

FLA COE  
FLB COE  
FLD Conventional  
Business Class  
FLC 112 Conventional

> Century Class Conventional  
Argosy COE  
Cargo  
> Columbia

Coronado  
Business Class M2  
> Cascadia  
108SD/114SD

Freightliner  
Service Bulletin

## General Information

On rack and pinion gears, inner tie rod looseness, pitting caused by corrosion, or power steering fluid leakage can lead to poor gear performance. If a customer complains of steering inconsistencies that may be related to the rack and pinion steering gear, complete the inspection procedure below.

If replacement of the gear is necessary, as indicated in any of the steps below, see the vehicle workshop manual for replacement instructions.

## Inspection

1. Park the vehicle on a level indoor surface with the front tires centered. Shut down the engine, set the parking brake, and chock the tires.
2. Raise the front wheels off the ground and support the vehicle with jack stands.

**IMPORTANT:** Complete the following steps on both sides of the vehicle.

3. Use brake cleaner to remove dirt and debris from the bellows and surrounding areas.
4. Remove the small and large Oetiker clamps from both bellows. Discard the clamps.
5. Grasp the tire and feel for looseness in the inner tie rods. If looseness is detected, check under the bellows to verify the inner tie rod is loose. If an inner tie rod is loose, replace the gear.
6. Pull the large ends of the bellows outboard as far as possible in order to wipe down the rack shafts, sockets, inner tie rod ball studs, passenger-side rack guide, and driver-side stop ring. Ensure all grease, dirt, and debris has been removed.
7. If power steering fluid is found under the bellows, check the gear for significant leaks.
  - 7.1 Wipe the rack shafts on both sides until clean.
  - 7.2 Start the vehicle, and allow the engine to idle until the power steering fluid reaches an operating temperature of at least 200 °F (93 °C).
  - 7.3 Turn the wheels back and forth to the stops three times each way.
  - 7.4 Center the wheels and shut down the engine.
  - 7.5 Pull the large ends of the bellows outboard as far as possible and inspect for leaking power steering fluid around the rack. If fluid leaked during the turn test, replace the gear.

**IMPORTANT:** Apply grease only to the rack shaft on the driver side. Do not apply grease to the teeth of the rack shaft. Do not apply grease to the passenger-side rack shaft.

8. Turn the wheels all the way to the right to fully expose the driver-side rack. Without applying grease to the teeth of the rack shaft, evenly apply a light film of Renolit CX-FO 20 grease to the metal surfaces covered by the driver-side bellows.
9. Inspect the bellows for damage, and replace if needed. See the vehicle workshop manual for replacement instructions.

**IMPORTANT:** Terostat MS 939 sealant must be applied at a temperature between 59 and 77°F (15 and 25°C) to effectively seal steering gear components.

Because Terostat sealant sets within ten minutes of application, the bellows should be installed within ten minutes of sealant application.

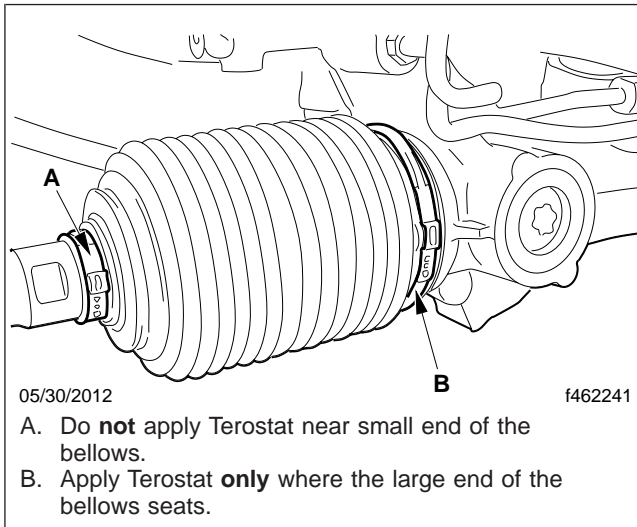
10. Evenly apply Terostat MS 939 sealant to the outer diameter of the rack housing where the large ends of the bellows seat on the gear housing. See [Fig. 1](#) and [Fig. 2](#).

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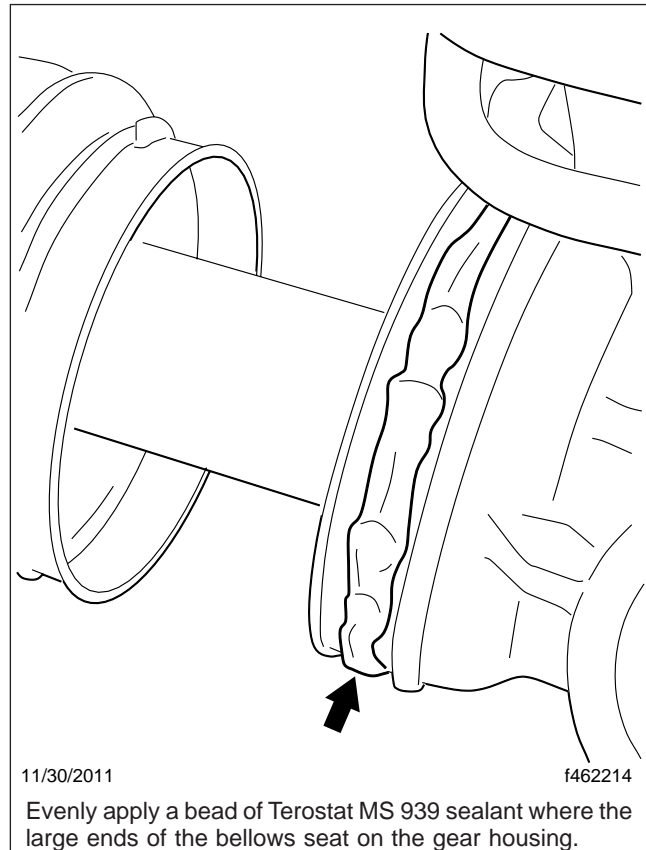
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**Fig. 1, Apply Terostat To Large End of Bellows**



**Fig. 2, Terostat MS 939 Sealant Application**

### NOTICE

**Improper installation may cause moisture and contaminants to enter the gear, which may result in severe damage.**

11. Seat the bellows on the gear housing and inner tie rods.
12. Rotate the bellows back and forth approximately 15 degrees in order to evenly disperse the sealant between the bellows and the gear housing.
13. Install new Oetiker clamps on each of the bellows as follows.
  - 13.1 Rotate the ears of the large Oetiker clamp forward on the bellows to avoid pinching the clamp in the next step.
  - 13.2 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. 3](#).

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## NOTICE

Do not over-tighten the Oetiker clamps. Over-tightening may lead to stretching of the clamp, which could allow moisture intrusion and corrosion. If an Oetiker clamp stretches, remove and discard the clamp and install a new clamp.

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 bellows must be tightly secured to the gear housing to prevent moisture intrusion and corrosion.

13.3 Using an Oetiker clamp tool (Fig. 4), crimp the small and large Oetiker bellows clamp ears until the ear width is 0.08 to 0.16 in (2 to 4 mm). See Fig. 5 and Fig. 6.

14. Remove excess sealant from the bellows ends and the gear housing.

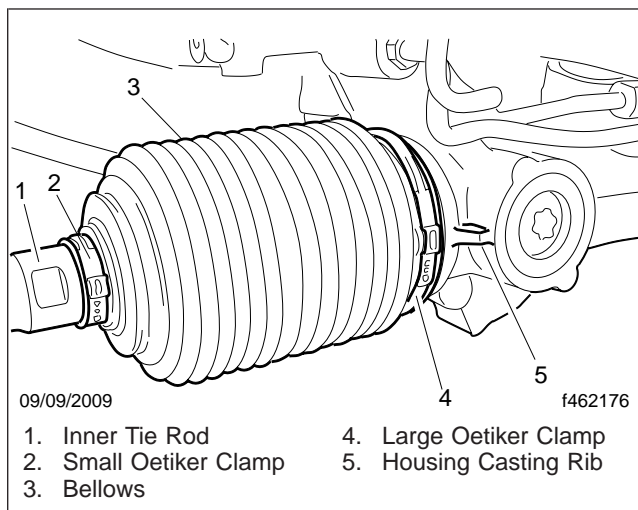


Fig. 3, Oetiker Clamp Alignment

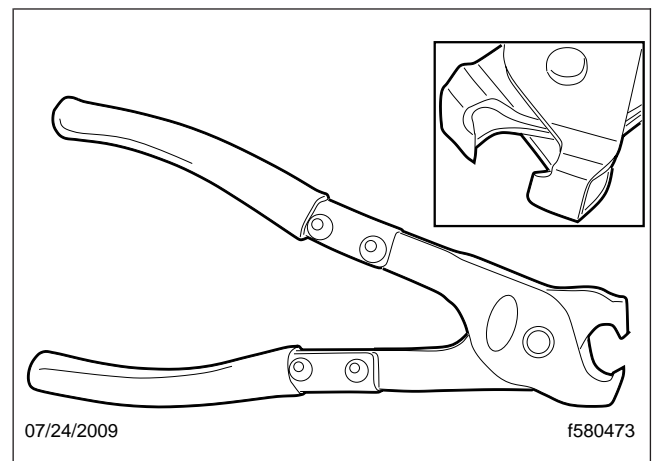


Fig. 4, Oetiker Clamp Tool, P/N 14100037 or 14100082

## Warranty

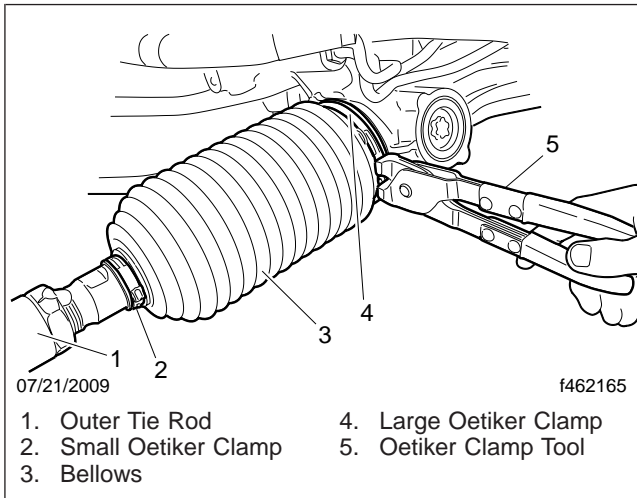
This is an informational bulletin only; normal warranty applies.

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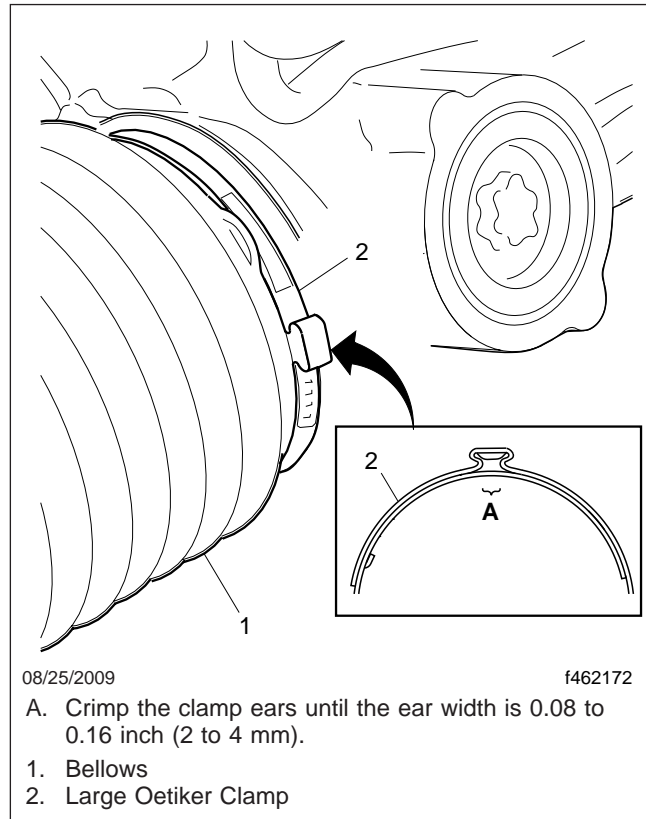
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**Fig. 5, Oetiker Clamp Installation**



**Fig. 6, Oetiker Clamp Ear Width**