

MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

This manual provides instruction for proper inspection and service of MGM Brakes LTS double diaphragm long stroke actuators with integrated release bolt. The following sections provide a guide for brake actuator inspection, service and disposal.



WARNING - Before performing any work on the vehicle's air brake system, or any pressurized component, understand and follow the vehicle manufacturer's recommendations for placing the vehicle in a safe working condition.

WARNING - Do not attempt to remove or install any brake actuator until you understand the recommended procedure. Use only the proper tools and observe all precautions pertaining to the use of those tools.

WARNING – Always wear appropriate personal protection equipment (PPE) when performing inspections and maintenance.

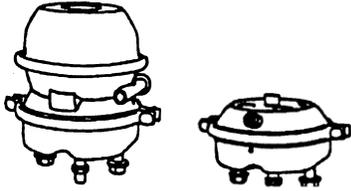
WARNING - Always block wheels to prevent vehicle rollaway when performing any brake inspection or maintenance.

WARNING - Replace any damaged or failed brake actuator with an approved replacement brake actuator of the same size, and type as originally installed on the vehicle.

WARNING - MGM Brakes parking actuators include a tamper resistant spring chamber which has been factory sealed for your protection. There are no user-serviceable parts inside the spring brake chamber. If you experience any damage or failure of your spring brake chamber, remove either the entire actuator as described in Section 2 or the parking spring brake chamber (piggyback) as in Section 5 of this manual. Reference Section 7 of this manual for proper disposal instructions. Never attempt to disassemble the spring brake chamber as serious personal injury could result from accidental sudden release of the high energy spring.

Contact MGM Brakes Customer Service at (800) 527-1534 ext. 6021 for product questions and technical support.

Service bulletins are available on www.mgmbrakes.com



MGM Brakes

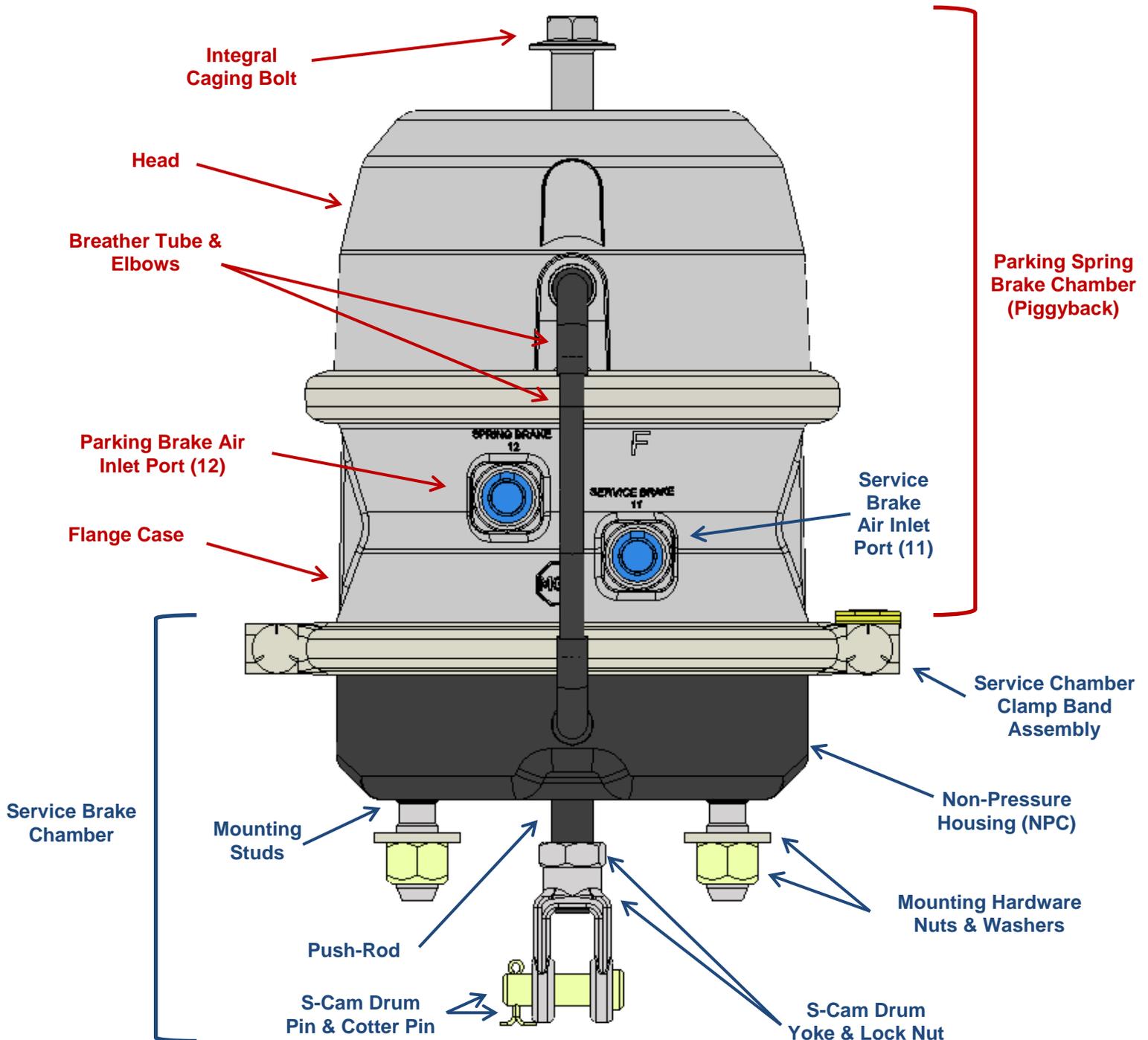
A Division of Indian Head Industries, Inc.

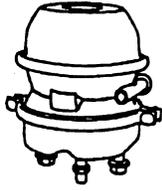
TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 1: Recommended Inspection Points

1.1 Figure 1: LTS Actuator External Components





MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

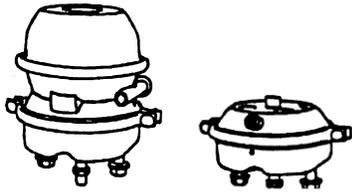


WARNING – Always block wheels to prevent vehicle rollaway when performing any brake inspection or maintenance.

1.2 Visual Inspection Points:

Carefully inspect the following actuator features described in Section 1. Reference Figure 1 for visible actuator components. If any damage is observed or suspected, carefully remove and replace the brake actuator by following the directions in this manual.

- Visually inspect the exterior surfaces of the brake actuator for signs of damage, cracks, non-manufactured holes, excessive corrosion or missing parts.
- **Mounting Hardware:** Check to ensure the mounting studs and nuts are present and are tightened to 133-155 ft-lbs [180-210 Nm] torque using a 15/16 in or 24mm wrench.
- **Integrated Caging Bolt:** Check to ensure the integrated caging bolt is seated against head insert and tightened to 50-60 ft-lbs [68-81 Nm] torque using a 3/4-inch wrench. This ensures the parking brake will have full stroke capability and the caging bolt O-ring is seated sealing out contaminants.
- **Breather Tube:** If equipped, check the parking brake actuator external breather tube to ensure there is no damage or cracks in the rubber elbows or tube. Ensure the tube is securely engaged a minimum of 0.5 in [12.7 mm] into the rubber elbows and glued in place. Use a high quality rubber cement or a hose clamp to secure the tube in the elbow. MGM Brakes offers a breather tube service kit if required.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

- **S-Cam Drum Brake Actuators:** Inspect the push-rod to be sure it is working free and not bent or binding. The push-rod must be square to the brake actuator mounting surface and remain within $\pm 3^\circ$ in any direction at any point in the stroke. If the push-rod is not square, make corrections by repositioning the brake actuator on the mounting bracket and/or the slack adjuster on the cam shaft.

Inspect the push-rod yoke assembly. Ensure the yoke pin is installed and retained into place with a cotter pin. Verify the yoke pin can be moved within the yoke when the brakes are fully released. Verify proper brake adjustment if the yoke pin is bound.

Verify that the yoke locknut is present and tightened to 25-50 ft-lbs [34-68 Nm] torque for threaded push-rods. Replace any damaged, worn or missing parts.

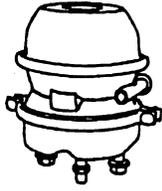
1.3 Leak Check Inspection Points:

Using vehicle system air, apply 90-100 psi [6.2 – 6.9 BAR] pressure to the brake actuator service and parking chambers. Test for air leaks with soapy water or leak detection solution. Never use oil as a leak check solution. Conduct leak check inspection with the service chamber followed by the parking chamber.

Air disc brake actuators are not serviceable and must be replaced if a leak is detected. Some S-Cam Drum brake actuator leaks may be serviced by referencing Section 5. Replace the brake actuator if air inlet fitting re-torquing or replacement does not correct the leak. Repair or replace hoses and fittings as required.

Service Chamber Leak Checks:

- Sealed Service Chambers – If bubbles appear around the service chamber roll-over then the brake actuator must be replaced.
- Clamp Band – If bubbles appear around clamp band, release air pressure from service chamber and tighten clamp band nuts to 30-35 ft-lbs [41-48 Nm] torque using 9/16-inch wrench. Recheck for leaks.



TECHNICAL BULLETIN

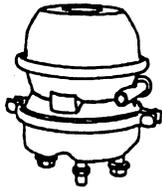
SUBJECT: LTS Parking Actuator Service Manual

- Inspect air lines, hoses and fittings attached to each chamber.
- Air Inlet Fittings - Tighten fittings if leak is found but do not over-torque. Reference Table 1 below for fitting torque. Remove air pressure when tightening fittings. Ensure thread sealant is present.

Table 1: Air Inlet Fitting Installation Torque Specifications	
Fitting	Installation Torque
3/8-18 NPTF	25-30 ft-lbs [34-41 Nm]
M16x1.5-6H	13-15 ft-lbs [18-20 Nm]
M22x1.5-6H	27-33 ft-lbs [37-45 Nm]

Parking Chamber Leak Checks:

- Head / Flange Case Rolled Interface – Replace the brake actuator if a leak is detected.
- Breather Tube Vent Elbow – If equipped, disconnect breather tube elbow from service chamber non-pressure housing (NPC) and check for leak from inside tube. Replace the brake actuator if a leak is detected.
- Center Seal – Check for continuous discharge from the service side (11) vehicle quick release valve. Replace the brake actuator if a leak is detected.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 2: Actuator Removal Instructions

2.1 Parking Spring Chamber Caging Instruction:



WARNING - MGM Brakes parking actuators include a tamper resistant spring chamber which has been factory sealed for your protection. There are no user-serviceable parts inside the spring brake chamber. If you experience any damage or failure of your spring brake chamber, remove either the entire actuator as described in Section 2 or the single (piggyback) as in Section 5 of this manual. Reference Section 8 of this manual for proper disposal instructions. Never attempt to disassemble the spring brake chamber as serious personal injury could result from accidental sudden release of the high energy spring.

WARNING - Always block wheels to prevent vehicle rollaway when performing any brake inspection or maintenance.

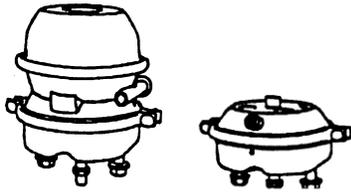
WARNING - Parking actuators must have the parking spring caged prior to removal.

- The integral caging bolt can be manually operated to cage the parking spring without air pressure.
- When possible, apply 90-100 psi [6.2 – 6.9 BAR] of air pressure to the spring air inlet port (12). This pneumatically “releases” the parking brake and compresses the parking spring which allows the caging bolt to move easier.
- Manually cage the spring by turning the integral caging bolt counter-clockwise using a 3/4-inch socket wrench until the spring is fully caged.



WARNING – Do not use an impact wrench.

WARNING - Do not exceed 74 ft-lbs [100 Nm] torque on the caging bolt at any time or damage may occur which could affect the performance of the spring brake chamber. If this occurs, replacement of the actuator is required.



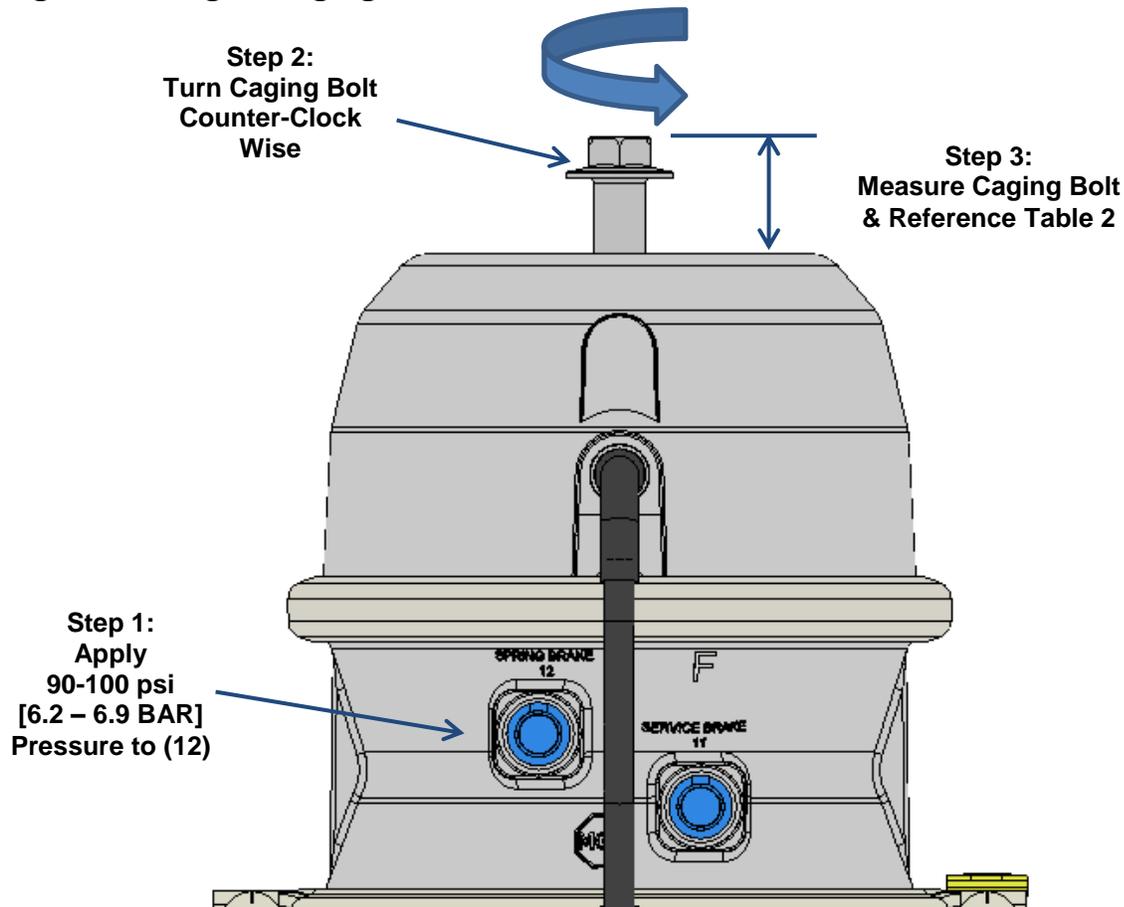
TECHNICAL BULLETIN

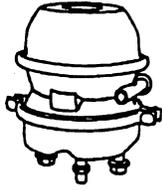
SUBJECT: LTS Parking Actuator Service Manual

- The integral caging bolt includes a dual thread which reduces the travel of the release bolt by a factor of 2.4. Reference Table 2 below for caging bolt full release length requirements. Reference Figure 2 below for additional description of caging operation.

Table 2: Integral Caging Bolt Height Specifications		
Rated Stroke	Caging Bolt Height	Number of Turns
3.00 in [76.2 mm]	1.3 in [33.0 mm]	22-23

Figure 2: Integral Caging Bolt





MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

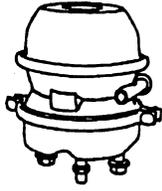
SUBJECT: LTS Parking Actuator Service Manual

2.2 Brake Actuator Removal:

- After ensuring the parking spring is properly caged, drain all air pressure from the service and spring chambers of the actuator. Mark each air-line with air-inlet port designations. Remove the air lines from the air-inlet ports.
- Where equipped, remove the cotter pin and yoke pin from the s-cam drum slack adjuster.

NOTE - Observe if the yoke pin hole remains aligned with the slack adjuster hole after the pin is removed. If not, then the actuator set up may have been pre-stroked which should be accounted for with the push-rod measurement and threaded yoke adjustment.

- Remove and discard mounting stud nuts using a 15/16 in or 24mm wrench and carefully remove the old actuator from the mounting bracket or caliper.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 3: Actuator Installation Instructions



WARNING - Improper installation of the new unit could result in malfunctioning brakes or premature failure of the braking system.

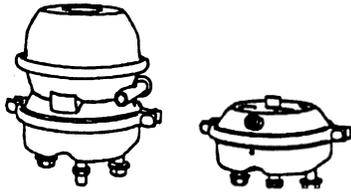
IMPORTANT - It is important to replace the retired brake actuator with an approved replacement actuator of the same size and type as originally installed on the vehicle.

NOTE - Reference Section 4 for s-cam drum piston rod length measurement and adjustment instructions.

NOTE - Reference Section 5 for s-cam drum air-port and clamp band orientation adjustment instructions.

- Remove mounting hardware from the mounting studs of the actuator.
- Install the actuator on the mounting bracket while ensuring the actuator air-inlet ports are properly aligned with the vehicle air lines.

IMPORTANT – Ensure that actuators with an external breather tube are installed with the tube oriented up and away from the road surface. This ensures proper venting. Failure to comply will void the MGM Brakes warranty on these models. Reference Figure 3 for proper breather tube orientation.



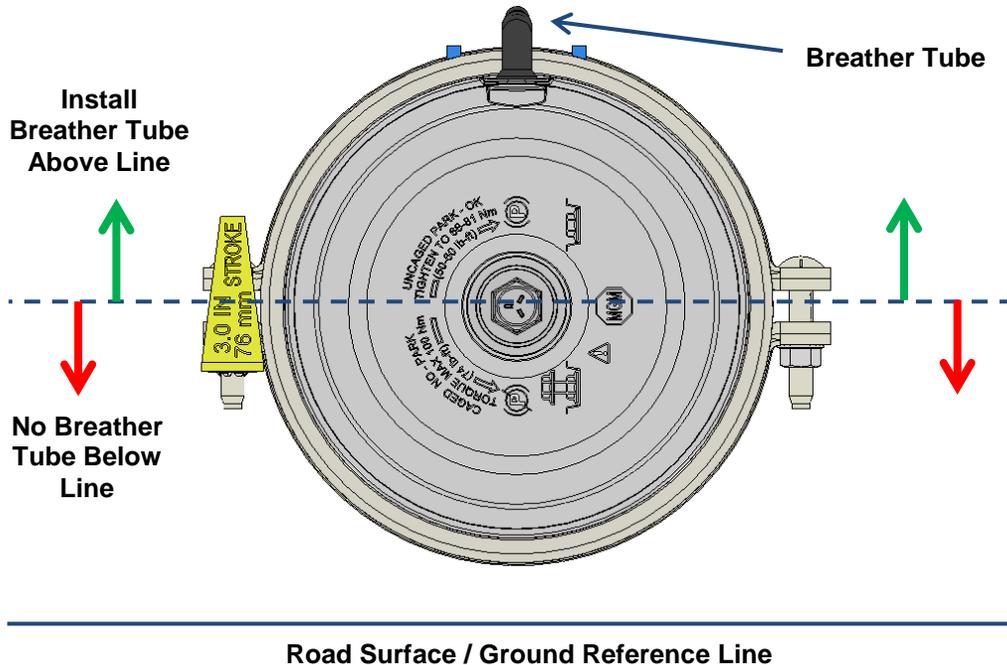
MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

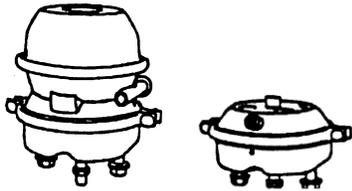
Figure 3: Proper Breather Tube Orientation



- Install mounting hardware on mounting studs using a 15/16 in or 24 mm wrench. Alternate sides when applying torque. First snug the mounting hardware to approximately 25 ft lbs [34 Nm], then apply final torque to 133-155 ft-lbs [180-210 Nm].
- Connect the push-rod yoke to the s-cam drum slack adjuster.

Inspect the push-rod to be sure it is working free and not bent or binding. The push-rod must be square to the brake actuator mounting surface and remain within $\pm 3^\circ$ in any direction at any point in the stroke. If the push-rod is not square, make corrections by repositioning the brake actuator on the mounting bracket and/or the slack adjuster on the cam shaft.

NOTE - Ensure that the correct diameter and length of yoke pin is installed into the correct hole in the slack adjuster. The yoke pin hole should align with the slack adjuster hole with proper push-rod yoke adjustment. The yoke position on the push-rod may require adjustment in order to properly align the pin holes with the slack adjuster. Secure the yoke pin with a new cotter pin.



MGM Brakes

A Division of Indian Head Industries, Inc.

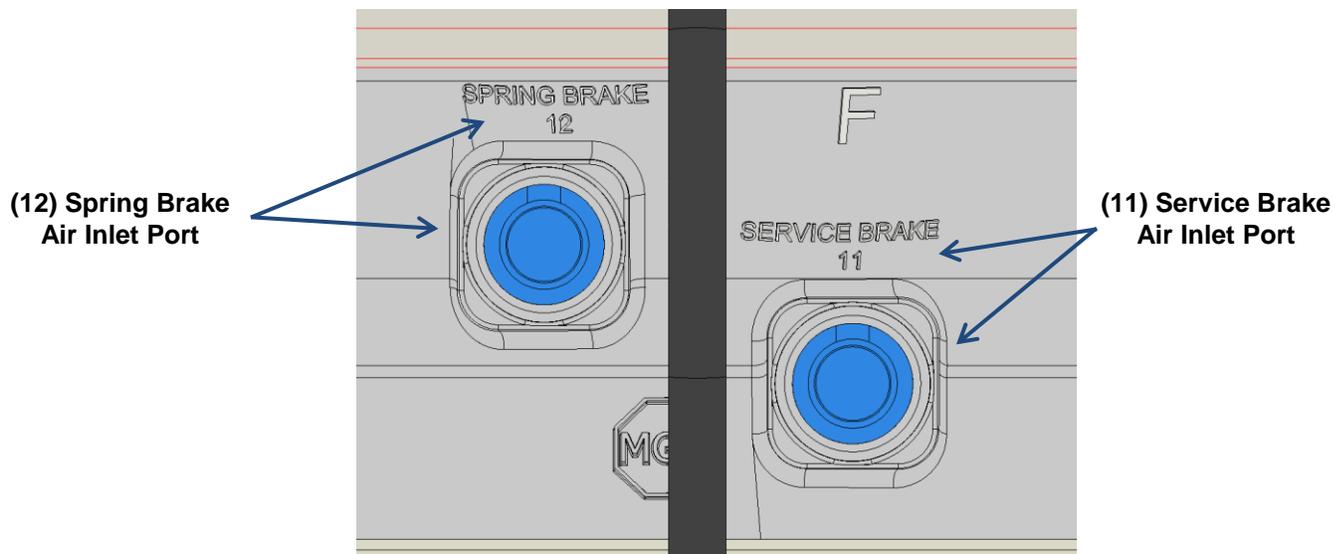
TECHNICAL BULLETIN

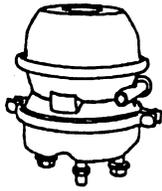
SUBJECT: LTS Parking Actuator Service Manual

IMPORTANT - When making a reconnection to an automatic slack adjuster follow the vehicle manufacturer's recommendations for installation and set-up.

- Install air lines to the actuator making sure each is mated to the correct air inlet port according to markings made earlier. Make note of the actuator inlet port markings on the actuator as shown in Figure 4.

Figure 4: Actuator Air Inlet Port Markings





TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

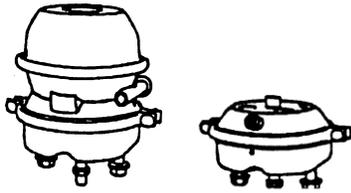
- Use high quality non-hardening sealing compound for NPT fittings. No sealing compound is required for metric fittings with O-rings. Ensure the O-rings are present and not damaged on metric fittings. Tighten fittings to the appropriate torque as specified in Table 3 below.

Table 3: Air Inlet Fitting Installation Torque Specifications	
Fitting	Installation Torque
3/8-18 NPTF	25-30 ft-lbs [34-41 Nm]
M16x1.5-6H	13-15 ft-lbs [18-20 Nm]
M22x1.5-6H	27-33 ft-lbs [37-45 Nm]

- Using vehicle system air, apply 90-100 psi [6.2 – 6.9 BAR] pressure to test for air leaks at air inlet fittings and clamp bands with soapy water or leak detection solution. Never use oil as a leak check solution.
- Exhaust air pressure from service brake chamber and with air pressure still applied to parking brake chamber uncage the parking spring.
- Manually tighten the integrated caging bolt clockwise until it is seated against the head insert and torqued to 50-60 ft-lbs [68-81 Nm]. This will ensure the parking brake will have full stroke capability and the release bolt O-ring is seated to seal out contaminants.



WARNING – Do not use an impact wrench.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 4: S-Cam / Drum Actuator Piston Rod Measurement and Adjustment



WARNING - Always block wheels to prevent vehicle rollaway when performing any brake inspection or maintenance.

WARNING - Improper installation of the new unit could result in malfunctioning brakes or premature failure of the braking system.

- Ensure the service and parking brake chambers are fully released. The push-rod must be fully retracted to the zero position. Reference Section 2 for parking chamber caging instructions. Ensure the service brakes are fully released prior to push-rod measurement.

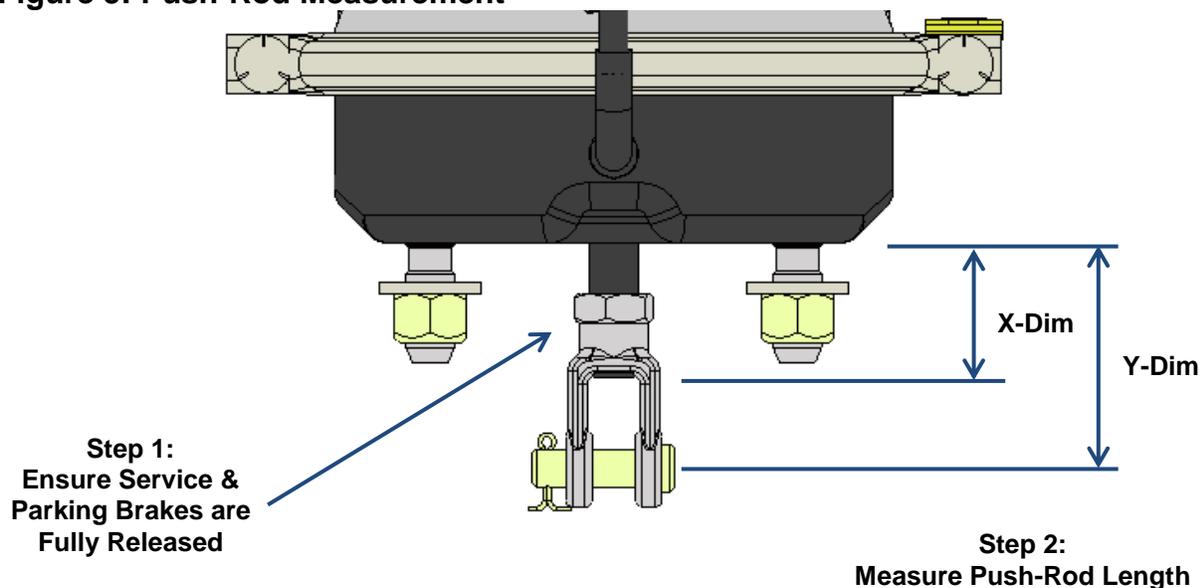
IMPORTANT - Checking that the yoke pin is loose within the yoke will verify that the actuator and slack adjuster holes are properly aligned.

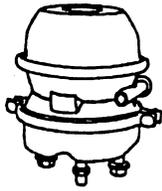
- Measure and record the “X” and / or “Y” dimensions as shown in Figure 5.

“X” Dimension - The dimension from bottom of actuator to end of push-rod.

“Y” Dimension - The dimension from bottom of actuator to center line of yoke pin.

Figure 5: Push-Rod Measurement





MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

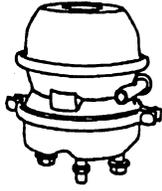
SUBJECT: LTS Parking Actuator Service Manual

NOTE - If for some reason the spring chamber parking spring cannot be caged and fully released, then the “X” and “Y” dimensions will need to be measured from another actuator of the exact type from the same vehicle provided it is retracted to its zero stroke position (brake fully released) and was operating correctly.

- Mark the “X” dimension location on the push-rod of the new actuator. Measure from the mounting surface of the new actuator.
- Thread the jam nut past the mark on the push-rod and align bottom edge of the nut with the mark.
- Use a sharp hack-saw to cut the push-rod to the marked length.
- After cutting the rod, thread jam nut off the push-rod to clean up the thread.
- Thread the jam nut back onto the push-rod followed by the yoke. The yoke from removed unit may be reused provided yoke pin hole is not worn. Adjust yoke to the same “Y” dimension as measured from the removed unit.

IMPORTANT – Ensure final push-rod set up dimension and orientation meets the vehicle manufacturer’s recommendations for installation with the mating slack adjuster.

- Orient the yoke to the proper alignment position. Tighten the locknut against the yoke and torque to 25-50 ft-lbs [34-68 Nm].



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 5: S-Cam / Drum Actuator Service Chamber Rebuild and Parking Spring Brake Chamber (Piggyback) Replacement



WARNING - Replace any damaged or failed brake actuator with an approved replacement brake actuator of the same size, and type as originally installed on the vehicle.

WARNING – MGM Brakes does not recommend mounting MGM parking spring brake chambers to other manufacturer’s NPC housings. Use of other manufacturer’s parts may alter performance of the completed actuator assembly. Use only genuine MGM Brakes replacement parts when servicing MGM Brake actuators.

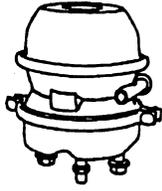
Reference this section for service chamber component replacement including the diaphragm and return spring as well as replacement of the parking spring brake chamber. The parking spring brake chamber is also known as a “single” or “piggyback” assembly.

5.1 Parking Spring Brake Spring Chamber (Piggyback) Removal

- The removal and installation of a parking spring brake chamber (piggyback) without removal of the complete brake actuator can be made easier by “locking off” the service chamber push-rod. To do this apply and hold the service brakes ON and clamp locking pliers on the push-rod to prevent the rod from retracting when air pressure is released.

IMPORTANT - Reference Section 2 for MGM Brake actuator removal instructions. Ensure the parking spring brake chamber (piggyback) is properly caged prior to removal.

- Drain all air pressure from the service and spring chambers of the actuator.
- Mark each air-line with air-inlet port designations and remove the air lines from the air-inlet ports if the parking spring brake chamber (piggyback) is being replaced.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

- If equipped, disconnect the external breather tube and elbow from the service chamber housing.
- Using a 9/16 in wrench, remove the clamp nuts on the service clamp ring. Then, while holding the parking spring brake chamber (piggyback) securely in place, remove the clamp ring to allow removal of the single brake from the service chamber. This operation can be made easier with two people.

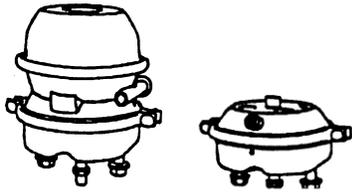


WARNING – Use caution when removing the service chamber clamp band. The service chamber includes a return spring capable of outputting up to 65 lbs [0.29 kN].

5.2 Parking Spring Brake Chamber (Piggyback) Installation

IMPORTANT - At this time inspect all parts in the service chamber including the diaphragm and return spring. Replace any parts which are damaged or worn. Use only genuine MGM Brakes replacement parts.

- Verify that the non-pressure chamber (NPC) housing includes a 0.5 in [12.7 mm] hole for the parking spring brake chamber (piggy back) breather tube elbow. A hole may need to be drilled if the existing actuator did not include a breather tube prior to service. This hole must be in the correct location to mate up with tube upon install. Reference Figure 3 for proper breather tube orientation after vehicle installation. An existing drip hole may be enlarged if in the correct location. Ensure the hole is properly deburred and the housing is cleaned of debris after drilling.
- Make sure the new parking spring brake chamber (piggyback) is fully released as outlined in Section 2.
- Install new return spring and push-rod components as required.

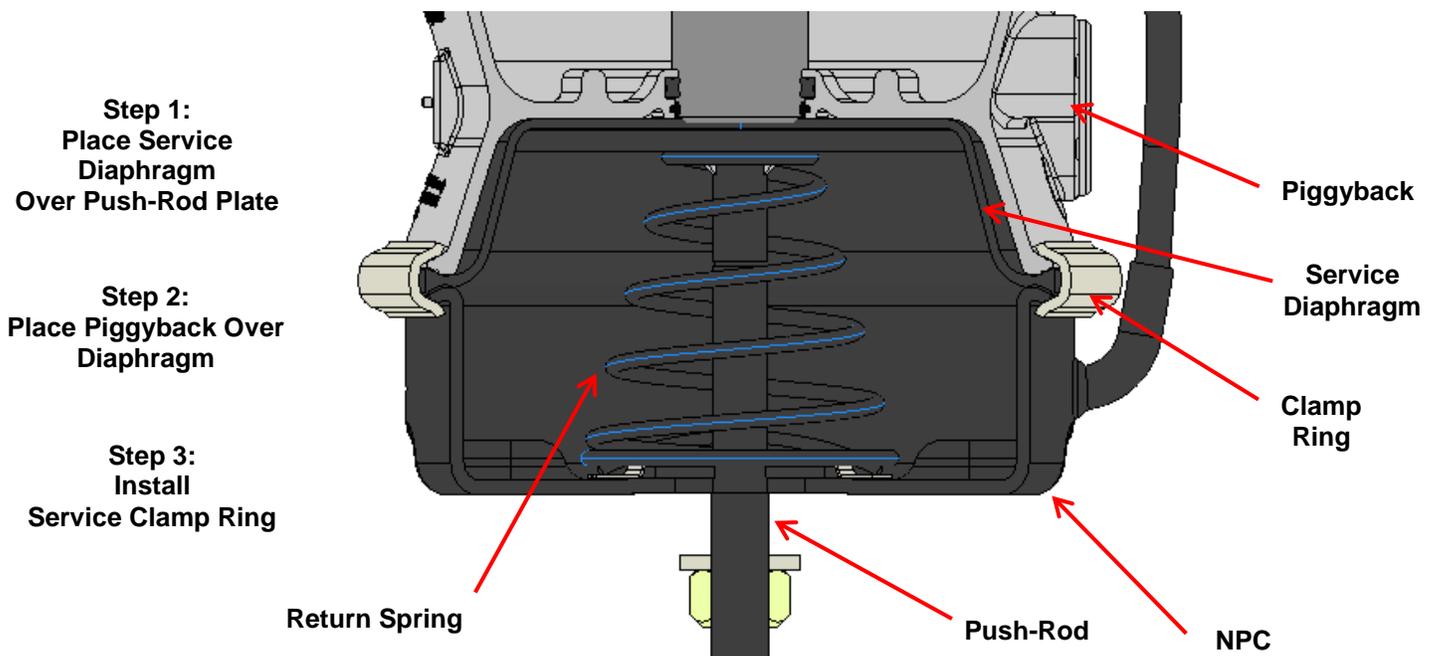


TECHNICAL BULLETIN

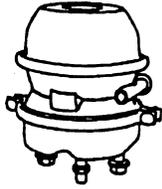
SUBJECT: LTS Parking Actuator Service Manual

- Position the diaphragm over the push-rod plate and center on the NPC lip. Then place the parking spring brake chamber (piggyback) over the diaphragm. Orient the parking spring brake chamber (piggyback) until all mating parts are aligned straight and the airlines are positioned to mate with the vehicle air supply lines. Replace the service clamp ring. Reference Figure 6.

Figure 6: Service Chamber Component Installation



- Re-install the clamp bolts and nuts. Alternately tighten each nut in 5-10 ft-lbs [7-14 Nm] torque increments while constantly rechecking mating parts alignment. If re-alignment is required, loosen clamp nuts and repeat the tightening process. Firmly tap around circumference of the clamp ring with a hammer to assure the full seating of the clamp and tighten the nuts to 30-35 ft-lbs [41-48 Nm] torque.



MGM Brakes

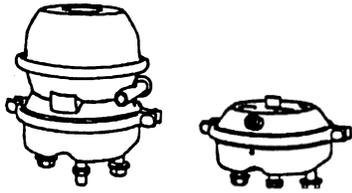
A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

IMPORTANT - Remove the locking pliers from the service push-rod to return actuator to normal operating condition and released position.

- Connect the external breather tube elbow to mating hole in the non-pressure chamber (NPC) housing. MGM Brakes offers a breather tube service kit if required.
- Follow Section 3 for complete brake actuator installation instructions.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

SECTION 6: S-Cam / Drum Actuator Adjustment Check

Maintaining proper brake adjustment is essential for safe and reliable operation of vehicles with air brakes. S-Cam Drum brake actuator stroke is more efficient within the first half of the stroke than near the end of the stroke. Long stroke actuators allow for additional safety factor with emergency situations. It is important to know the brake actuator size and stroke rating prior to measuring brake adjustment.



WARNING - Always block wheels to prevent vehicle rollaway when performing any brake inspection or maintenance.

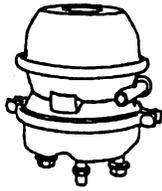
IMPORTANT – Always follow current CVSA guidelines for proper air brake system inspection and adjustment check procedures.

Brake adjustment limits for s-cam drum actuators can be measured as follows:

- Ensure brakes are cool and not hot from use.
- Release the parking brakes.
- Charge the vehicle air system to 90 – 100psi [6.2 – 6.9 BAR] and turn off engine.
- Release service brakes and make note of the actuator push-rod position. Measure from the actuator to a known point on the push-rod.
- Fully apply the service brakes and measure to the same point on the push-rod.

IMPORTANT - Make note if the orange push-rod stroke alert indicator stripe is visible as this is an indication that the actuator is at or near the adjustment limit.

- The difference in measurements is the brake stroke dimension.
- Reference the current CVSA Out of Service Criteria handbook for current brake adjustment limits.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

Section 7: Proper Disposal of Spring Brake Actuators

The brake actuator parking chamber includes a powerful high energy parking spring that outputs as much as 3200 lbs [14.2 kN] force. Refuse and scrap operations can crush and cut debris which could result in the parking spring becoming a projectile if disposed as an operational assembly. It is essential that all retired spring brake actuators be safely disarmed prior to disposal to prevent serious personal injury.

The actuator spring chamber must be disarmed by cutting at least two parking spring coils while the spring is retained in the actuator chamber assembly. Special tools and training are required to perform this operation.



WARNING - Parking actuators must have the parking spring caged prior to removal.

WARNING – Properly disarm spring brake actuators prior to disposal to prevent personal injury.

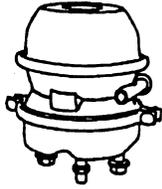
WARNING - Never attempt to remove the parking spring chamber head which contains the power spring.

WARNING – Understand and observe all safety precautions and instructions for proper use of cutting tools.

WARNING – Always wear appropriate personal protection equipment (PPE) when disarming spring brake actuators.

WARNING – It is the user’s responsibility to ensure the disarming container and tools are safe and suitable for the operation. The container MUST be strong enough to retain the actuator components and spring in the event that the actuator suddenly separates during the cutting operation. The container must have access holes to allow cutting of the actuator.

- Ensure the parking chamber is properly caged and remove the actuator from the vehicle following the instructions in Section 2.
- Place the actuator in the disarming container. Ensure the access door is completely closed and locked per the manufacturer’s recommendations.



MGM Brakes

A Division of Indian Head Industries, Inc.

TECHNICAL BULLETIN

SUBJECT: LTS Parking Actuator Service Manual

Orient the actuator so the spring chamber head is accessible through the container access holes.

- Use a cutting torch to cut a hole through the actuator parking spring chamber head and parking spring. Ensure at least two spring coils are completely cut.
- Allow the actuator to cool prior to removal from the disarming container.
- Properly dispose of the actuator following local refuse and scrap regulations.



WARNING – It is the user's responsibility to ensure actuator is completely disarmed and safe prior to disposal.

THIS DOCUMENT IS THE PROPERTY OF MGM BRAKES, DIVISION OF INDIAN HEAD INDUSTRIES INC. AND IS NOT FOR DISSEMINATION OR DISCLOSURE, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SUBMITTED, EXCEPT AS AUTHORIZED IN WRITING BY MGM BRAKES.