

DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE



CONTENTS:

SAFETY INFORMATION1-2

MECHANICAL RELEASE OF SPRING
BRAKE (CAGING)3-4

MOUNTING THE SPRING BRAKE
TO THE CALIPER5-6

USA PATENTS

5,285,716 5,758,564

5,791,232 5,829,339

6,129,004 6,131,501

Other patents pending

SAFETY INFORMATION

IMPORTANT: ALWAYS BLOCK WHEELS WHEN WORKING ON BRAKE ACTUATORS TO PREVENT VEHICLE ROLLAWAY.

WARNING: SPRING BRAKE ACTUATORS ARE UNDER MORE THAN 2000 POUNDS OF SPRING FORCE. MISHANDLING MAY CAUSE SERIOUS INJURY OR DEATH. DO NOT ATTEMPT TO SERVICE OR REPLACE WITHOUT PROPER KNOWLEDGE. DO NOT WORK FROM BEHIND SPRING BRAKES; ALWAYS WORK FROM THE SIDE AND FRONT.

WARNING: FAILURE IN NOT CAGING THE SPRING BRAKE FOR INSTALLATION MAY CAUSE THE MAIN SPRING TO NOT FULLY ENGAGE THE FOUNDATION BRAKE COMPONENTS, WHICH COULD CAUSE INSUFFICIENT BRAKING FORCE RESULTING IN DEATH, SEVERE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

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DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE

SAFETY INFORMATION (Continued)

DANGER: DO NOT ATTEMPT TO MECHANICALLY RELEASE (CAGE) THE SPRING ON ANY SPRING BRAKE IF IT SHOWS SIGNS OF STRUCTURAL DAMAGE, SIGNS OF SIGNIFICANT CORROSION OR ANY OTHER DAMAGES THAT THE OPERATOR OR MECHANIC WOULD FEEL UNSAFE DOING. HANDLE DAMAGED SPRING BRAKES WITH EXTREME CAUTION. DISASSEMBLY OF THE CHAMBER MAY RESULT IN THE FORCEFUL RELEASE OF THE SPRING CHAMBER AND/OR ITS CONTENTS, WHICH COULD CAUSE DEATH, SEVERE PERSONAL INJURY AND/OR PERSONAL PROPERTY DAMAGE.

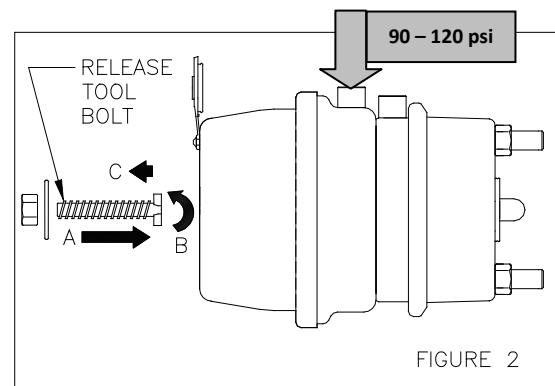
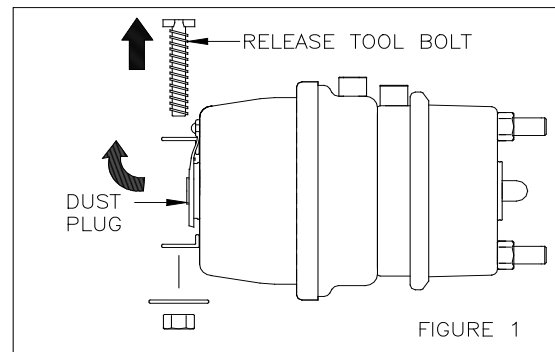
MECHANICAL RELEASE OF SPRING BRAKE (CAGING)

If the unit you are installing is already caged, proceed to MOUNTING THE SPRING BRAKE. Otherwise, continue on this page.

The preferred method of caging is to use compressed air. An alternative manual method can be used if compressed air is not available. See next page.

Caging the Spring Brake Using Compressed Air:

1. Remove the dust plug from the release tool access hole in the center of the spring housing. (Figure 1.)
2. Remove the release tool bolt, washer and nut from its holder. (Figure 1.)
3. Apply vehicle or shop air pressure, 120 psi (8.3 bar), 90 psi (6.2 bar) minimum, to the emergency side of the brake. Cycle the brake three (3) times. Maintain this air pressure.
4. Insert the release tool bolt through the access hole; all the way into the pressure plate, inside the spring housing. (Figure 2, Arrow A.)
5. Make sure you engage the release tool bolt in the pressure plate by turning the bolt 1/4 turn clockwise and pulling outward. If the release bolt is engaged properly on the pressure plate, it will not turn more than 1/4 turn clockwise and will not pull outward more than 3/4 inch (19mm). (Figure 2, Arrows B and C.)



DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE

Caging the Spring Brake Using Compressed Air: (Continued)

6. Install the release tool washer and tighten the nut finger-tight. The brake is now caged.
7. Release the air pressure and proceed to **MOUNTING THE SPRING BRAKE**.

WARNING: OVER-TORQUEING THE NUT CAN CAUSE PRESSURE PLATE, WASHER AND/OR SPRING HOUSING DAMAGE, RESULTING IN SUDDEN RELEASE OF THE MAIN SPRING AND POTENTIALLY CAUSING THE RELEASE TOOL, WASHER, NUT AND/OR FRAGMENTS TO BECOME AIRBORNE WHICH COULD CAUSE DEATH, SEVERE PERSONAL INJURY AND/OR PERSONAL PROPERTY DAMAGE.

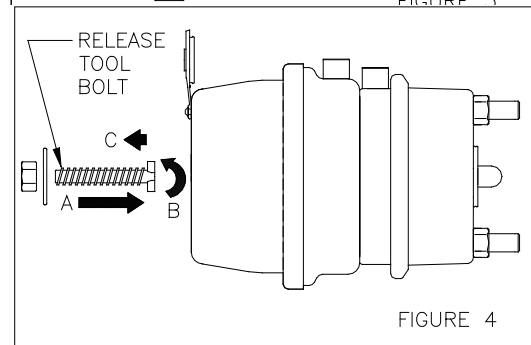
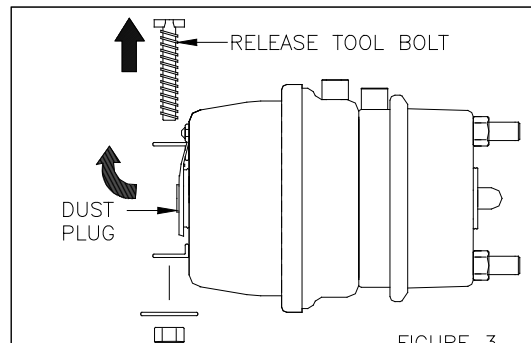
MECHANICAL RELEASE OF SPRING BRAKE (CAGING)

Caging the Spring Brake Using the Manual Method:

This manual method should only be used if the spring brake is not already caged and if a compressed air source is not available. The preferred method of caging is to use compressed air.

IMPORTANT: THIS METHOD APPLIES ONLY IF THE SPRING BRAKE IS NOT PRESSURIZED

1. Remove the dust plug from the release tool access hole in the center of the spring housing. (Figure 3.)
2. Remove the release tool bolt, washer and nut from its holder. (Figure 3.)
3. Using a flashlight, look through the access hole and check that the top of the pressure plate is located about 2.5-3.0 inches (63-76mm) deep.
4. Insert the release tool bolt through the access hole, all the way into the pressure plate, inside the spring housing. (Figure 4, Arrow A.)
5. Make sure you engage the release tool bolt in the pressure plate by turning the bolt 1/4 turn clockwise and pulling outward. If the release bolt is engaged properly on the pressure plate, it will not turn more than 1/4 turn clockwise and will not pull outward more than 3/4 inch. (19mm). (Figure 4, Arrows B and C.)



6. Install the release tool washer and tighten the nut finger-tight.

DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE

Caging the Spring Brake Using the Manual Method: (Continued)

7. Now cage the main spring by tightening the release tool nut with a hand wrench.

DO NOT USE AN IMPACT WRENCH. THE MAXIMUM RELEASE TOOL NUT TORQUE IS 50 FT-LBS (65 Nm). OVER TORQUEING THE RELEASE TOOL NUT CAN CAUSE PRESSURE PLATE DAMAGE.

8. Make sure the service push rod is retracting while you tighten the release tool nut. When the service pushrod stops moving and/or the release tool bolt torque reaches 35 - 50 Ft-lbs (47 – 65 Nm) or when the release tool extends beyond the nut by more than 3.25 inches (83mm), stop torqueing the release tool nut. The spring brake is now caged.
9. Proceed to MOUNTING THE SPRING BRAKE.

MOUNTING THE SPRING BRAKE

1. Check visually that the pushrod is centered on the face of the spring brake. If the pushrod is not centered, then correct it in this sequence:
 - a. With compressed air, cycle the service side of the unit five times.
 - b. If the pushrod is still not centered, or if compressed air is not available, use the side of your thumb to rock or move the pushrod into a center position.
2. Check the cleanliness of the spring brake. Make sure the rubber boot is well seated, free of debris, and shows no signs of damage. Do not install a spring brake that shows signs of debris or excess flash on the boot.
3. Check the cleanliness of the caliper. Make sure the caliper seal surface and the mounting surface are free of oil, grease or debris and show no signs of damage.
4. Follow the instructions of the caliper manufacturer regarding the caliper seal diaphragm. Some manufacturers have a seal that is to be removed before spring brake installation, while others have a permanent “puncture-in-place” design.



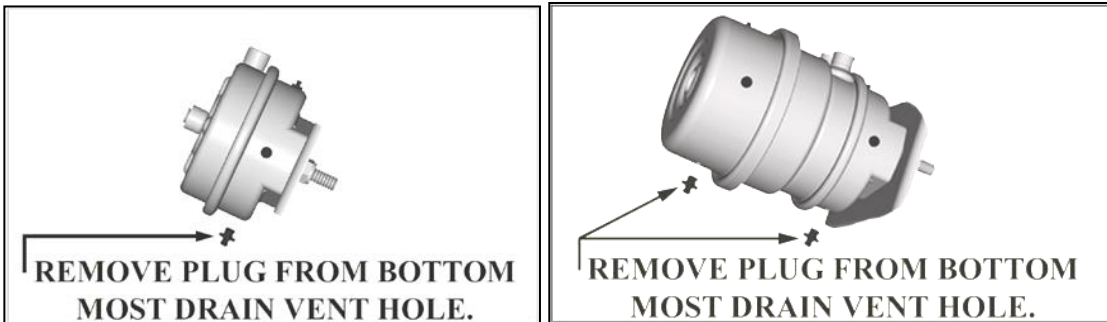
Follow the instructions of the caliper manufacturer regarding use of grease or lubricant on the spoon surface that accepts the pushrod.

5. Position the spring brake for insertion into the caliper mating face. Check to see which of the two possible orientations of the spring brake places the ports most favorably.

DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE

MOUNTING THE SPRING BRAKE (Continued)

6. As the spring brake starts to mate with the caliper, visually check that the pushrod is nesting in the spoon on the caliper.
7. Firmly hold the spring brake onto the caliper by hand, and place the two washers onto the mounting studs, followed by the two nuts.
8. Tighten the nuts in a 3-step alternating sequence:
 - a. First draw up the mating surfaces flush, with minimal torque on the two nuts.
 - b. Second, tighten each nut with a torque wrench to 59-74 ft-lb (80-100 Nm).
 - c. Third, tighten each nut with a torque wrench to 133-155 ft-lb (180-210 Nm).
9. If breather plugs are supplied, remove the breather plug from the bottom of the spring brake and leave the breather plug(s) in the upper breather hole(s).



WARNING: FAILURE TO REMOVE BOTTOM BREATHER PLUG WILL RESULT IN VOIDING OF TSE WARRANTY

10. Install the air hoses to the spring brake ports. Use non-hardening thread sealant on NPTF fittings to secure a leak-free connection. (Metric fittings usually incorporate a ring seal). Torque the fittings to 26-33 ft-lb (35-45 Nm).
11. Pressurize the air lines to check that there are no leaks. Soapy water may help here.
12. Uncage the mainspring by pressurizing the emergency side of the spring brake and removing the nut, washer and release tool bolt.

DISC BRAKE UNITS INSTALLATION AND SERVICE GUIDE

MOUNTING THE SPRING BRAKE (Continued)

13. Secure the release tool bolt, washer, and nut in its holder, and tighten with a torque wrench to 5-11 ft-lb (7-15 Nm).
14. Re-insert the dust plug into the release tool access hole in the center of the spring housing.
15. Follow the caliper manufacturer's instructions to adjust the caliper. Most calipers are self-adjusting, but it is critical to follow the manufacturer's specific procedure.