

Meritor EX+™ Series Air Disc Brake

REPLACING AIR DISC BRAKES WITH MERITOR EX+™ H MODEL AIR DISC BRAKES

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ 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.

How to Obtain Additional Maintenance, Service and Product Information

Refer to [Maintenance Manual MM-0467 EX+™ Air Disc Brake](#). To obtain this and additional publications, visit Literature on Demand at meritor.com.

Contact the Meritor OnTrac™ Customer Service Center

For additional information and guidance, contact the Meritor OnTrac™ Customer Service Center at 866-668-7221 (US and Canada) between 7:30 AM and 10:00 PM ET Monday through Friday, and between 9:00 AM and 6:00 PM ET on Saturday; 001-800-889-1834 (Mexico); or visit our website: www.meritor.com/warranty.

How to Obtain Kits

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

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

EX+™ H Model Air Disc Brake Retrofit Procedures

This publication provides procedures for removing an existing air disc brake and replacing it with a Meritor EX+™ H model air disc brake.

Tools Required

- Torque Wrench, 500 lb-ft (678 Nm) Capacity
- 17 mm-size Socket for Retainer Bar Bolt
- 10 mm-size Box Wrench for Adjuster
- 24 mm-size Socket for Brake Chamber Nut
- Appropriate-size Socket (24, 27 or 30 mm) for Caliper Bolt
- Extension Adapter, Meritor Part Number 3256-B-1354
- Needle Nose Pliers for Retainer Bar Clip
- Brake Manufacturer's Recommended Adjuster Tool

Safety Precautions

Before performing the procedures in this publication, read and understand the following safety precautions.

⚠ DANGER

ASBESTOS AND NON-ASBESTOS FIBERS - Some brake linings contain asbestos fibers, a cancer and lung disease hazard. Some brake linings contain non-asbestos fibers, whose long-term effects to health are unknown. Use caution when handling both asbestos and non-asbestos materials.

⚠ 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 safety stands can result in death or serious personal injury and damage to components.

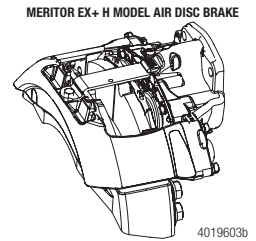
⚠ WARNING

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

Identify the Replacement Part Number

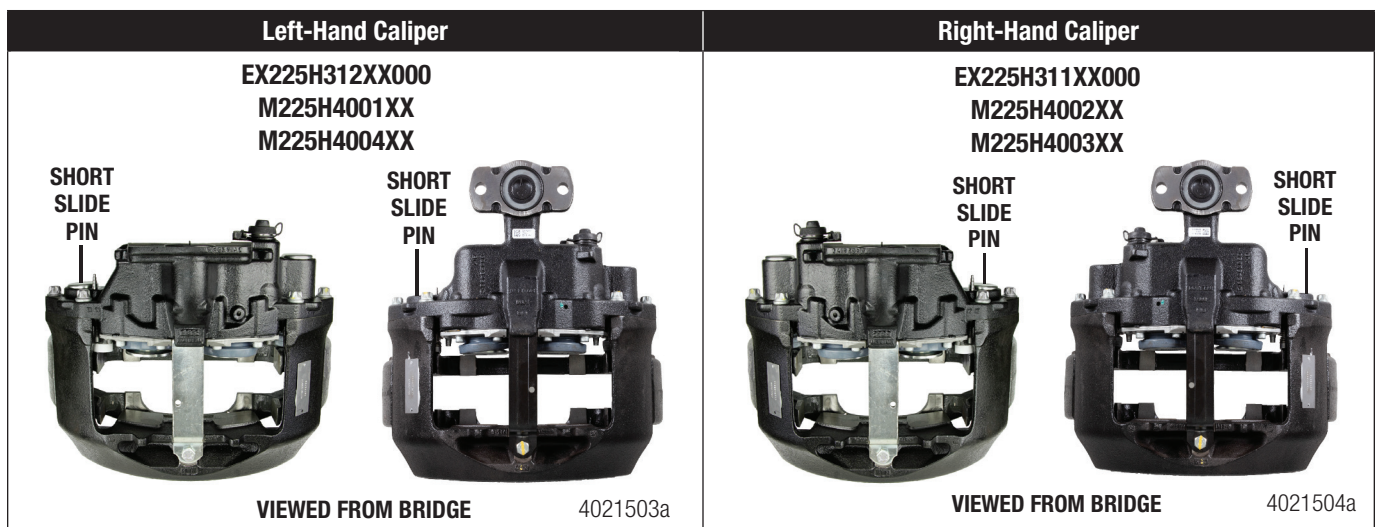
Before beginning, verify the part number is correct for the brake being replaced. Note the brake may be in a different position on the vehicle than noted in the Meritor part description. Always replace a left-hand caliper with a left-hand caliper and right-hand caliper with a right-hand caliper.

Bus OE #	Bendix #	Axle Mfr #	Use Meritor #	Description
6361223		81.50804.6597	EX225H311XX000	Xcelsior Front Street, Rear Curb
6361224		81.50804.6598	EX225H312XX000	Xcelsior Front Curb, Rear Street
6447269	K014998	81.50804.6670	EX225H312XX000	Xcelsior Front Curb
6447270	K081880	81.50804.6651	EX225H312XX000	Xcelsior Rear Street
6447271	K014997	81.50804.6669	EX225H311XX000	Xcelsior Front Street
6447272	K081879	81.50804.6652	EX225H311XX000	Xcelsior Rear Curb
6429512	K064526	0501 008 871	M225H4001XX	Xcelsior Center Street
6429515	K064525	0501.008.870	M225H4002XX	Xcelsior Center Curb
6447849	K064525	0501.008.870	M225H4002XX	Xcelsior Center Curb
6447850	K064526	0501 008 871	M225H4001XX	Xcelsior Center Street
N8908325			M225H4002XX	LFS Rear, Center Curb
N8908326			M225H4001XX	LFS Rear, Center Street
N8900425	K064529	0501.008.892	M225H4003XX	LFS Front Curb
N8900426	K064530	0501.008.893	M225H4004XX	LFS Front Street
N8893344	K011141		M225H4003XX	LFS Front Curb
N8893341	K011140		M225H4004XX	LFS Front Street
	K056448	0501 008 594	M225H4001XX	LFS Rear, Center Street
	K056447	0501 008 593	M225H4002XX	LFS Rear, Center Curb



How to Identify the Hand of the Caliper

View the caliper from the bridge side (as if mounted on the vehicle), and locate the short slide pin. If the short slide pin is on the left, the caliper is a 'left hand'. A caliper with the short slide pin on the right is a 'right hand'.



Caliper Removal Procedures

- Follow the Manufacturer's Removal Procedures -

The model/manufacturer of the brake to be removed will vary by vehicle. The following procedures provide general instructions for removing a typical brake. Always follow the brake manufacturer's or OEM's recommended instructions to safely remove the brake.

Remove the Brake Pads

1. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
2. Apply air pressure to release the parking brake system.

⚠ 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.

3. Remove all air from the air system. If the brake has a spring chamber, carefully cage and lock the spring so that it cannot actuate during assembly or disassembly. Follow the chamber manufacturer's instructions to completely release the brake. Figure 1.

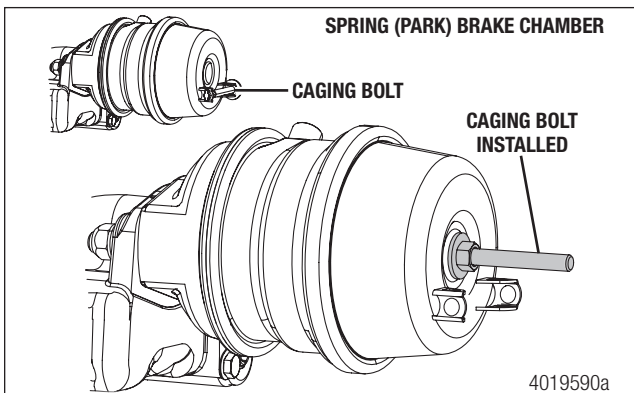


Figure 1

4. Use a jack to raise the vehicle so that the wheels to be serviced are off the ground. Support the vehicle with safety stands.
5. Remove the wheel and tire assemblies. Refer to the vehicle manufacturer's recommended instructions.
6. De-adjust the brake adjuster to provide clearance for caliper removal. To do so, remove the adjuster cap and turn the adjuster COUNTERCLOCKWISE until there is enough clearance to easily remove the pads. Figure 2 and Figure 3.

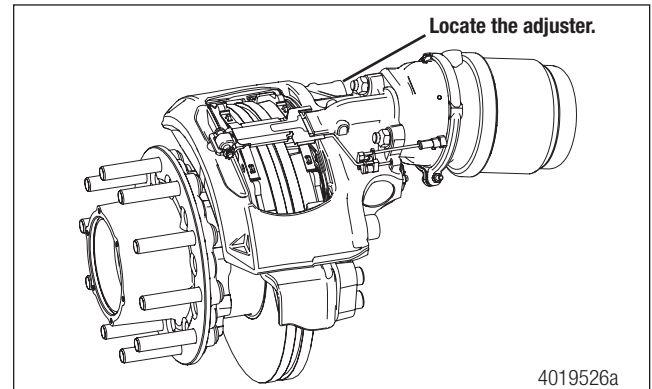


Figure 2

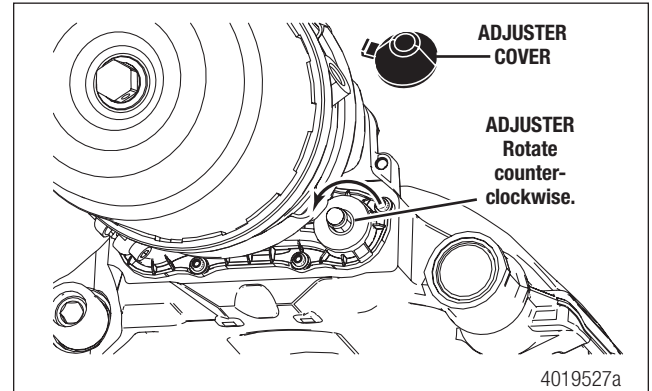


Figure 3

7. Remove the retainer pin clip, washer and pin from the retainer bar. Remove the retainer bar from the slot in the caliper. Figure 4.

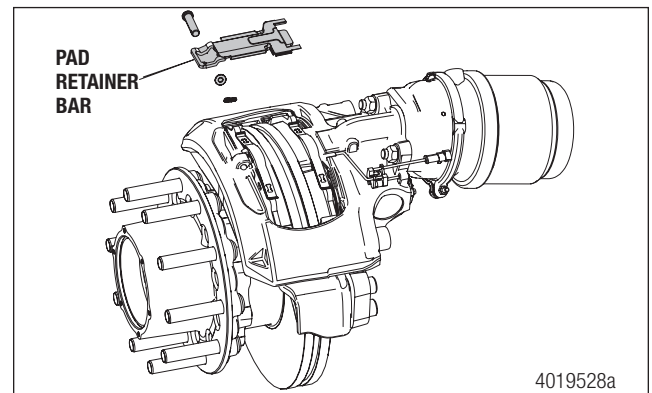


Figure 4

8. If equipped, remove the pad wear indicator assembly from the pad and set aside. Use care when removing the wear sensors to avoid damage. The pad wear indicator assembly can be reused if it is not damaged or worn through the pad. Disconnect the wear sensor harness. Replace if the sensor is damaged or wear shows contact with the rotor. Figure 5.

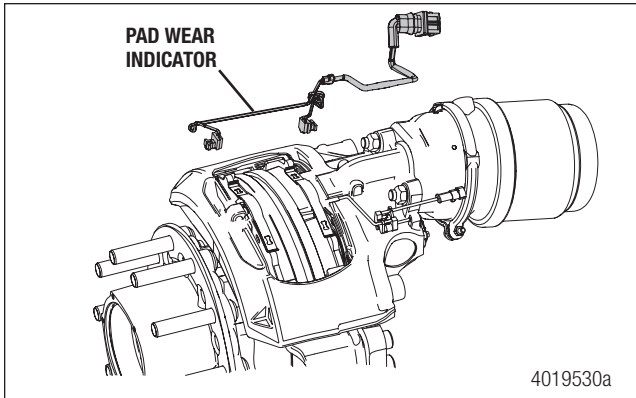


Figure 5

9. Remove the pad springs and brake pads from the caliper. Discard the removed parts. Figure 6.

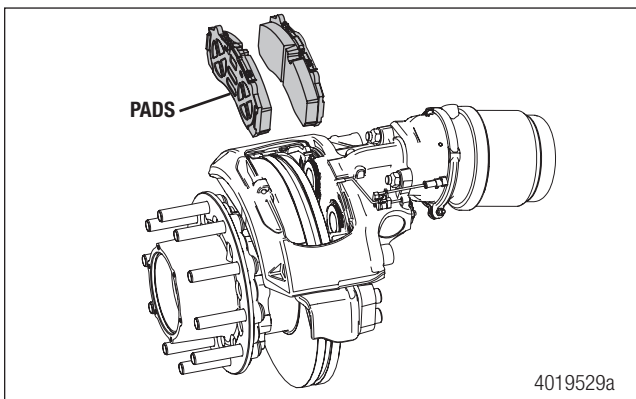


Figure 6

Remove the Caliper Assembly

1. Prior to removing the caliper assembly, use a tag or marker to label the location of the brake on the vehicle (i.e. LF for left front, RF for right front, LC for left center, RC for right center, LR for left rear, RR for right rear).

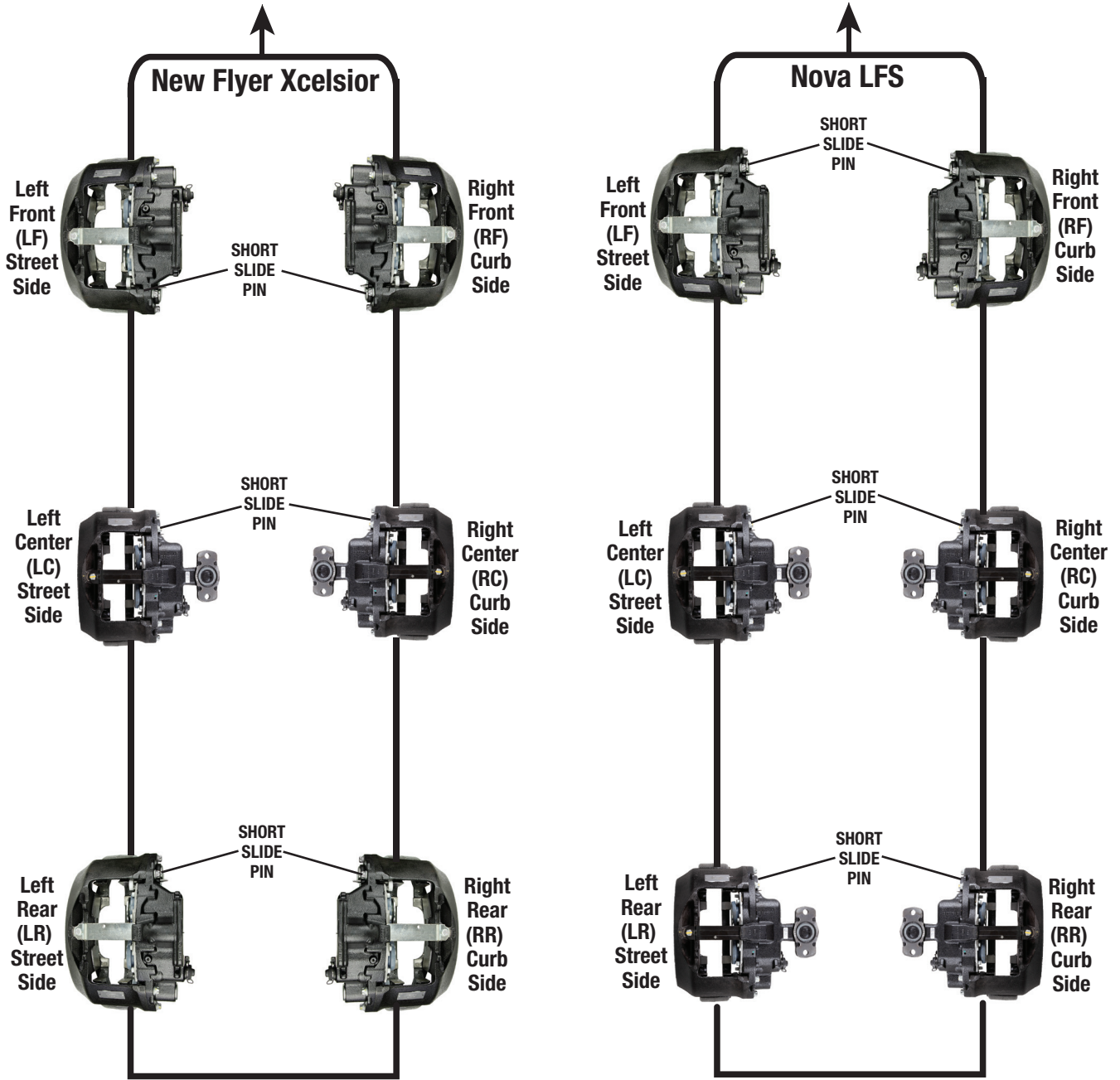
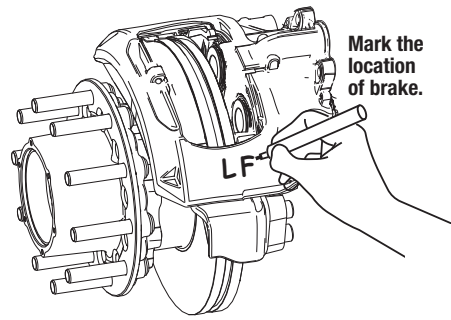
Note the position of the long and short slide pins on the caliper. Figure 7.

It is important to take note of the vehicle position and hand of the original caliper so the same hand EX+ caliper is installed in the same position. This is critical because the new caliper can fit on either side of the axle and can be installed in the wrong position.

WARNING

Installing the new caliper assembly in the wrong position can affect brake performance, resulting in death or serious personal injury.

Mark the position of brake on the vehicle.
 Note the orientation of long and short slide pins.
 Obtain the correct replacement caliper.



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Figure 7

NOTE: The caliper is not always mounted in this configuration due to clearance issues. Always default to the vehicle manufacturer's mounting orientation.

- Remove the two brake chamber mounting nuts and washers and set them aside for reuse. Remove the brake chamber from the caliper. Figure 8 and Figure 9.

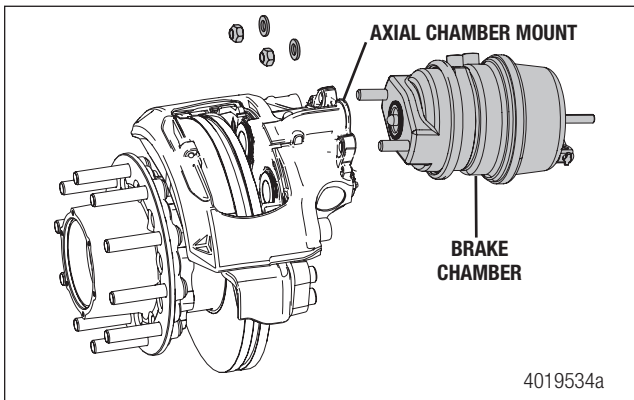


Figure 8

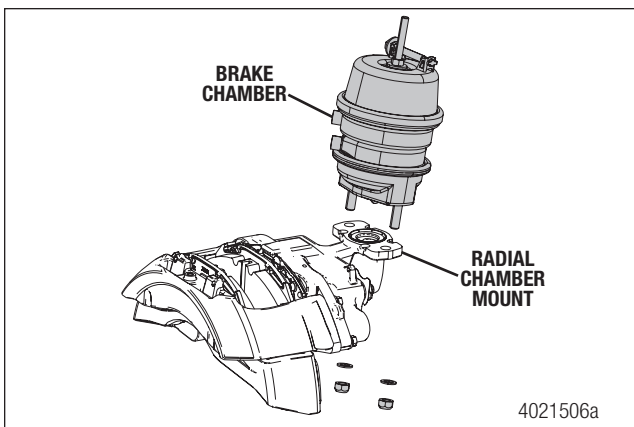


Figure 9

- Inspect the chamber for damage to the body, clamps, air lines, seals, mounting studs, drain plug or hole locations. Replace the chamber if damage is found.

NOTE: The chambers' drain ports should be positioned to the bottom side when mounted on the vehicle. If necessary, correct the drain position when the chamber is reinstalled.

- If the brake is equipped with an E-Stroke brake monitoring system, inspect the E-stroke system per the manufacturer's requirements.
- Use an appropriate-size socket and torque wrench to remove the caliper mounting bolts. The fasteners are torqued to high values so special tools will be required for removal. Once the fasteners are removed, lift the caliper assembly and remove it from the hub/rotor assembly. Place the caliper assembly near the wheel end for reference of the caliper location. Figure 10.

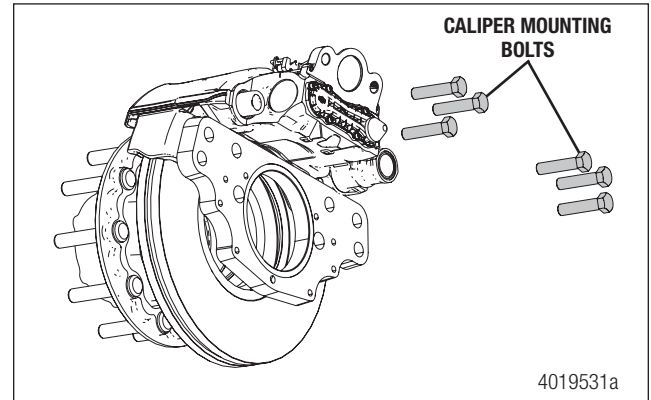


Figure 10

NOTE: If the bolts are hard to reach, Meritor has a special 7-inch extension adapter socket (30 mm) (3256-B-1354) that can be used to remove M20-size bolts. If the fasteners are a different size, consult the vehicle manufacturer for the appropriate adapter.

- Inspect the rotor for heat damage, cracks, grooves and scores. Measure the rotor thickness and runout. Refer to MM-0467 for rotor inspection and measurement details. Replace if necessary.

Install the New Caliper Assembly

⚠ CAUTION

The mixing of caliper brands on the same axle can affect vehicle brake performance.

- If upgrading to a Meritor brake caliper, then replace in axle sets.
- Obtain the correct retrofit caliper kit per the table on page 2. Each kit part number contains the following parts: 2 calipers (left and right), pad set (for 2 wheel ends), caliper mounting bolts.
- Verify that the part number and mounting hole pattern with the table on page 2 will fit the torque plate mounting pattern and fastener size. Check that the new caliper mounting bolts are the same length as the old fasteners.

⚠ CAUTION

The caliper mounting surface on the torque plate must be properly cleaned or the caliper can bind when the fasteners are tightened to specifications.

- Clean the caliper mounting surface on the torque plate with an abrasive cloth to remove any dirt or rust build up.

- Remove the chamber mounting hole plastic shipping film and pull the tab on the rubber plug to remove it. It will take some force to peel the perforated transit plug from the caliper chamber seal. There should be a small amount of grease in the aperture when the plug is removed from the caliper. Figure 11 and Figure 12.

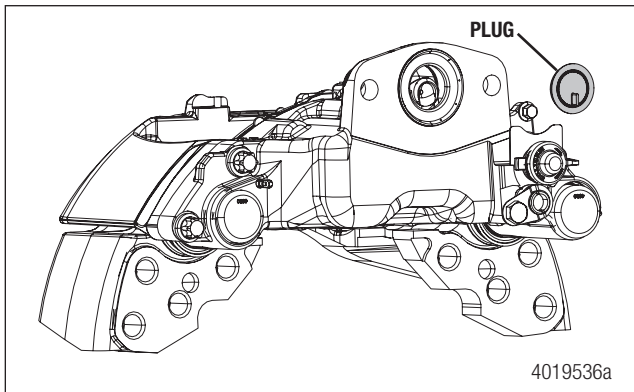


Figure 11

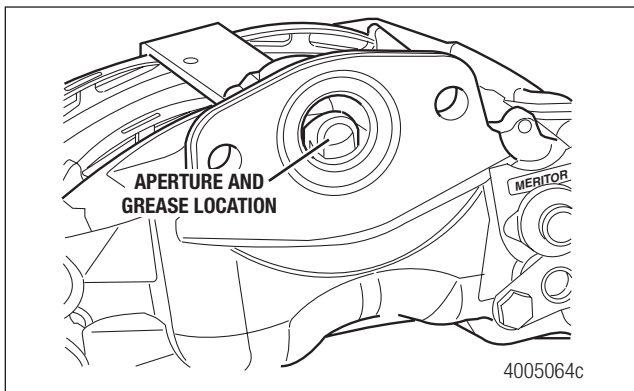


Figure 12

- Lift and place the caliper assembly over the rotor. Align the caliper carrier bolt holes with the torque plate and install the caliper mounting bolts. Figure 13.

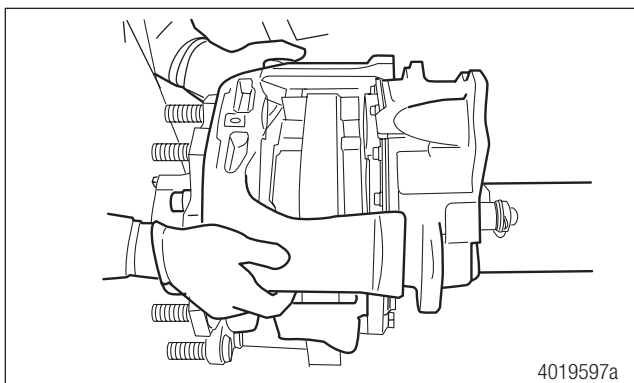


Figure 13

- Using an appropriate-size socket and torque wrench capable of 350-500 lb-ft, tighten the caliper fasteners to the OEM torque specification or the torque specified in the Torque Table on the last page. When it is not possible to reach the fastener directly with a torque wrench, a 7-inch extension adapter (30 mm) (3256-B-1354) may be used with the torque wrench to tighten M20-size fasteners. Figure 14 and Figure 15.

- If using the extension adapter in line with torque wrench, adjust the torque value using the chart in MM-0467.
- If the extension adapter is installed at a 90-degree angle to the direction of torque application, no adjustment in torque is required.

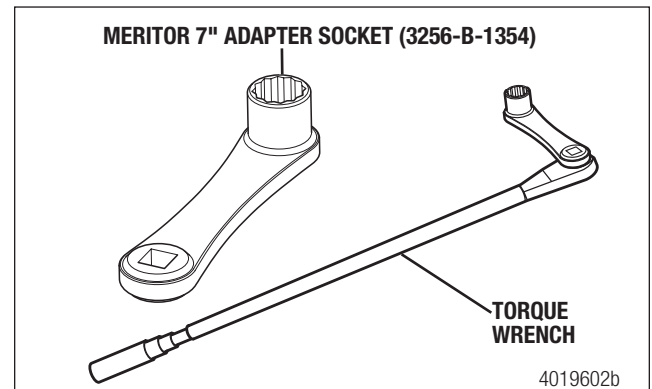


Figure 14

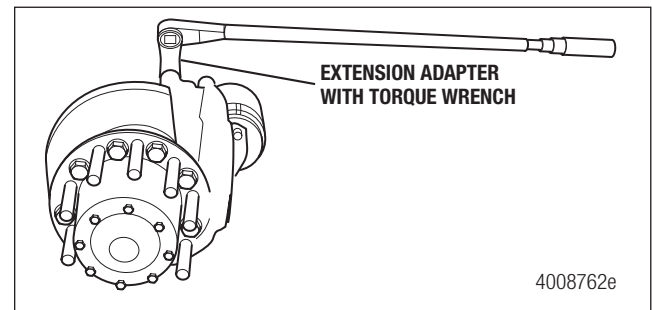


Figure 15

- Verify the caliper moves freely on the side pin bushings.
- Visually inspect the chamber-mounting aperture on the old caliper housing assembly for signs of water entry and corrosion. If signs of water entry and corrosion are present, replace the brake chamber. Figure 16.

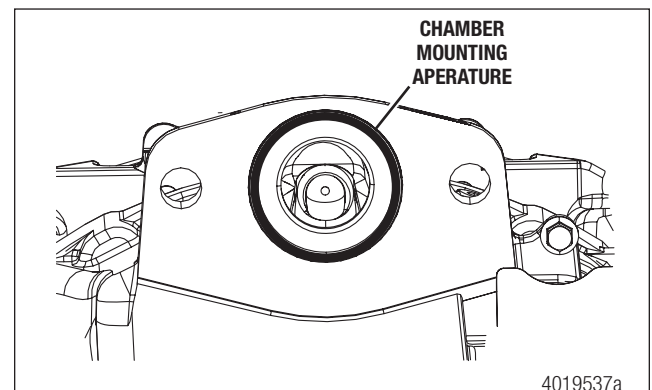


Figure 16

⚠ CAUTION

If the inner boot is damaged, water can enter the caliper housing assembly, resulting in damage to the component.

10. Inspect the chamber inner boot for damage. If the inner boot is damaged, replace the brake chamber per the manufacturer's recommendations. Figure 17.

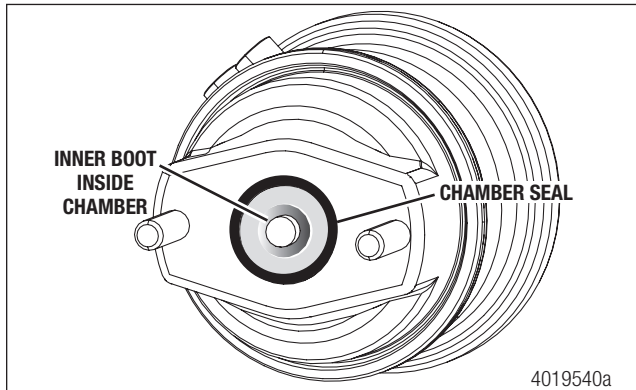


Figure 17

11. Inspect the external face seal for cuts, cracks or missing segments. Replace the chamber if the seal is less than 3 mm in height. Figure 17.
12. Inspect the piston rod for wear or damage. Make sure it extends to 0.59-inch (15 mm) standout length. Figure 18.

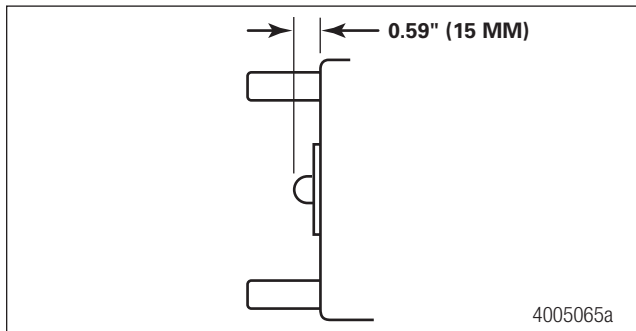


Figure 18

⚠ WARNING

Always install an air chamber with the correct chamber piston length. If an incorrect air chamber is installed, the difference in chamber piston length will result in partial brake application. Death or serious personal injury and damage to components can result.

13. Install the air chamber on the caliper assembly, making sure the push rod is properly seated in the pocket in the caliper aperture. Install the original washers and nuts on the studs, then tighten to an initial torque of 59-75 ft-lb (80-100 Nm) and final torque of 133-155 lb-ft (180-210 Nm). Figure 19 and Figure 20.

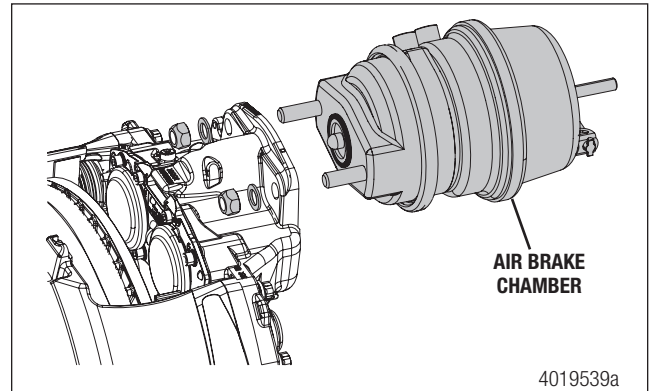


Figure 19

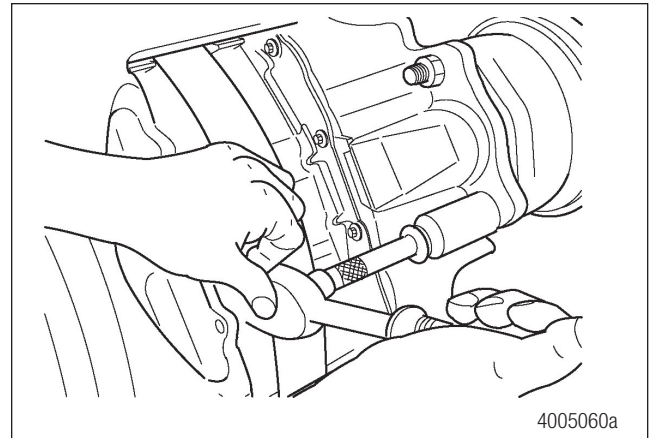


Figure 20

14. Verify the drain holes on the bottom of the chamber are open. If the chamber has plugs in these holes, move them to the top side of the chamber so the bottom holes are open. Figure 21.

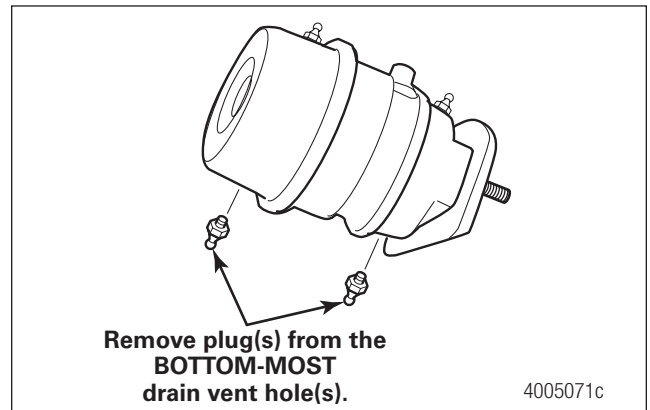


Figure 21

15. Remove fastener and pad retainer bar from the caliper with a 17 mm socket. Reuse the bolt.

WARNING

Always the install brake pads with the friction material facing towards the rotor. Installing the brake pads with the friction material facing away from the rotor cause brake noise and affect the stopping performance of the caliper. Death or serious personal injury can result.

16. Install brake pads into the caliper as follows. Slide the caliper **OUTWARD**. Install the outboard pad and spring into the outboard side of the caliper. Make sure the friction material is facing towards the rotor. Figure 22 and Figure 23.

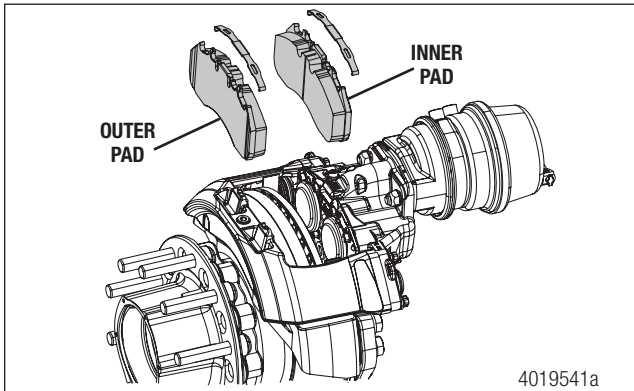


Figure 22

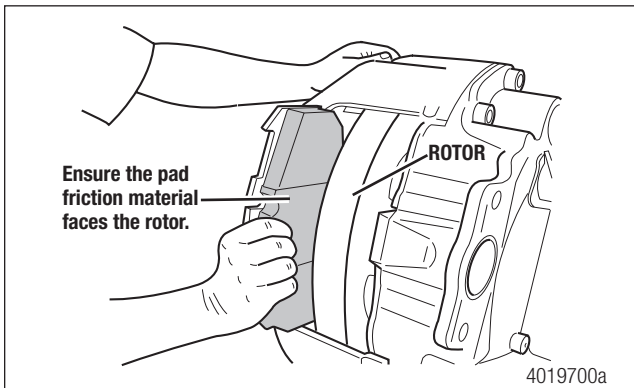


Figure 23

17. Slide the caliper **INWARD**. Install the inboard pad and spring into the inboard side of the caliper. Make sure the friction material is facing towards the rotor.

NOTE: The pads should slide into position with very little pressure. If the pad binds during installation, remove it, verify the caliper pistons are completely retracted, then reposition it until it slides into place.

18. Install the pad wear warning indicators (PWWI) as follows.
 - a. Install the pad wear warning indicator into the retainer clip, and then carefully clip the assembly to the pad retainer bar.
 - b. Carefully hold the pad retainer bar with the PWWI in position to allow for installation of the plastic sensor blocks. Install the plastic blocks into the pads. Do not use excessive force, but ensure they are pushed to the bottom of the slot. Figure 24.
 - c. Ensure the PWWI wiring is routed over the pad backplate, away from the rotor. Mount the wiring as shown in Figure 25.

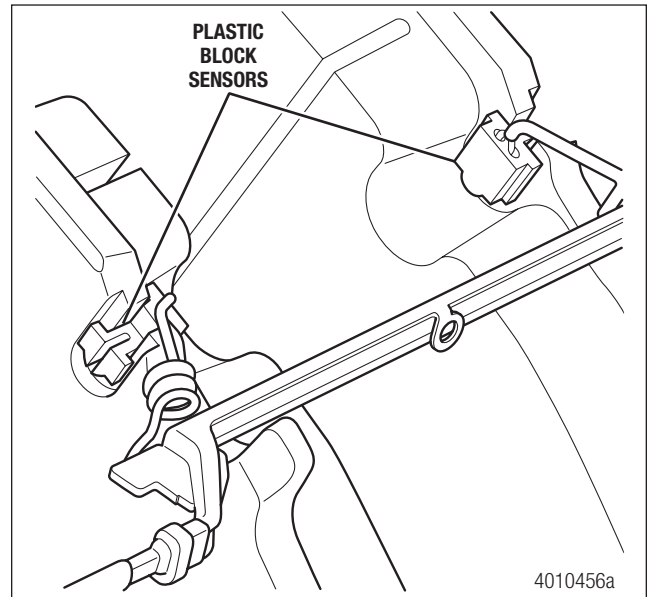


Figure 24

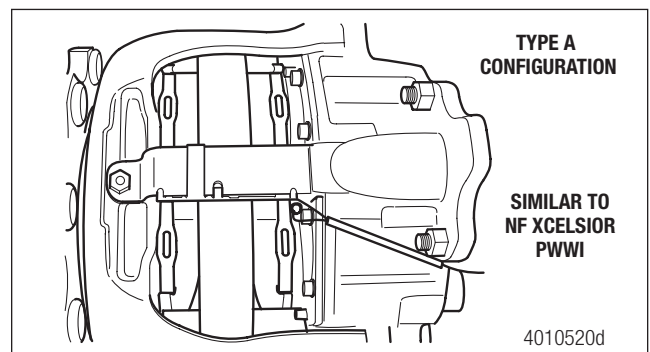


Figure 25

19. Insert the pad retainer bar into the slot on the caliper. Install the pad retainer bolt. Press down on the bar as needed to start the bolt into the threads. Tighten the bolt to 25-30 lb-ft (34-40 Nm). Figure 26 and Figure 27.

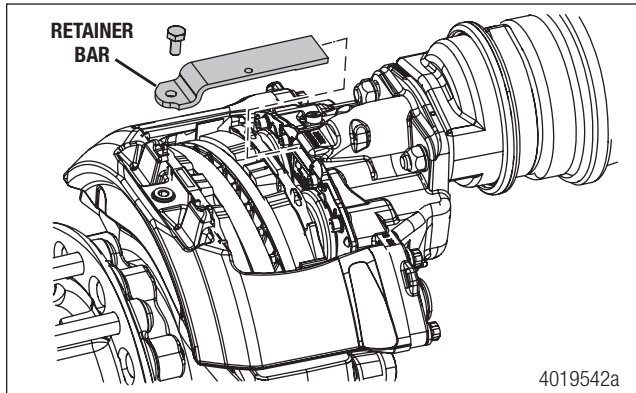


Figure 26

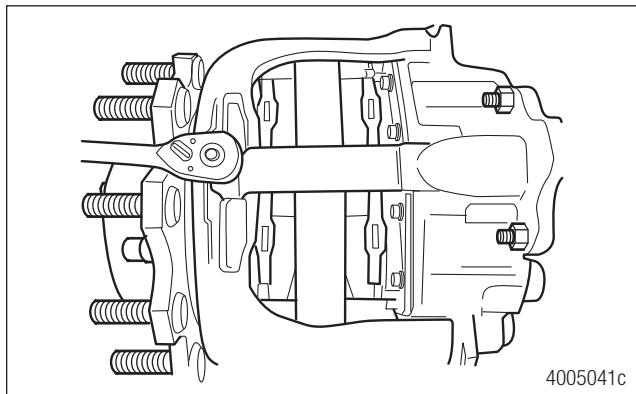


Figure 27

20. Adjust the brake as follows.

⚠ CAUTION

Do not use a screwdriver or similar tool to pry the cover off. Damage to the seal could occur.

- a. Locate the adjuster cover next to the long slide pin and remove it. Figure 28.

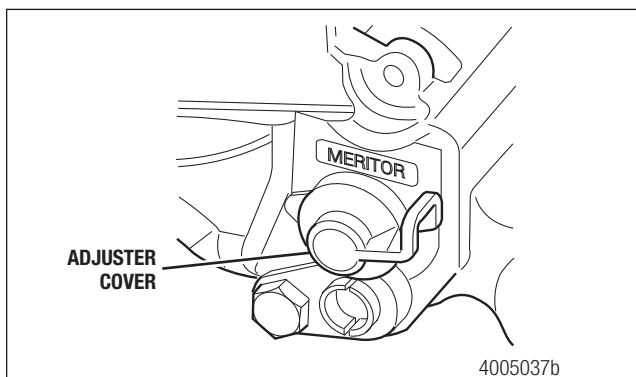


Figure 28

- b. Install a 10 mm boxed-end wrench onto the adjuster and turn **CLOCKWISE** until the pads contact the rotor.
- c. To set the correct brake adjustment clearance, de-adjust the brake by rotating the adjuster stem $\frac{1}{2}$ turn **COUNTERCLOCKWISE**. Figure 29 and Figure 30.

NOTE: The Meritor adjuster will not make a clicking noise while turning in either direction. It is not defective.

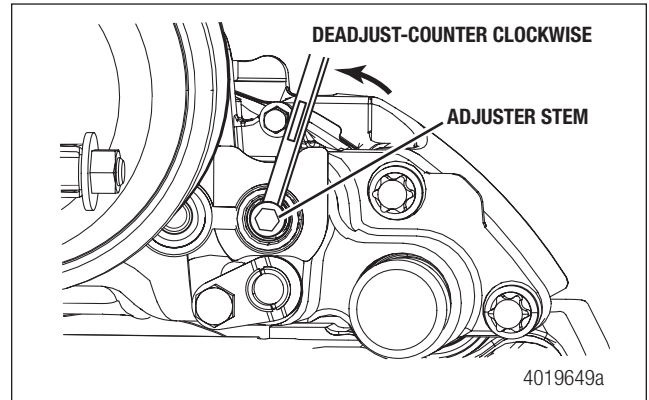


Figure 29

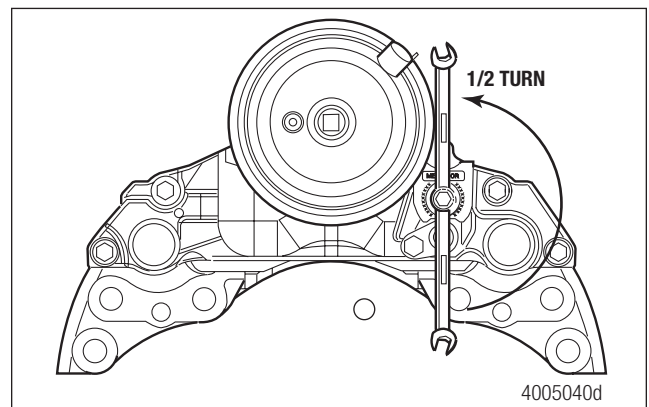


Figure 30

- d. With the 10 mm wrench on the adjuster stem, actuate the brake one time.

If the wrench rotates CLOCKWISE when actuating the brake: The adjuster mechanism is working correctly. Figure 31.

If the wrench does not rotate CLOCKWISE when actuating the brake: The adjuster mechanism is not working correctly. Replace the caliper assembly.

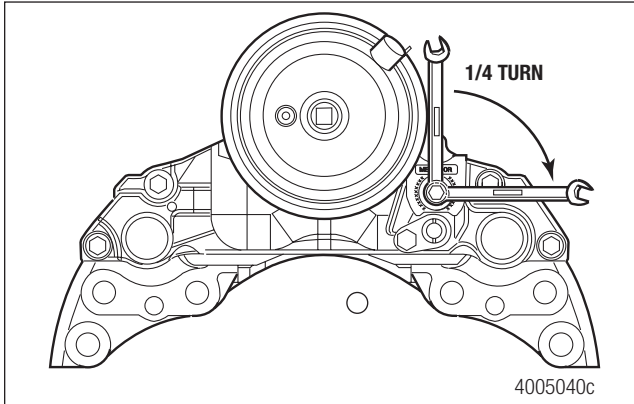


Figure 31

- e. Install the adjuster cover.
21. Uncage the parking brake spring chambers according to the manufacturer's instructions. Reinstall the chamber plug.

Road Test the Brakes

1. Initial Brake Check: Prior to leaving the facility parking lot, test the brakes at low speed with 3-5 brake applications. These brake applications allow the internal adjuster to fine tune the adjustment prior to reaching road speed.
2. Select Test Route: Pick a route that allows for multiple brake applications at 30-50 mph (48-80 kph). Drive the vehicle for 15-20 minutes to complete the road test or use the established facility/OEM recommended testing method.
3. Final Inspection: Upon return to the facility, take a thermal heat measuring device and measure the temperatures on each brake. Verify the temperature variances between wheel ends are within the vehicle manufacturer's recommended temperature range.
4. Retrofit Complete: If all inspections after the road test are confirmed to be satisfactory by OEM requirements, return the vehicle to service.

Torque Specifications

Component	Lb-Ft (Nm)
Retainer Bar Bolt – 10 mm	25-30 (34-40)
Caliper Mounting Bolts – 16 mm	205-235 (277-318)
Caliper Mounting Bolts – 18 mm	296-310 (400-420)
Caliper Mounting Bolts – 20 mm	350-450 (474-610)
Air Chamber Nuts – Initial	59-75 (80-100)
Air Chamber Nuts – Final	133-155 (180-210)



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