

\$2.50



MERITOR[™]

A Heritage of Rockwell Technology

SCL 2 Series Dry Disc Brake Calipers

**Maintenance Manual No. 4S
Revised 11-96**

**SCL 2-13
SCL 2-15
SCL 2-22
SCL 2-24**

**SCL 2-26
SCL 2-28
SCL 2-30**

Service Notes

Important Information

This manual contains maintenance procedures for the Meritor SCL 2-13, SCL 2-15, SCL 2-22, SCL 2-24, SCL 2-26, SCL 2-28 and SCL 2-30 Dry Disc Brake Calipers. The information contained in this manual was current at time of publication and is subject to change without notice or liability.

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

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



WARNING

A WARNING indicates that you must follow a procedure exactly. Otherwise, serious personal injury can occur.



CAUTION

A CAUTION indicates procedures that must be followed exactly. If the procedure is not followed, damage to equipment or components can occur. Serious personal injury can also occur in addition to damaged or malfunctioning equipment or components.

NOTE

A NOTE indicates an operation, procedure or instruction that is important for proper service. A NOTE can also supply information that can help to make service quicker and easier.



This symbol indicates that you must tighten fasteners to a specific torque value.

Also Available from Meritor

- **Video: T-95145V**

Servicing Meritor SCL 2 Series Dry Disc Brake Calipers

- **Catalog: PB-9201**

Hydraulic Dry Disc Brake Parts

How to Order

Order items from Meritor Literature Distribution Center, c/o Vispac, Inc., 35000 Industrial Road, Livonia, MI 48150. For videos, include a purchase order or check for \$20 payable to Meritor Automotive for each video.

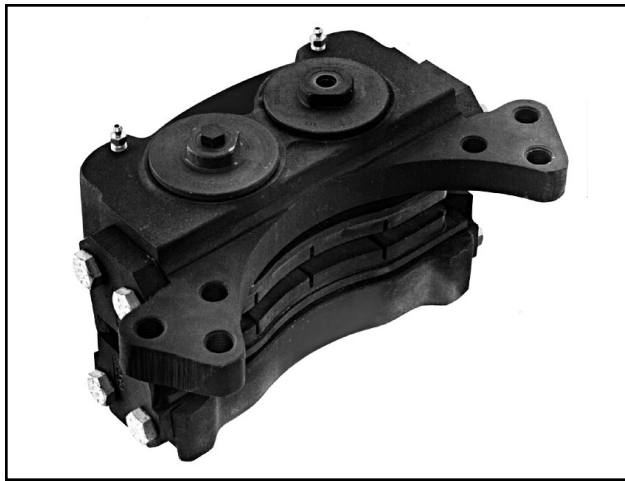
Phone orders are also accepted by calling Meritor's Customer Service Center at 800-535-5560.



ASBESTOS AND NON-ASBESTOS FIBER WARNING

Meritor SCL 2 Series Dry Disc Brake Caliper linings do not use asbestos fibers. Some aftermarket brake linings contain asbestos fiber, a cancer and lung disease hazard. Some brake linings contain non-asbestos fibers whose long term effects are unknown.

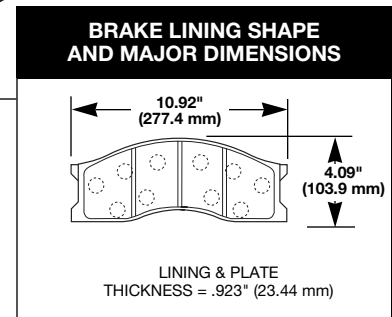
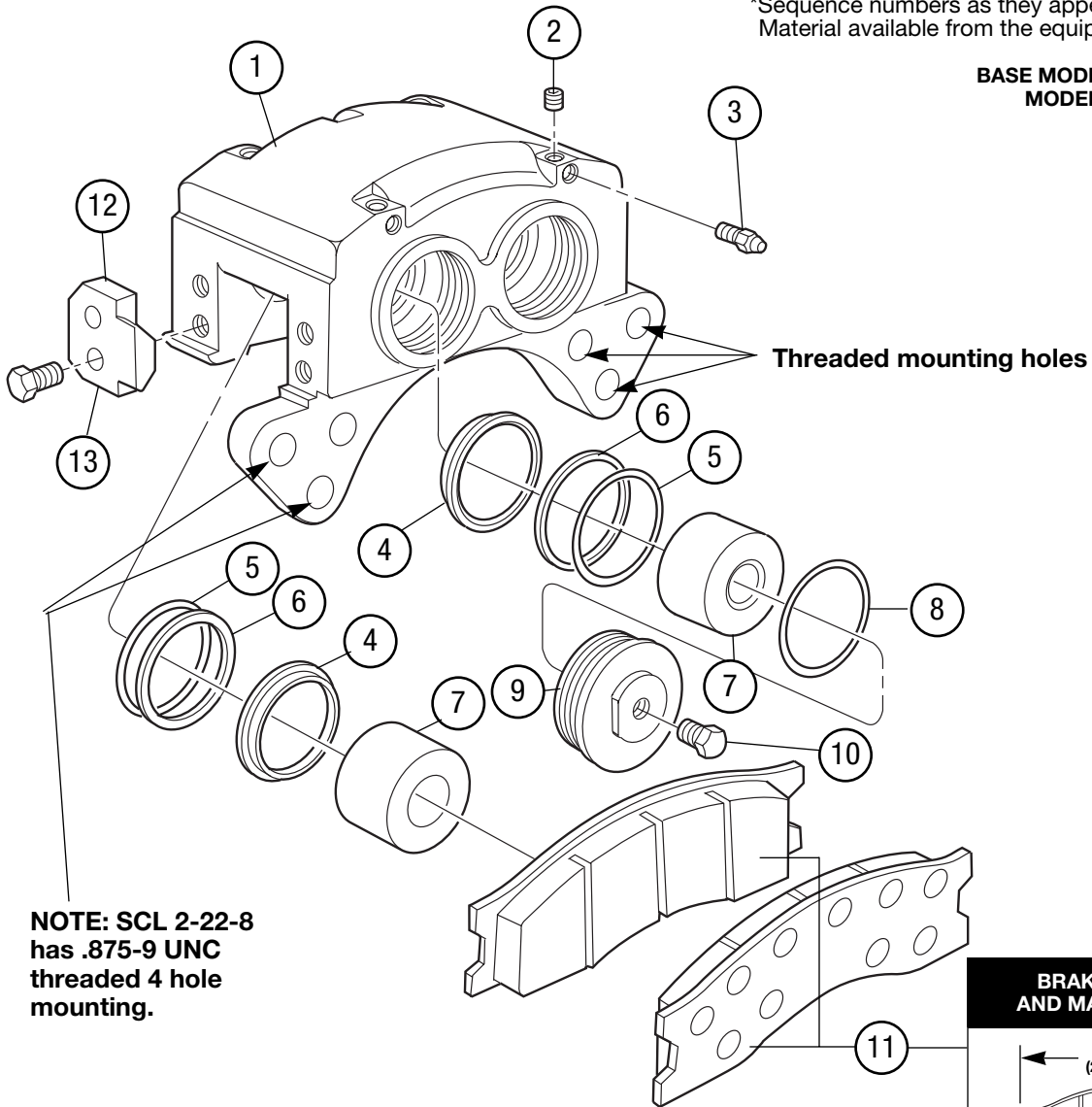
Caution should be exercised in handling both asbestos and non-asbestos materials as described on page 2.

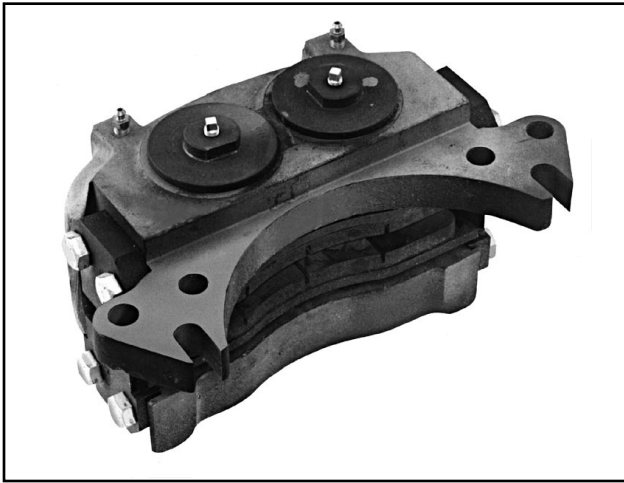


ITEM	DESCRIPTION	QTY.	*SEQUENCE NUMBER
1	Housing	1	00100
2	Plug	4	00110
3	Bleeder Screw	2	00230
4	Dust Seal	4	00140
5	O-Ring	4	00130
6	Back-up Ring	4	00120
7	Piston	4	00150
8	O-Ring	2	00160
9	Cylinder Cap	2	00170
10	Plug	1	00210
11	Lining Assembly	2	00180
12	End Plate	4	00190
13	End Plate Bolt	8	00200

*Sequence numbers as they appear in the Bill of Material available from the equipment manufacturer.

BASE MODEL: SCL 2
MODELS: SCL 2-13
 SCL 2-22
 SCL 2-28
 SCL 2-30

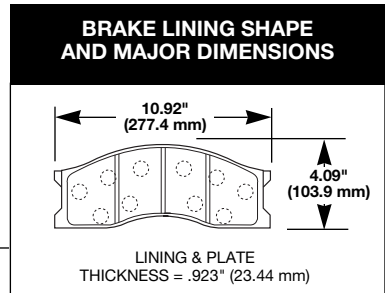
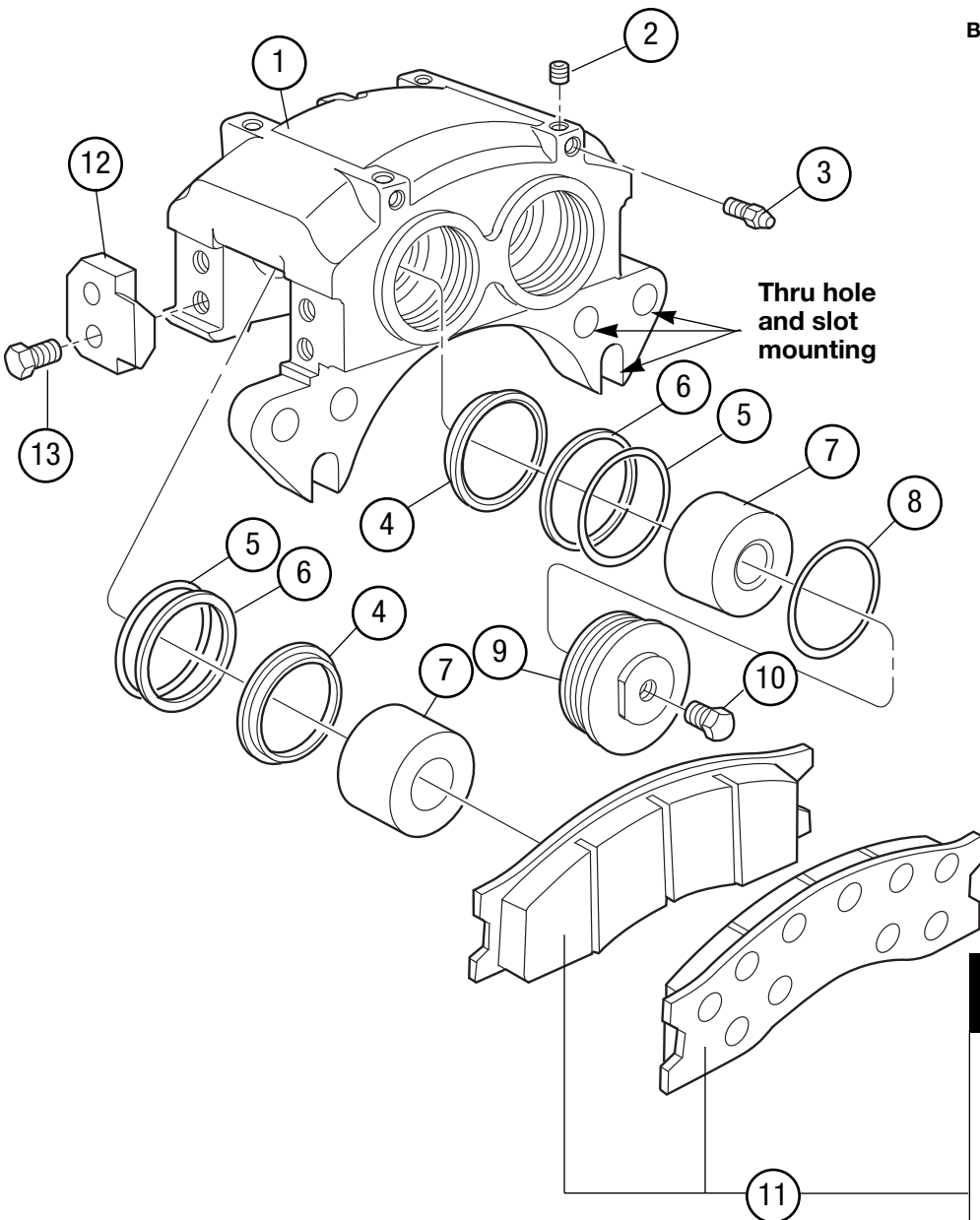


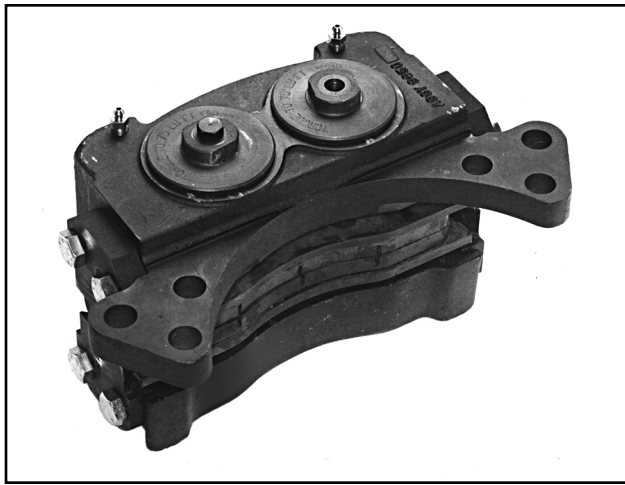


ITEM	DESCRIPTION	QTY.	*SEQUENCE NUMBER
1	Housing	1	00100
2	Plug	4	00110
3	Bleeder Screw	2	00230
4	Dust Seal	4	00140
5	O-Ring	4	00130
6	Back-up Ring	4	00120
7	Piston	4	00150
8	O-Ring	2	00160
9	Cylinder Cap	2	00170
10	Plug	2	00210
11	Lining Assembly	2	00180
12	End Plate	4	00190
13	End Plate Bolt	8	00200

*Sequence numbers as they appear in the Bill of Material available from the equipment manufacturer.

BASE MODEL: SCL 2
MODEL: SCL 2-15

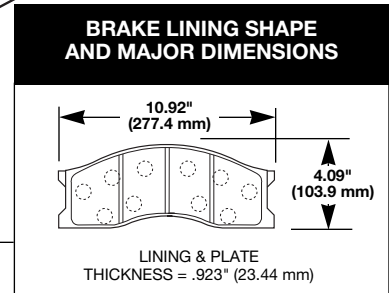
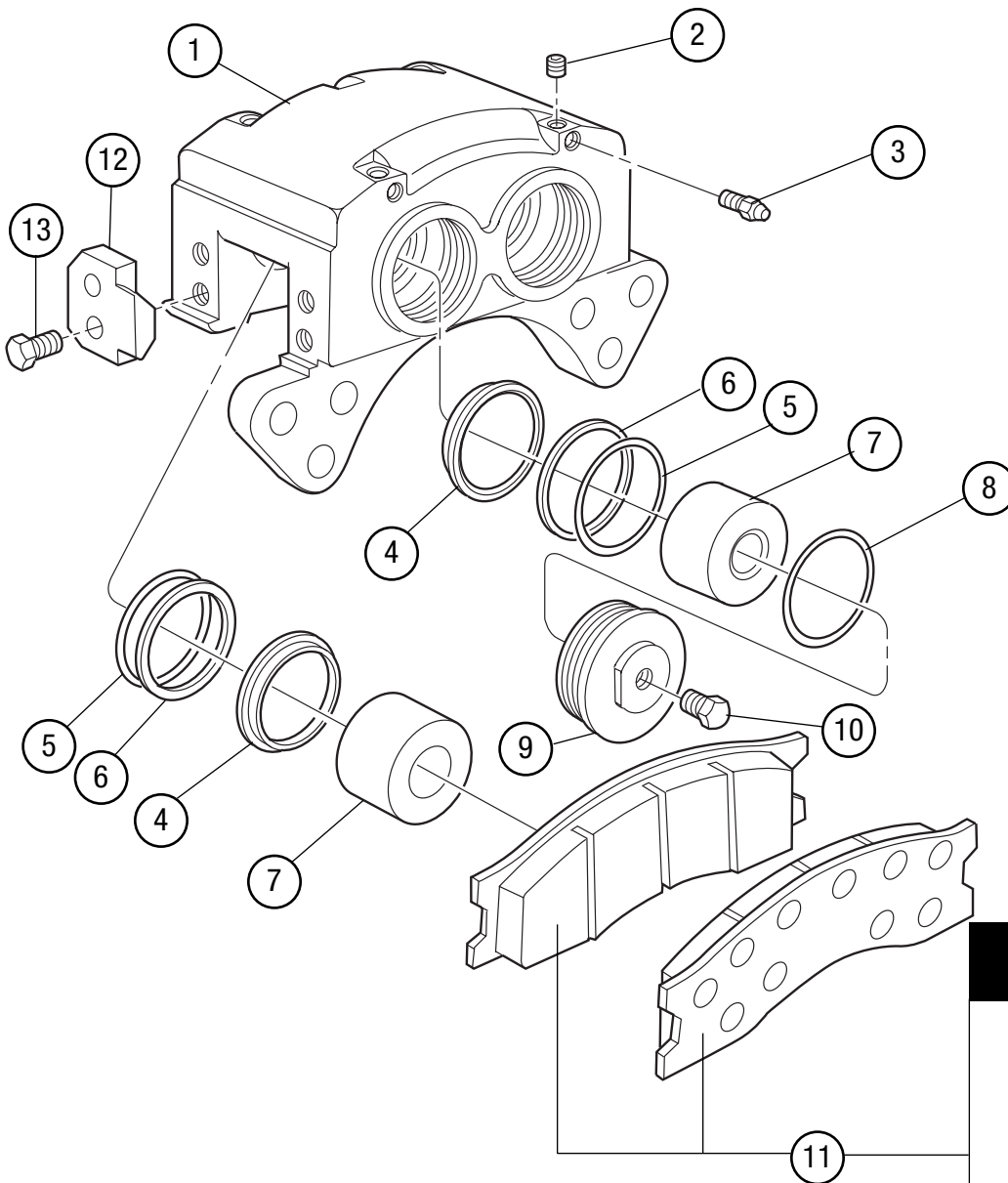


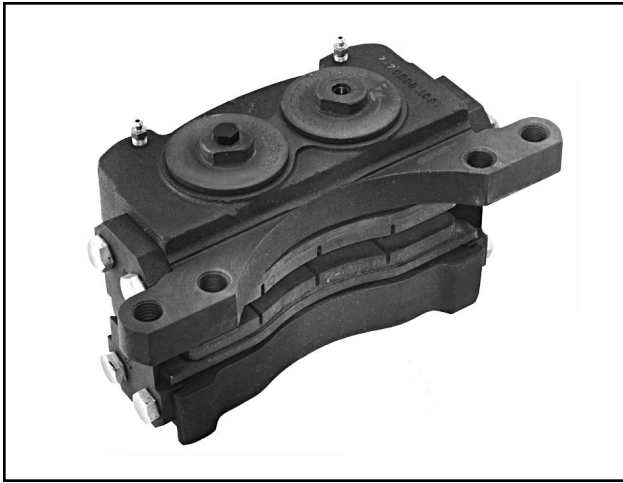


ITEM	DESCRIPTION	QTY.	*SEQUENCE NUMBER
1	Housing	1	00100
2	Plug	4	00110
3	Bleeder Screw	2	00230
4	Dust Seal	4	00140
5	O-Ring	4	00130
6	Back-up Ring	4	00120
7	Piston	4	00150
8	O-Ring	2	00160
9	Cylinder Cap	1	00170
10	Plug	2	00210
11	Lining Assembly	2	00180
12	End Plate	4	00190
13	End Plate Bolt	8	00200

*Sequence numbers as they appear in the Bill of Material available from the equipment manufacturer.

BASE MODEL: SCL 2
MODEL: SCL 2-24





ITEM	DESCRIPTION	QTY.	*SEQUENCE NUMBER
1	Housing	1	00100
2	Plug	4	00110
3	Bleeder Screw	2	00230
4	Dust Seal	4	00140
5	O-Ring	4	00130
6	Back-up Ring	4	00120
7	Piston	4	00150
8	O-Ring	2	00160
9	Cylinder Cap	2	00170
10	Plug	1	00210
11	Lining Assembly	2	00180
12	End Plate	4	00190
13	End Plate Bolt	8	00200

*Sequence numbers as they appear in the Bill of Material available from the equipment manufacturer.

BASE MODEL: SCL 2
MODEL: SCL 2-26

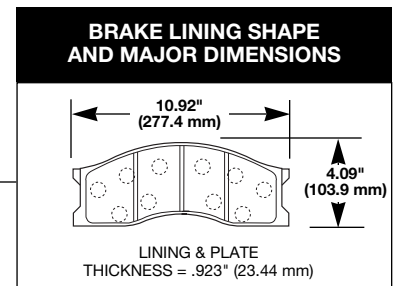
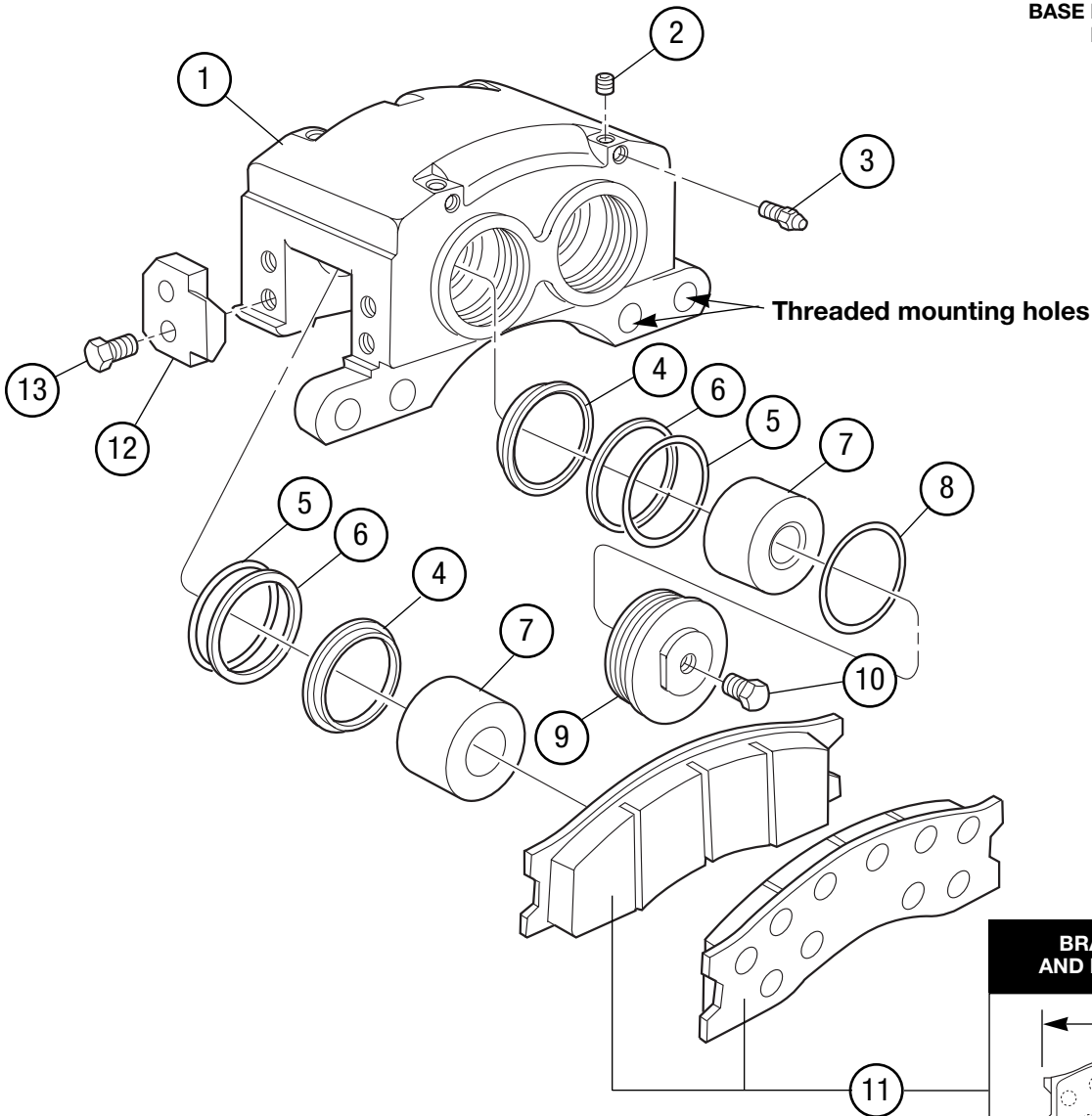


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Asbestos and Non-Asbestos Fibers



ASBESTOS FIBER WARNING

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

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 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, 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 potential cancer and lung disease hazard. Material Safety Data Sheets are available from Meritor.

Hazard Summary

Most recently manufactured brake linings do not contain asbestos fibers. These brake linings may contain one or more of a variety of ingredients, including glass fibers, mineral wool, 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 exposures levels may exceed OSHA or manufacturer's 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.

Section 1 Introduction

Description

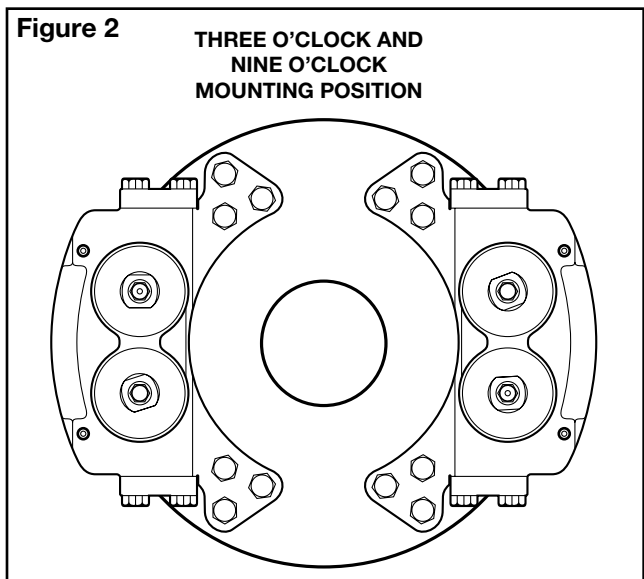
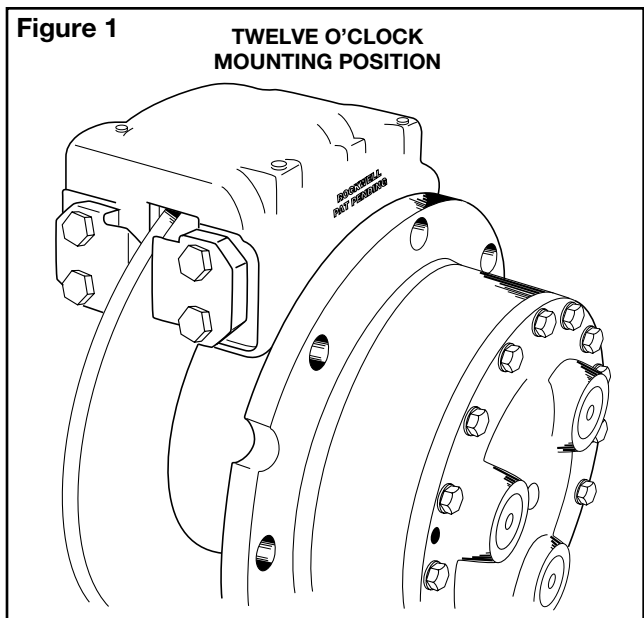
The SCL 2 Series dry disc brake calipers are intended only for service use on hydraulic brake systems. All calipers mount to a fixed position on fixed position discs.

The calipers have four pistons with two pistons on each side of the disc. The linings are made from non-asbestos material.

CALIPER	MOUNTING
SCL 2-13	M20 X 2.5 threaded 6 hole mounting (metric)
SCL 2-15	0.766" (19.15 mm) diameter 4 through hole and 2 slot hole mounting
SCL 2-22	0.750-10 UNC threaded 6 hole mounting except SCL 2-22-8 has 0.875-9 UNC threaded 4 hole mounting
SCL 2-24	0.828" (21 mm) diameter 6 through hole mounting
SCL 2-26	0.875-9 UNC threaded 4 hole mounting
SCL 2-28	0.750-10 UNC threaded 6 hole mounting
SCL 2-30	M20 X 2.5 threaded 6 hole mounting (metric)

One or two calipers can be used on a disc.

- If one caliper is used, it is mounted at the 12 o'clock position. **Figure 1.**
- If two calipers are used, they are mounted at the 3 o'clock and the 9 o'clock positions. **Figure 2.**



Section 1

Introduction

Hydraulic Fluid

WARNING

- **Use only the type of hydraulic fluid specified by the equipment manufacturer. Do not use different types of hydraulic fluid. The wrong hydraulic fluid will damage the rubber parts of the caliper and cause damage, loss of braking and serious personal injury.**
- **Do not reuse hydraulic fluid. Used fluid can be contaminated and can cause incorrect operation which could result in serious personal injury.**

The brake system uses one of two types of fluid:

- Petroleum Base Hydraulic Fluid (Mineral Oil)
Example: Meets MIL-H-5606 specifications.
- Non-Petroleum Base Hydraulic Fluid (Automotive Brake Fluid)
Example: Glycol DOT 3, meets SAE J-1703 specifications.

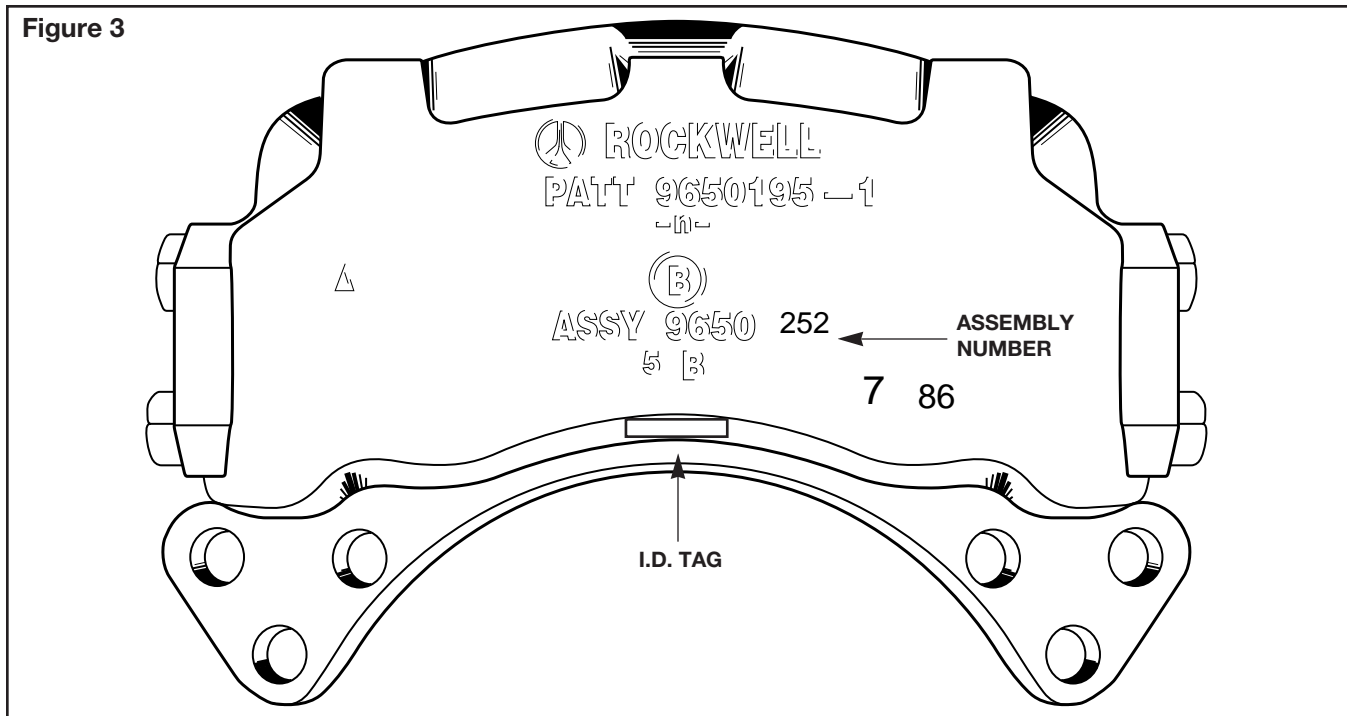
For the type of fluid and specifications, see the recommendations of the equipment manufacturer.

Identification

Older assemblies can be identified by a seven-digit assembly number marked on the side of the caliper that is opposite from the mounting plate. More recent assemblies are identified by an identification tag located on the inside radius of the caliper opposite from the mounting plate. **Figure 3.**

CAUTION

Use only the specified components when you assemble the caliper. Do not mix components from other calipers. If you install the wrong components, the caliper will not operate correctly and can cause damage to the equipment. Use of non-Meritor parts can cause damage, loss of braking and serious personal injury.



Section 2

Removal and Disassembly

Remove Linings



WARNING

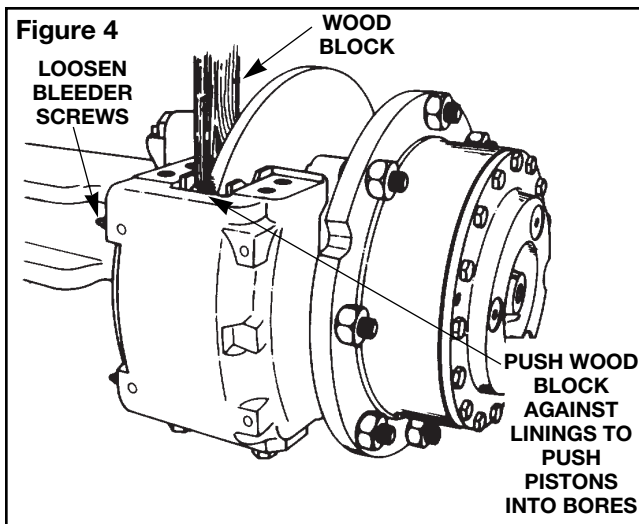
To prevent serious eye injury, always wear safe eye protection when doing maintenance or service.



WARNING

Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip or fall over and cause serious personal injury.

1. Place blocks under the wheels of the vehicle to keep the vehicle from moving.
2. Remove the bolts that fasten the end plates to one side of the caliper housing. Remove the end plates. If end plates are worn, replace end plates.
3. Loosen the bleeder screws to release the hydraulic pressure in the caliper. **Figure 4.**



4. Use a piece of wood against the linings as a pry bar to push the pistons completely into the housing. Tighten the bleeder screws. **Figure 4.**
5. Remove the linings from the caliper housing. If necessary, discard the linings.

Remove Caliper

1. Place blocks under the wheels of the vehicle to keep the vehicle from moving.
2. Disconnect the brake line from the inlet fitting. Put a plug in the brake line and the inlet fitting to prevent contamination of the system.
3. Remove the linings as described earlier in this section.
4. Remove the fasteners that hold the caliper housing on the mounting bracket. Remove the caliper housing from the mounting bracket. If shims are used between the housing and the bracket, mark the position of the shims.

Disassemble Caliper

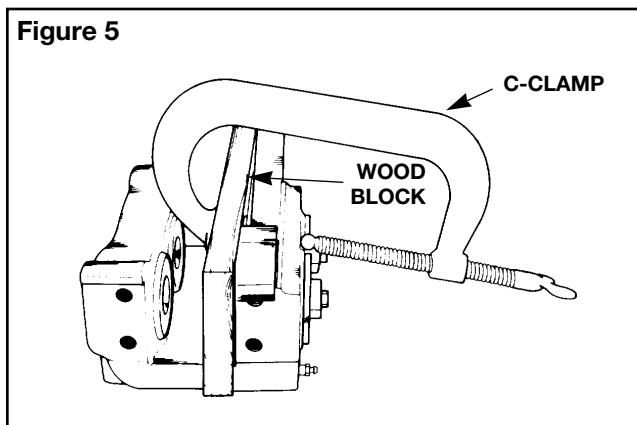
1. Remove the inlet fitting and the O-ring from the cylinder cap. Drain the hydraulic fluid from the caliper. Discard the fluid.
2. Clean the outside of the housing with isopropyl alcohol. Dry the housing with a clean cloth.
3. If installed, remove the bolts that hold the end plates on the housing. Remove the end plates and linings.

Section 2

Removal and Disassembly

4. Remove the pistons from the side of the housing opposite the mounting plate according to the following procedure:

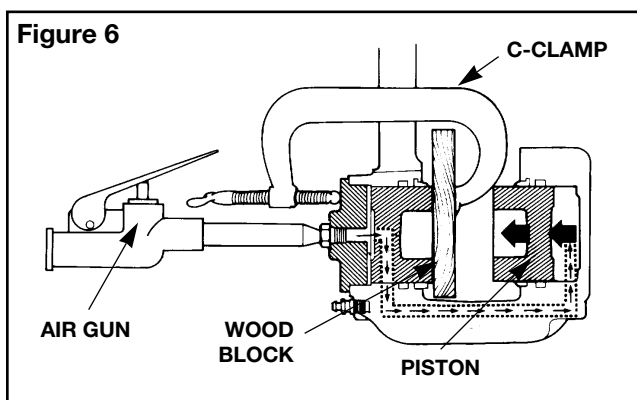
- a. Use a C-clamp to hold a 0.50 inch (12.7 mm) block of wood against two pistons on the mounting side of the housing. Make sure the C-clamp is not in the area in front of the piston bore. **Figure 5.**



WARNING

Do not put your hand in front of the pistons when you force out the pistons or serious personal injury may occur.

- b. Apply compressed air to the inlet fitting to force the pistons out of the housing. If one piston comes out before the other piston, put a piece of wood in front of the piston that comes out first. Apply compressed air to force the other piston out of the housing. **Figure 6.**

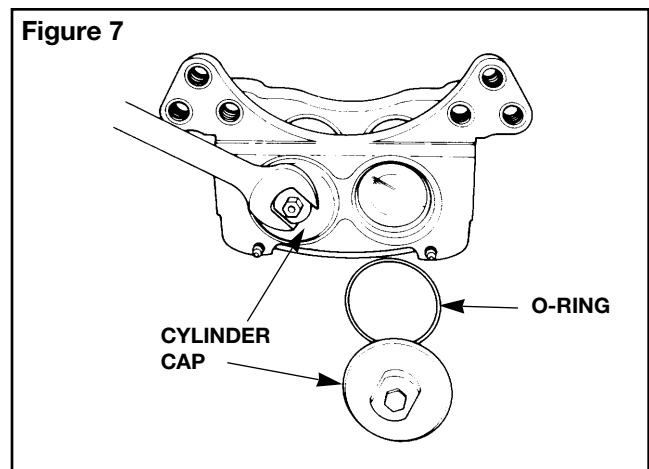


- c. Remove the wood block and the C-clamp from the housing.

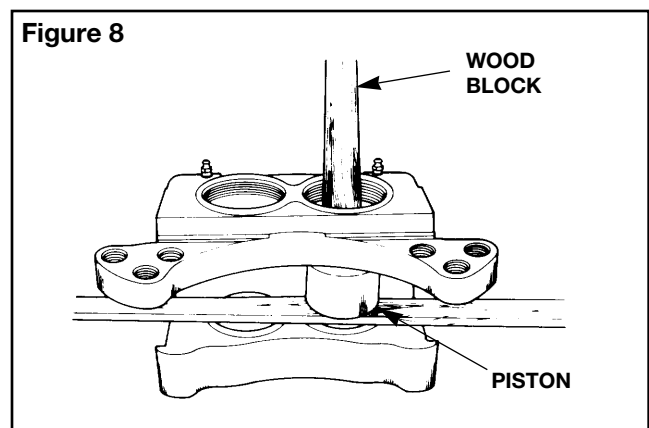
- d. Remove the pistons from the bores that are opposite from the mounting plate.

5. Remove the two bleeder screws from the housing.

6. Put an open-end wrench on the two flat areas on top of the cylinder cap. Remove the cylinder caps from the housing. Remove and discard the O-ring. **Figure 7.**



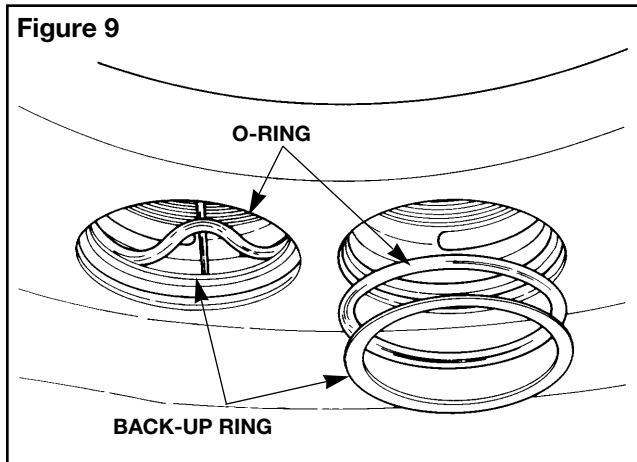
7. Remove the pistons from the mounting plate side of the housing. Push on the ends of the pistons to force them out of the disc side of the housing. **Figure 8.**



Section 2

Removal and Disassembly

8. Remove the dust seals from the housing.
9. Remove and discard the O-rings and the back-up rings. **Figure 9.**



10. Inspect the ring grooves in the housing for scratches and rust. Remove small scratches and rust with emery cloth. Replace the housing if there are large scratches or large amounts of rust. See Section 3, "Inspect Caliper Parts."
11. Inspect the pistons and the bores for scratches and rust. Remove small scratches and rust with emery cloth. Replace the components if they are worn or if there are large scratches or large amounts of rust. See Section 3, "Inspect Caliper Parts."

Section 3

Inspecting and Cleaning

Periodic On-Vehicle Inspections



WARNING

To prevent serious eye injury, always wear safe eye protection when doing maintenance or service.

Inspect the caliper, linings and disc as specified by the maintenance schedule of the vehicle or equipment manufacturer.

Inspect Shoes, Linings and End Plates

Remove the shoes and linings. To help prevent abnormal lining wear, replace worn, bent or cracked end plates and distorted backing plates. Inspect end plate bolts for wear. Replace the bolts if worn. Inspect the linings for:

Lining Wear. Replace the linings when the thickness of the lining is less than 0.125 inch (3.2 mm) from the back plate. **Figure 10.**

Lining Wear Not Even. Replace the linings if the thickness of the two linings is significantly different. Check the pistons for correct operation. Replace the piston and/or housing if a piston is cocked in the bore. Check that the disc surface is flat and parallel to the linings. **Figure 10.**

Oil or Grease on Linings. Replace the linings.

Cracks on Linings. Replace linings that have large or deep cracks.

NOTE:

Small, tight cracks on the surface of the lining are normal when the caliper is used under high temperature conditions.

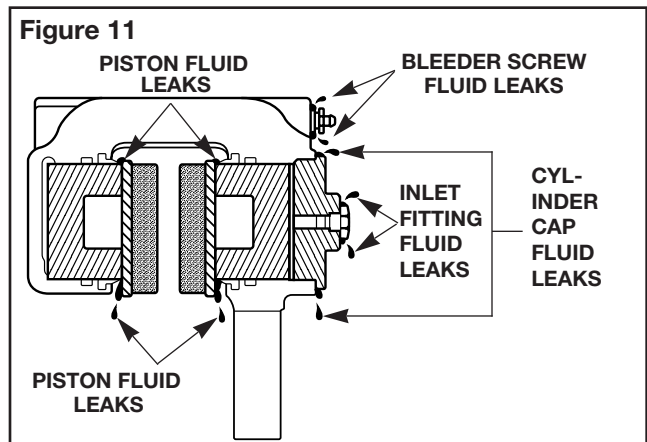


CAUTION

Always replace both linings. If only one lining is replaced, possible disc damage can occur.

Inspect for Caliper Leaks

Inspect the following areas for fluid leaks. **Figure 11.**

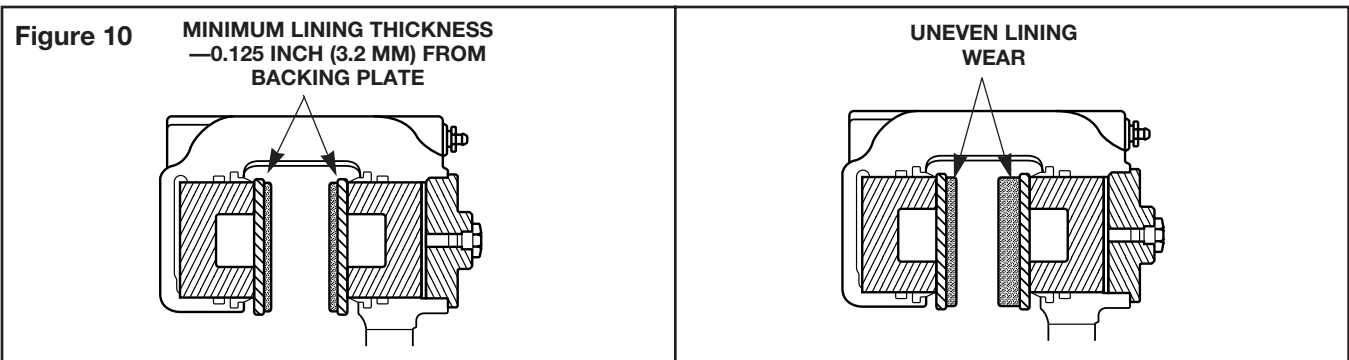


Pistons. If fluid leaks at a piston, disassemble the caliper. Inspect the piston, the bore, the O-rings and the back-up rings. Service as necessary.

Cylinder Cap. If fluid leaks at a cylinder cap, tighten the cylinder cap, the inlet fitting and the plug. If the leak continues, disassemble the caliper. Inspect the cylinder cap threads, the housing threads and the O-ring. Service as necessary.

Bleeder Screw. If fluid leaks at the bleeder screw, tighten the bleeder screw. If the leak continues, replace the bleeder screw.

Inlet Fitting. If fluid leaks at the inlet fitting, tighten the fitting. If the leak continues, replace the O-ring.



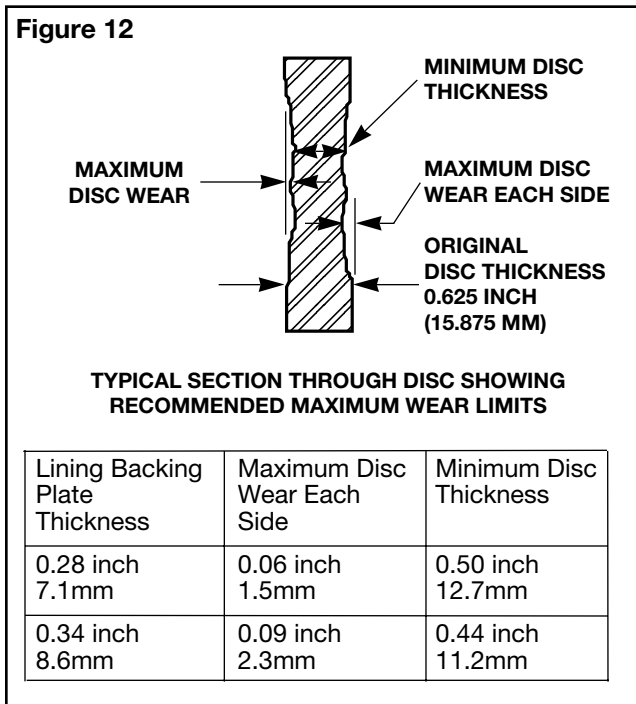
Section 3 Inspecting and Cleaning

Inspect Dust Seals

Make sure the dust seals are soft and flexible. Disassemble the caliper and replace dust seals that are hard or damaged.

Inspect Disc

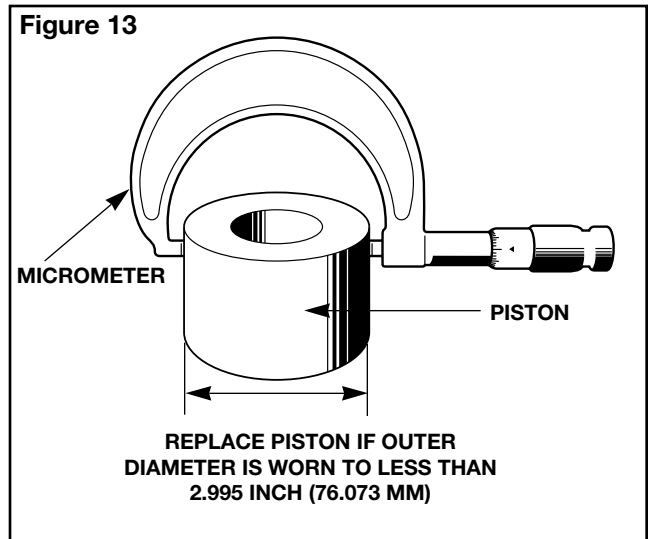
If the disc is worn beyond the wear limits, replace the disc. **Figure 12.** See the specifications of the vehicle manufacturer for wear limits that may be different from those shown below.



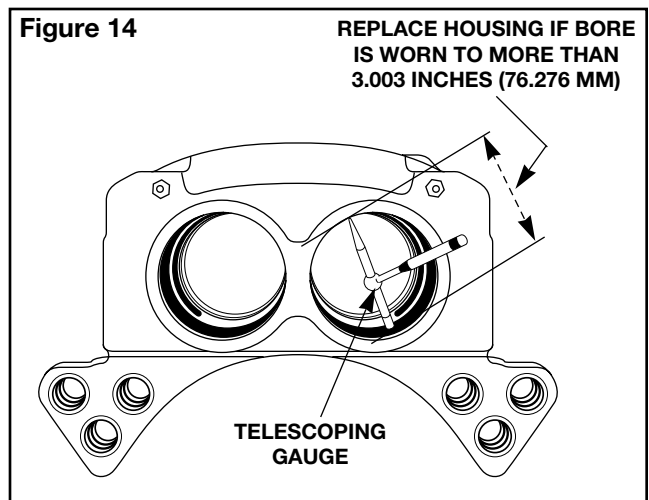
Inspect Caliper Parts

1. Inspect the pistons, housing bores and O-ring grooves for scratches or corrosion. Remove small scratches or corrosion with fine emery cloth. Replace the components if they are worn beyond wear limits or if there are large scratches or large amounts of corrosion.

2. Measure the diameter of the piston. Replace the piston if the outer diameter is worn to less than 2.995 inches (76.073 mm). **Figure 13.**



3. Measure the diameter of the housing bore. Replace the housing if the diameter is worn to more than 3.003 inches (76.276 mm). **Figure 14.**



Section 3

Inspecting and Cleaning

4. Inspect the linings as described earlier in this section.
5. Inspect the threads of the caliper, cylinder caps and all fittings. Replace any component that has thread damage that cannot be repaired.
6. Discard all back up rings, O-rings and dust seals and use new ones when you assemble the caliper.

Cleaning



WARNING

If you use cleaning solvents, hot solution tanks or alkaline solutions incorrectly, serious personal injury can occur. To prevent serious personal injury, follow the instructions supplied by the manufacturer of these products. Do NOT use gasoline to clean parts. Gasoline can explode and cause serious personal injury.



CAUTION

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

- Use solvent cleaners to clean all metal parts that have ground or polished surfaces. Examples of ground or polished parts are the piston and the piston bore in the caliper.
- Metal parts with rough surfaces can be cleaned with solvent cleaners or with alkaline solutions.
- Use a wire brush to clean the threads of fasteners and fittings.
- Use soap and water to clean parts that are not made of metal.
- Scrape away build-ups of mud and dirt on the linings. Replace all linings contaminated with oil or grease.
- Immediately after cleaning, dry all parts with clean paper or rags.

Corrosion Protection

Apply brake system fluid to the cleaned and dried parts that are not damaged and are to be immediately assembled. Do NOT apply fluid to the brake linings or the disc.

If parts are to be stored, apply a special material that prevents corrosion to all surfaces. Do NOT apply the material to the brake linings or the disc. Store the parts inside special paper or other material that prevents corrosion.

Section 4

Assembly and Installation

Assemble Caliper



WARNING

To prevent serious eye injury, always wear safe eye protection when doing maintenance or service.



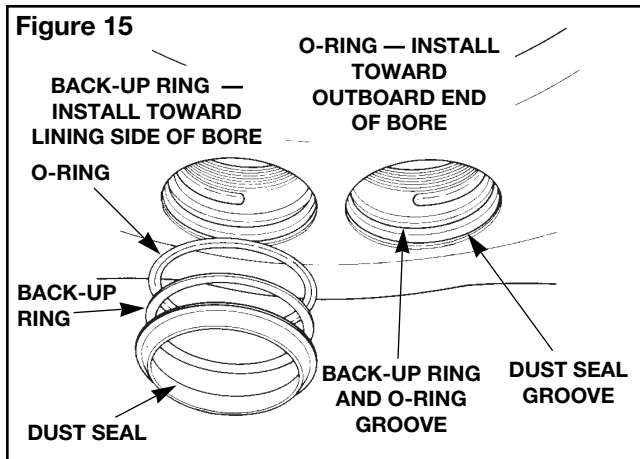
CAUTION

Use only the specified components when you assemble the caliper. Do not mix components from other calipers. If you install the wrong components, the caliper will not operate correctly and may cause damage to the equipment. Use of non-Meritor parts can cause damage, loss of braking and serious personal injury.

NOTE:

The O-rings, back-up rings, pistons and bores must be lubricated before you can install the pistons.

1. Lubricate all pistons, bores, O-rings, and back-up rings with silicone grease such as Dow Corning DC-4 or equivalent. If silicone grease is not available, use the same type of fluid that is used in the brake system.
2. Install a new O-ring and a new back-up ring in the groove in the middle of the bore. The O-ring is installed toward the outboard end of the bore. The back-up ring is installed toward the lining side of the bore. **Figure 15. Do not use silicone grease on the dust seal.**
3. Install a new dust seal in the top groove of the bore. **Figure 15.**



4. Install the pistons in the housing. Push the pistons in from the lining side of the housing. Make sure the pistons are straight in the bores. Push each piston into the bore until the top of the piston is even with the top of the dust seal. **Figures 16 and 17.**

Figure 16

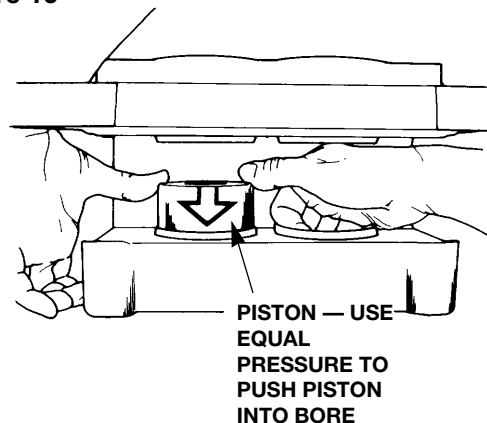
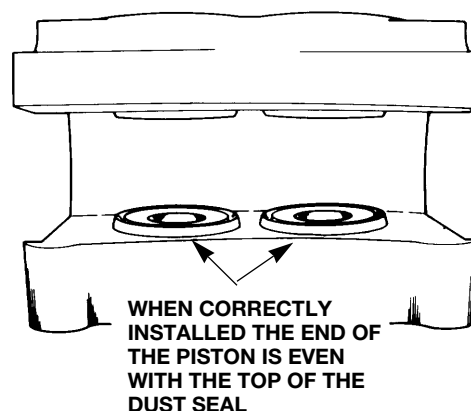


Figure 17



5. Install a new O-ring in the groove on the cylinder cap. Make sure the O-ring is not cut by the threads on the cylinder cap.

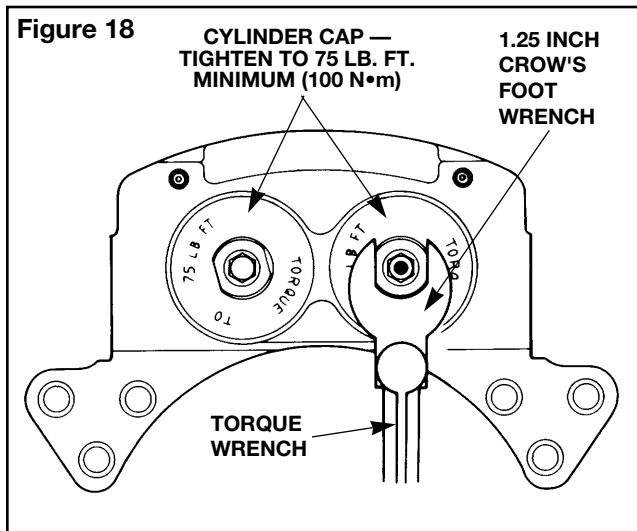
NOTE:

Apply extra grease on O-ring before installing cylinder caps. This will keep O-ring from catching on threads as cylinder cap is threaded into housing.

Section 4

Assembly and Installation

6. Install the cylinder caps in the caliper housing. Tighten the cylinder caps to 75 lb-ft (100 N•m) minimum as shown in **Figure 18**.



7. Install the bleeder screws in the housing. Tighten to 100-120 lb-in (11.3-13.6 N•m).



8. Install the O-ring and the inlet fitting in the cylinder cap.

Install Linings



CAUTION

Always replace both linings. If only one lining is replaced, possible disc damage can occur.

1. Place blocks under the wheels of the vehicle to keep the vehicle from moving.
2. Install the linings in the caliper housing.



WARNING

To avoid serious personal injury, be careful when using Loctite. Follow the manufacturer's instructions for safe use to prevent irritation to eyes and skin. Wash after skin contact. If the Loctite gets in the eyes, flush the eyes with water for 15 minutes. Have eyes checked by a doctor.

3. Apply Loctite 271 or equivalent to the threads of the bolts and fasten the end plates to the housing.

4. Place the end plates on the housing. Install and tighten the bolts to 165-210 lb-ft (224-285 N•m). Make sure the linings move freely in the housing.



5. Remove the air from the brake system. See Bleed Brakes in this manual.
6. Apply and release the brakes three times to make sure the caliper operates correctly. Check for fluid leaks. Make sure the linings move freely in the housing.

Install Caliper

1. Place blocks under the wheels of the vehicle to keep the vehicle from moving.
2. If shims are used, put the shims in the position marked during removal.
3. Place the caliper housing on the mounting bracket. Install the fasteners that hold the caliper on the bracket. Tighten the fasteners to the torque specified by the equipment manufacturer.
4. Install the brake linings in the caliper housing. Apply Loctite 271 or equivalent to the threads of the bolts that fasten the end plates to the housing.
5. Place the end plates on the housing. Install and tighten the bolts to 165-210 lb-ft (224-285 N•m).

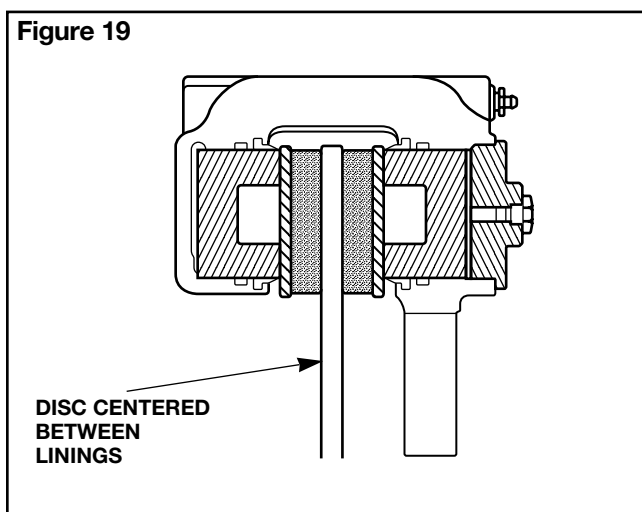


Section 4

Assembly and Installation

6. Make sure the housing is installed correctly on the mounting bracket. The disc must be within $\pm .06$ inches (± 1.5 mm) of being centered between the lining end plates.
 - To increase outboard clearance and decrease inboard clearance, install a shim either between the housing and mounting bracket or between the hub and disc.

The shims must be steel, ground flat and parallel and must cover the entire mounting surface of the hub or housing. The linings must move freely in the housing and between the end plates. **Figure 19.**



7. Remove the plugs from the brake line and the inlet fitting. Connect the brake line to the inlet fitting.
8. Remove the air from the brake system. See Bleeding the Brakes in this manual.
9. Apply and release the brakes three times to make sure the caliper operates correctly. Check for fluid leaks. Make sure the linings move freely in the caliper.

Bleed Brakes

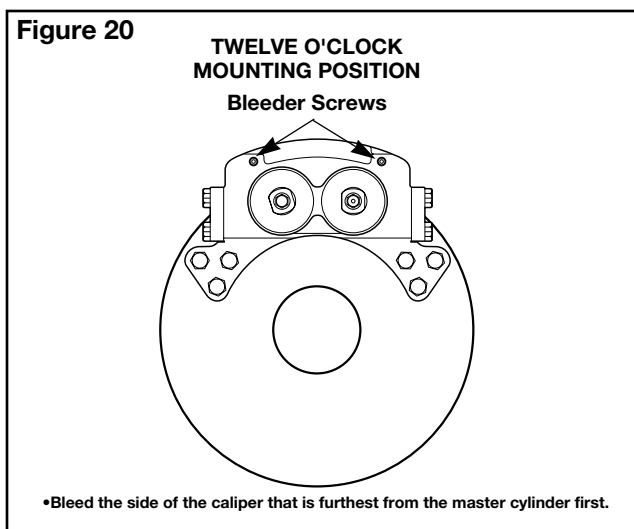
WARNING

When you loosen any brake system hydraulic connection, you must bleed the brakes to remove all air from the system. Air can prevent hydraulic pressure from applying the brakes properly which could increase the stopping distances and result in serious personal injury.

NOTE:

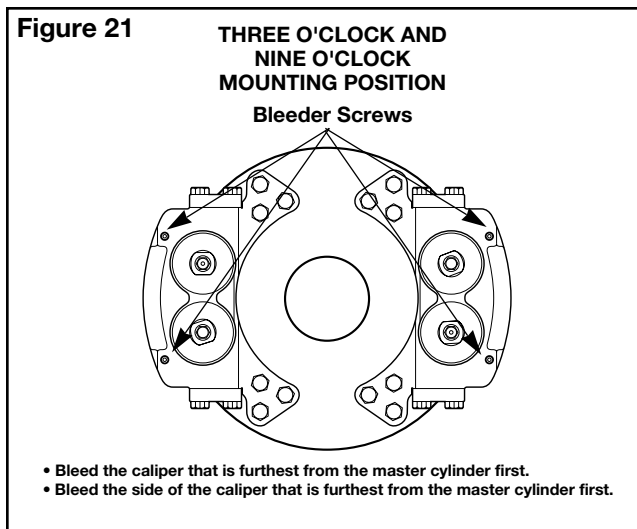
The SCL 2 series dry disc brake calipers are designed to bleed properly when mounted at the 3, 9 or 12 o'clock position.

Always start at the point in the system that is furthest from the master cylinder and work back toward the master cylinder. **Figures 20 and 21.** Bleed every bleeder screw on every caliper on every wheel. When you complete a bleeder screw, go to the next closest bleeder screw on the same caliper. When you complete a caliper, go to the next closest caliper on the same wheel. When you complete a wheel, go to the furthest bleeder screw on the next closest wheel.



Section 4

Assembly and Installation



WARNING

- **Use only the type of hydraulic fluid specified by the equipment manufacturer. Do not use or mix different types of hydraulic fluid. The wrong hydraulic fluid will damage the rubber parts of the caliper and cause damage, loss of braking and serious personal injury.**
- **Do not reuse hydraulic fluid. Used fluid can be contaminated and can cause incorrect operation which could result in serious personal injury.**

1. Make sure that the master cylinder is filled to the specified level with the type of hydraulic fluid specified by the equipment manufacturer. Keep the master cylinder filled during bleeding so that you do not pull air into the system through the master cylinder. Make sure the master cylinder is filled when you are done bleeding the system.
2. Place a clear tube on the bleeder screw. Submerge the other end of the tube in a clear container of the specified fluid.

3. Bleed brakes.

Full full hydraulic systems:

Slowly apply low hydraulic pressure to the caliper. Loosen the bleeder screw. Continue to apply pressure until there are no air bubbles in the fluid. Tighten the bleeder screw 100-120 lb-in (11.3-13.6 N•m) and then release the pressure to the caliper.



For air/hydraulic or mechanical actuator systems:

Apply the brake pedal and then loosen the bleeder screw. Tighten the bleeder screw 100-120 lb-in (11.3-13.6 N•m) before you release the brake pedal so that air is not pulled back into the system. Repeat until there are no air bubbles in the fluid when you apply the brake pedal and loosen the bleeder screw.



4. Check for fluid leaks.

Section 5

Diagnostics

Brake Does Not Apply

CONDITION	POSSIBLE CAUSES	CORRECTION
No pressure to brake.	<ol style="list-style-type: none"> 1. Empty fluid reservoir. 2. Damaged hydraulic system. 	<ol style="list-style-type: none"> 1. Fill reservoir to correct level with specified fluid. 2. Repair hydraulic system.
Piston does not move.	<ol style="list-style-type: none"> 1. No pressure to brake. 2. Piston cocked in bore. 	<ol style="list-style-type: none"> 1. Fill reservoir to correct level with specified fluid. 2. Piston diameter worn less than 2.995 inches (76.073 mm): <ul style="list-style-type: none"> • Replace piston. <p>Caliper bore diameter worn more than 3.003 inches (76.276 mm):</p> <ul style="list-style-type: none"> • Replace caliper housing. <p>Tapered lining wear:</p> <ul style="list-style-type: none"> • Replace linings. Remove dirt and other material between lining and piston.
Brake leaking.	<ol style="list-style-type: none"> 1. Loose bleeder screw. 2. Loose inlet fitting. 3. Damaged inlet fitting. 4. Worn or damaged O-rings and/or backup rings. 5. Loose cylinder cap. 	<ol style="list-style-type: none"> 1. Tighten bleeder screw to 100-120 lb-in (11.3-13.6 N•m). 2. Tighten inlet fitting. 3. Replace inlet fitting. 4. Replace O-rings and/or backup rings. Inspect piston for wear and damage. Service as necessary. 5. Tighten cylinder cap to 75 lb-ft (100 N•m) minimum.
Damaged linings.	<ol style="list-style-type: none"> 1. Lining thickness less than 0.125 inch (3 mm). 2. Lining wear not even. 3. Cracked or broken linings. 4. Oil or grease on linings. 	<ol style="list-style-type: none"> 1. Replace linings. 2. Inspect piston. Service as necessary. Caliper bore diameter worn more than 3.003 inch (76.276 mm): <ul style="list-style-type: none"> • Replace caliper. <p>Inspect housing for clogged fluid passages. Service as necessary. Worn end plates:</p> <ul style="list-style-type: none"> • Replace end plates. <ol style="list-style-type: none"> 3. Replace linings. 4. Replace linings.

Brake Does Not Release

CONDITION	POSSIBLE CAUSES	CORRECTION
Vehicle does not move.	<ol style="list-style-type: none"> 1. Parking brake applied. 2. Damaged hydraulic system. 	<ol style="list-style-type: none"> 1. Release parking brake. 2. Repair hydraulic system.
Brakes dragging on disc and running too hot.	<ol style="list-style-type: none"> 1. More than 3 psi (.2 bar) pressure applied when brakes are released. 2. Vehicle or equipment not operated correctly. 3. Piston cocked in bore. 	<ol style="list-style-type: none"> 1. Repair hydraulic system so that pressure is less than 3 psi (.2 bar) when brakes are released. Bleed brakes. 2. Advise operator on correct vehicle or equipment operation. 3. Piston diameter worn less than 2.995 inches (76.073 mm): <ul style="list-style-type: none"> • Replace piston. <p>Caliper bore diameter worn to more than 3.003 inches (76.276 mm):</p> <ul style="list-style-type: none"> • Replace caliper housing. <p>Tapered lining wear:</p> <ul style="list-style-type: none"> • Replace linings. Remove dirt and other material between lining and piston.

Section 6 Specifications

Torque Chart

Bleeder screws.....	100-120 lb-in (11.3-13.6 N•m)
Cylinder caps.....	75 lb-ft (100 N•m) minimum
End plate bolts	165-210 lb-ft (224-285 N•m)



Meritor Heavy Vehicle Systems, LLC
2135 West Maple Road
Troy, MI 48084 U.S.A.
248-435-1085
800-535-5560 (North America only)
www.meritorauto.com

Meritor do Brasil Ltda.
Av. João Batista, 824
06097-900 Osasco-SP
BRAZIL
(55-11) 704-6510
Fax: (55-11) 702-6510

Meritor Heavy Vehicle Systems, LLC – St. Etienne S.A.
4, rue Jean Servanton
BP 656
42042 St. Etienne Cedex 1
FRANCE
(33-477) 92-8800 Fax: (33-477) 92-8890

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