



Installation Instructions

This instructions cover the removal of Bendix air disc brake pads, rotor inspection and installation of new brake pads. For vehicles with wear sensors and/or electronic wear diagnostic equipment, consult the Service Data Sheet SD-23-7541.

SAFE MAINTENANCE PRACTICES

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. Where specifically directed, the parking brakes may have to be released, and/or spring brakes caged, and this will require that the vehicle be prevented from moving by other means for the duration of these tests/procedures.
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 an 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® 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 Antilock 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.

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.

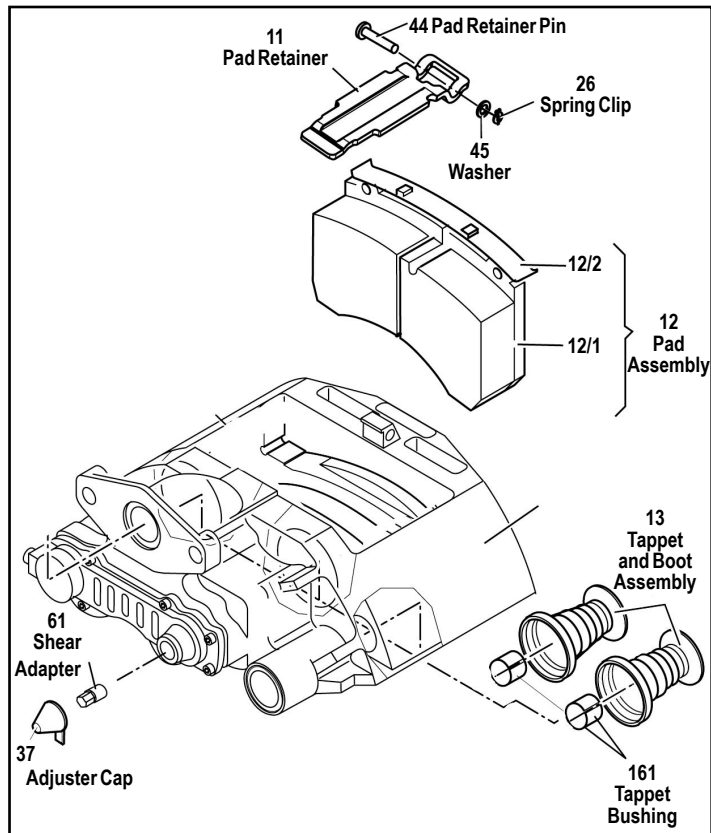
WARNING: AVOID CREATING DUST. POSSIBLE CANCER AND LUNG DISEASE HAZARD.

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 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. Call 1-800-247-2725 and speak to the Tech Team or e-mail techteam@bendix.com

KIT CONTENTS

Description	Qty	Key
Washer	2	45
Spring clip	2	26
Brake pad complete	4	12
Pad Retainer bar	2	11
Adjuster cap	2	37
Shear adapter	2	61
Pad retainer pin	2	44



AIR DISC BRAKE IDENTIFICATION

To determine which version of the Bendix air disc brake is installed, locate the identification label near the guide pin housing. See below for examples of the different styles of label you may find.

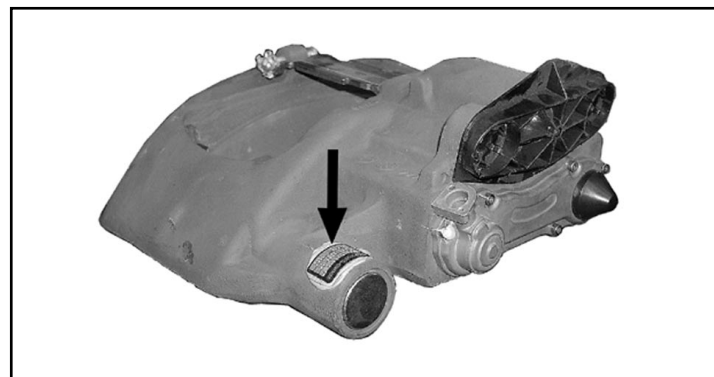


FIGURE 1 - PART NUMBER LABEL LOCATION

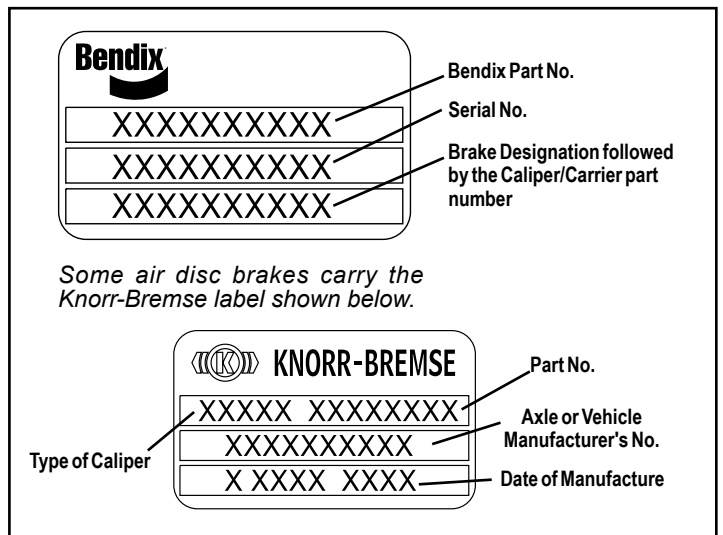


FIGURE 2 - PART NUMBER LABEL FIELDS

PAD REPLACEMENT

CAUTION: Follow all standard safety procedures including, but not limited to, those on page 1 of this service manual. See 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.

As noted earlier, 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.

PAD REMOVAL

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

Release or cage spring brakes and remove the wheel (refer to the vehicle manufacturer's recommendations).

Note: Before removing the brake pads it is strongly recommended that the adjuster mechanism be checked for correct operation (see Page 4).

Remove the clip (26) and washer (45), depress the pad retainer (11) and remove the pad retainer pin (44). Discard these four items - replacements are included in the service kits. As necessary remove any in-pad wear sensor components and discard.

Pull off the adjuster cap (37) using the tab, taking care to keep the shear adapter (61) in position on the adjuster (23).

Using a box-end wrench or socket, fully wind back the tappet and boot assemblies (13) by rotating the shear adapter (61) in an counter-clockwise direction (see Page 15). Note: Do not use an open-ended wrench as this may damage the adapter.

CAUTION: Never turn the adjuster (23) without the shear adapter (61) installed. The shear adapter is a safety feature

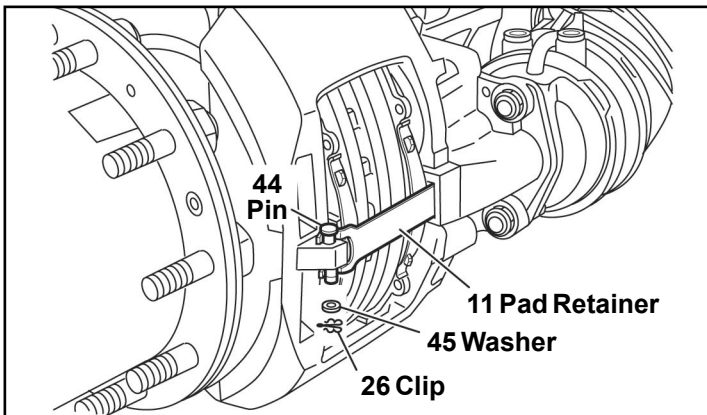


FIGURE 3 - BRAKE PAD REMOVAL

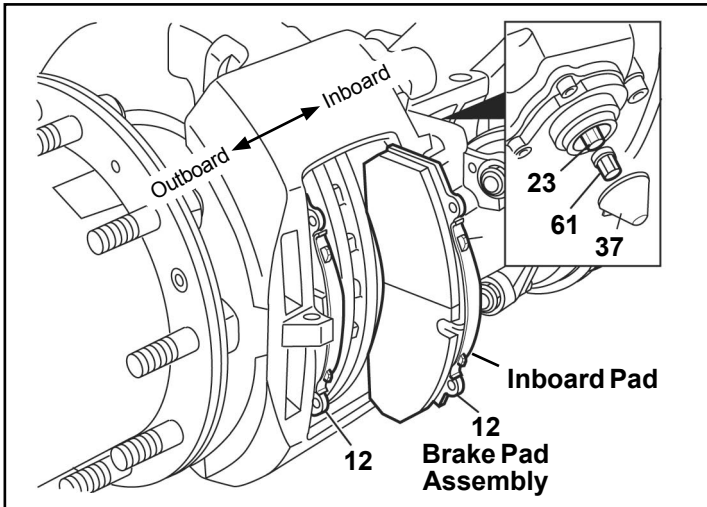


FIGURE 4 - BRAKE PAD REMOVAL

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. A second failure of the shear adapter confirms that the adjustment mechanism is seized and the caliper/carrier assembly must be replaced.

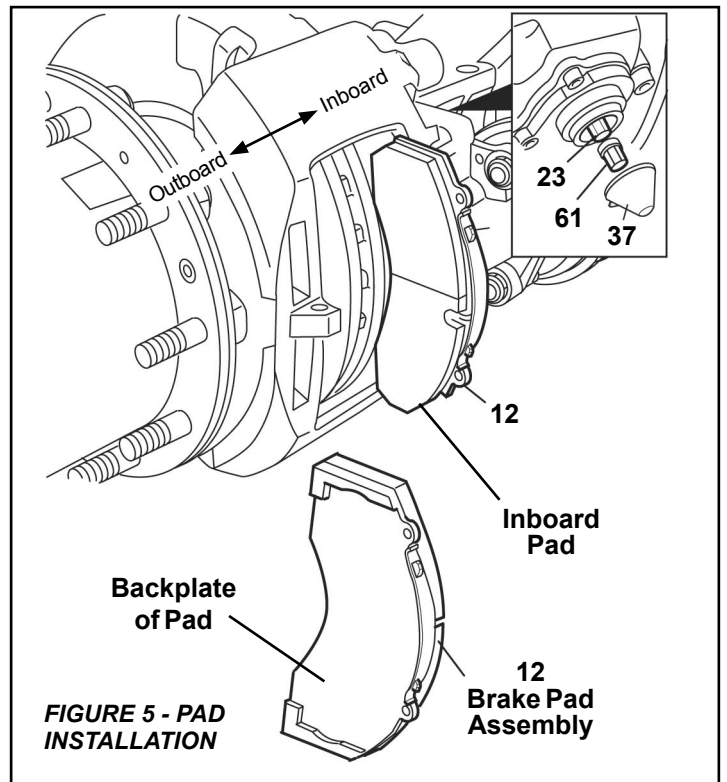
To remove the outboard brake pad (12), slide the caliper (1) fully to the outboard position first. Similarly, to remove the inboard pad, first move the caliper fully to the inboard position, and then remove the pad. See Figure 4.

Inspect the rotor. For full details, see Service Data sheet SD-23-7541.

PAD INSTALLATION

CAUTION: When replacing brake pads take care to always use the correct replacement pads. For example, note that two thicknesses of backing plate 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 that when replacing brake pads, 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, as outlined above. Clean the brake as needed - see the vehicle manufacturer's recommendations.

To install the outboard brake pad (12), 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 appropriate (see Pages 3).

Using a box-end wrench or socket, turn the shear adapter (61) clockwise until the pads come into contact with the rotor. Then turn back the shear adapter counter-clockwise 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 (11) supplied with the kit, into the groove of the caliper (1), it must be depressed to enable the insertion of the pad retainer pin (44).

Install the supplied washer (45) and spring clip (26) to the pad retainer pin (44). It is recommended that the pad retainer pin (44) be installed pointing downwards (see Figure 7).

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

Install a new adjuster cap (37). Note: One of two types of

adjuster caps may be included in the kit. For caps with a tab, the tab of the adjuster cap should be positioned as shown by the arrow in Figure 6 for ease of access.

Re-install 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.

ADJUSTER MECHANISM INSPECTION

CAUTION: Follow all standard safety procedures including, but not limited to, those on page 1 of these instructions. See the vehicle manufacturer's recommendations. Aside from the normal maintenance schedule, this Adjuster Check is also carried out when the Caliper Movement Test (see below) finds that the running clearance is too small or too large.

The adjuster should then be checked as follows:

With the spring brake released (or caged), remove the adjuster cap (37) using the tab, taking care not to move the shear adapter (61). 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 (61) **counter-clockwise** 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 (23) without the shear adapter (61) 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. 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 8) 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.

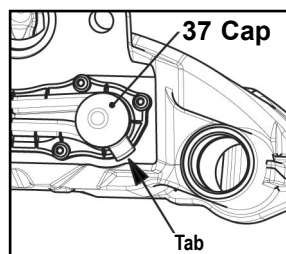


FIGURE 6 - ADJUSTER CAP INSTALLATION. FOR CAPS WITH A TAB, SEE CORRECT TAB POSITION SHOWN

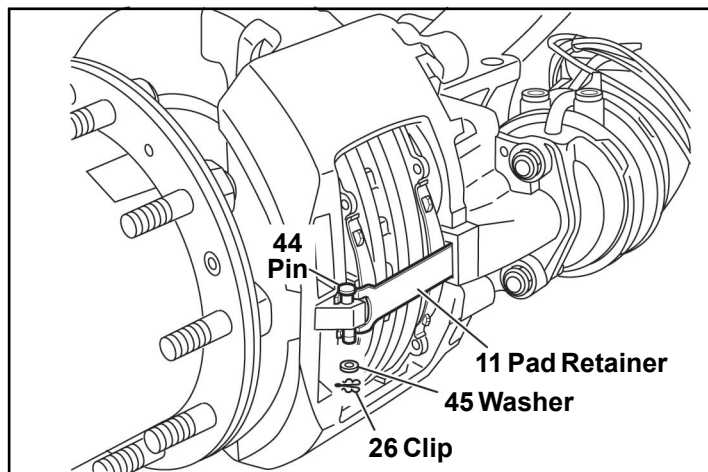


FIGURE 7 - BRAKE PAD INSTALLATION

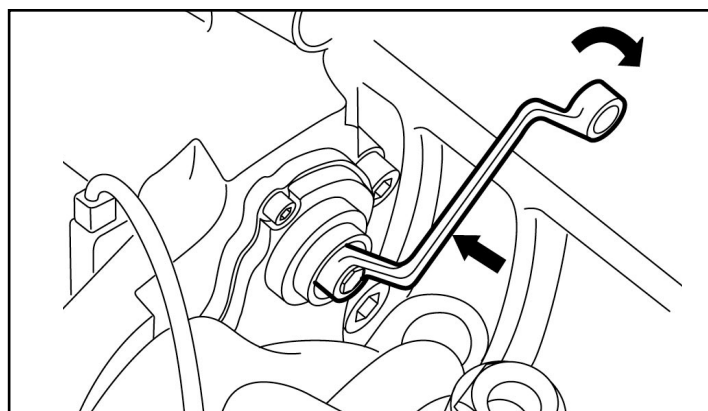


FIGURE 8 - ADJUSTMENT MECHANISM TEST

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 does not: (a) 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 white lithium-based grease) when returning the air brake to service. Ensure that the tab is in the position shown in Figure 6.

Air Disc Brake Running Clearance Inspection.

Follow all industry safety guidelines, including those listed on Page 1. 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 0.80" (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 Service Data sheet SD-23-7541.