



# Installation Instructions

## BENDIX® VERSAJUST™ AUTOMATIC SLACK ADJUSTER INSTALLATION

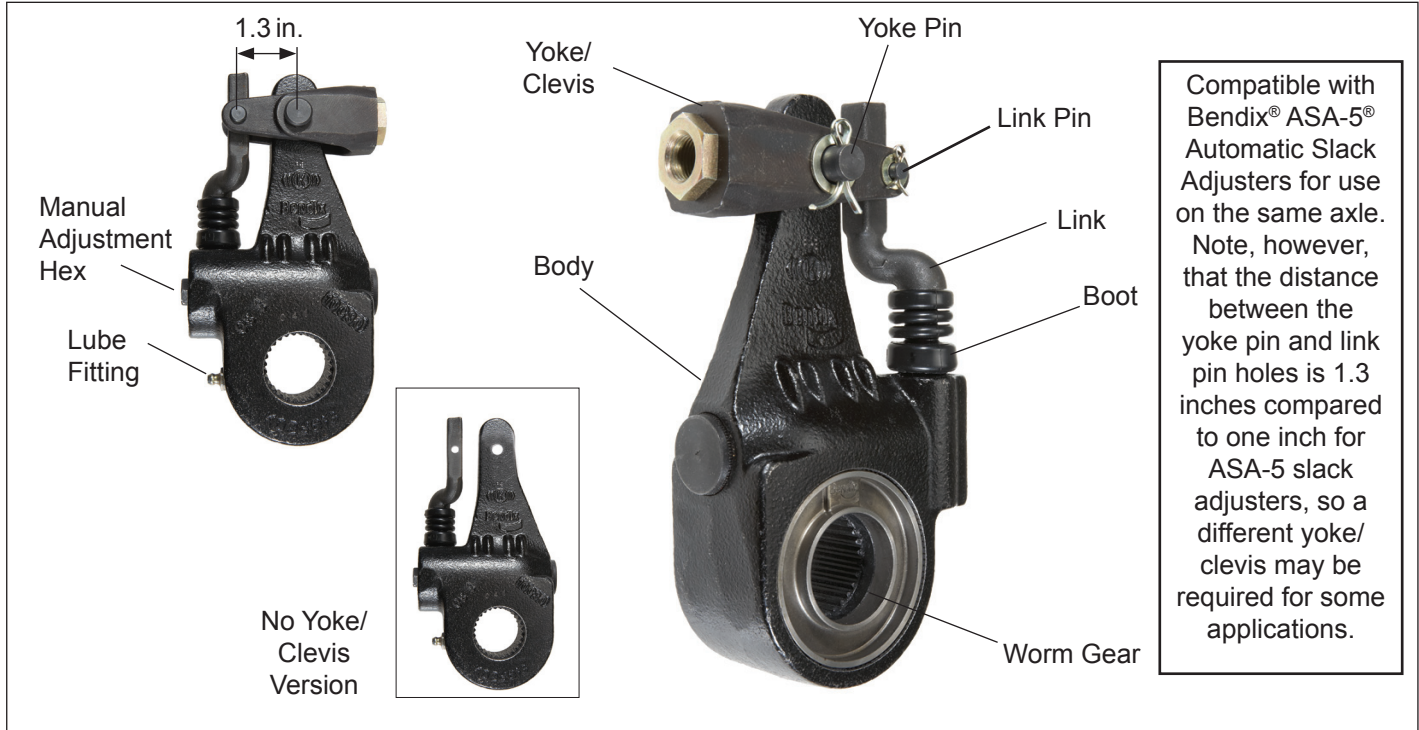


FIGURE 1 - BENDIX® VERSAJUST™ AUTOMATIC SLACK ADJUSTER

Follow all General Safety Guidelines (see Page 2).

### RETROFITTING THE BENDIX® VERSAJUST™ AUTOMATIC SLACK ADJUSTER

**PREPARATION:** The Bendix® Versajust™ automatic slack adjuster can replace a manual slack adjuster or competitive automatic slack adjuster, provided some simple considerations are kept in mind:

1. Excessive duty cycles, high application pressures, improper slack and chamber push rod alignment, and brake application compounding can result in reduced slack adjuster durability.
2. Determine that the AL factor of the vehicle to be retrofitted is 180 or less. To determine the AL factor, multiply the slack adjuster arm length (from center of the cam spline to the center of the yoke pin hole in use) times (x) the brake chamber size.

**Example:** For a type 30 brake chamber connected to a 6 inch arm slack adjuster:

A = 30 square inches, L = 6 inches;  
therefore,  $30 \times 6 = 180 = \text{AL factor}$ .

3. Make sure the foundation brake components are in good condition. Excessive drum out-of-roundness will result in excessive lining wear. See the "In Service Inspection" contained in Service Data Sheet SD-05-4630.
4. In order to select the proper slack adjuster, choose a Bendix Versajust automatic slack adjuster with the same offset, arm length, spline size, and push rod thread size as the slack adjuster it is replacing. Note that the Bendix Versajust automatic slack adjuster is compatible with Bendix® ASA-5® automatic slack adjusters. Therefore, it is acceptable to have a Bendix Versajust automatic slack adjuster on one side of the axle and a Bendix® ASA-5® automatic slack adjuster on the other side of the same axle.
5. When retrofitting the Bendix Versajust slack adjuster, make certain to read the instructions along with any other literature packaged with service replacement Bendix Versajust slack adjusters.

**Note:** The manual adjuster hex is intended for use during installation. **CAUTION:** Automatic slack adjusters should not be adjusted manually to correct excessive push rod stroke.

## GENERAL SAFETY GUIDELINES

### **WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:**

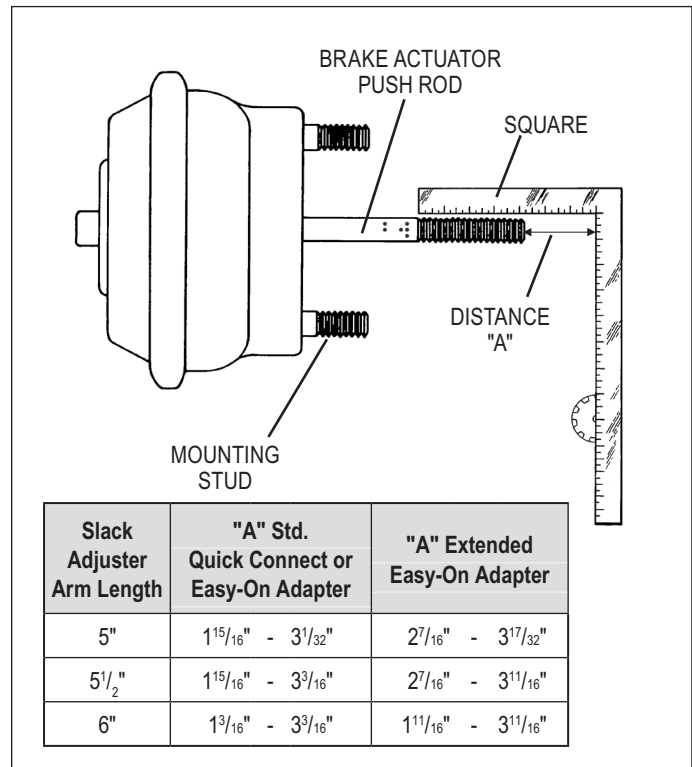
When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
3. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning **ANY** work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
6. Never exceed manufacturer's recommended pressures.
7. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
8. Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
9. Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
10. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
11. For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.

## INSTALLATION PREPARATION

In order to install the new Bendix® Versajust™ automatic slack adjuster:

1. Remove the manual or automatic slack adjuster currently installed, including the brake chamber yoke assembly.
2. It is recommended that the brake actuator push rod length be checked to determine if shortening or replacement is required.
  - A. With the brake chamber in the released position, place a square (or an equivalent object) so that one edge is parallel to the actuator push rod, while the other edge bisects the brake camshaft. Measure the distance from the push rod end to the vertical edge of the square and compare it to the values in Figure 2.



**FIGURE 2 - MEASURING THE BRAKE ACTUATOR PUSH ROD**

- B. If the measurement is less than the minimum shown in Figure 4, the brake actuator push rod must be shortened. If the measurement is greater than the maximum values, the brake actuator push rod may require replacement. The extended adapter – available as a separate service part (5/8"-18 pc. no. 297700 and 1/2"-20 pc. no. 297701) – may avoid the need to replace the brake actuator push rod. The extended adapter is available for the easy-on yoke assembly only. *Note: Installing any other type of push rod extender is not recommended. These devices may loosen over time and result in an improperly adjusted brake.*
3. Inspect the foundation brake, brake actuator and related components. Make certain the camshaft bushings and seals are not excessively worn. Maximum camshaft

radial play is 0.035 inches. The combined camshaft and slack adjuster axial play should be checked. The permitted range of the axial play is from 0.005 inches to a maximum of 0.025 inches. Servicing camshafts will reduce brake friction wear and increase the life of the entire system.

- Lubricate the camshaft bushings. Check the brake actuator bracket for cracks and excessive corrosion. The brake actuator push rod should not be loose (wobble) or bent and the return spring should be firm. Replace parts or components that are suspect.
- Wire brush the foundation brake camshaft and the chamber push rod to loosen contamination and wipe clean. Apply an anti-seize compound to both the camshaft and worm gear spline. Apply an anti-seize compound to the push rod threads, and the adapter bushing groove if quick connect yoke is used.

### BENDIX® VERSAJUST™ INSTALLATION

- Select the proper Bendix Versajust. See "Preparation" section of this instruction sheet. Note: Make certain the vehicle has been prepared according to the "GENERAL SAFETY GUIDELINES".
- Install the Bendix Versajust slack adjuster on the brake camshaft with enough washer spacers to align the slack adjuster to the center of the push rod. Add washers to the outside of the slack adjuster until the snap ring groove is just visible. Install the snap ring or E clip. The total end play allowed for the slack assembly, as well as the cam, is maximum 0.025, and minimum 0.005 inches.
- Bendix Versajust slack adjusters may be equipped with one of three yoke designs: quick-connect; easy-on; or without a yoke (for use with welded push rods). The quick-connect and easy-on types are designed to permit installation or removal of the slack adjuster along with its yoke body and its attached adjusting linkage. See *Figure 3 for yoke configurations*.

### For Bendix® Versajust™ slack adjusters equipped with easy-on yokes:

Position the actuator jam nut approximately  $1 \frac{5}{16}$  inches from the end. Thread the easy-on yoke adapter on the push rod until it is about  $\frac{3}{8}$  inch from the end of the push rod. Turn the adjustment hex clockwise until the adapter extends into the threaded bore of the Bendix Versajust slack adjuster yoke, approximately  $\frac{1}{8}$  inch. Thread the adapter into the yoke, tighten to 10 foot pounds.

### For Bendix® Versajust™ slack adjusters equipped with quick-connect yokes:

Position the actuator jam nut approximately 1 inch from the end. Thread the quick connect adapter bushing on the brake actuator push rod until it is flush with the end of the brake actuator push rod. Install the retaining ring on the adapter bushing making certain it is in the adapter bushing groove. Turn the Bendix Versajust slack adjuster manual adjustment hex clockwise until the adapter bushing begins to enter the yoke. Fully compress the "legs" of the retaining ring and continue turning the manual adjustment hex until the adapter is completely in the yoke. Allow the retaining ring to expand into the corresponding groove in the yoke. Make certain the retaining ring is seated in both the yoke and adapter bushing groove by manually pulling on the slack adjuster arm, attempting to separate the adapter bushing and yoke. Run the actuator push rod jam nut down against the adapter. Hold the adapter or adapter bushing hex with a wrench and tighten the jam nut to 25 – 35 ft. lbs. for the  $\frac{1}{2}$  inch-20 thread rod and 35 – 50 ft. lbs. for the  $\frac{5}{8}$  inch-18 thread rods.

### For Bendix® Versajust™ slack adjusters that will be used with a welded push rod clevis combination:

Ensure that the welded clevis is aligned with the slack adjuster, such that the clevis will not bind on the slack adjuster's body during regular operation. If necessary, the orientation of the welded clevis can be adjusted

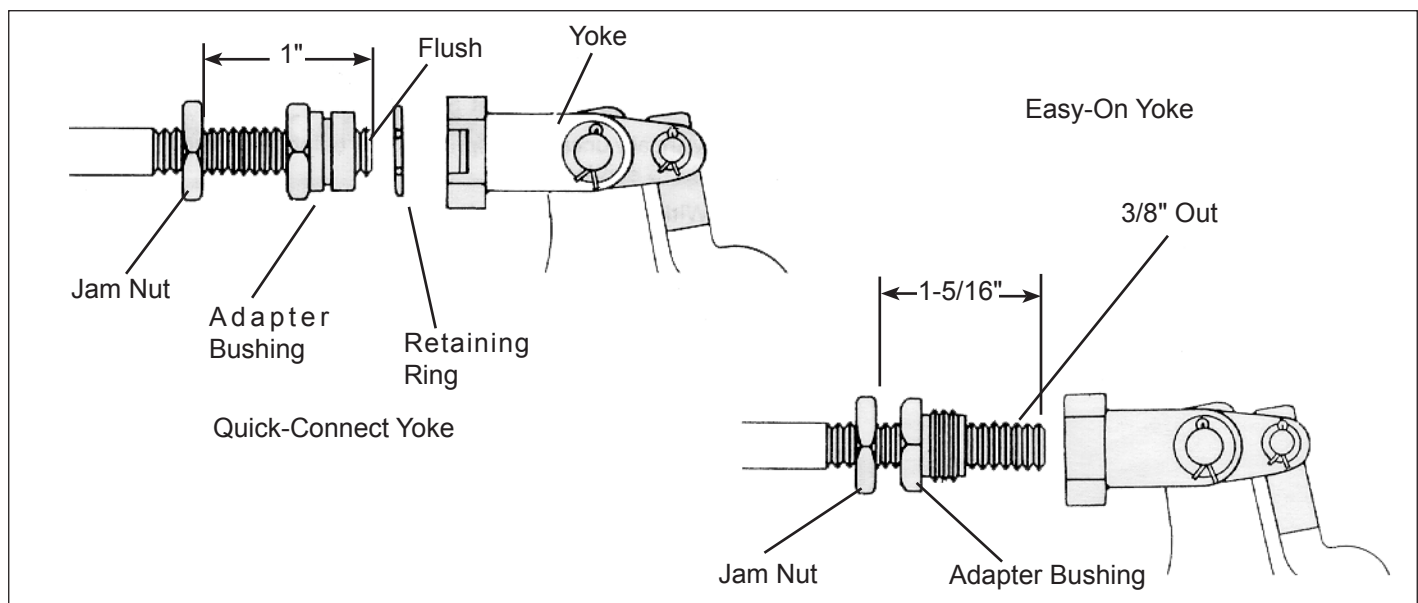


FIGURE 3 - QUICK CONNECT YOKE/EASY-ON YOKE

by simply rotating the push rod relative to the actuator chamber. Use a bar or pipe inserted between the clevis jaws to provide leverage for rotation. Once the push rod orientation has been adjusted, align the clevis holes with the matching holes in the slack adjuster body and link. Insert the clevis pins (pre-greased with a good quality anti-seize compound), washers and cotter pins.

### COTTER PIN INSTALLATION

Secure the cotter pins per Figure 4.

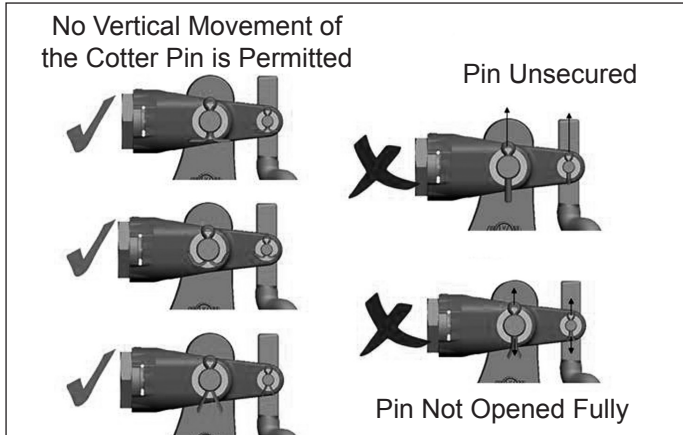


FIGURE 4 - THE COTTER PIN MUST BE OPENED, PREVENTING VERTICAL MOVEMENT

### BRAKE ADJUSTMENT

1. Rotate the manual adjustment hex clockwise until the linings are snug against the drum.
2. Turn the adjustment hex counterclockwise one half turn.
3. Pull the brake actuator push rod to confirm that approximately 1/2 inch of free stroke exists.
4. Build up the system air pressure until the gauge reads from 80 to 90 PSI. Make a full brake application and check that the brake actuator push rod stroke is below the readjustment limit set by the U.S. Department of Transportation (DOT). See Figure 5.

80 to 90 PSI System Pressure	
Brake Chamber Size	Max. Readjustable Stroke
Type 6	1.25"
Type 9, 12	1.375"
Type 12 Long Stroke	1.75"
Type 16, 20, 24	1.75"
Type 16, 20, 24 Long Stroke	2.00"
Type 24 (with 3" Extended Long Stroke)	2.50"
Type 30	2.00"
Type 30 Long Stroke	2.50"

FIGURE 5 - READJUSTABLE STROKE

5. If the stroke exceeds the re-adjustment limit, check the condition of the foundation brake. Refer to "Brake

Maintenance Inspection" section of Service Data Sheet SD-05-4630.

6. Manually uncage the spring brakes before returning the vehicle to service, following the manufacturer's instructions.
7. With the Bendix® Versajust™ slack adjuster installed on the vehicle, ensure clearance requirements are met with the brake chamber fully released and at full stroke. Also, consider the clearance with the vehicle suspension springs depressed to bumpers, as well as in the rebound state.
8. The Bendix Versajust automatic slack adjuster should be lubricated every 50,000 miles, 6 months, or at the time of routine vehicle chassis lubrication, whichever occurs first. The Bendix Versajust automatic slack adjuster should be lubricated through the lube fitting with a quality multipurpose chassis lubricant (N.L.G.I. Grade 2). Lubricant should be added to the slack adjuster until clean lubricant flows from the grease relief opening in the boot. After lubrication, free stroke and power stroke must be checked to ensure the proper operation of all the components of the brake system.
9. When relining a brake, a resistance torque should be felt during the back off of the slack adjuster; this is normal. When backing off the adjustment, only back off enough to allow the removal of the drum. Manual repositioning of the slack by counterclockwise adjustments of the slack adjuster will wear the clutch excessively resulting in premature failure of the slack. Frequent adjustment of an automatic slack adjuster is a dangerous practice as stated by the CVSA and DOT.

### BOOT INSPECTION

The final step of any Versajust installation (or inspection) is to verify that the boot is in the correct position. See Figure 6. Adjust any boot that is not fully seated at the top or bottom.

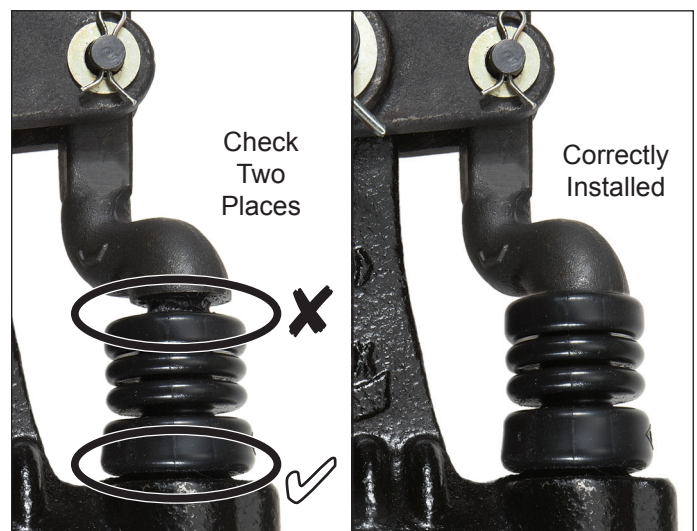


FIGURE 6 - INSPECT BOOT LOCATION (LEFT: TOP LOCATION IS NOT SEALED CORRECTLY)

