

530 SERIES SPRING BRAKES

Installation and Service Instructions

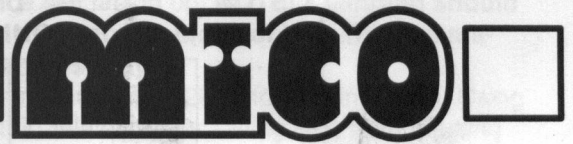


TABLE 1

Caliper Model Number	Caliper with Rectangular Bracket Model Number	Caliper with Triangular Bracket Model Number	Lining Kit Number	Seal Kit Number	*Repair Kit Number
01-530-306 (HO)	02-530-306 (HO)	03-530-306 (HO)	20-060-113	02-500-058	02-500-223
01-530-307 (BF)	02-530-307 (BF)	03-530-307 (BF)	20-060-113	02-500-040	02-500-225
	02-530-308 (HO)		20-060-113	02-500-058	02-500-229
	02-530-310 (HO)		20-060-113	02-500-058	02-500-223
	02-530-312 (HO)		20-060-113	02-500-058	02-500-223
01-530-314 (HO)	02-530-314 (HO)		20-060-116	02-500-058	12-501-407
01-530-628 (HO)	02-530-628 (HO)	03-530-628 (HO)	20-060-113	02-500-058	02-500-224
01-530-629 (BF)	02-530-629 (BF)	03-530-629 (BF)	20-060-113	02-500-040	02-500-226
	02-530-630 (HO)		20-060-113	02-500-230	02-500-228
	02-530-632 (HO)	03-530-632 (HO)	20-060-116	02-500-058	12-501-407

HO = Mineral Base Hydraulic Oil BF = Brake Fluid

* **Belleville Springs are pre-greased. DO NOT remove grease from springs (See GREASE NOTE in Figure 6).**

NOTE: If your product number is not listed, please call MICO, Inc. for information.

BE SURE TO READ GENERAL INSTALLATION GUIDELINES SHEET (81-600-001) BEFORE PROCEEDING

WARNING

MICO Disc Brake Linings do not contain asbestos. Brake lining compounds do, however, contain elements that may become airborne during the life of the lining. To prevent any health problems associated with lining dust, we suggest ventilators be installed as needed on enclosed or stationary equipment. A Material Safety Data Sheet is available upon request.

When installing these MICO Spring Brakes, it is of utmost importance that the caliper be centered evenly and squarely over the disc. This will ensure even lining to disc contact. When linings have been worn to a point of replacement, replace with lining kit specified in Table

1. This series of MICO 530 Spring Brakes is designed for use with a disc of 7.9-12.7 mm (0.31-0.50 in) thickness.

MOUNTING PROCEDURE

- Figures 1 & 2 illustrate the two methods of mounting this series of brakes. See grease note, Figure 6. The mounting surface to disc face dimension should be closely held as this provides for the required caliper

movement. Use shims as needed to obtain the proper distance.

- Using Table 2 and Figures 3 & 4 on page 2, determine "A" dimension and locate mounting bracket assembly holes.
- Loosen lock nut and back off adjusting screw slightly. Push lining assembly back into brake housing.
- Mount brake and bracket assembly on disc and bolt securely to machine using SAE grade 8 or better mounting bolts with lock washers.

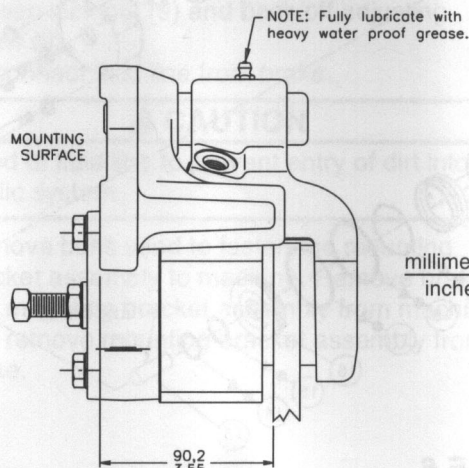


FIGURE 1

millimeters
inches

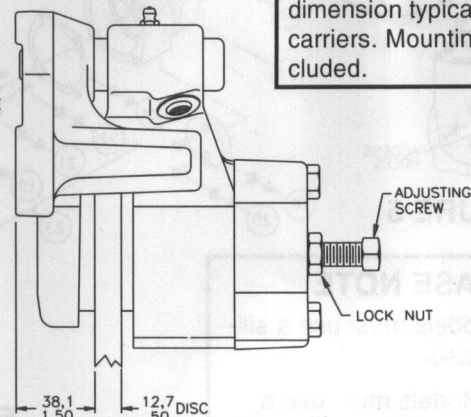


FIGURE 2

NOTE

Dimensions shown in Figures 1 & 2 are typical for all models. Mounting surface to disc face dimension typical of both style carriers. Mounting bolts not included.

TABLE 2
DISC CENTERLINE TO
MOUNTING HOLE DIMENSION

Disc Diameter	Rectangular Mount "A" Dimension	Triangular Mount "A" Dimension
228.6 mm (9 in)	155.6 mm (6.125 in)	117.5 mm (4.625 in)
254.0 mm (10 in)	168.3 mm (6.625 in)	130.2 mm (5.125 in)
304.8 mm (12 in)	193.7 mm (7.625 in)	155.6 mm (6.125 in)
356.6 mm (14 in)	219.1 mm (8.625 in)	181.0 mm (7.125 in)
406.4 mm (16 in)	247.6 mm (9.75 in)	206.4 mm (8.125 in)
457.2 mm (18 in)	273.0 mm (10.75 in)	231.8 mm (9.125 in)
508.0 mm (20 in)	298.4 mm (11.75 in)	257.2 mm (10.125 in)
558.8 mm (22 in)	323.8 mm (12.75 in)	282.6 mm (11.125 in)
609.6 mm (24 in)	349.2 mm (13.75 in)	308.0 mm (12.125 in)

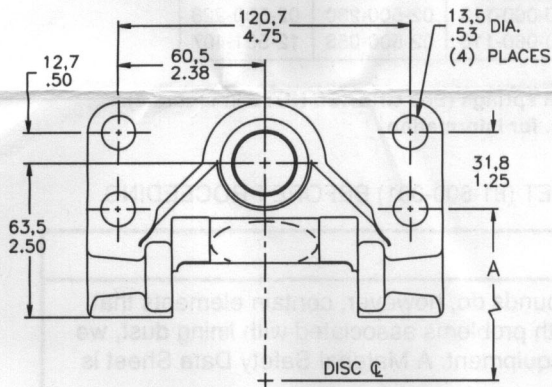


FIGURE 3 **RECTANGULAR MOUNT**

NOTE: For disc diameters greater than 610 mm, add 44 mm (24 in, add 1.75 in) to disc radius to obtain "A" dimension.

- Included in Seal Kit
- ▲ Included in Repair Kit
- Included in Lining Kit
- * Not used in all models

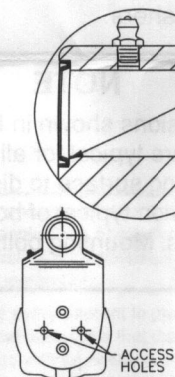


FIGURE 5

GREASE NOTE

Brake Fluid Models must use a silicone base grease.

Hydraulic Oil Models must use a mineral base grease.

millimeters
inches

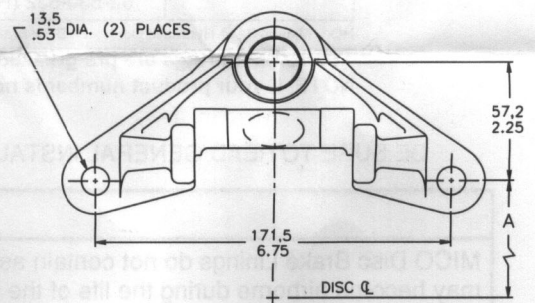


FIGURE 4 **TRIANGULAR MOUNT**

NOTE: For disc diameters greater than 610 mm, add 3 mm (24 in, add 0.125 in) to disc radius to obtain "A" dimension.

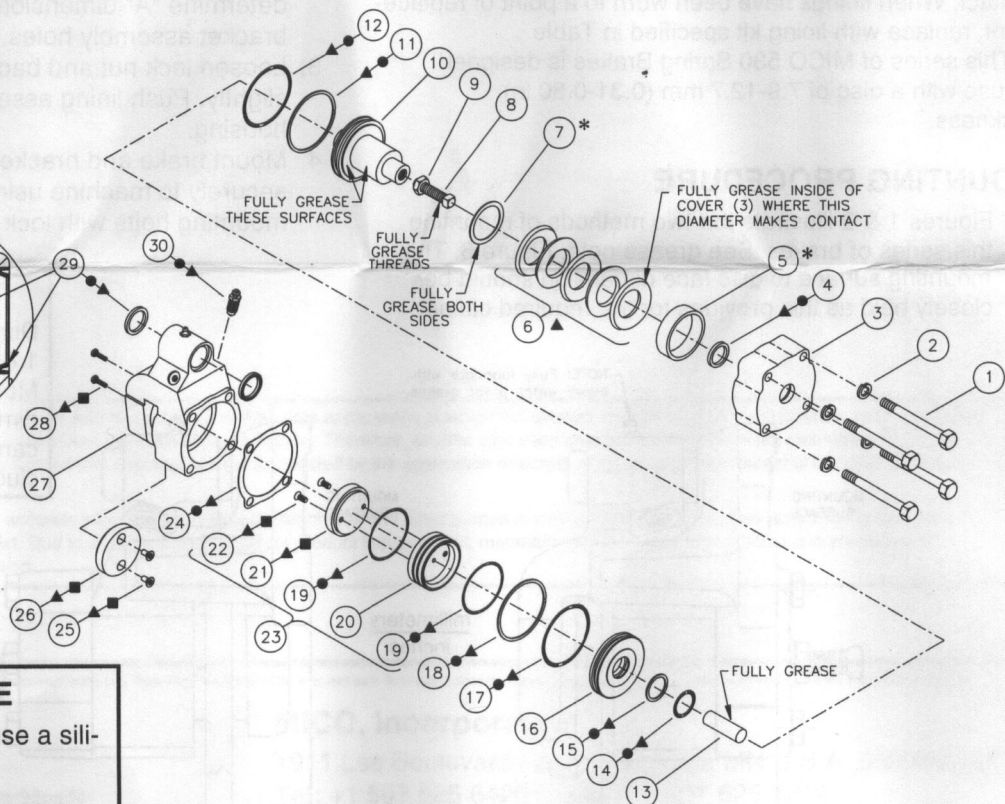


FIGURE 6

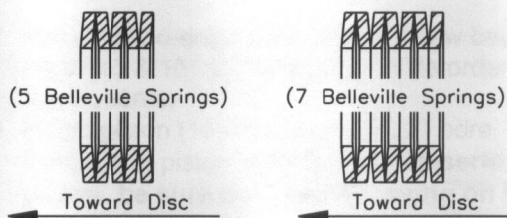


FIGURE 7

PLUMBING PROCEDURE

1. After brake is mounted on machine, install the hydraulic line and the bleeder screw (provided with brake). **NOTE: All porting is designed for #4 SAE o-ring boss port adapters.**
2. Bleed system making sure all air is eliminated. Apply rated pressure and check for leaks. Tighten fittings if leaks occur.

BRAKE ADJUSTMENT PROCEDURE

(Refer to Figure 2)

1. Apply rated hydraulic pressure.
2. Loosen lock nut and adjusting screw.
3. Place 0.30 mm (0.012 in) thick shim between disc and one of the linings.
4. Tighten adjusting screw until it is just possible to remove the shim.
5. Torque lock nut 29.8-36.6 N·m (22-27 lb·ft) while holding adjusting screw with a wrench. Remove shim and release hydraulic pressure.

CHANGE REPAIR KIT PROCEDURE

(Refer to Figures 5 & 6)

NOTE

This literature services various models in this brake series. The components shown in Figure 6 may appear different than what is found in your brake.

When removing seals and back-up rings be careful not to scratch or mar pistons. When installing new seals in the brake, make sure the kit used is the proper one for the system fluid used.

New linings must be kept free of oil, grease, etc.

1. Loosen lock nut (9) and back off adjusting screw (8).

CAUTION

Cap end of fluid line to prevent entry of dirt into hydraulic system.

2. Disconnect fluid line from brake.
3. Remove bolts used to fasten the mounting bracket assembly to machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from brake.
4. Place brake in a soft jawed vise with cover (3) in a vertical position. **NOTE: Clamping should be done on the sides of the brakes on machined surfaces.**

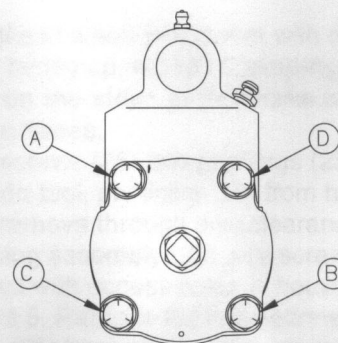


FIGURE 8

5. Remove bleeder screw (30).
6. Using a sharp bladed tool, carefully remove two seals (29) from housing (27).
7. To remove cover (3), loosen four cap screws (1).

CAUTION

Loosen cap screws evenly and in order (A, B, C, D, see Figure 8) until spring preload is released.

8. Remove cap screws (1), lock washers (2), cover (3) and gasket (24). Using a thin blade tool, remove seal (4) from cover.
9. Remove spacer (5), belleville springs (6) and washer (7). Note the stacking sequence of belleville springs. **NOTE: Not all models use spacer (5), or washer (7). Some models use two washers (7).**
10. Remove piston (10) from housing (27) bore. Remove o-ring (12) and back-up ring (11) from piston. Push rod (13) should also come out with piston.
11. Remove piston (16) from housing (27) bore. Remove o-rings (14 & 17) and back-up rings (15 & 18) from piston.
12. Remove lining assembly (23) from housing (27) bore. Holding assembly on a flat surface, separate lining (21) and piston (20) by removing flat head screws (22). Remove o-rings (19) from piston (20).
13. Loosen vise jaws and rotate brake so that disc clearance slot is facing upward. Remove pan head screws (28), lining (26) and bushings (25) from housing (27).
14. Lubricate all rubber components from kit with clean type fluid used in the system.
15. Clean all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. **NOTE: Use a heavy, waterproof grease to lubricate surfaces as shown in Figure 6. (See GREASE NOTE)**
16. Install new lining (26) in housing (27) using new bushings (25) and new pan head screws (28). Torque screws (28) 2.5-3.2 N·m (22-28 lb-in).
17. Install new lining (21) on piston (20) using new flat head screws (22). Torque screws (22) 2.7-3.4 N·m (24-30 lb-in). Install new o-rings (19) on piston (20) and insert lining assembly (23) into housing (27) bore.
18. Carefully install two new seals (29) in housing (27). Note direction of seals (29). Cup side of seals (29) face outward. **NO NOT LUBRICATE SEALS (29).**

19. Install new bleeder screw (30). Torque bleeder screw 12.2-20.3 N·m (9-15 lb·ft).
20. Install new o-rings (14 & 17) and new back-up rings (15 & 18) on piston (16). Note order of components.
21. Install piston (16) into housing (27) bore. Note direction of piston. **NOTE: When inserting piston, be sure not to pinch o-ring on inlet ports.**
22. Install new back-up ring (11) and new o-ring (12) on piston (10). Note order of components. Install push rod (13) in bore of piston. Install piston into housing (27) bore.
23. Fully lubricate threads of adjusting screw (8) and lock nut (9) and install into piston (10).
24. Install washer (7), spacer (5) and belleville springs (6) over end of piston (9). Follow the stacking sequence shown in Figure 7. Not all models use spacer (5), or washer (7). Some models use two washers (7). **NOTE: If seal kit is being installed use existing belleville springs after completely lubricating with a light coat of heavy, water proof grease (See Grease Note, Figure 6). If repair kit is being installed use new belleville springs, already greased. Note that the belleville spring nearest the cover will contact the cover with its outside diameter.**
25. Install new seal (4) in cover (3).
26. Install new gasket (24), cover (3), lock washers (2) and cap screws (1). Torque cap screws 29.8-36.6 N·m (22-27 lb·ft).

⚠ CAUTION

Tighten cap screws evenly and in order (A, B, C, D, see Figure 8).

27. To continue assembly refer to MOUNTING PROCEDURE Section (steps 3 & 4), PLUMBING PROCEDURE Section and BRAKE ADJUSTMENT PROCEDURE Section.

CHANGE SEAL KIT PROCEDURE

(Refer to Figure 6)

NOTE

This literature services various models in this brake series. The components shown in Figure 6 may appear different than what is found in your brake.

When removing seals and back-up rings be careful not to scratch or mar pistons. When installing new seals in the brake, make sure the seal kit used is the proper one for the system fluid used.

New linings must be kept free of oil, grease, etc.

1. Loosen lock nut (9) and back off adjusting screw (8).

2. Disconnect fluid line from brake.

⚠ CAUTION

Cap end of fluid line to prevent entry of dirt into hydraulic system.

3. Remove bolts used to fasten the mounting bracket assembly to machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from brake.
4. Place brake in a soft jawed vise with cover (3) in a vertical position. **NOTE: Clamping should be done on the sides of the brake on machined surfaces.**
5. Remove bleeder screw (30).
6. Using a sharp bladed tool, carefully remove two seals (29) from housing (27).
7. To remove cover (3), loosen four cap screws (1).

⚠ CAUTION

Loosen cap screws evenly and in order (A, B, C, D, see Figure 8) until spring preload is released.

8. Remove cap screws (1), lock washers (2), cover (3) and gasket (24). Using a thin blade tool, remove seal (4) from cover.
9. Remove spacer (5), belleville springs (6) and washer (7). Note the stacking sequence of belleville springs. **NOTE: Not all models use spacer (5), or washer (7). Some models use two washers (7).**
10. Remove piston (10) from housing (27) bore. Remove o-ring (12) and back-up ring (11) from piston. Push rod (13) should also come out with piston.
11. Remove piston (16) from housing (27) bore. Remove o-rings (14 & 17) and back-up rings (15 & 18) from piston.
12. Remove lining assembly (23) from housing (27) bore. Remove o-rings (19) from lining assembly.

⚠ CAUTION

Linings must be kept free of oil, grease, etc.

13. Lubricate all rubber components from kit with clean type fluid used in the system.
14. Clean all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. **NOTE: Use a heavy, waterproof grease to lubricate surfaces as shown in Figure 6. (See GREASE NOTE)**
15. Carefully install two new seals (29) in housing (27). Note direction of seals (29). Cup side of seals (29) face outward. **DO NOT LUBRICATE SEALS (29).**
16. Install new o-rings (19) on lining assembly (23). Install lining assembly (23) in housing (27) bore.

17. Install new o-rings (14 & 17) and new back-up rings (15 & 18) on piston (16). Note order of components.
18. Install piston (16) into housing (27) bore. Note direction of piston. **NOTE: When inserting piston, be sure not to pinch o-ring on inlet ports.**
19. Install new back-up ring (11) and new o-ring (12) on piston (10). Note order of components. Install push rod (13) in bore of piston. Install piston into housing (27) bore.
20. Fully lubricate threads of adjusting screw (8) and lock nut (9) and install into piston (10).
21. Install washer (7), spacer (5) and belleville springs (6) over end of piston (10). Follow the stacking sequence shown in Figure 7. Not all models use spacer (5), or washer (7). **NOTE: Completely lubricate belleville springs (6) with a light coat of heavy, waterproof grease (See Grease Note, Figure 6).**
22. Install new seal (4) in cover (3).
23. Install new gasket (24), cover (3), lock washers (2) and cap screws (1). Torque cap screws 29.8-36.6 N·m (22-27 lb·ft).

⚠ CAUTION

Tighten cap screws evenly and in order (A, B, C, D, see Figure 8).

24. To continue assembly refer to MOUNTING PROCEDURE Section (steps 3 & 4), PLUMBING PROCEDURE Section and BRAKE ADJUSTMENT PROCEDURE Section.

LINING KIT REPLACEMENT PROCEDURE

(Refer to Figures 5 & 6)

NOTE

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New linings must be kept free of oil, grease, etc.

1. Loosen lock nut (9) and back off adjusting screw (8).
2. Disconnect fluid line from brake.

⚠ CAUTION

Cap end of fluid line to prevent entry of dirt into hydraulic system.

3. Remove bolts used to fasten the mounting bracket assembly to machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from brake.

4. Place brake in a soft jawed vise with disc clearance slot facing up. **NOTE: Clamping should be done on the sides of the brake on machined surfaces.**
5. Remove screws (28) and bushings (25). Using a thin blade tool, pry lining (26) from housing (27) and remove through disc clearance slot.
6. Rotate lining assembly (23) until screws (22) are aligned with access holes in housing (27), see Figure 5. Remove flat head screws (22). Pry lining (21) from piston (20) and remove through disc clearance slot.
7. Install new lining (21) into piston (20) thru disc clearance slot. Install new flat head screws (22) and torque 2.7-3.4 N·m (24-30 lb·in).
8. Insert new bushings (25) into new lining (26). Install new lining into housing through disc clearance slot. Line up the holes with the housing and fasten with new screws (28). Torque screws (28) 2.5-3.2 N·m (22-28 lb·in).
9. Reinstall brake on machine as described in MOUNTING PROCEDURE Section (steps 3 & 4) and PLUMBING PROCEDURE Section.
10. Adjust brake as described in BRAKE ADJUSTMENT PROCEDURE Section.

MICO could not possibly know of and give advice with respect to all conceivable applications in which this product may be used and the possible hazards and/or results of each application. MICO has not undertaken any such wide evaluation. Therefore, anyone who uses an application which is not recommended by the manufacturer, first must completely satisfy himself that a danger will not be created by the application selected, or by the particular model of our product that is selected for the application.

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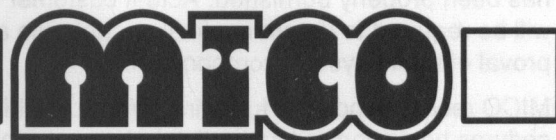
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Recommended Brake Service Procedures to Reduce Exposure to Non-Asbestos Fiber

TECHNICAL NOTICE



FOR ALL MICO NON-ASBESTOS BRAKE LININGS

Recently manufactured brake linings no longer contain asbestos fibers. In place of asbestos, these linings contain a variety of ingredients, including glass fibers, mineral wool, aramid fibers, ceramic fibers, and carbon fibers. At present, OSHA does not specifically regulate these non-asbestos fibers, except as nuisance dust.

Medical experts do not agree about the potential long-term risks from working with and inhaling non-asbestos fibers. Some experts nonetheless think that long-term exposure to some non-asbestos fibers may cause diseases of the lung, including pneumoconiosis, fibrosis and cancer. Therefore, MICO recommends that workers use caution to avoid creating and breathing dust when working on brakes that contain non-asbestos fibers.

⚠ WARNING

1. Whenever possible, work on brakes in a separate area away from other operations.
2. Always wear a respirator approved by NIOSH or MSHA during all brake service procedures. Wear the respirator from removal of the wheels through assembly.
3. **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 sleeves. But, if such equipment is not available, carefully clean parts and assemblies in the open air.
4. During disassembly, carefully place all parts on the floor to avoid getting dust into 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.
5. Grinding or machining brake linings. If you must grind or machine brake linings, take additional precautions because contact with fiber dust is higher during these operations. In addition to wearing an approved respirator, do such work in an area with exhaust ventilation.
6. Cleaning the work area. **NEVER** use compressed air or dry sweeping to clean the work area. Use an industrial vacuum with a HEPA filter and rags soaked in water and wrung until nearly dry. Dispose of used rags with care to avoid getting dust into the air. Use an approved respirator when emptying vacuum cleaners and handling used rags.
7. Worker clean-up. Wash your hands before eating, drinking or smoking. Do not wear your work clothes home. Vacuum your work clothes after use and then launder them separately, without shaking, to prevent fiber dust from getting into the air.
8. Material safety data sheets on this product, as required by OSHA, are available from MICO.

MICO could not possibly know of and give advice with respect to all conceivable applications in which this product may be used and the possible hazards and/or results of each application. MICO has not undertaken any such wide evaluation. Therefore, anyone who uses an application which is not recommended by the manufacturer, first must completely satisfy himself that a danger will not be created by the application selected, or by the particular model of our product that is selected for the application.

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BURNISHING PROCEDURES FOR MICO CALIPER DISC BRAKES

Maximum torque will be achieved only after the brake has been properly burnished. Actual customer testing will be required to determine final acceptance and approval of brake system components.

MICO recommends the following SAE burnishing procedures be performed immediately following the installation and adjustment of the brake. These "SAE recommended practices" (J360; paragraph 7.3 for parking brakes and J786a; paragraph 5.5 for service brakes) are intended to be used as guidelines only. Contact the vehicle (or equipment) manufacturer for specific recommendations.

PARKING BRAKE: Make 10 stops from 10 MPH (45 m/sec) at 3 ft/sec² (0.9 m/sec²). Space the stops a minimum of 2.5 miles (4000 m) apart and operate the vehicle at 20 MPH (9 m/sec) between stops.

SERVICE BRAKE: Make at least 200 "Brake Snubs", not less than 50 in a series, from 40 to 20 MPH (64 to 32 km/hr) at 10 ft/sec² (3 m/sec²) in normal gear range. A "Brake Snub" is the act of retarding a motor vehicle between two positive speed values by the use of a brake system.

Accelerate to 40 MPH at moderate acceleration after each "snub" and drive 40 MPH (64 km/hr) between snubs.

At every 25th application (minimum), make a **full** stop from 40 MPH (46 km/hr).

APPLICATION INTERVALS:

- For light trucks and buses [6,000-10,000 lb (2,700-4,500kg) GVW]: 1.0 mile (1.6 km)
- For truck, bus, and combination of vehicles over 10,000 lb (4,500 kg) GVW: 1.5 miles (2.4 km)

NOTE: Other burnish procedures which produce similar braking conditions and performance characteristics are permissible.

After burnishing, adjust the parking brake and actuation system in accordance with MICO specifications (or the appropriate manufacturer's specifications for components of the actuation system not supplied by MICO).

Immediately following any dynamic stop resulting from the application of the parking brake, the brake and disc must be inspected for any unusual wear or conditions and then adjusted in accordance with MICO specifications.

Recommended Disc Material

High quality brake discs should be used in conjunction with MICO Caliper Disc Brakes. Depending on strength and performance requirements, low to medium carbon steel is generally recommended. Fabrication procedures are as follows:

1. Flame cut or machine to required outside diameter with inside diameter machined to size.
2. Stress relieve after all machining operations.
3. Blanchard ground to a surface finish of 54 Ra to 72 Ra with a visible cross-hatch pattern.
4. Surfaces to be parallel within 0.05 mm (0.002 in).
5. Surfaces to be flat within 0.13 mm (0.005 in).