FREIGHTLINER® LLC
A DaimlerChrysler Company

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March 13, 2006

Dan Smith
Associate Administrator for Vehicle Safety
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Re: Defect Information Report – supplemental information
(FL-451), NHTSA no. 05V-285, ConMet TruTurn Drum Tapered Mounting Flange

Mr. Smith:

In accordance with Part 573 of Title 49 of the Code of Federal Regulations, Freightliner LLC herewith submits supplemental defect information and copies of documents to be distributed to dealers and purchasers.

Please contact me if you have any questions.

Sincerely yours,

Timothy Blubaugh

Cc: Michael Mason, CAL-OSHA
DOSH, Legal Unit
10th Floor
455 Golden Gate Avenue
San Francisco, CA 94102

Enclosure

Certified Mail Article Number:

7003 2260 0001 3403 4230

Section 573.6 Defect Information Report

FL-451, ConMet TruTurn Drum Tapered Mounting Flange; NHTSA no. 05V-285

Supplement No.: 03

March 13, 2006

(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) 1,786

(c) (9) Communications sent to dealers: posted March 8, 2006
Communications sent to owners: to be mailed March 15, 2006

FREIGHTLINER® LLC
A DaimlerChrysler Company

Recall Campaign

March 2006
FL451A-S
NHTSA #05V-285

Subject: ConMet TruTurn Brake Drums

Models Affected: Specific Freightliner Business Class M2, Century Class S/T, Classic, Classic XL, Columbia, Coronado, and FLD vehicles; Sterling A/L-Line and Acterra vehicles; and Western Star 4900 vehicles built between August 26, 2004, and March 31, 2005, with ConMet TruTurn Brake Drums.

General Information

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

There are approximately 2,000 vehicles involved in this campaign.

The mounting flange on certain ConMet TruTurn front brake drums may have been manufactured with a taper from the pilot hole to the barrel of the drum. This taper may cause cracks or a fracture in the front wheel hub, resulting in a possible vehicle crash without prior warning. Manufacturing defects that caused a taper in the drum were traced to vehicles built on certain production dates.

Each front brake drum will be inspected for this taper. If it is found, the affected drum and hub will be replaced. The expected replacement rate is between 10% and 20%.

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.

If our records show your dealership has ordered any vehicles involved in campaign number FL451A-S, 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.

IMPORTANT: Most vehicles will not require replacements. The expected replacement rate is between 10% and 20%.

There is one brake drum kit, refer to **Table 1**, for all vehicles that require replacements. There are several hub kits; be sure to determine which hub is appropriate for the specific vehicle by referring to ServicePro and **Table 2**. The possible combinations of kits that might be needed include:

- No kits (the inspection shows that neither brake drum has the taper).
- One drum kit and one hub kit (the brake drum on one side of the vehicle has the taper; the other side does not so no replacement needed).
- Two drum kits and two hub kits (both brake drums have the taper).

Recall Campaign

FREIGHTLINER® LLC
A DaimlerChrysler Company

March 2006
FL451A-S
NHTSA #05V-285

Table 1 - Brake Drum Replacement Kit for FL451A-S

Brake Drum Kit 25-FL451-006

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit	Suggested Wholesale*
FL451A-S Use this brake drum for all vehicles.	25-FL451-006	Brake Drum	CM 10009920	1 ea	$79.03 U.S. $115.03 CAN
		Completion Sticker	WAR260	1 ea	

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

Table 1

Table 2 - Hub Replacement Kits for FL451A-S

Please do not over order kits. The maximum number of vehicles that **might** need each kit is listed in the table below.

Hub Kits 25-FL451-000 to 25-FL451-021

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit	Suggested Wholesale*
FL451A 556 vehicles	25-FL451-000	Preset Hub	CM 10003889	1 ea	$200.70 U.S. $292.09 CAN
		Completion Sticker	WAR261	1 ea	
FL451B 1,048 vehicles	25-FL451-001	Preset Hub	CM 10003890	1 ea	$200.70 U.S. $292.09 CAN
		Completion Sticker	WAR261	1 ea	
FL451C 20 vehicles	25-FL451-002	Standard Hub	CM 104221	1 ea	$187.71 U.S. $273.18 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451D 2 vehicles	25-FL451-003	Preset Hub, Left	CM 10003891	1 ea	$207.33 U.S. $301.76 CAN
		Completion Sticker	WAR261	1 ea	
FL451D 2 vehicles	25-FL451-004	Preset Hub, Right	CM 10003892	1 ea	$207.33 U.S. $301.76 CAN
		Completion Sticker	WAR261	1 ea	
FL451E 140 vehicles	25-FL451-005	Standard Front Hub	CM 104222	1 ea	$209.40 U.S. $304.75 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451F 116 vehicles	25-FL451-007	Preset Hub	CM 104565	1 ea	$229.84 U.S. $334.50 CAN
		Completion Sticker	WAR261	1 ea	
FL451G 35 vehicles	25-FL451-008	Standard Hub, Iron	CM 10003478	1 ea	$159.67 U.S. $232.38 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451H 29 vehicles	25-FL451-009	Standard Hub, Iron	CM 10003479	1 ea	$159.67 U.S. $232.38 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	

Table 2, continues on the next page

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit	Suggested Wholesale*
FL451I 17 vehicles	25-FL451-010	Preset Hub	CM 10003953	1 ea	$242.51 U.S. $352.96 CAN
		Completion Sticker	WAR261	1 ea	
FL451J 10 vehicles	25-FL451-011	Preset Hub, Left	CM 10003893	1 ea	$228.01 U.S. $331.85 CAN
		Completion Sticker	WAR261	1 ea	
FL451J 10 vehicles	25-FL451-012	Preset Hub, Right	CM 10003894	1 ea	$228.01 U.S. $331.85 CAN
		Completion Sticker	WAR261	1 ea	
FL451K 6 vehicles	25-FL451-013	Standard Hub, Iron	GUN HF770S1	1 ea	$277.78 U.S. $404.26 CAN
		Oil Seal	CHR 35066	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451M 3 vehicles	25-FL451-015	Standard Hub	CM 10001128	1 ea	$221.04 U.S. $321.68 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451P 1 vehicle	25-FL451-018	Preset Hub	CM 10005328	1 ea	$223.57 U.S. $329.74 CAN
		Completion Sticker	WAR261	1 ea	
FL451Q 1 vehicle	25-FL451-019	Standard Hub	CM 10001126	1 ea	$207.63 U.S. $302.19 CAN
		Oil Seal	CHR 35058	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451R 1 vehicle	25-FL451-020	Standard Hub, Iron	GUN HF770S3	1 ea	$279.66 U.S. $407.03 CAN
		Oil Seal	CHR 35066	1 ea	
		Completion Sticker	WAR261	1 ea	
FL451S 1 vehicle	25-FL451-021	Standard Hub, Iron	GUN HF770S4	1 ea	$295.97 U.S. $430.74 CAN
		Oil Seal	CHR 35066	1 ea	
		Completion Sticker	WAR261	1 ea	

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

Table 2, continued from the previous page

Additional Parts

When replacing one or both brake drums and hubs additional parts may be needed. The following may be claimed as miscellaneous parts: hub cap gasket, oil seal, and oil for the hub (up to one quart per hub).

Removed Parts

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

Recall Campaign

March 2006
FL451A-S
NHTSA #05V-285

Labor Allowance

Table 3 - Labor Allowance

Campaign Number	Procedure	Time Allowed (hours)	SRT Code	Damage Code
FL451A-S	Inspect both front brake drums	0.8	996-0637A	000-Inspected
FL451A, B, D, F, I, J, P	Inspect both front brake drums and remove/replace front hub and drum on one side - preset hubs	1.0	996-0637B	000-Modifiedx
FL451A, B, D, F, I J, P	Inspect both front brake drums and remove/replace front hub and drum on both sides - preset hubs	1.9	996-0637C	000-Modifiedx
FL451C, E, G, H, K, M, Q, R, S	Inspect both front brake drums and remove/replace front hubs and drums on one side - standard hubs	1.2	996-0637D	000-Modifiedx
FL451C, E, G, H, K, M, Q, R, S	Inspect both front brake drums and remove/replace front hubs and drums on both sides - standard hubs	2.1	996-0637E	000-Modifiedx

Table 3

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 (e.g. **FL451A, FL451B, FL451C, etc.**).
- In the Primary Failed Part Number field, enter **25-FL451-000**.
- In the Parts field, enter the appropriate kit number(s) as shown in the Replacement Parts Table.

  Additional parts: When replacing one or both brake drums/hubs additional parts may be needed. The following may be claimed as miscellaneous parts: hub cap gasket, oil seal, and oil for the hub (up to one quart per hub).

  IMPORTANT: Most vehicles will not require replacements. The expected replacement rate is between 10% and 20%.

  There is one brake drum kit, refer to **Table 1**, for all vehicles that require replacements. There are several hub kits; be sure to determine which hub is appropriate for the specific vehicle by referring to ServicePro and **Table 2**. The possible combinations of kits that might be needed include:

  - No kits (the inspection shows that neither brake drum has the taper).
  - One drum kit and one hub kit (the brake drum on one side of the vehicle has the taper; the other side does not so no replacement needed).
  - Two drum kits and two hub kits (both brake drums have the taper).
- 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.

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 (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. 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.

Recall Campaign

FREIGHTLINER® LLC
A DaimlerChrysler Company

March 2006
FL451A-S
NHTSA #05V-285

Copy of Letter to Owner

Subject: ConMet TruTurn Brake Drums

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

Freightliner LLC, on behalf of its Freightliner Trucks Division and its wholly owned subsidiary, Sterling Truck Corporation, has decided that a defect which relates to motor vehicle safety exists on specific Freightliner Business Class M2, Century Class S/T, Classic, Classic XL, Columbia, Coronado, and FLD vehicles; Sterling A/L-Line and Acterra vehicles; and Western Star 4900 vehicles built between August 26, 2004, and March 31, 2005, with ConMet TruTurn Brake Drums.

The mounting flange on certain ConMet TruTurn front brake drums may have been manufactured with a taper from the pilot hole to the barrel of the drum. This taper may cause cracks or a fracture in the front wheel hub, resulting in a possible vehicle crash without prior warning.

Each front brake drum will be inspected for this taper. If it is found, the affected drum and hub 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. To locate a dealer, search online at www.FreightlinerTrucks.com, SterlingTrucks.com, or contact the Warranty Campaigns Department for assistance.

When you contact your dealer, refer to campaign number **FL451A-S**. Once kit(s) are received at the dealership, the modification will take up to approximately two and half hours, depending on the work needed, and will be performed at no charge to you.

IMPORTANT: When the recall has been completed, please ensure that a label has been affixed to your vehicle referencing **FL451A-S**.

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 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, 7:00 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 call the Vehicle Safety Hotline at (888) 327-4236 (TTY: 800-424-9153); or to to http://www.safercar.gov. 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

Work Instructions

Subject: ConMet TruTurn Brake Drums

Models Affected: Specific Freightliner Business Class M2, Century Class S/T, Classic, Classic XL, Columbia, Coronado, and FLD vehicles; Sterling A/L-Line and Acterra vehicles; and Western Star 4900 vehicles built between August 26, 2004, and March 31, 2005, with ConMet TruTurn Brake Drums.

IMPORTANT: Not all vehicles require replacements. The expected replacement rate is between 10% and 20%.

There is one brake drum kit, refer to **Table 1** at the front of this bulletin, for all vehicles that require replacements. There are several hub kits; be sure to determine which hub is appropriate for the specific vehicle by referring to ServicePro and **Table 2** at the front of this bulletin. The possible combinations of kits that might be needed include:

- No kits (the inspection shows that neither front drum has the taper).
- One drum kit and one hub kit (the front brake drum on one side of the vehicle has the taper; the other side does not require replacement).
- Two drum kits and two hub kits (both front brake drums have the taper).

Brake Drum Inspection Procedure

1. Check the base label (Form WAR259) for a completion sticker for FL451 (Form WAR260) indicating this work has been done. The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch.

   If a sticker is present, nothing more needs to be done.

   If no sticker is present, go to the next step.
2. Park the vehicle on a level surface. Shut down the engine, set the parking brake, and chock the tires.
3. Raise the front of the vehicle until the tires clear the ground. Then place safety stands under the axle.

⚠ WARNING

Never work under a vehicle that is supported only by a jack. Jacks can slip, resulting in serious personal injury or death. Always use safety stands to support the vehicle when working under it.

4. Back off the slack adjusters to release the front axle brake shoes.
5. Remove the wheel-and-tire assemblies.
6. Before proceeding further, mark one stud hole and the stud going through it with paint. Do this for both brake drums.

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

7. On one side of the vehicle, remove the brake drum.

8. Measure the removed brake drum for flatness. See **Fig. 1**.

   8.1 Make sure the surface of the flange where you will measure is free of all paint, grease, and dirt. If necessary, scrape the surface down to bare metal.

   8.2 Lay a 12-inch (30 cm) straightedge across the diameter of the drum, on the inside flange. See **Fig. 2**.

   8.3 Slide the straightedge so one end of it is all the way outboard on the machined surface of the brake drum.

   8.4 Using a feeler gauge, check and record the gap (if present) between the machined face of the drum flange (outboard of the bolt holes) and the outboard end of straightedge. See **Fig. 2**.

   8.5 Repeat the above measurement, at a 90-degree angle to the first measurement.

   If the gap at either measurement is greater than 0.010 inch (0.25 mm), the brake drum and the hub need to be replaced. Mark the drum as right or left side and defective, and set it aside.

   If there is no gap or the gap is 0.010 inch (0.25 mm) or smaller, the brake drum is O.K. Mark the drum as right or left side, and O.K., and set it aside.

   8.6 Repeat the above measuring procedure on the other brake drum. Be sure to make the two measurements at a 90-degree angle to each other.

9. If both brake drums are O.K., install the brake drums and the wheel-and- tire assemblies. Raise the vehicle, remove the safety stands, then lower the vehicle and remove the chocks from the tires. Go to step 10.

   If one brake drum is O.K., install it and the wheel-and-tire assembly on the vehicle, then go to "Hub and Brake Drum Replacement" in these Work Instructions to replace the other brake drum and hub.

   If both brake drums and hubs need replacing, go to "Hub and Brake Drum Replacement Procedure" in these Work Instructions.

10. Clean a spot on the base label (Form WAR259). The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch. Attach a completion sticker for campaign FL451 (Form WAR260) to the base label.

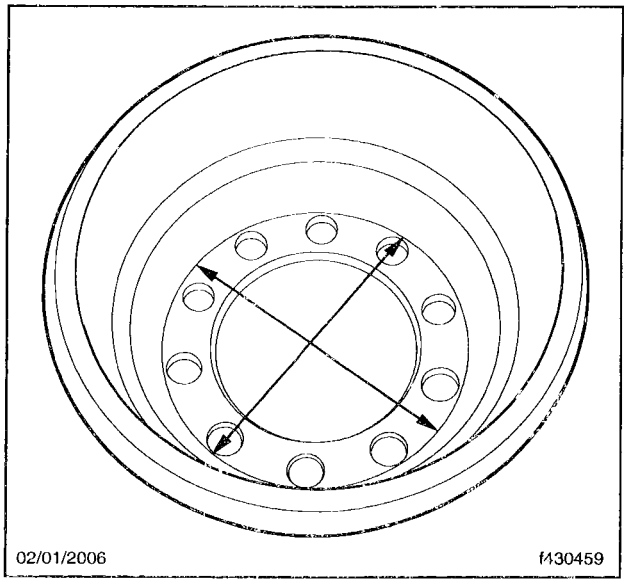
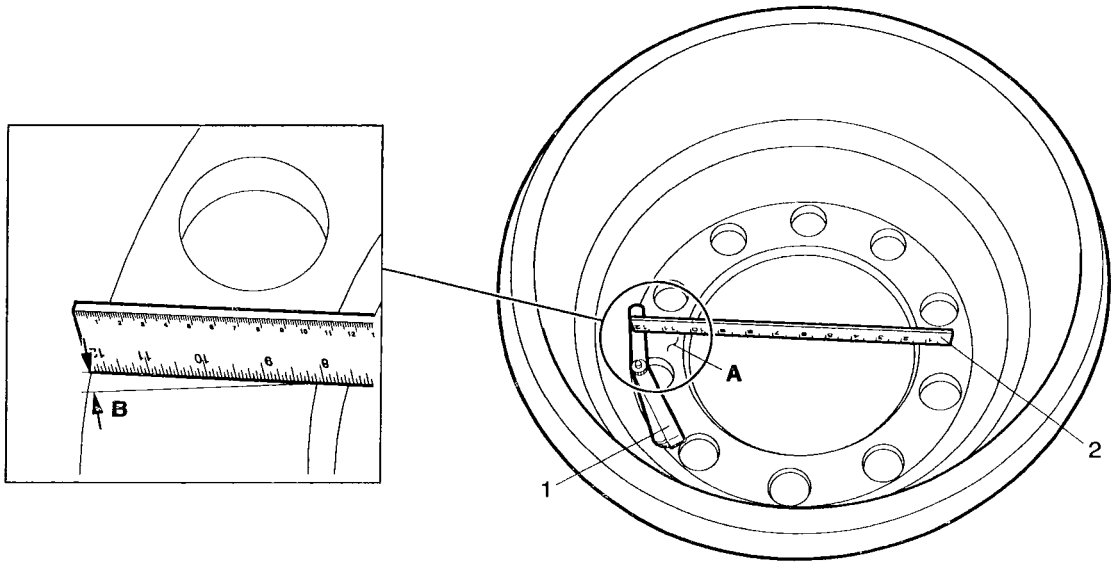


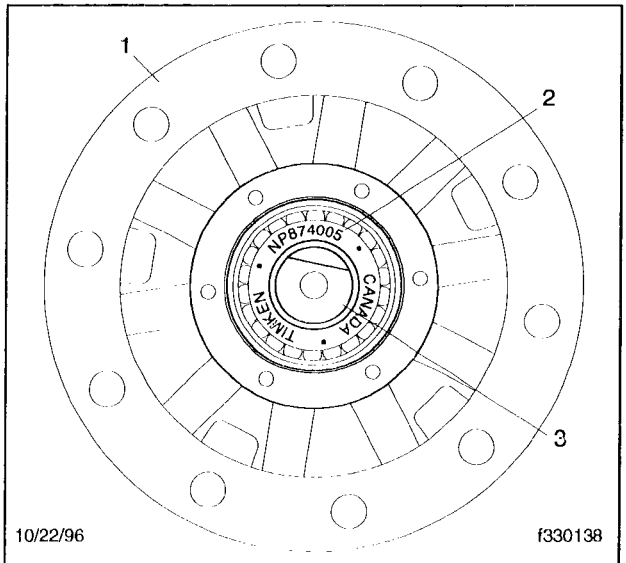
Fig. 1, Measuring the Brake Drum Flange at Two Places



A. Make sure this surface is bare metal.
B. Gap to be a maximum of 0.010 inch (0.25 mm), measured at the end of the straightedge.

1. Feeler Gauge
2. 12-Inch (30 cm) Straightedge

Fig. 2, Measuring the Gap



1. Front Axle Hub
2. Outer Bearing Cone and Part Number
3. Axle Spindle

Fig. 3, Identifying a ConMet Preset Hub

Recall Campaign

March 2006
FL451A-S
NHTSA #05V-285

Hub and Brake Drum Replacement

1. On one side of the vehicle, place a basin under the hub to catch any oil.
2. Remove the capscrews, washers, and hub cap. Remove and discard the hub cap gasket.
3. Replace the hub and brake drum, following the applicable procedure below.

NOTE: The first procedure covers replacing Con Met Preset® hubs; the second procedure covers replacing Con Met standard hubs.

Replacing ConMet Preset Hubs

Front axle preset hubs can be identified by the part number NP874005 stamped on the outer bearing cone. The outer bearing cone is visible when the Axilok® retaining nut is removed. See **Fig. 3**.

⚠ CAUTION

Use only the correct size, six-point socket to remove or install Axilok spindle nuts. Do not use a worn or loose-fitting socket. Do not use a 12-point socket. Using the wrong type of socket or wrench on an Axilok nut can result in damage to the locking mechanism on the spindle nut.

ConMet Preset hubs use Axilok retaining nuts. See **Fig. 4** and **Fig. 5**. Axilok retaining nuts can be damaged if they are not removed or installed correctly. Use the following guidelines when removing and installing Axilok retaining nuts.

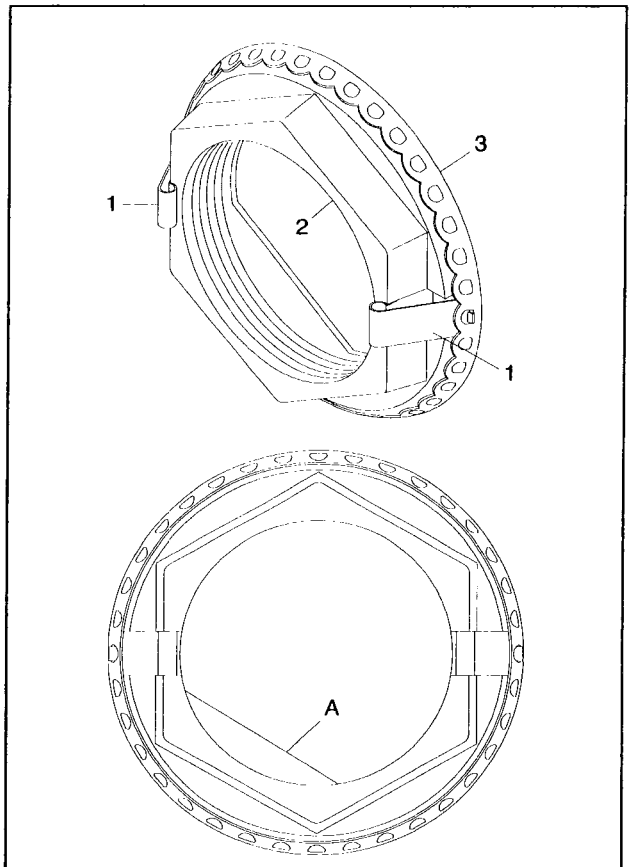
- Use only the correct size, *six-point* socket to remove or install Axilok spindle nuts. Do not use a worn or loose-fitting socket. *Do not use a 12-point socket.*
- Do not use hammers, chisels, pliers, wrenches, or power tools to remove or install Axilok nuts.
- Do not use an Axilok nut if the locking clips are damaged or missing, or if the retainer cage tab or D-flat is damaged or missing.
- Never try to repair a damaged Axilok nut; always replace it with a new one.
- Always start an Axilok installation by hand. A good-fitting six-point socket will completely disengage the nut's locking clips, allowing it to spin freely by hand. See **Fig. 6**. Use an accurately calibrated torque wrench to tighten the nut to its final torque value.
- After the nut is installed, always make sure that both locking clips are present and engaged in the retainer cage. See **Fig. 6**. If the locking clips are not engaged, the nut is not locked in position and can rotate freely.

⚠ CAUTION

On vehicles equipped with WABCO ABS, use care when working with the hubs. To prevent damage to the tone wheel, do not drop the hub or lay it down in a way that would damage the tone wheel.

1. On one side of the vehicle, remove the Axilok nut holding the hub assembly in place.
2. Cover the axle spindle threads with friction tape to protect them.
3. Remove the hub, bearings, and oil seal as a unit from the axle. Be careful not to damage the axle spindle threads.
4. If the oil seal or any part of it is still on the axle spindle, remove it.
5. Wipe a film of axle oil on the axle spindle to prevent rust from forming behind the inner wheel bearing.

NOTE: Wheel bearing adjustment is unnecessary when installing these hubs, because the spacer, together with specially toleranced bearings, automatically sets the bearing end-play to zero.

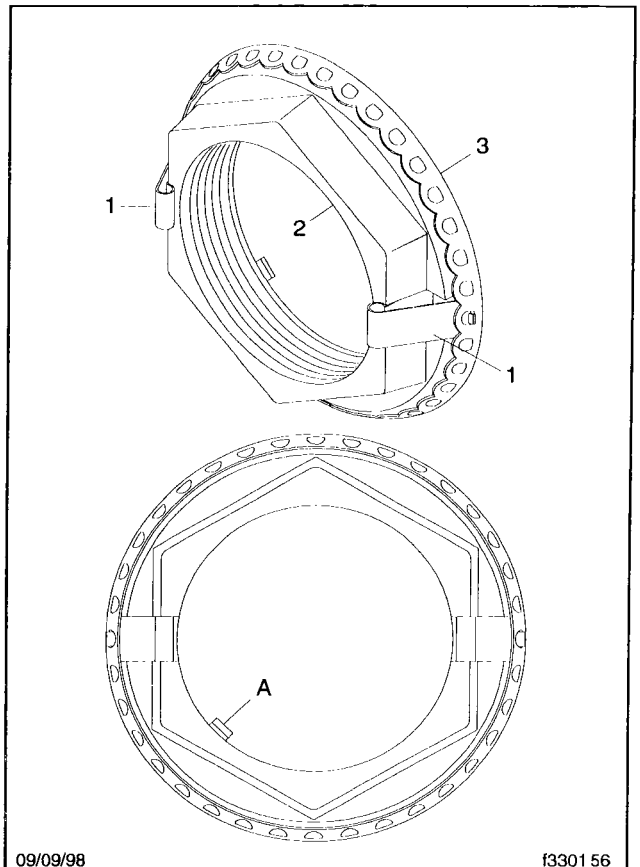


06/20/95 f330126

A. The flat side of the retainer must engage the flat side of the axle spindle.

1. Locking Clip
2. Nut
3. Retainer Cage

Fig. 4, Axilok Retaining Nut, Meritor Front Axle



09/09/98 f330156

A. This retainer tab must engage the keyway of the axle spindle.

1. Locking Clip
2. Nut
3. Retainer Cage

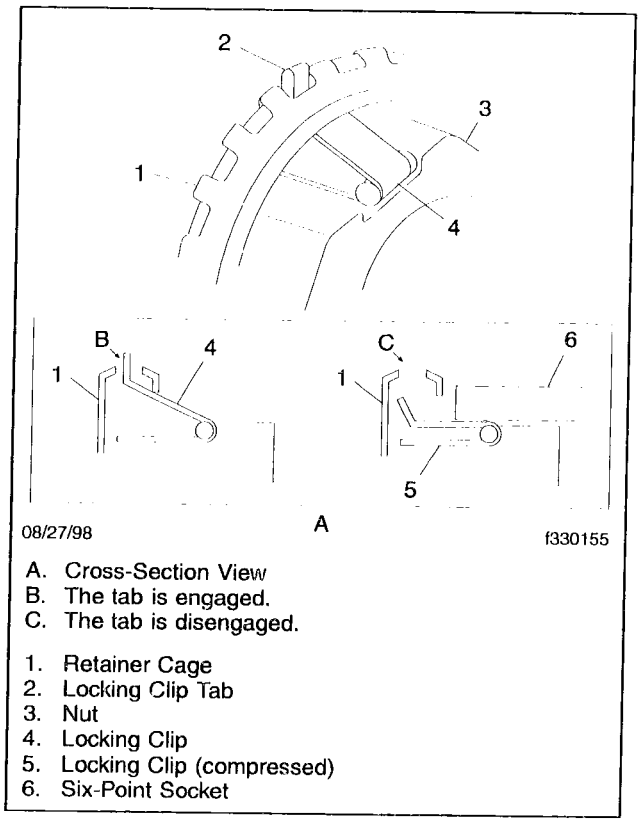
Fig. 5, Axilok Retaining Nut, Dana Spicer Front Axle

6. Install the new Preset hub assembly all the way onto the axle spindle.

⚠ CAUTION

Do not remove the outer wheel bearing once the hub is installed on the axle. Removing the outer bearing could cause the oil seal to become misaligned, which could cause damage to the wheel bearings, the hub, and the axle spindle.

7. If present, remove the temporary plastic bearing cover from the front of the new Preset hub.
8. Remove the friction tape from the axle spindle threads.



A. Cross-Section View
B. The tab is engaged.
C. The tab is disengaged.

1. Retainer Cage
2. Locking Clip Tab
3. Nut
4. Locking Clip
5. Locking Clip (compressed)
6. Six-Point Socket

Fig. 6, Axilok Nut, Checking the Position of the Locking Clip

⚠ WARNING

Follow the guidelines and information at the beginning of this procedure when installing an Axilok nut. Axilok retaining nuts secure the hub assemblies on the axle. If the Axilok nut is not correctly installed, the hub could separate from the axle, resulting in severe personal injury or death.

9. Install the Axilok retaining nut on the axle spindle. See **Fig. 5** or **Fig. 6**.
10. Tighten the retaining nut 300 lbf·ft (407 N·m). Do not back off the retaining nut. The nut should lock in place when you remove the wrench. If it does not, advance it until it does.
11. Install the hub cap, using a new gasket. Tighten the capscrews 15 lbf·ft (20 N·m).

⚠ CAUTION

Make sure the hubs are filled with oil. Driving with hubs dry will cause bearing damage.

12. Fill the hub with fresh oil to the level shown on the hub cap. Do not overfill.
13. Install the new brake drum.
14. If applicable, repeat the entire hub and brake drum replacement procedure on the other side of the vehicle.
15. Install the wheel-and-tire assemblies.
16. Raise the vehicle, remove the safety stands, then lower the vehicle.

17. Clean a spot on the base label (Form WAR259). The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch. Attach a completion sticker for campaign FL451 (Form WAR260) to the base label.

Replacing ConMet or Gunite Standard Hubs

NOTE: A very few vehicles may be equipped with Gunite hubs. The replacement procedure is the same for both ConMet and Gunite standard hubs.

⚠ CAUTION

On vehicles equipped with WABCO ABS, use care when working with the hubs. To prevent damage to the tone wheel, do not drop the hub or lay it down in a way that would damage the tone wheel.

1. On one side of the vehicle, remove the hub.
   - 1.1 Remove the jam nut, locking device(s), and adjusting nut.
   - 1.2 Cover the axle spindle threads with friction tape to protect them.
   - 1.3 Move the hub about 1/2 inch (13 mm) to jar loose the outer wheel bearing (allow the hub-only assembly to rest on the axle spindle; be careful not to damage the axle spindle threads).

⚠ CAUTION

Do not spin bearing rollers at any time. Dirt or grit can scratch the roller surface and cause rapid wear of the bearing assembly. Treat used bearings as carefully as new ones.

   - 1.4 Carefully remove the outer wheel bearing, then remove the hub. Be careful not to damage the axle spindle threads as the assembly is removed.
   - 1.5 Remove the inner wheel bearing from the axle. Occasionally, the inner wheel bearing will remain in the hub after the hub is removed from the axle. In those cases, place a protective cushion where it will catch the bearings. Then use a hardwood drift and a light hammer to gently tap the bearing (and seal, if necessary) out of the cup.
   - 1.6 Save the wheel bearings for installation of the new hub. Handle them carefully and wrap them in a clean, dry, lint-free cloth.
   - 1.7 If present, remove the oil seal from the axle spindle.
2. Install the new oil seal in the hub.

   NOTE: The following procedure applies to the Chicago Rawhide Scotseal® oil seal.
   - 2.1 Coat the wheel bearing cones with fresh oil.

⚠ CAUTION

Make sure that both bearing assemblies are coated with fresh oil. Use only fresh oil on the bearing assemblies; old oil could be contaminated with dirt or water (both are corrosives) and could cause damage to both wheel bearing assemblies and the wheel hub.

   - 2.2 Install the inner wheel bearing cone in the inner wheel bearing cup of the hub.
   - 2.3 Seat the small outside edge of the seal in the recess of the tool adapter. See **Fig. 7**. The correct adapter is identified on the box.
   - 2.4 Insert the centering plug of the tool in the bore of the inner bearing cone. See **Fig. 8**. The plug prevents cocking of the seal in the bore.

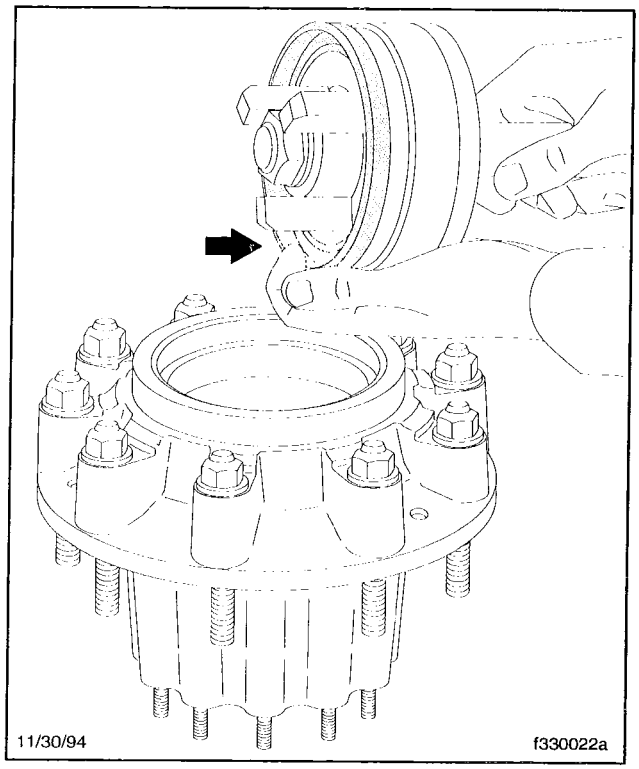


Fig. 7, Place the Seal on the Installation Tool (typical installation shown)

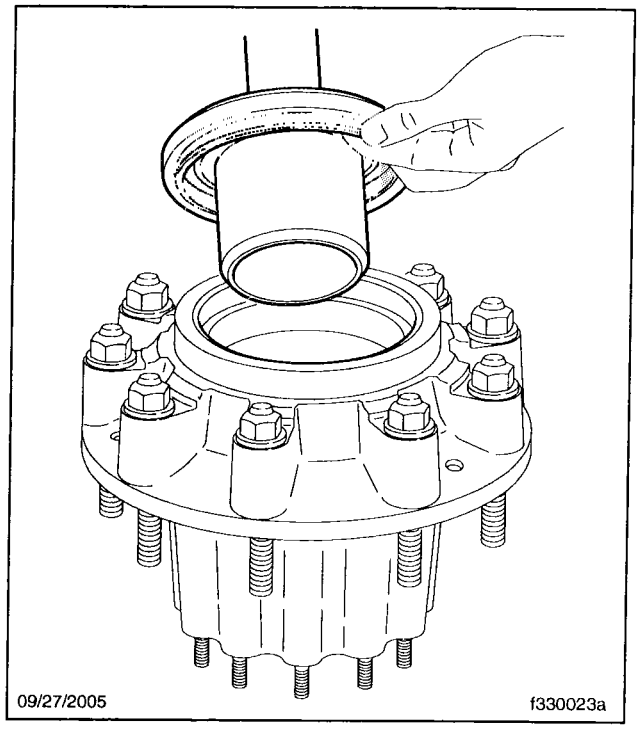


Fig. 8, Insert the Tool in the Hub Bore (typical installation shown)

2.5 Hold the tool handle firmly, and strike it until the sound of the impact changes as the seal bottoms out. See **Fig. 9**. Hold the tool firmly to avoid bounce or unseating of the seal from the adapter.

2.6 After the seal is bottomed in the bore, check for freedom of movement by manually moving the interior rubber part of the seal back and forth. A slight movement indicates a damage-free installation.

3. Carefully mount the hub and inner wheel bearing assembly on the axle spindle. Be careful not to unseat the inner wheel bearing or seal.

4. Fill the hub cavity with oil, then install the outer wheel bearing; handle the bearings with clean, dry hands. Use care not to damage the bearings as they are seated in the bearing cups. Remove the friction tape from the axle spindle threads.

5. Install the wheel bearing adjusting nut. See **Fig. 10**.

5.1 After the wheel hub and bearings are assembled on the spindle, tighten the inner adjusting nut finger-tight.

5.2 While rotating the wheel hub assembly, tighten the adjusting nut 100 lbf·ft (136 N·m).

5.3 Back off the adjusting nut completely.

5.4 Tighten the adjusting nut 20 lbf·ft (27 N·m) while rotating the wheel hub assembly.

5.5 Back off the adjusting nut one-third turn.

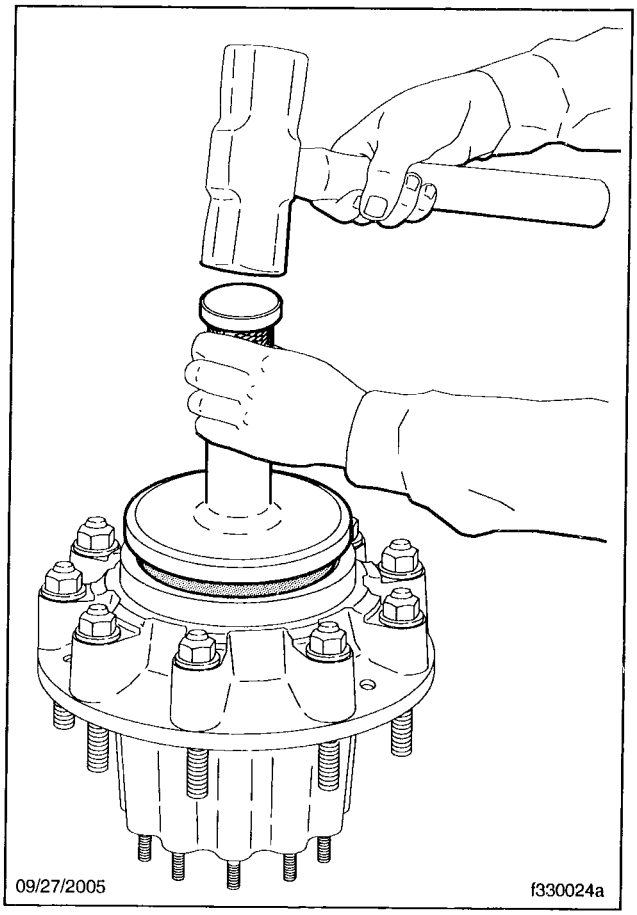


Fig. 9, Strike the Tool (typical installation shown)

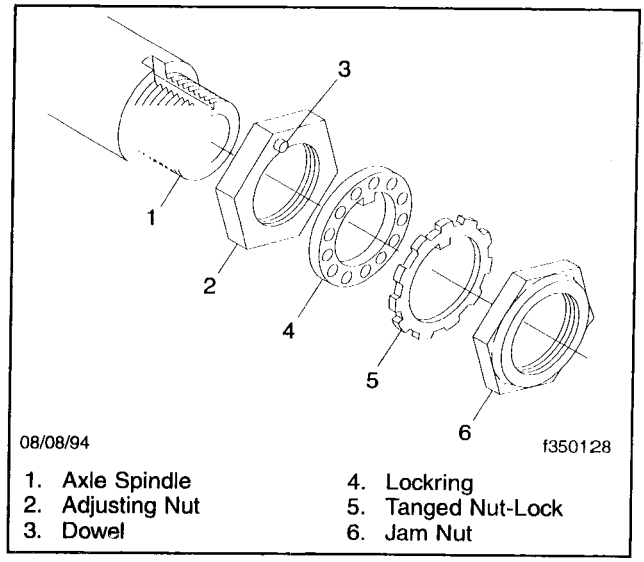


Fig. 10, Axle With Nut-Lock and Lockring

6. Install the locking device and the jam nut as follows:

   6.1 Install the locking device.

   NOTE: If no hole in the lockring aligns with the dowel on the adjusting nut, remove the lockring, turn it over and install it again. If a hole still doesn't align with the dowel, loosen the adjusting nut, but only enough to align the dowel with a hole in the lockring.

   6.2 Install the jam nut, and tighten it to the applicable torque value in **Table 4**.

Jam Nut Torque Values	
Size	**Torque: lbf·ft (N·m)**
1-1/8 to 2-1/2 Inch	200–300 (271–407)
2-5/8 Inch or Larger	250–400 (339–542)

Table 4, Jam Nut Torque Values

7. With the jam nut installed and tightened, adjust the bearings as follows:

   IMPORTANT: Do *not* adjust the wheel bearings with the wheel mounted on the hub. You cannot accurately adjust or measure bearing end play with the wheel mounted on the hub.

   7.1 Attach a dial indicator to the hub and set the point of the indicator in line with the end of the axle spindle.

   If the hub is aluminum, you may have to install the new brake drum on the hub to provide a steel base for the magnet of the dial indicator. Mount the new drum on the hub's drum pilot, then adjust the brake or have someone apply the brakes to hold the drum securely while you secure the drum using the stud at the 12 o'clock position, then the studs at about the 4 o'clock and 8 o'clock positions.

   NOTE: If using a stud-piloted hub and a steel drum, install 1-1/4 inch washers between the nuts and the new drum.

   7.2 Release the brakes if you used them to hold the drum while installing it.

   7.3 Grip the sides of the hub at the three o'clock and nine o'clock positions. Push in on the hub (and drum, if applicable), to seat the inboard bearing set. Zero the dial indicator.

   7.4 Once again, grip the sides of the hub at the three o'clock and nine o'clock positions. This time, pull out on the hub (and drum, if applicable). Read the dial indicator, and note the end play.

   7.5 Push the hub back in to confirm that the needle of the dial indicator returns to zero.

8. The end play must be between 0.001 and 0.005 inch (0.03 and 0.13 mm). If the end play is not within this range, adjust the end play as follows:

   8.1 Remove the jam nut and locking device, and back off or tighten the inner adjusting nut.

   8.2 Install the locking device and jam nut as described earlier, and measure the end play. If the end play is not between 0.001 and 0.005 inch (0.03 and 0.13 mm), turn the adjusting nut again.

   8.3 Once the end play is correct, bend two tabs of the nut-lock over opposing flats on the jam nut.

   8.4 Rotate the hub in both directions. It should turn freely with no dragging or binding. End play should be between 0.001 and 0.005 inch (0.03 to 0.13 mm).

9. Using a new gasket, install the hub cap.

10. If not already done, install the new brake drum.

11. If applicable, repeat the entire oil-seal and hub and brake drum replacement procedures on the other side of the vehicle.

12. Install the wheel-and-tire assemblies.

13. Raise the vehicle, remove the safety stands, then lower the vehicle.

14. Clean a spot on the base label (Form WAR259). The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch. Attach a completion sticker for campaign FL451 (Form WAR260) to the base label.

15. Remove the chocks from the tires.