



Installation Instructions

BENDIX® ADB22X™ AIR DISC BRAKE GUIDE PIN REPLACEMENT

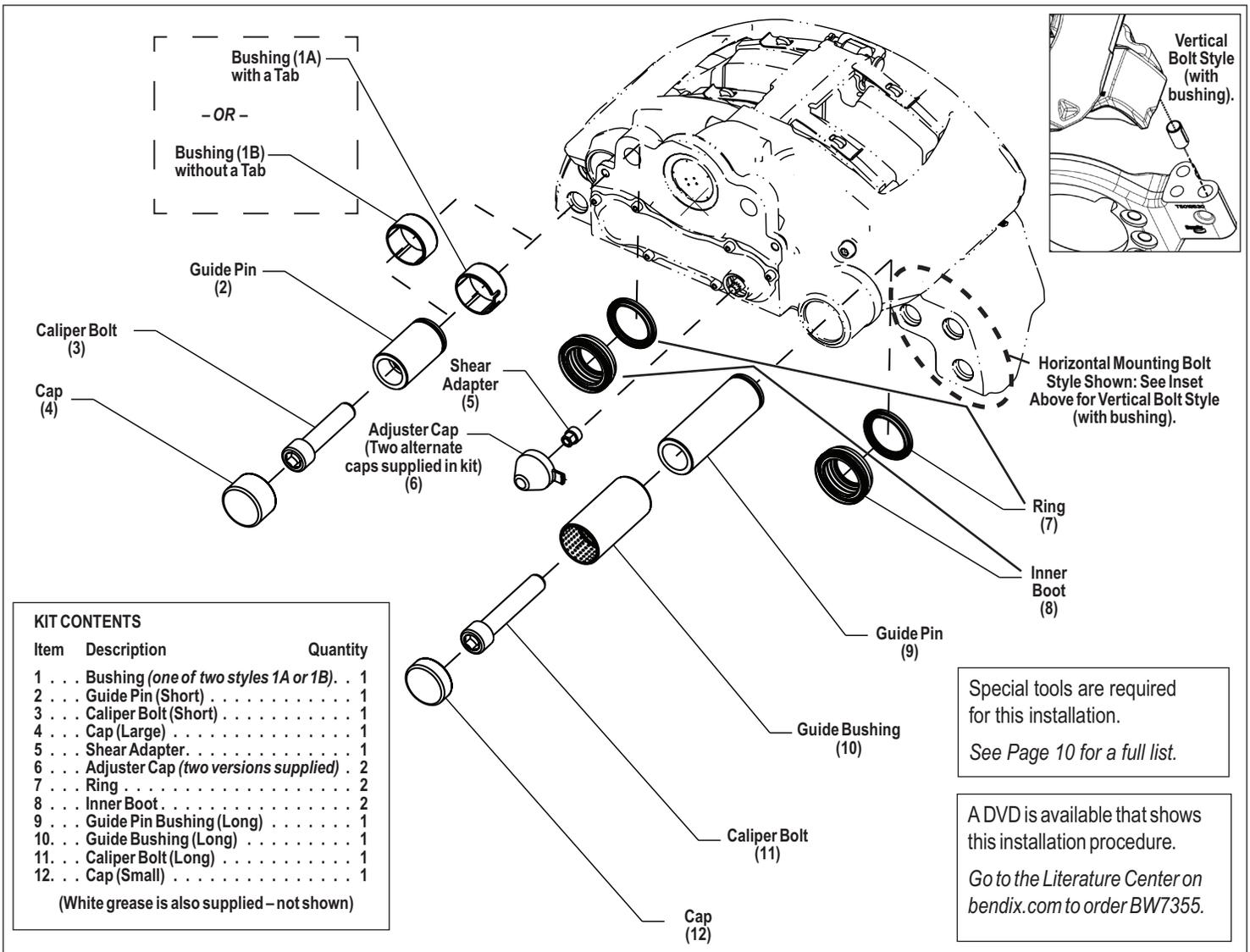


Figure 1 - Guide Pin Exploded View

Follow all standard safety procedures including, but not limited to, those on page 2 of these instructions. Also read the vehicle manufacturer's recommendations. When working on foundation brakes, be sure that the vehicle is on level ground, that the vehicle is parked by other means than the foundation brakes, and that the wheels are chocked. When installing pads, where appropriate, use heavy duty gloves and always keep fingers away from potential pinch hazard areas.

Bendix® Air Disc Brakes are precision-engineered braking mechanisms. The "friction couple" braking characteristics have

been carefully optimized and the rotor design and materials have been matched with special formulation brake pads for optimal performance.

GUIDE PIN REPLACEMENT

In nearly all cases, the air disc brake caliper/carrier will need to be removed from the vehicle in order to complete this procedure. The first step is to remove the brake pads.

BRAKE PAD REMOVAL

Bendix strongly recommends when replacing brake pads, that the pads are replaced as an axle set.

These instructions cover the removal of Bendix air disc brake pads, and installation of replacement guide pins and brake pads. For vehicles with wear sensors and/or electronic wear diagnostic equipment, consult Bendix® Service Data Sheet SD-23-7541.



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 guidelines should be observed AT ALL TIMES:

- ▲ Park the vehicle on a level surface, apply the parking brakes and always block the wheels. Always wear personal protection equipment.
- ▲ Stop the engine and remove the 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.
- ▲ 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.
- ▲ 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, a Bendix® DRM™ dryer reservoir module, or a Bendix® AD-9si® air dryer, be sure to drain the purge reservoir.
- ▲ Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
- ▲ Never exceed manufacturer's recommended pressures.
- ▲ Never connect or disconnect a hose or line containing pressure; it may whip and/or cause hazardous airborne dust and dirt particles. Wear eye protection. Slowly open connections with care, and verify that no pressure is present. Never remove a component or plug unless you are certain all system pressure has been depleted.
- ▲ Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, wiring, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
- ▲ 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.
- ▲ Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
- ▲ 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.
- ▲ The power MUST be temporarily disconnected from the radar sensor whenever any tests USING A DYNAMOMETER are conducted on a vehicle equipped with a Bendix® Wingman® system.
- ▲ You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.

The spring brake should be caged before removing the brake assembly. Release (and cage) the spring brakes and remove the wheel (refer to the vehicle manufacturer's recommendations).

CAGING THE SPRING BRAKE

CAUTION: Following all safety guidelines. Be familiar with the spring brake manufacturer's recommended safety practices.

With the vehicle on a level surface and the wheels properly chocked, apply air to release the spring brakes (parking brakes) by using the dash-mounted air control valve.



WARNING: Not all wheels and valve stems are compatible with Bendix® Air Disc Brakes. Use only wheels and valve stems approved by the vehicle manufacturer to avoid the risk of valve stem shear and other compatibility issues.



WARNING: AVOID CREATING DUST. POSSIBLE CANCER AND LUNG DISEASE HAZARD.

While Bendix Spicer Foundation Brake LLC does not offer asbestos brake linings, the long-term effects of some non-asbestos fibers have not been determined. Current Occupational Safety and Health Administration (OSHA) Regulations cover exposure levels to some components of non-asbestos linings, but not all. The following precautions must be used when handling these materials.

- ▲ Avoid creating dust. Compressed air or dry brushing must never be used for cleaning brake assemblies or the work area.
- ▲ Bendix recommends that workers doing brake work must take steps to minimize exposure to airborne brake lining particles. Proper procedures to reduce exposure include working in a well-ventilated area, segregation of areas where brake work is done, use of local filtered ventilation systems or use of enclosed cells with filtered vacuums. Respirators approved by the Mine Safety and Health Administration (MSHA) or National Institute for Occupational Safety and Health (NIOSH) should be worn at all times during brake servicing.
- ▲ Workers must wash before eating, drinking or smoking; shower after working, and should not wear work clothes home. Work clothes should be vacuumed and laundered separately without shaking.
- ▲ OSHA Regulations regarding testing, disposal of waste and methods of reducing exposure for asbestos are set forth in 29 Code of Federal Regulations §1910.001. These Regulations provide valuable information which can be utilized to reduce exposure to airborne particles.
- ▲ Material Safety Data Sheets on this product, as required by OSHA, are available from Bendix. Contact the Bendix Tech Team at 1-800-247-2725, option 2, or techteam@bendix.com.

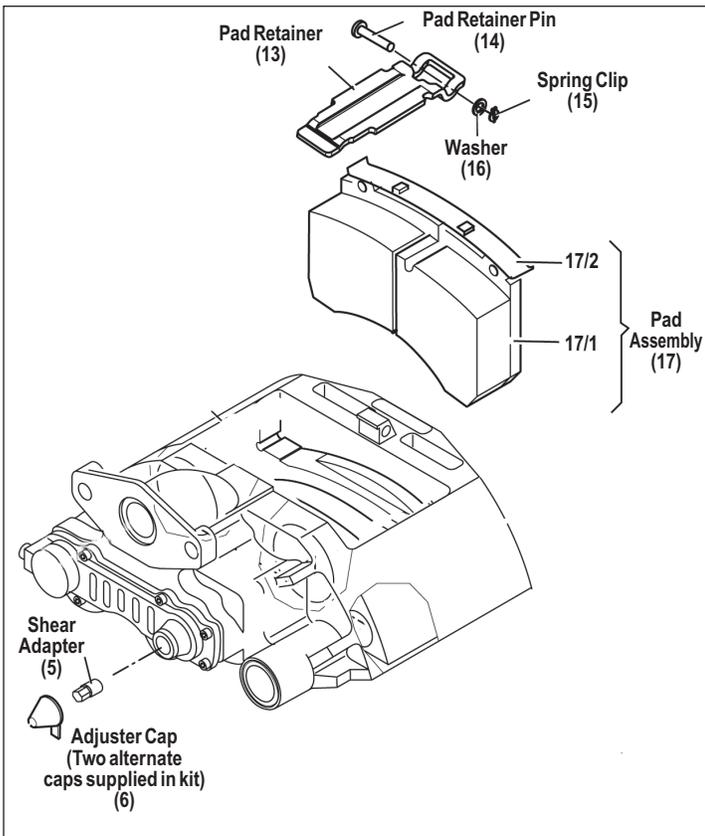


Figure 2 - Part Identification

Back out the release bolt (*Figure 3, arrow D*), using a maximum torque of 26 ft-lbs (35 N•m) to cage the air released spring force on the pushrod. Refer to the spring brake and vehicle manufacturer's recommendations – in some cases it may be permissible to cage the spring brake while the spring brake is engaged.

Note: Before removing the brake pads it is strongly recommended that the air disc brake adjuster mechanism be checked for correct operation (*see page 10 of this document*).

Refer to Figures 2 to 5 throughout this procedure. Remove the clip (15) and washer (16), depress the pad retainer (13) and remove the pad retainer pin (14). If the installer is using a brake pad replacement kit, discard these four items – replacements are included in the pad service kit. As necessary, remove any in-pad wear sensor components. (*See Service Data Sheet SD-23-7541 for more information about wear sensors.*)

Remove the adjuster cap (6) using its tab, taking care to keep the shear adapter (5) in position on the adjuster (18). When using the full brake pad service kit, note which size of adjuster cap is used on this brake (two sizes are included in the brake kit), and be sure to use the original size cap when the cap is replaced during installation.

Using a box-end wrench or socket (typically 10 mm), fully wind back the tappet and boot assemblies (13) by rotating the shear adapter (5) in a counterclockwise direction (*see Page 8*). Note: Do not use an open-ended wrench as this may damage the adapter.

CAUTION: Never turn the adjuster (18) without the shear adapter (5) installed. The shear adapter is a safety feature and is designed to prevent an excess of torque being

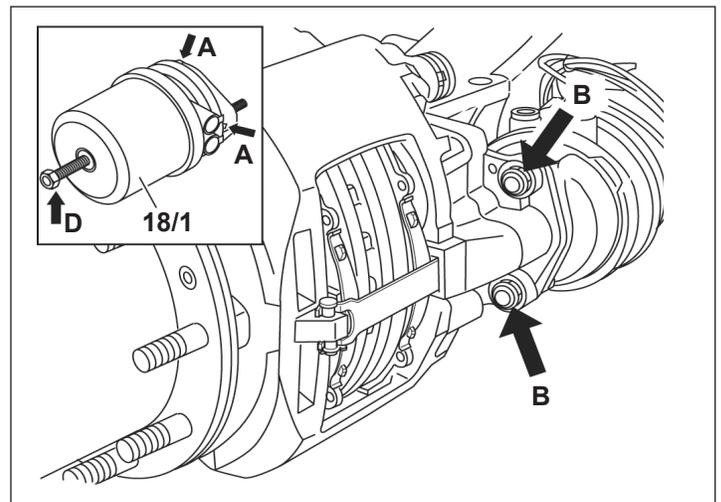


Figure 3 - Spring Brake Removal

applied to the adjuster. The shear adapter will fail (by breaking loose) if too much torque is applied.

If the shear adapter fails, you may attempt a second time with a new (unused) shear adapter. A second failure of the shear adapter confirms that the adjustment mechanism is seized and **the caliper/carrier assembly must be replaced**.

To remove the outboard brake pad (17), slide the caliper (1) fully to the outboard position first. Similarly, to remove the inboard pad, first move the caliper fully to the inboard position, and then remove the pad. *See Figure 5.*

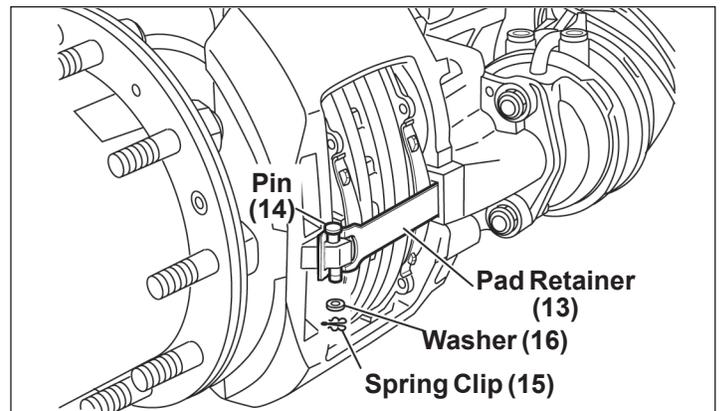


Figure 4 - Brake Pad Removal

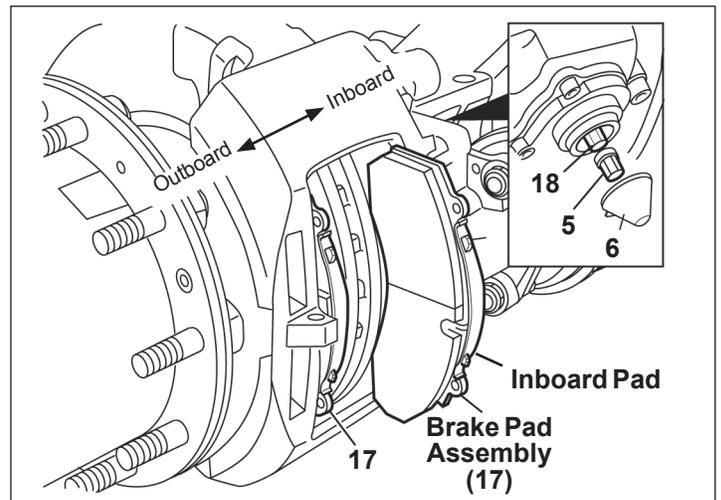


Figure 5 - Brake Pad Removal

CALIPER/CARRIER/ACTUATOR ASSEMBLY REMOVAL

Following all safety guidelines, clean the wheel area. There are two styles of mounting: vertical and horizontal. See Figure 1.

Vertical Mounting Bolt Style:

Disconnect the air hose(s) to the brake chamber. Supporting the air disc brake by necessary means, remove the six (6) mounting bolts and discard. Note: Bendix strongly recommends that during reassembly these bolts and washers are replaced—see vehicle manufacturer for replacement hardware. Lift the caliper up off the anchor plate.

The vertical bolt assembly includes an alignment bushing. This bushing must be saved for reuse during reassembly of the brake. The bushing mounts in the torque plate and is used to maintain the correct alignment of the brake assembly relative to the rotor.

If the brake assembly does not separate from the anchor plate it may be helpful to install an M16X2.0 screw longer than 120 mm at the bushing locations and tap the end of the bolt with a hammer to free the brake assembly. Remove the assembly.

Horizontal Mounting Bolt Style:

Disconnect the air hose(s) to the brake chamber. Supporting the air disc brake by necessary means, remove the six (6) bolts attaching the brake to the anchor plate and remove the caliper/carrier assembly from the vehicle. Note: Bendix strongly recommends that during reassembly these bolts and washers are replaced—see vehicle manufacturer for replacement hardware. Remove the assembly.

In some cases, removal of the service or spring brake chamber may be required in order to do the maintenance work—see below. In cases where spring brakes will be removed, be sure to follow the manufacturer's instructions for caging the spring brake, before removal.

BRAKE CHAMBER REMOVAL

CAUTION: Follow all safety guidelines. For spring brake chambers, see *Caging the Spring Brake* on page 2; be familiar with the spring brake manufacturer's recommended safety practices. Cage the spring brake before proceeding.

Exhaust the air from the brake chambers by using the dash-mounted air control valve. With all air pressure drained from the system, disconnect the air hoses from the brake chamber. While supporting the brake chamber in position, remove and discard the brake chamber mounting nuts (Figure 3, arrow B). Remove the brake chamber.

GUIDE PIN DISASSEMBLY

Figure 6 shows the tools used for this process and their item numbers.

Cap Removal

Refer to Figure 1. Place the brake on a workbench and, using a vice, secure it by the carrier. Using a small chisel or punch, tap a hole in the center of the guide pin cap (12), taking care

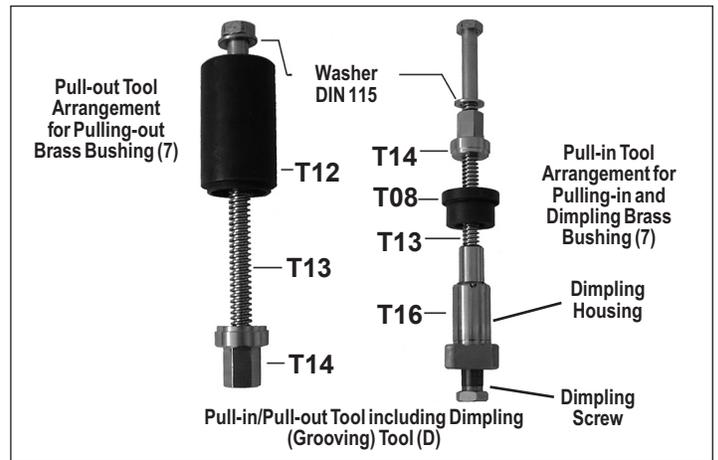


Figure 6 - Tools Used

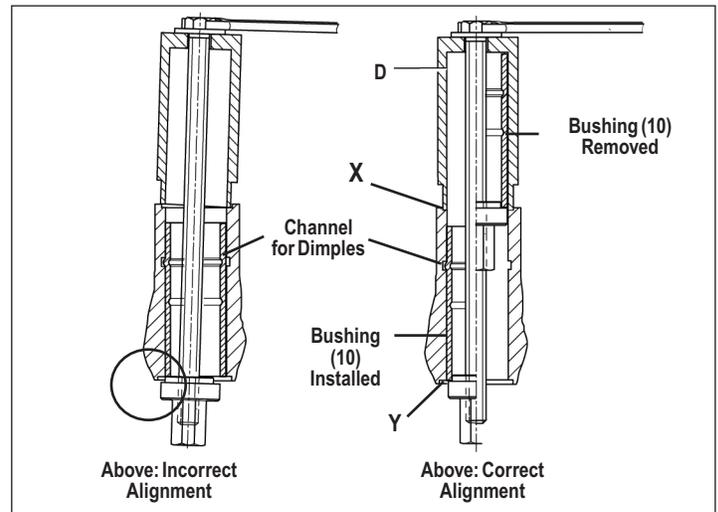


Figure 7 - Tool Orientation

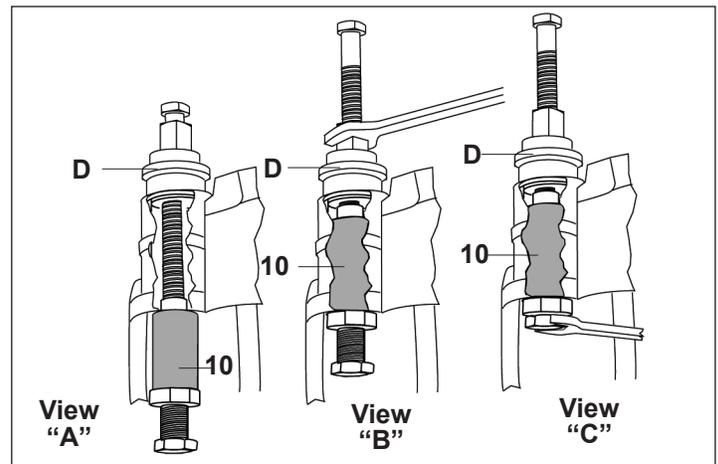


Figure 8 - Installation

not to insert the chisel too far. Using the hole just made, pry the cap off and discard. Release the second cap (4) by using a small chisel and hammer to apply light blows to the cap, with the chisel aimed away from the casting. Discard the cap (4).

CALIPER BOLT, GUIDE PIN AND INNER BOOT REMOVAL

Using a 14 mm hex bit socket, remove and discard the two caliper bolts (3) and (11). Retract both guide pins slightly and remove the caliper from the carrier.

Remove the boot retaining rings (7) and the guide pins (2) and (9). Use a screwdriver to pry out the inner boots (8).

LONG FIXED GUIDE PIN BUSHING (10) REMOVAL

Clean the caliper upper and lower surfaces around the bushings (X) and (Y)—see *Figure 7*.

Position tool arrangement for pulling out of brass bushing (10)—see *Figure 7*. In order to remove the bushing, use the tool arrangement shown on the left of *Figure 6*. The tool nut (T14) is removed, the threaded shaft (T13) of the tool is fed through the caliper body and the tool section T14 reinstalled. Lubricate the tool's thread for ease of use.

Note: During the pulling process, ensure that the tool is aligned vertically with the bushing, that the tube (T12) is resting evenly on the caliper and that the nut (T14) is centered in the brass bushing (10). See *Figure 7*.

Use a box-end wrench or socket to turn the bolt (not the nut) on the threaded shaft (T13) to pull out the bushing. Discard the bushing.

Guide Pin Bushing (10) Installation

See *Figures 6 and 8*. Clamp the carrier in a vise so that the guide channel is vertically oriented. Fully wind the brass nut (T14) on to the spindle (T13) followed by the flange (T08). Place a new brass bushing (10) on the dimpling tool (T16) and insert into caliper bore. Note: The dimpling tool is sometimes referred to as a grooving tool.

Insert the spindle (T13) through the fixed guide pin bore, and screw the spindle (T13) into the dimpling tool. See *Figure 8*, view "A."

Check that the flange (T08 in *Figure 6*) is in an upright position at the top of the caliper recess. See *Figure 6*, right side arrangement for the tool used. Pull in the brass bushing (10) using brass nut (T14) up until the dimpling tool bottoms on the caliper.

Note: The final stage in the installation uses the dimpling tool (T16)—see *Figure 8*—to hold the brass guide bushing at the correct point in the casting, preventing lateral bushing movement after installation.

With the dimpling tool (T16) in position, tighten the dimpling screw until it contacts the dimpling screw housing. See *Figure 6 and view "C" of Figure 8*. This causes three dimples to be made in the bushing.

Back the dimpling screw out approximately 0.75 inches (20 mm). Loosen the brass nut (T14) and rotate the dimpling tool (T16) 60 degrees. Repeat the dimpling process by tightening the brass nut (T14) and then tighten the dimpling screw until it contacts the dimpling screw housing. Back out the dimpling screw approximately 0.75 inches (20 mm). The brass bushing (10) is now held in position by the six dimples made by the tool.

Remove the installation tools and check the brass bushing (10), removing any burrs. Be sure to remove any metal filings.

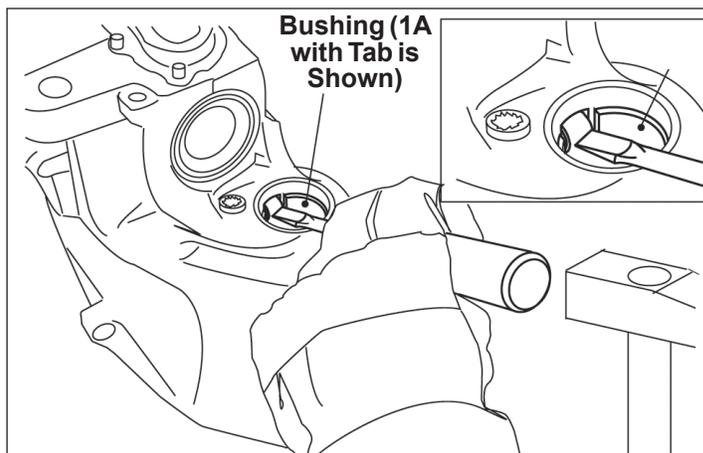


Figure 9 - Tab Removal For Bushings Where A Tab Is Used

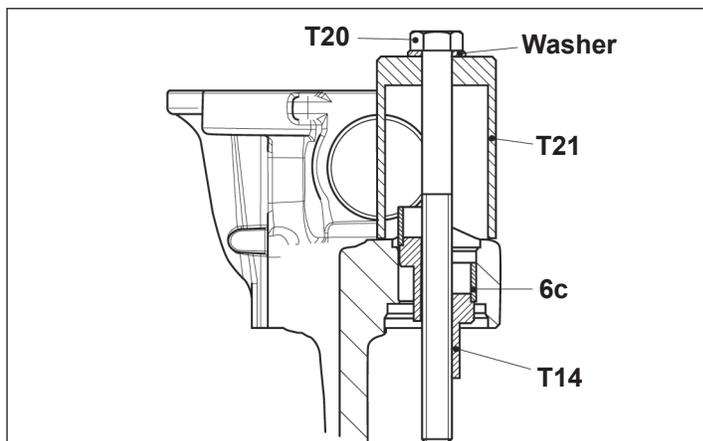


Figure 10 - Guide Pin Bushing Removal

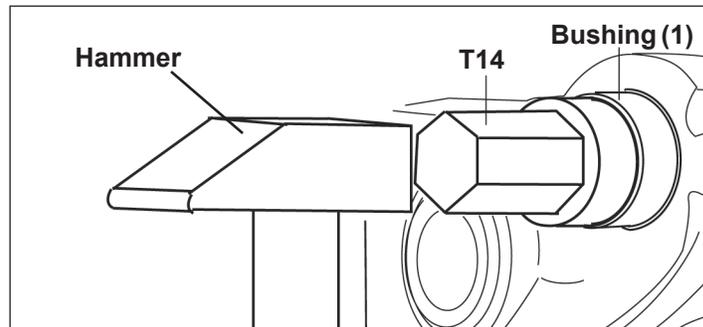


Figure 11 - Guide Pin Bushing Installation

Coat the inside of the bushing (10) with the white grease included in the kit.

Floating Guide Pin Bushing (1) Removal

Locate the bushing (1A or 1B), and in the case of a 1A-style bushing, use a small chisel or similar tool to remove the tab as shown in *Figure 9*, by striking low on the base of the tab. Remove the tab with a magnet and use a clean shop cloth to remove any excess debris. Note that in some cases, the tab may be in the opposite slot in the bore.

Use the tool combination shown in *Figure 10* (comprising 6c, T14, T20, T21, and a washer) to remove the bushing (1A or 1B). Screw nut (T14) onto the assembly by hand, then tighten bolt (T20) using a box end wrench or socket to pull out the bushing. Discard the removed bushing, and verify that the bore is clean by wiping with a shop cloth.

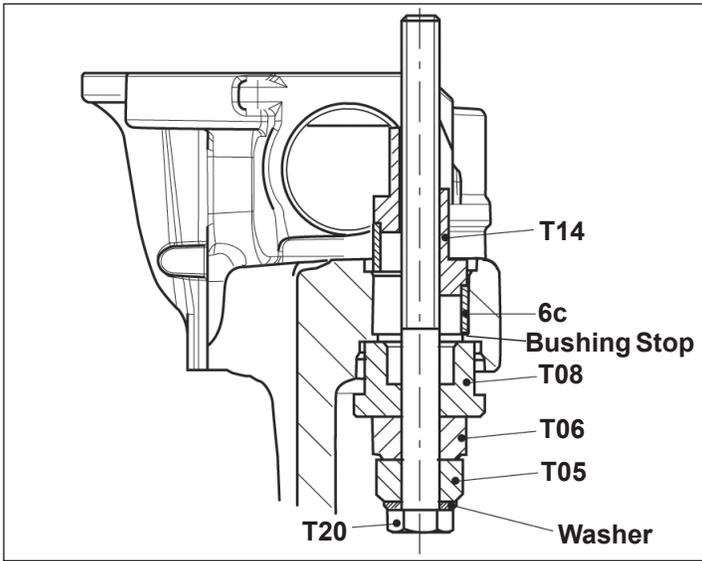


Figure 12 - Guide Pin Bushing Installation

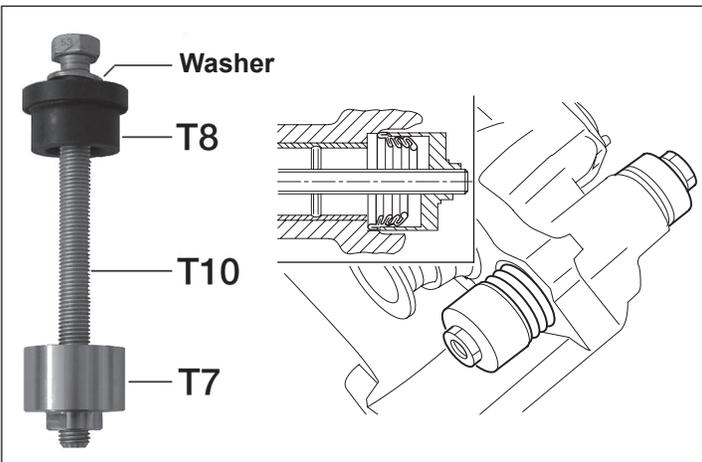


Figure 13 - Inner Boot Installation

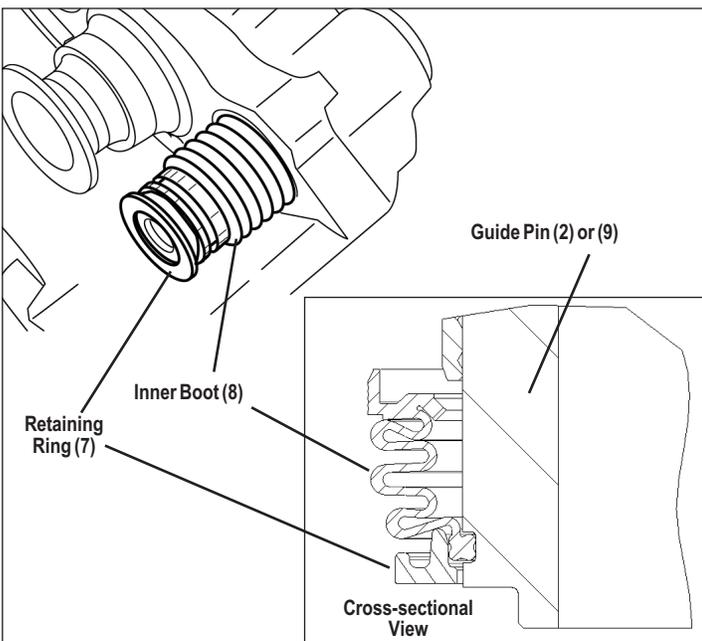


Figure 14 - Guide Pin Installation

INSTALLATION OF FLOATING GUIDE BUSHING (1A OR 1B)

Inspect the bore for corrosion, damage etc. and clean (or replace the caliper) as necessary.

See Figure 1. Place the new bushing (Style 1A or 1B) in position. In the case of 1A-style bushings, orient it so that when pulled into position, the tab will align with one of the slots in the casting. With the tab aligned, place tool (T14) over the bushing and tap lightly. To position the bushing, see Figure 11.

Use the tool combination shown in Figure 12 to pull the bushing (1A or 1B) into the caliper. Hand tighten the nut (T14) into position. Then tighten the bolt (T20) using a box end wrench or socket to pull the bushing into the caliper until the bushing contacts the machined step in the bore. Remove the tool.

In the case of a 1A-style bushing, use a punch to bend the tab into the groove by aligning the punch with the upper part of the tab and tapping the punch with a hammer.

Coat the inside of the bushing (6c) with a light coat of the white grease included in the kit.

INNER BOOT (8) INSTALLATION

Both inner boots are identical.

See Figure 13. Clean the area where the inner boots will be installed and inspect for corrosion. If the sealing surface of the

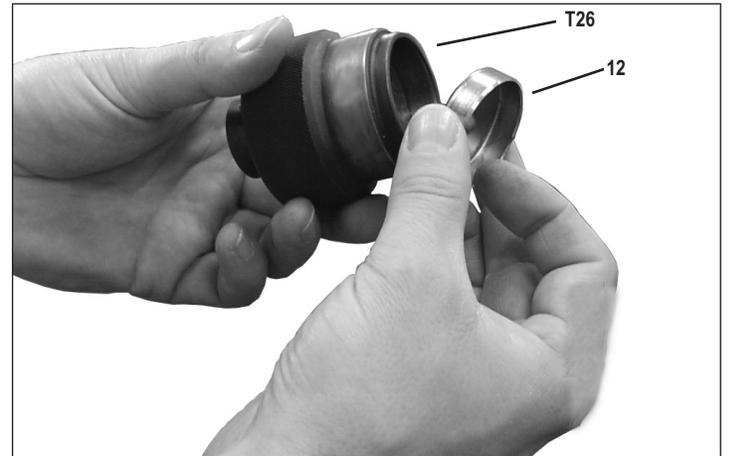


Figure 15 - Guide Cap Installation

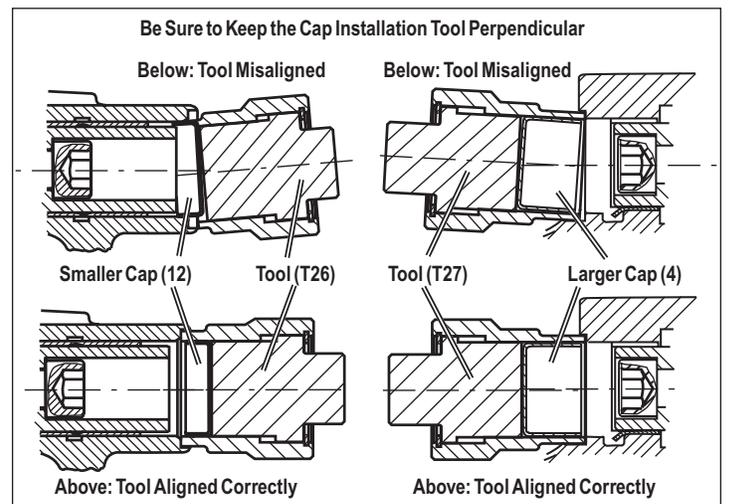


Figure 16 - Guide Cap Installation

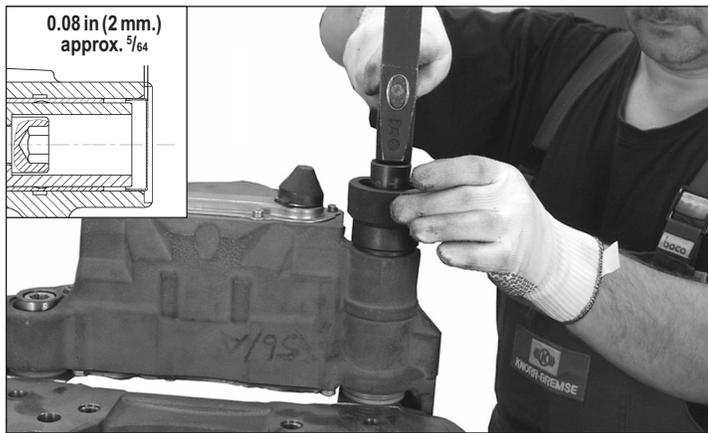


Figure 17 - Guide Cap (12) Installation

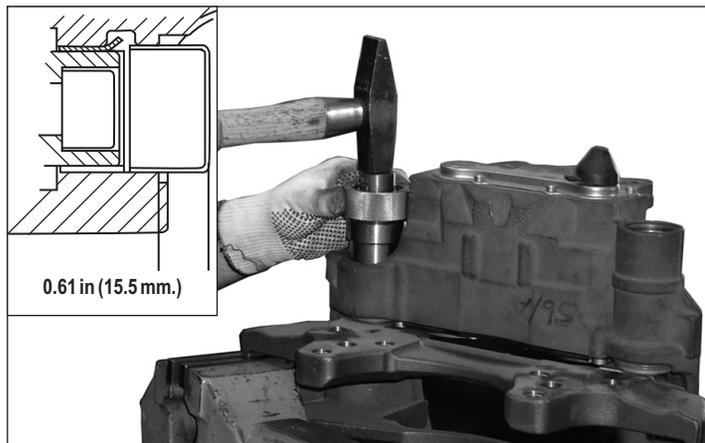


Figure 18 - Guide Cap (4) Installation

caliper is damaged, replace the caliper. Place a boot into the installer tool, making sure that the inner bellows are arranged close to the side walls of the tool and will not be damaged during installation. Using 70 in-lbs (8 N•m) of torque maximum, tighten bolt (T10) to install the inner boot. Repeat for the second inner boot. Check that the boots are held securely in place and that no damage occurred during installation.

GUIDE PIN INSTALLATION

Lubricate both guide pins with the white grease supplied. Insert the guide pins into their respective bores with the grooved end towards the bellows. Fit the lip in the end of the inner boots (8) into the groove of the guide pins (See Figure 14). Push on each ring (7) ensuring that the boot (8) is engaged onto the end of the guide pins (2 or 9).

CARRIER INSTALLATION

With the caliper resting on a bench, slide the carrier into place with a slight rocking motion, taking care that as you do so, the inner boots and guide pins are seated in their proper place on the carrier. Identify the two caliper bolts (3) and (11). With the shorter bolt positioned in the floating pin bushing (2), and the longer bolt positioned in the fixed pin bushing (9), attach the bushings to the carrier using 133 ft-lbs (180 N•m), and then tighten an additional 90° (ninety degrees).

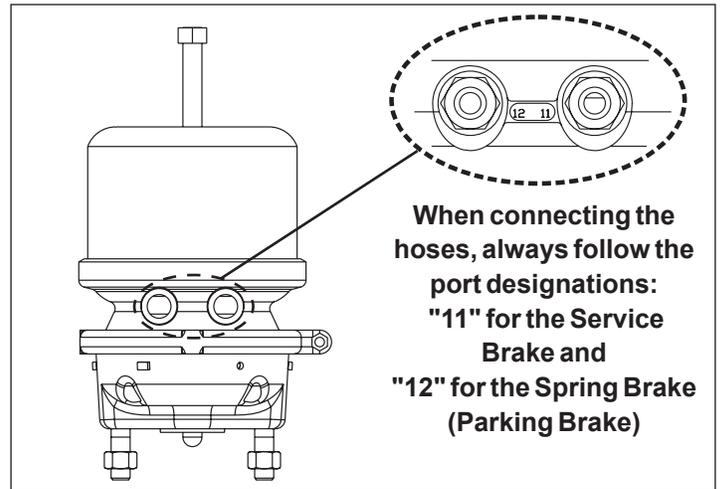


Figure 19 - Spring Brake Port Connections

INSTALLING THE TWO GUIDE PIN CAPS

Position the caliper/carrier assembly resting on a bench so that the inner boots are fully compressed, check that the bores are clean and dry (i.e. free from lubrication). Note: It is important that the inner boots are fully compressed during this procedure to ensure that the least amount of air is retained within the guide pin channel. If too much air is trapped, the bellows can potentially be damaged during the operation of the brake.

Clean the two caps, and check that the caliper surfaces where the caps will be installed are clean and have no signs of damage.

Select one cap, and with the correct installation tool—the smaller cap (12) uses tool (T26), and the larger cap (4) uses tool (T27)—place the cap in position, using the machined channel in the caliper to assist in centering the tool. Use a hammer to tap them into position. See Figure 16. Note that the tool needs to remain perpendicular to the channel to prevent damage during installation. See Figures 16, 17 and 18. Note that, after installation, the smaller cap (12) extends 0.08 in. (2 mm), and the larger cap (4) extends 0.61 in. (15.5 mm).

INSPECTION

Check that the guide pins move freely when the carrier is moved laterally, and that air is not trapped within the inner boots, and that the boots (8) and ring (7) are in the proper position before continuing with the installation.

CALIPER/CARRIER ASSEMBLY INSTALLATION

Supporting the air disc brake by necessary means, attach the brake to the anchor plate using six (6) bolts (**Bendix strongly recommends not reusing the original bolts**). Torque to vehicle manufacturer's specifications. If torque values and bolts are not specified by the vehicle manufacturer, then select a replacement bolt as follows:

Axial (Horizontal) Mounting Bolt Style

The bolts must have M20 X 2.5 mm threads and must be Class 10.9. The bolts' length must be sufficient to thread into the carrier a minimum of 0.94 in. (24 mm), but must not exceed 1.14 in. (29 mm) into the carrier. Use bolts the same

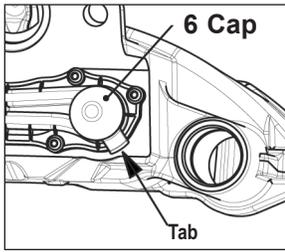


Figure 20 - Adjuster Cap Installation. For Caps With A Tab, See Correct Tab Position Shown

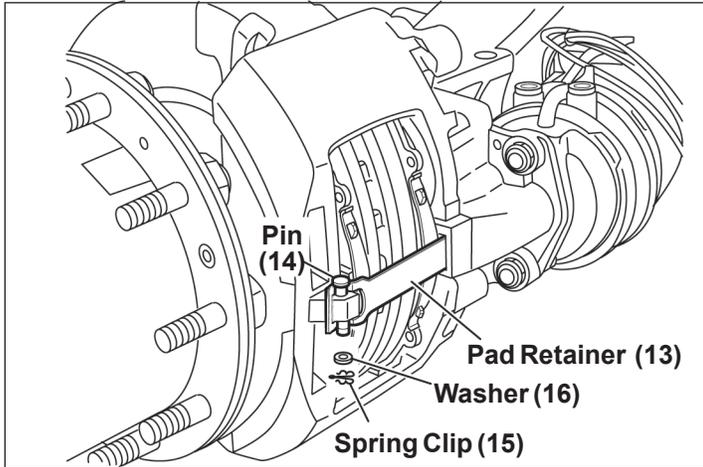


Figure 21 - Brake Pad Installation

length as those that were removed. Over-length bolts may damage the rotor, and bolts that are too short may result in the required torque not being maintained.

If the vehicle is using a Bendix® Anchor Plate, with a thickness of 1.14 in. (29 mm) where these bolts are assembled, then a bolt with an overall length of 2.36 in. (60 mm) will meet these requirements.

Use a 3 mm minimum thickness hardened washer under the bolt head. The washer outside diameter must be less than 1.1 in. (28.5 mm).

Torque specification for M20X2.5 bolts (plain with oil coating):

Initial Pre-Torque to 20-60 ft-lbs.

Final Torque to 350-400 ft-lbs using a cross-pattern.

Reconnect/reinstall the service or spring brake chamber as necessary.

Vertical Mounting Bolt Style

The vertical bolt brake assembly is attached using M16X2.0 110 mm long, class 10.9, socket head screws.

Ensure the alignment bushing is installed in the torque plate. This bushing is required in order to maintain proper alignment of the brake assembly relative to the rotor.

Place the caliper on to the anchor plate and start the bolt into the hole with the alignment bushing. On the opposite mount pad, pull the brake assembly against the "mounting shelf" and install the (3) mounting bolts.

With the brake assembly against the "mounting shelf" tighten the mounting bolts to 50 ft-lbs.

Be sure to use the cross-pattern shown in Figure 22 to install the remaining bolts and torque to 50 ft-lbs.

Tighten all the bolts – using the same torque pattern – to a final torque of 180–200 ft-lbs.

Once installed, verify the caliper slides freely.

Reconnect/reinstall the brake chamber as necessary.

BRAKE CHAMBER INSTALLATION

These instructions cover both spring and service brake chamber installations.

Before installing the brake chamber, the actuator flange must be cleaned and inspected (see Figure 24, arrow C). Consult the vehicle manual. The spherical cup in the lever (19) must be greased with white grease (Part No. II14525 or II32868).

CAUTION: Do not use grease containing molybdenum disulfate.

The seal, as well as the push rod area, must be clean and dry.

CAUTION: Do not use brake chambers with seals that have a thickness less than 0.12 in. (3 mm). Use only actuators which are recommended by the vehicle manufacturer.

Install the brake chamber using new self-locking nuts (EN ISO 10513). Tighten alternately both the nuts, step by step, up to a final torque of 133 ± 7 ft-lbs (180 ± 10 N•m). **Bendix strongly recommends that new nuts be used.**

Re-connect the air hose(s) and be sure that each hose is not twisted or in contact with moving vehicle components. The air hose routing must allow for full caliper travel. Note that for spring brake service chambers the ports are indicated by:

"11" Service Brake Port and "12" Spring Brake Port

Note: Where a new spring brake chamber is being installed, note that typically drain plugs are installed (see Figure 24, arrows A). After installation, remove whichever plug is at the lowest position. Be sure that all other drain holes remain plugged. The selected drain hole must be aligned downwards (or within ±30°) when installed on the vehicle.

In the case of spring brake chambers, install the pads before uncaging the spring.

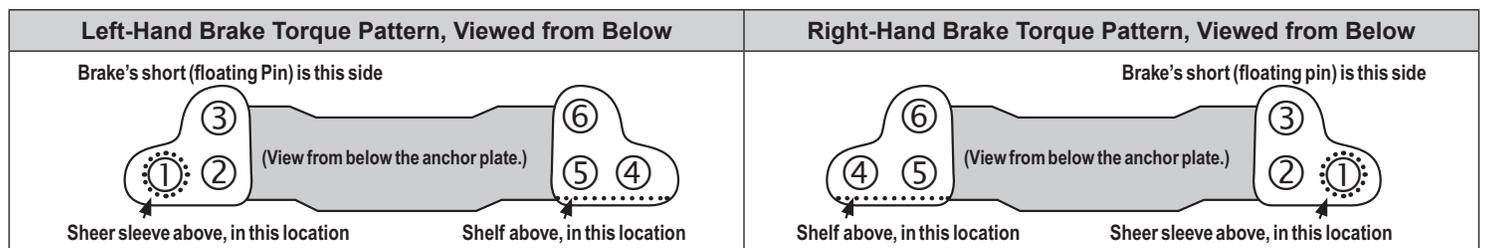


Figure 22 - Torque Pattern To Use When Installing Vertical Mount Bendix ADB22X Brake Assembly

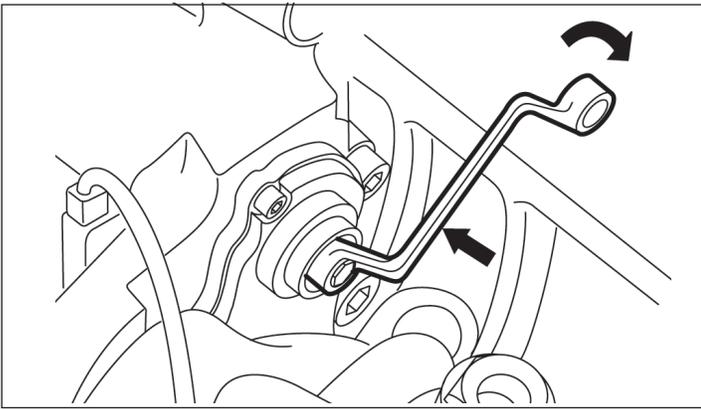


Figure 23 - Adjustment Mechanism Test

PAD INSTALLATION

CAUTION: When replacing brake pads, take care to always use the correct replacement pads. For example, note that two thicknesses of backing plates are generally available—to maintain vehicle within spec's only use brake pads with the type of backing plate and lining material originally supplied by the vehicle manufacturer. See the manual supplied with the vehicle for further information.

As noted above, Bendix strongly recommends when replacing brake pads, that the pads are replaced as an axle set. **Use only pads which are permitted by the vehicle manufacturer, axle manufacturer and/or disc brake manufacturer. Failure to comply with this may invalidate the vehicle manufacturer's warranty.**

Check that the tappet and boot assemblies have been fully retracted. Clean the brake as needed—see the vehicle manufacturer's recommendations.

To install the outboard brake pad (17), slide the caliper (1) fully to the outboard position before inserting the pad (with the brake lining material facing the rotor). Similarly, to install the inboard pad, move the caliper fully to the inboard position, and then install the brake pad (with the lining material facing the rotor).

Install new in-pad wear indicator kit, if required.

Using a box-end wrench or socket (typically 10 mm metric), turn the shear adapter (5) clockwise until the pads come into contact with the rotor. Then turn back the shear adapter counterclockwise two clicks to set the initial running clearance.

Note: Use only pads with the same backing plate thickness as originally specified for the vehicle's brakes.

Note: The Bendix® Air Disc Brakes covered by this service manual use more than one pad retainer design. Be sure to install the correct part number for the vehicle.

After installing the pad retainer bar (13) supplied with the brake pad kit, into the groove of the caliper (1), it must be depressed to enable the insertion of the pad retainer pin (14).

Install the supplied washer (16) and spring clip (15) to the pad retainer pin (14). It is recommended that the pad retainer pin (14) be installed pointing downwards (see Figure 21).

Apply and release the brake and then check that the hub turns easily by hand.

Install a new adjuster cap (6)—provided in the brake pad kit. Note: Two types of adjuster caps are included in the kit, use the same type as was originally installed. For caps with a tab, the tab of the adjuster cap should be positioned as shown by the arrow in Figure 19 for ease of access.

UNCAGING SPRING BRAKE CHAMBERS

Apply air to release the spring brakes (parking brakes) by using the dash-mounted air control valve. Thread the release bolt (Figure 24, arrow D) into the spring brake, using a torque of 5 to 15 ft-lbs (20 to 70 N•m) to uncage the air released spring force on the pushrod.

Test for leakage and check the brake operation and effectiveness before returning vehicle to service.

Reinstall the wheel according to the vehicle manufacturer's recommendations.

WARNING: Not all wheels and valve stems are compatible with Bendix Air Disc Brakes. Use only wheels and valve stems approved by the vehicle manufacturer to avoid risk of valve stem shear and other compatibility issues.

CAUTION: Bendix recommends that after every air brake service, if available, the technician checks the brake performance and the system behavior on a dynamometer and/or a driving test track.

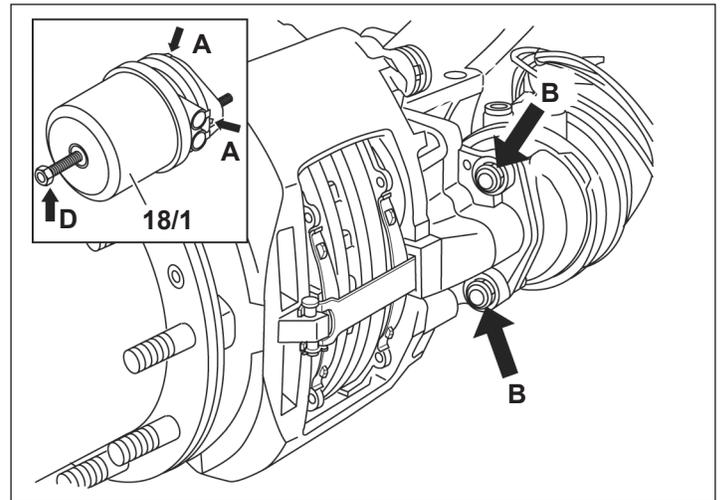


Figure 24 - Spring Brake Installation

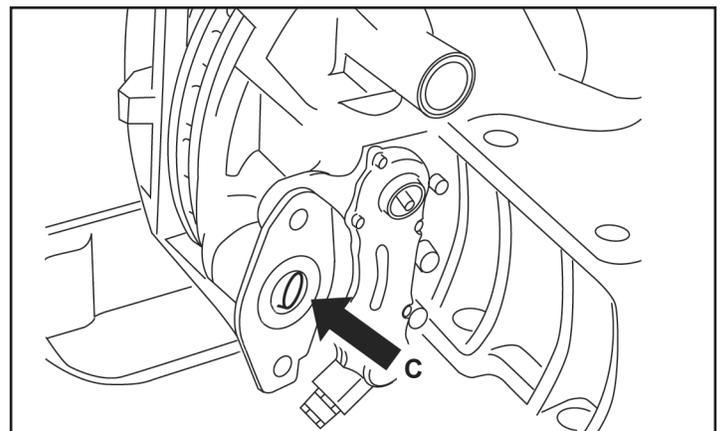


Figure 25 - Spring Brake Installation

ADJUSTER MECHANISM INSPECTION

CAUTION: Follow all standard safety procedures including, but not limited to, those on page 2 of these instructions. See the vehicle manufacturer's recommendations. Aside from the normal maintenance schedule, this Adjuster Check is also carried out when the *Air Disc Brake Running Clearance Inspection* (see box on this page) finds that the running clearance is too small or too large.

The adjuster should then be checked as follows:

With the spring brake released (and caged), remove the adjuster cap (6) using the tab, taking care not to move the shear adapter (5). Note: One of two styles of adjuster cover (stamped metal or plastic) may be used.

Only turn the adjuster with the shear adapter installed on the adjuster. Using a box-end wrench or socket, turn the Shear Adapter (5) **counterclockwise** and listen for the sound of 2 or 3 clicks as the mechanism increases the running clearance. *Note:* Do not use an open-ended wrench as this may damage the adapter.

CAUTION: Never turn the adjuster (18) without the shear adapter (5) installed. The shear adapter is a safety feature and is designed to prevent an excess of torque being applied to the adjuster. The shear adapter will fail (by breaking loose) if too much torque is applied.

If the shear adapter fails, you may attempt a second time with a new (unused) shear adapter, included in the brake pad kit. A second failure of the shear adapter confirms that the adjustment mechanism is seized and **the caliper must be replaced.**

With a box-end wrench (or socket) positioned so that it can turn freely without coming into contact with parts of the vehicle (see Figure 23) on the shear adapter, make five to ten moderate applications of the brakes [at about 30 psi (2 Bar)]. For a normally functioning Bendix® Air Disc Brake, the box-end wrench or socket should turn clockwise in small increments. *NOTE:* As the number of applications increases, the turning movement will decrease (as the brake reaches its normal calibration point).

If the box-end wrench or socket: (a) does not turn at all, or (b) turns only with the first application, or (c) turns forward and backward with every application, the automatic adjuster has failed and the caliper/carrier assembly must be replaced.

Bendix recommends installing a new adjuster cap (lightly greased using the white lithium-based grease supplied) when returning the air brake to service. Ensure that the tab is in the position shown in Figure 20.

LEAKAGE TEST

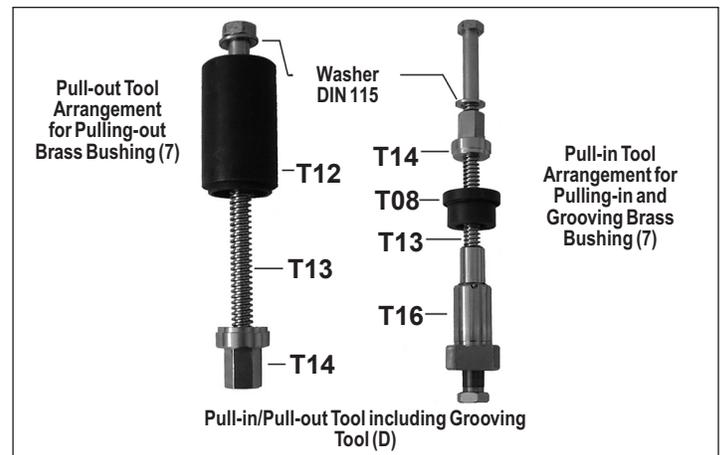
Before returning vehicle to service, with system pressurized, using a soap solution, check for air leakage (e.g. at the air hose connections to the brake chambers) and repair any leaks found.

TOOLS REQUIRED

The complete tool kit is part number K016947.

This includes the following tools required for this installation:

Tool #	Description	Bendix Part #
T05	Disc	K026835
T06	Disc	K026851
T07	Sleeve	K026879
T08	Disc	K026867
T10	Z004357	K026887
T12	Sleeve	K026834
T13	Hex Head Screw	K026866
T14	Nut	K026888
T16	Dimpling Tool	K026854
T20	Hex Head Screw	K026873
T21	Sleeve	K026853
T26	Fixed Pin Cap Tool	K029109, K029108 or K031477
T27	Floating Pin Cap Tool	K029109, K029106 or K031477



AIR DISC BRAKE RUNNING CLEARANCE INSPECTION

Follow all industry safety guidelines, including those listed on page 2. On level ground, with the wheels chocked and the parking brake temporarily released, check for movement of the brake caliper. This small movement, less than 0.080" (2 mm) – approximately the thickness of a nickel – in the inboard/outboard direction indicates that the brake is moving properly on its guide pins. If the caliper has no movement or appears to move greater than the distances above, a full wheel-removed inspection will be necessary.

See Bendix® Service Data Sheet SD-23-7541.

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