Brake systems for medium duty trucks

305x76 Park Brake

Service Manual
2nd Edition

BOSCH
Important Service Notes

The information in this publication was current at the time of printing. The information presented in this publication is subject to change without notice or liability.

The information contained in this publication is intended for use by properly trained and equipped professional technicians and is NOT for the “Do It Yourselfer.”

⚠️ WARNING

Failure to follow safety and vehicle repair procedures either contained in this manual, in the chassis and vehicle manufacturer’s repair manuals or in accordance with other accepted methods can result in personal injury, death, or damage to components, vehicles, or personal property.

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305x76 mm Park Brake

EXPLODED VIEW
(Typical)

Figure 1.
Introduction

The Bosch 305 x 76 mm park brake is a lever actuated, duo-servo, single-anchor drum brake. The brake is designed for driveline mounted applications typically on the rear axle differential carrier housing. Its self-adjusting feature enables the brake to maintain a consistent functional clearance between the brake shoes and the drum as the shoe linings wear.

There are three (3) releases of this brake in service. Release 1 was the original release and manufactured prior to April 2002. The Release 2 design has a brake manufacture date after April 2002 and up to December 2005. The Release 3 design has a manufacture date after December 2005. Figure 2 shows the Release 1 brake, highlights the differences between the Release 1 and Release 2 brakes. Figure 3 shows the Release 2 brake and highlights the differences between Release 1 and Release 2 brakes. Figure 4 shows the Release 3 brake and highlights the differences between Release 2 and Release 3.

Basic Major Components

The foundation of the brake is a ductile iron backing plate. Major actuating components are a cam and a lever, which are fastened to the backing plate by an anchor screw. An anti-rattle spring under the head of this screw reduces clatter. Brakes with hex socket anchor screw (Release 1) will also have two flat washers immediately under the head of the screw. The anchor point for brake actuation and shoe abutment is located at the 12 o’clock position when the assembly is properly mounted. See Figures 1, 2, 3 and 4.

Service Component Interchangeability

Only use Release 1 brake components on Release 1 brakes.
Only use Release 2 brake components on Release 2 brakes.
Release 3 brake components can be used on Release 2 brakes.
305 x 76 mm Park Brake

Figure 2. 305x76 Park Brake Major Components
(Release 1 Shown)

Release 1 - Manufactured prior to April 2002.

Features:
• No apply lever guide
• Apply lever without stop
• Internal hex socket style anchor screw with M10 thread
• Abex-6092-HH lining code
305 x 76 mm Park Brake

Release 2 - Manufactured from April 2002 to December 2005.

Features:
- Apply lever guide
- Apply lever with bump stop
- External hex head style anchor screw with M12 thread
- Abex-6082-GG lining code
- Revised adjuster cable anchor end fitting (late)
- Adjuster cable retainer tab (late)
305 x 76 mm Park Brake

Release 3 - Manufactured beginning December 2005.

Features:
- No apply lever guide
- Revised anti-rattle spring
- Adjuster access slot size increased

Includes features from Release 2:
- Apply lever with bump stop
- External hex head style anchor screw with M12 thread
- Abex-6082-GG lining codes
- Revised adjuster cable anchor end fitting
- Adjuster cable retainer tab
Shoes and Related Components

Brake shoes are attached to the backing plate by hold-down springs and pins, shown in Figure 5. Both shoes seat against the backing plate anchor post at the top and are connected by the adjuster nut and screw assembly at the bottom. Shoe hold-down brackets are permanently mounted to the backing plate to assist in guiding the shoes. The shoes are pulled toward each other by two low-tension shoe return springs. Proper orientation of the various springs, including their hook ends, must be maintained for proper function. The starwheel used for adjusting the shoe clearance to the drum is on the adjuster nut.

Figure 5. Brake Shoes and Related Components (Release 3 shown)
Shoe Cage Adjusting Components

The clearance between the shoe linings and the inside drum surface is adjusted in response to excessive movement of a given shoe when the brake is actuated. This excessive movement is typically due to normal wear of the lining during use. (See SHOE REPLACEMENT and SHOE CAGE ADJUSTMENT procedures for details.) The adjuster cable is anchored on top of the anchor post, under the cam, by the anchor screw, routed along the side of the shoe by a cable guide, and attached to the auto adjuster lever via a spring (assembled on the cable end-fitting) at the bottom of the brake. A push in panel tab retains the cable in the cable guide. The adjuster lever seats against the starwheel on the adjuster nut. The adjuster screw and adjuster nut/starwheel assembly use left hand threads to expand the shoes to compensate for lining wear.

Figure 6. Shoe Cage Adjusting Components
(Release 3 shown)
Before Servicing Brakes...

Information in this manual is not intended to replace the vehicle manufacturer’s service manual. Always refer to the latest vehicle manufacturer’s service information. Information contained in this manual is subject to change without notice.

Always verify proper operation of the park brake prior to returning vehicle to service.

⚠️ WARNING
Always wear eye protection. Keep fingers, hands and other body parts away from the brake when verifying operation. Do not stand by or under a vehicle at this time.

⚠️ WARNING
Always block vehicle to prevent vehicle movement, such as with suitable wheel chocks. Failure to do this could result in personal injury or property damage.

⚠️ WARNING
Do not work under or around a vehicle supported by a mechanical or hydraulic jack. Vehicle must be supported by suitable floor stands. Failure to do so can result in personal injury or property damage.

⚠️ CAUTION
Keep grease and other foreign materials away from the shoe lining and drum surfaces. Contamination of shoe linings or drum surface may result in degradation of brake holding capability, possibly resulting in personal injury or property damage.

⚠️ WARNING
Use only original equipment parts, available through the vehicle manufacturer’s Service department.

Failure to do so may result in reduced brake performance, possibly resulting in personal injury or property damage.
Inspection

Note: It is not necessary to raise vehicle for “inspection” in most cases. However, if required, follow steps 1 through 3 in SHOE REPLACEMENT section.

Anytime service is required, it is recommended that a complete visual inspection be performed on all components in the park brake assembly. This includes:

1. Follow manufacturer’s recommended procedures to ready the vehicle for servicing. Pay attention to all WARNING and CAUTION notes throughout this booklet.

2. Remove the drum. See vehicle manufacturer’s service manual for details.

3. Clean the individual brake components, removing dust and grease.

4. Visually inspect the brake shoes (Figure 5). Shoes should be replaced if there is uneven lining wear or when the remaining lining reaches 0.76 mm (0.030” or approximately 1/32”) thickness or less above the shoe. If grease, automotive fluids, or other foreign material that would compromise operation is found on, soaked into or embedded in the linings, the shoes should be replaced. Also, if cracks, excessive deformation, or wear on either end is found, the shoes should be replaced. See section on SHOE REPLACEMENT for service details.

5. Visually inspect the brake lever and cam (Figure 1). If cracks, excessive wear, or abnormal deformation is found in either part, they should be replaced. Light wear, which typically shows up as polishing is acceptable. If unsure, replace brake lever, cam plate and anchor screw. See section on ANCHOR SCREW, LEVER, AND CAM REPLACEMENT for service details.

6. Inspect various springs and hold down pins (Figure 5) for excessive wear, heat discoloration, heavy corrosion or other damage and replace as necessary. See section on SHOE REPLACEMENT for service details.

WARNING

Whenever possible, work on brakes in a separate area away from other operations. Always wear a respirator approved by NIOSH or MSHA during all brake service procedures. NEVER use compressed air or dry brushing to clean brake parts or assemblies. OSHA recommends that you use cylinders that enclose the brake. These cylinders have vacuums with high efficiency HEPA filters and worker’s arm access sleeves. But, if such equipment is not available, carefully clean parts and assemblies in the open air.

Clean brake parts and assemblies in the open air. During disassembly, carefully handle all parts to avoid getting dust in the air. Use an industrial vacuum cleaner with a HEPA filter system to clean dust from the brake drums, backing plates and other brake parts. After using the vacuum, remove any remaining dust with a rag soaked in water and wrung until nearly dry.
Inspection (continued)

7. Inspect adjuster cable assembly for damage or wear (Figure 5). Replace as necessary. See section on SHOE REPLACEMENT for service details.

8. Inspect adjuster nut and screw (Figure 5) for any damage or corrosion to the threads or burrs, chips, corrosion or other damage to the teeth on the adjuster nut starwheel. Damaged teeth or threads may prevent proper function of the brake self-adjusting function. Replace as necessary. See section SHOE REPLACEMENT for service details.

9. Clean-out all dust or grease present on the inside of drum. Use a 12 inch caliper or an inside diameter micrometer to measure the manufacturer's recommended inside diameter of the drum. Replace drum if it exceeds maximum inside diameter (which typically is stamped on the inside of the drum near the mounting holes), is worn unevenly, has deep grooves, heavy corrosion or excessive runout. See vehicle manufacturer's service manual for details.

10. Inspect the parking brake lever-apply cable for excessive wear or damage, and replace as necessary. See vehicle manufacturer's service manual for details.

11. Inspect the axle pinion oil seal for leakage that can contaminate the park brake system parts and repair as necessary. See vehicle manufacturer's service manual for details.

12. After a thorough inspection, if the brake and its components are found to be in good working condition, check parking brake for proper shoe cage adjustment. See Shoe Cage Adjustment Procedures section for details.
Shoe Replacement

Removing the Shoes
1. Block the front wheels to keep the vehicle from moving.
2. With the engine off and battery disconnected, place the transmission in gear and release the parking brake.
3. If recommended in vehicle manufacturer’s service manual, raise the rear of the vehicle so the wheels clear the floor and install safety stands to support.
4. Remove the drum. See vehicle manufacturer’s service manual for details, if necessary.

Note: If the drum proves difficult to remove, insert a thin flat bladed screwdriver through the brake adjusting hole in the backing plate and disengage the adjuster lever from the adjuster nut teeth. With the adjuster lever disengaged as shown in Figures 14 and 15, insert a brake adjusting tool (or flat bladed screwdriver) through the adjusting hole to engage the adjusting nut teeth. Move the teeth upward enough times to retract the brake shoes to clear the drum. If the drum is rusted to the axle input flange yoke pilot, tap the center of the brake drum with a nonmetallic mallet to loosen.

5. Inspect the brake per the INSPECTION PROCEDURE in this service manual.

Figure 7. Adjuster Lever and Adjuster Spring Removal

CAUTION
Do not use a drum puller or a torch to remove a brake drum. Drum distortion may result.
Removing the Shoes (continued)

6. Detach adjuster cable from adjuster lever, slide cable off of adjuster cable guide, and remove the cable retaining tab if so equipped. See Figure 7.

7. Remove the adjuster lever and the adjuster spring. (These parts will need to be placed on the new replacement shoe, along with the adjuster lever mounting pin, in the opposite order removed.) See Figure 7.

8. Remove both shoe-return springs. Use pliers, vice-grips, or a heavy duty brake spring tool as shown in Figure 8.

9. Remove both shoe hold-down springs. Use a brake shoe spring tool as shown in Figure 9.

**TIP:** Detach the parking brake apply cable and lever return spring from the end of the lever to allow easier access to the spring on the lever side.

**Note:** If the brake is a Release 2 level design with a lever guide present, it will need to be removed to provide access to the spring underneath with the tool shown in Figure 9. Upon removal of the hold down springs, the shoes, and the adjuster nut screw assembly will fall if not secured by hand.

10. Remove brake shoes from backing plate.

11. Disassemble the adjuster nut and screw assembly for cleaning and inspection of the threads.
Installing the Shoes

⚠️ WARNING
Failure to correctly assemble the Adjuster Cable may result in reduced brake performance that could cause personal injury or property damage.

⚠️ WARNING
Torque all fasteners to the manufacturer’s recommended torque using a torque wrench. Failure to do so could possibly result in personal injury or property damage.
Installing the Shoes (continued)

1. Clean backing plate and adjuster screw assembly. Remove old grease from shoe contact points and adjuster threads as well as debris and corrosion that could contaminate linings or interfere with proper brake operation.

2. Apply a light film of Wolfrakote paste ledge grease to the six (6) backing plate shoe ledges and one (1) anchor post as shown in Figure 10.

3. Apply Chevron RPM heavy duty, lithium complex, molybdenum disulfide, extreme pressure grease, or equivalent, to the cam plate lugs where they contact the shoe ends, the end of the shoes that contact the cam lugs, and the brake lever.

Figure 10. Application of Wolfrakote Paste Grease to Wear Points and Chevron RPM Lithium Shoe Grease to Adjuster Screw
Installing the Shoes (continued)

4. Apply Chevron RPM heavy duty, lithium complex, molybdenum disulfide, extreme pressure grease to the threads of the adjuster screw, adjuster nut, and the socket ends of the adjuster nut and install the screw fully into the adjuster nut. Insure the screw moves in and out freely. If any damage to the threads prohibits free movement, or if the starwheel is damaged, replace adjuster assembly. See Figure 10.

Note: Only use the approved lubricants as specified. Do not substitute.

Note: When installing new shoes, make sure the shoe with the adjuster cable guide and adjuster lever pin is installed on the correct side of the shoe. See Figure 11.

5. Place one shoe into the installed position. Reattach shoe hold-down spring and pin. See Figures 9 and 11.

CAUTION
For Steps 5 through 10, proper orientation of the various springs, including their hook-ends must be maintained, as shown in Figure 11, for proper brake function.

Figure 11. Brake Shoe Installation
Installing the Shoes (continued)

6. Position the second shoe and the adjuster nut and screw assembly as shown in Figure 11. The adjuster nut (internally threaded) should be seated against the shoe with the adjuster cable guide and pin. Reattach shoe hold-down spring to shoe hold-down pin using the brake spring tool as shown in Figure 9.

7. Install both shoe-return springs as shown in Figure 11.

8. Install the adjuster spring and the adjuster lever. Ensure that the adjuster lever is properly seated against the starwheel as shown in Figure 11.

9. If the lever has been removed, reinstall lever and associated components per the ANCHOR SCREW, LEVER, AND CAM REPLACEMENT section in the manual.

Figure 12. Adjuster Cable Installation
Installing the Shoes (continued)

10. Route the adjuster cable around the adjuster cable guide, under the shoe hold down spring, and attach to the adjuster lever as shown in Figure 12. Install adjuster cable retaining tab if so equipped.

   Note: Correctly assembled, the adjuster cable end-fitting is behind the adjuster lever, with the spring hook facing out as shown in Figure 12.

11. The shoe cage should be adjusted now per the SHOE CAGE ADJUSTMENT PRIMARY procedure or after the drum has been reinstalled per the SHOE CAGE ADJUSTMENT ALTERNATE procedure in this service manual.

12. Make a final inspection of the shoe linings and the inside of the drum to ensure that no grease or other contamination was accidentally applied.

   **WARNING**

   Keep grease and other foreign materials away from the shoe lining and drum surfaces. Contamination of shoe linings or drum surface may result in degradation of brake holding capability, possibly resulting in personal injury or property damage.

13. Inspect, service and reinstall drum per the vehicle manufacturer’s service manual.

14. Lower the vehicle and test the brake for proper function before returning the vehicle for service use. If necessary, make adjustments per the vehicle manufacturer’s service manual.

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**Shoe Cage Adjustment Procedures**

**Adjustment with Drum Off - Primary Procedure**

1. Use a 12 inch caliper, or inside micrometer, to measure the inside diameter of the drum. Subtract 0.025 inches from the drum inside diameter measurement. Set the measurement caliper to this value, and lock the set screw.

2. Rotate the axle input flange yoke as necessary to provide clearance for the measurement caliper.

3. Place the pre-adjusted caliper over the shoes at the center of the shoes.
Adjustment with Drum Off - Primary Procedure (continued)

4. To adjust brake, rotate the starwheel until the shoes touch the measurement caliper jaws. It is necessary to disengage the adjuster lever away from the starwheel. See Figure 13.

Note: During adjustment the calipers should be moved up and down around the shoe center points to ensure adjustment at the highest points across the width of the shoes.
Adjustment with Drum Installed - Alternate Procedure

1. With the engine off, the battery disconnected, and the tires blocked to prevent vehicle movement, place transmission in neutral and fully release the parking brake. Check to see if the drum can be rotated back and forth by hand. If the drum cannot rotate, it will be necessary to raise the rear wheels off the ground, in order to allow rotation of the drum. Support the vehicle with suitable floor stands.

*Note: Some vehicles may not have enough clearance behind the park brake to have direct access through the access slot to the adjuster lever. In these cases, an adjuster lever tool can be made from 3/32” diameter welding filler rod. See Figure 16.*

2. Insert the adjuster lever tool or a thin flat bladed screwdriver through the adjusting slot in the backplate and push on the adjuster lever to disengage it from the adjuster starwheel. Insert a brake adjusting tool (or flathead screwdriver) through the adjusting slot and move the starwheel teeth downward to expand the brake shoes outward. See Figures 14 and 15. Continue expanding the shoes until the drum can not be rotated by hand.

3. Now adjust the starwheel teeth upward to retract the shoes until the drum just begins to rotate freely by hand (without drag from the shoes). See Figures 14 and 15.

![Figure 14. Brake Adjustment With Drum In Place (cut away view)](image-url)
Disengaging Adjuster Lever from Adjuster Starwheel to Allow Retracting the Brake shoes (Loosen Brake)

Note: Some vehicles may not have enough clearance behind the park brake to have direct access through the access slot to the adjuster lever. In these cases, an adjuster lever tool can be made from 3/32” diameter welding filler rod. See Figure 16.

Figure 15. Disengaging Adjuster Lever from Adjuster Starwheel to Allow Retracting the Brake Shoes (Loosen Brake)
Figure 16. Brake Adjuster Lever Tool
Anchor Screw, Lever, and Cam Replacement

Removing Components

Note: The anchor screw, lever, and cam should all be replaced at the same time. Do not replace just one or two of the three parts at any time. Inspection of these parts is recommended at 250,000 miles or 5 years for typical use, or more often under severe operating conditions.

1. Block the front wheels to keep the vehicle from moving.

2. With the engine off and battery disconnected, place the transmission in gear and fully release the parking brake.

3. If recommended in vehicle manufacturer’s service manual, raise the rear of the vehicle so the wheels clear the floor and install safety stands to support.

4. Remove the drum. See vehicle manufacturer’s service manual for details, if necessary.

Note: If the drum proves difficult to remove, insert a narrow screwdriver through the brake adjusting hole in the backing plate and disengage the adjuster lever from the adjuster nut starwheel teeth. With adjuster lever disengaged as shown in Figures 14 and 15, insert a brake adjusting tool (or screw driver) through the adjusting hole to engage the adjusting nut teeth. Move the teeth upward enough times to retract the brake shoes to clear the drum. If the drum is rusted to the axle input flange yoke pilot, tap the center of the brake drum with a non-metallic mallet to loosen.

5. Inspect the brake per the INSPECTION procedure in this service manual.

6. Detach the parking brake apply cable and lever return spring from end of brake lever. Remove the apply lever guide (on Release 2 brakes).

7. Detach adjuster cable from the adjuster lever and slide adjuster cable off the adjuster cable guide, remove retaining tab if so equipped. See Figure 7.

8. Remove the anchor screw. See Figure 17.
Removing Components (continued)

Note: On Release 1 brakes with a hex socket anchor screw, the use of a thread-locking compound may prevent removal of the anchor screw with a hex key and torque in excess of 55 Nm (40 ft.-lbs.) May break or deform a 6mm hex key. If necessary, use a pipe wrench, vice grips, or similar tool on the knurling of the head to loosen the anchor screw. Replace screw if removed, regardless of condition.

9. Remove the flat washers (if installed on your application for Release 1 level brake), anti-rattle spring, lever, cam, and adjuster cable. See Figures 2 and 17.

Figure 17. Spring, Lever, Cam, and Adjuster Cable Removal
(Release 3 Brake Shown)
Installing Components

Note: If for any reason the cam, lever, and anchor screw is removed, a complete new set is recommended for service.

1. Remove the cured thread-locking compound from the anchor post hole threads. Run the appropriate size tap completely into the anchor post and back out to clean the threads. Remove loose debris from anchor post hole.

Note: For brakes with a hex socket head anchor screw, use an M10 x 1.5 tap (brakes manufactured prior to April 2002). For brakes with an external hex head anchor screw, use an M12 x 1.75 tap (brakes manufactured after April 2002).

2. Apply Chevron heavy duty lithium complex extreme pressure grease, or equivalent, to the cam plate lugs where they contact the shoes and the apply lever, to the cam plate slotted hole and top and bottom faces. Apply grease to the brake lever pivot hole and the contact surfaces with the cam plate lugs. Apply grease to the non-threaded portion of the anchor screw. Do not get grease on anchor screw threads or in anchor post threaded hole.

3. Reinstall the adjuster cable, new cam plate, new lever, anti-rattle spring (small coil end toward screw head for Release 2), flat washers (if previously installed on your application), and new anchor screw as shown in Figure 8. Make sure the adjuster cable end fitting is installed to allow the cam plate to sit flat on the fitting and anchor post.
   • Stepped type end fitting - the step faces towards the backplate. See Figure 18.
   • Alternate “eyelet” type fitting - cable crimp portion faces towards the backplate. See Figure 18.

⚠️ CAUTION
Only thread anchor screw into the anchor post 1 to 2 turns to temporarily hold assembly together. Do not thread in completely until ready to tighten to specification (step 4).

A faulty installation will result if the thread-locking compound is activated and begins to cure prior to tightening the screw.

⚠️ CAUTION
When installing the hex socket head anchor screw, careful attention should be taken during reassembly to ensure that the adjuster cable-end fitting is not clamped underneath the shoulder of the anchor screw during reassembly.

Clamping the adjuster cable may prevent proper functioning of the brake self-adjust feature.
Installing Components (continued)

4. Tighten the anchor screw per the appropriate specification:
   - For the internal hex socket anchor screw tighten to $50 \pm 3$ Nm ($37 \pm 2$ ft-lbs.)
   - For the external hex head anchor screw tighten to $100 \pm 10$ Nm ($74 \pm 7$ ft-lbs.)

   **CAUTION**
   To tighten the anchor screw, only use a recently calibrated, known good, “clicker” type torque wrench set to the correct torque specification. Do not use add on devices such as universal joints, swivels, crows feet or other devices as these can cause inaccurate tightening results. Do not attempt this repair if a recently calibrated, known good “clicker” type torque wrench is not available. Failure to do so could result in personal injury or property damage.

   *Note: Remove excess grease that could contaminate brake drum or linings while the brake is in service.*

5. Reinstall the lever return spring and parking brake cable to the end of the brake lever.

6. Route the adjuster cable around the adjuster cable guide, under the shoe hold-down spring, and attach to the adjuster lever as shown in Figure 12. Install adjuster cable retainer tab if equipped.

   *Note: When correctly assembled, the adjuster cable end-fitting is behind the adjuster lever with the spring hook facing out as shown in Figures 12 and 18. Failure to do so may result in reduced brake operation.*
7. The shoe cage should now be adjusted per the SHOE CAGE ADJUSTMENT PRIMARY procedure or after the drum has been reinstalled, per the SHOE CAGE ADJUSTMENT ALTERNATE procedure in this service manual.

8. Make a final inspection of the shoe linings and the inside of the drum to ensure that no grease or other contamination is present.

**CAUTION**

Keep grease and other foreign materials away from the shoe lining and drum surfaces. Contamination of shoe linings or drum surface may result in degradation of brake holding capability, possibly resulting in personal injury or property damage.

9. Inspect, service, then reinstall drum per the vehicle manufacturer’s service manual.

10. Lower vehicle and remove the blocks or wheel chocks from the front wheels.

11. Test the brake for proper function before returning the vehicle for service use. If necessary, make adjustments per the vehicle manufacturer’s service manual.
## Trouble Shooting

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<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
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<tbody>
<tr>
<td>Light force or lack of resistance when applying brake lever (on manual apply systems)</td>
<td>Shoe cage under-adjusted¹</td>
<td>Adjust shoes per shoe cage adjustment procedure</td>
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<tr>
<td></td>
<td>Worn or deformed actuation components (lever, cam lugs shoe ends)</td>
<td>Inspect and replace per Anchor Screw, Lever, and Cam Replacement procedure or Shoe Replacement procedure</td>
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<tr>
<td></td>
<td>Apply system not operating properly</td>
<td>Repair per manufacturer’s recommended procedure</td>
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<tr>
<td>Heavy force or excessive resistance when applying brake lever (on manual apply system)</td>
<td>Over adjusted brake</td>
<td>Adjust brake cage clearance diameter</td>
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<td>Apply system over adjusted</td>
<td>Adjust or repair per manufacturer’s recommended procedures</td>
</tr>
<tr>
<td>Brake does not release</td>
<td>Internal damage to brake</td>
<td>Inspect and replace damaged components</td>
</tr>
<tr>
<td></td>
<td>Apply cable bound up</td>
<td>Check cable for corrosion, binding, kinks, or damage. Repair per vehicle manufacturer’s recommended procedures</td>
</tr>
<tr>
<td></td>
<td>Apply system not operating properly</td>
<td>Repair per vehicle manufacturer’s recommended procedure</td>
</tr>
<tr>
<td>Brake does not hold vehicle on hill</td>
<td>Grease, oil or other foreign material on or embedded in shoe linings</td>
<td>Replace shoes and clean drum²</td>
</tr>
<tr>
<td></td>
<td>Damaged or incorrect shoes</td>
<td>Replace with correct shoes</td>
</tr>
<tr>
<td></td>
<td>Worn out lining (metal shoe rim contacting drum)</td>
<td>Replace shoes and resurface or replace drum as necessary</td>
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<td></td>
<td>Excessive drum runout</td>
<td>Resurface or replace drum per manufacturer’s recommended procedure</td>
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<td>Shoe cage under-adjusted</td>
<td>Adjust shoes per primary (or alternate) Shoe Cage Adjustment procedure</td>
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<tr>
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<td>Worn or deformed actuation components (lever, cam lugs, shoe)</td>
<td>Inspect and replace per Anchor Screw, Lever, and Cam Replacement procedure</td>
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¹ Inspect adjuster components to see if any are damaged or jammed.
² Inspect the rear pinion seal for leakage that can contaminate the park brake system parts. Repair as necessary.
Component Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
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<td>76mm (3.00 inch)</td>
</tr>
<tr>
<td>Drum (typical): (non Bosch part)</td>
<td></td>
</tr>
<tr>
<td>inside diameter</td>
<td>304.8mm (12.000 inch)</td>
</tr>
<tr>
<td>max inside diameter</td>
<td>305.7mm (12.035 inch)</td>
</tr>
<tr>
<td>thickness</td>
<td>8 mm (0.315 inch)</td>
</tr>
<tr>
<td>surface finish</td>
<td>3.2 micro m (125 micro in) or less</td>
</tr>
</tbody>
</table>

Fastener Torque Specifications

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Size</th>
<th>Torque</th>
<th>Brake Manufacture Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor Screw, hex socket head</td>
<td>M10 x 1.5</td>
<td>50±Nm (37 ± 2 ft-lbs)</td>
<td>Before April 2002</td>
</tr>
<tr>
<td>Anchor Screw, external hex head</td>
<td>M12 x 1.75</td>
<td>100±1 Nm (74 ± 7 ft-lbs)</td>
<td>After April 2002</td>
</tr>
</tbody>
</table>

Special Tools

These tools aid in servicing the parking brake:
- Heavy duty brake spring tool such as those available from, Lisle (#44800), Matco Tools (#BST 4480), Snap-On Tools (#BT19A) and others.
- Brake shoe retaining spring tool is available from Matco Tools (#RST10), Vim Tools - Durston Manufacturing (#B10) and others.

Lubrication

- Wolfrakote top paste (#89003-198)
  Manufacturer: Kluber Lubrication, 32 Industrial Dr., Londonberry, NH 03053, www.kluber.com, phone 603-647-4101
- Chevron RPM heavy duty LC EP NLGI 2 grease
  Distributor: Brenntag Southeast, 4200 Azelea Dr., Charleston, SC 29405, phone 843-744-7421
Correspondence concerning this manual should be addressed to:

Robert Bosch Corporation
ATTN: Foundation Brake Engineering
401 North Bendix Drive
South Bend, Indiana 46628

Fax: 574-237-5603