusting rings in the carrier leg and cap bores adjusts and maintains the differential tapered bearing preload and sets ring & pinion backlash.
- The teeth of the floating sun gear mesh with the teeth of the planetary spur gears.
- The planetary gears rotate on planetary shafts that are mounted on a spider. The planetary gear teeth in turn mesh with the teeth of the floating ring gear.
- The hypoid gear set in the carrier transmits power to the axle shafts and the sun gear of the final reduction, through the revolving planetary gears, and into the planetary spider.
- The planetary wheel ends on the PRC485, PRC785, and PRLC1015 are serviced almost identically for cam, wet disc, or hydraulic disc brakes.

2 Introduction

Identification Tag

All products are identified by the model and serial number. This information is stamped on the identification tag and affixed to the case. Have reference numbers handy when ordering replacement parts or requesting service repairs.

DO NOT REMOVE OR DESTROY THE IDENTIFICATION TAG.



PRC485Q (with Q PLUS™ CAM BRAKES) 4018404a

Model Nomenclature

P R L C 175 6 RSA 208 XXX

Configuration
N - Non-Drive
P - Planetary

Type
R - Rigid
S - Steer
XR - XTL® Wheel End

Only If Applicable
L - Mounting Other Than Pad with Drilling
O - Oscillating or Pin Mount
T - Transmission on Carrier
V - Variable

Housing
A - Pot or Split Carrier
C - Integral Cast
S - Stamped

First Two or Three Digits
Wheel End Designation
(Basic Model Number)

Last Digit
Carrier Designation
(For Base Model Number)

Brakes
ADB - Air Disc
HDB - Hydraulic Disc
M - Mechanical Drum
N - None
NR - With Rotor Less Calipers
P/Q - S-Cam Drum Brake
RDA - Wedge Brake (Dual Air Chambers)
RDH - Wedge Brake (Dual Hydraulic Cylinders)
RSA - Wedge Brake (Single Air Chamber)
RSH - Wedge Brake (Single Hydraulic Cylinder)
W2H - Dura-Disc® 9" (229mm) Wet Disc
W3H - Dura-Disc® 13" (330mm & 360mm) Wet Disc
W4H - Dura-Disc® 17" (432mm) Wet Disc
W4M - Dura-Disc® 17" (432mm) Wet Disc SAHR
WDH330 - Dura-Disc® 13" (330mm) Wet Disc (Unit Mount)
WDH432 - Dura-Disc® 17" (432mm) Wet Disc (Unit Mount)
WDM - Dura-Disc® 17" (432mm) Wet Disc (Unit Mount) SAHR

Specification

Carrier Ratio

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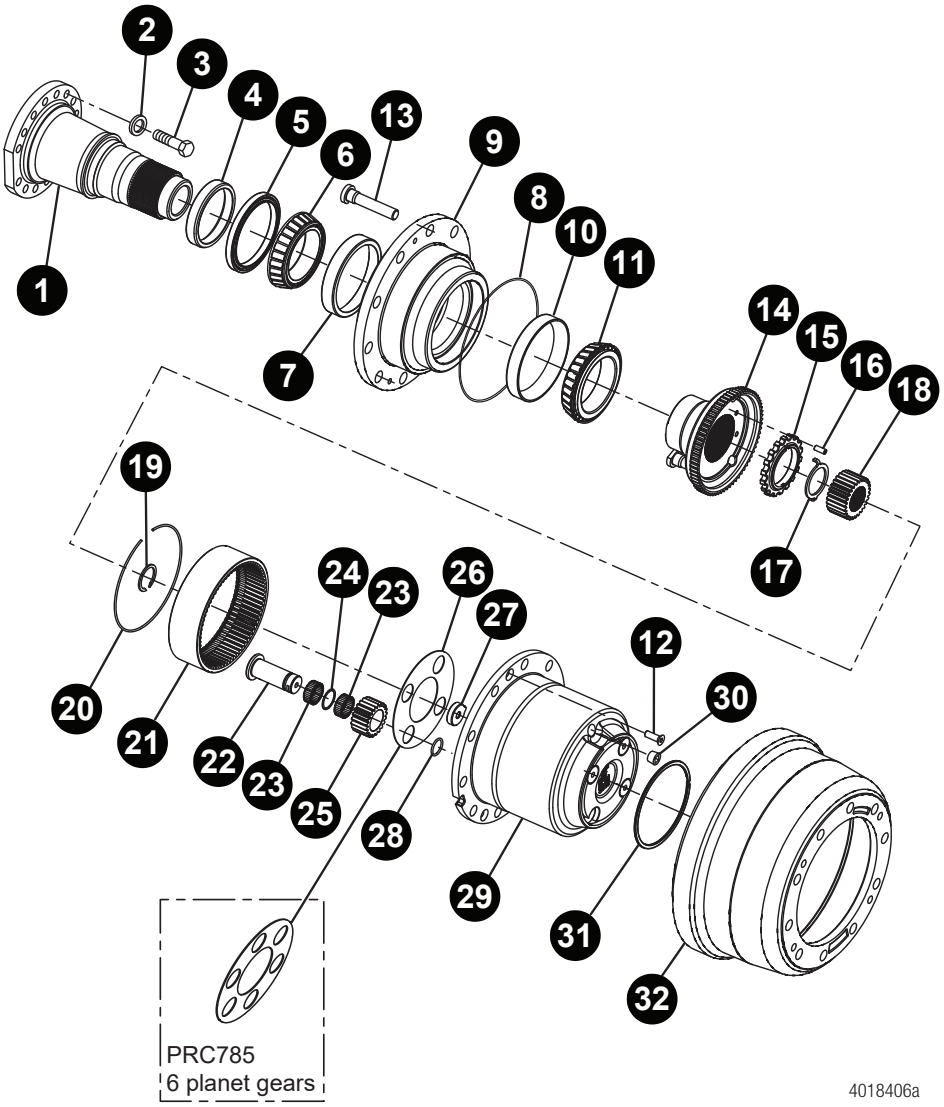
PRC485Q & PRC785Q with Q Plus Cam Brakes

Exploded View

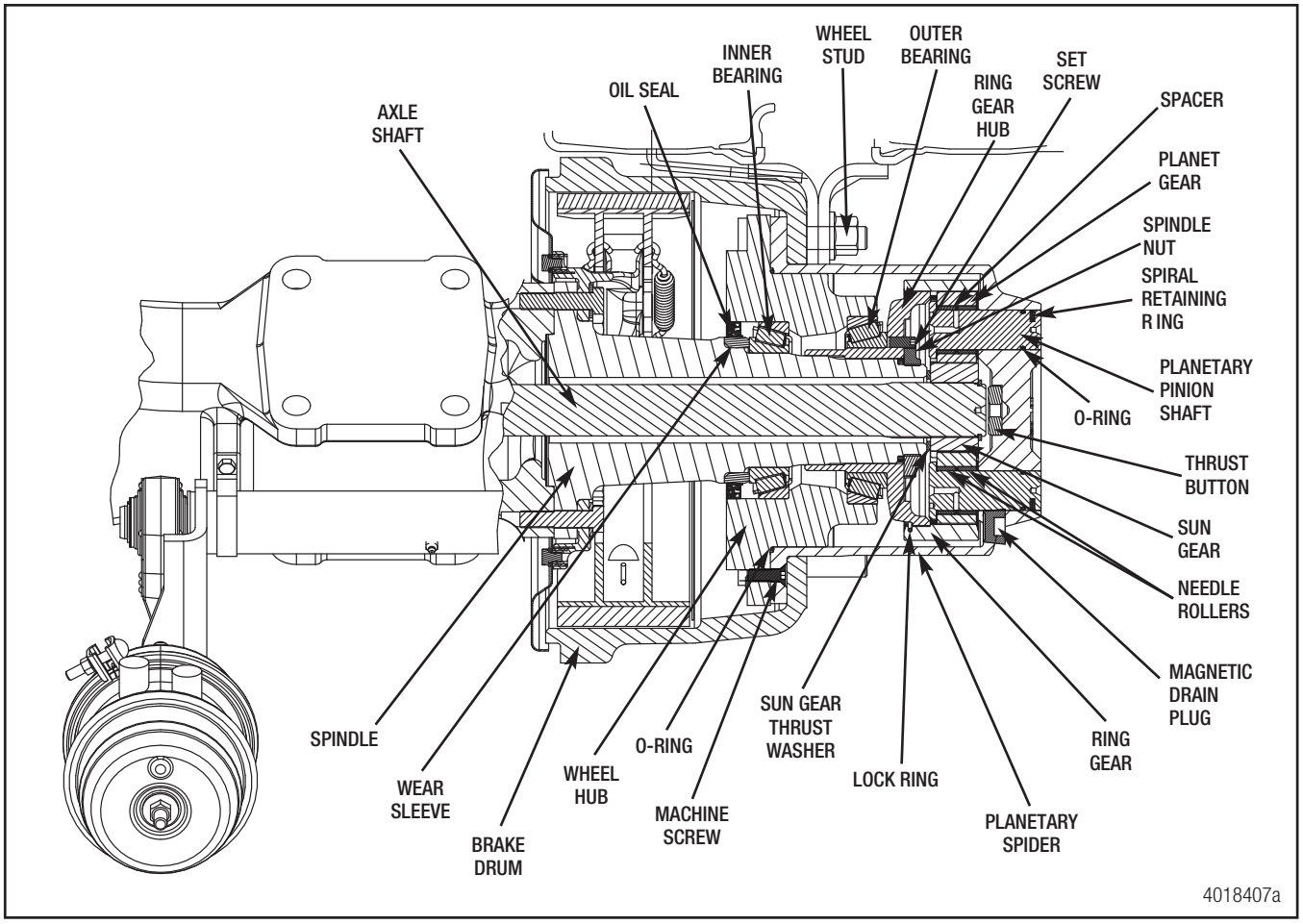


Item	Description
1	Spindle
2	Flat Washer
3	Capscrew
4	Wear Sleeve
5	Oil Seal Assembly
6	Inner Bearing Cone
7	Inner Bearing Cup
8	O-ring
9	Hub
10	Outer Bearing Cup
11	Outer Bearing Cone

Item	Description
12	Machine Screw
13	Wheel Stud
14	Ring Gear Hub
15	Spindle Nut
16	Set Screw
17	Sun Gear Thrust Washer
18	Planetary Sun Gear
19	Snap Ring
20	Lock Ring
21	Ring Gear
22	Pinion Shaft

Item	Description
23	Needle Rollers
24	Spacer
25	Planetary Pinion Gear
26	Thrust Washer
27	Thrust Button
28	O-ring
29	Planetary Spider
30	Magnetic Drain Plug
31	Spiral Retaining Ring
32	Brake Drum

Cross Section



Disassembly

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use a jack stand can result in serious personal injury and damage to components.

⚠ DANGER

Take care when using lifting devices during service and maintenance procedures to avoid serious personal injury and damage to components. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Brake Drum

1. Ensure 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 the wheels of the axle to be serviced are off the ground. Support the vehicle with safety stands. Refer to the vehicle 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. Remove the plug. Drain and discard the lubricant from both wheel ends.
6. If necessary, remove the magnetic drain plug from the bottom of the axle housing. Drain and discard the lubricant from the carrier center section.

⚠ WARNING

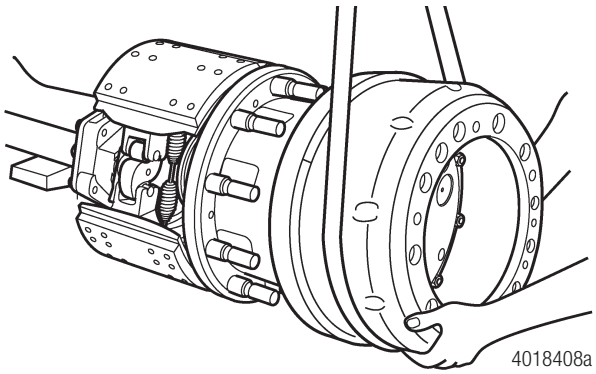
Before servicing a spring chamber, carefully follow the manufacturer's instructions to compress and lock the spring to completely release the brake. Verify no air pressure remains in the service chamber before proceeding. Sudden release of compressed air can cause serious personal injury and damage to components.

7. If the brake air chamber assembly has a spring chamber unit, carefully cage and lock the spring to prevent the spring from activating during disassembly.

NOTE: If automatic slack adjusters are used, refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual for the correct adjustment procedure.

8. Adjust the brake slack adjuster to retract the brake shoes to produce clearance between the lining and the brake drum.

9. Use a lifting device to support the brake drum.



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10. Install capscrews into the threaded holes in the brake drum. Gradually tighten the capscrews in equal amounts to push the drum off the pilot surface of the planetary spider.

11. With the lifting device, carefully remove the brake drum.

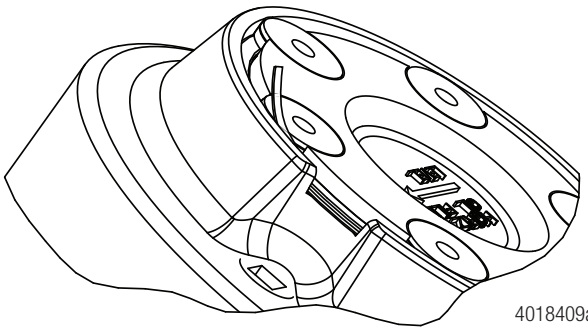
Planetary Spider Assembly

1. Remove the 3 slotted head machine screws attaching the planetary spider to the hub.

2. With a lifting device, remove the planetary spider assembly from the wheel hub and set it on a workbench. Rest the spider with the large flange ending up.

3. Mark the large ends of the planetary pinion shafts and the planetary spider to aid in reassembly if the original pinion shafts are used.

4. Place the planetary spider assembly on blocks with the large flange end facing DOWN. Remove the spiral retaining ring by lifting exposed ring end with a screw driver and spiraling ring out from slot in pins. If removal is not possible, the spiral retaining ring may be cut into sections.



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⚠ DANGER

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

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

⚠ 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.

5. Use a press to remove the pinion shafts out of the spider. If a press is not available, use a brass drift and mallet to drive out the shaft. Press or drive the pinion shaft out toward the large flange end of the spider which faces DOWN.

6. Remove the planetary pinions and the thrust washer from the planetary spider.

7. Remove axle-shaft thrust button only if worn.

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

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

9. Remove the sun gear thrust washer from the axle shaft or if necessary remove the sun gear thrust washer from the end of the spindle.

10. Remove the snap ring from the axle shaft to allow for the removal of the sun gear from the axle shaft.

11. Remove the lock ring.

12. Remove the ring gear.

13. Remove the set screw from the spindle nut.

14. Remove the spindle nut.

15. 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.

16. Remove the wheel hub. The hub oil seal and inner bearing assembly will remain in the hub.

⚠ 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.

17. Remove the hub oil seal.

18. Remove the inner bearing cone.

19. If replacement of the wheel bearings is necessary, press out the outer bearing cup and inner bearing cup.

20. Remove and discard the o-ring from the wheel hub.

Cam Brakes

To disassemble the PRC485Q (with Q Plus™ cam brakes), refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual.

If it is necessary to remove the anchor pins, remove the brake dust shields for convenient access to the anchor pins.

Spindle & Brake Spider

⚠ WARNING

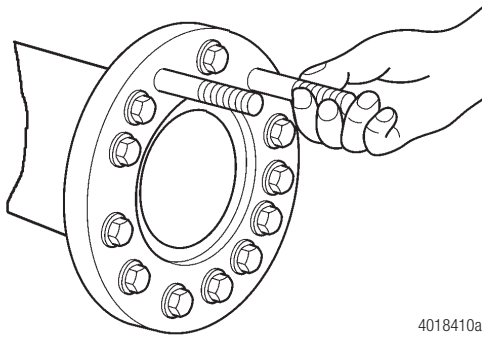
Removal of the capscrews allows the spindle and piston housing to separate. They can fall from the planetary axle housing and cause damage to components and serious personal injury.

1. To prevent the spindle and the brake spider from falling after all the mounting capscrews are removed, use one of the following procedures:

   a. Use a lifting device to support the spindle during disassembly.

   b. Remove only two capscrews. Replace them with two temporary M16 x 2.0 thread studs 4“ (102 mm) long before the remaining capscrews are removed.

   - Install one stud at the 11:00 position.
   - Install one stud at the 1:00 position.



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2. Remove the two capscrews and washers mounting the clamp around the brake camshaft housing tube to the axle housing.

3. Remove the capscrews and washers mounting the brake spider and spindle to the axle housing.

4. Remove the brake spider and air chamber assembly from the spindle.

5. Remove the spindle from the axle housing. If necessary, tap lightly on the spindle to loosen the pilot fit and to overcome the adhesion due to the cured gasket material in the flange joint.

6. Inspect the wear sleeve for damage and wear and remove it as necessary using heat.

Assembly

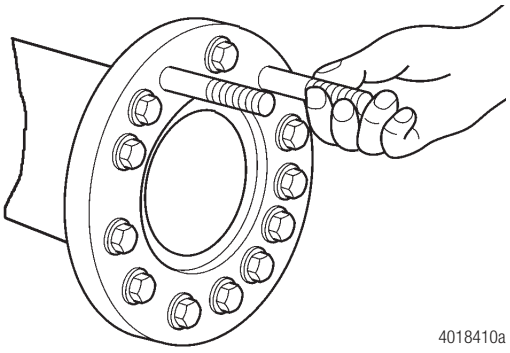
Follow all Service Notes and Safety Information found in the front of this manual.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

Spindle, Brake Spider, & Brake

1. Install two temporary studs (M16 - 2.0 threads, approximately 4" long) into the axle housing flange. Install the studs at the 11:00 and 1:00 positions.



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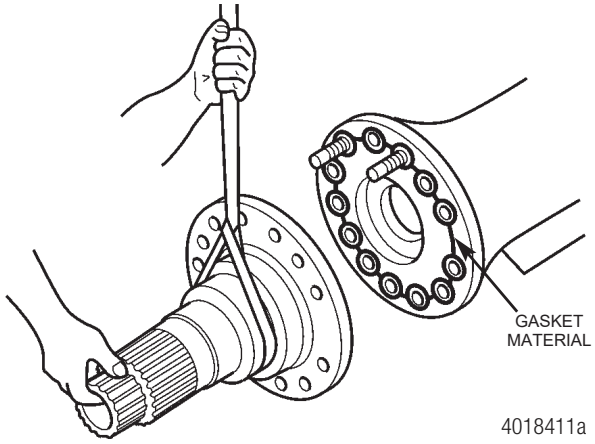
⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

2. If the wear sleeve was removed, reinstall by applying Loctite 518 to the spindle and then heating the sleeve to 300°F and placing it on the spindle.

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.



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4. Install the spindle onto the axle housing.

5. Install the brake spider onto the spindle.

6. Install and hand-tighten some of the spindle mounting capscrews and washers.

7. Remove the two temporary studs.

8. Install the remaining spindle mounting capscrews and washers. Tighten all capscrews to 200-260 lb-ft (270-350 Nm).

NOTE: Replace the camshaft bushing and grease seals before the camshaft bracket is installed onto the brake spider. Refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual.

9. Install the brake camshaft bracket with the o-ring on the pilot onto the brake spider.

10. Install the four mounting capscrews and washers. See "Torque Chart" on page 15.

NOTE: Refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual to install the brake camshaft, anchor pin components, brake shoes, brake springs, slack adjusters and related parts.

11. Install the brake camshaft bracket clamp around the bracket tube. Install the two capscrews and washers mounting the clamp to the axle housing. See "Torque Chart" on page 15.

12. Install the air chamber-to-bracket mounting nuts. See "Torque Chart" on page 15.

13. Attach the chamber push rod yoke to the slack adjuster. See "Torque Chart" on page 15.

14. Install the brake dust shield. Tighten the mounting capscrews and washers. See "Torque Chart" on page 15.

Wheel End

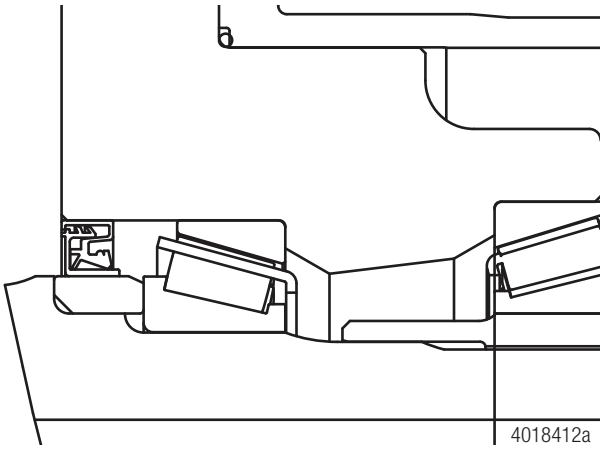
1. Press the new inner and outer bearing cups into the wheel hub using TC-79541 and TC-79540 drivers.
2. Position the wheel hub with the oil seal bore facing UP.
3. Apply axle gear lubricant to the bearing rollers and install the inner wheel bearing cone.

⚠ 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: Use a Permatex coating to seal against leaks around the hub oil seal. Leaks would result in requiring disassembly, should leak be noted after the final axle assembly.

4. Apply a light, uniform coating of Permatex to the wheel hub bore.
5. Use the hub seal driver TC-79542 to install the wheel hub oil seal. See the figure below for proper seal orientation. Press the seal into the hub until the seal face is flush with the hub face.



6. Apply a light film of axle lubricant to the hub oil seal rubber lips and wear sleeve contact surface and lead in chamfer.
7. Install the wheel hub, inner bearing, and oil seal assembly onto the spindle. Keep the hub assembly aligned with the spindle.
8. Apply axle lubricant to the outer bearing cone rollers. Install the outer bearing cone onto the ring gear hub.
9. Install the planetary ring gear onto the ring gear hub with lock ring.
10. Install ring gear hub/ring gear onto spindle.
11. Install the wheel bearing adjusting nut.

Adjust the Wheel Bearing Preload

NOTE: To adjust the wheel bearing preload, the bearings must be seated and the rollers in proper alignment.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

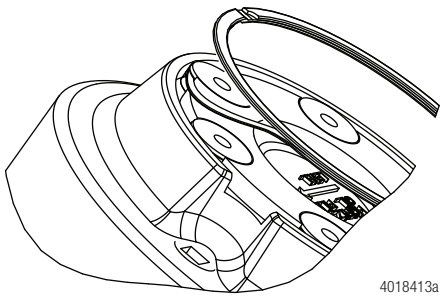
1. Install the wheel bearing adjusting nut. See “Torque Chart” on page 15.
2. Rotate the hub in both directions. At the same time, tap the hub several times with a brass or plastic mallet.
3. Tighten the nut using the “Spindle Nut Socket (TC-79534)” on page 44. Tighten further until one of the nut’s scallops lines-up with one of the threaded holes in the ring hub. See “Torque Chart” on page 15.
4. Back off the nut approximately 1/4 turn to relieve the preload produced in Step 3.
5. Install the set screw.
6. Tighten the set screw. See “Torque Chart” on page 15.
7. Apply a thin layer of axle grease to the face of the sun gear thrust washer.
8. Install the sun gear thrust washer. The washer tangs must engage the slots in the spindle nut.
9. Install the planetary sun gear and snap ring onto the axle shaft.
10. Install the axle shaft and sun gear assembly. For correct installation:
    - The axle shaft must make engagement with the differential side gear.
    - The sun gear must make contact with the thrust washer.
    - Ensure washer tangs are keyed into the spindle nut slots.
11. Install the o-ring on the wheel hub at the base of the flange.

Planetary Spider & Gearing Assembly

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

1. Apply adhesive material to the axle shaft thrust button shaft before placing it into the spider.
2. Ensure no adhesive will touch the o-ring or the internal surface of the spider holes.
3. Make the planet gear sub-assemblies:
   a. Put a planet shaft standing with the big shoulder flange down.
   b. Apply gear lubricant.
   c. Assemble on the planet shaft shoulder 33 needle rollers.
   d. Insert the planet gear on the planet shaft such as the rollers end up between the planet shaft OD and planet gear ID with the grooved face of planet gear down against shaft flange.
   e. Insert a spacer on top of the 1st set of 33 needle rollers.
   f. Add the 2nd set of 33 needle rollers.
4. Install the planet gears sub-assemblies into the planet spider.
5. Install the big thrust washer.
6. Install the corresponding o-rings into each planet gears subassembly.
7. Align the spider with the planet gears sub-assemblies and with the flange down.
8. Press the spider into the planet gears sub-assemblies until the planet gears sub-assemblies are flush with the end of the spider.
9. Install the spiral retaining ring by feeding one end of the ring into the slots in the planet pins.



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Final Assembly

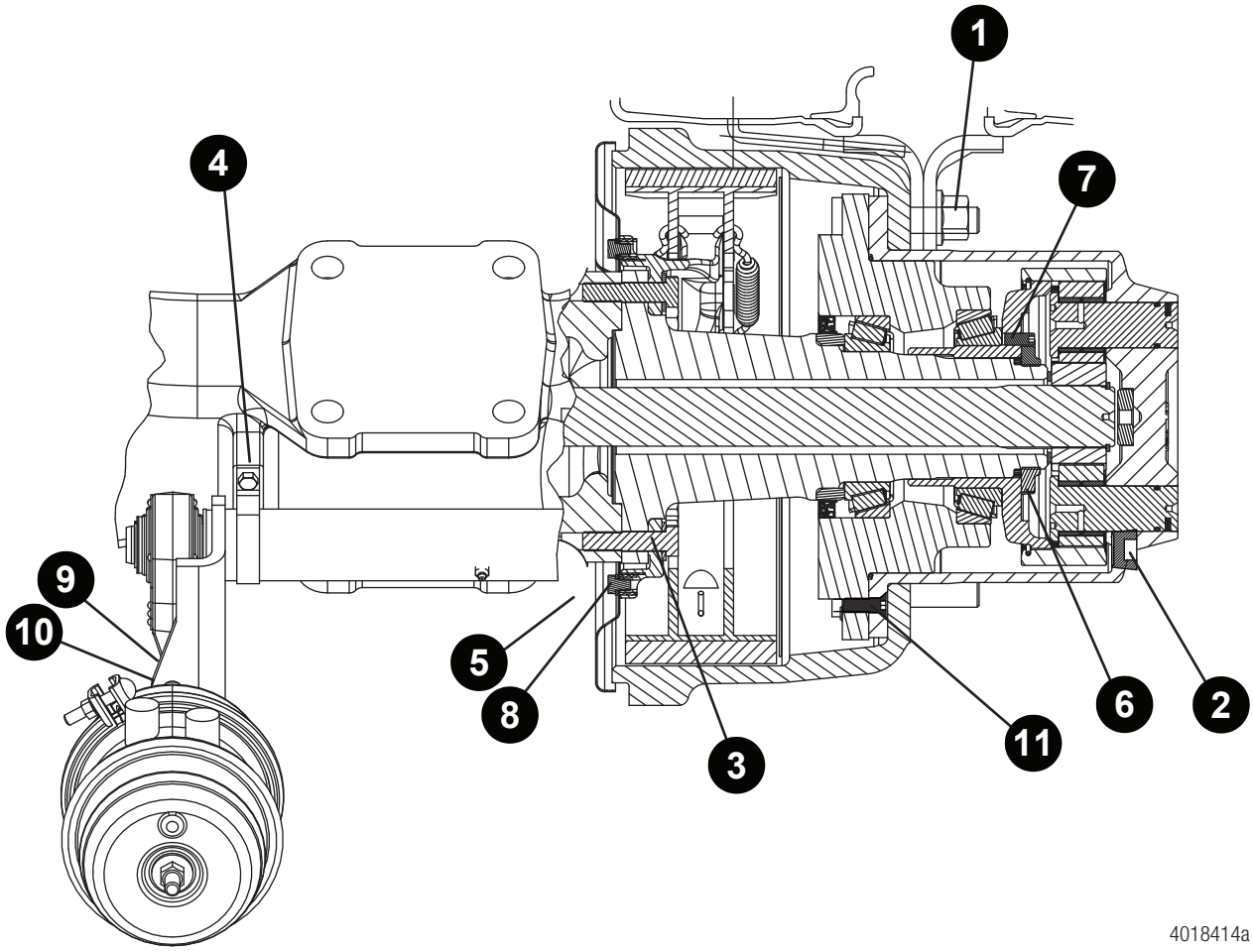
NOTE: For correct installation, the planetary pinions must engage both the sun gear and the ring gear before installation.

1. Install the planetary spider and gearing assembly onto the wheel hub.
2. Install the three slotted head machine screws attaching the planetary spider to the wheel hub. Tighten the screws, compressing o-ring until no gap exists between wheel hub flange and spider flange.
3. Install the brake drum over the wheel studs until the drum seats onto the planetary spider flange.
4. Mount the inner and outer wheels. Install the wheel nuts and tighten them to the vehicle manufacturer's specification.

NOTE: The PRC485Q (with Q Plus™ Cam Brakes) axle has a common oil level between the carrier and the wheel ends. Three locations must be filled. The vehicle must be on a level surface when filling. Fill to the bottom of each fill plughole. Wait and allow the oil to flow through the axle. Check the oil level again after several minutes and fill to the specified level if necessary.

5. Add the correct axle lubricant into each wheel end through the oil fill/level hole in the planetary spider at the horizontal position (3:00 or 9:00).
6. Add the correct lubricant to the axle housing bowl area.
7. Apply sealant to the threads of the oil fill/level plugs.
8. Install the oil fill/level plugs and tighten to 35 lb-ft (47 Nm).

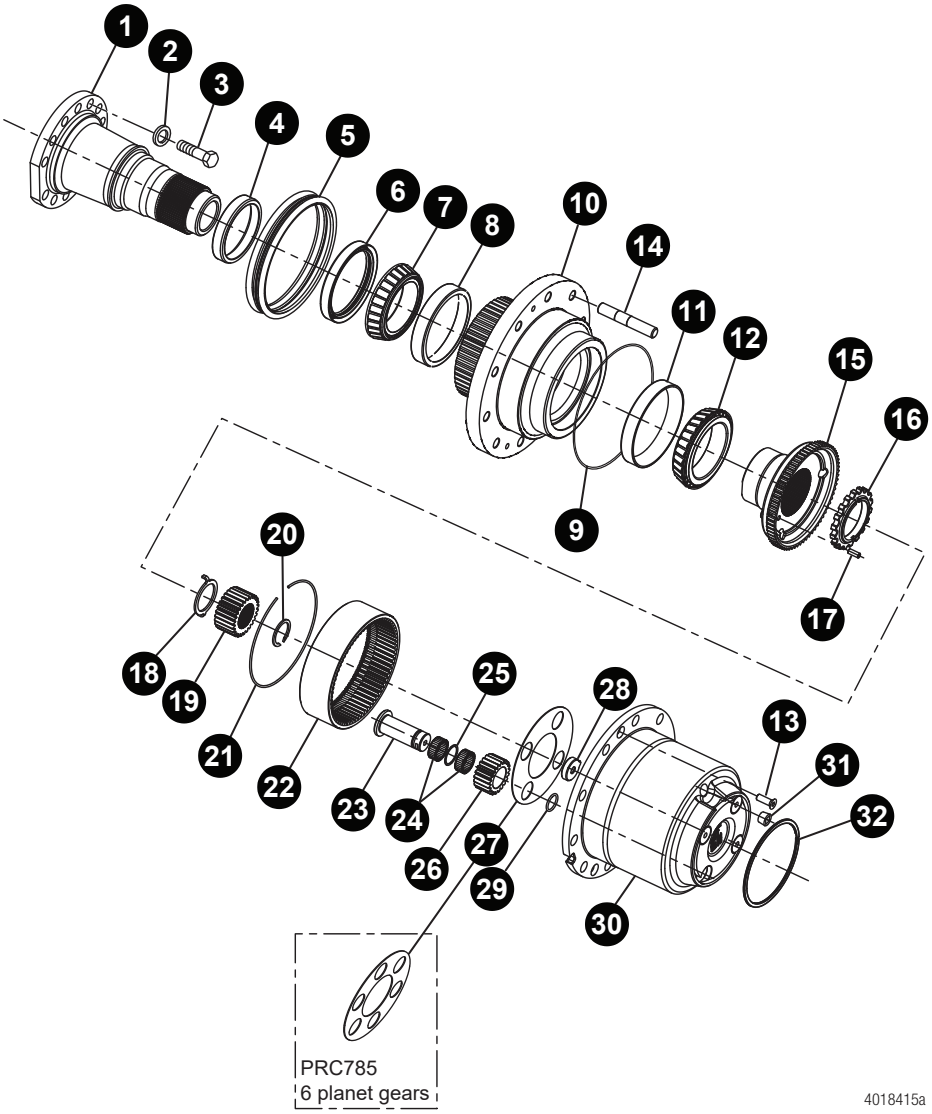
Torque Chart



Item	Fastener	Torque Value
1	Wheel rim nut	Per OEM specification
2	Oil fill / level / drain plug	35 lb-ft (47 Nm)
3	Spindle and brake spider mounting (drum)	200-260 lb-ft (270-350 Nm)
4	Camshaft bracket clamp	35-50 lb-ft (47-68 Nm)
5	Camshaft bracket to spider	90-120 lb-ft (122-163 Nm)
6	Wheel bearing adjusting nut	400 lb-ft (542 Nm)
7	Adjusting nut set screw	35 lb-ft (47 Nm)
8	Dust shield mounting 3/8”-16 Grade 8	30-50 lb-ft (41-68 Nm)
9	Air chamber mounting	133-155 lb-ft (180-210 Nm)
10	Push rod lock nut 5/8”-18	25-50 lb-ft (34-68 Nm)
11	Planetary spider-to-wheel hub slotted head screws	Refer to “Final Assembly” on page 14

PRC485W3H & PRC785W3H

Exploded View



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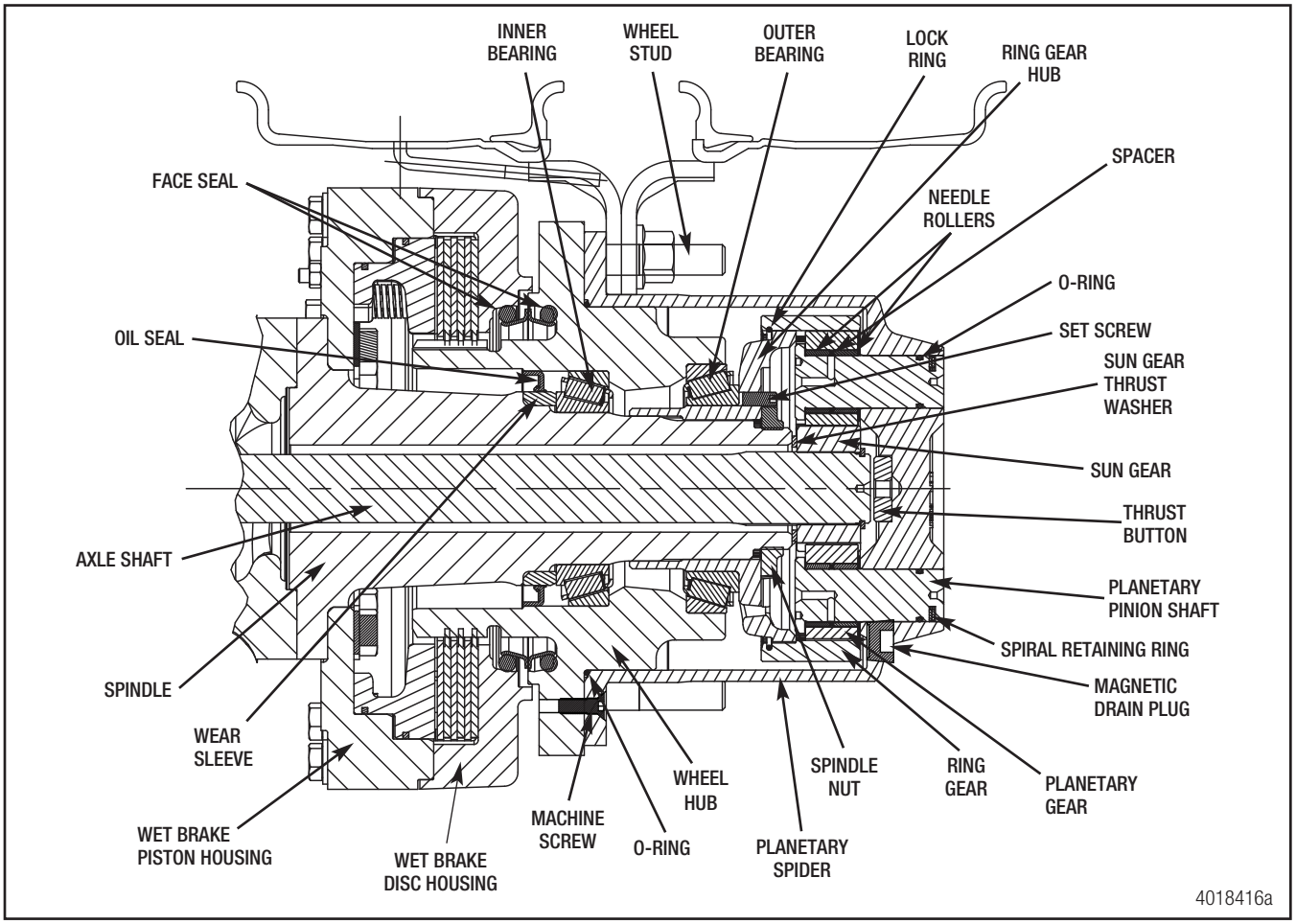
Item	Description
1	Spindle
2	Flat Washer
3	Capscrew
4	Wear Sleeve
5	TRS Face Seal Assembly
6	Oil Seal Assembly
7	Inner Bearing Cone
8	Inner Bearing Cup
9	O-ring
10	Hub
11	Outer Bearing Cup

Item	Description
12	Outer Bearing Cone
13	Machine Screw
14	Wheel Stud
15	Ring Gear Hub
16	Spindle Nut
17	Set Screw
18	Sun Gear Thrust Washer
19	Planetary Sun Gear
20	Snap Ring
21	Lock Ring
22	Ring Gear

Item	Description
23	Pinion Shaft
24	Needle Rollers
25	Spacer
26	Planetary Pinion Gear
27	Thrust Washer
28	Thrust Button
29	O-ring
30	Planetary Spider
31	Magnetic Drain Plug
32	Spiral Retaining Ring

Cross Section



Disassembly

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use a jack stand can result in serious personal injury and damage to components.

⚠ DANGER

Take care when using lifting devices during service and maintenance procedures to avoid serious personal injury and damage to components. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading.

⚠ WARNING

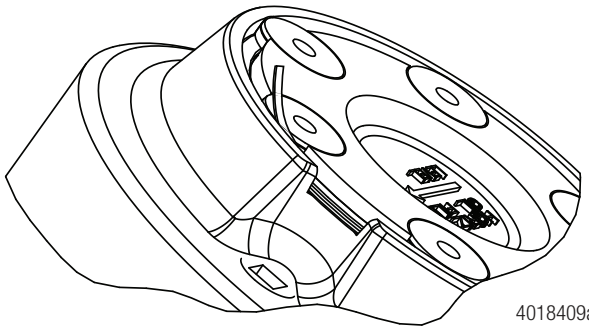
To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Preliminary Disassembly

1. Ensure 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 the wheels of the axle to be serviced are off the ground. Support the vehicle with safety stands. Refer to the vehicle 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. Remove the plug. Drain and discard the lubricant from both wheel ends.
6. If necessary, remove the magnetic drain plug from the bottom of the axle housing. Drain and discard the lubricant from the carrier center section.

Planetary Spider & Wheel Hub Disassembly

1. Remove the 3 slotted head machine screws attaching the planetary spider to the hub.
2. With a lifting device, remove the planetary spider assembly from the wheel hub and set it on a workbench. Rest the spider with the large flange ending up.
3. Mark the large ends of the planetary pinion shafts and the planetary spider to aid in reassembly if the original pinion shafts are used.
4. Place the planetary spider assembly on blocks with the large flange end facing DOWN. Remove the spiral retaining ring by lifting exposed ring end with a screw driver and spiraling ring out from slot in pins. If removal is not possible, the spiral retaining ring may be cut into sections.



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⚠ DANGER

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

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

⚠ 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.

5. Use a press to remove the pinion shafts out of the spider. If a press is not available, use a brass drift and mallet to drive out the shaft. Press or drive the pinion shaft out toward the large flange end of the spider which faces DOWN.
6. Remove the planetary pinions and the thrust washer from the planetary spider.
7. Remove axle-shaft thrust button only if worn.
8. Remove the axle shaft, planetary sun gear, and snap ring assembly.

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

9. Remove the sun gear thrust washer from the axle shaft or if necessary remove the sun gear thrust washer from the end of the spindle.
10. Remove the snap ring from the axle shaft to allow for the removal of the sun gear from the axle shaft.
11. Remove the lock ring.
12. Remove the ring gear.
13. Remove the set screw from the spindle nut.
14. Remove the spindle nut.
15. 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.
16. Remove the wheel hub. The hub oil seal and inner bearing assembly will remain in the hub.

⚠ 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.

17. Remove the hub oil seal.
18. Remove the inner bearing cone.
19. If replacement of the wheel bearings is necessary, press out the outer bearing cup and inner bearing cup.
20. Remove and discard the o-ring from the wheel hub.

Spindle & Wet Disc Brake Disassembly

Refer to BSM-0110 - W3H (360mm) Wet Disc Brake with Dowel Pins Service Manual.

⚠ CAUTION

Care should be taken to store the (2) halves of the face seal to protect them from damage and saved for reassembly later when required.

1. Remove the half TRS face seal from the hub.
2. Remove the remaining half of the face seal from the brake disc assembly.

NOTE: Place the face seals together and store in a safe package to prevent damage.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

3. Loosen sixteen M16 x 1.5 threaded capscrews. Hit the threaded capscrew heads with a mallet to separate the wet disc brake housing.
4. Remove all but two capscrews at the 11:00 and 1:00 positions.

⚠ CAUTION

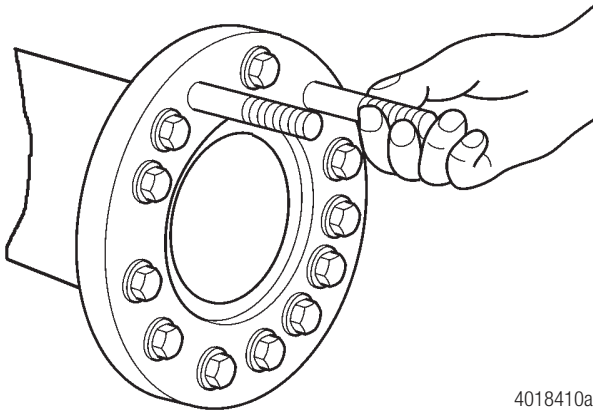
Do not reuse a damaged friction disc or stationary disc. Damage to components can result.
The friction discs and stationary discs are loose inside the brake housing assembly. Reach through the center of the brake housing and keep the discs from falling out.

5. Support the brake housing assembly. Remove the remaining capscrews.
6. Remove the brake housing assembly from the piston housing and set it on a table with the discs facing up to prevent the discs from falling out.
7. Remove the four shoulder bolts from the piston and piston housing.
8. Remove the washers and springs from the shoulder bolts. Push the piston from the piston housing. Use less than 20 psi (1.38 bar) air pressure. Insert three adjuster screws. Evenly turn the screws CLOCKWISE.

⚠ WARNING

Removal of the capscrews allows the spindle and piston housing to separate. They can fall from the planetary axle housing and cause damage to components and serious personal injury.

9. To prevent the spindle and piston housing from falling after all the mounting capscrews are removed, perform the following procedures:
   a. Use a lifting device to support the spindle during disassembly.
   b. Remove only two capscrews. Replace them with two temporary M20 x 2.5 thread studs 4” (102 mm) long before the remaining capscrews are removed.
   - Install one stud at the 11:00 position.
   - Install one stud at the 1:00 position.



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10. Remove the capscrews and washers securing the piston housing and spindle to the axle housing.
11. Remove the piston housing from the spindle.
12. Remove the spindle from the axle housing. If necessary, tap lightly on the spindle to loosen the pilot fit and to overcome the adhesion due to the cured gasket material in the flange joint.
13. Inspect the wear sleeve for damage and wear and remove it as necessary using heat.

Wet Disc Brakes

Refer to BSM-0110 - W3H (360mm) Wet Disc Brake with Dowel Pins Service Manual.

Assembly

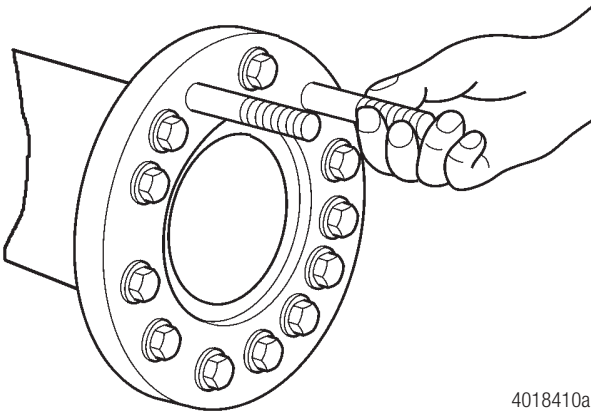
Follow all Service Notes and Safety Information found in the front of this manual.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

Spindle & Wet Disc Brake Assembly

1. Install two temporary studs (M20 x 2.5 threads, approximately 4" long) into the axle housing flange. Install the studs at the 11:00 and 1:00 positions.



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⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

2. If wear sleeve was removed, reinstall by applying Loctite 518 to the spindle and then heating the sleeve to 300°F and placing it on the spindle.

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

3. Clean and inspect the spindle and piston housing for damage. Apply a small, two millimeter bead of Q48 (Loctite 518) near the OD of the spindle flange and around each bolt hole, on both sides of the spindle flange.

4. Mount the spindle and piston housing (lug on TOP) onto the axle housing using thirteen M20 x 2.5 thread capscrews. Tighten the capscrews in an "X" torquing pattern to achieve 370-480 lb-ft (500-650 Nm).

5. Install 10 mm x 60 mm long assembly studs into the four M8 x 1.25 thread holes in the piston cover.

To assemble the wet disc brakes, refer to BSM-0110 - W3H (360mm) Wet Disc Brake with Dowel Pins Service Manual.

NOTE: To continue assembling the wet disc brake wheel end, continue with the following steps.

6. Clean and inspect the piston for damage, inspect the piston grooves to ensure no contaminants remain in the grooves.

7. Apply an oil lubricant to the "D" seals and assemble the "D" seals into the appropriate grooves in the piston.

8. 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.

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

9. Remove and store the four assembly studs.

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

11. Apply a small bead of Loctite 518 to the shoulder bolt threads and install into the piston and piston housing. Tighten to 22-30 lb-ft (30-40 Nm).

12. Clean and inspect the brake housing, stationary plates, and dowels for damage.

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

13. Place the brake housing on an assembly bench. Assemble the eight dowels into the slots in the brake housing.

⚠ CAUTION

Do not reuse a damaged friction disc or stationary disc. Damage to components can result.
The friction discs and stationary discs are loose inside the brake housing assembly. Reach through the center of the brake housing and keep the discs from falling out.

14. Line up all the friction disc splines and grooves in a stack so they can be assembled this way inside the brake housing.

15. 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.

16. Repeat these steps until completing the assembly stack of discs. Realign all the friction discs' splines and grooves.

17. Apply a small, continuous two millimeter bead of Loctite 518 onto the mounting face of the brake housing and around each bolt hole. Carefully lift the brake housing assembly (lug on TOP) and install it onto the piston housing already mounted on the axle.

18. Tighten sixteen M16 x 1.5 threaded capscrews in an "X" torquing pattern to achieve 200-258 lb-ft (270-350 Nm).

NOTE: Use isopropyl alcohol to lubricate the o-ring immediately before this installation of the face seal.

19. Refer to"Toric Ring Face Seal into Wheel Hub" on page 22 to install half of the TRS face seal into the brake housing by using tool TC-79461 to properly position the o-ring and steel ring assembly beyond the lip and into the tapered bore in the brake housing. See "Tools" on page 44.

20. Measure the height of the metal face above the housing to ensure the tolerance is within 1 mm variation.

Planetary Spider & Wheel Hub Assembly

1. Clean and inspect the hub.

2. Press the new inner and outer bearing cups into the wheel hub using TC-79541 and TC-79540 drivers.

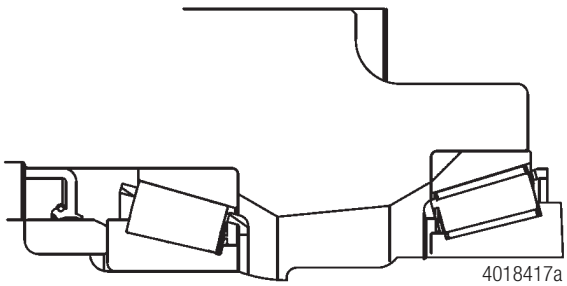
3. Position the wheel hub with the oil seal bore facing UP.

4. Apply axle gear lubricant to the bearing rollers and install the inner wheel bearing cone.

NOTE: Use a Permatex coating to seal against leaks around the hub oil seal. Leaks would result in requiring disassembly, should the leak be noted after the final axle assembly.

5. Apply a light, uniform coating of Permatex to the wheel hub bore.

6. Use the hub seal driver TC-79542 (see "Tools" on page 44) to install the wheel hub oil seal. See the figure below for proper seal orientation. Press the seal into the hub until the seal face is flush with the shoulder in the hub bore.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NOTE: Use isopropyl alcohol to lubricate the o-ring immediately before this installation.

7. Refer to "Toric Ring Face Seal into Wheel Hub" on page 22 to install the second half of the toric face seal into the hub and cup assembly by using tool TC-79461 to properly position the o-ring and steel ring assembly beyond the lip and into the tapered bore in the hub. See "Tools" on page 44.

8. Measure the height of the metal face above the housing to ensure the tolerance is within 1 mm variation.

⚠ CAUTION

Do not apply lubricant to the o-ring. Damage and leaks will result.

9. Apply a light coating of lubricant to the two mating surfaces of the face seal's steel rings only. Do not allow the lubricant to contact the o-ring. Use the same lubricant that was used on the coolant side.

10. Apply a light film of axle lubrication to the hub oil seal rubber lips and wear sleeve contact surface and lead in chamfer.

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

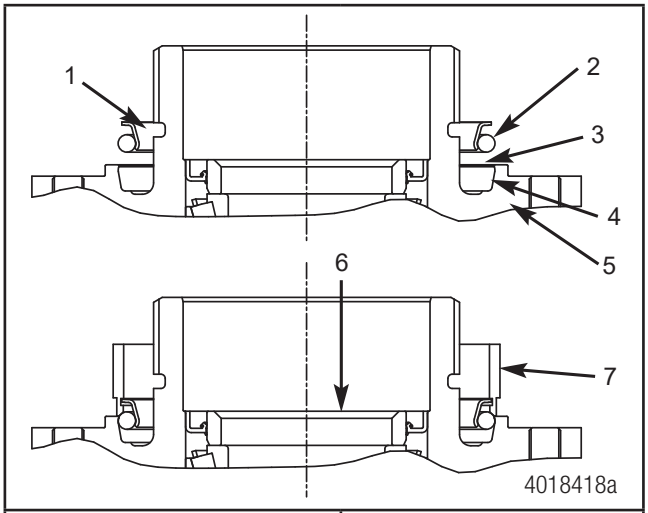
12. Install the outer bearing cone on the spindle. Install the spindle nut on the spindle. Rotate the hub while tightening the nut as recommended in Adjust the Wheel Bearing Preload section.

Toric Ring Face Seal into Wheel 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 TRS Toric Ring Face seal half must be installed in the hub before the hub can be assembled to the spindle. Install the Toric Ring Face seal half in the hub as follows:



1. Seal Ring	5. Seal Ring Housing
2. Toric Ring	6. Seal Ring Face
3. Housing Retainer Lip	7. Installation Tool (TC-79461)
4. Housing Ramp	

⚠ DANGER

Solvent cleaners can be flammable, poisonous, and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear eye protection.
- Wear clothing that protects the skin.
- Work in a well-ventilated area.
- NEVER use gasoline or solvents containing gasoline. Gasoline can explode.
- Hot solution tanks or alkaline solutions must be used correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

⚠ CAUTION

Check for solvent residue on all seating surfaces. Solvents leaving a residue on the Toric Ring, metal face seal or on the housing seal seating surface can cause the Toric Ring to roll into the seal, rather than slide. Damage to the seal can result.

1. Make sure the formed seal ring, Toric Ring, and wheel hub are clean and free of any oil or other contaminants. If required, use a solvent like isopropyl alcohol, that evaporates quickly, leaves no residue, and is compatible with the Toric Ring.

⚠ CAUTION

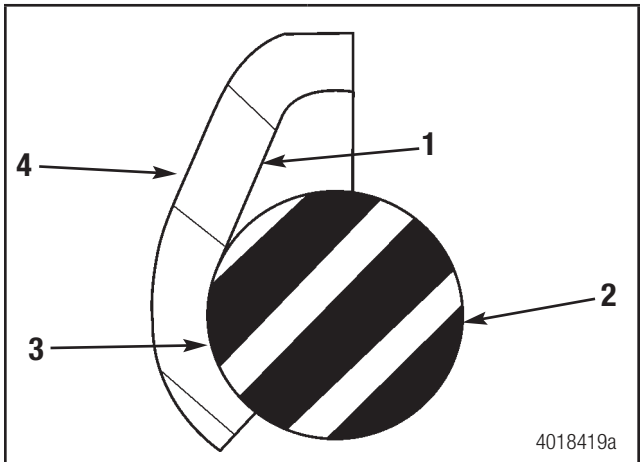
Install the Toric Ring into the seal ring and make sure it is flat. Do not twist the Toric Ring when installing onto the seal ring. A twisted Toric Ring will not seal correctly, allowing leakage of lubricant and pumping of debris past the ring. Damage to components can result.

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

⚠ CAUTION

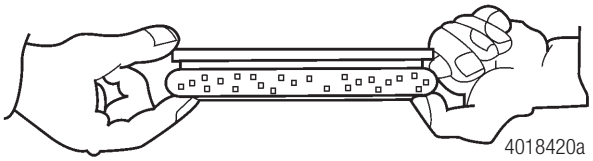
Do not use Stanosol® or any other liquid leaving an oily film and does not evaporate quickly, since this may result in incorrect seating of the Toric Ring in the housing, resulting in seal leakage.

a. Wet the rubber Toric Ring with isopropyl alcohol and install it onto the formed seal ring so it is seated at the bottom of the seal ring ramp and against the retaining lip.



1. Seal Ring Ramp	3. Seal Ring Retaining Lip
2. Rubber Toric Ring	4. Seal Ring

b. Make sure the Toric 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 Toric Ring seal, as this will cause leaks.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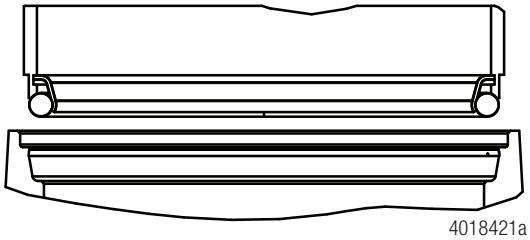
3. Coat the Toric Ring with isopropyl alcohol so it slides easily past the retainer lip in the wheel hub and installs correctly on the spindle ramp.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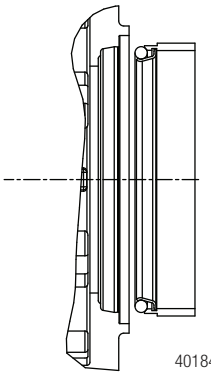
4. Place installation tool part number TC-79461 (see page 44) around the metal seal ring and Toric Ring.

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 wheel hub with a firm push of the installation tool.

7. Remove the installation tool.

8. Follow the same procedure to install the other half of the face seal assembly onto the wet disc brake housing.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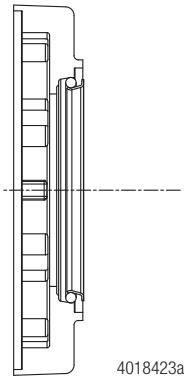
Check for Correct Seal Installation

Check the spindle and wheel hub for correct installation of the TRS Toric Ring face seal before the hub can be installed onto the spindle.

1. Check assembled height variation (A) in at least four places, 90° 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 0.02" (0.5 mm).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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 Toric 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 Toric Ring and face seal.
   b. With your fingers, pull up uniformly on the Toric Ring and face seal.

⚠ CAUTION

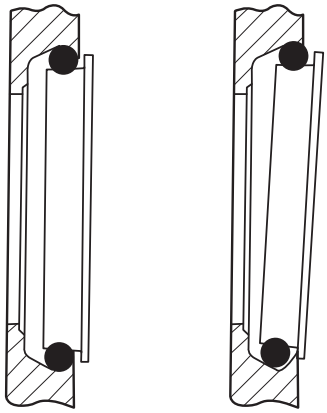
Apply isopropyl alcohol to the Toric Ring. Check the retaining lip of the seal seating area for burrs or fins, which can cause a seal to leak. Damage to components can result.

3. Apply isopropyl alcohol as a lubricant to the Toric Ring and place in the seating area. If installation does not appear smooth, flat and correct, remove the seal from the spindle and repeat the process.

⚠ CAUTION

To prevent slippage of the Toric Ring, allow sufficient evaporation time for the assembly before proceeding with further assembly. Damage to components can result.

4. Seat Toric Ring correctly. Once correctly in place, the Toric Ring must roll on ramp only.



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Wheel Hub to Spindle Assembly

NOTE: Complete the assembly of the wheel hub to the spindle. Before installing the wheel hub onto the spindle, however, keep the following points in mind to ensure correct sealing between the faces of the Toric Ring.

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 seal journal.

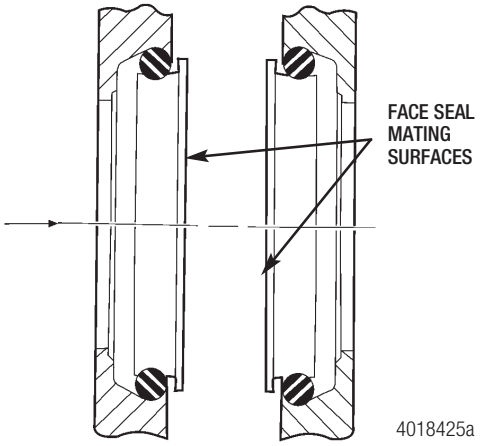
2. Remove the protective pad from the spindle's seal journal.

⚠ CAUTION

Do not apply lubricant to the Toric Ring. The Toric 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 Toric Ring. The Toric Ring can leak.

   - When installing the hub onto the spindle, both seal housings must be aligned correctly.
   - Slowly bring the hub and spindle assembly together as the spindle bearing adjustment nut is tightened.



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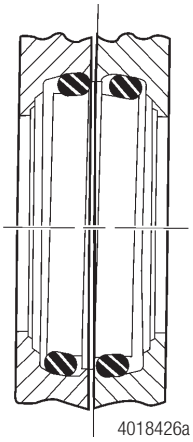
   - If the seals are not aligned correctly:
     The seals will move. Any wobbling motion of the seals is an indication of incorrectly positioned (cocked) seals. Dirt can enter past the Toric Ring.

- The Toric Rings have slipped, instead of rolling on the left-hand side of the seal. Note how the top Toric Ring is to the right and the bottom Toric Ring is to the left. The same seals are also shown after the bottom half is rotated 90°.



- If the Toric Ring slips at any location, it will twist, causing the formed seal rings to seat incorrectly (cock).

Adjust the Wheel Bearing Preload

NOTE: To adjust the wheel bearing preload, the bearings must be seated and the rollers in proper alignment.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

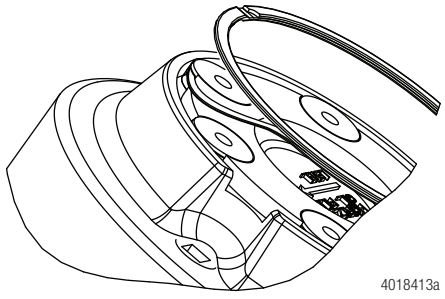
1. Install the wheel bearing adjusting nut. See “Torque Chart” on page 27.
2. Rotate the hub in both directions. At the same time, tap the hub several times with a brass or plastic mallet.
3. Tighten the nut using spindle nut socket TC-79534. Tighten further until one of the nut’s scallops lines-up with one of the threaded holes in the ring hub. See “Tools” on page 44 and “Torque Chart” on page 27.
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 Nm).
6. Install the set screw.
7. Tighten the set screw. See “Torque Chart” on page 27.
8. Apply a thin layer of axle grease to the face of the sun gear thrust washer.
9. Install the sun gear thrust washer. The washer tangs must engage the slots in the spindle 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 axle shaft must make engagement with the differential side gear.
    - The sun gear must make contact with the thrust washer.
    - Ensure washer tangs are keyed into the spindle nut slots.
12. Install the o-ring on the wheel hub at the base of the flange.

Planetary Spider & Gearing Assembly

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

1. Apply adhesive material to the axle shaft thrust button shaft before placing it into the spider.
2. Ensure no adhesive will touch the o-ring or the internal surface of the spider holes.
3. Make the planet gear sub-assemblies:
   a. Put a planet shaft standing with the big shoulder flange down.
   b. Apply gear lubricant.
   c. Assembly on the planet shaft shoulder 33 needle rollers.
   d. Insert the planet gear on the planet shaft such as the rollers end up between the planet shaft OD and planet gear ID with the grooved face of planet gear down against shaft flange.
   e. Insert a spacer on top of the 1st set of 33 needle rollers.
   f. Add the 2nd set of 33 needle rollers.
4. Install the planet gears sub-assemblies into the planet spider.
5. Install the thrust washer.
6. Install the corresponding o-rings into each planet gears subassembly
7. Align the spider with the planet gears sub-assemblies and with the flange down.
8. Press the spider into the planet gears sub-assemblies until the planet gears sub-assemblies are flush with the end of the spider.
9. Install the spiral retaining ring by feeding one end of the ring into the slots in the planet pins.



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Final Assembly

NOTE: For correct installation, the planetary pinions must engage both the sun gear and the ring gear before installation.

1. Install the planetary spider and gearing assembly onto the wheel hub.
2. Install the three slotted head machine screws attaching the planetary spider to the wheel hub. Tighten the screws, compressing o-ring until no gap exists between wheel hub flange and spider flange.
3. Mount the inner and outer wheels. Install the wheel nuts and tighten them to the vehicle manufacturer's specification.
4. Add the correct axle lubricant into each wheel end through the oil fill/level hole in the planetary spider at the horizontal position (3:00 or 9:00).
5. Add the correct lubricant to the axle housing bowl area.
6. Apply sealant to the threads of the oil fill/level plugs.
7. Install the oil fill/level plugs and tighten to 35 lb-ft (47 Nm).

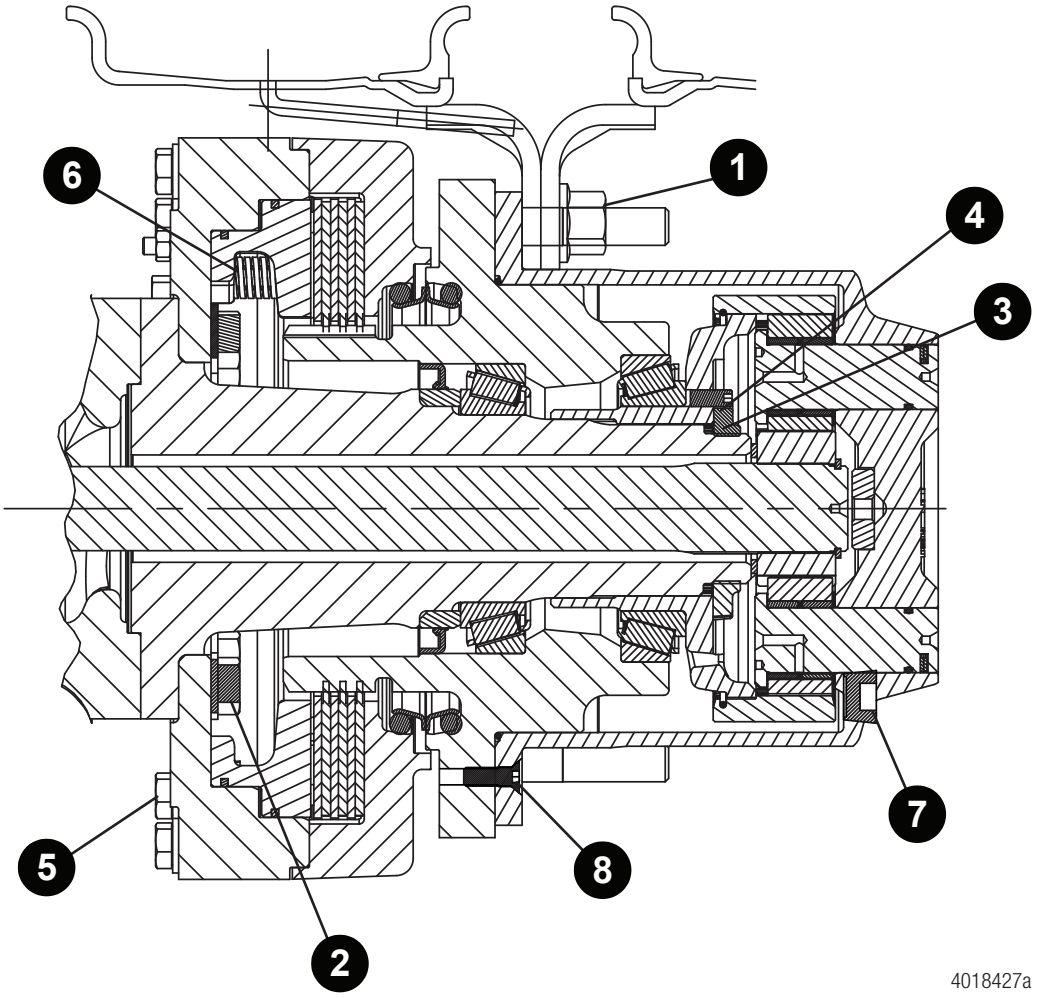
Fill Wet Disc Brakes with Hydraulic Fluid

1. Fill the wet disc brakes with tractor oil universal (TOU) fluid by using the 0.875"-14 UNF o-ring plug near the top of the brake and a 0.875"-14 UNF o-ring plug above the 3:00 or 9:00 position. Fill the brakes until oil exits the lower plug (above the 3:00 or 9:00 position). Install the lower plug and add two more liters of oil through the top plug.
2. Connect the brake coolant lines and brake actuation lines at the proper locations.

NOTE: Brake coolant inlet is connected to the 0.875"-14 UNF o-ring plug at the top position of the brake between the mounting bolts. The brake actuation line is connected at the 0.5625"-18 UNF plug at either the 3:00 or 9:00 position.

3. Thoroughly bleed all the air from the brake actuation system.
4. Preform pressure test on brake apply circuit.

Torque Chart



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Item	Fastener	Torque Value
1	Wheel rim nut	Per OEM specification
2	Spindle and wet disc brake housing mounting	370-480 lb-ft (500-650 Nm)
3	Wheel bearing adjusting nut	400 lb-ft (542 Nm)
4	Adjusting nut set screw	35 lb-ft (47 Nm)
5	Brake housing capscrews	200-258 lb-ft (270-350 Nm)
6	Piston return spring shoulder bolts	22-30 lb-ft (30-40 Nm)
7	Oil fill / drain plug	35 lb-ft (47 Nm)
8	Planetary spider-to-wheel hub slotted head screws	Hand-tighten (no specification)

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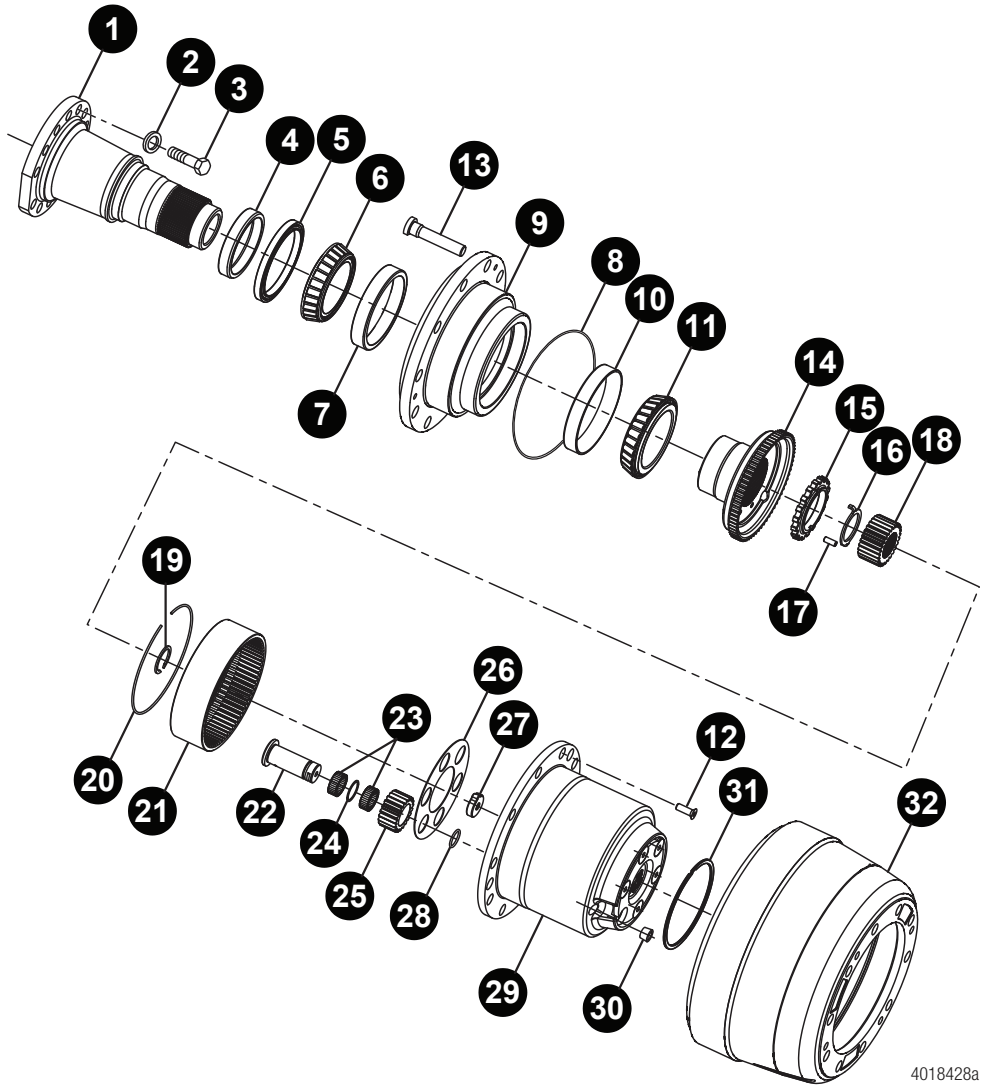
Exploded View

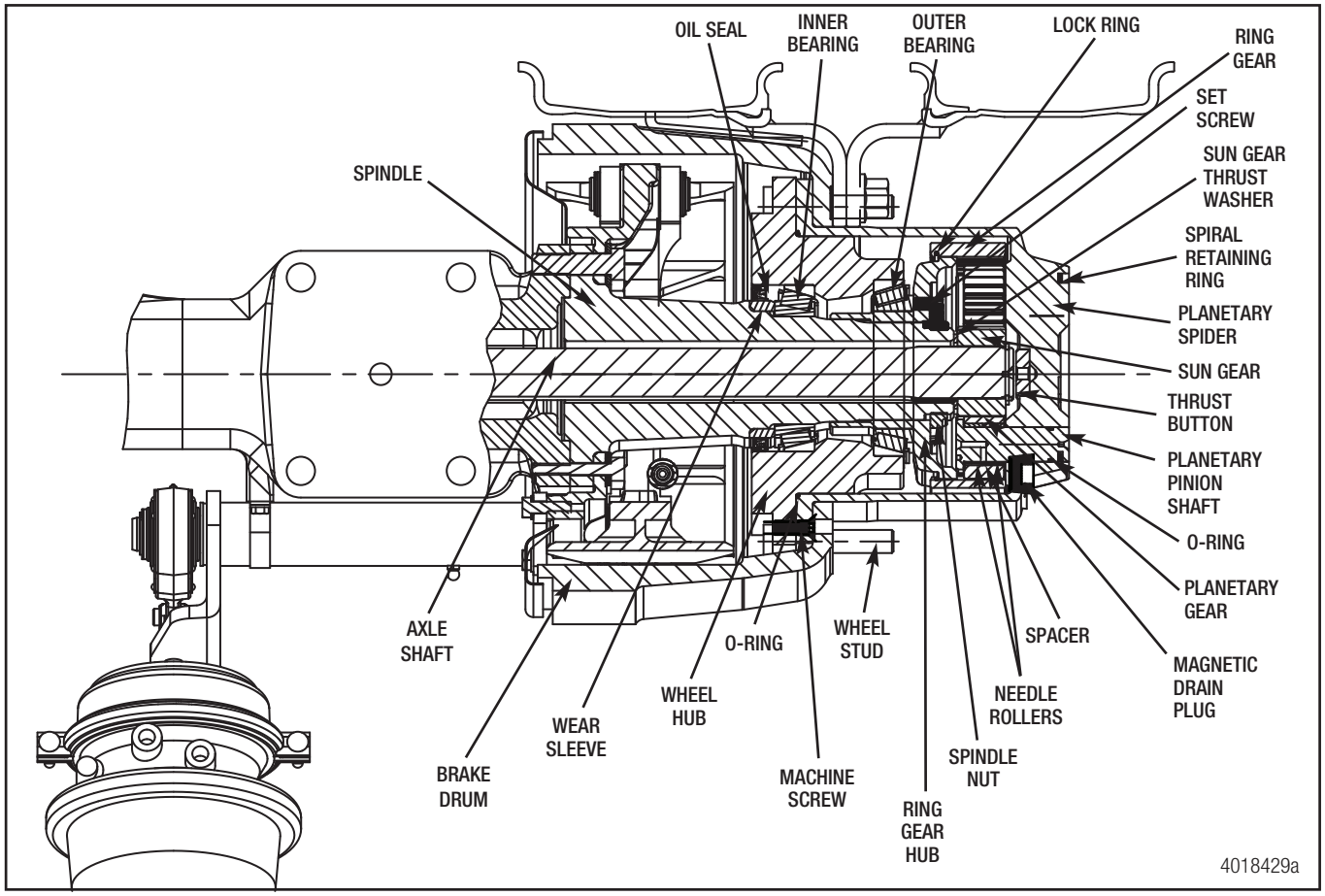


Item	Description
1	Spindle
2	Flat Washer
3	Capscrew
4	Wear Sleeve
5	Oil Seal Assembly
6	Inner Bearing Cone
7	Inner Bearing Cup
8	O-ring
9	Hub
10	Outer Bearing Cup
11	Outer Bearing Cone

Item	Description
12	Machine Screw
13	Wheel Stud
14	Ring Gear Hub
15	Spindle Nut
16	Sun Gear Thrust Washer
17	Set Screw
18	Planetary Sun Gear
19	Snap Ring
20	Lock Ring
21	Ring Gear
22	Pinion Shaft

Item	Description
23	Needle Rollers
24	Spacer
25	Planetary Pinion Gear
26	Thrust Washer
27	Thrust Button
28	O-ring
29	Planetary Spider
30	Magnetic Drain Plug
31	Spiral Retaining Ring
32	Brake Drum

Cross Section



Disassembly

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use a jack stand can result in serious personal injury and damage to components.

⚠ DANGER

Take care when using lifting devices during service and maintenance procedures to avoid serious personal injury and damage to components. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Brake Drum

1. Ensure 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 the wheels of the axle to be serviced are off the ground. Support the vehicle with safety stands. Refer to the vehicle service 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. Remove the plug. Drain and discard the lubricant from both wheel ends.
6. If necessary, remove the magnetic drain plug from the bottom of the axle housing. Drain and discard the lubricant from the carrier center section.

⚠ WARNING

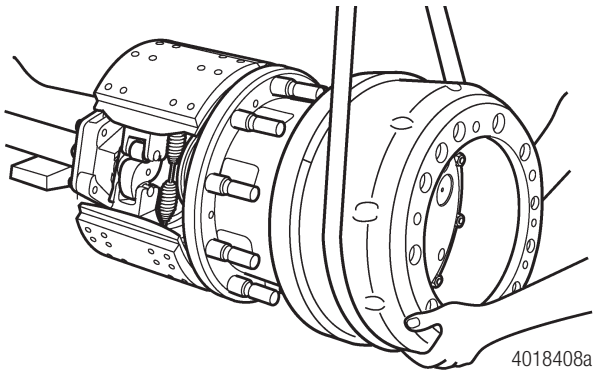
Before servicing a spring chamber, carefully follow the manufacturer's instructions to compress and lock the spring to completely release the brake. Verify no air pressure remains in the service chamber before proceeding. Sudden release of compressed air can cause serious personal injury and damage to components.

7. If the brake air chamber assembly has a spring chamber unit, carefully cage and lock the spring to prevent the spring from activating during disassembly.

NOTE: If automatic slack adjusters are used, refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual for the correct adjustment procedure.

8. Adjust the brake slack adjuster to retract the brake shoes to produce clearance between the lining and the brake drum.

9. Use a lifting device to support the brake drum.



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10. Install capscrews into the threaded holes in the brake drum. Gradually tighten the capscrews in equal amounts to push the drum off the pilot surface of the planetary spider.

11. With the lifting device, carefully remove the brake drum.

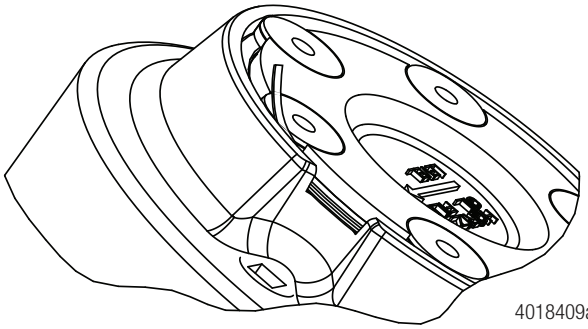
Planetary Spider & Wheel Hub Disassembly

1. Remove the 3 slotted head machine screws attaching the planetary spider to the hub.

2. With a lifting device, remove the planetary spider assembly from the wheel hub and set it on a workbench. Rest the spider with the large flange ending up.

3. Mark the large ends of the planetary pinion shafts and the planetary spider to aid in reassembly if the original pinion shafts are used.

4. Place the planetary spider assembly on blocks with the large flange end facing DOWN. Remove the spiral retaining ring by lifting exposed ring end with a screw driver and spiraling ring out from slot in pins. If removal is not possible, the spiral retaining ring may be cut into sections.



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⚠ DANGER

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

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

⚠ 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.

5. Use a press to remove the pinion shafts out of the spider. If a press is not available, use a brass drift and mallet to drive out the shaft. Press or drive the pinion shaft out toward the large flange end of the spider which faces DOWN.

6. Remove the planetary pinions and the thrust washer from the planetary spider.

7. Remove axle-shaft thrust button only if worn.

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

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

9. Remove the sun gear thrust washer from the axle shaft or if necessary remove the sun gear thrust washer from the end of the spindle.

10. Remove the snap ring from the axle shaft to allow for the removal of the sun gear from the axle shaft.

11. Remove the lock ring.

12. Remove the ring gear.

13. Remove the set screw from the spindle nut.

14. Remove the spindle nut.

15. 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.

16. Remove the wheel hub. The hub oil seal and inner bearing assembly will remain in the hub.

⚠ 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.

17. Remove the hub oil seal.

18. Remove the inner bearing cone.

19. If replacement of the wheel bearings is necessary, press out the outer bearing cup and inner bearing cup.

20. Remove and discard the o-ring from the wheel hub.

Cam Brakes Disassembly

To disassemble the P Series brake, refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual.

If it is necessary to remove the anchor pins, remove the brake dust shields for convenient access to the anchor pins.

Spindle & Brake Spider Disassembly

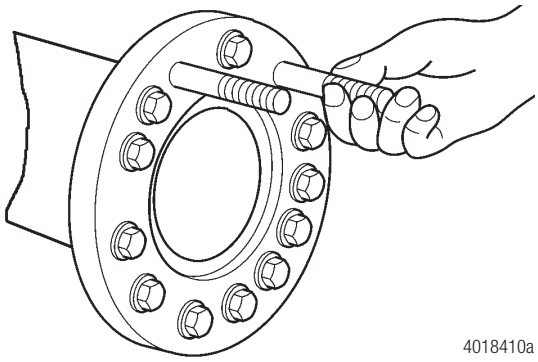
⚠ WARNING

Removal of the capscrews allows the spindle and piston housing to separate. They can fall from the planetary axle housing and cause damage to components and serious personal injury.

1. To prevent the spindle and brake spider from falling after all the mounting capscrews are removed, use one of the following procedures:

   a. Use a lifting device to support the spindle during disassembly.
   b. Remove only two capscrews. Replace them with two temporary M20 x 2.5 UNC thread studs 4” (102 mm) long before the remaining capscrews are removed.

   - Install one stud at the 11:00 position.
   - Install one stud at the 1:00 position.



2. Remove the two capscrews and washers mounting the clamp around the brake camshaft housing tube to the axle housing.

3. Remove the capscrews and washers securing the brake spider and spindle to the axle housing.

4. Remove the brake spider and air chamber assembly from the spindle.

5. Remove the spindle from the axle housing. If necessary, tap lightly on the spindle to loosen the pilot fit and to overcome the adhesion due to the cured gasket material in the flange joint.

6. Inspect the wear sleeve for damage and wear and remove it as necessary using heat.

Assembly

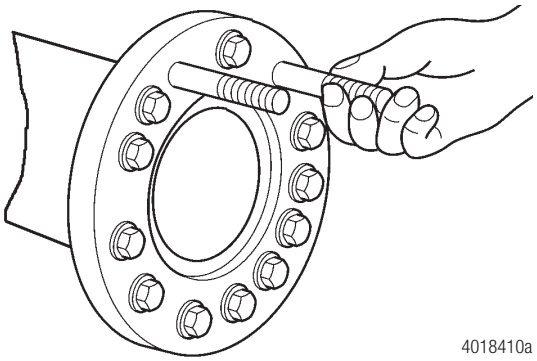
Follow all Service Notes and Safety Information found in the front of this manual.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

Spindle & Brake Assembly

1. Install two temporary studs (M20 -2.5 threads, approximately 4" long) into the axle housing flange. Install the studs at the 11:00 and 1:00 positions.



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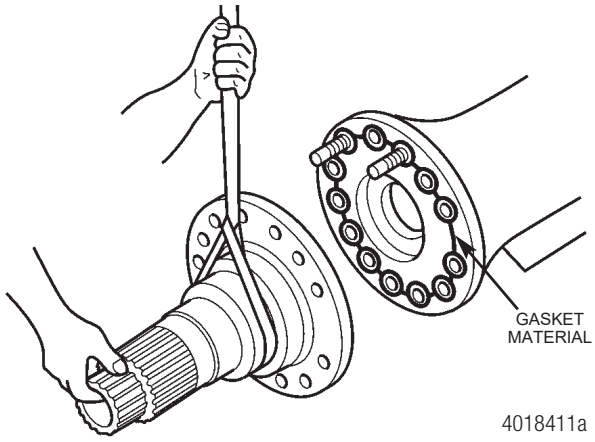
⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

2. If wear sleeve was removed, reinstall by applying Loctite 518 to the spindle and then heating the sleeve to 300°F and placing it on the spindle.

3. Apply a 0.125" (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.

4. Align the flange flats. Install the spindle onto the axle housing.



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5. Install the brake spider onto the spindle.

6. Install and hand-tighten some of the spindle mounting capscrews and washers.

7. Remove the two temporary studs.

8. Install the remaining spindle mounting capscrews and washers. Tighten all capscrews and washers to 370-480 lb-ft (500-650 Nm).

NOTE: Replace the camshaft bushing and grease seals before the camshaft bracket is installed onto the brake spider. Refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual.

9. Install the brake camshaft bracket with the o-ring on the pilot onto the brake spider.

10. Install the four mounting capscrews and washers. See "Torque Chart" on page 35.

NOTE: Refer to BSM-0042 - Cam Brakes & Automatic Slack Adjusters Service Manual to install the brake camshaft, anchor pin components, brake shoes, brake springs, slack adjusters, and related parts.

11. Install the brake camshaft bracket clamp around the bracket tube. Install the two capscrews and washers mounting the clamp to the axle housing. See "Torque Chart" on page 35.

12. Install the air chamber-to-bracket mounting nuts. See "Torque Chart" on page 35.

13. Attach the chamber push rod yoke to the slack adjuster. See "Torque Chart" on page 35.

14. Install the brake dust shield. Tighten the mounting capscrews and washers to 35-50 lb-ft (47-68 Nm).

Planetary Spider & Wheel Hub Assembly

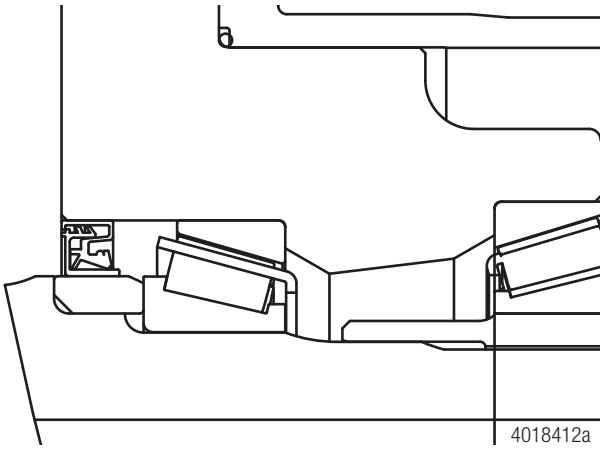
1. Press the new inner and outer bearing cups into the wheel hub using TC-79541 and TC-79540 drivers.
2. Position the wheel hub with the oil seal bore facing UP.
3. Apply axle gear lubricant to the bearing rollers and install the inner wheel bearing cone.

⚠ 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: Use a Permatex coating to seal against leaks around the hub oil seal. Leaks would result in requiring disassembly, should leak be noted after the final axle assembly.

4. Apply a light, uniform coating of Permatex to the wheel hub bore.
5. Use the hub seal driver TC-79542 to install the wheel hub oil seal. See the figure below for proper seal orientation. Press the seal into the hub until the seal face is flush with the hub face.



6. Apply a light film of axle lubricant to the hub oil seal rubber lips and wear sleeve contact surface and lead in chamfer.
7. Install the wheel hub, inner bearing, and oil seal assembly onto the spindle. Keep the hub assembly aligned with the spindle.
8. Apply axle lubricant to the outer bearing cone rollers. Install the outer bearing cone onto the ring gear hub.
9. Install the planetary ring gear onto the ring gear hub with lock ring.
10. Install ring gear hub/ring gear onto spindle.
11. Install the wheel bearing adjusting nut.

NOTE: To adjust the wheel bearing preload, the bearings must be seated and the rollers in proper alignment.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

12. Install the wheel bearing adjusting nut. See “Torque Chart” on page 35.
13. Rotate the hub in both directions. At the same time, tap the hub several times with a brass or plastic mallet.
14. Tighten the nut using spindle nut socket TC-79534. Tighten further until one of the nut’s scallops lines-up with one of the threaded holes in the ring hub. See “Tools” on page 44 and “Torque Chart” on page 35.
15. Back off the nut approximately 1/4 turn to relieve the preload produced in Step 3.
16. Tighten the nut to 200 lb-ft (271 Nm).
17. Install the set screw.
18. Tighten the set screw. See “Torque Chart” on page 35.
19. Apply a thin layer of axle grease to the face of the sun gear thrust washer.
20. Install the sun gear thrust washer. The washer tangs must engage the slots in the spindle nut.
21. Install the planetary sun gear and snap ring onto the axle shaft.
22. Install the axle shaft and sun gear assembly. For correct installation:
    - The axle shaft must make engagement with the differential side gear.
    - The sun gear must make contact with the thrust washer.
    - Ensure washer tangs are keyed into the spindle nut slots.
23. Install the o-ring on the wheel hub at the base of the flange.

Planetary Spider & Gearing Assembly

1. Apply adhesive material to the axle shaft thrust button shaft before placing it into the spider.
2. Ensure no adhesive will touch the o-ring or the internal surface of the spider holes.
3. Make the planet gear sub-assemblies.
    a. Put a planet shaft standing with the big shoulder flange down.
    b. Apply gear lubricant.
    c. Assemble on the planet shaft shoulder 33 needle rollers.
    d. Insert the planet gear on the planet shaft such as the rollers end up between the planet shaft OD and planet gear ID with the grooved face of the planet gear down against the shaft flange.
    e. Insert a spacer on top of the 1st set of 33 needle rollers.
    f. Add the 2nd set of 33 needle rollers.
4. Install the planet gears sub-assemblies.
5. Install the thrust washer
6. Install the corresponding o-rings into each planet gears subassembly.
7. Align the spider with the planet gears sub-assemblies and with the flange down.
8. Press the spider into the planet gears sub-assemblies until the planet gears sub-assemblies are flush with the end of the spider.
9. Install the spiral retaining ring by feeding one end of the ring into the slots in the planet pins.

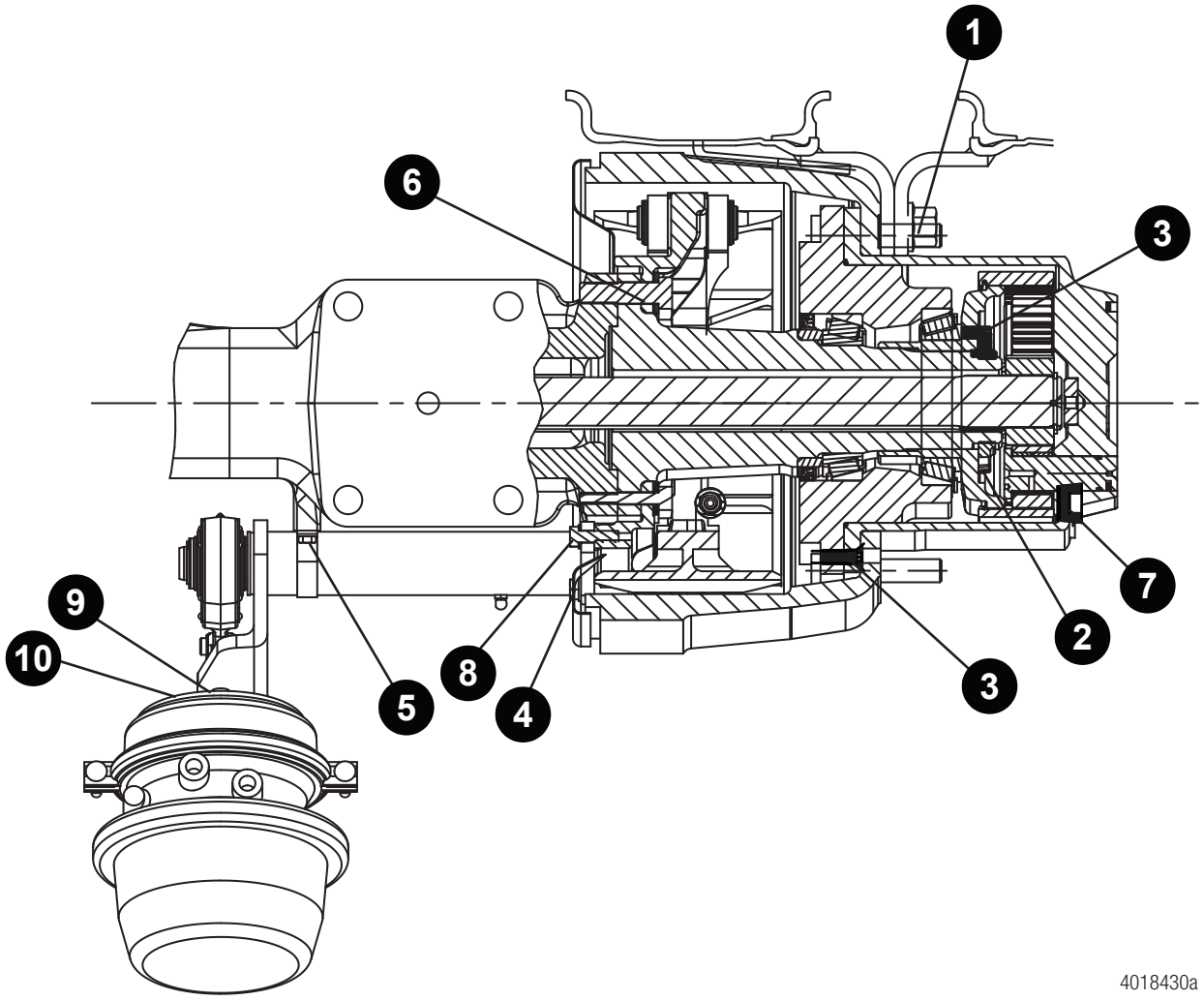
NOTE: For correct installation, the planetary pinions must engage both the sun gear and the ring gear before installation.

10. Install the planetary spider and gearing assembly onto the wheel hub.
11. Install the three slotted head machine screws attaching the planetary spider to the wheel hub. Tighten the screws compressing the o-ring until no gap exists between wheel hub flange and spider flange.
12. Install the brake drum over the wheel studs until the drum seats onto the planetary spider flange.
13. Mount the inner and outer wheels. Install the wheel nuts and tighten them to the vehicle manufacturer's specification.

NOTE: The PRC785P axle has a common oil level between the carrier and the wheel ends. Three locations must be filled. The vehicle must be on a level surface when filling. Fill to the bottom of each fill plughole. Wait and allow the oil to flow through the axle. Check the oil level again after several minutes and fill to the specified level if necessary.

14. Add the correct axle lubricant into each wheel end through the oil fill/level hole in the planetary spider at the horizontal position (3:00 or 9:00).
15. Add the correct lubricant to the axle housing bowl area.
16. Apply sealant to the threads of the oil fill/level plugs.
17. Install the oil fill/level plugs and tighten to 35 lb-ft (47 Nm).

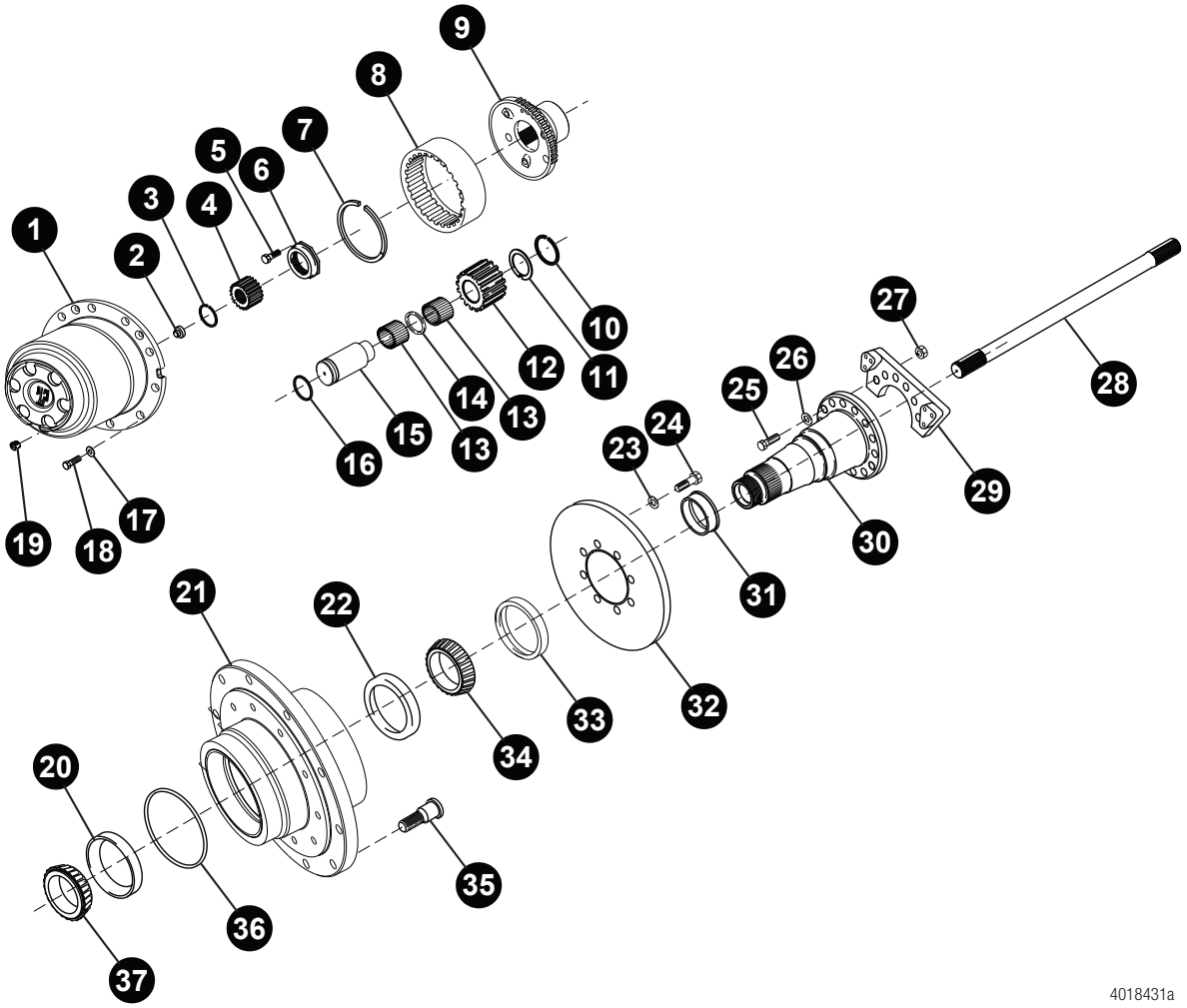
Torque Chart



Item	Fastener	Torque Value
1	Wheel rim nut	Per OEM specification
2	Wheel bearing adjusting nut	400 lb-ft (542 Nm)
3	Adjusting nut set screw	35 lb-ft (47 Nm)
4	Camshaft bracket to spider	90-120 lb-ft (122-163 Nm)
5	Camshaft bracket clamp	35-50 lb-ft (47-68 Nm)
6	Spindle and brake mounting (drum)	370-480 lb-ft (500-650 Nm)
7	Oil fill / drain plug	35 lb-ft (47 Nm)
8	Dust shield mounting 3/8”-16 Grade 8	30-50 lb-ft (41-68 Nm)
9	Air chamber mounting	133-155 lb-ft (180-210 Nm)
10	Push rod locknut 5/8”-18	25-50 lb-ft (34-68 Nm)
11	Planetary spider-to-wheel hub slotted head screws	Hand-tighten (no specification)

PRLC1015HDB

Exploded View



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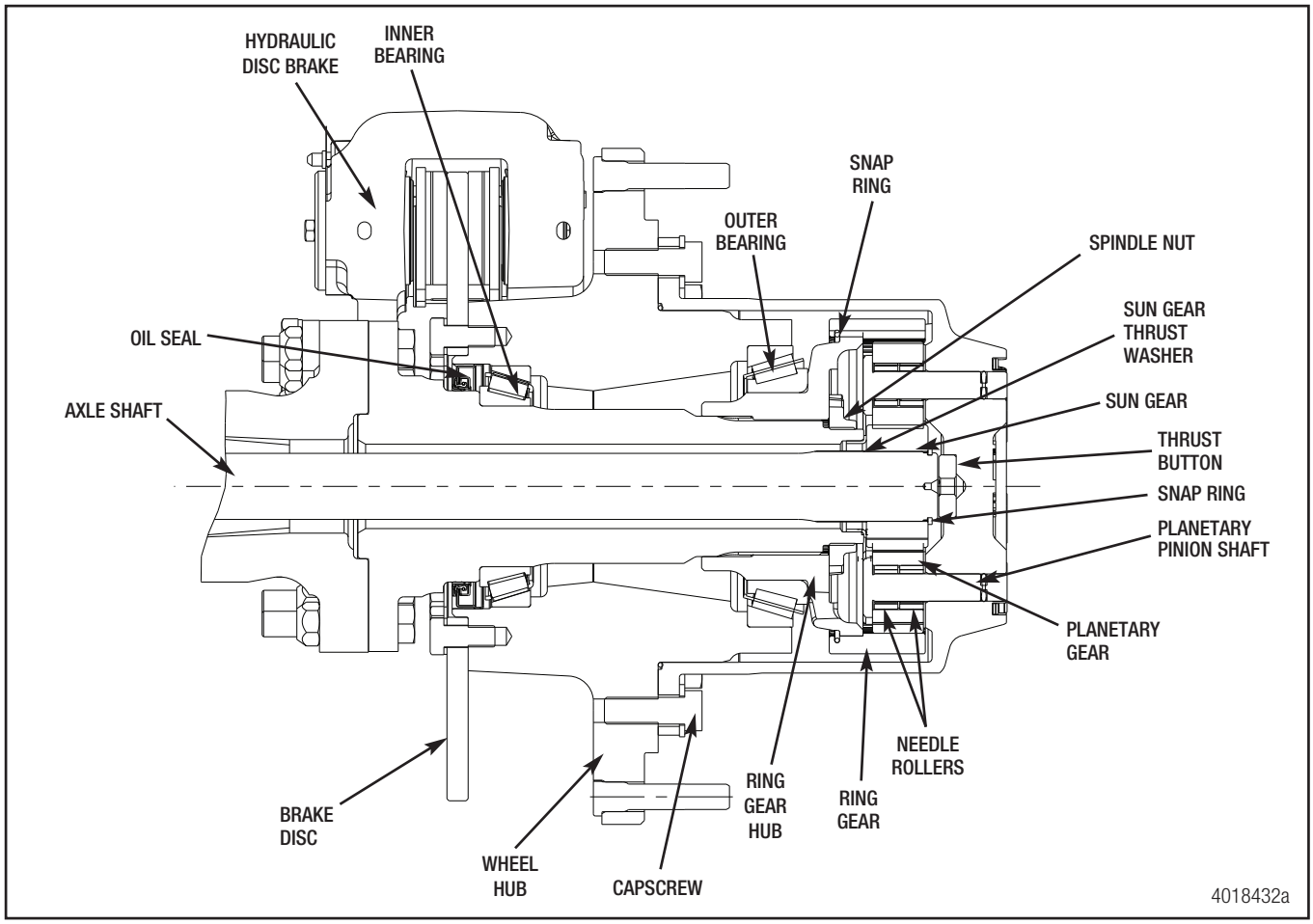
Item	Description
1	Planetary Spider Assembly
2	Thrust Button Washer
3	Snap Ring
4	Planetary Sun Gear
5	Screw
6	Wheel Bearing Nut
7	Ring Lock
8	Planetary Ring Gear
9	Ring Gear Hub
10	Snap Ring
11	Thrust Washer
12	Planetary Pinion
13	Needle Bearing

Item	Description
14	Spacer
15	Shaft Assembly
16	O-ring
17	Washer
18	Capscrew
19	Magnetic Drain Plug
20	Bearing Cup
21	Hub & Rotor Assembly
22	Bearing Cup
23	Washer
24	Capscrew
25	Capscrew
26	Washer

Item	Description
27	Nut
28	Axle Shaft
29	Brake Adapter
30	Spindle Assembly
31	Thrust Washer
32	Disc Brake Rotor
33	Oil Seal Assembly
34	Bearing Cone
35	Wheel Stud
36	O-ring
37	Bearing Cone

Cross Section



Disassembly

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use a jack stand can result in serious personal injury and damage to components.

⚠ DANGER

Take care when using lifting devices during service and maintenance procedures to avoid serious personal injury and damage to components. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading.

⚠ WARNING

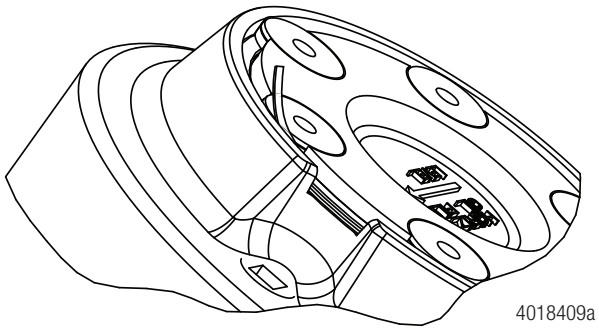
To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Preliminary Disassembly

1. Ensure 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 the wheels of the axle to be serviced are off the ground. Support the vehicle with safety stands. Refer to the vehicle service 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. Remove the plug. Drain and discard the lubricant from both wheel ends.
6. If necessary, remove the magnetic drain plug from the bottom of the axle housing. Drain and discard the lubricant from the carrier center section.

Planetary Spider Assembly

1. Remove the 3 slotted head machine screws attaching the planetary spider to the hub.
2. With a lifting device, remove the planetary spider assembly from the wheel hub and set it on a workbench. Rest the spider with the large flange ending up.
3. Mark the large ends of the planetary pinion shafts and the planetary spider to aid in reassembly if the original pinion shafts are used.
4. Place the planetary spider assembly on blocks with the large flange end facing DOWN. Remove the spiral retaining ring by lifting exposed ring end with a screw driver and spiraling ring out from slot in pins. If removal is not possible, the spiral retaining ring may be cut into sections.



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⚠ DANGER

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

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

⚠ 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.

5. Use a press to remove the pinion shafts out of the spider. If a press is not available, use a brass drift and mallet to drive out the shaft. Press or drive the pinion shaft out toward the large flange end of the spider which faces DOWN.
6. Remove the planetary pinions and the thrust washer from the planetary spider.
7. Remove axle-shaft thrust button only if worn.
8. Remove the axle shaft, planetary sun gear, and snap ring assembly.

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

9. Remove the sun gear thrust washer from the axle shaft or if necessary remove the sun gear thrust washer from the end of the spindle.
10. Remove the snap ring from the axle shaft to allow for the removal of the sun gear from the axle shaft.
11. Remove the lock ring.
12. Remove the ring gear.
13. Remove the set screw from the spindle nut.
14. Remove the spindle nut.
15. 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.
16. Remove the wheel hub. The hub oil seal and inner bearing assembly will remain in the hub.

⚠ 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.

17. Remove the hub oil seal.
18. Remove the inner bearing cone.
19. If replacement of the wheel bearings is necessary, press out the outer bearing cup and inner bearing cup.
20. Remove and discard the o-ring from the wheel hub.

Wheel End

Refer to BSM-0476 - 4x76 Hydraulic Dry Disc Brake Calipers Service Manual.

⚠ CAUTION

Care should be taken to store the (2) halves of the face seal to protect them from damage and saved for reassembly later when required.

1. Remove the half TRS face seal from the hub.
2. Remove the remaining half of the face seal from the brake disc assembly.

NOTE: Place the face seals together and store in a safe package to prevent damage.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

3. Loosen sixteen M16 x 1.5 threaded capscrews. Hit the threaded capscrew heads with a mallet to separate the wet disc brake housing.
4. Remove all but two capscrews at 11:00 and 1:00 positions.

⚠ CAUTION

Do not reuse a damaged friction disc or stationary disc. Damage to components can result.
The friction discs and stationary discs are loose inside the brake housing assembly. Reach through the center of the brake housing and keep the discs from falling out.

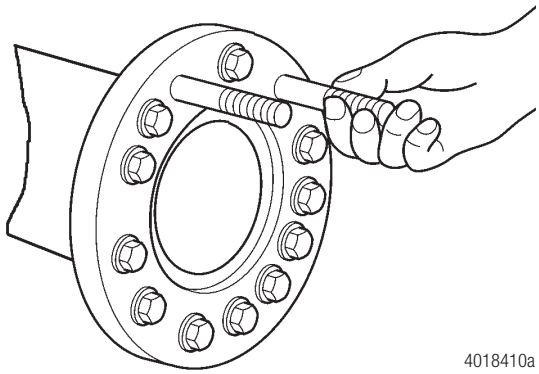
5. Support the brake housing assembly. Remove the remaining capscrews.
6. Remove the brake housing assembly from the piston housing and set it on a table with the discs facing up to prevent the discs from falling out.
7. Remove the four shoulder bolts from the piston and piston housing.
8. Remove the washers and springs from the shoulder bolts. Push the piston from the piston housing. Use less than 20 psi (1.38 bar) air pressure. Insert three adjuster screws. Evenly turn the screws CLOCKWISE.

Spindle & Piston Housing

⚠ WARNING

Removal of the capscrews allows the spindle and piston housing to separate. They can fall from the planetary axle housing and cause damage to components and serious personal injury.

1. To prevent the spindle and piston housing from falling after all the mounting capscrews are removed, perform the following procedures:
   a. Use a lifting device to support the spindle during disassembly.
   b. Remove only two capscrews. Replace them with two temporary M20 x 2.5 thread studs 4” (102 mm) long before the remaining capscrews are removed.
   - Install one stud at the 11:00 position.
   - Install one stud at the 1:00 position.



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2. Remove the capscrews and washers securing the piston housing and spindle to the axle housing.
3. Remove the piston housing from the spindle.
4. Remove the spindle from the axle housing. If necessary, tap lightly on the spindle to loosen the pilot fit and to overcome the adhesion due to the cured gasket material in the flange joint.
5. Inspect the wear sleeve for damage and wear and remove it as necessary using heat.

Hydraulic Dry Disc Brakes

Refer to BSM-0476 - 4x76 Hydraulic Dry Disc Brake Calipers Service Manual.

Assembly

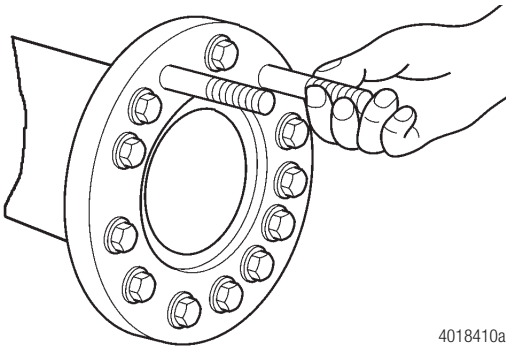
Follow all Service Notes and Safety Information found in the front of this manual.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

Spindle, Brake Spider, & Brake

1. Install two temporary studs (M20 -2.5 threads, approximately 4" long) into the axle housing flange. Install the studs at the 11:00 and 1:00 positions.



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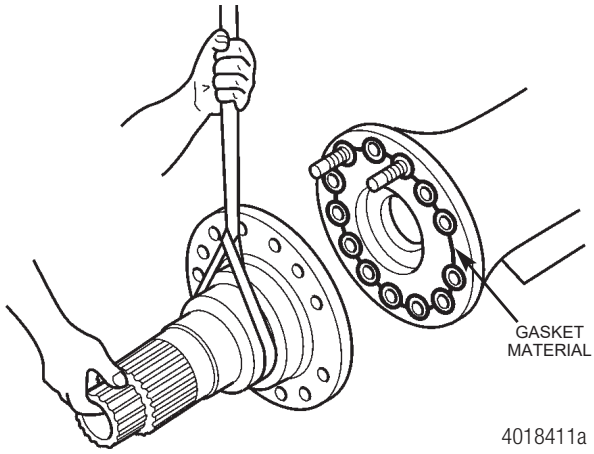
⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

2. If wear sleeve was removed, reinstall by applying Loctite 518 to the spindle and then heating the sleeve to 300°F and placing it on the spindle.

3. Apply a 0.125" (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.

4. Align the flange flats. Install the spindle onto the axle housing.



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5. Install and hand-tighten some of the spindle mounting capscrews and washers.

6. Remove the two temporary studs.

7. Install the remaining spindle mounting capscrews, washers, and nuts. Tighten to 360-470 lb-ft (488-637 Nm).

8. Attached the disc brake rotor to the hub assembly with capscrews and washers. Torque to 180-230 lb-ft (244-312 Nm).

9. Install the oil seal assembly.

Wheel End

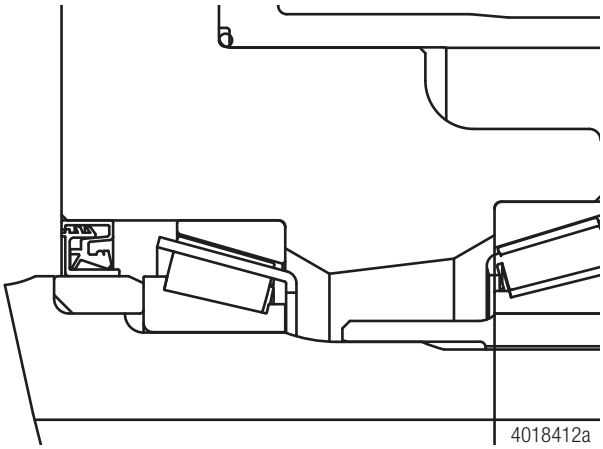
1. Press the new inner and outer bearing cups into the wheel hub using TC-79541 and TC-79540 drivers.
2. Position the wheel hub with the oil seal bore facing UP.
3. Apply axle gear lubricant to the bearing rollers and install the inner wheel bearing cone.

⚠ 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: Use a Permatex coating to seal against leaks around the hub oil seal. Leaks would result in requiring disassembly, should leak be noted after the final axle assembly.

4. Apply a light, uniform coating of Permatex to the wheel hub bore.
5. Use the hub seal driver TC-79542 to install the wheel hub oil seal. See the figure below for proper seal orientation. Press the seal into the hub until the seal face is flush with the hub face.



6. Apply a light film of axle lubricant to the hub oil seal rubber lips and wear sleeve contact surface and lead in chamfer.
7. Install the wheel hub, inner bearing, and oil seal assembly onto the spindle. Keep the hub assembly aligned with the spindle.
8. Apply axle lubricant to the outer bearing cone rollers. Install the outer bearing cone onto the ring gear hub.
9. Install the planetary ring gear onto the ring gear hub with lock ring.
10. Install ring gear hub/ring gear onto spindle.
11. Install the wheel bearing adjusting nut.

Adjust the Wheel Bearing Preload

NOTE: To adjust the wheel bearing preload, the bearings must be seated and the rollers in proper alignment.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

1. Install the wheel bearing adjusting nut. See “Torque Chart” on page 43.
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 using spindle nut socket TC-79534. Tighten further until one of the nut’s scallops lines-up with one of the threaded holes in the ring hub. See “Tools” on page 44 and “Torque Chart” on page 43.
4. Back off the nut approximately 1/4 turn to relieve the preload produced in Step 3.
5. Tighten the nut to 350 lb-ft (475 Nm).
6. Install the set screw.
7. Tighten the set screw. See “Torque Chart” on page 43.
8. Apply a thin layer of axle grease to the face of the sun gear thrust washer.
9. Install the sun gear thrust washer. The washer tangs must engage the slots in the spindle 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 axle shaft must make engagement with the differential side gear.
    - The sun gear must make contact with the thrust washer.
    - Ensure washer tangs are keyed into the spindle nut slots.
12. Install the o-ring on the wheel hub at the base of the flange.

Planetary Spider & Gearing Assembly

1. Apply adhesive material to the axle shaft thrust button shaft before placing it into the spider.
2. Ensure no adhesive will touch the o-ring or the internal surface of the spider holes.
3. Make the planet gear sub-assemblies:
   a. Put a planet shaft standing with the big shoulder flange down.
   b. Apply gear lubricant.
   c. Assemble on the planet shaft shoulder 33 needle rollers.
   d. Insert the planet gear on the planet shaft such as the rollers end up between the planet shaft OD and planet gear ID with the grooved face of the planet gear down against the shaft flange.
   e. Insert a spacer on top of the 1st set of 33 needle rollers.
   f. Add the 2nd set of 33 needle rollers.
4. Install the planet gears sub-assemblies.
5. Install the thrust washer
6. Install the corresponding o-rings into each planet gears subassembly.
7. Align the spider with the planet gears sub-assemblies and with the flange down.
8. Press the spider into the planet gears sub-assemblies until the planet gears sub-assemblies are flush with the end of the spider.
9. Install the spiral retaining ring by feeding one end of the ring into the slots in the planet pins.

Final Assembly

NOTE: For correct installation, the planetary pinions must engage both the sun gear and the ring gear before installation.

1. Install the planetary spider and gearing assembly onto the wheel hub.
2. Install the three slotted head machine screws attaching the planetary spider to the wheel hub. Tighten the screws compressing the o-ring until no gap exists between wheel hub flange and spider flange.
3. Install the hydraulic disc brake over the brake disc rotor until it seats properly. Tighten the mounting capscrews and washers to 310-400 lb-ft (420-542 Nm).

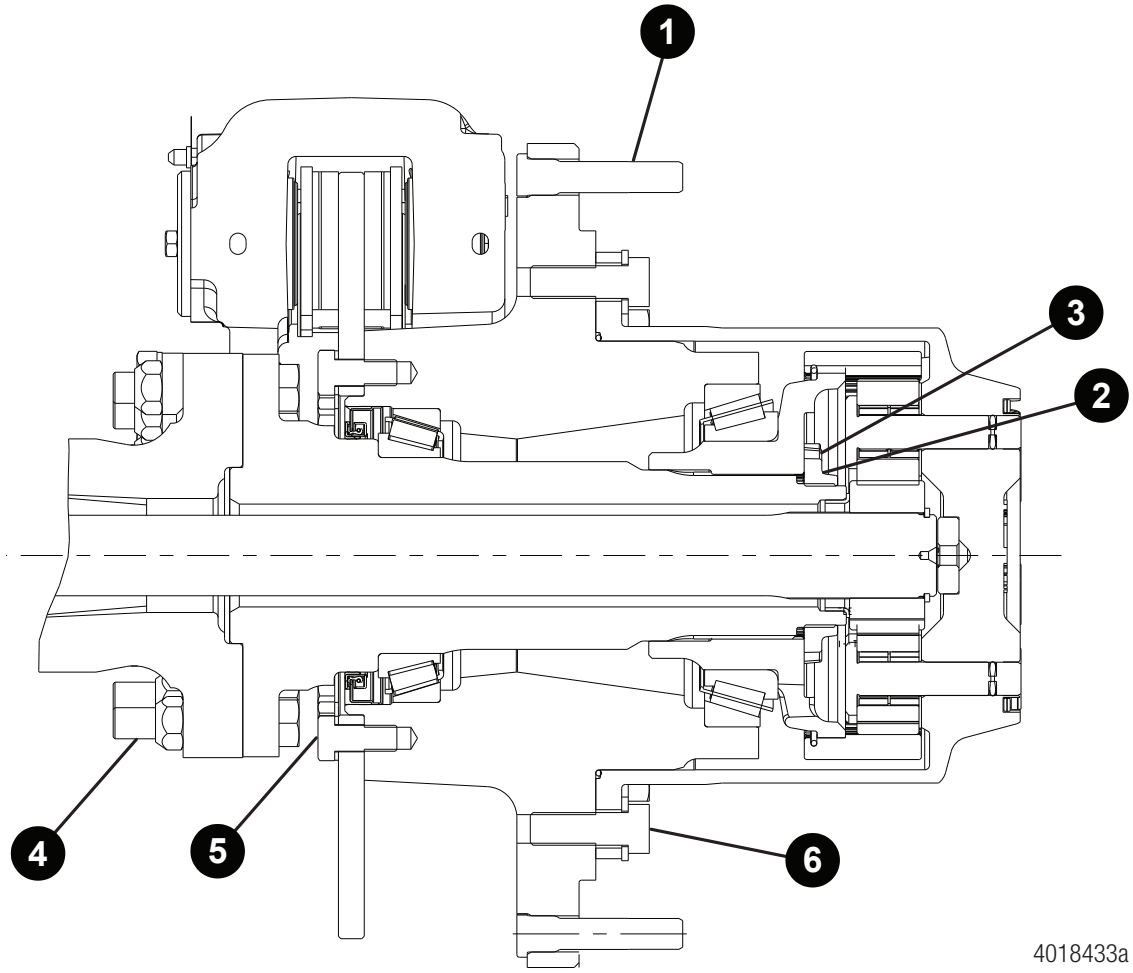
NOTE: Refer to BSM-0476 - 4x76 Hydraulic Dry Disc Brake Calipers Service Manual.

4. Mount the inner and outer wheels. Install the wheel nuts and tighten them to the vehicle manufacturer's specification.

NOTE: The PRLC1015HDB axle has a common oil level between the carrier and the wheel ends. Three locations must be filled. The vehicle must be on a level surface when filling. Fill to the bottom of each fill plughole. Wait and allow the oil to flow through the axle. Check the oil level again after several minutes and fill to the specified level if necessary.

5. Add the correct axle lubricant into each wheel end through the oil fill/level hole in the planetary spider at the horizontal position (3:00 or 9:00).
6. Add the correct lubricant to the axle housing bowl area.
7. Apply sealant to the threads of the oil fill/level plugs.
8. Install the oil fill/level plugs and tighten to 35 lb-ft (47 Nm).

Torque Chart

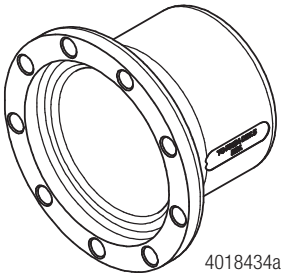


Item	Fastener	Torque Value
1	Wheel rim nut	Per OEM specification
2	Wheel bearing adjusting nut	400 lb-ft (542 Nm)
3	Adjusting nut set screw	30-35 lb-ft (41-47 Nm)
4	Spindle mounting	360-470 lb-ft (488-637 Nm)
5	Disc brake rotor	180-230 lb-ft (244-312 Nm)
6	Planetary bolts	369-480 lb-ft (500-651 Nm)
7*	Brake housing capscrews	310-400 lb-ft (420-542 Nm)
8*	Oil fill / drain plug	35 lb-ft (47 Nm)
9*	Carrier bolts	180-230 lb-ft (244-312 Nm)
10*	Ring gear bolts	200-260 lb-ft (271-353 Nm)
11*	Pinion cage assembly capscrews	74-96 lb-ft (100-130 Nm)
12*	Differential case	74-96 lb-ft (100-130 Nm)
13*	Pinion nut	920-1130 lb-ft (1247-1532 Nm)

* Not shown

Tools

Spindle Nut Socket (TC-79534)



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Toric Ring Face Seal Tool (TC-79461)

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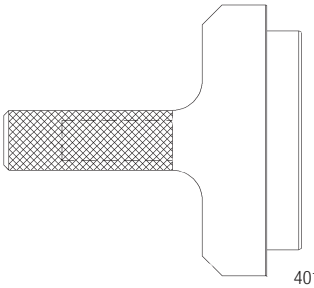
Hub Seal Driver (TC-79542)



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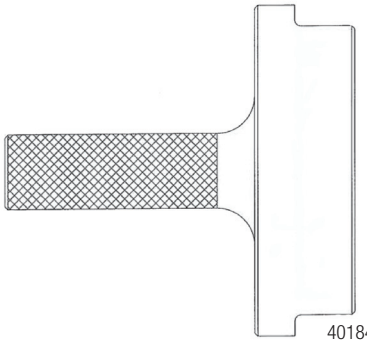
Outer Bearing Cup Driver (TC-79540)



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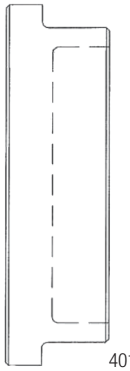
Inner Bearing Cup Driver (TC-79541)



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