Daimler Trucks North America LLC

Recall Campaign

November 2012
FL628AB
NHTSA #12V-242

Subject: Bosch Hydraulic Brake Calipers

Models Affected: Specific Freightliner Custom Chassis motor-home chassis manufactured March 28, 2005, through July 19, 2011, with certain Bosch hydraulic brake calipers.

General Information

Daimler Trucks North America LLC (DTNA), on behalf of its wholly owned subsidiary, Freightliner Custom Chassis Corporation, has decided that a defect that relates to motor vehicle safety exists on the vehicles mentioned above.

There are approximately 2,300 vehicles involved in this campaign.

Certain motorhome chassis with hydraulic brakes that are exposed to long periods of non-driving may experience diametrical brake caliper piston growth and reduced piston to bore clearance. This may lead to brake drag and overheating, resulting in reduced brake performance. Under certain driving conditions, reduced brake performance may increase the risk of a crash.

Brake calipers will be inspected and replaced as needed on vehicles in FL628A and FL628B. **Vehicles in FL628C have had the Interim Recall performed, and no further work is needed. FL628C will not appear in OWL as no claims will be submitted.**

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 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 parts are now available and can be obtained by ordering from your facing Parts Distribution Center.

If our records show your dealership has ordered any vehicles involved in campaign number FL628AB, 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 Parts for FL628

NOTE: Brake pads are a wear item and should only be replaced as part of this recall for reasons due to brake overheating or seized calipers, see the Work Instructions. If replacing brake pads, they must be replaced on both ends of an axle. Brake rotors may be included on claims without additional authorization as outlined in **Table 3**. **Attach a photo of each damaged rotor to the claim.** Brake rotors should be replaced on both ends of an axle.

Campaign Number	Kit Number	Part Description	Part Number	Qty.	Suggested Wholesale*
FL628A (2,221 Vehicles)	25-FL628-000	CALIPER-PS HYD, 73MM	ASL 0204742996	1 ea	$158.78 U.S. $161.96 CAN
		BLEEDER SCREW	ASL 02040J2122	1 ea	
	N/A	KIT-PAD DISC REPAIR 73MM	ASL 02040J2676	1 Per Axle	$100.06 U.S. $102.06 CAN
FL628B (66 Vehicles)	N/A	CALIPER ASSEMBLY, BRAKE 66MM	ASL 0204719661	1 Per Caliper Replaced	$100.50 U.S. $102.51 CAN
	N/A	SHOE AND LINING KIT (66MM)	ASL 02040J2675	1 Per Axle	$100.30 U.S. $102.30CAN
FL628AB	N/A	15.00X1.43 ROTOR	GUN D6176M	2 Per Axle	$119.48 U.S. $121.88 CAN

* Please charge all U.S. and Canadian Direct Warranty Customers the above-listed price for the kit, as they are authorized to perform their own Recalls. This pricing does not apply to Export Distributors.

Table 1

Labor Allowance

Table 2 - Labor Allowance

NOTE: More than one SRT will be claimed when replacing at least one caliper. The SRT for bleeding the hydraulic system is claimed once when replacing one or more calipers in addition to the SRT(s) for replacing calipers.

Campaign Number	Procedure	Time Allowed (hours)	SRT Code	Damage Code
FL628AB	Inspect all brake calipers	0.1	996-0882A	000-Inspected
	Inspect all and replace one front brake caliper (with or without replacing brake pads)	1.2	996-0882B	000-Modifiedx
	Inspect all and replace two front brake calipers (with or without replacing brake pads)	1.6	996-0882C	000-Modifiedx
	Inspect all and replace one rear brake caliper (with or without replacing brake pads)	1.4	996-0882D	000-Modifiedx
	Inspect all and replace two rear brake calipers (with or without replacing brake pads)	1.8	996-0882E	000-Modifiedx
	Inspect all, replace one front brake caliper, and replace two front rotors with a photo of the damaged rotor(s) (with or without replacing brake pads)	2.8	996-0882F	000-Modifiedx
	Inspect all, replace two front brake calipers, and replace two front rotors with a photo of the damaged rotor(s)(with or without replacing brake pads)	2.8	996-0882G	000-Modifiedx
	Inspect all, replace one rear brake caliper, and replace two rear rotors with a photo of the damaged rotor(s)(with or without replacing brake pads)	3.3	996-0882H	000-Modifiedx
	Inspect all, replace twp rear brake calipers, and replace two rear rotors with a photo of the damaged rotor(s)(with or without replacing brake pads)	3.3	996-0882I	000-Modifiedx
	Hydraulic system bleeding (claimed once per vehicle when at least one caliper is replaced)	0.4	996-0882J	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.

Removed Parts

U. S. and Canadian Dealers, please follow Warranty Failed Parts Tracking shipping instructions for the disposition of all removed parts. Export distributors, please destroy removed parts unless otherwise advised.

Claims for Credit

You will be reimbursed for your parts, labor, and handling (landed cost for Export Distributors) by submitting your claim through the Warranty system within 30 days of completing this campaign. Please reference the following information in QuickClaim or OWL:

- Claim type is **Recall**.
- In the FTL Authorization field, enter the campaign number and appropriate condition code (**FL628A or FL682B**). **No claims will be submitted for vehicles in FL628C.**
- In the Primary Failed Part Number field, enter **25-FL628-000**.
- In the Parts field, enter the appropriate kit/part number(s) as shown in the Replacement Parts Table.
- Brake pads are a wear item and should only be replaced as part of this Recall for reasons due to brake overheating or seized calipers. This is a change from the Interim Recall. If replacing brake pads, they must be replaced on both ends of an axle. If they are needed, add them to the parts listed on the claim (they will not auto populate when retrieving the recall).
- Brake rotors may be included on claims without additional authorization as outlined in **Table 3** below. **Attach a photo of each damaged rotor to the claim.** Brake rotors should be replaced on both ends of an axle.

Table 3 - Rotor Surface Check

Item from Figure 6 (page 14)	Description of Rotor Issue	Action	Responsibility
Item A	Large radial crack(s) through the outer surface	Replace	With signs of significant heat damage - Recall Without signs of significant heat damage - Customer
Item B	Small radial crack(s)	Do not replace	If replaced - Customer
Item C	Minor discoloration and some transfer of material	Do not replace	If replaced - Customer
Item D	Heavy discoloration and heavy transfer of material	Replace	Recall
Item E	Normal	Do not replace	If replaced - Customer

Table 3

- In the Labor field, first enter the appropriate SRT from the Labor Allowance Table. For administrative time, enter SRT 939-0010A for 0.4 hours for RVs. NOTE: More than one SRT will be claimed when replacing at least one caliper. The SRT for bleeding the hydraulic system is claimed once when replacing one or more calipers in addition to the SRT(s) for replacing calipers.
- For OWL, the VMRS Component Code is 013-001-028 and the Cause Code is A1 - Campaign.

U.S. and Canada – 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.)
- Submit a Campaign Pre-Approval inquiry to 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.

IMPORTANT: ServicePro or OWL 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.

U.S. and Canadian dealers, contact the Warranty Campaigns Department from 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, via Web inquiry at AccessFreightliner.com / Support / My Tickets and 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. Export distributors, submit a Web inquiry or contact your International Service Manager.

U.S. and Canadian Dealers: 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. Export Distributors: Excess inventory may be returned as noted for U.S. and Canadian dealers. Export locations will pay freight to return kits. Export Distributors:

The letter notifying U.S. and Canadian vehicle owners is included for your reference.

Please note that the National Traffic and Motor Vehicle Safety Act, as amended (Title 49, United States Code, Chapter 301), 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. Any lessor is required to send a copy of the recall notification to the lessee within 10 days. Any subsequent stage manufacturer is required to forward this notice to its distributors and retail outlets within five working days.

Copy of Notice to Owners

Subject: Bosch Hydraulic Brake Calipers

For the Notice to U.S. Customers: This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

For the Notice to Canadian Customers: This notice is sent to you in accordance with the Canadian Motor Vehicles Safety Act.

Daimler Trucks North America LLC (DTNA), 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 motorhome chassis manufactured March 28, 2005, through July 19, 2011, with certain Bosch hydraulic brake calipers.

Certain motorhome chassis with hydraulic brakes that are exposed to long periods of non-driving may experience diametrical brake caliper piston growth and reduced piston to bore clearance. This may lead to brake drag and overheating, resulting in reduced brake performance. Under certain driving conditions, reduced brake performance may increase the risk of a crash.

Brake calipers will be inspected and replaced as needed on vehicles in FL628A and FL628B. **Vehicles in FL628C have had the Interim Recall performed, and no further work is needed. If your vehicle had the Interim Recall performed, no work is needed, and you do not need to take any further action (FL628C).**

Please contact an authorized Daimler Trucks North America dealer to arrange to have the recall performed and to ensure that parts are available at the dealership. To locate an authorized dealer, search online at www.Daimler-TrucksNorthAmerica.com. The Recall will take between half an hour and three and a half hours, depending on the work needed, and will be performed at no charge to you.

You may be liable for any progressive damage that results from your failure to complete the Recall within a reasonable time after receiving notification.

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, Federal law requires that you forward this notice to the lessee within 10 days. If you are a subsequent stage manufacturer, Federal law requires that you forward this notice to your distributors and retail outlets within five working days. If you have paid to have 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.

For the Notice to U.S. Customers: If you have questions about this Recall, please contact the Warranty Campaigns Department at (800) 547-0712, 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, e-mail address DTNA.Warranty.Campaigns@Daimler.com, or the Customer Assistance Center at (800) 385-4357 after normal business hours. If you are not able to have the defect remedied without charge and within a reasonable time, you may wish to submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590; or call the Vehicle Safety Hotline at (888) 327-4236 (TTY: 800-424-9153); or to http://www.safercar.gov.

For the Notice to Canadian Customers: If you have questions about this Recall, please contact the Warranty Campaigns Department at (800) 547-0712, 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, e-mail address DTNA.Warranty.Campaigns@Daimler.com, or the Customer Assistance Center at (800) 385-4357 after normal business hours.

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

WARRANTY CAMPAIGNS DEPARTMENT

Enclosure

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 Daimler Trucks North America 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 Daimler Trucks North America LLC dealer.

Please speak with your Daimler Trucks North America LLC authorized dealer concerning this matter.

Work Instructions

Subject: Bosch Hydraulic Brake Calipers

Models Affected: Specific Freightliner Custom Chassis motor-home chassis manufactured March 28, 2005, through July 19, 2011, with certain Bosch hydraulic brake calipers.

IMPORTANT: Brake calipers will be inspected and replaced as needed on vehicles in FL628A and FL628B. **Vehicles in FL628C have had the Interim Recall performed, and no further work is needed. FL628C will not appear in OWL as no claims will be submitted.**

NOTE: This is a change from the Interim Recall. Brake pads are a wear item and should only be replaced as part of this recall for the following reasons likely due to brake overheating or seized calipers:

- Replace the brake pads if the pad surface is rough/damaged due to resin and/or material transfer to the rotor.
- Replace the brake pads if the pad surface is highly glazed due to resin/binder melt.
- Replace the brake pads if one pad has substantial wear compared to the other pad(s) on the same caliper or axle (likely due to brake seize on one caliper).
- Replace the brake pads if the other pads on the same axle are replaced for one of the above reasons.

NOTE: More than one SRT will be claimed when replacing at least one caliper. The SRT for bleeding the hydraulic system is claimed once when replacing one or more calipers in addition to the SRT(s) for replacing calipers.

General Safety Precautions

⚠ WARNING

When replacing brake pads and shoes always replace components as an axle set.

- **Always reline both sets of brakes on an axle at the same time.**
- **Always install the same type of linings/pads or drums/rotors on both axle ends of a single axle at the same time. Do not mix component types.**

Failure to do so could cause uneven braking and loss of vehicle control, resulting in property damage, personal injury, or death.

⚠ WARNING

Hydraulic brake fluid is hazardous, and can cause blindness if it gets in your eyes. Always wear safety glasses when handling brake fluid or bleeding brake components. Brake fluid may also be a skin irritant. If you get it on your skin, wash it off as soon as possible.

NOTICE

Power steering fluid and brake fluid are incompatible. Never mix these two fluids or serious damage to both hydraulic systems will result. Use only brake fluid for the master cylinder and brake lines. Use only power steering fluid for the power booster.

Special care must be taken when disposing of used brake fluid. Put the fluid in a sealed plastic container and label it "Used Brake Fluid." Then dispose of it in an approved manner. Check with local and state regulations as to the correct disposal procedure.

IMPORTANT: During service procedures, keep grease and other foreign material away from caliper assemblies, disc brake pads, brake rotors and external surfaces of the hub. Handle parts carefully to avoid damage to the caliper, rotor, disc brake pads, or brake lines.

Asbestos and Non-Asbestos Safety

⚠ WARNING

Wear a respirator at all times when servicing the brakes, starting with the removal of the wheels and continuing through assembly. 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 MSHA or NIOSH.

Because some brake linings contain asbestos, you should know the potential hazards of asbestos and the precautions to be taken. Exposure to airborne asbestos brake lining dust can cause serious and possibly fatal diseases such as asbestosis (a chronic lung disease) and cancer.

Because medical experts believe that long-term exposure to some *non-asbestos* fibers could also be a health hazard, the following precautions should also be observed if servicing non-asbestos brake linings.

Areas where brake work is done should be separate from other operations, if possible. As required by OHSA regulations, the entrance to the areas should have a sign displayed indicating the health hazard.

During brake servicing, an air purifying respirator with high-efficiency filters must be worn. The respirator and filter must be approved by MSHA or NIOSH, and worn during all procedures.

OSHA recommends that enclosed cylinders equipped with vacuums and high-efficiency (HEPA) filters be used during brake repairs. Under this system, the entire brake assembly is placed within the cylinder and the mechanic works on the brake through sleeves attached to the cylinder. Compressed air is blown into the cylinder to clean the assembly, and the dirty air is then removed from the cylinder by the vacuum.

If such an enclosed system is not available, the brake assembly must be cleaned in the open air. During disassembly, carefully place all parts on the floor to minimize creating airborne dust. Using an industrial vacuum cleaner with a HEPA filter system, remove dust from the brake drums, brake backing plates, and brake parts. After vacuuming, any remaining dust should be removed using a rag soaked in water and wrung until nearly dry. Do not use compressed air or dry brushing to clean the brake assembly.

If grinding or other machining of the brake linings is necessary, other precautions must be taken because exposure to asbestos dust is highest during such operations. In addition to the use of an approved respirator, there must be local exhaust ventilation such that worker exposure is kept as low as possible.

Work areas should be cleaned by industrial vacuums with HEPA filters or by wet wiping. Compressed air or dry sweeping should never be used for cleaning. Asbestos-containing waste, such as dirty rags, should be sealed, labeled, and disposed of as required by EPA and OSHA regulations. Respirators should be used when emptying vacuum cleaners and handling asbestos waste products.

Workers should wash before eating, drinking, or smoking, should shower after work, and should not wear work clothes home. Work clothes should be vacuumed after use and then laundered, without shaking, to prevent the release of asbestos fibers into the air.

Caliper Inspection

1. Check the base label (Form WAR259) for a completion sticker for FL628 (Form WAR260) indicating this work has been done. The base label is usually located on the front wall under the dash. If a sticker is present, no work needs to be done. If there is no sticker, proceed with the next step.
2. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires.
3. Turn the front wheels as needed to access the caliper on the front axle.
4. Using a flashlight, inspect the caliper to determine the date code. See **Fig. 1** for an example of the date code and location. See **Table 3** for a list of affected date ranges. The alpha numeric date code for the caliper is made up of four digits and one letter; ignore the letter for this inspection.

   If the date code falls within one of the ranges listed in **Table 3**, replace the caliper. Go to "Brake Caliper Replacement" in these work instructions.

   If the date code is illegible and cannot be determined for any reason, replace the caliper. Go to "Brake Caliper Replacement" in these work instructions.

   If a caliper is not a Bosch caliper, replace the caliper. Go to "Brake Caliper Replacement" in these work instructions.

   If the date code does not fall within one of the ranges, no further work is necessary. Clean a spot on the base label (Form WAR259), write the recall number FL628 on a completion sticker (Form WAR260), and attach it to the base label.

07/17/2012 f430551

1. Date Code

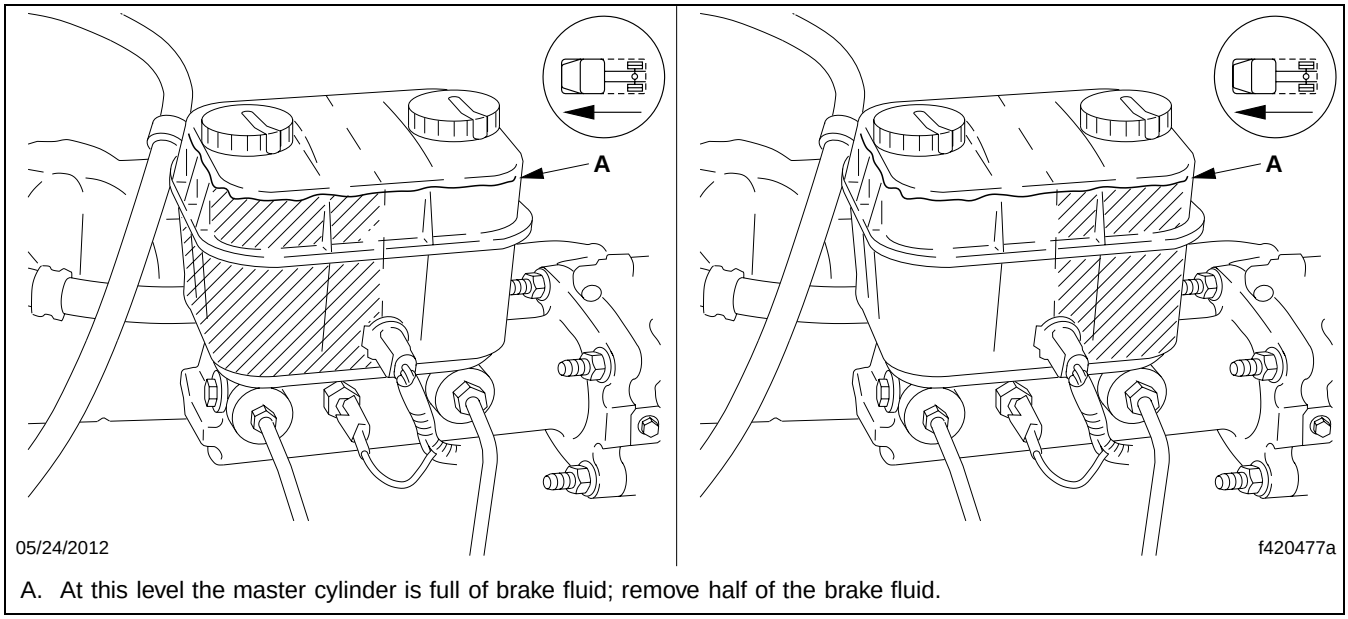
Fig. 1, Date Code Location on Caliper

Affected Caliper Date Codes	
Caliper	**Range**
66 mm	0001 to 0155
73 mm	5001 to 5365
	6001 to 6365
	7001 to 7365
	8001 to 8365
	9001 to 9365
	0001 to 0365
	1001 to 1164

Table 3

Brake Caliper Replacement

1. Open the engine access panel.
2. If removing the rear wheel caliper(s), remove half the fluid from the rear section of the master cylinder reservoir. See **Fig. 2**. If removing the front wheel caliper(s), remove half the fluid from the front section. Removing the fluid from the reservoir keeps the reservoir from overflowing when retracting pistons into the caliper.



A. At this level the master cylinder is full of brake fluid; remove half of the brake fluid.

Fig. 2, Master Cylinder Reservoir

3. Chock the front or rear tires, depending on which axle is being worked on. Jack up the axle and support it with jackstands.

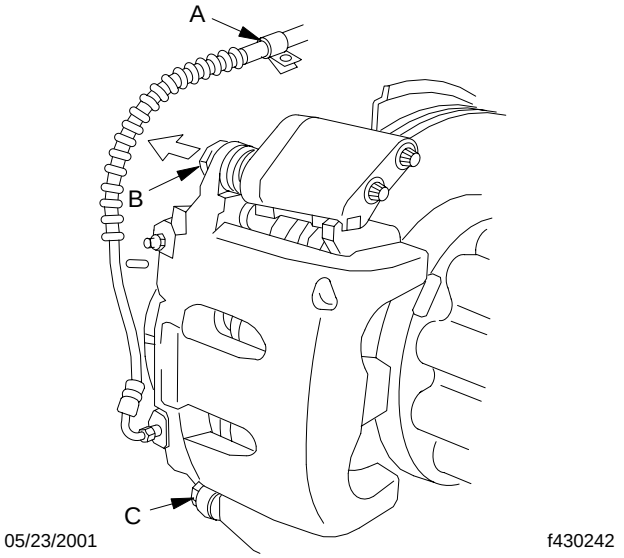
IMPORTANT: Prior to removal, mark the orientation of the wheel assembly and hub.

4. Remove the wheels. For instructions, see **Section 40.00** of the *Recreational Vehicle Chassis Workshop Manual*.
5. On front axles only, remove the brake line retaining clip from its support mounting. This will allow the brake line hose to hang free. See **Fig. 3**.
6. Remove the upper (top) guide pin bolt. See **Fig. 3**

NOTICE

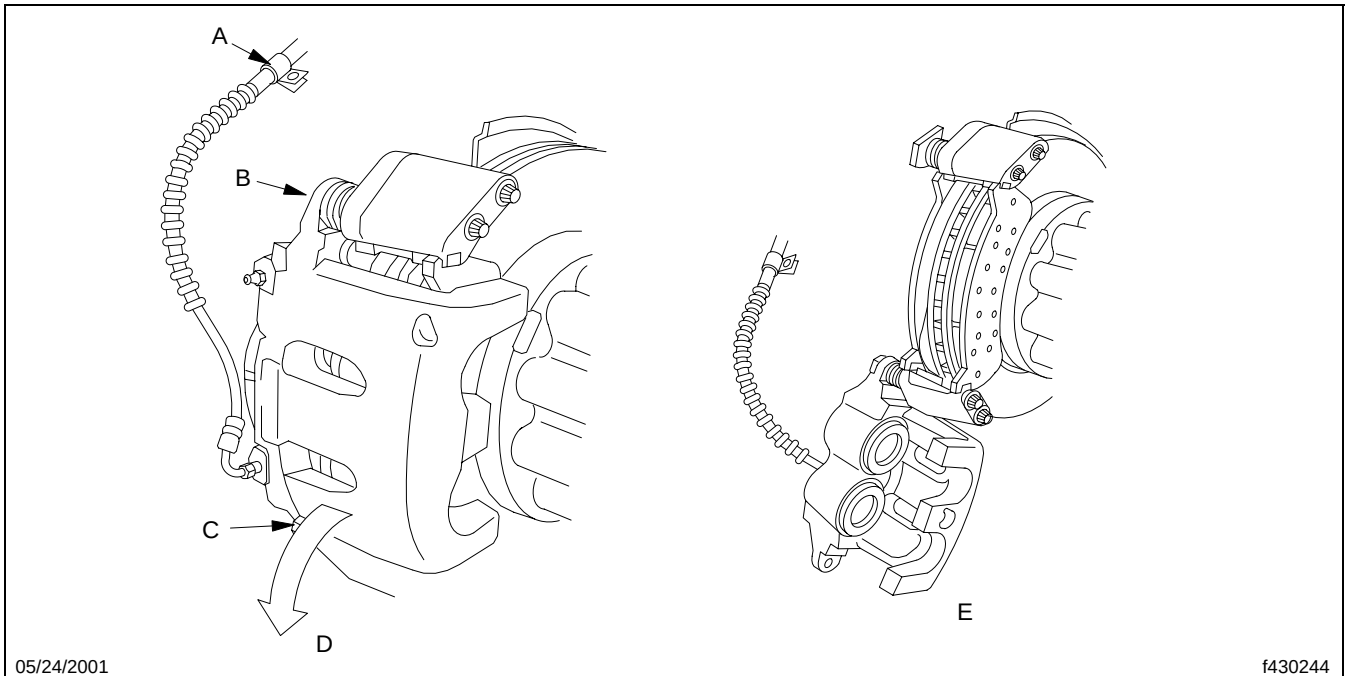
Do not pull on the guide pins. This may dislodge the guide pin boot from the guide pin or anchor plate grooves, which could damage the guide pin boot.

7. Swing the caliper assembly away from the rotor by carefully rotating the caliper on the lower guide pin and bolt. See **Fig. 4**. Do not allow the brake line hose to become pinched or kinked.
8. Disconnect the brake fluid line from the caliper. See **Fig. 5**.
9. Remove the lower guide pin bolt and remove the caliper from the anchor plate.



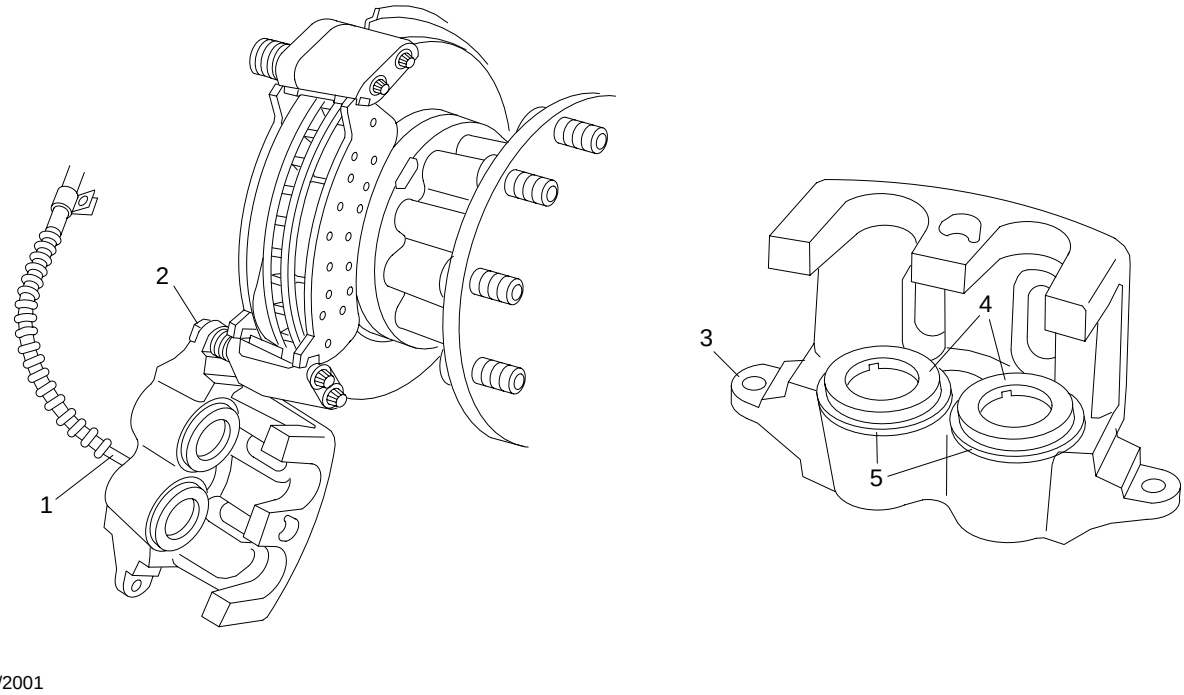
A. Make sure this clip is detached from the support bracket.
B. Remove the upper guide pin bolt.
C. Do not loosen the lower guide pin bolt.

Fig. 3, Upper Guide Pin Mounting Bolt Removal



A. Make sure this clip is detached from the support bracket.
B. Upper guide pin bolt has been removed.
C. Lower Guide Pin Bolt (remove after caliper is lowered).
D. Swing the caliper down until it stops.
E. Caliper in the lowered position.

Fig. 4, Swinging the Caliper Down (Open)



1. Brake Line
2. Lower Guide Pin Bolt
3. Machined Face
4. Pistons
5. Piston Boots

Fig. 5, Removing the Caliper from the Anchor Plate

IMPORTANT: Use isopropyl alcohol to clean the brake seals, boots, and pistons. Do not soak components for an extended period of time.

10. Clean contamination, dirt, and debris from the exterior of the caliper, machined faces, and around the caliper piston boots.
11. Make sure the pistons are fully retracted into the caliper. Piston boots must be fully seated in the piston boot groove and the boot grooves in the caliper face.

IMPORTANT: Identify the brake pad location before removing them, in case the brake pads are used again.

12. Remove the inboard and outboard disc brake pads from the anchor plate pad abutment slippers.

IMPORTANT: Do not damage or dislodge the guide pin boots while cleaning the machined surfaces.

13. Inspect the machined surfaces of the guide pin mounting face and anchor plate. If rust or corrosion is present, use a hand-held wire brush to clean the surfaces.
14. Inspect the anchor plate for damage to the mating surfaces at the anchor plate pad abutment slippers and guide pin heads. If damage is found, repair or replace as required.

NOTE: Brake rotors must be replaced on both ends of an axle even when just one rotor is damaged. Attach a photo of each damaged rotor to the claim.

15. Inspect the rotor for scoring, warping, large radial cracks, bluing, heat spots, or other damage. See **Fig. 6**. If any damage is found, replace the rotor per **Table 5** - Rotor Surface Check. Heat checking, and other damage without without signs of excessive heat, is not a replaceable condition.

Table 5 - Rotor Surface Check

Item from Figure 6	Description of Rotor Issue	Action	Responsibility
Item A	Large radial crack(s) through the outer surface	Replace	With signs of heat significant damage - Recall Without signs of significant heat damage - Customer
Item B	Small radial crack(s)	Do not replace	If replaced - Customer
Item C	Minor discoloration and some transfer of material	Do not replace	If replaced - Customer
Item D	Heavy discoloration and heavy transfer of material	Replace	Recall
Item E	Normal	Do not replace	If replaced - Customer

Table 5

16. Position a metal plate across both caliper pistons. Use a C-clamp to push both pistons into the caliper to provide clearance for the new disc brake pads. See **Fig. 7**.

⚠ CAUTION

When replacing disc brake pads, use the same lining material on both axles. Mixing lining types can result in unbalanced braking, increased pad wear, or degraded stopping performance.

⚠ WARNING

Before replacing the brake pads, review the Safety Precautions in these work instructions.

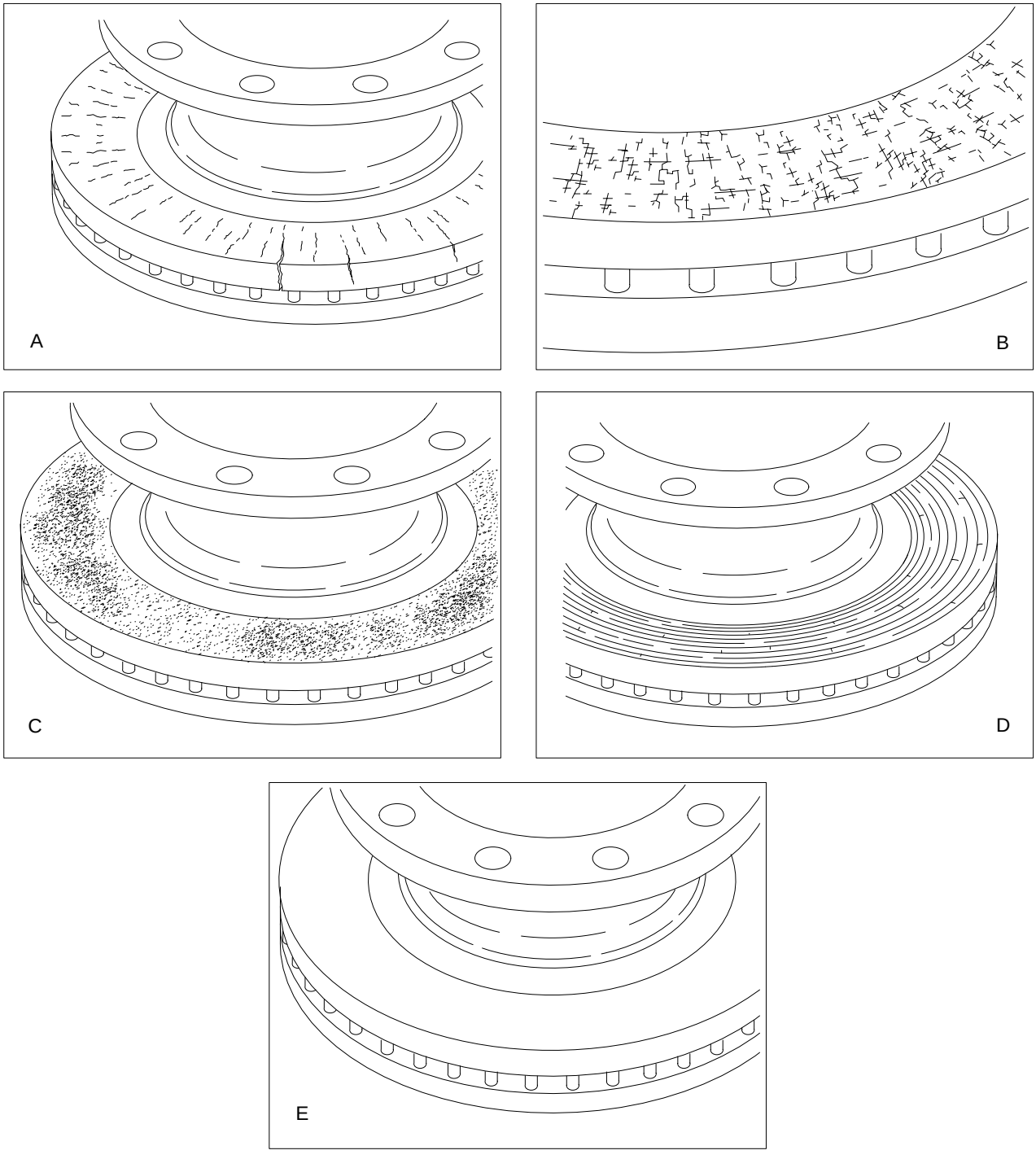
17. Inspect the original brake pads. If the brake pads do not meet any of the following criteria, install the old pads.

    If the brake pads meet one or more of the following criteria, install new brake pads.

NOTE: Brake pads must be replaced on both ends of an axle even when just one caliper on that axle is replaced.

Brake pads are a wear item and should only be replaced as part of this recall for the following reasons, likely due to brake overheating or seized calipers:

- Replace the brake pads if the pad surface is rough/damaged due to resin and/or material transfer to the rotor.
- Replace the brake pads if the pad surface is highly glazed due to resin/binder melt.
- Replace the brake pads if one pad has substantial wear compared to the other pad(s) on the same caliper or axle.
- Replace the brake pads if the lining thickness is 3/16 inch (5 mm) or less at the thinnest point.
- Replace the brake pads if the other pads on the same axle meet one of the above criteria.



A. Cracking
B. Heat Checking
C. Discoloration
D. Scoring
E. Normal Finish

Fig. 6, Rotor Surface Check

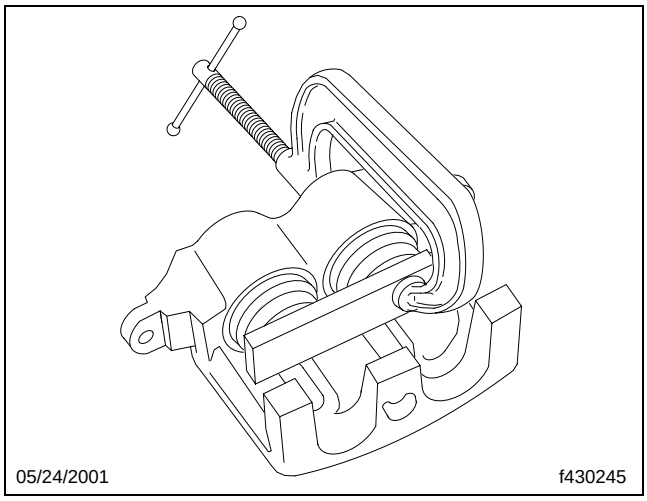


Fig. 7, Retracting Pistons Into the Caliper

⚠ WARNING

When replacing brake pads and shoes always replace components as an axle set.

- **Always reline both sets of brakes on an axle at the same time.**
- **Always install the same type of linings/pads or drums/rotors on both axle ends of a single axle at the same time. Do not mix component types.**

Failure to do so could cause uneven braking and loss of vehicle control, resulting in property damage, personal injury, or death.

IMPORTANT: Inboard and outboard brake pads may not be interchangeable. The word FORWARD and a forward rotor rotation direction arrow may appear on each pad backing plate. Orient the pads as indicated by the arrow.

18. Remove the slippers. See **Fig. 8**. Clean the anchor plate abutments and install the new slippers included in the brake pad kit.

19. Position the inboard and outboard disc brake pads onto the anchor plate pad abutment slippers with the lining facing toward the rotor. See **Fig. 8**.

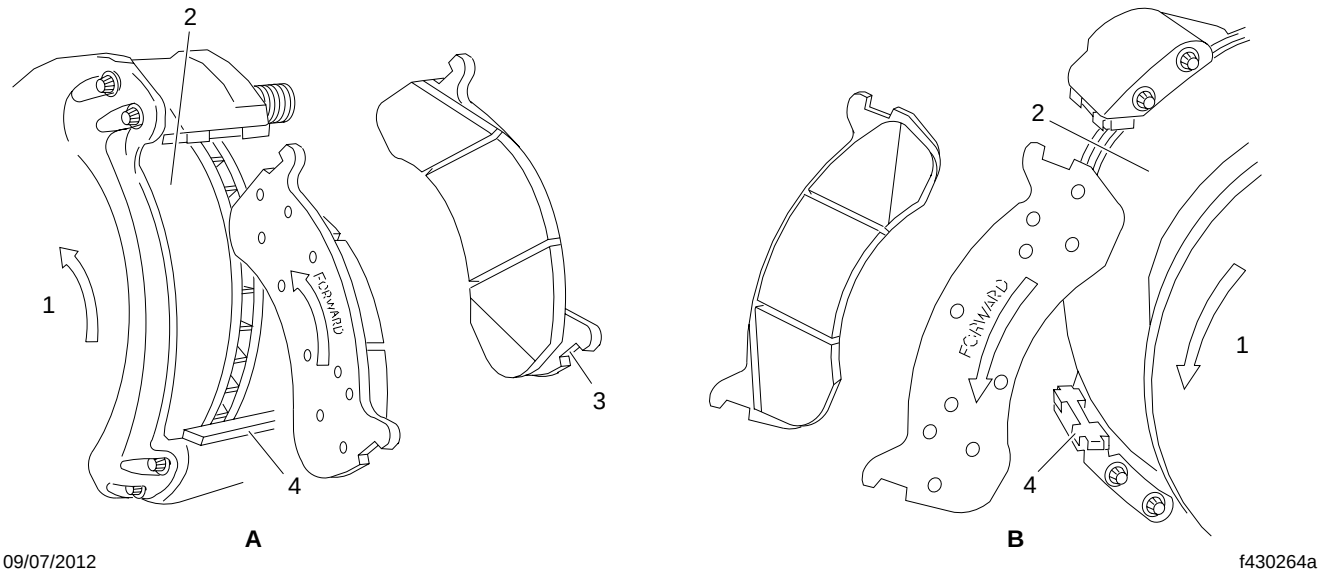
20. Position the caliper on the anchor plate with the caliper lower guide pin boss hole aligned with the threaded hole in the lower guide pin head. Hand-thread the guide pin bolt through the caliper and into the anchor plate.

IMPORTANT: Use care when positioning the caliper over the disc brake pads, rotor, and upper guide pin head to avoid tearing, cutting, or dislodging the piston boots or guide pin boot.

21. Carefully rotate the caliper closed about the lower guide pin and bolt. Do not allow the brake line hose to become pinched or kinked. Align the flat on the upper guide pin head with the flat on the caliper upper guide pin boss. See **Fig. 9**.

IMPORTANT: Always tighten caliper guide pin bolts in the proper sequence. Do not overtighten caliper guide pin bolts. Increased brake drag may result from incorrect tightening. See **Fig. 10** and **Fig. 11** for the MCL chassis and **Fig. 12** and **Fig. 13** for the MC chassis before tightening either the upper or lower bolt.

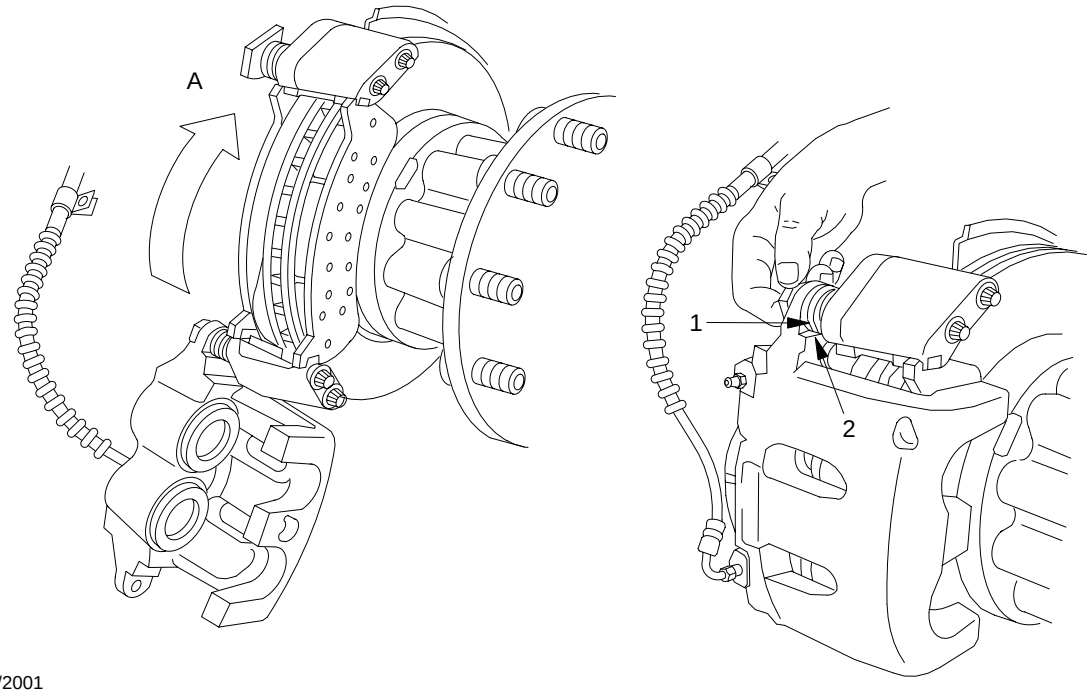
22. Hold the caliper in the closed position with the caliper upper guide pin boss hole aligned with the threaded hole in the upper guide pin head. Hand-thread the upper guide pin bolt. Then tighten the upper and lower guide pin bolts 93 to 107 lbf·ft (126 to 145 N·m) in the order shown in **Fig. 10** and **Fig. 11** for the MCL chassis and **Fig. 12** and **Fig. 13** for the MC chassis.



A. Driver Side Rear
B. Driver Side Front

1. Wheel Rotation
2. Rotor Face
3. Pad Notch
4. Slipper

Fig. 8, Replacing Brake Pads on Front and Rear Brakes



A. Swing the caliper up into position.

1. Flat on Guide Pin
2. Flat on Caliper

Fig. 9, Closing the Caliper Over the Brake Pads and Rotor

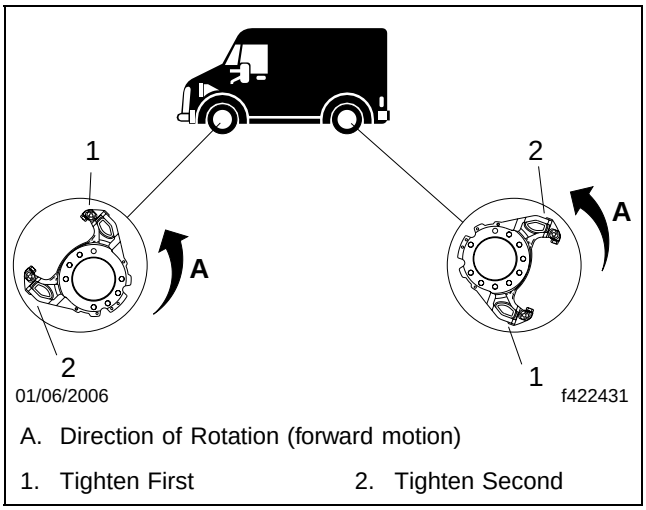


Fig. 10, Tightening Sequence for Caliper Mounting Bolts, Left Side (MCL chassis)

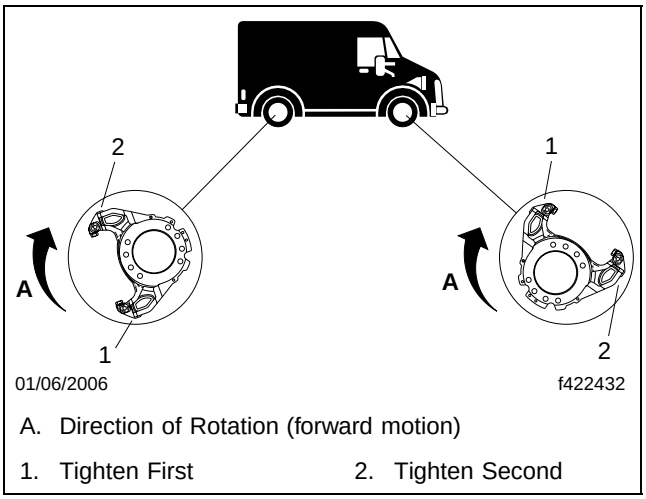


Fig. 11, Tightening Sequence for Caliper Mounting Bolts, Right Side (MCL chassis)

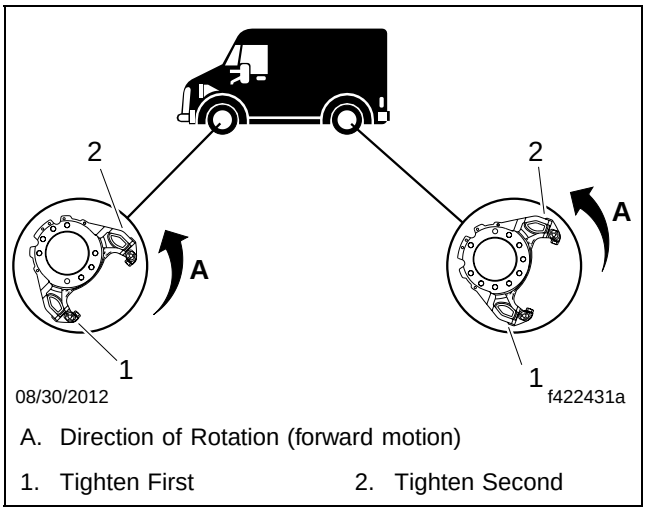


Fig. 12, Tightening Sequence for Caliper Mounting Bolts, Left Side (MC chassis)

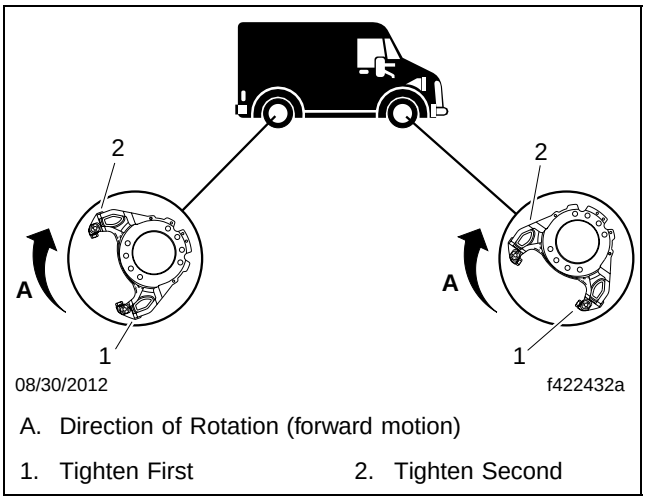


Fig. 13, Tightening Sequence for Caliper Mounting Bolts, Right Side (MC chassis)

23. On front axles only, install the previously removed brake line retaining clip. Make sure the brake line hose is not pinched or kinked.
24. Connect the brake supply hose and tighten the fitting 15 lbf·ft (20 N·m).
25. Pump the brake pedal until it feels firm. If it does not get firm, check for leaks or air in the brake system. Repair any leaks, if needed, then bleed the system.
26. Go to "Hydraulic System Bleeding" in these work instructions.

Hydraulic System Bleeding

IMPORTANT: Whenever any hydraulic system fitting is loosened or disconnected, the entire system must be bled to remove any air that may have entered it.

NOTICE

Power steering fluid and brake fluid are incompatible. Never mix these two fluids, or serious damage to both hydraulic systems will result. Use only brake fluid for the master cylinder and brake lines. Use only power steering fluid for the power booster.

Always use new, clean brake fluid that meets DOT 3® specifications when bleeding the master cylinder and service brake system. Never reuse brake fluid, and do not use brake fluid containers for any other purpose. Keep brake fluid containers tightly closed to keep new brake fluid clean.

IMPORTANT: Do not let brake fluid touch any painted surfaces, as it will remove the paint. Brake fluid may also damage certain non-metal surfaces. Do not let it get on brake pads or rotors.

If the dealership has a pressure bleeder kit, go to the Pressure Bleeding section.

If the dealership does not have a pressure bleeder kit, go to the Manual Bleeding section.

Pressure Bleeding, Service Brake System

Pressure bleeding is the preferred method for bleeding the service brake system. It requires the use of a special pressure bleeder kit, consisting of a tank, pressure pump and valve, gauge, tubing, and adaptor. These are available from a number of manufacturers, and include instructions for use. See **Fig. 14**.

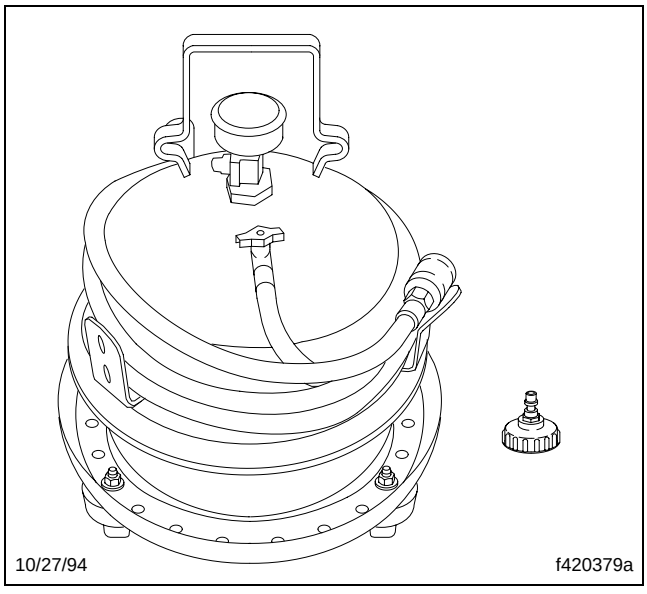


Fig. 14, Pressure Bleeder Kit

1. Connect the pressure bleeder to the brake master cylinder reservoir, following the manufacturer's instructions.
   1.1 Fill the pressure bleeder with new DOT 3 approved brake fluid, then pressurize it according to the manufacturer's instructions.
   1.2 Using the adaptor provided in the pressure bleeder kit, connect the pressure bleeder to the rear compartment of the master cylinder reservoir.
2. Bleed the hydraulic connections at the rear wheel calipers, starting on the right side.
   2.1 Place a wrench on the bleeder fitting at the caliper, then attach a length of clear tubing to the bleeder fitting. Make sure the tube fits snugly. Submerge the tubing in a container of clean brake fluid. See **Fig. 15**.
   2.2 Loosen the bleeder fitting about 3/4 turn, and let the brake fluid flow out of the fitting until it is free of air bubbles. See **Fig. 15** and **Fig. 16**. Then tighten the fitting firmly.
   2.3 Move to the left rear caliper, and repeat the steps for bleeding the caliper.
3. Disconnect the pressure bleeder from the rear compartment of the master cylinder reservoir, then connect it to the front compartment of the reservoir.
4. Bleed the front wheel brake calipers, starting at the right side.
   4.1 Place a wrench on the bleeder fitting at the caliper, then attach a length of clear tubing to the bleeder fitting. Make sure the tube fits snugly. Submerge the tubing into a container of clean brake fluid. See **Fig. 15**.
   4.2 Loosen the bleeder fitting about 3/4 turn, and let the brake fluid flow out of the fitting until it is free of air bubbles. See **Fig. 15** and **Fig. 16**. Then tighten the fitting firmly.
   4.3 Move to the left front wheel caliper, and repeat the steps for bleeding the caliper.
5. Check the brake fluid level in both compartments of the reservoir. Add new DOT 3 approved brake fluid if needed.
6. Check the operation of the brakes by depressing the brake pedal several times, until it feels firm and is not going all the way down to the floor.
7. Close the engine access panel and remove the chocks from the tires.
8. Using the marks previously made on the wheel assembly and hub, install the wheel assembly. Remove the jackstands and lower the vehicle.
9. Road test the vehicle and seat the brake pads, as follows.
   9.1 Accelerate the vehicle to 30 mph (48 km/h), then brake to a stop, using medium brake pedal pressure. *Do not slam on the brakes.*
   9.2 Repeat this step 4 or 5 times, allowing a one-minute interval between brake applications.
10. Clean a spot on the base label (Form WAR259), write the recall number FL628 on a completion sticker (Form WAR260), and attach it to the base label.

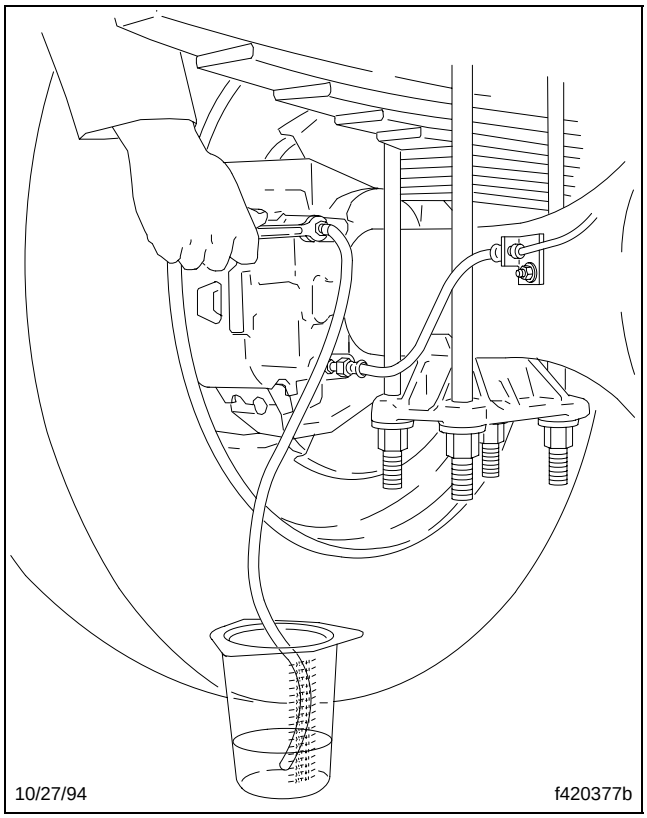
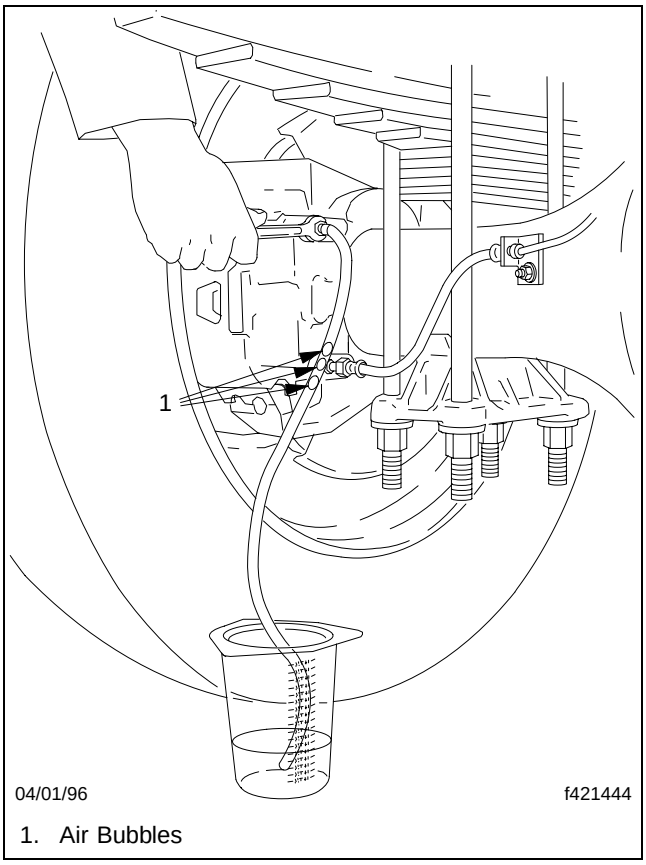


Fig. 15, Bleeding the Connections at the Rear Wheel Calipers



1. Air Bubbles

Fig. 16, Loosening the Bleeder Fitting Until the Air Bubbles are Gone

Manual Bleeding, Service Brake System

If pressure bleeding equipment is not available, use the manual bleeding procedure.

IMPORTANT: Do not let the brake master cylinder fluid level get too low during manual bleeding operation. Keep the master cylinder reservoir filled with new, DOT 3 approved brake fluid. Failure to keep the brake reservoir filled could result in more air entering the system, making it impossible to effectively bleed the system.

1. Bleed the master cylinder.

    1.1 Using a wrench and a rag to absorb leaking brake fluid, loosen the fitting at the rear outlet port on the master cylinder. See **Fig. 17**. Loosen the fitting about one full turn.

    1.2 Have someone push the brake pedal down slowly by hand, to the floor of the vehicle. Brake fluid, and any air in the master cylinder will exit from the fitting.

    1.3 *With the brake pedal held down,* tighten the rear hydraulic line fitting firmly.

    IMPORTANT: Do not release the brake pedal until the fitting is tightened, or more air will get into the system.

    1.4 Release the brake pedal.

    1.5 Loosen the fitting again, and repeat the steps for bleeding as required until no air escapes from the fitting and the brake pedal feels firm.

1.6 Check the brake fluid level in the rear compartment of the reservoir, then add new DOT 3 approved brake fluid if needed.

1.7 Using a wrench and a rag to absorb leaking brake fluid, loosen the fitting at the front outlet port on the master cylinder. See **Fig. 18**. Loosen the fitting about one full turn.

1.8 Repeat the steps as required for the front outlet port.

1.9 Check the brake fluid level in the front compartment of the reservoir. Add new DOT 3 approved brake fluid if needed.

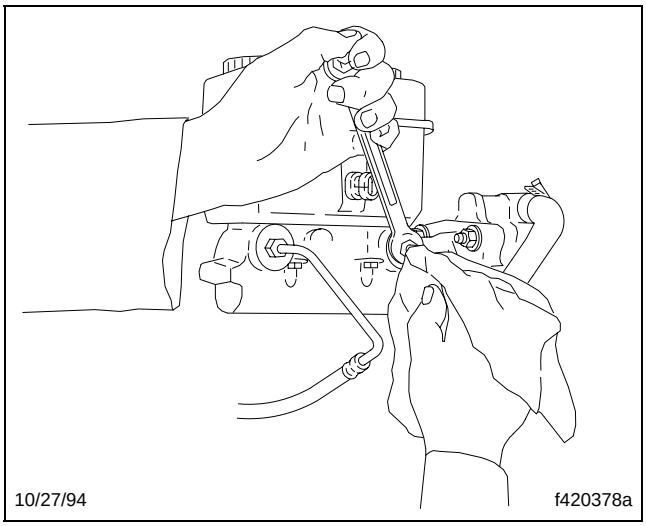


Fig. 17, Loosening the Fitting at the Rear Outlet Port

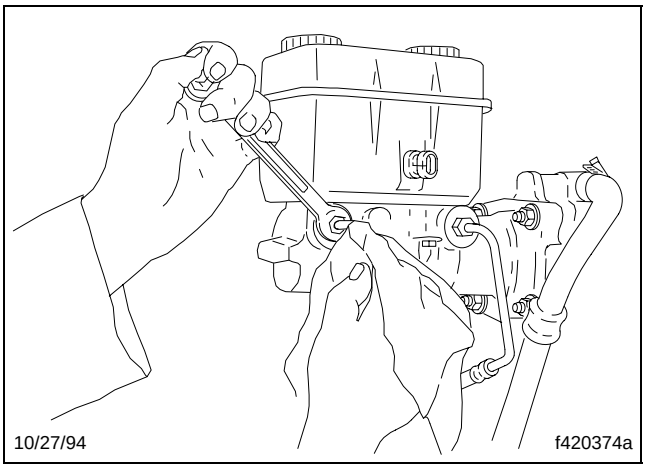


Fig. 18, Loosening the Fitting at the Front Outlet Port

2. Bleed the hydraulic connections at the wheel calipers, starting at the right rear wheel caliper.

2.1 Place a wrench on the bleeder fitting at the caliper, then attach a length of clear tubing to the bleeder fitting. Make sure the tube fits snugly. Submerge the tubing in a container of clean brake fluid. See **Fig. 15**.

2.2 Loosen the bleeder fitting about 3/4 turn.

2.3 Have someone slowly push the brake pedal to the floor, then *with the brake pedal depressed,* tighten the bleeder fitting.

IMPORTANT: Make sure the brake pedal stays depressed while tightening the fitting. If it is released before the fitting is tightened, more air will get into the system.

2.4 Release the brake pedal. Check the fluid in the tube. If air bubbles are present, repeat the steps as required until the fluid in the tube is completely free of air bubbles, as shown in **Fig. 15** and **Fig. 16**.

2.5 Check the brake fluid level in the reservoir. Add new DOT 3 approved brake fluid if needed.

2.6 Repeat the steps for bleeding the connections for the left rear caliper, then the right front caliper, and finally for the left front caliper.

3. Close the engine access panel and remove the chocks from the tires.
4. Using the marks previously made on the wheel assembly and hub, install the wheel assembly. Remove the jackstands and lower the vehicle.
5. Road test the vehicle and seat the brake pads, as follows.
   5.1 Accelerate the vehicle to 30 mph (48 km/h), then brake to a stop, using medium brake pedal pressure. *Do not slam on the brakes.*
   5.2 Repeat this step 4 or 5 times, allowing a one-minute interval between brake applications.
6. Clean a spot on the base label (Form WAR259), write the recall number FL628 on a completion sticker (Form WAR260), and attach it to the base label.