

Thermal Overload  
 VAH, VHD, VN

**FSB 512-001, Thermal Overload**

(November 2013)

It has been reported in the field that the Bendix air disc brake may exhibit a thermal overload condition. Thermal overload is simply an over adjustment of the normal pad wear compensation that maintains the running clearance between the brake pad and rotor. Thermal overload reduces the running clearance between the pad and rotor below a desired level. This over adjustment does not come on suddenly, but rather slowly over time, until the running clearance goes to zero and the pads are in contact with the rotor. Under this condition the pads swell and may drag until the high temperature (accelerated) wear removes enough pad material to reestablish running clearance. The main causal issue is high frequency or magnitude of axle vibration and why it is typically only seen at one wheel end.

There have been very limited occurrences of thermal overload across varying applications and vehicle configurations. However, in the event that any of the above issues are found, or any thermal overload is suspected, immediately go to the on-line document library at [www.bendix.com](http://www.bendix.com) for free downloads of Service Data Sheets (SD-23-7541). BW7514b will provide specific instructions regarding how to diagnose a potential thermal overload occurrence. You can also contact the Bendix Technical Help Line: 1-800-AIR-BRAKE, (1-800-247-2725) and select option 2, then option 1, Mon.- Fri., 8 a.m. - 6 p.m. EST. for information on how to remedy these issues.

**Part Numbers**

- 85136663 — Disc Brake Caliper Assembly LHS
- 85136662 — Disc Brake Caliper Assembly RHS
- 85136940 — Brake Shoes
- 21538404 — Brake Rotor

Service personnel: Please circulate, read and initial

Service Manager	Warranty Administrator	Workshop Foreman	Service Technicians						

## Inspection Procedure

### Section A: Inspect Vehicle (Thermal Overload Event)

- 1 Secure the vehicle for service by parking it on a level surface, applying the parking brake, blocking the wheels, and placing the transmission in neutral or park.
- 2 Disconnect all cables from the negative (ground) battery terminals to prevent personal injury from electrical shock and prevent damage to electrical components.
- 3 Follow safe lifting guidelines, lift and support both the frame and the axle housing.



#### **DANGER**

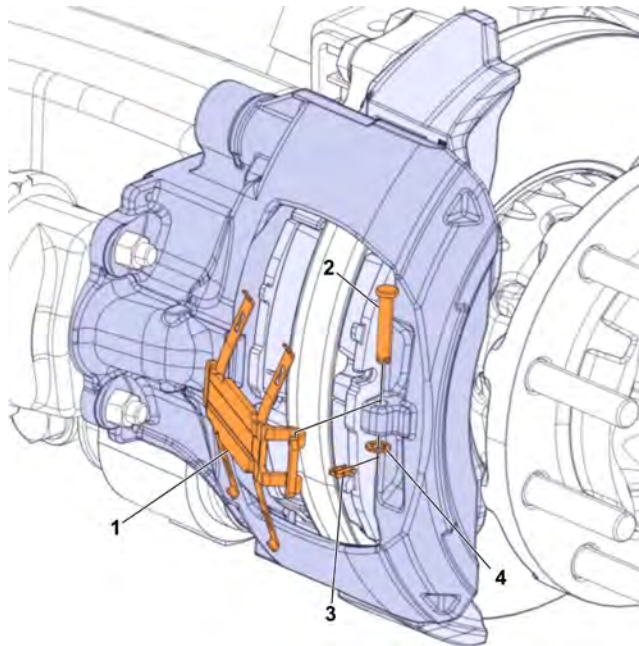
Failure to properly support the front of the axle housing may result in the axle rolling forward, causing serious injury or death.

- 4 Remove the wheels and tires.
- 5 Release the parking brake.
- 6 Retrieve instructions for inspection.
- 7 Perform a search for the words "thermal overload".
- 8 Click "*more*" on the *Bendix Commercial Vehicle Systems, BW7514 THERMAL OVERLOAD CHECKLIST Download*.
- 9 Download the latest *BW7514 THERMAL OVERLOAD CHECKLIST*.
- 10 Perform steps in the checklist.
- 11 Replace as needed.

## Brake Pad Replacement

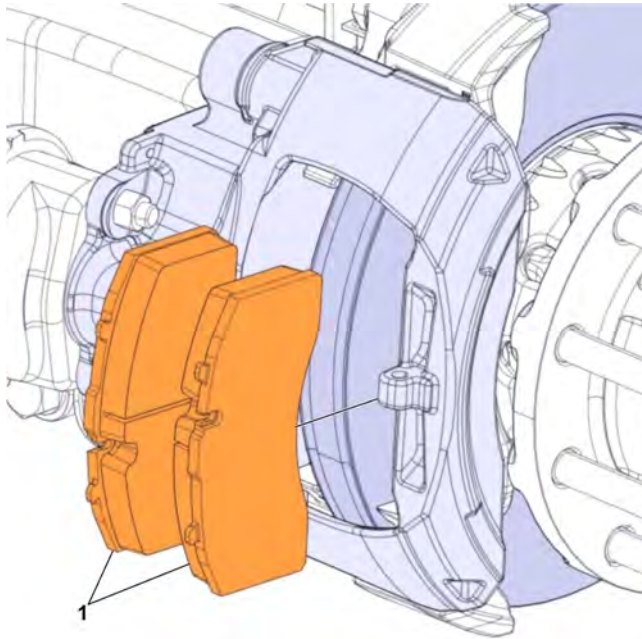
- 1 Chock the wheels.
- 2 Lift and support the axle on jack stands.
- 3 Release the parking brakes.
- 4 Remove the wheel(s) from the wheel end in question.
- 5 Back off the brake adjuster.
- 6 Remove the brake pad retainer, pin and clip. Remove the brake pads.

**Note:** Ensure the rest of the brake assembly is operational and within serviceable limits.



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- 1 Retainer
- 2 Pin
- 3 Clip
- 4 Washer



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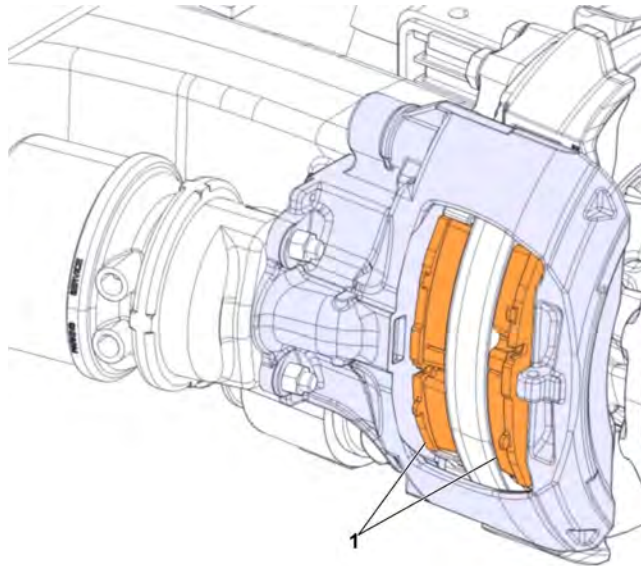
1 Pad removal

7 Install new brake pads and secure with retainer, pin, washer and clip.

**Note:** If wear sensors are used, ensure they are serviceable or replace as needed.

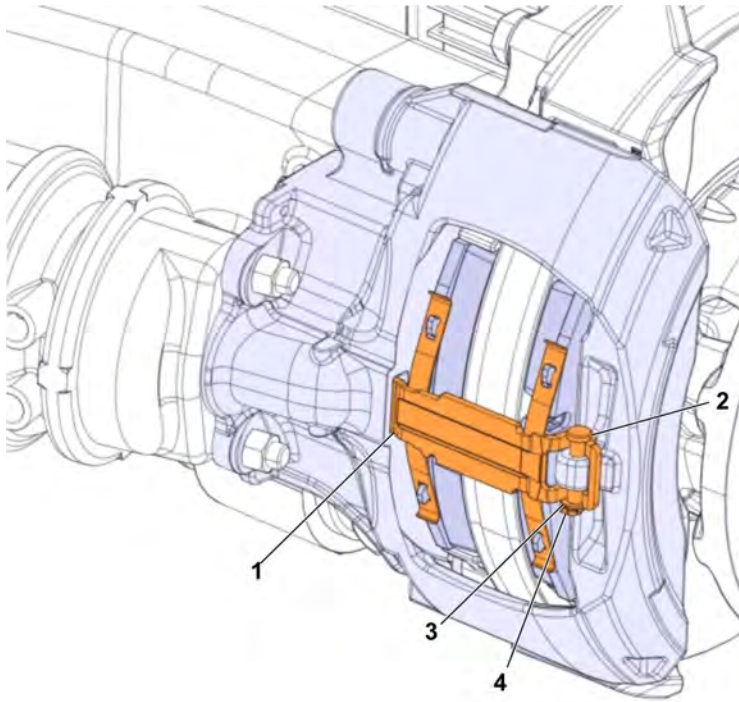
**Note:** The adjuster may need to be turned counter-clockwise to open up enough room between the caliper and rotor to install the pads.

**Note:** Clean the brake pad contact area on caliper.



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1 Pads installed



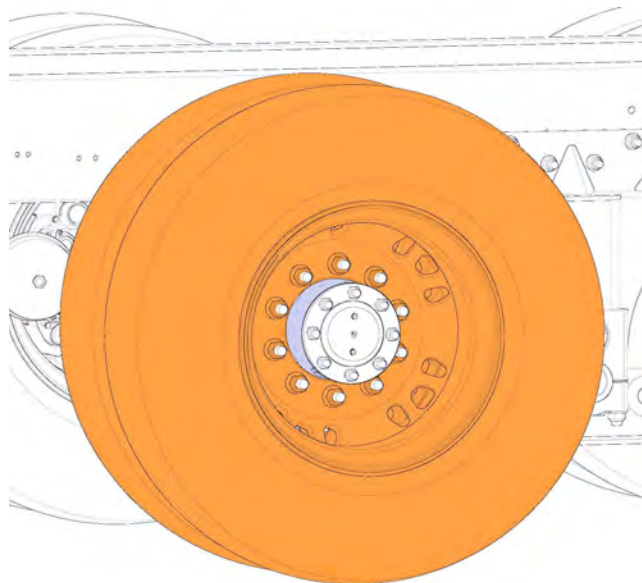
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- 1 Retainer
- 2 Pin
- 3 Clip
- 4 Washer

8 Adjust the brake pad clearance by turning the adjuster screw until the clearance between the tappets and pads is between 0.5 mm (0.020 in.) and 1.0 mm (0.040 in.).

**Note:** The caliper should be pushed inboard on its guide pins during this check.

- 9 Repeat the above steps for the other wheel end of the same axle.
- 10 Install wheel(s). Torque to 610 NM (450 ft-lb).



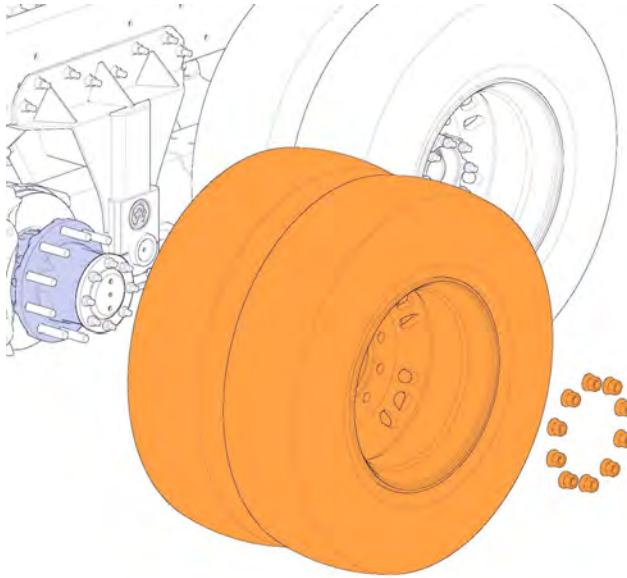
W5084816

11 Apply the parking brake.

12 Lift the axle, remove the jack stands and chocks. Lower vehicle.

## Caliper Replacement

- 1 Chock the wheels.
- 2 Lift and support the axle on jack stands.
- 3 Release the parking brakes.
- 4 Remove the wheel(s) from the wheel end in question.

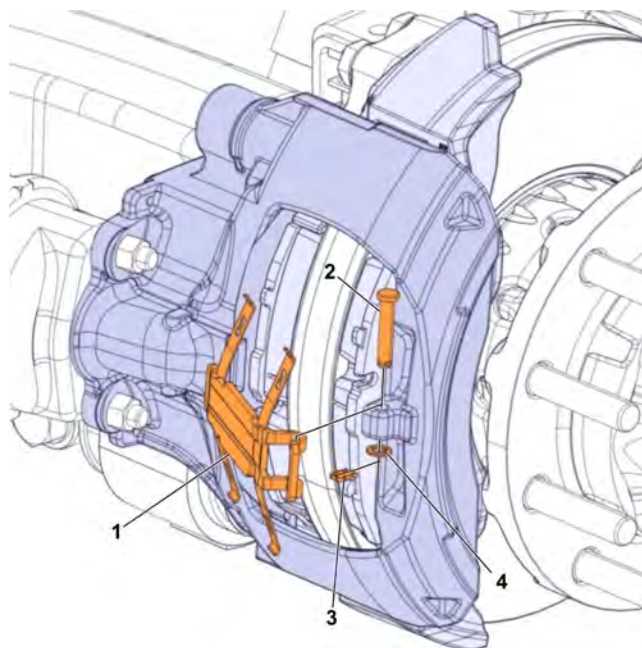


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- 5 Back off the brake adjuster.
- 6 Remove the brake pad retainer, pin and clip. Remove the brake pads.

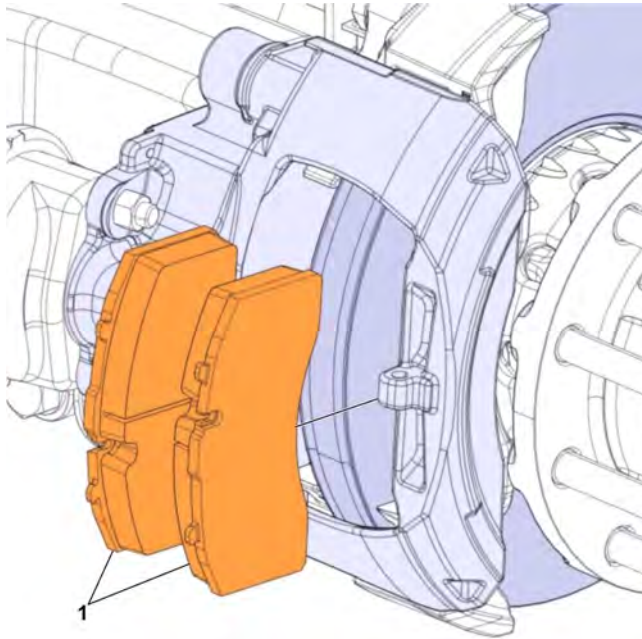
**Note:** Ensure the rest of the brake assembly is operational and within serviceable limits.





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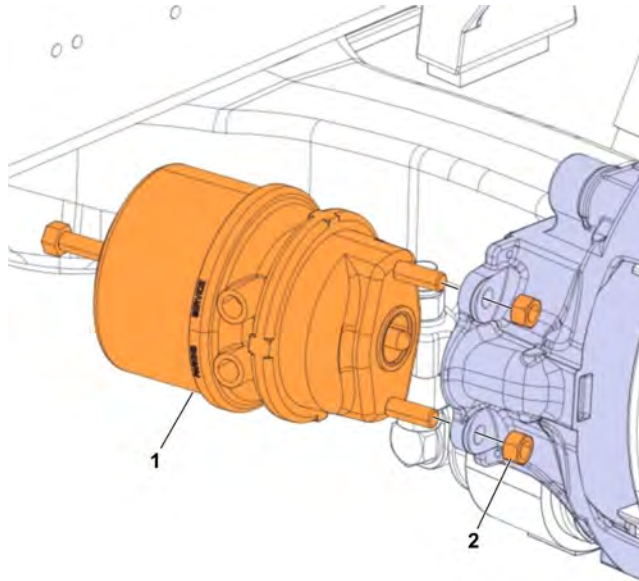
- 1 Retainer
- 2 Pin
- 3 Clip
- 4 Washer



W5084510

1 Pad removal

- 7 Release parking brakes and cage brake chamber (if applicable).
- 8 Remove the brake hose.
- 9 Remove the actuator assembly - service brake chamber or park brake chamber.



W5084511

- 1 Actuator Assembly (Park Brake Chamber)
- 2 Fasteners

10 Remove the outer boot clips or cap.

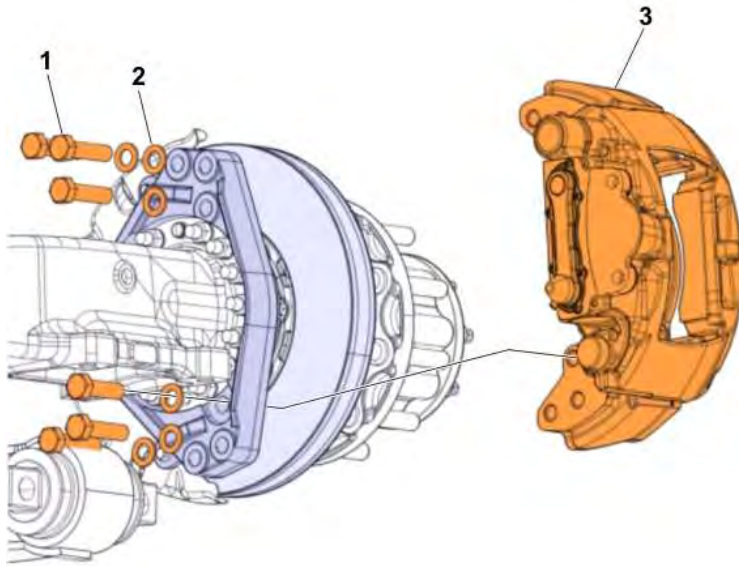
**Note:** Brake chamber mounting hardware can be reused.

11 Remove the caliper bolts and discard.



### WARNING

Never insert fingers between caliper and carrier. Hold the exterior of caliper only, or serious personal injury may result.



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- 1 Bolts
- 2 Washers
- 3 Caliper

12 Remove lower fasteners on suspension (if applicable) to access caliper bolts.

**Note:** Use new caliper mounting hardware.

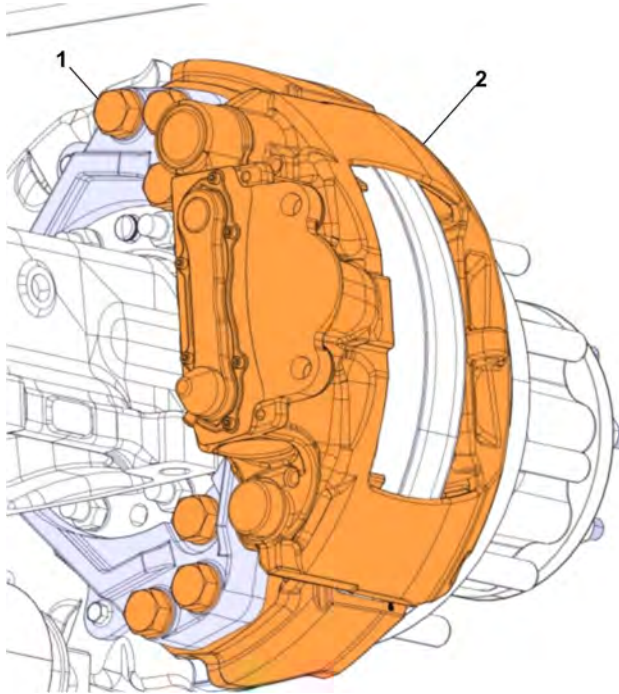
13 Remove upper fasteners (if applicable).

14 Remove bracket (if applicable).

15 Check part numbers to ensure correct installation of new caliper.

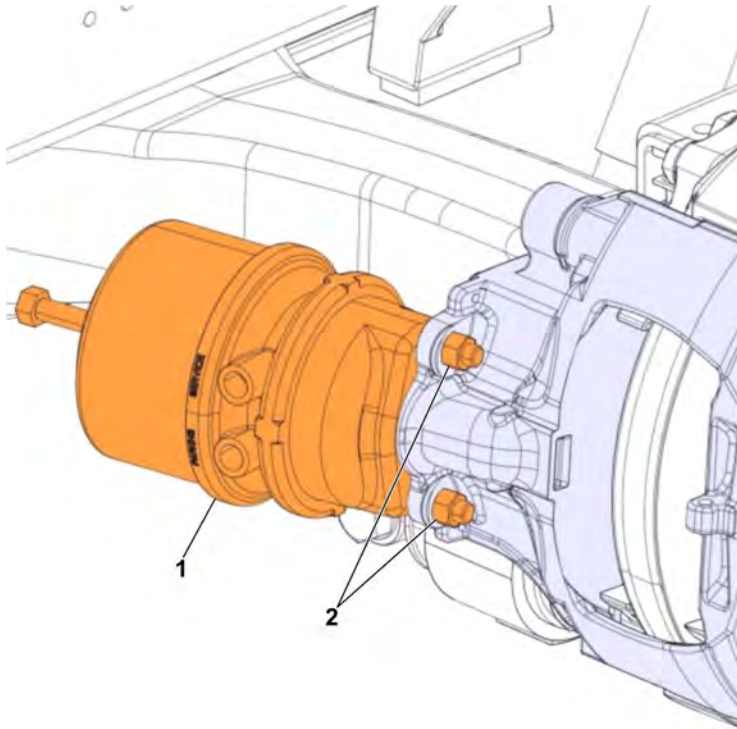
### Install Caliper with Rubber Boot

- 1 Install caliper to carrier with new hardware and tighten M20 bolts to:  
Highway Brake: 508 Nm (375 ft-lb)  
Refuse Brake: 271 Nm + 60 degrees (200 ft-lb + 60 degrees).



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- 1 Fastener
  - 2 Caliper
- 2 Check caliper after mounting to carrier: Ensure caliper slides easily on carrier and check inner boot position on caliper bolt sleeves.
  - 3 Install rubber boots and clips.  
**Note:** Replace rubber boots and clips if necessary.
  - 4 Install brake pads and secure retainer, pin, washer and clip.  
Torque to  $27 \pm 3$  Nm ( $20 \pm 2$  ft-lb)
  - 5 Install the actuator assembly - service brake chamber or park brake chamber. Torque to  $180 \pm 30$  Nm ( $133 \pm 22$  ft-lb).

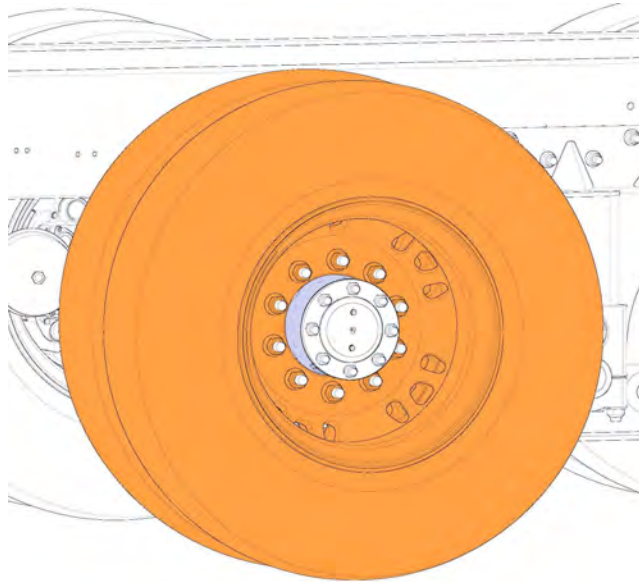


W5084525

1 Actuator Assembly (Park Brake Chamber)

2 Fastener

- 6 If spring brake chamber was installed, un-cage park brake chamber at this time.
- 7 Install brake hose.
- 8 Adjust the brake pad clearance by turning the adjuster screw until the clearance between the tappets and pads is between 0.5 mm (0.020 in.) and 1.0 mm (0.040 in.).  
**Note:** The caliper should be pushed inboard on its guide pins during this check.
- 9 Install wheel(s). Torque to 610 NM (450 ft-lb).



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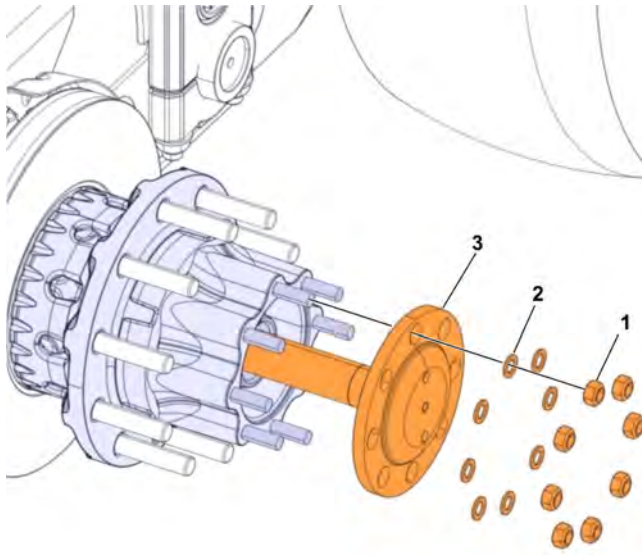
10 Apply the parking brake.

11 Lift the axle, remove the jack stands and chocks. Lower vehicle.

## Rotor Replacement (1 Wheel)

The Mack proprietary axle will be covered by Volvo (not Bendix product), otherwise it is covered in SD-23-7541 for Volvo vendor axles.

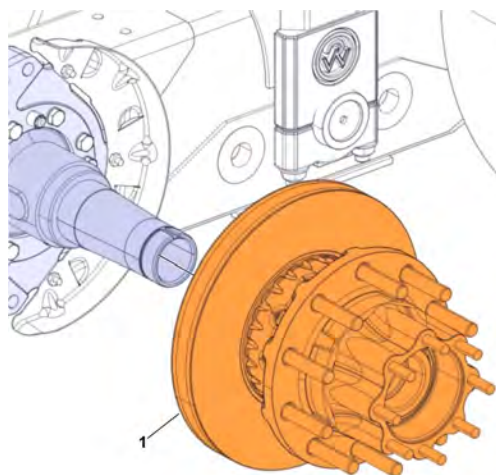
- 1 Prior to removing the brake rotor, the brake pads and caliper should be removed.
- 2 Remove the hub from the vehicle.



W5084513

- 1 Nuts
- 2 Washers
- 3 Axle

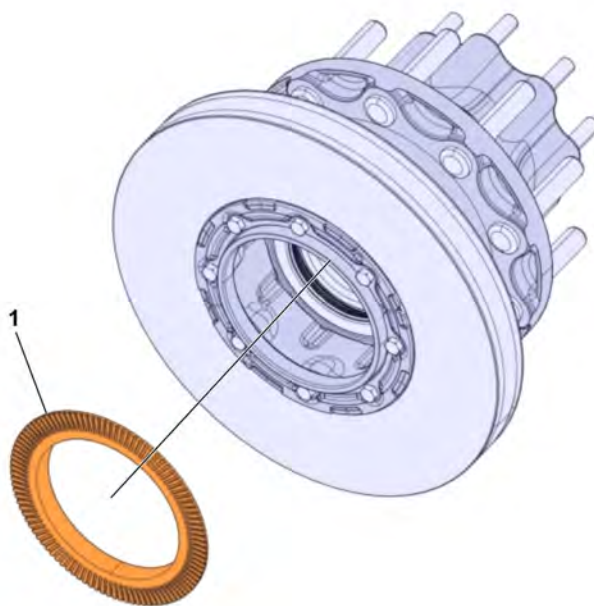




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1 Hub Assembly

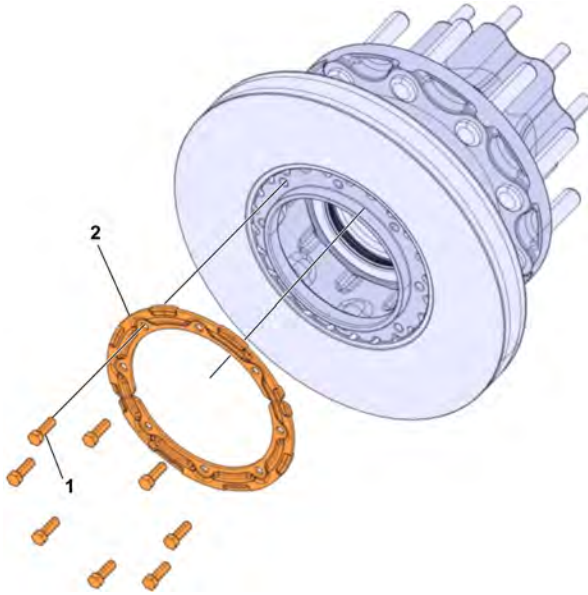
3 Remove ABS tone ring.



W5084515

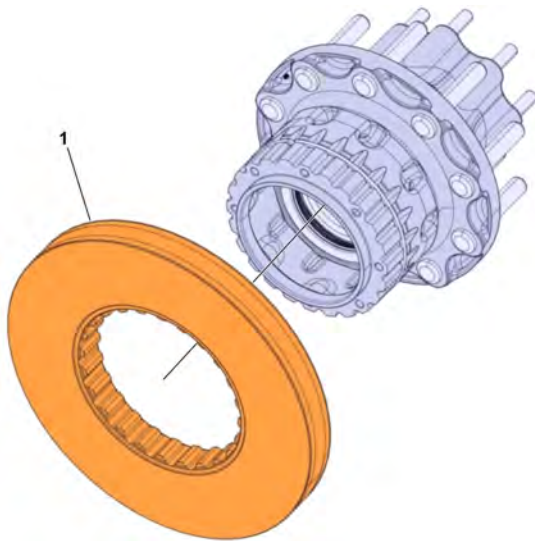
1 ABS Tone Ring

4 Remove the rotor from the hub.



W5084516

- 1 Fasteners
- 2 Spacer Ring



W5084517

- 1 Rotor

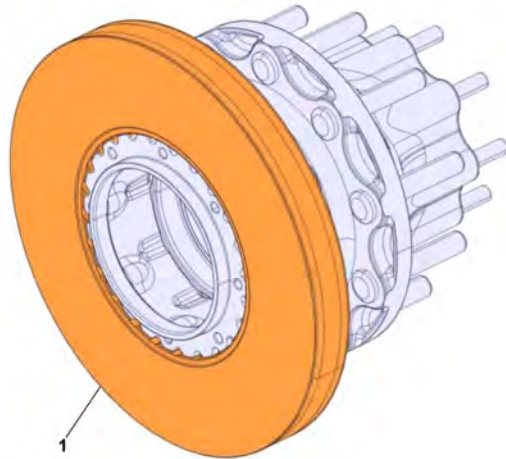
5 Install the new rotor onto the hub and torque fasteners. Torque rotor bolts, using regular cross/wheel pattern.

Step 1: Torque bolts to 15 Nm +9/-3 (11 ft-lb +7/-2)

Step 2: Torque bolts to 41 Nm +4/-5 (30 ft-lb +3/-4)

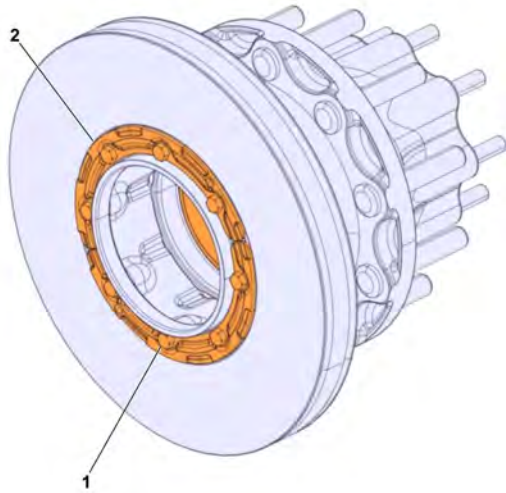
Step 3: Torque bolts to 57 Nm +8/-9 (42 ft-lb +6/-7)

**Note:** Use new rotor mounting hardware.



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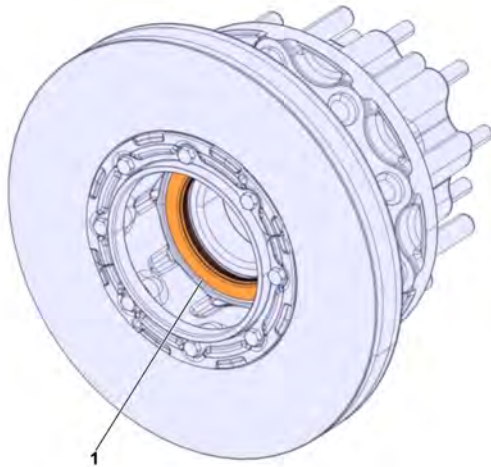
1 Rotor



W5084519

- 1 Fastener
- 2 Spacer Ring

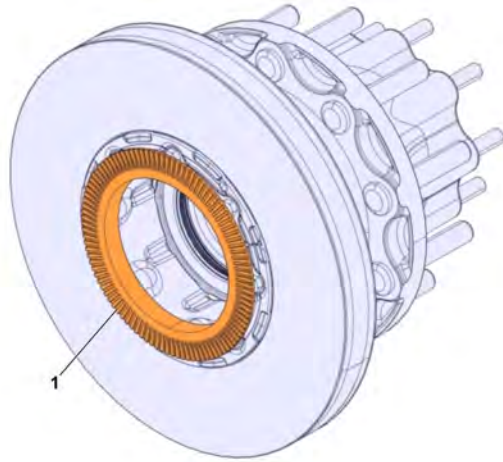
6 Replace wheel seal.



W5084520

- 1 Wheel Seal

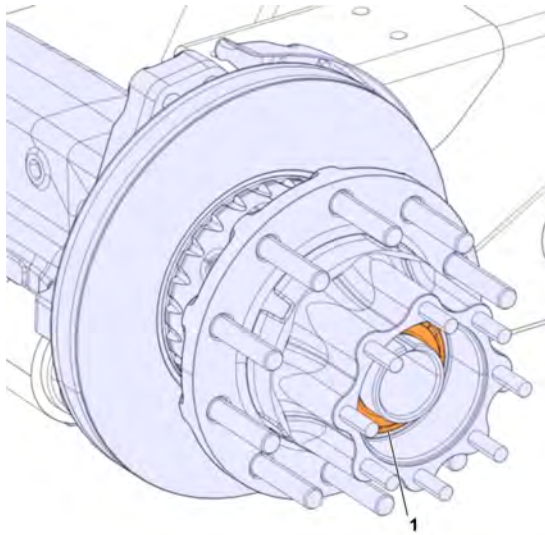
7 Install new ABS tone ring.



W5084521

1 ABS Tone Ring

- 8 Install hub onto axle and adjust wheel end bearing according to either preset or unitized specifications.



W5084522

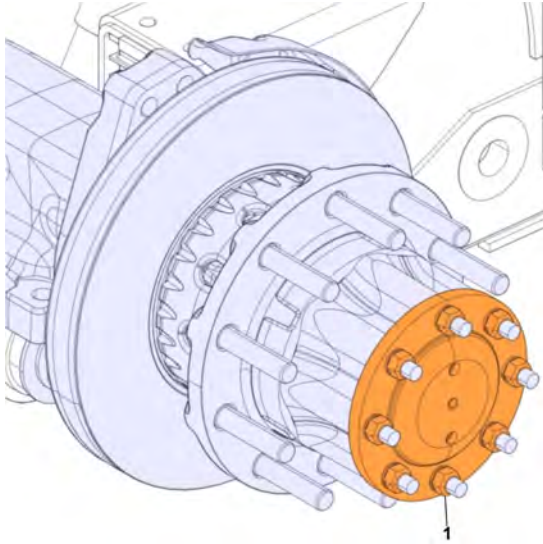
1 Hub installed

9 Install axle and secure. Torque as follows:

$\frac{3}{4}$ "-16: 372±34 Nm (275±25 ft-lb)

5/8": 136±20 Nm (100±15 ft-lb) (Plain Nut with Tapered Dowel and Split Lockwasher)

M14: 150±15 Nm (111±11 ft-lb)



W5084523

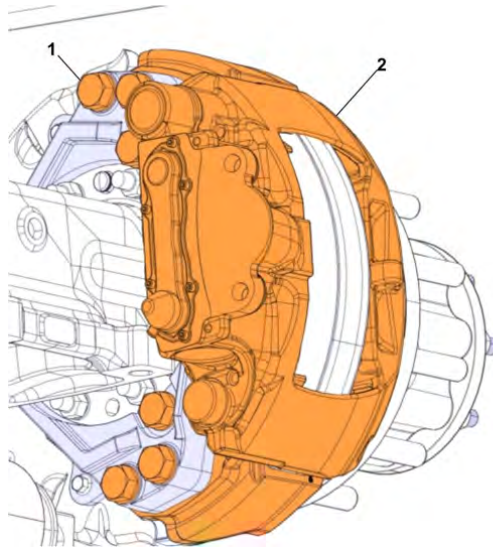
1 Axle Fasteners

10 Install bracket (if applicable).

11 Install upper fasteners on suspension (if applicable).

12 Install lower fasteners (if applicable).

13 Install caliper to carrier with new hardware and tighten bolts to 285±25 Nm (210 ±18 ft-lb).



W5084524

- 1 Fastener
- 2 Caliper

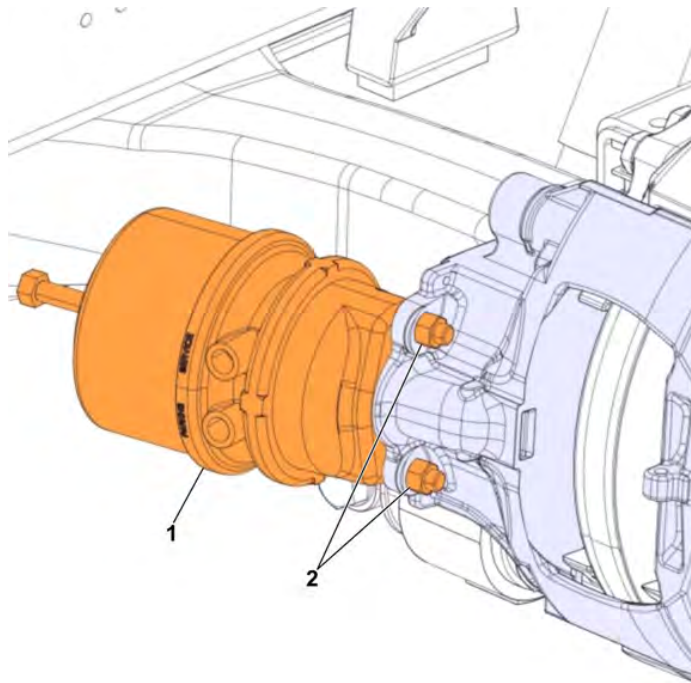
14 Check caliper after mounting to carrier: Ensure caliper slides easily on carrier and check inner boot position on caliper bolt sleeves.

15 Install rubber boots and clips.

**Note:** Replace rubber boots and clips if necessary.

16 Install brake pads and secure retainer, pin, washer and clip.

17 Install the actuator assembly - service brake chamber or park brake chamber. Torque to  $180 \pm 30$  Nm ( $133 \pm 22$  ft-lb).



W5084525

- 1 Actuator Assembly (Park Brake Chamber)
- 2 Fastener

18 If spring brake chamber was installed, un-cage park brake chamber at this time.

19 Install brake hose.

20 Adjust the brake pad clearance by turning the adjuster screw until the clearance between the tappets and pads is between 0.5 mm (0.020 in.) and 1.0 mm (0.040 in.).

**Note:** The caliper should be pushed inboard on its guide pins during this check.

21 Install wheel(s). Torque to 610 NM (450 ft-lb).

22 Apply the parking brake.

23 Lift the axle, remove the jack stands and chocks. Lower vehicle.

**Bendix Document Number/ Description:**

BW7514/ Thermal Overload Checklist

SD-23-7541/ AIR DISC BRAKE ADB22X AND ADB22X-V

**Bendix contact Info:**

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