Recall Campaign

Daimler Trucks
North America LLC

February 2010
FL557AB
NHTSA #09V-357

Copy of Letter to Owner

Subject: Rack and Pinion Steering Inner Tie Rod Ends

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.

Daimler Trucks North America LLC, on behalf of its Freightliner Trucks Division, has decided that a defect which relates to motor vehicle safety exists on specific Freightliner Cascadia, Century Class S/T, Columbia, and Coronado vehicles manufactured November 11, 2004, through July 20, 2009, with rack and pinion steering.

Under certain conditions, the left hand inner tie rod end may loosen over time. If not corrected, it could separate from the rack, making the vehicle more difficult to control at higher speeds and resulting in a possible vehicle crash.

The left hand inner tie rod will be removed from the steering rack and reinstalled with Loctite®. During the repair, the steering rack will be inspected and any rack with threads damaged due to a loosened inner tie rod will be replaced.

Parts are now available for authorized dealers to order. Contact your authorized dealer to arrange to have the recall performed and to ensure that parts are available at the dealership. To locate a dealer, search online at www.FreightlinerTrucks.com or contact the Warranty Campaigns Department for assistance.

When you contact your dealer, refer to campaign number **FL557AB**. Once parts are received at the dealership, the Recall will take between approximately half an hour and four hours, depending on the work needed, and will be performed at no charge to you. Should the entire rack and pinion gear require replacement, please allow time for the gear to shipped to the dealership.

IMPORTANT: When the Recall has been completed, please ensure that a label has been affixed to your vehicle referencing **FL557AB**.

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.

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 DTNA.Warranty.Campaigns@Daimler.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,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. 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

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: Rack and Pinion Steering Inner Tie Rod Ends

Models Affected: Specific Freightliner Cascadia, Century Class S/T, Columbia, and Coronado vehicles manufactured November 11, 2004, through July 20, 2009, with rack and pinion steering.

Please note the following:

- **FL513:** If a vehicle is also included in FL513, Rack and Pinion Steering – Steering Stops, FL513 must be completed **before** performing FL557.
- **Gear Replacement:** The need to replace a rack and pinion gear due to inner tie rod thread damage is expected to be rare and requires pre-authorization to include on FL557 claims. Submit a "CampaignPreApproval" inquiry to Warranty Campaigns describing the thread damage found and attach photos showing the damage. The gear will be requested for inspection.
- **Loctite:** An allowance of up to $1.00 may be included on the claim for Loctite 603.
- **Bellows:** If the left hand bellows shows substantial damage, it may be replaced without additional authorization (part number THY 607210A, Service Kit-Bellows). The reason must be included in the claim story.
- **Completion Stickers:** Please use blank completion stickers and write in the recall number, FL557.
- **Fixture:** If your dealership has not received the fixture that holds the rack during the repair and has a vehicle scheduled for FL557, submit a Campaign Issue inquiry to Warranty Campaigns and instructions will be provided.

Inner Tie Rod Inspection and Loctite® 603 Application

1. Check the base label (Form WAR259) for a completion sticker for campaign FL557 (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 completion sticker is present, no further work is needed. If a completion sticker is not present, proceed to the next step.
2. Place the front tires in the straight-ahead position on a level surface.

IMPORTANT: Do not park the vehicle on turnplates. The passenger-side tire must be on firm ground.

3. Turn the steering wheel one full rotation to the left to move the inner tie rod inward and align the gear for the following steps. Ensure the timing pointers on the input shaft seal cover and input shaft housing are aligned. See **Fig. 1**.
4. Apply the parking brakes and shut down the engine.
5. Visually inspect the top of the rack and pinion gear near the input shaft for a green or blue paint mark.

   If a green or blue paint mark is present, no further is needed. Clean a spot on the base label (Form WAR259), write the recall number, FL557, on a blank red completion sticker (Form WAR260) and attach it to the base label.

   If a green or blue paint mark is not present, proceed to the next step.

⚠ WARNING

Wear safety goggles when using compressed air to clean parts, as permanent harm to eyes could result from flying debris.

6. Using compressed air, clean the driver-side fittings and bellows on the steering gear until they are free of dirt and debris.
7. Remove the power steering fluid line clamp from the axle-mounted bracket to allow sufficient movement of the gear.
8. Remove the large Oetiker clamp from the driver-side bellows. Discard the clamp.

NOTE: Do not remove the small Oetiker clamp from the bellows.

9. Visually inspect the connection between the rack and the inner tie rod. Note if there is a gap present between the inner tie rod socket and the rack (**Fig. 2**, Items 2, 3, and A). This information will be used in step 32.
10. Place a jack under the left side of the front axle and jack up the driver-side steer tire, making sure the passenger-side tire remains firmly on the ground. Support the vehicle with a jack stand.
11. Remove the cotter pin and castellated nut and disconnect the driver-side outer tie rod from the tie rod arm.
12. Install the holding fixture as follows.

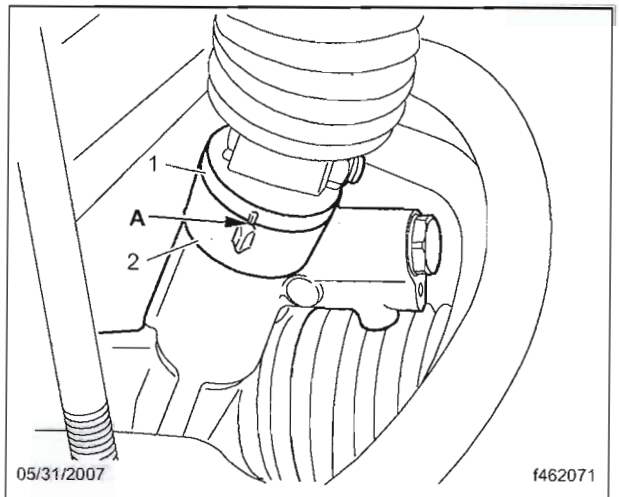
    IMPORTANT: Use a block of wood or a pad on the floor jack to prevent scratching or damage to the gear.

    12.1 Place a floor jack two inches under the gear to support the rack until the holding fixture is completely installed.

    12.2 Remove and discard the four steering gear mounting bolts and four nuts that secure the gear to the steering gear brackets on the axle. Lower the gear two inches (51 mm) onto the floor jack.

NOTICE

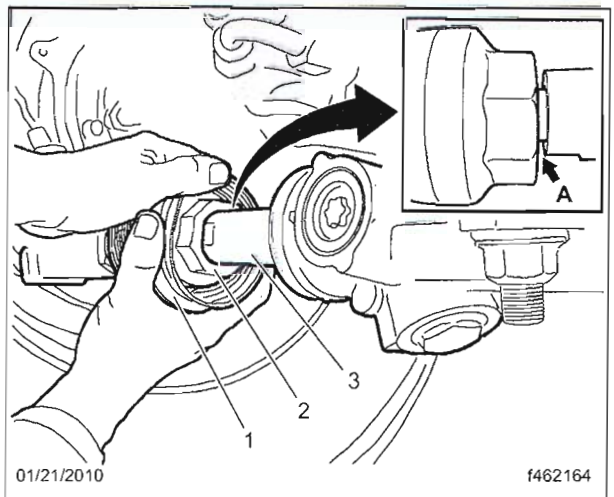
Do not make contact with the hard power assist lines while installing the holding fixture on the gear. Bolt only the holding fixture only to the steering gear bracket.



A. Align the pointers.

1. Input Shaft Seal Cover
2. Input Shaft Housing

Fig. 1, Pointer Alignment



A. Note if there is a gap between the inner tie rod socket and the rack.

1. Bellows
2. Inner Tie Rod Socket
3. Rack

Fig. 2, Inner Tie Rod Inspection

12.3 Place the holding fixture around the rack flats. Using 5/8–2" bolts and 5/8" nuts, mount the fixture to the driver-side steering gear bracket on the axle. Tighten the nuts 50 lbf·ft (68 N·m).

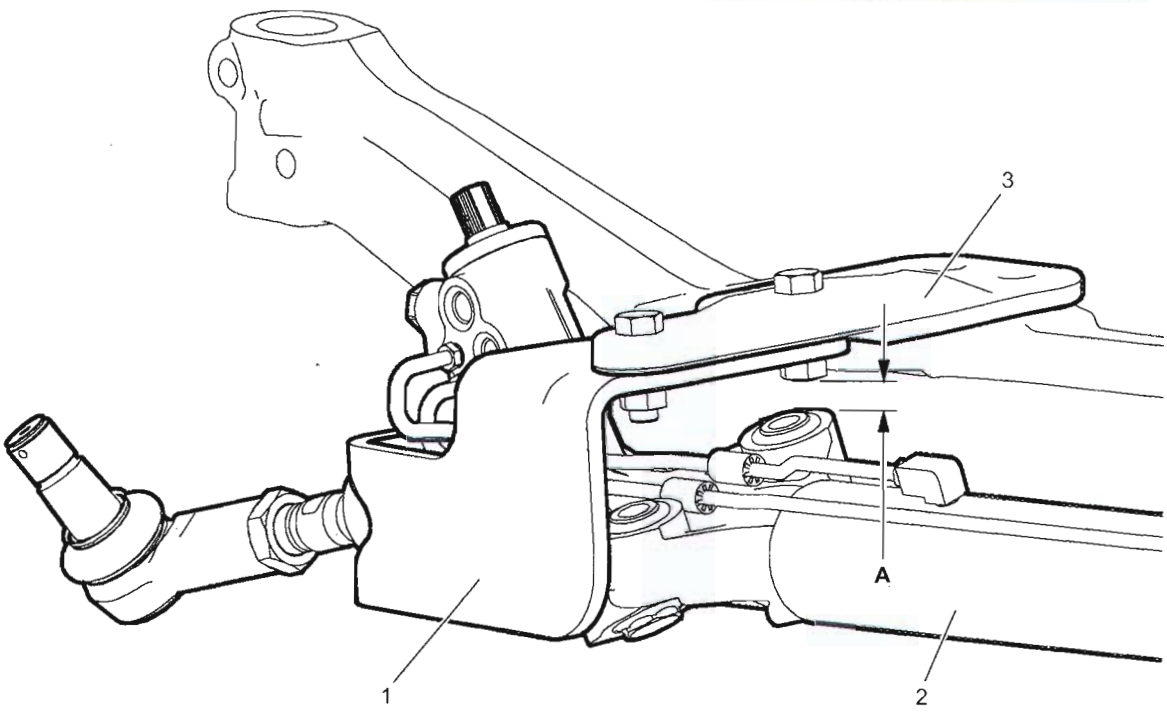
12.4 Ensure that there is at least 1 inch of clearance between the top of the steering gear and the holding fixture mounting bolts. See **Fig. 3**.

12.5 Ensure that the floor jack no longer supports the gear. See **Fig. 4**. The rack should be parallel to the ground, and the rack flats should be fully engaged in the fixture.

13. Unscrew the driver-side inner tie rod and disconnect it from the rack and pinion gear.

14. Visually inspect the threads of the inner tie rod. If the threads have sustained obvious damage, discontinue this procedure and replace the gear. This is expected to be rare and requires pre-approval, see the Claims for Credit section of this bulletin. For replacement instructions, see **Group 46** in the applicable workshop manual.

IMPORTANT: Before installing a new rack and pinion gear, check the replacement gear for a green or blue paint mark. If no paint mark is present, the replacement requires the Loctite® 603 repair outlined in these Work Instructions. Submit a "CampaignPreApproval" inquiry to Warranty Campaigns for how to claim.



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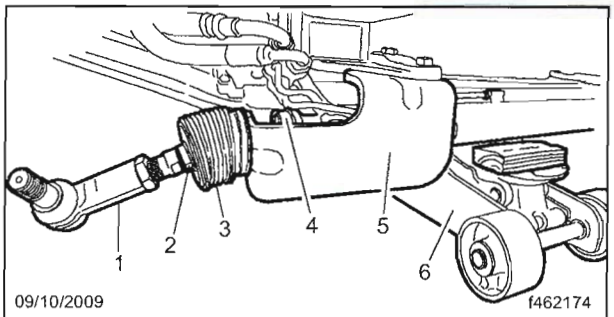
A. Ensure that there is at least 1 inch of clearance between the top of the steering gear and the holding fixture mounting bolts.

1. Holding Fixture
2. Driver-Side Steering Gear Bracket
3. Rack and Pinion Gear

Fig. 3, Rack and Pinion Gear Engaged in Holding Fixture

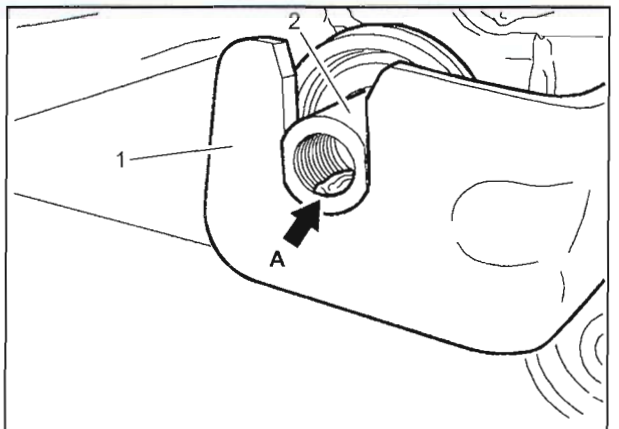
15. Remove excess oil from the internal threads of the rack and the external threads of the inner tie rod.
16. Remove any dirt or debris present on the rack or bellows seat.
17. Inspect the bellows to ensure that it has not been torn, punctured, or otherwise damaged. If the bellows has been damaged, replace it before proceeding to the next step.
18. Slowly apply 0.05 to 0.06 oz (1.5 to 2 mL) of Loctite 603 Retaining Compound to the internal threads in the rack. See **Fig. 5**. Wipe off any excess Loctite that drips from the threads.

IMPORTANT: Do not operate the vehicle for at least 30 minutes after applying Loctite 603.



1. Outer Tie Rod
2. Small Oetiker Clamp
3. Bellows
4. Rack
5. Holding Fixture
6. Floor Jack

Fig. 4, Holding Fixture Installation



A. Apply 0.05 to 0.06 oz of Loctite to the internal threads of the rack.

1. Holding Fixture
2. Rack

Fig. 5, Loctite Application

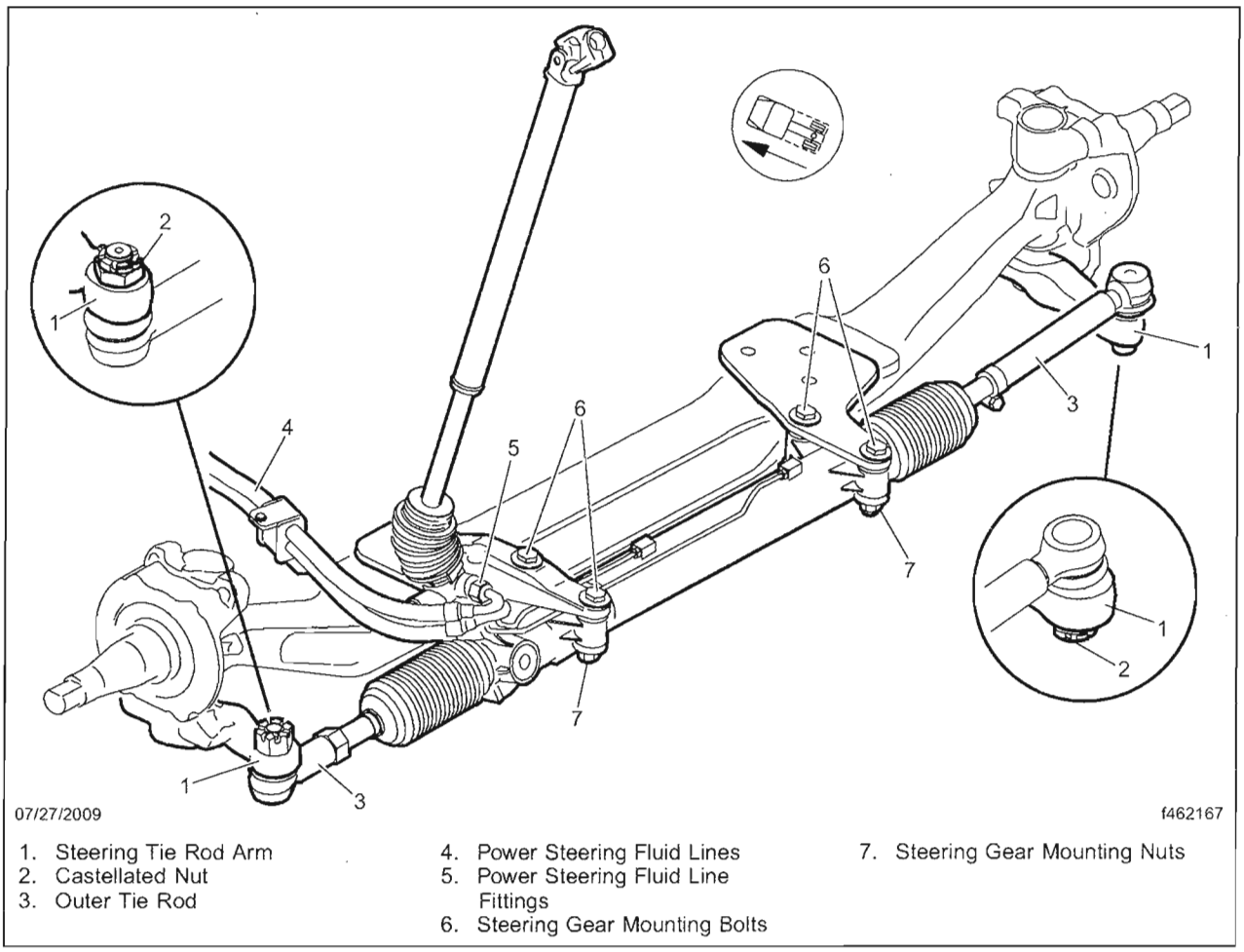
NOTICE

Fully opening the Oetiker clamp may cause permanent damage and render it ineffective.

19. Loosely install a new large Oetiker clamp on the bellows.
20. Lift the inner tie rod by hand and thread it onto the rack until it is hand-tight.
21. Rotate the ears of the large Oetiker clamp forward on the bellows to avoid pinching the clamp in the next step.

IMPORTANT: A 50 mm crow-foot adaptor and a torque wrench must be used in line with each other to achieve the proper torque.

22. Ensure that the rack protrudes slightly beyond the outside edge of the holding fixture when tightening the inner tie rod. Set a 50 mm crow-foot adaptor on a torque wrench to 180 lbf·ft (244 N·m), then tighten the inner tie rod.
23. Unbolt and remove the holding fixture from the axle.
24. Using new mounting bolts and nuts (**Fig. 6**, Items 6 and 7), install the steering gear on the axle. Tighten the fasteners 229 lbf·ft (311 N·m).



1. Steering Tie Rod Arm
2. Castellated Nut
3. Outer Tie Rod
4. Power Steering Fluid Lines
5. Power Steering Fluid Line Fittings
6. Steering Gear Mounting Bolts
7. Steering Gear Mounting Nuts

Fig. 6, Rack and Pinion Steering Gear Assembly

25. Using a clean rag, wipe the bellows and gear housing mating surfaces. Return the bellows to its normal length and ensure it is seated properly in the gear housing groove.

26. Ensure the large Oetiker clamp is properly seated in the clamp groove on the bellows. Align the large Oetiker clamp ear with the small clamp ear. Both clamp ears should be aligned with the rack housing casting rib. See **Fig. 7**.

IMPORTANT: All three barbs on the clamp must be engaged. If all three barbs are not engaged after crimping, remove and discard the clamp and install a new clamp. Oetiker clamps must be adequately crimped and the boot must be tightly secured to the gear housing to prevent moisture intrusion and corrosion.

27. Using an Oetiker clamp tool, crimp the large Oetiker bellows clamp ear until the inner ear width is 1/8 to 3/16 inch (3 to 5 mm). See **Fig. 8** and **Fig. 9**.

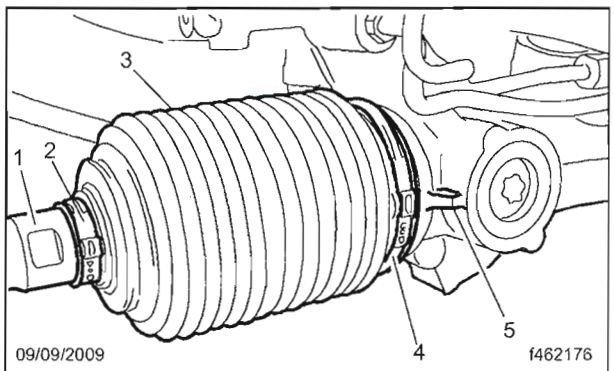
28. Install the power steering fluid line clamp on the axle-mounted bracket.

29. Attach the driver-side outer tie rod to the tie rod arm. Tighten the castellated nut 240 lbf·ft (325 N·m). Continue to tighten until the next castellated nut slot aligns with the hole in the ball stud and insert the cotter pin.

30. Using *green* paint, mark the top of the rack and pinion gear near the input shaft to indicate that the gear has been repaired. See **Fig. 10**.

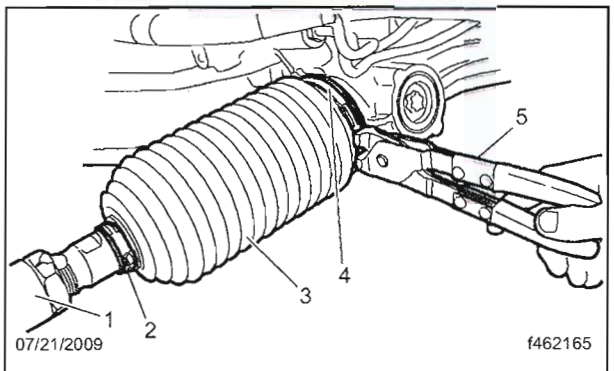
31. Lower the driver-side tire to the ground and start the engine. Turn the steering wheel 1/4 of a turn right and left ten times to accelerate curing of the Loctite by raising the inner tie rod joint temperature.

NOTE: It is not necessary to align the rack and pinion gear.



1. Outer Tie Rod
2. Small Oetiker Clamp
3. Bellows
4. Large Oetiker Clamp
5. Housing Casting Rib

Fig. 7, Oetiker Clamp Alignment



1. Outer Tie Rod
2. Small Oetiker Clamp
3. Bellows
4. Large Oetiker Clamp
5. Oetiker Clamp Tool

Fig. 8, Oetiker Clamp Installation

32. If a gap was found between the inner tie rod socket and the rack in step 9, adjust each tie rod length to obtain the specified toe-in dimension, as follows. Use a toe bar or tape measure to complete the following steps. If no gap was found, go to step 33.

    32.1 Loosen the driver-side tie rod jam nut. If necessary, hold the inner tie rod in place with a backup wrench on the inner tie rod flat (**Fig. 11**, Item 3).

    32.2 With the gear on-center, place a wrench on the driver-side inner tie rod flat and align the left tire by rotating the inner tie rod.

    Total left side toe-in should be between 0 and 1/16 inch (1.58 mm).

    32.3 Tighten the tie rod jam nut 285 to 305 lbf·ft (386 to 413 N·m).

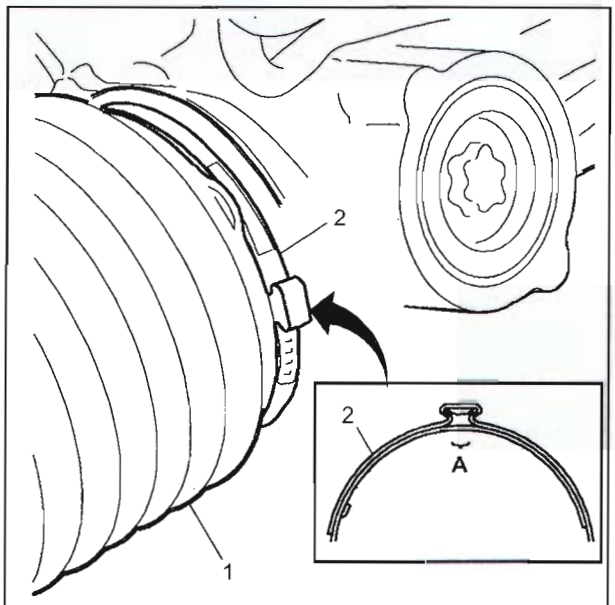
    32.4 Loosen the passenger-side tie rod clamp nut.

    32.5 With the gear on-center, place a wrench on the passenger-side inner tie rod flat and align the right tire by rotating the inner tie rod.

    Total right side toe-in should be between 0 and 1/16 inch (1.58 mm).

    32.6 Tighten the tie rod clamp nut 30 to 36 lbf·ft (41 to 48 N·m).

    IMPORTANT: Total toe-in for both sides should be as close to 0 as possible, and no greater than 1/8 inch (3.18 mm).



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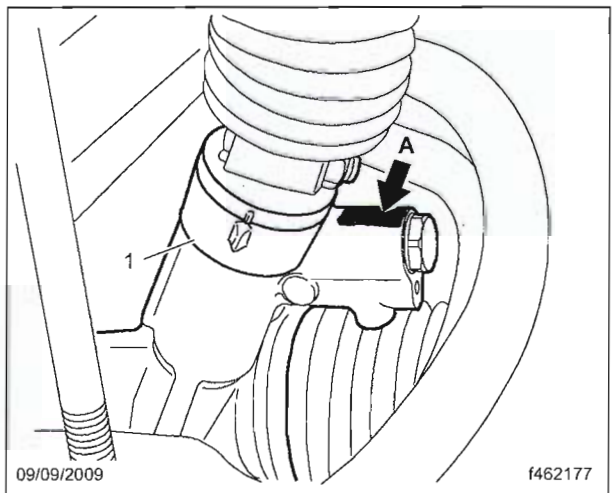
A. Crimp the clamp ears until the ear width is 1/8 to 3/16 inch (3 to 5 mm).

1. Bellows
2. Large Oetiker Clamp

Fig. 9, Oetiker Clamp Ear Width



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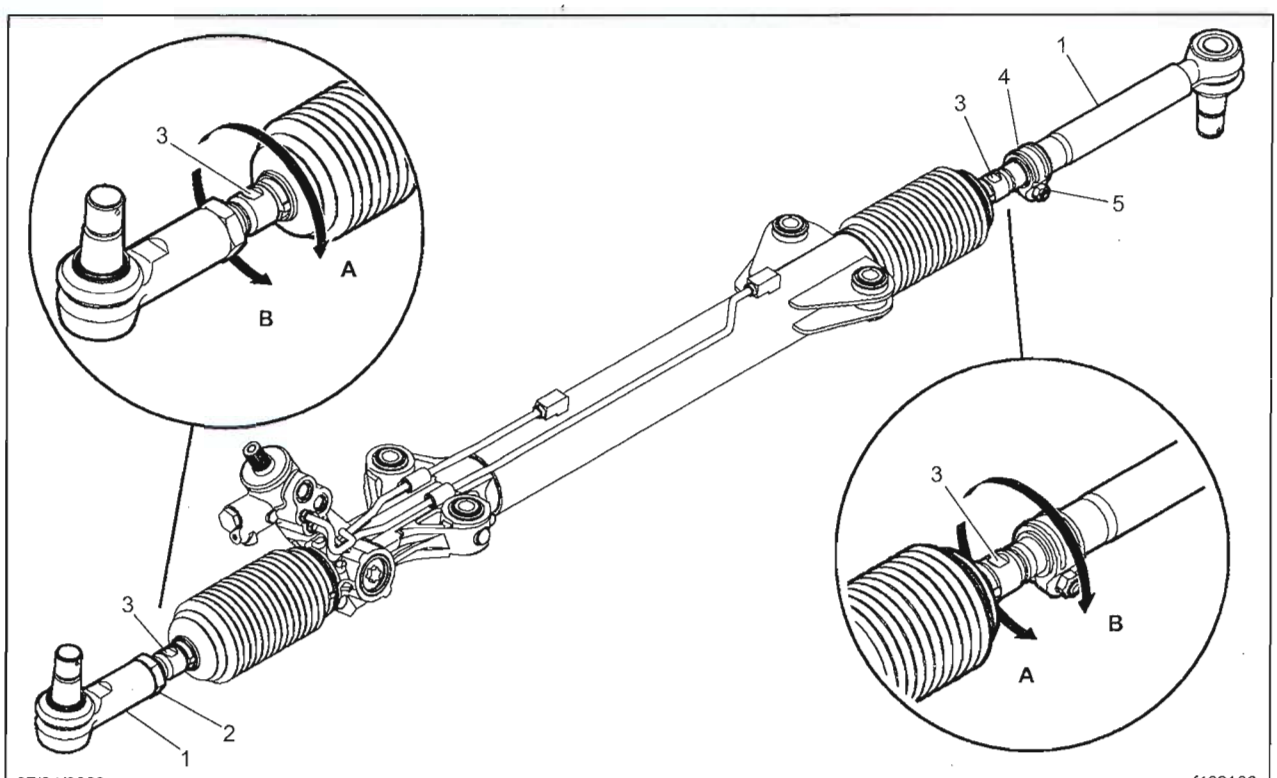
A. Apply green paint next to the input shaft housing.

1. Input Shaft Housing

Fig. 10, Paint Mark Location



A. Counterclockwise rotation *increases* the toe-in angle
B. Clockwise rotation *decreases* the toe-in angle

1. Outer Tie Rod
2. Tie Rod Jam Nut
3. Inner Tie Rod Flat
4. Tie Rod Clamp
5. Tie Rod Clamp Nut

Fig. 11, Rack and Pinion Gear Assembly

33. 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 (Form WAR260) for campaign FL557 to the base label.