

GUNITE SLACK ADJUSTER



Service Manual

GUNITE[®]
CORPORATION

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WARNING

AS WITH ALL PRODUCTS, CLOSE ATTENTION SHOULD BE GIVEN TO ALL INSTRUCTIONS INCORPORATED IN THIS MANUAL, IN PARTICULAR THE NOTES AND WARNINGS WHICH ARE HIGHLIGHTED.

FAILURE TO STRICTLY FOLLOW THESE INSTRUCTIONS MAY RESULT IN THE UNIT PERFORMING IN AN UNSATISFACTORY MANNER AND RESULT IN INADEQUATE BRAKING ABILITY OR DRAGGING BRAKES. THESE CONDITIONS COULD MAKE OPERATION OF THE VEHICLE EXTREMELY HAZARDOUS.

ATTENTION

When installing or replacing a Gunite Slack Adjuster, a new clevis must be installed. Refer to Gunite Parts Catalog GFL-ASA for clevis selection.

OVERVIEW

Gunite offers a complete line of unhandled slack adjusters for installation on steering, drive and trailer axles. The space required for the Gunite slack adjuster is similar to that which is required for manual slack adjusters. Gunite slack adjusters do not require any external brackets, adapters or special mounting holes for installation.

Popular spline and arm length combinations allow them to be used to replace most other slack adjusters. However, brands should not be mixed on the same axle.

THE BRAKES SHOULD BE IN GOOD OPERATING CONDITION AND STATE OF REPAIR WHEN GUNITE SLACK ADJUSTERS ARE INSTALLED. NO SLACK ADJUSTER CAN COMPENSATE FOR PROBLEMS AND DEFICIENCIES IN THE FOUNDATION BRAKING SYSTEM.

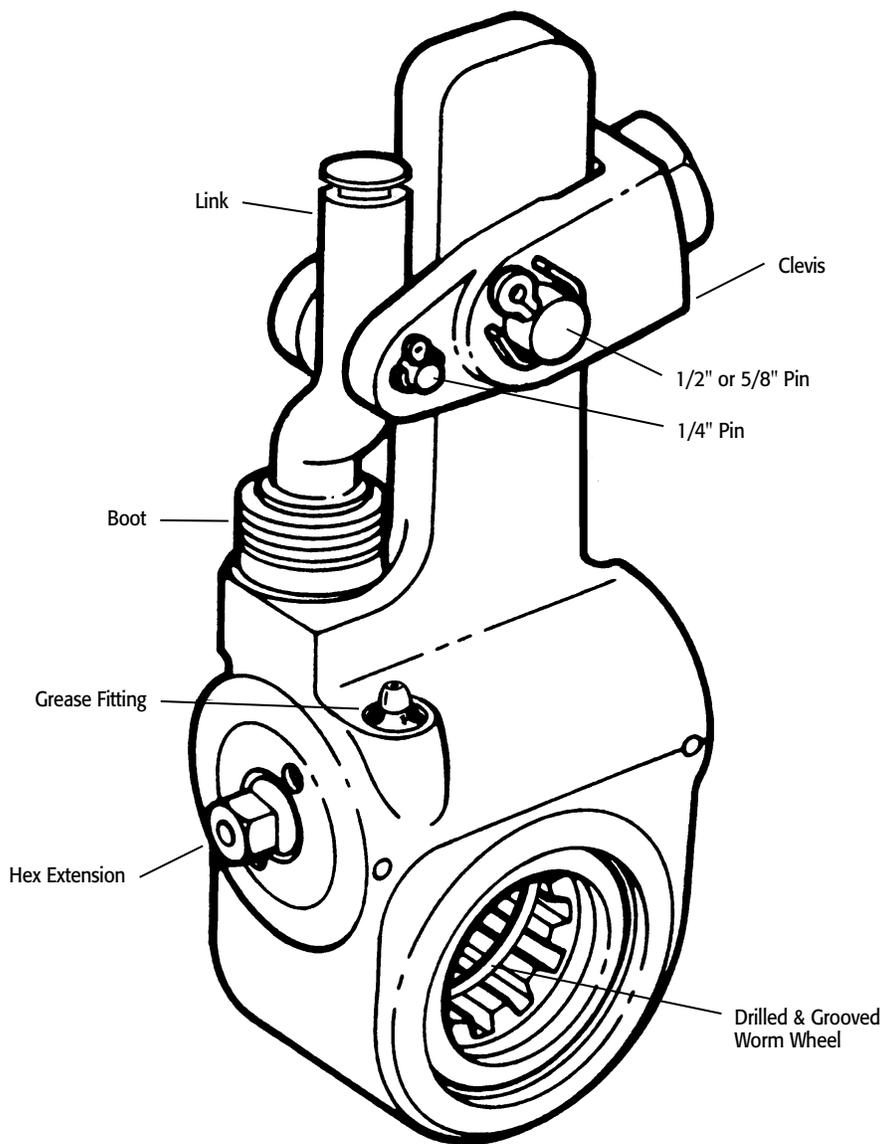


Figure 1 – Gunite Slack Adjuster

INSTALLATION PROCEDURES

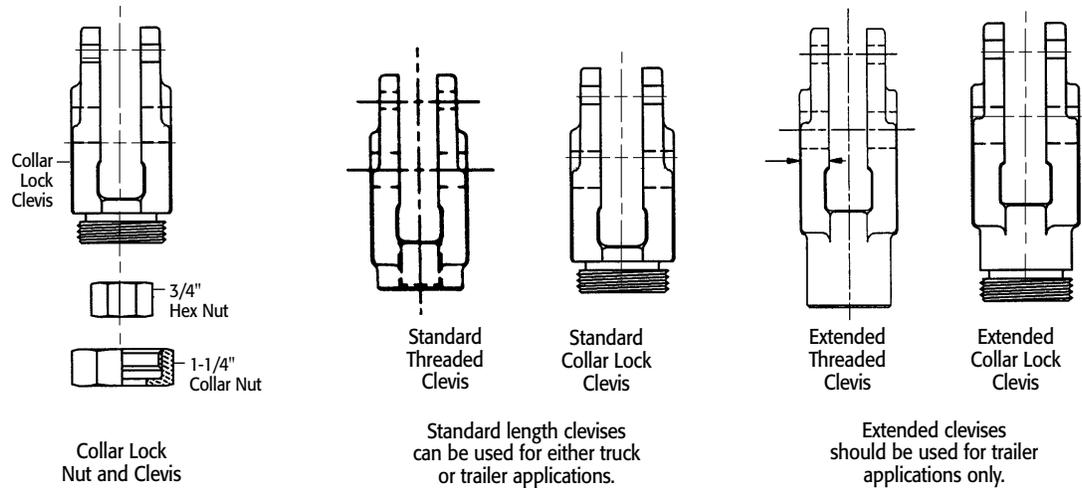


Figure 2 – Clevis Types

Preparation for Installation

1. If the axle is equipped with spring brake chambers, manually cage the spring brakes following the manufacturer's recommended procedures.

NOTE

When caging the spring brakes, always be sure to block the vehicle wheels to prevent unwanted movement.

2. Check the operating condition of the foundation brakes, including drums, shoe and linings, cams, bushings, rollers, etc. Replace or repair as necessary.

3. Remove the existing clevis and slack adjuster. Do not discard the existing mounting hardware. Do not remove the clevis jam nut.
4. Refer to figure 2 and determine if your Gunite automatic slack adjusters are equipped with the threaded clevis or the collar lock clevis (extended or standard length). Refer to the correct installation procedure for the style of clevis used on your Gunite slack adjusters.

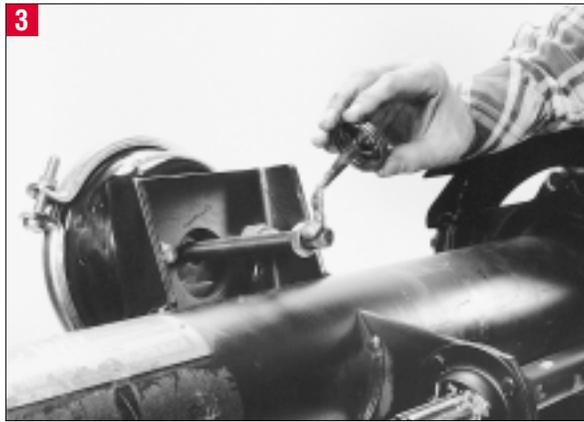
Installation Procedures for Gunite Slack Adjusters Using a Collar Lock Clevis



Block the vehicle's wheels. If the axle is equipped with spring brakes, manually cage the brakes following the manufacturer's recommended procedures.



Remove the existing clevis and slack adjuster. Keep the existing mounting hardware. Do not remove the clevis jam nut.



Apply anti-seize to the chamber push rod threads before installing the new clevis. Also apply anti-seize to the camshaft at this time.



Using the hex extension and a wrench, adjust the slack so that the collar nut aligns with the threaded area of the clevis.



When installing a Gunitite slack adjuster with a collar lock clevis, place the 1-1/4" collar nut on the push rod against the 15/16" jam nut. Next thread the 3/4" hex nut onto the push rod.



Before attaching the 1-1/4" collar nut to the clevis, check to make sure the threaded push rod is fully engaged in the 3/4" hex nut. If the push rod does not have full engagement, a new push rod must be installed and cut to length. Refer to the section on cutting a new pushrod to length in the service manual.



Install the slack onto the camshaft using the original mounting hardware.

The push rod may extend up to 1/16" past the clevis opening. If the push rod extends more than 1/16" past the clevis opening, mark the push rod and remove the clevis to allow the push rod to be cut to the proper length.

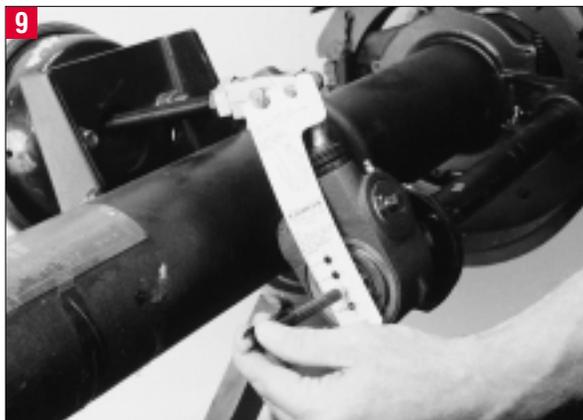
Gunitite slack adjusters using the collar lock clevis are available with either standard or extended clevis designs depending on the application. On trailer applications, an extended clevis can be used instead of replacing the push rod. However, you must still have full thread engagement inside the hex nut. If you have less than full thread engagement, a new push rod must be installed. If you replace the push rod, you must cut the new push rod to the proper length. Refer to the section on cutting a new push rod to length in the service manual. **Do not use extended clevis on tractor applications.**

NOTE

On axles equipped with spring brake chambers, be sure the chambers are fully caged before cutting the push rod. If the spring brakes are not fully caged, the push rod can be cut too short.



After threading the 1-1/4" collar nut onto the clevis housing, place the template over the large and small clevis pins as shown above.



Align the slack by adjusting the 3/4" hex nut on the push rod until the appropriate centering hole on the template aligns with the center hole on the camshaft. The template is provided with centering holes for 5, 5.5, 6 and 6.5 inch slacks.



Using a torque wrench, tighten the 1-1/4" collar nut to the clevis using 40 to 50 ft lbs of torque.



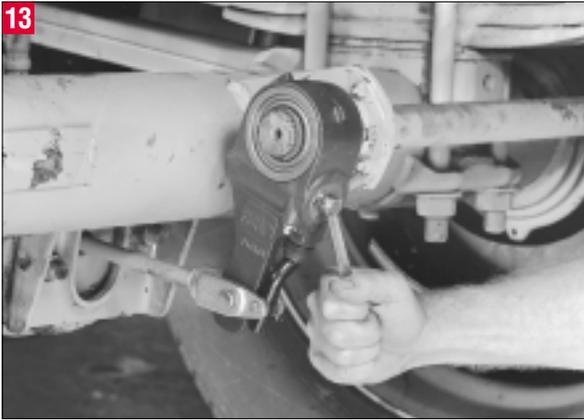
Once the 1-1/4" collar nut has been properly tightened to the clevis, tighten the 15/16" jam nut against the collar lock nut using 40 to 50 ft lbs of torque.

NOTE

Failure to tighten the jam nut will allow the air chamber push rod to rotate in the clevis and change the installed position of the slack, preventing proper automatic adjuster function.



Fully apply the brakes and allow the chamber push rod to travel its maximum stroke. Clearance must exist between the slack adjuster and all adjacent chassis components. Release the brakes.



Pre-adjust the brakes by rotating the hex extension clockwise until the brake lining contacts the brake drum. Back the slack adjuster off by rotating the hex counterclockwise 1/2 turn. Backing off a new slack adjuster may require up to 50 ft lbs of torque. A ratcheting sound will be heard when backing the slack off.

After completing this step, uncage the spring brake. Refer to page 10 for proper brake adjustment procedures.

Installation Procedures for Gunitite Slack Adjusters Using a Threaded Clevis



Block the vehicle's wheels. If the axle is equipped with spring brakes, manually cage the brakes following the manufacturer's recommended procedures.



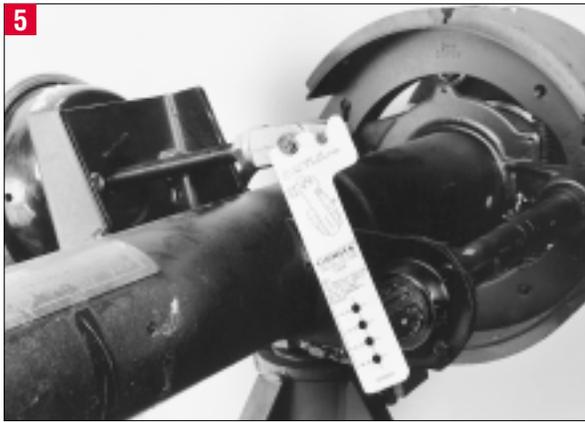
Apply anti-seize to the chamber push rod threads before installing the new clevis.



Remove the existing clevis and slack adjuster. Keep the existing mounting hardware. Do not remove the clevis jam nut.



When installing a Gunitite slack adjuster with a threaded clevis, install the new clevis on the push rod in the same location as the clevis which was removed. Do not tighten the jam nut at this time.



Once the clevis has been installed on the threaded push rod, install both the large and small clevis pins. Now position the installation template over both the large and small clevis pins.



Align the clevis on the threaded push rod until the appropriate centering hole on the template aligns with the center hole on the camshaft. The template is provided with centering holes for 5, 5.5, 6 and 6.5 inch slacks.

Once the clevis has been properly adjusted, remove the template and the two clevis pins.



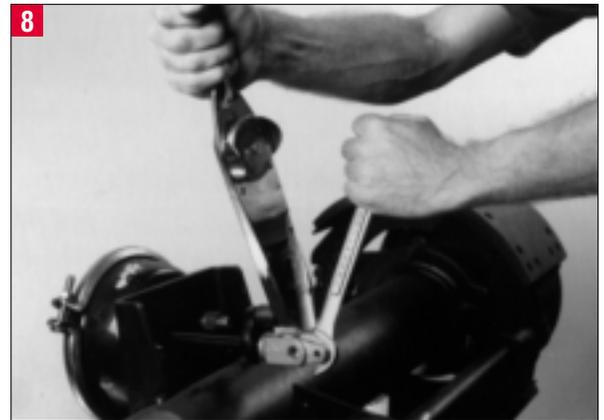
Inspect the clevis installation to make sure that the threaded push rod extends no more than 1/16" past the end of the opening of the clevis in the clevis housing. If the push rod extends more than 1/16" past the clevis housing, the clevis must be removed and the push rod cut to the proper length.

It is also important to make sure that the push rod is not too short for proper installation. To do this, check to make sure that the push rod is not more than 1/8" short of being flush with the clevis opening on a standard clevis (5/8" on an extended clevis). If the threaded push rod is more than 1/8" from being flush with the clevis opening on a standard clevis (5/8" on an extended clevis) it must be removed, a new push rod must be installed and cut to the proper length.

Follow instructions in the service manual for cutting a push rod to length.

NOTE

On axles equipped with spring brake chambers, be sure the chambers are fully caged before cutting the push rod. If the spring brakes are not fully caged, the push rod can be cut too short.



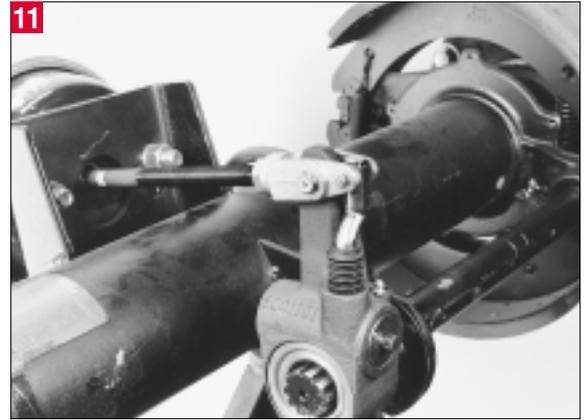
Tighten the jam nut against the clevis housing using 40 to 50 ft lbs of torque. If you do not tighten the jam nut now, it will allow the clevis to rotate freely and change the position of the slack resulting in an improper installation.

NOTE

Failure to tighten the jam nut will allow the air chamber push rod to rotate in the clevis and change the installed position of the slack, preventing proper automatic adjuster function.



Apply anti-seize compound to the camshaft, install the slack adjuster and adjust the position of the slack using the hex extension. Adjust the slack until the holes in the slack housing align properly with the corresponding holes in the clevis.



Fully apply the brakes and allow the chamber push rod to travel its maximum stroke. Clearance must exist between the slack adjuster and all adjacent chassis components. Release the brakes.



Once the clevis is properly aligned with the slack adjuster, insert both the large and small clevis pins and secure with the cotter pins supplied.



Pre-adjust the brakes by rotating the hex extension clockwise until the brake lining contacts the brake drum. Back the slack adjuster off by rotating the hex counterclockwise 1/2 turn. Backing off a new slack adjuster may require up to 50 ft lbs of torque. A ratcheting sound will be heard when backing the slack off.

After completing this step, uncage the spring brake.

Refer to page 10 for proper brake adjustment procedures.

BRAKE ADJUSTMENT AFTER INSTALLATION

Adjust the brakes as follows:

1. Rotate the hex extension clockwise until the brake linings contact the brake drum. Back off the slack adjuster by rotating the hex counterclockwise 1/2 turn.
2. Backing off the slack will require approximately 25 to 30 ft lbs of torque. When backing off the slack adjuster, a ratcheting sound will be heard.
3. Using a ruler, measure the distance from the face of the air chamber to the center of the large pin in the clevis (A) (see fig. 4). Make an 85 psi brake application and allow the chamber push rod to travel its maximum stroke. Measure to the center of the large pin (B). The difference between (A) and (B) is the push rod stroke. Check the following chart for proper maximum stroke after adjustment of the brakes.

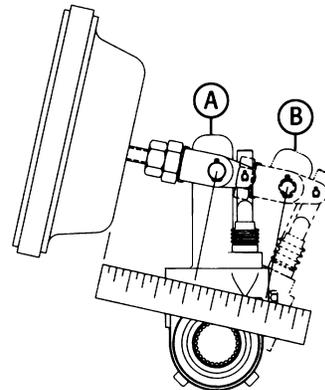


Figure 4 – Measuring Maximum Stroke

“STANDARD” CLAMP TYPE BRAKE CHAMBER DATA

Type	Outside Diameter	Rated Stroke	Maximum stroke at which brakes must be readjusted
9	5-1/4	1.75	1-3/8
12	5-11/16	1.75	1-3/8
16	6-3/8	2.25	1-3/4
20	6-25/32	2.25	1-3/4
24	7-7/32	2.25	1-3/4
30	8-3/32	2.50	2
36*	9	3.00	2-1/4

* Note: If type 36 chamber is used, slack length should be less than 6".

“LONG STROKE” CLAMP TYPE BRAKE CHAMBER DATA

Type	Outside Diameter	Rated Stroke	Maximum stroke at which brakes must be readjusted
16	6-3/8	2.50	2
20	6-25/32	2.50	2
24	7-7/32	2.50	2
24*	7-7/32	3.00	2-1/2
30*	8-3/32	3.00	2-1/2

* Note: Identified by square air port bosses.

Measuring the Free Stroke

4. Free stroke is the amount of movement of the slack adjuster required to move the brake shoes against the drum. With brakes released, measure from the face of the chamber to the center of the clevis pin. Use a ruler to measure the movement of the slack adjuster until the brake shoes contact the drum (fig. 5). The difference between the released and applied measurements is the free stroke. The free stroke should be 3/8" to 5/8".

If the free stroke is good, but the applied stroke is too long, there is a problem with the foundation brake. Check the foundation brake for missing or worn components, cracked brake drums, or improper lining to drum contact.

If the free stroke is greater than the recommended distance (3/8" to 5/8"), a function test of the slack adjuster should be performed (see page 12).

If the free stroke is less than 3/8", a dragging brake can occur. Check to see that the manual adjustment procedure was followed correctly. Manually readjust the brake following the “Brake Adjustment After Installation” procedure on this page.

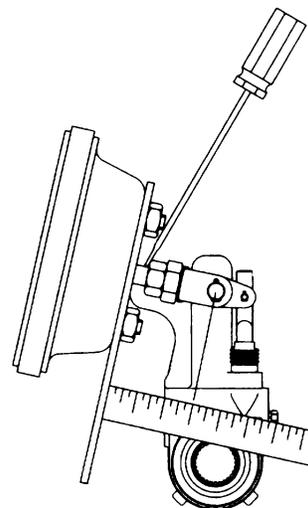


Figure 5 – Free Stroke

RECOMMENDED PREVENTATIVE MAINTENANCE

Every Three Months or 25,000 Miles

1. Check the condition of the foundation brakes, including drums, shoes and linings, cams, rollers, bushings, etc.
2. Check for structural damage of the housing, worn clevis, worn clevis bushings and condition of the boot for cuts or tears. Replace if necessary.
3. After allowing the brake drum to cool to room temperature, check for correct chamber stroke following the procedure on page 10. Due to different operating

conditions, chamber stroke tests may be necessary at earlier intervals. See Charts on page 10 for the recommended stroke measurements.

NOTE

An automatic slack adjuster should not have to be manually adjusted except for initial installation and at the time of brake reline.

Every Six Months or 50,000 Miles

Gunite slack adjusters are factory lubricated and extensively sealed to protect against dirt, water, salt and other corrosive elements. Nevertheless, periodic lubrication is recommended.

NOTE

Slack Adjusters with a grooved and drilled worm wheel will not have a grease relief on the end cap opposite the adjusting hex.

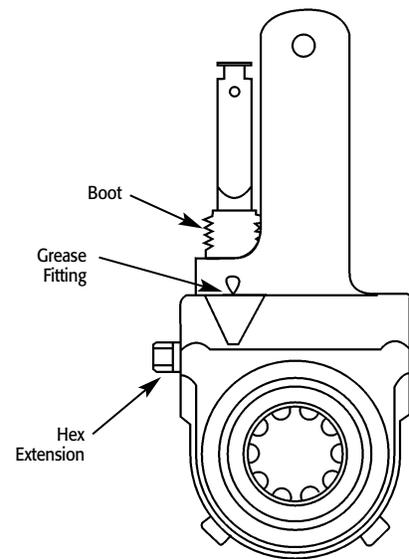


Figure 6 – Lubrication Points

Greasing the Slack Adjuster

1. A grease fitting is provided to allow lubrication during normal chassis servicing (see fig. 6). With a conventional grease gun, lubricate until grease appears on the camshaft, or grease flows from the grease relief.
2. The newest Gunite slack adjusters are produced without a grease relief, forcing lubricant through the drilled worm wheel onto the camshaft. Previous designs incorporated a grease relief (see fig. 7).
3. Lubriplate Aero is the grease used in the manufacture of Gunite slack adjusters. It is recommended for use in temperatures as low as -40 degrees F.

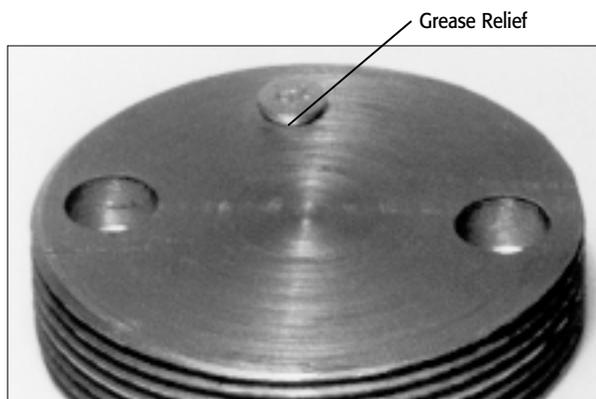


Figure 7 – Grease Relief

Slack Adjuster Function Test

If the maximum stroke, with an 85 psi brake application is less than the distance shown in the chart on page 10, the Gunite slack adjuster is functioning properly.

Trouble-shooting

1. The Gunite slack adjuster should not require manual readjustment. If the maximum chamber stroke is within the range for the size chamber used (see fig. 4), the slack adjuster should not be manually readjusted.

If the chamber stroke exceeds the limit, measure the free stroke. If the free stroke is good, but the applied stroke is too long, there is a problem with the foundation brake. Check the foundation brake for missing or worn components, cracked brake drums, or improper lining to drum contact.

If the free stroke is **greater** than the recommended distance (3/8" to 5/8"), a function test of the slack adjuster should be performed. To test the function of the slack adjuster, place a 7/16" box wrench on the hex extension and rotate it 3/4 of a turn counterclockwise. A ratcheting sound will be heard. Mark the 7/16" hex extension with chalk and apply the brakes several times and watch for the hex to rotate clockwise (see fig. 8). The hex extension must rotate clockwise. The adjustment is intentionally made in small increments so it will take several cycles to bring the adjuster within the stroke limit shown in the chart.

If the free stroke is **less** than 3/8", a dragging brake can occur. Check to see that the manual adjustment procedure was followed correctly. Manually readjust the brake following the "Brake Adjustment After Installation" procedure on page 10.



Figure 8 – Adjuster Function

2. Check the torque by attaching a torque wrench to the hex extension and turning it in a counterclockwise direction and record the measurement.
3. If the hex extension did not rotate clockwise during brake application or there is less than 15 ft lbs of torque required to rotate the hex extension in the counterclockwise direction, the slack adjuster must be replaced. If immediate replacement is not possible, proper brake adjustment must be maintained by manual adjustment.
4. If the hex extension rotates clockwise and has a torque of greater than 15 ft lbs when rotated counterclockwise, the slack is functioning properly. Check the foundation brake for proper function, worn cam bushing, pins and rollers, broken springs, worn quick connect devis, worn clevis bushings and clevis pins. Repair as necessary and repeat the function test.
5. Readjust the brake after the function test.

Boot Replacement

1. Remove the 1/4" and the large clevis pins.
2. Rotate the hex extension counterclockwise to clear the link from the clevis. This could require up to 50 ft lbs of torque and produce a ratcheting sound.
3. Remove the damaged boot from the link.

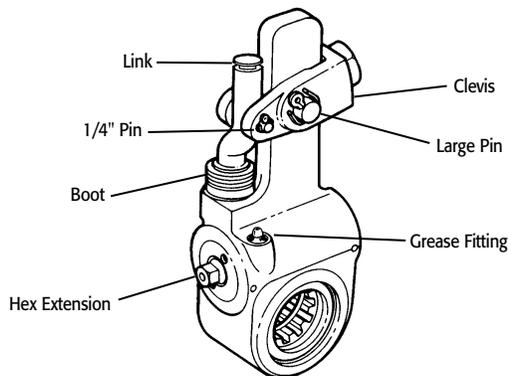


Figure 9 – Location of Clevis Pins, Hex Extension & Boot

4. Install the replacement boot over the link with the heavy section down. Care should be taken not to damage the boot with a sharp tool.

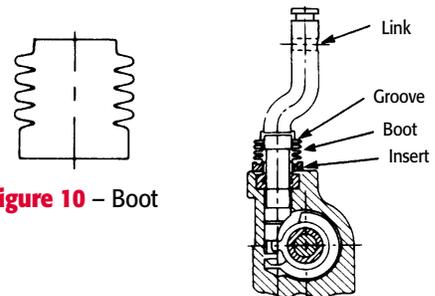


Figure 10 – Boot

Figure 11 – Boot Position

5. Position the boot on the link so that the bottom is retained by the boot insert and the top is positioned by the groove in the link.
6. Install the clevis pins

CUTTING UNIVERSAL CHAMBER PUSH RODS

Cutting the Push Rod

1. Install the brake chamber in the proper mounting holes of the chamber bracket for the slack adjuster length required.
2. If the axle is equipped with spring brake chamber, manually cage the spring brakes following the manufacturer's recommended procedures. The chamber must be in the fully released position.
3. Using a square, mark the universal push rod at the 90 degree position when the square edge is centered in the end of the S-Cam (see fig. 12). Make sure the push rod is centered in the chamber and not cocked before marking the push rod.
4. From the 90 degree mark, measure back toward the air chamber the proper "X" distance from the following chart. Mark the push rod at the "X" dimension. Cut the push rod at this mark (see fig. 13). The clevis is now ready to install on the push rod.

Slack Adjuster Length	"X" Dimension
5" - 5-1/2"	2-1/4"
6" - 6-1/2"	2-1/2"

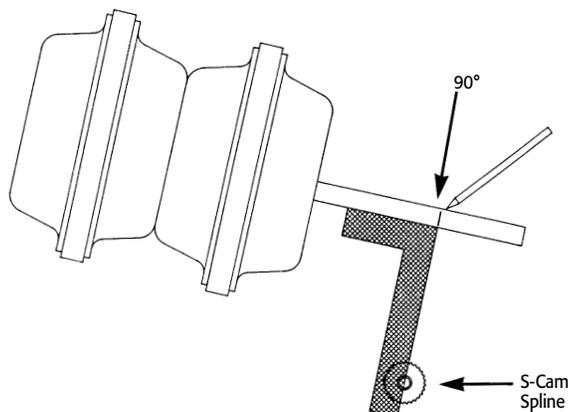


Figure 12 – Marking the Push Rod

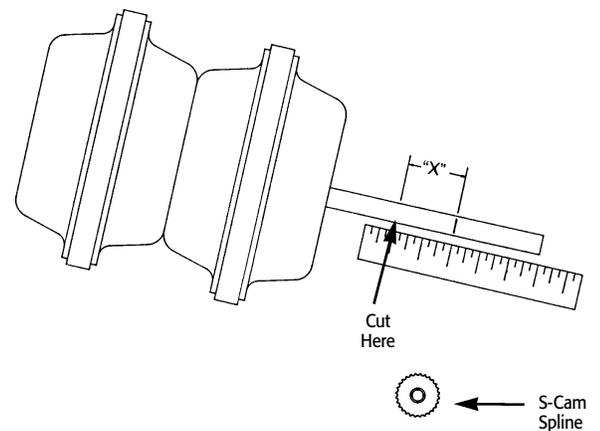
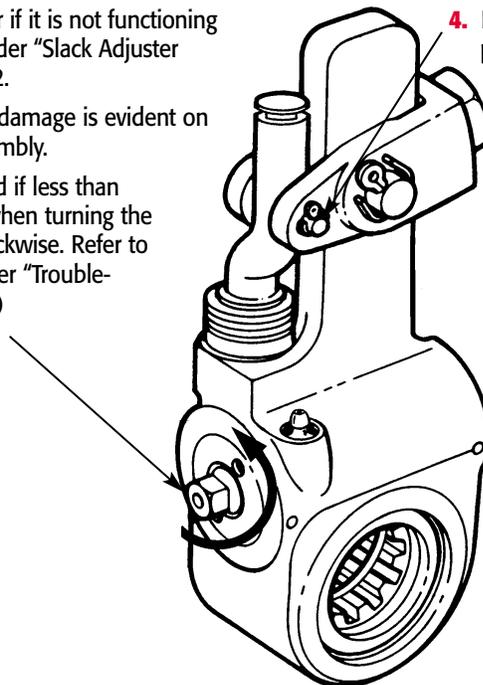


Figure 13 – Cutting the Push Rod

SERVICE PRACTICES: POINTS AND PRECAUTIONS

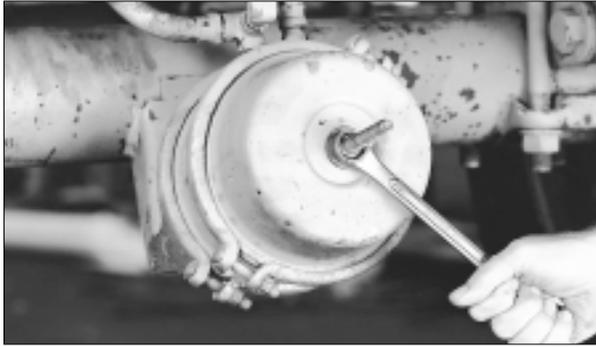
1. Replace the slack adjuster if it is not functioning properly, as described under "Slack Adjuster Function Test" on page 12.
2. Replace the entire unit if damage is evident on the slack housing or assembly.
3. The unit must be replaced if less than 15 ft lb of torque exists when turning the hex extension counterclockwise. Refer to the test as described under "Troubleshooting" (ref. ASA drwg.)
4. Never operate the vehicle with small 1/4" pin missing from the clevis. The slack adjuster will not maintain proper brake adjustment with either pin missing. (ref. ASA drwg.)
5. Never attempt to disassemble the slack adjuster. Factory setting cannot be duplicated in the field. Instead, replace the entire unit.



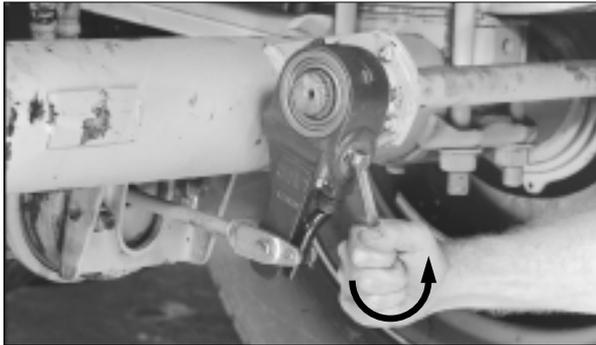
PROCEDURE FOR BRAKE LINING AND/OR DRUM REPLACEMENT

Special attention must be given to following proper maintenance procedures when changing linings and/or drums on a vehicle equipped with Gunite slack adjusters. Following these procedures will ensure that the slack adjuster is functioning correctly before returning the vehicle to service.

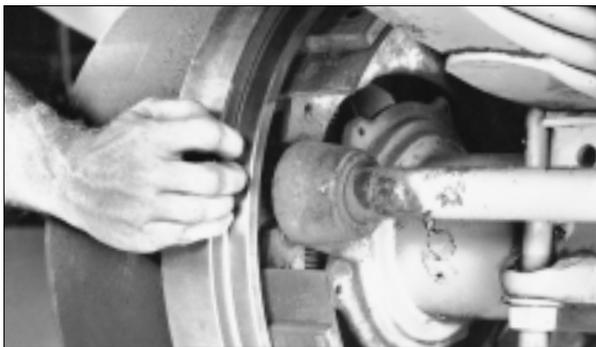
1. Block the vehicle's wheels.



2. If the vehicle is equipped with spring brake chambers, manually cage the spring brakes following the manufacturer's recommended procedures.



3. Using a 7/16" wrench or socket, rotate the hex extension counterclockwise. You should have at least 15 ft lbs resistance and a ratcheting sound will be heard as the hex extension is rotated.



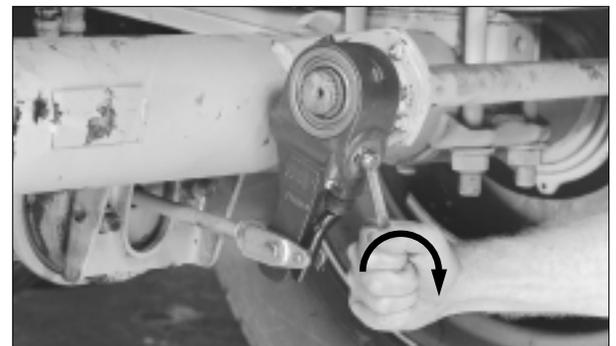
4. Only back off the adjusting hex enough to allow the drum to clear the lining. Remove the brake drum.



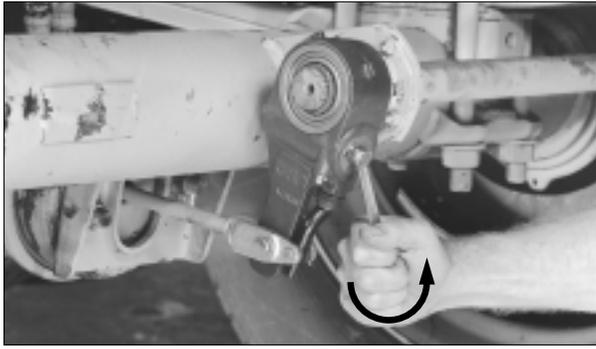
5. After the brake drum has been removed; rotate the hex extension clockwise until the cam turns over. This will allow the brake rollers to be in the release position.



6. Proceed with the lining change and/or brake drum replacement.



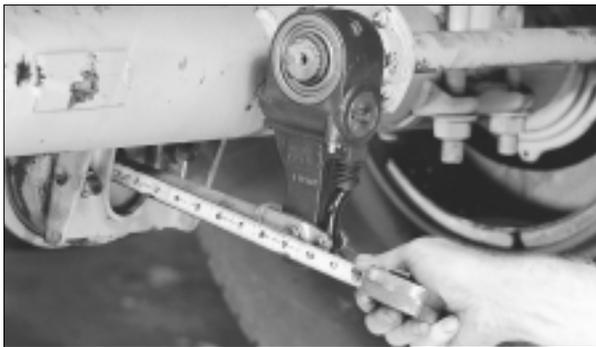
7. Once the linings have been replaced and the brake drum installed, rotate the hex extension clockwise until the brake linings contact the brake drum.



- Back-off the slack adjuster by rotating the hex extension 1/2 turn counterclockwise. A ratcheting sound will be heard. This will provide running clearance between the lining and the drums braking surface.



- Using a ruler, measure the distance from the face of the air chamber to the center of the large pin in the clevis (A) (see fig. 14).



- Make an 85 psi brake application and allow the air chamber to travel its maximum stroke. Measure the distance between the face of the air chamber and the center of the large clevis pin (B) (see fig. 14). The difference between the (A) measurement and the (B) measurement is the push rod stroke. Check the charts located on page 10 for the proper maximum stroke after adjustment of the brakes.
- Manually uncage the spring brakes before returning the vehicle to service.

“STANDARD” CLAMP TYPE BRAKE CHAMBER DATA

Type	Outside Diameter	Rated Stroke	Maximum stroke at which brakes must be readjusted
9	5-1/4	1.75	1-3/8
12	5-11/16	1.75	1-3/8
16	6-3/8	2.25	1-3/4
20	6-25/32	2.25	1-3/4
24	7-7/32	2.25	1-3/4
30	8-3/32	2.50	2
36*	9	3.00	2-1/4

*Note: If type 36 chamber is used, slack length should be less than 6".

“LONG STROKE” CLAMP TYPE BRAKE CHAMBER DATA

Type	Outside Diameter	Rated Stroke	Maximum stroke at which brakes must be readjusted
16	6-3/8	2.50	2
20	6-25/32	2.50	2
24	7-7/32	2.50	2
24*	7-7/32	3.00	2-1/2
30*	8-3/32	3.00	2-1/2

*Note: Identified by square air port bosses.

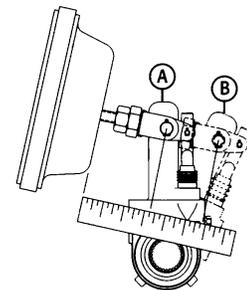


Figure 14 – Measuring Maximum Stroke

If you need additional service manuals or installation gages, contact Gunite Corporation at the address listed on the back of this manual.



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