

INSTALLING TUNED CAMSHAFTS AND A FULL BRAKE ASSEMBLY

Be sure to follow the General Safety Guidelines on page 2 of this document for vehicle preparation.

REMOVING THE CAM

1. Safely jack up the vehicle, supporting it with jack stands. Follow all shop safety rules.
2. Before removing the wheel, mark the end of one wheel stud with a paint marker; mark the wheel at the stud so it can be reinstalled in the same position.
3. With the wheel removed, mark the drum at the same marked stud so that it, too, can be reinstalled in the same position it was removed.
4. Remove the brake shoes. Mark the brake shoes so that they can be reinstalled in the same position (forward or at the rear).
5. Remove the air chamber clevis pin(s), camshaft retaining E-clip, shims, and automatic brake adjuster. Remove the camshaft.

INSTALLING THE NEW CAM

1. Inspect the air chamber bracket tube making sure the grease seals and bushing are good. Repair or replace as needed.
2. Remove the cam head washer from the old cam and install it on the new cam in the proper direction.
3. Carefully install the camshaft so no damage occurs to the grease seals.
4. Install the inner washer on the cam, and the slack adjuster. Then use shim washers to set the end play to .035" maximum, and install the E-clip. The E-clip must be in the groove at the end of cam; check that it is present.
5. Measure the camshaft radial play. The maximum permitted spec. is 0.035".
6. Install the clevis pins, making sure to pre-lube the pin(s).
7. Grease the cam tube and slack adjuster until they purge. Make sure that the grease seal at the cam head does not leak. (Note: Replace the seal as needed.)

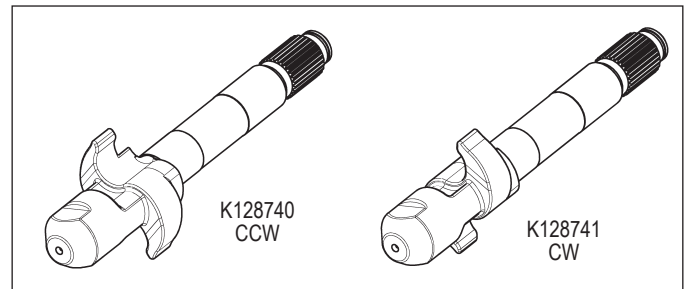


Figure 1 – Tuned Camshaft Versions Covered

8. Pre-lube the roller and anchor pin pockets on the brake shoes before installing the brake shoes.
9. Install the brake shoes in the same position (forward or at the rear) as they were removed.
10. Be sure to properly clean the friction material and brake drum surface before installing the brake drum.
11. Install the brake drum, making sure to align the reference marks made on the drum and wheel stud during the removal procedure.
12. Install the wheel, making sure to align the reference marks made on the wheel and the wheel stud during the removal procedure. Torque to the manufacturer's specifications.
13. Adjust the brakes to the Federal Motor Carrier Safety Association (FMCSA) specifications. We recommend following the FMCSA brake adjustment procedures found on the www.fmcsa.dot.gov web site.
14. Apply ten (10) full brake applications and releases after the brake adjustment and check the adjustment again.
15. After the brake adjustment, rotate the wheel and check that the brake is not dragging or the drum is not out of round.



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.



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 §1910.1001. 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 by contacting the Bendix Tech Team at 1-800-247-2725, option 2, or techteam@bendix.com.

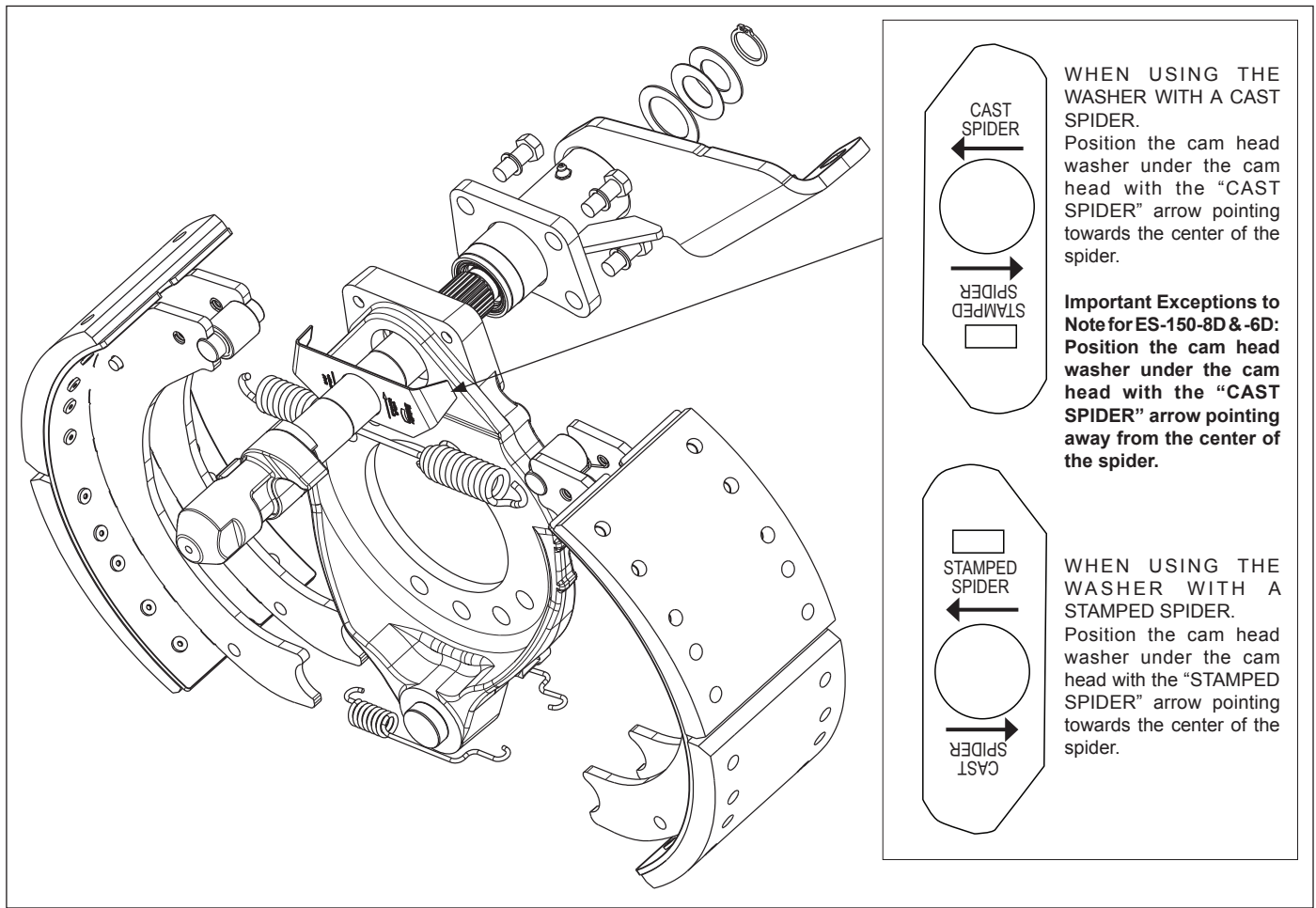


Figure 2 – Typical Brake Exploded View with Inset Showing the Cam Head Washer Orientation

GENERAL INSTRUCTIONS FOR INSTALLING A FULL BRAKE ASSEMBLY

REMOVING THE BRAKE ASSEMBLY

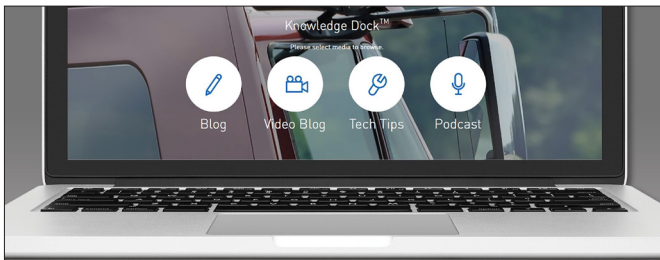
1. Safely jack up the vehicle, supporting it with jack stands. Follow all shop safety rules.
2. Before removing the wheel, mark the end of one wheel stud with a paint marker; mark the wheel at the stud so it can be reinstalled in the same position.
3. With the wheel removed, mark the drum at the same marked stud so that it, also, can be reinstalled in the same position it was removed.
4. Remove the hub.
5. Disconnect the air hoses from the brake chamber.
6. Remove the spider mounting bolts and place the brake assembly on the floor.

INSTALLING THE BRAKE ASSEMBLY

1. Clean the mounting surface on the spindle before installing the brake assembly.
2. Making sure the assembly is in position, install new mounting bolts and torque to the manufacturer's specification.

3. Install all the components that are not included with the brake assembly (i.e. chamber, slack adjuster, cam bracket, camshaft, brake shoes).
 - Remove the cam head washer from the old cam and install on the new cam in the proper direction. See Figure 2.
 - Lubricate the splines of the camshaft. Install the camshaft avoiding damaging the grease seals.
 - Install the inner washer on the cam, and the slack adjuster. Then use shim washers to set the end play to .035" maximum, and install the E-clip. The E-clip must be in the groove at the end of the cam; check that it is present.
 - Measure the camshaft radial play. The maximum permitted spec. is 0.035".
 - Install the clevis pin(s), making sure to pre-lube the pin(s).
 - Grease the cam tube and slack adjuster until they purge. Make sure that the grease seal at cam head does not leak. (Note: Replace the seal as needed.)
 - Pre-lube roller and anchor pin pockets on the brake shoes before installing the brake shoes.
 - Torque the chamber mounting nuts to the manufacturer's specs.

4. Make sure that all components installed by the technician comply with the manufacturer's specs.
5. Install the hub and a new wheel seal. Torque the wheel bearing nuts per the manufacturer's specs. Fill the hub with lubricant per the manufacturer's specifications.
6. Install the brake drum. Make sure to align the reference marks made on the drum and wheel stud during the removal procedure.
7. Install the wheel. Make sure to align the reference marks made on the wheel and the wheel stud during the removal procedure. Torque to the manufacturer's specifications.
8. Adjust the brakes to the FMCSA specifications. We recommend following the FMCSA brake adjustment procedures found on the www.fmcsa.dot.gov web site.
9. Apply ten (10) full brake applications and releases after the brake adjustment and check the adjustment again.
10. After the brake adjustment, rotate the wheel and check that the brake is not dragging or the drum is not out of round.




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