L30006
Rev. 10/04

CSI Midland/Gunite Automatic Brake Adjuster Service Manual

Haldex

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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 an Automatic Brake Adjuster, a new clevis must be installed. Refer to the Haldex/Midland Master Catalog (MC2004) for clevis selection.

OVERVIEW

Haldex offers a complete line of unhanded automatic brake adjusters for installation on steering, drive and trailer axles. The space required for the CSI Midland/Gunite automatic brake adjuster is similar to that which is required for manual brake adjusters.

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

The brakes should be in good operating condition and state of repair when automatic brake adjusters are installed. No automatic brake adjuster can compensate for problems and deficiencies in the foundation braking system.

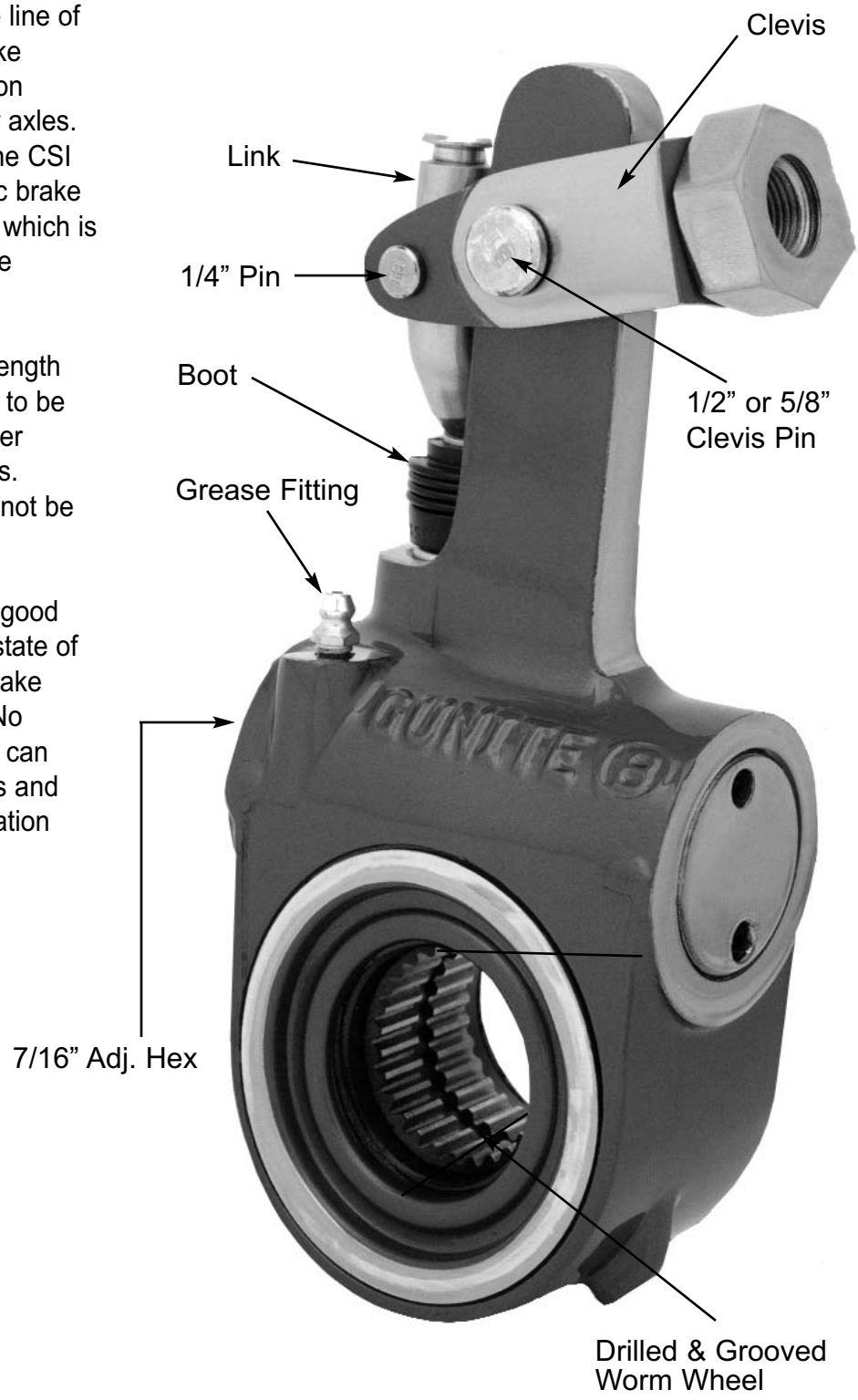


Figure 1 - Standard Brake Adjuster With Collar Lock Clevis.

INSTALLATION PROCEDURES

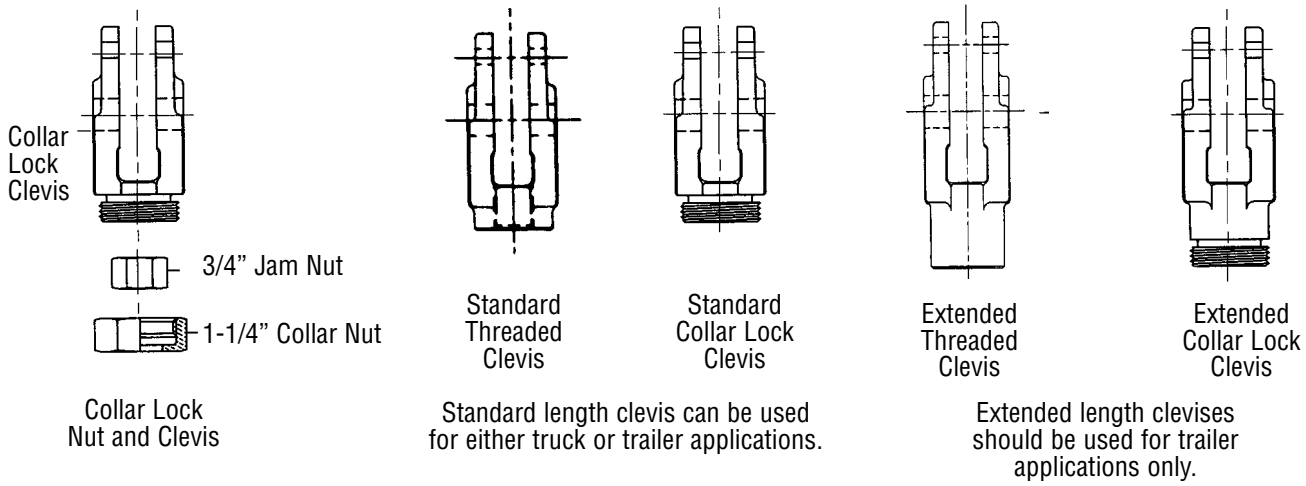


Figure 2
Clevis Types

NOTE: DO NOT attempt to use any of these clevis configurations in the installation of a Midland/Gunite 2000 Brake Adjuster. The adjuster is designed only for use with air chambers having a welded on clevis.

Preparation for Installation on Collar Lock and Threaded Clevis Applications Only

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

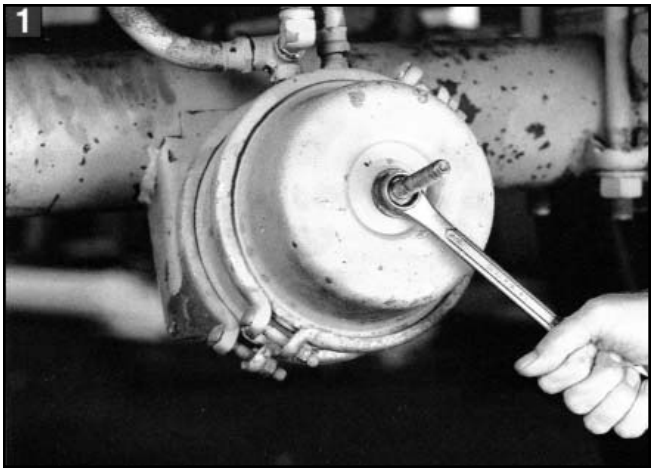
NOTE
When caging the spring brakes, always be sure to block the vehicle wheels to prevent unwanted movement.

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

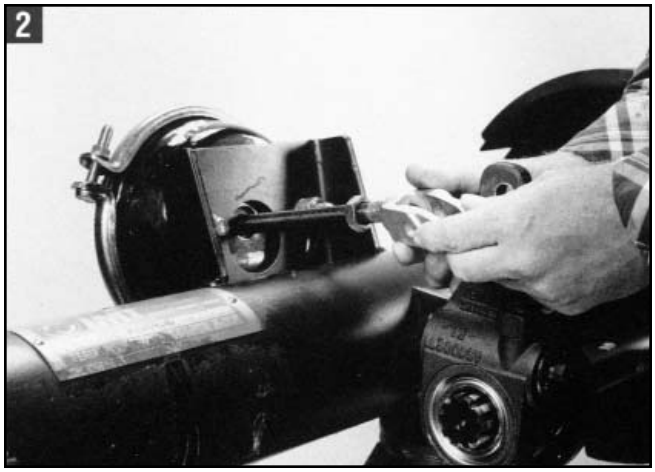
3. Remove the existing clevis and brake adjuster. Do not discard the existing mounting hardware. Do not remove the clevis jam nut.

4. Refer to Figure 2 and determine if your CSI Midland/Gunite automatic brake 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.

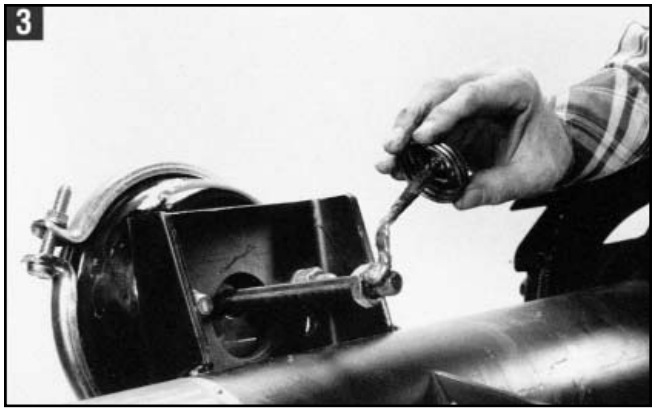
Installation Procedure for CSI Midland/Gunite Brake Adjuster Using a Collar Lock Clevis



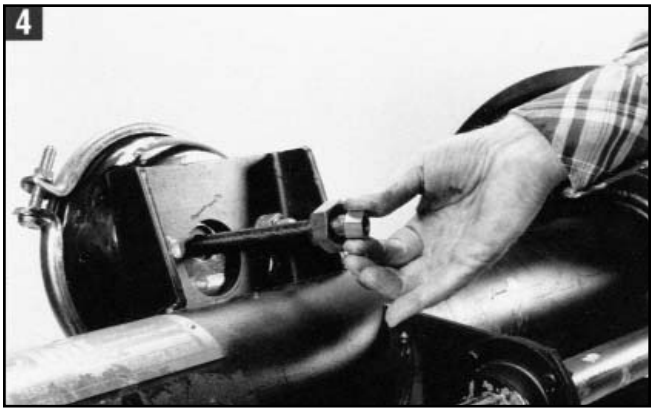
1. Block the vehicle's wheels. If the axle is equipped with spring brakes, manually cage the brakes following the manufacturer's recommended procedures.



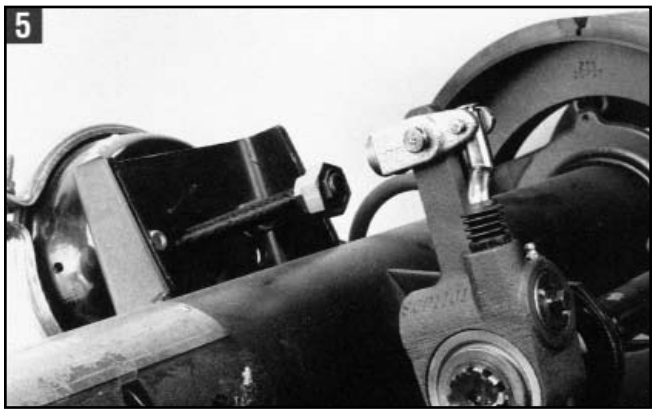
2. Remove the existing clevis and brake adjuster. Keep the existing mounting hardware. Do not remove the clevis jam nut.



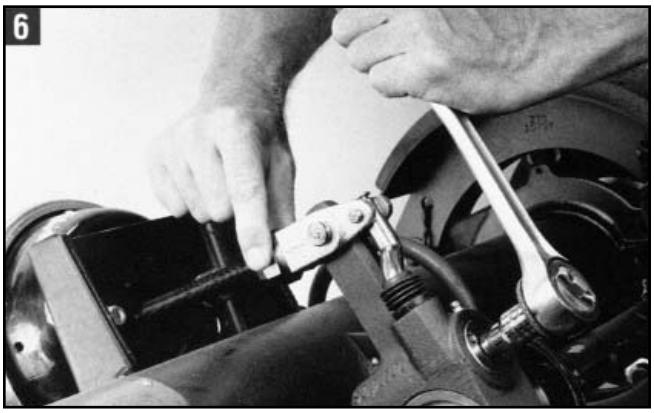
3. Apply anti-seize to the chamber push rod threads before installing the new clevis. Also apply anti-seize to the camshaft splines at this time.



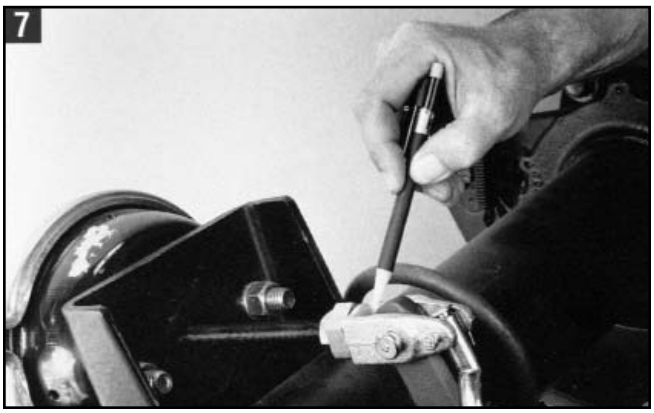
4. When installing a CSI Midland/Gunite automatic brake adjuster with a collar lock clevis, place the 1 1/4" collar nut on the push rod against the 15/16" jam nut. Next thread the 3/4" jam nut onto the push rod.



5. Install the brake adjuster onto the camshaft with the adjusting hex pointing away from the brake chamber. Secure the brake adjuster on the camshaft. Use at least one inner washer and enough outer washers to allow no more than .060 movement of adjuster on camshaft. (Per TMC recommended practice RP609-A). **NOTE: Do NOT pull push rod out to meet the brake adjuster.** Rotate the 7/16" adjusting hex nut CLOCKWISE.



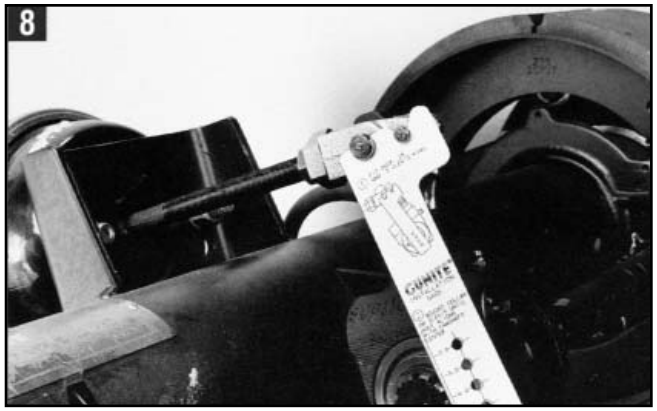
6. Using the hex extension and a wrench, adjust the brake adjuster so that the collar nut aligns with the threaded area of the clevis.



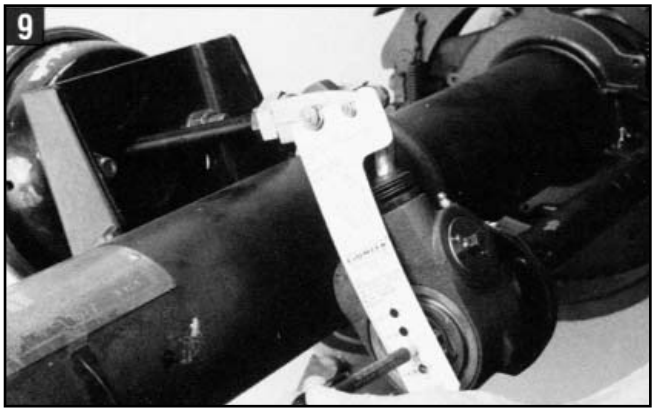
7. Before attaching the 1 1/4" collar nut to the clevis, check to make sure the threaded push rod is fully engaged in the 3/4" hex nut. If the push rod does not have full engagement, a new push rod must be installed and cut to length. Refer to the section on cutting a new push rod to length in this manual.

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.

CSI Midland/Gunite automatic brake 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 this manual. Do not use extended clevis on tractor applications.



8. 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.

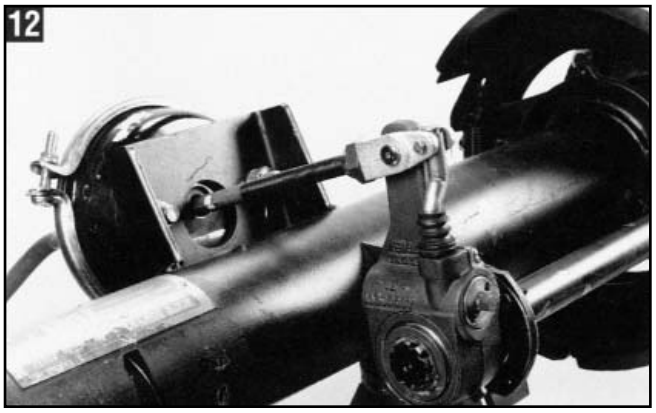


9. Align the brake adjuster by adjusting the 3/4” hex nut on the push rod until the appropriate centering hole on the template aligns with the center hole on the camshaft. The template is provided with centering holes for 5, 5.5, 6 and 6.5 inch brake adjusters.

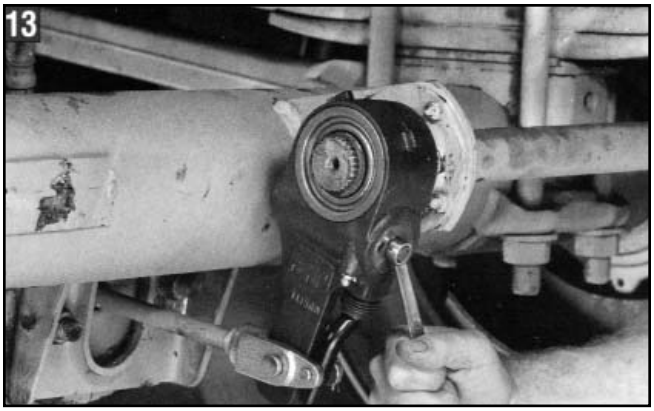
10. Using a torque wrench, tighten the 1 1/4” collar nut to the clevis using 40 to 50 ft lbs of torque.

11. 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 brake adjuster, preventing proper automatic adjuster function.



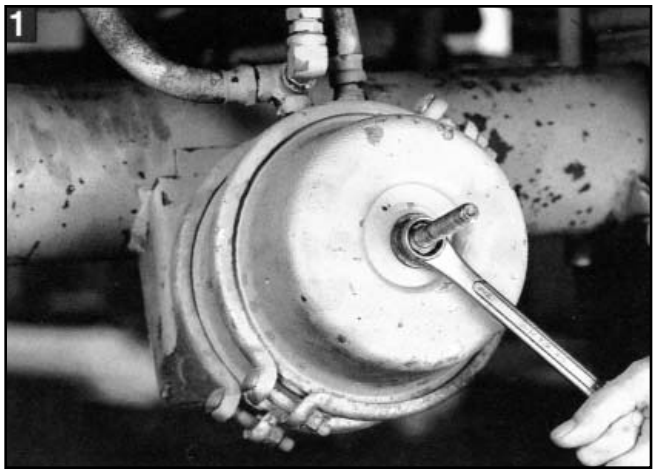
12. Fully apply the brakes and allow the chamber push rod to travel its maximum stroke. Clearance must exist between the brake adjuster and all adjacent chassis components. Release the brakes.



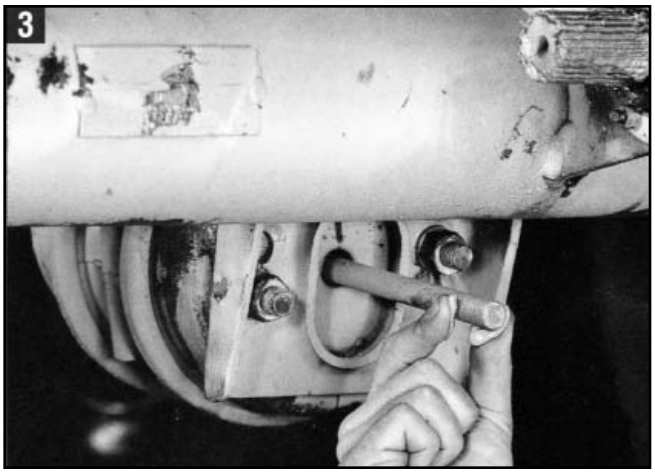
13. Pre-adjust the brakes by rotating the adjust hex clockwise until the brake lining contacts the brake drum. Back the brake adjuster off by rotating the hex counterclockwise 1/2 turn. Backing off a new brake adjuster may require up to 50 ft lbs of torque. A ratcheting sound will be heard when backing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

After completing Step 13, uncage the spring brake. Refer to Proper Brake Adjustment Procedures in this manual.

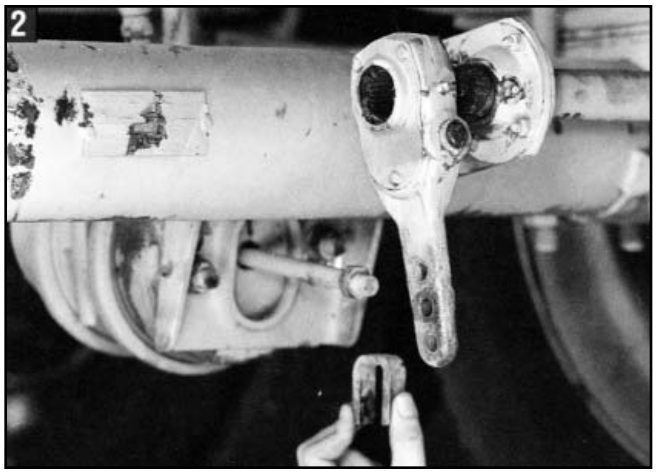
Installation Procedure for CSI Midland/Gunite Brake Adjuster Using a Threaded Clevis



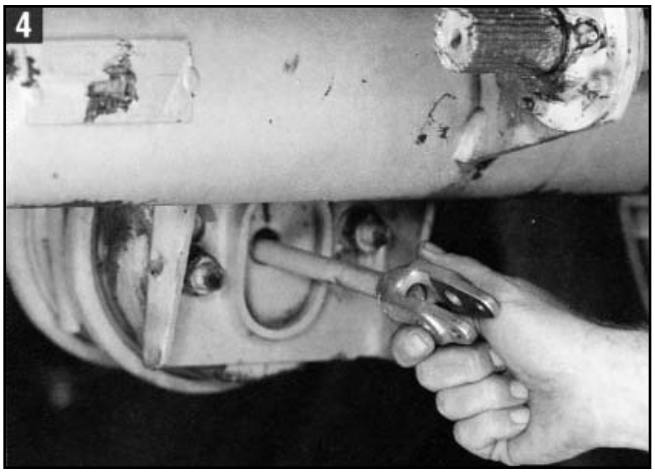
1. Block the vehicle's wheels. If the axle is equipped with spring brakes, manually cage the brakes following the manufacturer's recommended procedures.



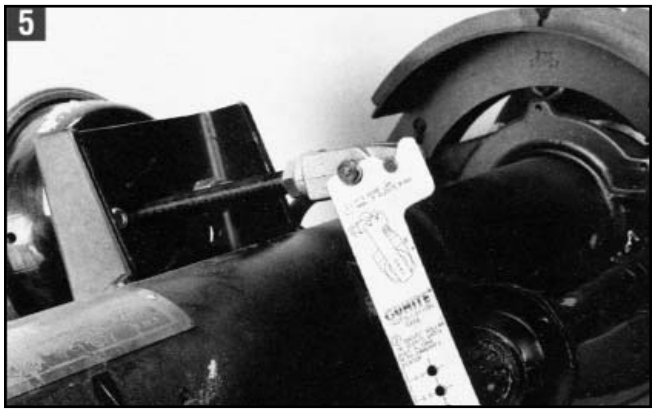
3. Apply anti-seize to the chamber push rod threads before installing the new clevis.



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



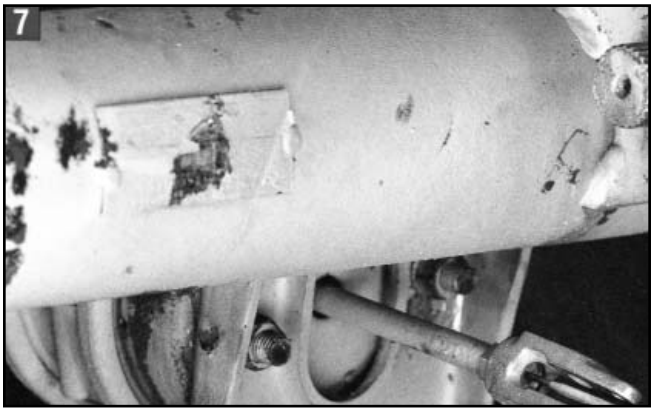
4. When installing a CSI Midland/Gunite automatic brake adjuster with a threaded clevis, install the new clevis on the push rod in the same locations as the clevis which was removed. Do not tighten the jam nut at this time.



5. 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.

6. 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 brake adjusters.

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



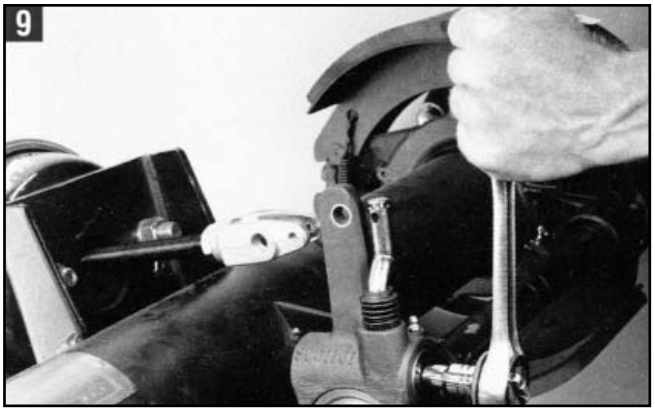
7. Inspect the clevis installation to make sure the threaded push rod extends no more than 1/16" past the end of the opening of the clevis in the clevis housing. If the push rod extends more than 1/16" past the clevis opening, mark the push rod and remove the clevis to allow the push rod to be cut to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

7. (cont'd) It is also important to make sure the push rod is not too short for proper installation. To do this, check to make sure 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. 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. 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 this manual.

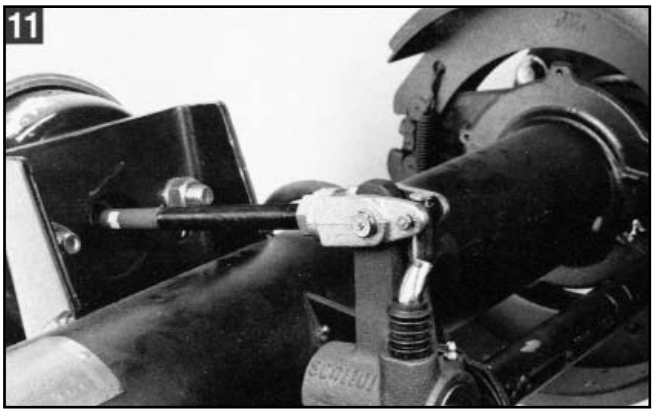
NOTE
On axles equipped with spring brake chambers, be sure the chambers are fully caged before cutting the push rod. If the spring brakes are not fully caged, the push rod can be cut too short.

8. 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 clevis 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 brake adjuster, preventing proper automatic adjuster function.



9. Apply anti-seize compound to the camshaft and clevis pins. Install the brake adjuster onto the camshaft with the adjusting hex pointing away from the brake chamber. Secure the brake adjuster on the camshaft. Use at least one inner washer and enough outer washers to allow no more than .060 movement of adjuster on camshaft. (Per TMC recommended practice RP609-A). **NOTE: Do NOT pull push rod out to meet the brake adjuster.** Rotate the 7/16" adjusting hex nut CLOCKWISE.



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

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

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

After completing Step 12, uncage the spring brake. Refer to Proper Brake Adjustment Procedures in this manual.

BRAKE ADJUSTMENT AFTER INSTALLATION

Procedure for Collar Lock and Threaded Clevis Applications Only

Adjust the brakes and measure "Applied Stroke":

1. Rotate the adj hex clockwise until the brake linings contact the brake drum. Back off the brake adjuster by rotating the hex counterclockwise 1/2 turn.

2. Backing off the brake adjuster could require up to 50 ft lbs of torque. When backing off the brake 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 Figure 3). Make a 90 to 100 reservoir pressure 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 charts for proper maximum stroke after adjustment of the brakes.

"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, brake adjuster 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.

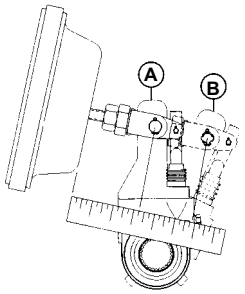


Figure 3 - Measuring Maximum "Applied Stroke"

Measuring the Free Stroke

4. Free stroke is the amount of movement of the brake adjuster arm 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 brake adjuster until the brake shoes contact the drum **(Figure 4)**. 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 brake adjuster should be performed (see page 15).

   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.

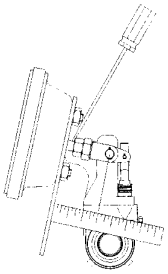


Figure 4 - Free Stroke

INSTALLATION PROCEDURES

Midland/Gunite 2000 Brake Adjuster on Welded Clevis Applications Only

NOTE: THESE INSTRUCTIONS ARE FOR THE MIDLAND/GUNITE 2000 BRAKE ADJUSTER. THIS BRAKE ADJUSTER IS SPECIALLY DESIGNED FOR THE LATEST WELDED CLEVIS, LONG STROKE BRAKE CHAMBER APPLICATIONS. DO NOT ATTEMPT TO USE A COLLAR LOCK OR THREADED CLEVIS WITH THIS BRAKE ADJUSTER.

Preparation for Installation

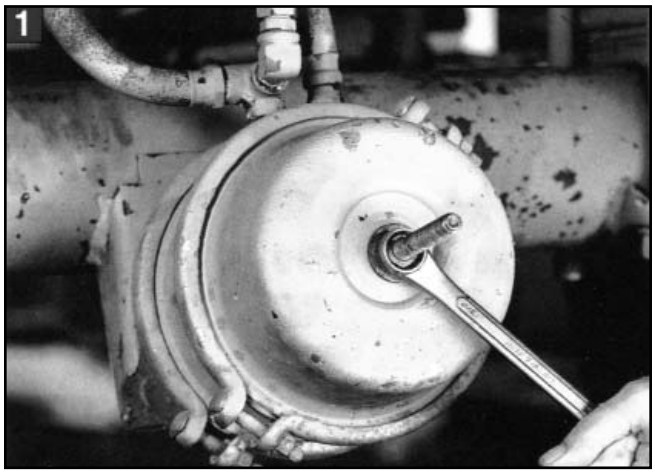
1. If the axle is equipped with spring brake chambers, manually cage the spring brakes following the manufacturer's recommended procedures.

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

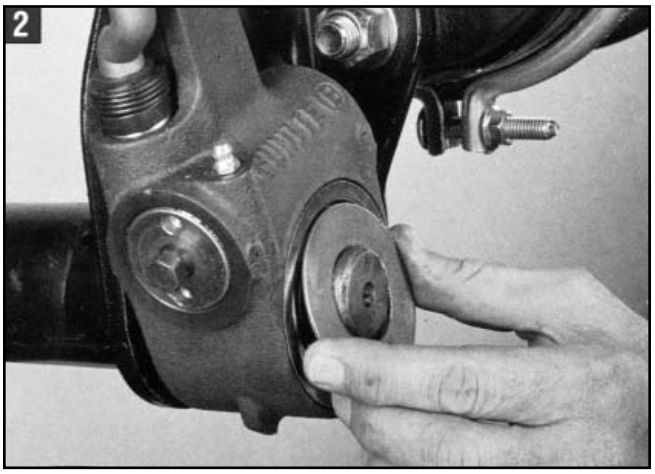
2. Check the operating condition of the foundation brakes, including drums, shoe and linings, cams, bushings, etc. Replace or repair any damaged or worn parts.

3. Remove the existing brake adjuster from the camshaft. Do not discard the mounting hardware including the two washers and lock ring. You will need these during installation of the Midland/Gunite 2000 brake adjuster.

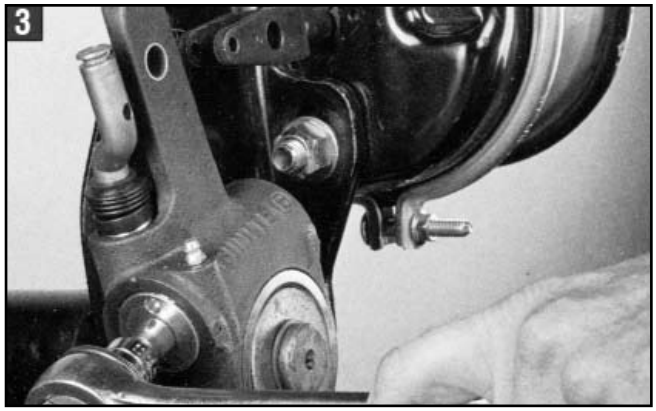
Installation Procedure for Midland/Gunite 2000 Brake Adjuster



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. Apply anti-seize compound to the camshaft splines. Install the brake adjuster onto the camshaft with the adjusting hex pointing away from the brake chamber. Secure the brake adjuster on the camshaft. Use at least one inner washer and enough outer washers to allow no more than .060 movement of adjuster on camshaft. (Per TMC recommended practice RP609-A). **NOTE: Do NOT pull push rod out to meet the brake adjuster.**

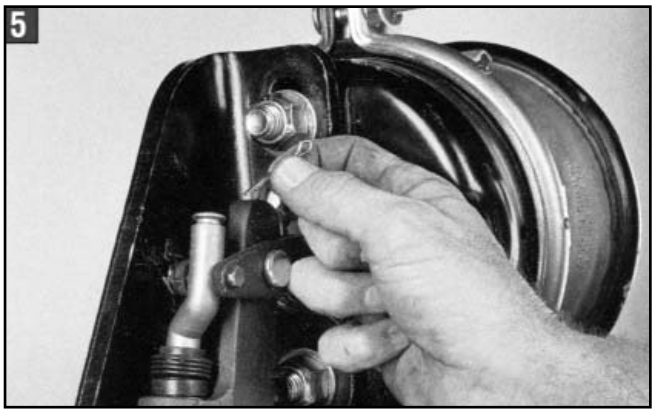


3. Using a 7/16" wrench or a socket, rotate the adj hex clockwise until the holes in the brake adjuster are properly aligned with the corresponding holes in the welded clevis.

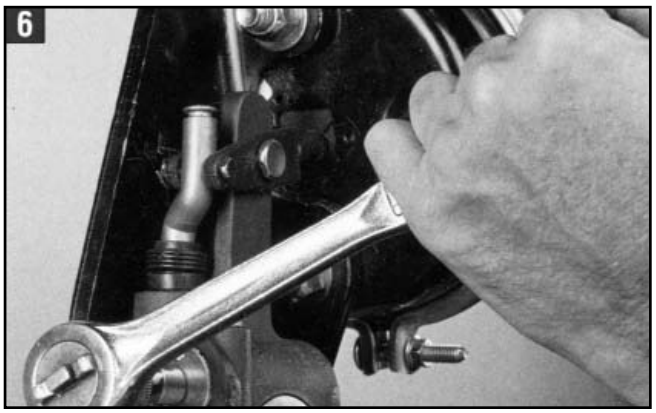
4. Apply anti-seize compound and insert the large and small pins in the proper holes.

NOTE

When installing the Midland/Gunite 2000 brake adjuster it is not necessary to use an installation gauge. The proper mounting angle has been designed into the product. Once you have installed the Midland/Gunite 2000 brake adjuster following the instructions above you must complete the Installation Check before proceeding to the adjustment of the brake.



5. Insert the cotter pins into the large and small holes and secure the cotter pins.



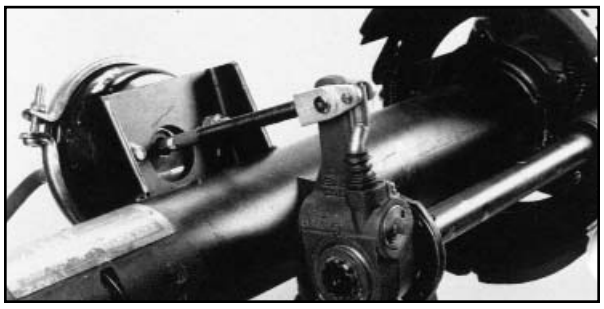
6. Pre-adjust the brakes by rotating the adjust hex clockwise until the brake lining contacts the brake drum. Back the brake adjuster off by rotating the hex counter-clockwise 1/2 turn. Backing off a new brake adjuster may require up to 50 ft lbs of torque. A ratcheting sound will be heard when backing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

Installation Check for Midland/Gunite 2000 Brake Adjuster on Welded Clevis App.

1. Uncage the spring brakes.

2. Build-up the vehicle air pressure. If the axle on which you have installed the brake adjuster has parking brakes, be sure they are released.

3. Once the pressure has built-up in the system, have some-one apply the brakes and allow the air chamber push rod to travel its maximum stroke. Visually monitor the travel of the push rod as the brakes are applied, there must be sufficient clearance to prevent any interference between the brake adjuster and any adjacent chassis components such as axle housing, suspension brackets, etc. Release the brakes.



4. After completing this procedure follow the instructions for the proper adjustment of the brakes starting with Step 1 of the procedure under **Brake Adjustment After Installation.**

BRAKE ADJUSTMENT AFTER INSTALLATION

Procedure for CSI Midland/2000 Brake Adjuster on Welded Clevis Application Only

Adjust the brakes as follows:

1. Using a 7/16" wrench or socket, rotate the adj hex **clockwise** until the brake linings make contact with the braking surface of the drum.

2. Using the 7/16" wrench adj or socket, back off the brake adjuster by rotating the hex **counterclockwise** 1/2 turn. This could require approximately 50 ft lbs of torque. When backing off the brake 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). Make a 90 to 100 psi reservoir pressure brake application and measure the difference between Dimension (A) and Dimension (B) - Figure 5. Check the following chart for proper maximum applied stroke after adjustment of the brakes.

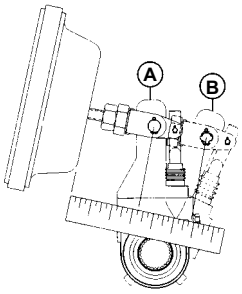


Figure 5 - Measuring Maximum Stroke

"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.

Lubrication

All Midland/Gunite 2000 brake adjusters are factory lubricated and extensively sealed to protect against contamination from dirt, water, salt and other corrosive elements. However, periodic lubrication is recommended every 6 months or 50,000 miles.

Measuring the Free Stroke

4. Free stroke is the amount of movement of the brake adjuster arm 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 brake adjuster until the brake shoes contact the drum **(Figure 6)**. 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 brake adjuster should be performed (see page 15).

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.

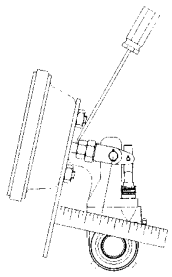


Figure 6 - Free Stroke

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 page10 for the recommended stroke measurements.

NOTE
An automatic brake adjuster should not have to be manually adjusted except for initial installation and at the time of brake reline. Constant manual adjustment may shorten service life.

Every Six Months or 50,000 Miles

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

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

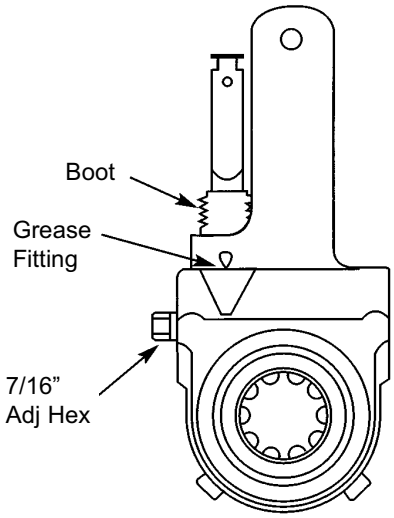


Figure 7 - Lubrication Points

Greasing the Automatic Brake Adjuster

1. A grease fitting is provided to allow lubrication during normal chassis servicing (See **Figure 7**). With a conventional grease gun, lubricate until grease appears on the camshaft or grease flows from the grease relief.

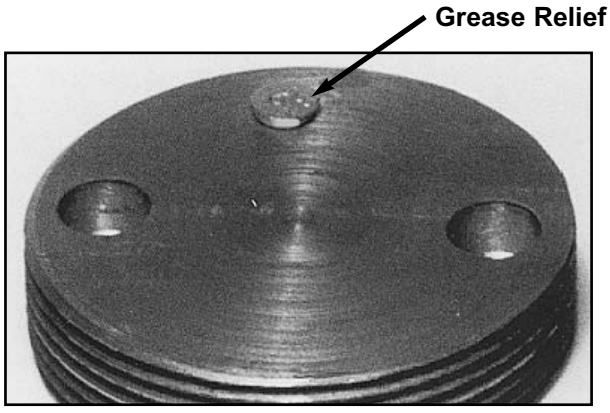


Figure 8 - Grease Relief

2. The newest Midland/Gunite automatic brake adjusters are produced without a grease relief, forcing lubricant through the drilled worm wheel onto the camshaft. Previous designs incorporated a grease relief (See **Figure 8**).

3. Lubriplate Aero is the grease used in the manufacture of Midland/Gunite automatic brake adjusters. It is recommended for use in temperatures as low as -40ºF.

TROUBLESHOOTING AND BOOT REPLACEMENT

Brake Adjuster Function Test

If the maximum stroke with a 90 to 100 psi reservoir pressure brake application is less than the distance shown in the chart on page 10, the Midland/Gunite brake adjuster is functioning properly.

Troubleshooting

1. The Midland/Gunite automatic brake adjuster should not require manual readjustment. If the maximum chamber stroke is within the range for the size chamber used (See Figure 5, Page 13), the brake 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 brake adjuster should be performed. To test the function of the brake adjuster, place a 7/16" box wrench on the adj hex and rotate it 3/4 of a turn counterclockwise. A ratcheting sound will be heard. Mark the 7/16" adj hex with chalk and apply the brakes several times and watch for the adj hex to rotate clockwise (See Figure 9). The adj hex 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.

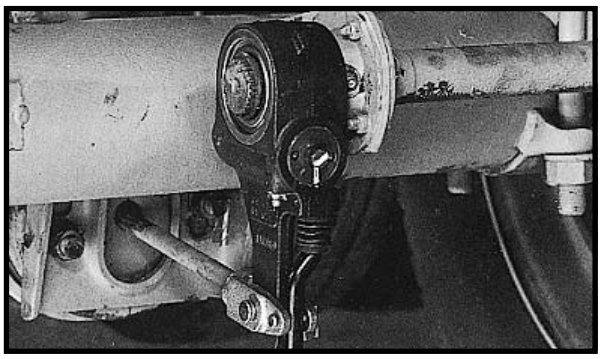


Figure 9 - Brake Adjuster Function

2. Check the torque by attaching a torque wrench to the 7/16" adj hex and turning it in a counterclockwise direction – record the measurement.

3. If the adj hex did not rotate clockwise during brake application or there is less than 15 ft-lbs of torque required to rotate the adj hex in the counterclockwise direction, the brake adjuster must be replaced. If immediate replacement is not possible, proper brake adjustment must be maintained by frequent manual adjustment.

4. If the adj hex rotates clockwise and has a torque of greater than 15 ft-lbs when rotated counterclockwise, the brake adjuster is functioning properly. Check the foundation brake for proper function, worn cam bushing, pins and rollers, broken springs, worn quick connect clevis, worn clevis bushings and clevis pins. Repair as necessary and repeat the function test.

5. Readjust the brake adjuster after the function test.

Boot Replacement

1. Remove the 1/4" and the large clevis pins.

2. Rotate the adj hex counterclockwise to clear the link from the clevis. This will require up to 50 ft-lbs of torque and produce a ratcheting sound.

3. Remove the damaged boot from the link.

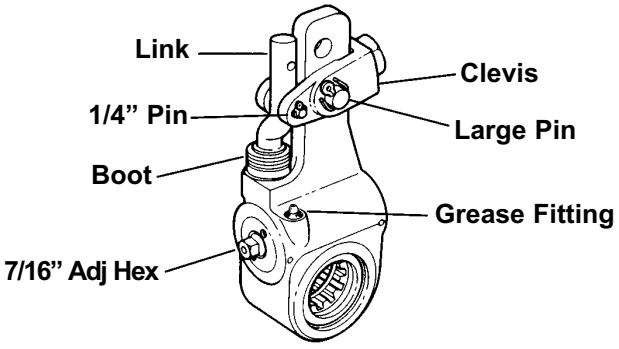


Figure 10 - Location of Clevis Pins, Hex & Boot

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.

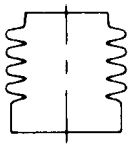


Figure 11 - Boot

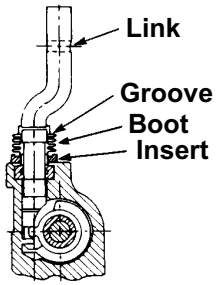


Figure 12 - Boot Position

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 as described in "Aligning the Automatic Brake Adjuster with the Clevis" on page 9.

CUTTING THE BRAKE CHAMBER PUSH-ROD

(Service Brake Chamber or Double Diaphragm Spring Brake Chamber)

This procedure is applicable to
CSI Midland/Gunite Automatic Brake Adjusters

⚠ WARNING: Always chock wheels to prevent vehicle from moving. Vent vehicle system air pressure to zero psi.

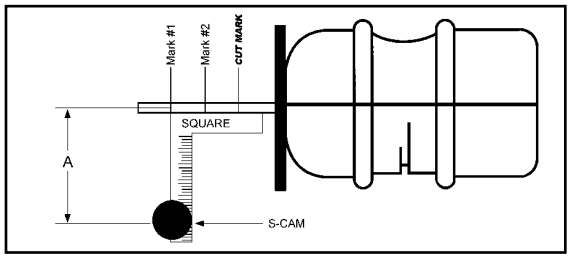
A. When preparing to install a spring brake chamber, ensure that the unit is fully released (power spring caged) and the service brake push-rod is fully retracted to zero stroke position. Thread the clevis jam nut onto the push-rod.

B. Place the brake chamber into the appropriate brake assembly bracket. Tighten the holding nuts to the bracket studs (100 - 140 lb. ft.).

C. Measure the distance from the centerline of the S-Cam to the centerline of the push-rod **(See Figure 1 - Dimension A).** This measurement should be equal to the length of the brake adjuster being used **(See Figure 2 - Dimension A).**

NOTE: If **Dimension A - Figure 1** and **Dimension A - Figure 2** are not identical, the chamber mounting bracket is either bent and must be straightened or replaced, the chamber has been mounted improperly in the bracket or the length of the adjuster installed is incorrect. Make any necessary corrections before going to Step D.

Figure 1



D. Using a square, mark the push-rod at the 90° setting **(See Figure 1 - Mark #1)**.

E. From **Mark #1** measure back toward the brake chamber mounting surface in accordance with **Chart A ("X" Dimension)**, make a second mark and cut the push-rod at **Mark #2 - See Figure 1)**.

F. Install the clevis onto the push-rod and secure the jam nut. Connect the clevis to the brake adjuster. Uncage the spring brake.

G. Release parking spring brakes and adjust the brake adjuster to the shortest possible stroke without the brakes dragging. Proper set-up stroke should now be established.

Figure 2

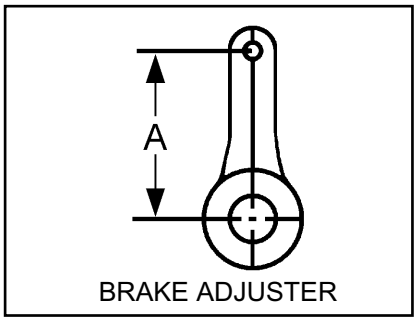


Chart A

Brake Adjuster Length	"X" Dimension
5" - 5 1/2"	2 1/4"
6" - 7"	2 1/2"

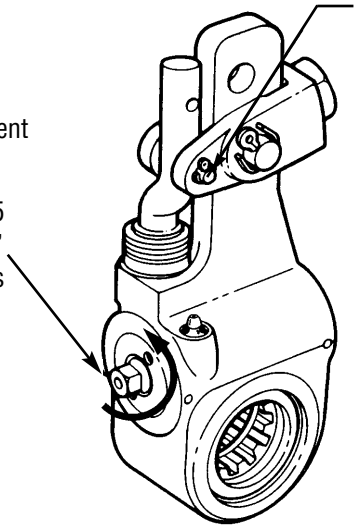
⚠ DANGER A spring brake or combination service/spring brake must be disarmed before disposal, or forceful release of the compression spring may occur in the future without warning.

SERVICE PRACTICES: POINTS & PRECAUTIONS

1. Replace the brake adjuster if it is not functioning properly, as described under "Brake Adjuster Function Test" on Page 15.

2. Replace the entire unit if damage is evident on the brake adjuster housing or assembly.

3. The unit must be replaced if less than 15 ft-lbs of torque exists when turning the 7/16" adj hex counterclockwise. Refer to the test as described under "Troubleshooting and Boot Replacement" - Figure 10 on Page 15.



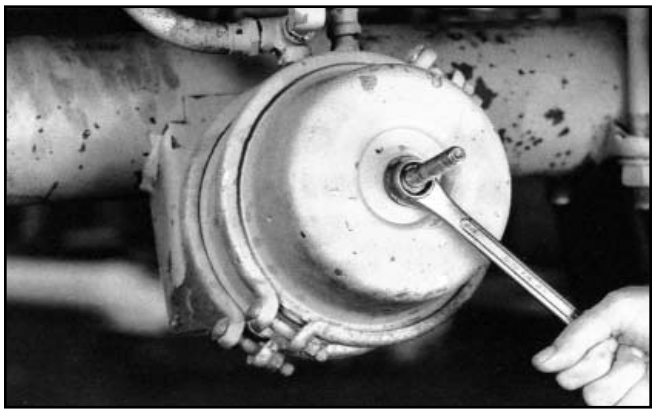
4. Never operate the vehicle with small 1/4" pin missing from the clevis. The brake adjuster will not maintain proper brake adjustment with either pin missing. (See Figure 10 on Page 15).

5. Never attempt to disassemble the brake adjuster. Factory setting cannot be duplicated in the field. Instead, replace the entire unit.

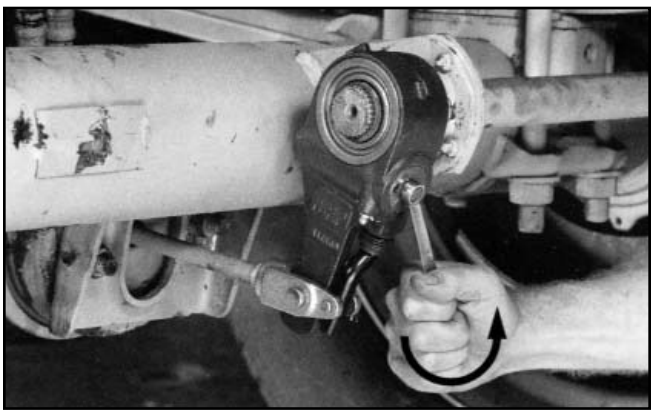
PROCEDURE FOR BRAKE LINING AND/OR DRUM REPLACEMENT

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

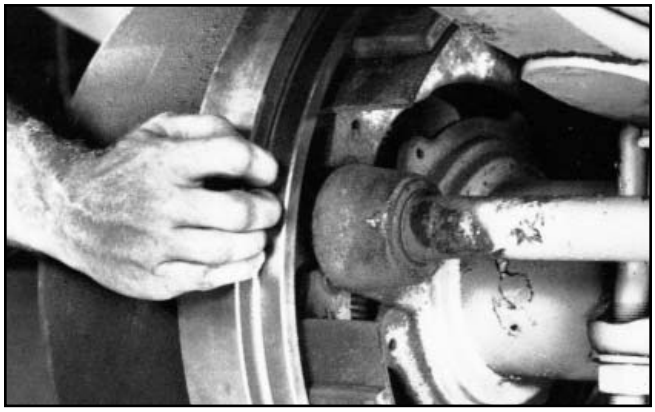
1. Block the vehicle's wheels.



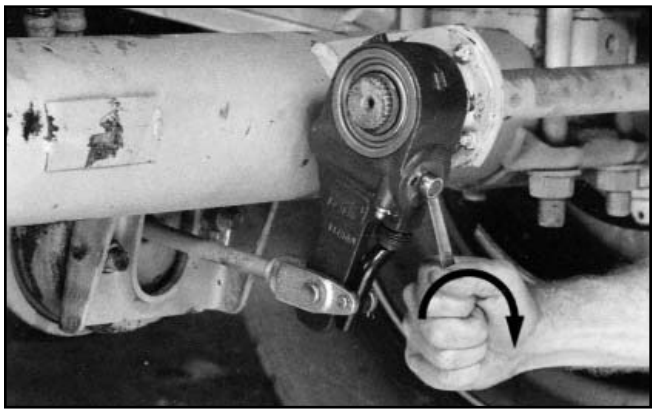
2. If the vehicle is equipped with spring brake chambers, manually cage the spring brakes following the manufacturer's recommended procedures.



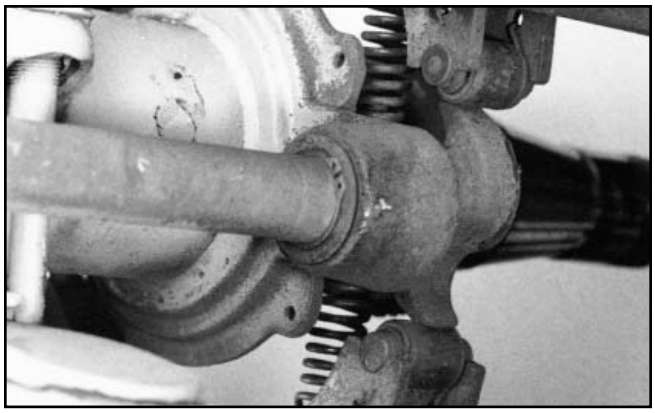
3. Using a 7/16" wrench or socket, rotate the adj hex counterclockwise. You should have at least 15 ft. lbs. resistance and a ratcheting sound will be heard as the adj hex is rotated.



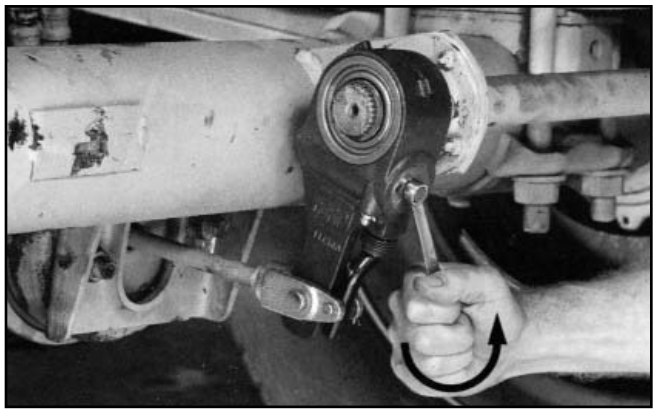
4. Only back off the adjusting hex enough to allow the drum to clear the lining. Remove the brake drum.



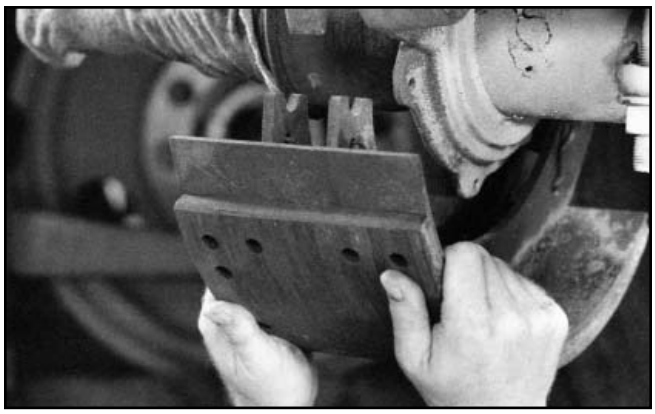
7. Once the linings have been replaced and the brake drum installed, rotate the adj hex clockwise until the brake linings contact the brake drum.



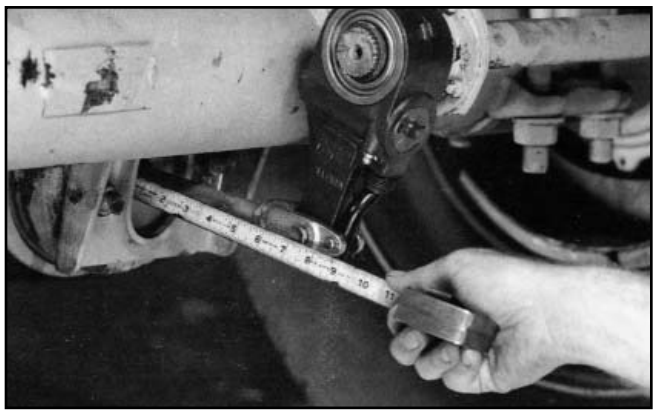
5. After the brake drum has been removed; rotate the adj hex clockwise until the cam turns over. This will allow the brake rollers to be in the release position.



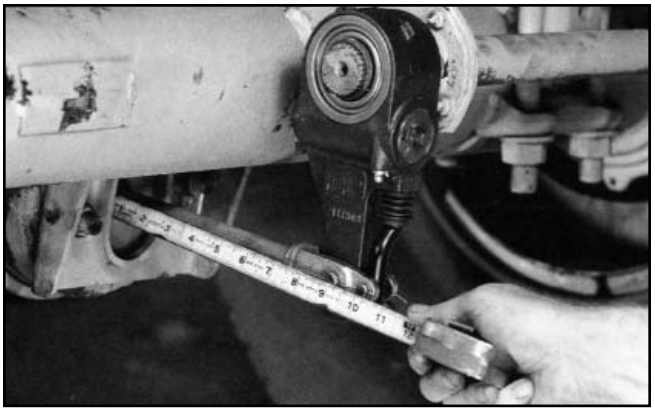
8. Back-off the brake adjuster by rotating the adj hex 1/2 turn counterclockwise. A ratcheting sound will be heard. This will provide running clearance between the lining and the drum's braking surface.



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



9. 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 Figure 15.)



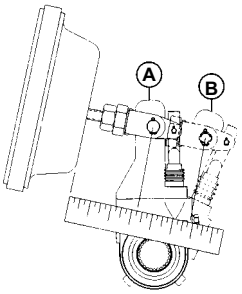


Figure 15 - Measuring Maximum Stroke

10. Make a 90 to 100 psi reservoir pressure 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 Figure 15.) The difference between the (A) measurement and the (B) measurement is the applied push rod stroke. Check the following charts for proper maximum stroke after adjustment of the brakes.

11. Manually uncage the spring brakes before returning the

"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, brake adjuster 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.

Additional Support

For additional service manuals, contact the Haldex Customer Service Department at 800-643-2374 and order Item #L30006. For additional technical support, contact the Haldex Technical Services Department at 800-643-2374.

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