# Section 573.6 Defect Information Report

**FL-428, NHTSA no. 04V-271**

**Supplement No.: 1**

December 1, 2004

**(c) (1) Manufacturer**: FREIGHTLINER LLC
P.O. BOX 3849
Portland, Oregon 97208
(503) 745-5219

**(c) (3) Total number of vehicles potentially affected:** (Revise to read) 307

**(c) (9) Communications sent to dealers:** Posted November 16, 2004
**Communications sent to owners:** Mailed November 19, 2004

FREIGHTLINER LLC
A DaimlerChrysler Company

# Recall Campaign

**November 2004**
**FL428AB**
**NHTSA #04V-271**

## Subject: Bosch Zero Offset Pin Slide Hydraulic Brake Calipers

**Models Affected: Specific Freightliner Custom Chassis MB45 and MB55 shuttle bus chassis manufactured between January 1, 1999, and June 30, 2002.**

### General Information

Freightliner LLC, on behalf of its wholly owned subsidiary, Freightliner Custom Chassis Corporation, has decided that a defect which relates to motor vehicle safety exists on the vehicles mentioned above.

There are approximately 300 vehicles involved in this campaign.

Zero Offset Pin Slide (ZOPS) hydraulic brake calipers may bind due to insufficient lubrication of the slide pins which may lead to the brakes seizing or smoking and a possible fire without prior warning.

The calipers will be inspected and the piston boots or calipers will be replaced.

### Additional Repairs

Dealers must complete all outstanding recall and field service campaigns prior to the sale or delivery of a vehicle. A Dealer will be liable for any progressive damage that results from its failure to complete campaigns before sale or delivery of a vehicle.

Owners may be liable for any progressive damage that results from its failure to complete campaigns within a reasonable time after receiving notification.

### Work Instructions

Please refer to the attached work instructions. Prior to performing the campaign, check the vehicle for a completion sticker (Form WAR260).

### Replacement Parts

Replacement kits are now available and can be obtained by ordering the kit number(s) listed below from your facing Parts Distribution Center. Place orders with vehicle serial number for overnight delivery. Freight may be added to the claim.

**IMPORTANT: If initial inspection detects OEM parts, each wheel will require either a piston boot replacement OR a caliper replacement. Place a critical order for the quantity of each kit indicated on the replacement parts table. Each involved wheel needs a total of 3 kits, a maximum of twelve kits per vehicle, depending on the inspection results.**

FL428A: For each wheel, first inspect to detect OEM parts. If yes, then determine which kits are needed.

- MB45 piston boot replacement requires one each of 25-FL428-001, 25-FL428-004, and 25-FL428-005.
- MB45 caliper replacement requires one each 25-FL428-003, 25-FL428-004, and 25-FL428-005.

FL428B: For each wheel, first inspect to detect OEM parts. If yes, then determine which kits are needed.

- MB55 73mm piston boot replacement requires one each 25-FL428-000, 25-FL428-004, and 25-FL428-005.
- MB55 66mm piston boot replacement requires one each 25-FL428-001, 25-FL428-004, and 25-FL428-005.
- MB55 73mm caliper replacement requires one each 25-FL428-002, 25-FL428-004, and 25-FL428-005.
- MB55 66mm caliper replacement requires one each 25-FL428-003, 25-FL428-004, and 25-FL428-005.

# Recall Campaign

FREIGHTLINER® LLC
A DaimlerChrysler Company

**November 2004**
**FL428AB**
**NHTSA #04V-271**

If our records show your dealership has ordered any vehicles involved in campaign number FL428AB, a list of the customers and vehicle identification numbers will be available on AccessFreightliner.com. Please refer to this list when ordering parts for this recall.

**Table 1** - Replacement Kits for FL428AB (One set of kits per wheel).

| Campaign Number | Kit Number | Part Description | Part Number | Qty. per Kit | Suggested Wholesale* |
|---|---|---|---|---|---|
| FL428A: MB45 Piston Boot Replacement | 25-FL428-001 | Piston Boot Replacement Kit 66mm | ASL 0204062350 | 1 ea | $9.33 U.S. $13.26 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |
| FL428A: MB45 Caliper Replacement | 25-FL428-003 | Caliper Replacement Kit 66mm | ASL 0204062354 | 1 ea | $109.21 U.S. $155.19 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |
| FL428B: MB55 **73mm** Piston Boot Replacement | 25-FL428-000 | Piston Boot Replacement Kit 73mm | ASL 0204062351 | 1 ea | $9.33 U.S. $13.26 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |
| FL428B: MB55 **66mm** Piston Boot Replacement | 25-FL428-001 | Piston Boot Replacement Kit 66mm | ASL 0204062350 | 1 ea | $9.33 U.S. $13.26 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |
| FL428B: MB55 **73mm** Caliper Replacement | 25-FL428-002 | Caliper Replacement Kit 73mm | ASL 0204062355 | 1 ea | $119.57 U.S. $169.92 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |
| FL428B: MB55 **66mm** Caliper Replacement | 25-FL428-003 | Caliper Replacement Kit 66mm | ASL 0204062354 | 1 ea | $109.21 U.S. $155.19 CAN |
| | 25-FL428-004 | Guide Pin Boot Replacement Kit | ASL 0204062356 | 1 ea | $11.20 U.S. $15.92 CAN |
| | 25-FL428-005 | Guide Pin Replacement Kit | ASL 0204062357 | 1 ea | $14.00 U.S. $19.89 CAN |

* Please charge all Direct Warranty Customers the above-listed price for the kit, as they are authorized to perform their own Recalls.

**Table 1**

## Removed Parts

Please follow Warranty Failed Parts Tracking shipping instructions for the disposition of all removed parts.

## Labor Allowance

**Table 2** - Labor Allowance (One SRT per wheel).

| Campaign Number | Procedure | Time Allowed (hours) | SRT Code | Damage Code |
|---|---|---|---|---|
| FL428AB | Inspect for OEM parts | 0.1 | 996-0606A | 000-Inspected |
| | Inspect and replace one piston boot, guide pin boot, and guide pin | 0.5 | 996-0606B | 000-Modifiedx |
| | Inspect and replace one caliper, guide pin boot, and guide pin | 0.7 | 996-0606C | 000-Modifiedx |

**Table 2**

**IMPORTANT:** When the recall has been completed, locate the base completion label in the appropriate location on the vehicle, and attach the red completion sticker provided in the recall kit (Form WAR260). If the vehicle does not have a base completion label, clean a spot on the appropriate location of the vehicle and first attach the base completion label (Form WAR259). If a recall kit is not required or there is no completion sticker in the kit, write the recall number on a blank sticker and attach it to the base completion label.

## Claims for Credit

You will be reimbursed for your parts, labor, and handling by submitting your claim through the Warranty system within 30 days of completing this campaign. Please reference the following information in QuickClaim®:

- Claim type is **Recall**.
- In the FTL Authorization field, enter the campaign number and appropriate condition code (**FL428A or FL428B**).
- In the Primary Failed Part Number field, enter **25-FL428-000**.
- In the Parts field, enter the appropriate kit number(s) as shown in the Replacement Parts Table. **Freight charges may be added to the recall claim. Each involved wheel must have three kits. A maximum of twelve kits may be claimed.**
- In the Labor field, first enter the appropriate SRT from the Labor Allowance Table. For administrative time, enter SRT 939-0010A for 0.3 hours. **Each claim must have a total of FOUR SRT's, one for each wheel.**
- **Reimbursement for Prior Repairs.** When a customer asks about reimbursement, please do the following.
  - Accept the documentation of the previous repair.
  - Make a brief check of the customer's paperwork to see if the repair may be eligible for reimbursement. (See the "Copy of Owner Letter" section of this bulletin for reimbursement guidelines for this recall.)
  - Contact the Warranty Campaigns Department for a decision and authorization number.
  - Include the approved amount on your claim in sublet/outside purchases.
  - In the claim story, first note the authorization number and that the claim includes a reimbursement request.
  - Retain the documentation and provide it to Warranty Campaigns or Claims Processing if requested.
  - When your claim is paid, reimburse the customer the appropriate amount.
  - If Freightliner LLC denies a customer's request for reimbursement, the amount will be denied on your claim with a message stating this, and Freightliner LLC will send a letter to the customer with the reason(s) for the denial.

# Recall Campaign

FREIGHTLINER® LLC
A DaimlerChrysler Company

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NOTE: ServicePro®/Service Advisor® must be viewed prior to performing the recall to ensure the vehicle is involved and the campaign has not been previously completed. Also, check for a completion sticker prior to beginning work.

Contact the Warranty Campaigns Department at (800) 547-0712, from 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, Web inquiry at AccessFreightliner.com / Support / Submit an Inquiry, or the Customer Assistance Center at (800) 385-4357, after normal business hours, if you have any questions or need additional information.

To return excess kit inventory related to this campaign, U.S. dealers must submit a Parts Authorization Return (PAR) to the Memphis PDC. Canadian dealers must submit a PAR to their facing PDC. All kits must be in resalable condition. PAR requests must include the original purchase invoice number.

The letter notifying vehicle owners is included for your reference.

Please note that the National Traffic and Motor Vehicle Safety Act, as amended (49 USC), requires the owner's vehicle(s) be corrected within a reasonable time after parts are available to you. The Act states that failure to repair a vehicle within 60 days after tender for repair shall be prima facie evidence of an unreasonable time. However, circumstances of a particular situation may reduce the 60 day period. Failure to repair a vehicle within a reasonable time can result in either the obligation to (a) replace the vehicle with an identical or reasonably equivalent vehicle, without charge, or (b) refund the purchase price in full, less a reasonable allowance for depreciation. The Act further prohibits dealers from selling a vehicle unless all outstanding recalls are performed. Also, any lessor is required to send a copy of the recall notification to the lessee.

Finally, the Act states that a remedy need not be provided without charge if the vehicle was bought by the first purchaser more than ten (10) calendar years before notice is given.

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# Recall Campaign

**November 2004**
**FL428AB**
**NHTSA #04V-271**

## Copy of Letter to Owner

### Subject: Bosch Zero Offset Pin Slide Hydraulic Brake Calipers

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act and the Canadian Motor Vehicles Safety Act.

Freightliner LLC, on behalf of its wholly owned subsidiary, Freightliner Custom Chassis Corporation, has decided that a defect which relates to motor vehicle safety exists on specific Freightliner Custom Chassis MB45 and MB55 shuttle bus chassis manufactured between January 1, 1999, and June 30, 2002.

Zero Offset Pin Slide (ZOPS) hydraulic brake calipers may bind due to insufficient lubrication of the slide pins which may lead to the brakes seizing or smoking and a possible fire without prior warning.

The calipers will be inspected and the piston boots or calipers will be replaced.

Repair kits are now available for authorized dealers to order. Contact your authorized dealer to arrange to have your vehicle(s) modified and to assure that parts are available at the dealer.

When you contact your dealer, refer to campaign number **FL428AB**. Once kit(s) are received at the dealership, the modification will take approximately three hours and will be performed at no charge to you.

As stated in the terms of your express limited warranty, Freightliner LLC will not pay for any damage caused by failure to properly maintain your vehicle. Freightliner LLC considers the work necessary under this campaign to be proper maintenance and will, therefore, not pay for any damage to your vehicle caused by your failure to have the repairs that are the subject of this campaign performed in a reasonable time.

IMPORTANT: When the recall has been completed, please ensure that a label has been affixed to your vehicle referencing **FL428AB**.

If you do not own the vehicle that corresponds to the identification number(s) which appears on the Recall Notification, please return the notification to the Warranty Campaigns Department with any information you can furnish that will assist us in locating the present owner. If you have leased this vehicle, please make sure this notification is immediately forwarded to the lessee. If you have paid to have this this recall condition corrected prior to this notice, you may be eligible to receive reimbursement. Please see the reverse side of this notice for details.

If you are not able to have the defect remedied without charge and within a reasonable time, which is not longer than 60 days after you tender the vehicle for repair, please contact the Warranty Campaigns Department at (800) 547-0712, 700 a.m. to 4:00 p.m. Pacific Time Monday through Friday, e-mail address WarrantyCampaigns@freightliner.com, or the Customer Assistance Center at (800) FTL-HELP or (800) STL-HELP, after normal business hours. You may also wish to submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 7th Street S.W., Washington, D.C. 20590, or phone (888) 327-4236. If your vehicle is involved in the Canadian portion, you may wish to notify Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa, ON K1A 0N5, or phone (800) 333-0510.

We regret any inconvenience this action may cause but feel certain you understand our interest in motor vehicle safety.

WARRANTY CAMPAIGNS DEPARTMENT

Enclosure

# Recall Campaign

FREIGHTLINER® LLC
A DaimlerChrysler Company

**November 2004**
**FL428AB**
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## Reimbursement to Customers for Repairs Performed Prior to Recall

If you have already **paid** to have this recall condition corrected you may be eligible to receive reimbursement.

Requests for reimbursement may include parts and labor. Reimbursement may be limited to the amount the repair would have cost if completed by an authorized Freightliner LLC dealer. The following documentation must be presented to your dealer for consideration for reimbursement.

Please provide original or clear copies of all receipts, invoices, and repair orders that show:

- The name and address of the person who paid for the repair.
- The Vehicle Identification Number (VIN) of the vehicle that was repaired.
- What problem occurred, what repair was done, when the repair was done.
- Who repaired the vehicle.
- The total cost of the repair expense that is being claimed.
- Proof of payment for the repair (such as the front and back of a cancelled check or a credit card receipt).

Reimbursement will be made by check from your Freightliner LLC dealer. If your claim is denied, you will receive a letter from Freightliner LLC with the reason(s) for the denial.

Please speak with your Freightliner LLC authorized dealer concerning this matter.

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# Work Instructions

## Subject: Bosch Zero Offset Pin Slide Hydraulic Brake Calipers

**Models Affected: Specific Freightliner Custom Chassis MB45 and MB55 shuttle bus chassis manufactured between January 1, 1999, and June 30, 2002.**

## General Information

**IMPORTANT: If initial inspection detects OEM parts, each wheel will require either a piston boot replacement or a caliper replacement. Place a critical order for the quantity of each kit indicated on the replacement parts table. Each involved wheel needs a total of 3 kits, a maximum of twelve kits per vehicle, depending on the inspection results.**

FL428A: For each wheel, first inspect to detect OEM parts. If yes, then determine which kits are needed.

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- MB45 caliper replacement requires one each 25-FL428-003, 25-FL428-004, and 25-FL428-005.

FL428B: For each wheel, first inspect to detect OEM parts. If yes, then determine which kits are needed.

- MB55 73mm piston boot replacement requires one each 25-FL428-000, 25-FL428-004, and 25-FL428-005.
- MB55 66mm piston boot replacement requires one each 25-FL428-001, 25-FL428-004, and 25-FL428-005.
- MB55 73mm caliper replacement requires one each 25-FL428-002, 25-FL428-004, and 25-FL428-005.
- MB55 66mm caliper replacement requires one each 25-FL428-003, 25-FL428-004, and 25-FL428-005.

## Caliper Identification

1. Park the vehicle on a level surface. Shut down the engine, set the parking brake, and chock the tires.
2. Inspect the drivers area for a campaign completion sticker (Form WAR259). If a sticker is present for campaign FL428, no further work needs to be done. If there is no sticker, proceed with the steps below.

**⚠ WARNING**

**Support the vehicle with adequate safety stands. Do not work under or around a vehicle supported only by jacks. Jacks can slip, allowing the vehicle to fall, which could result in death, severe injury, or property damage.**

3. Use jacks to raise the vehicle until the wheels clear the ground, then support the vehicle with jack stands.

**⚠ WARNING**

**Breathing brake lining dust (asbestos or non-asbestos) could cause lung cancer or lung disease. OSHA has set maximum levels of exposure and requires workers to wear an air purifying respirator approved by NIOSH or MSHA. Wear a respirator at all times when servicing the brakes, starting with removal of the wheels and continuing through assembly.**

4. Remove the wheel.

5. Verify that the caliper on the vehicle is Bosch original equipment and not a remanufactured or non-Bosch caliper. The Bosch piston boot is dark grey and the caliper has a black plating.

IMPORTANT: If the caliper is a Bosch OEM caliper, proceed to the **Caliper Inspection** heading. If the caliper is not a Bosch OEM caliper, stop the procedure, replace the wheel, go to the next wheel, and begin the caliper identification process.

## Caliper Inspection

1. Remove the brake hose retaining fasteners to allow the caliper to be rotated for piston boot inspection.

NOTE: Do not remove the brake hose at the caliper inlet.

2. Using a suitable pry bar on the outboard side of the rotor, pull the caliper housing outboard until the pistons are pushed back into the housing. See **Fig. 1**.
3. Remove the upper (top) caliper mounting bolt that secures the caliper to the anchor plate.
4. Rotate the caliper assembly away from the rotor. Support the caliper assembly on a suitable stand for inspection.

IMPORTANT: Do not allow the caliper assembly to hang by the hose.

NOTE: Pad removal may not be required. However, if they are removed, mark them so that they can be installed in the same location. Do not mark on the pad face. Keep the pad face free of any grease or foreign materials.

IMPORTANT: Always wear safety glasses.

5. Using a wire brush, remove loose rust, dirt and road debris from the caliper underside near and beneath both pistons and on the caliper housing around the pistons and boots. Carefully blow away any loose debris with low-pressure shop air.

**⚠ CAUTION**

**Keep hands away from the pistons when the brake pedal is depressed. Otherwise, injury may occur.**

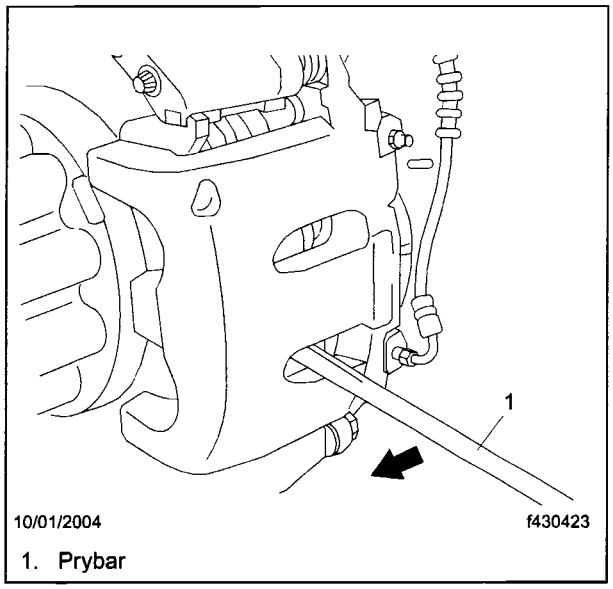
6. Place a 9 x 2.75 x 2.25 inch (229 x 70 x 57 mm) spacer block into the caliper housing between the pistons and caliper legs. See **Fig. 2**. On a vehicle equipped with 2.9 inch (73 mm) calipers, use the 2.25 inch (57 mm) dimension of the spacer block. On a vehicle equipped with 2.6 inch (66 mm) calipers, use the 2.75 inch (70 mm) dimension of the spacer block. Slowly depress the brake pedal just enough to extend the pistons to contact the spacer.

**⚠ WARNING**

**Use only the block thickness indicated. Otherwise, the pistons will extend too far and cause a high-pressure brake fluid leak, resulting in possible personal injury.**

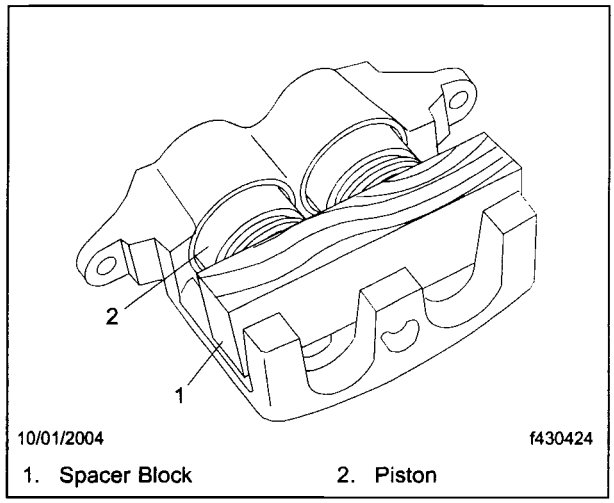
If the pistons are extended too far, do not attempt to reinstall the pistons. Remove the brake hose at the caliper. Cap the brake line and remove the caliper assembly. Proceed to the **Caliper Replacement Procedure** heading.

7. The caliper date code is stamped on the back near the center of the caliper housing and contains four numbers and a letter. The caliper housing may need to be brushed with a wire brush to expose the date code. See **Fig. 3**. If the caliper date code is higher than 1274A, 1274B, or 1274C, proceed to the **Anchor Plate Inspection** heading. Otherwise, continue to the next step.
8. Remove both piston boots with a flat-blade screwdriver. Discard the piston boots.
9. Clean the exposed pistons and visible caliper housing bore surfaces using isopropyl or denatured alcohol. See **Fig. 4**.




1. Prybar

**Fig. 1, Prybar Location**



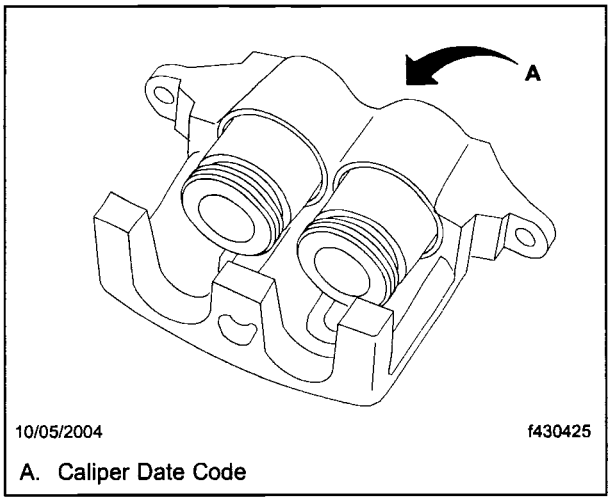

1. Spacer Block 2. Piston

**Fig. 2, Spacer Block Placement**

## ⚠ WARNING

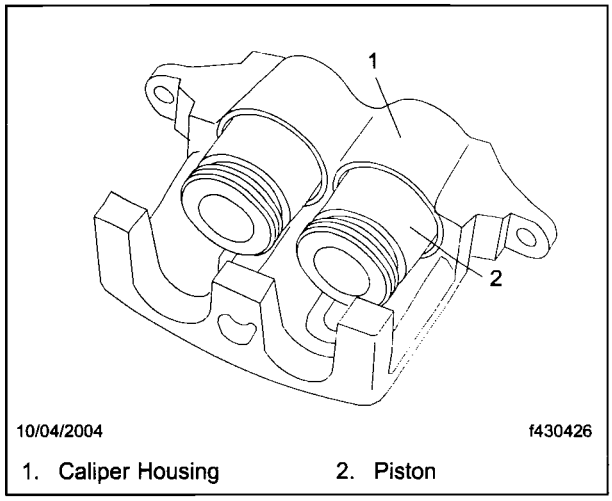
**Do not use commercially available brake cleaners. The pistons could be damaged, resulting in loss of braking, loss of vehicle control, and personal injury.**

10. Wipe the pistons and caliper housing bore area using a clean, lint-free type shop cloth.
11. Carefully air dry the pistons and caliper bore area with low-pressure shop air.




A. Caliper Date Code

**Fig. 3, Caliper Date Code Location**




1. Caliper Housing 2. Piston

**Fig. 4, Caliper Housing Bore Area**

12. Using a shop light or flashlight, inspect the caliper housing bore near the piston area for corrosion. Inspect the entire circumference around the piston. Inspect the piston for any indication of deterioration such as cracks or crumbling. Inspect all components to be sure they are dry before proceeding to the next step.

**IMPORTANT:** If any corrosion is found, proceed to the **Caliper Replacement Procedure** heading to replace the brake calipers, guide pin boots, and guide pins. If no corrosion is found, replace the piston boots, guide pin boots, and guide pins. See the steps below for replacement of these items.

13. Using an acid brush, lubricate the pistons and caliper housing bore area with Bosch disc brake corrosion control grease found in kits 25-FL428-000 and 25-FL428-001.

IMPORTANT: Use care when applying grease to avoid getting any debris on the clean greased surfaces.

14. Place a small amount of disc brake corrosion control grease onto the piston. One packet of grease should be used for both pistons and bores of one caliper. See **Fig. 5**.

NOTE: Begin greasing at the caliper housing piston opening and work up the piston, including the piston boot groove. Spread the grease uniformly. Stop greasing at the piston boot groove. See **Fig. 6** and **Fig. 7**.

15. Install new piston boots (either kit 25-FL428-000 or 25-FL428-001). Inspect the new piston boots for cuts, tears, or damage. If the boots are damaged, discard them. With the pistons still extended, make sure that the boot bead is fully seated in the piston boot bead groove. See **Fig. 8**.

16. Carefully move the free end of the boot back to the bead end of the piston so that the boot folds up correctly. Rotate the piston boot to firmly seat in the piston boot bead in the groove. See **Fig. 9**.

NOTE: The piston and piston boot insertion tool must be properly oriented. See **Fig. 10** for an illustration of the piston boot insertion tool.

17. Install the insertion tool on the piston boot and push in the piston and piston boot.

    17.1 Insert a spacer block in front of one piston to keep it in place.

    17.2 Center the piston boot insertion tool on the opposite piston and boot.

    17.3 Using a C-clamp, slowly insert the opposite piston and piston boot completely into the housing.

18. Using the 2.75 inch (70 mm) dimension of the spacer block, place the spacer block against the inserted piston to keep the piston from being pushed out when the second piston is being pushed into the housing. See **Fig. 11**.

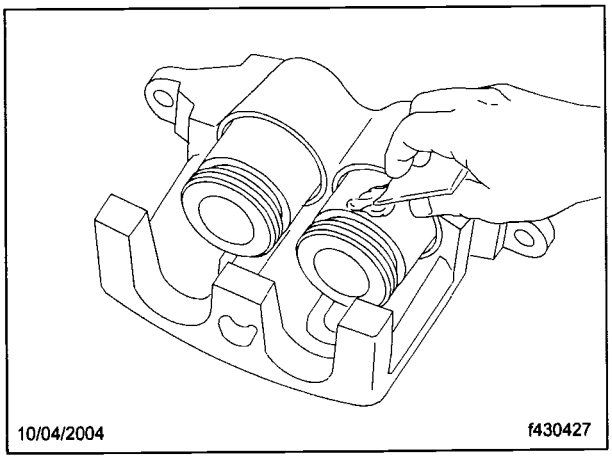



**Fig. 5, Grease Application**

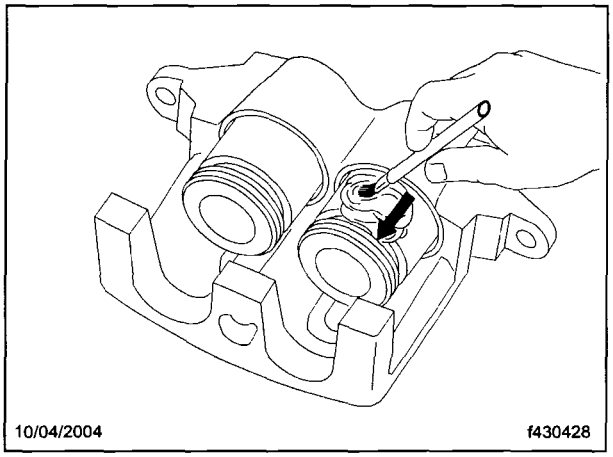



**Fig. 6, Grease Application Starting at the Caliper Housing Piston Opening**

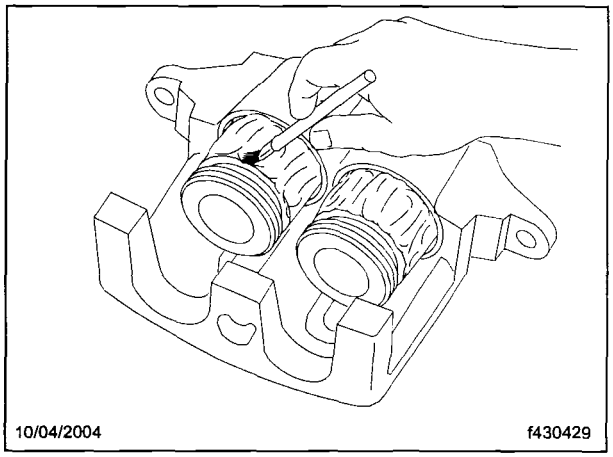
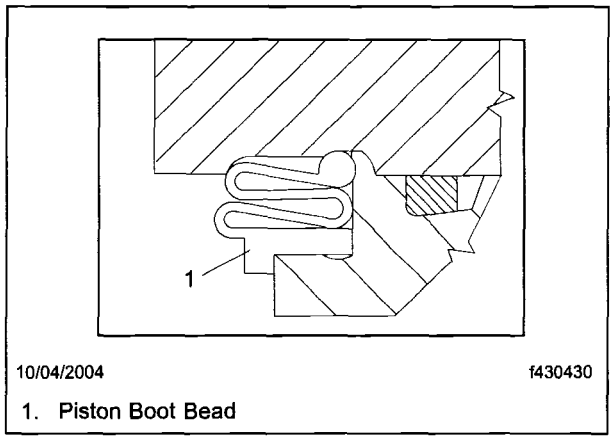



**Fig. 7, Grease Application Ending at the Piston Boot Groove**




1. Piston Boot Bead

**Fig. 8, Piston Boot Bead Fully Seated**

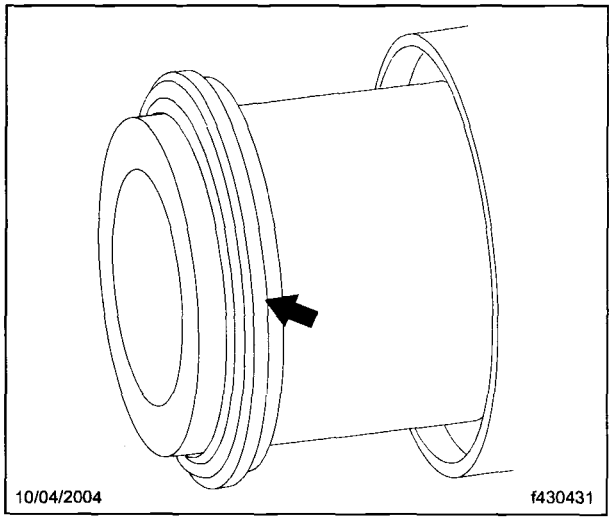



**Fig. 9, Correct Boot Position**

18.1 Center the piston boot insertion tool on the opposite piston and boot.

18.2 Using a C-clamp, slowly insert the opposite piston and piston boot completely into the housing. See **Fig. 11**.

## Anchor Plate Inspection

1. Inspect the caliper mounting bolt and slide pins. The ZOPS bolt (M12 x 1.75 x 30) has a heavy hexhead, is yellow in color, and has a course thread. If the bolt is a ZOPS bolt and neither pin has a notch in the mounting flange, go to step 2. If the bolt has a fine thread and one pin *does* have a notch in the mounting flange, the rear axle guide pins cannot be removed. Go to step 5 for rear axle guide pins which cannot be removed.
2. Remove the lower caliper mounting bolt and secure the caliper.

IMPORTANT: Do not allow the caliper assembly to hang by the hose.

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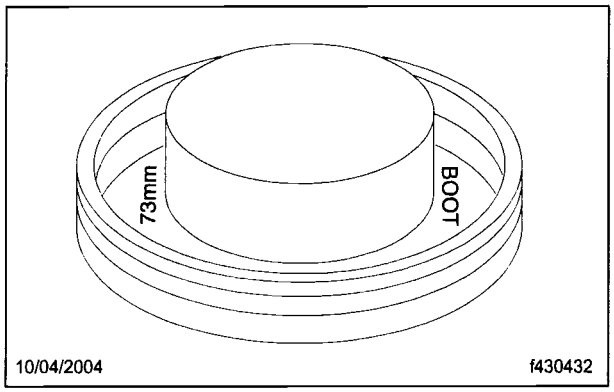



**Fig. 10, Piston Boot Insertion Tool, 73mm (66 mm Tool is Similar)**

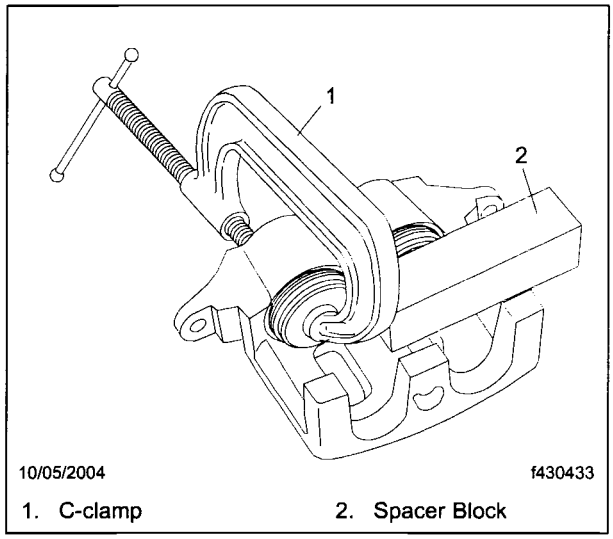



**Fig. 11, Piston Insertion**

3. Remove the upper and lower caliper mounting pins and pin boots from the anchor plate.

NOTE: On some rear axle applications, the caliper mounting pin (typically the uppermost pin) cannot be removed without removal of the anchor plate. If the rear axle guide pin cannot be removed, go to step 5. If the rear axle guide pin can be removed, go to step 4.

4. Inspect the rear axle guide pin. Most rear axle guide pins cannot be readily removed from the anchor plate. For rear axle guide pins that can be removed go to the next step.

   4.1 Pull the caliper guide pin out as far as possible and cut the boot off.

   IMPORTANT: Do not use liquid alcohol directly on the guide pin. It may collect in the anchor plate bore and degrade the guide pin lubricating grease.

   4.2 Use a clean cloth dampened with isopropyl or denatured alcohol to clean the pin. Air dry the pin with low-pressure shop air.

   4.3 Replace the caliper guide pin.

   NOTE: Disc brake guide pin/boot grease for the anchor plate pin bore, caliper mounting pin and pin boot is contained in a two-chamber packet found in kit 25-FL428-004. One chamber of the grease packet is used for each anchor plate bore/guide pin boot combination.

5. Use the following steps for the rear axle guide pin which cannot be removed.

   5.1 Lubricate the guide pin.

   5.2 Carefully install a new boot over the pin flange and seat the boot into the groove.

   5.3 Push the guide pin into the anchor plate bore and seat the boot into the anchor plate boot groove. Verify that the boot was not damaged during installation.

6. Using a round wire brush and isopropyl or denatured alcohol, clean the upper and lower anchor plate pin bores. Clean out any remaining loose residue with a clean shop cloth or swab. Carefully air dry the pin bores.

7. For pins removed from the anchor plate bores, use an acid brush to clean the pins. Using disc brake guide pin/boot grease, carefully grease the anchor plate bore, caliper mounting pins, and pin boot beads.

8. Assemble the pin boots (from kit 25-FL428-004) onto the pins (from kit 25-FL428-005) and install them into the anchor plate.
9. Align the leading and trailing pin flange flats so that they are parallel with each other.

IMPORTANT: Make sure that the pins are installed in the correct location and the correct bolt torque is used.

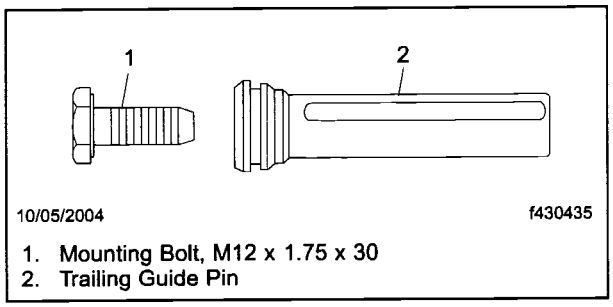
IMPORTANT: Knowing the anchor plate leading and trailing position is critical because:

- The leading bolt is always tightened first. See **Fig. 13** for the anchor plate leading and trailing positions.
- ZOPS pins will fit in any anchor plate as long as both pins are the same type. The two pins used in the same anchor plate must be ZOPS.

10. Position the caliper assembly over the leading pins and trailing pins.
11. Install both the leading and trailing caliper mounting bolts finger-tight. See **Fig. 12.**
12. Tighten the leading caliper mounting bolt 70 to 80 lbf·ft (95 to 108 N·m).
    - The leading bolt is always tightened first. See **Fig. 12** for the anchor plate leading and trailing positions.

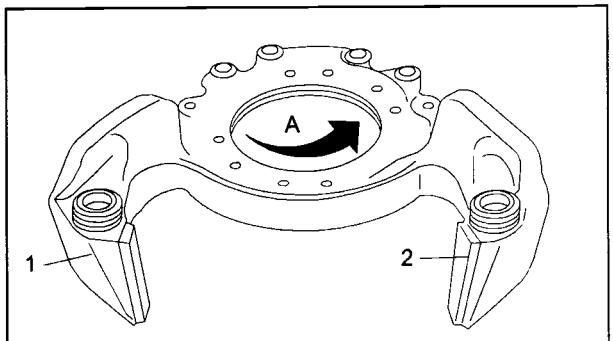
NOTE: When installing the mounting bolt and pin, use a medium to large flat-blade screwdriver under the pin flange to keep it parallel to the caliper abutment during mounting bolt tightening. Do not allow the screwdriver to puncture the boot.

13. Tighten the trailing bolt completely using the torque specifications in the previous step.
14. Assemble the brake hose retaining fastener and tighten to the OEM recommended torque specification.
15. Push and pull the caliper and check to see that the caliper assembly slides on the guide pins. If the caliper assembly slides on the guide pins, the procedure is complete. If the caliper assembly does not slide on the guide pins, proceed to the next step.
16. If the caliper assembly does not slide on the guide pins, do the following:
    16.1 Remove the upper caliper mounting bolt. This may be the leading or trailing bolt depending on the caliper mounting orientation.




1. Mounting Bolt, M12 x 1.75 x 30
2. Trailing Guide Pin

**Fig. 12, ZOPS Mounting Bolt and Leading/Trailing Guide Pin**




A. Rotor Rotation

1. Leading Bolt
2. Trailing Bolt

**Fig. 13, Anchor Plate Leading and Trailing Position**

16.2 Rotate the caliper assembly out slightly.

16.3 Rotate the upper caliper guide pin 180 degrees.

16.4 Clean the bolt and apply Loctite® 2440 to the threads.

16.5 Install the upper caliper mounting pin bolt using a flat-blade screwdriver and tighten 70 to 80 lbf·ft (95 to 108 N·m).

16.6 Check that the caliper assembly slides on the guide pins. If the caliper does not slide, install new guide pins.

## Caliper Replacement Procedure

1. Remove the brake line hose and cap it.
2. Remove the lower caliper mounting bolt.
3. If the pads are removed, install new pads. If the original pads are used again, install them in the same location that they were removed from. Be sure the pad face is free of any grease or foreign materials.
4. Get a new caliper replacement assembly (kit 25-FL428-002 or 25-FL428-003) and return to the **Anchor Plate Inspection** heading for instructions on installing the new calipers.

NOTE: The new caliper is installed after the anchor plate inspection has been completed.

5. Install the wheel. Repeat this procedures on all four wheels.
6. Once all four calipers have been inspected and/or repaired, lower the vehicle.
7. Clean a spot on the base completion label (Form WAR259). Attach a completion sticker (Form WAR260) for campaign FL428 to the base label.
8. Remove the chocks from the tires.