



Technical Bulletin

Input Cage Leak Repair

Meritor Forward Tandem Drive Axles

RP 140 and 160 Series (With a Pump)
MD and RD 140 and 160 Series (Without a Pump)

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

How to Obtain Additional Maintenance, Service and Product Information

Refer to Maintenance Manual 5L, Single-Reduction Forward Differential Carriers on Tandem and Tridem Axles. To obtain this publication, visit Literature on Demand at meritor.com.

KIT 2916

KIT 2916 contains the following items. To obtain this kit, call Meritor's Commercial Vehicle Aftermarket at 888-725-9355.

- Loctite® sealant, only for axles without a pump (part number 2297-G-8613)
- Two O-rings (part numbers 5X1343 and 5X1034)
- Shim kit 2429
- Input seal assembly (part number A1-1205X2728)

Tools and Work Practices

Common air and hand tools were used to disassemble and assemble components, except in those instances where special tools are specified.

For assembly procedures, air tools were used only in areas that did not adversely affect the integrity of components and fasteners.

For assembly and disassembly procedures on lighter components and smaller fasteners, air ratchets or hand tools were used.

As the final assembly step, all fasteners were tightened to the correct torque specifications.

Service Procedures

Refer to Maintenance Manual 5L, Single-Reduction Forward Differential Carriers on Tandem and Tridem Axles, for complete maintenance and service procedures.

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

1. Park the vehicle on a level surface. Wear safe eye protection.
2. Disconnect the drive shaft from the forward-rear axle.
3. Check and document the input shaft endplay for reference later in this procedure.

Input shaft endplay = _____.

4. Inspect for evidence of a drive yoke seal leak before removing the input bearing cage. Figure 1. Lube from input seal leaks is most often seen on the input bearing cage in the area below the seal. Clean and inspect the joint for leakage at the input cage before you continue with the input cage leak repair.

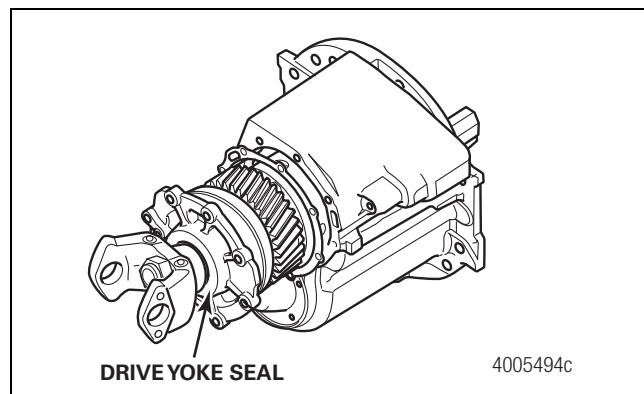


Figure 1

- Remove the seven input bearing cage capscrews. Figure 2.

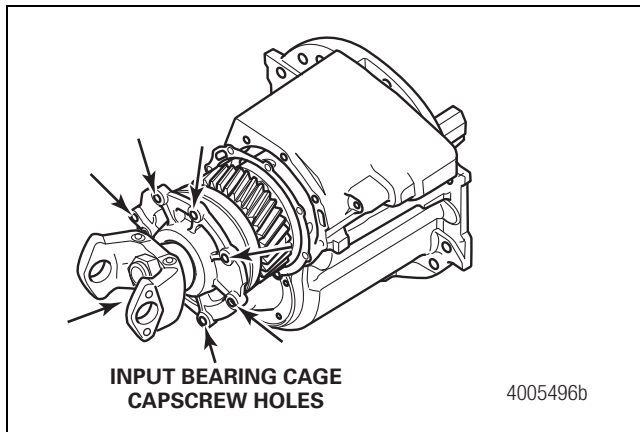


Figure 2

- Carefully withdraw the input shaft bearing cage assembly two to three inches only.
- Remove the shim pack, but keep it intact. Measure the shim pack thickness for later reference.
Shim pack thickness = _____.
- Remove the O-ring(s) from the input bearing cage and inspect them for cuts and nicks. Figure 3. The O-ring(s) can be removed by stretching them over the input cage and yoke. A nick or cut may indicate the presence of lead in chamfer damage.
The O-ring condition is _____.

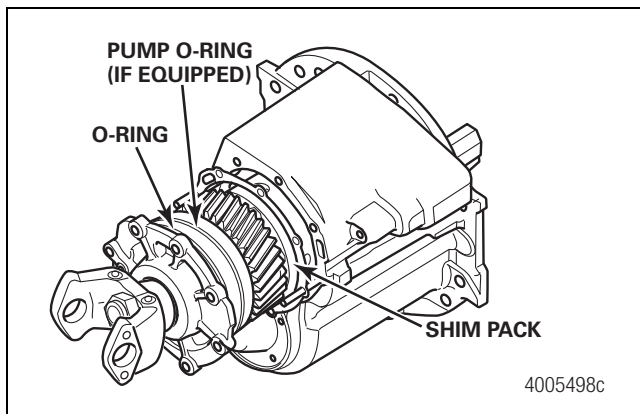


Figure 3

- Clean all sealant from surfaces surrounding the oil ports of the bearing cage and carrier assembly. Figure 4.

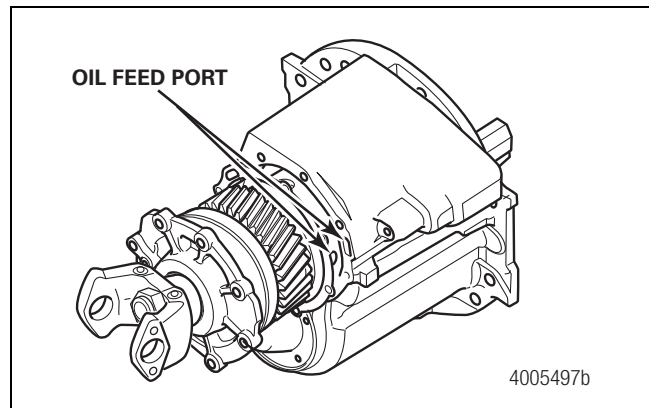


Figure 4

- Inspect the flange and lead in chamfer of the bore for nicks or other surface anomalies. Surface and chamfer conditions OK = Yes/No.
- Install the new O-ring(s) by stretching them over the yoke and flange. Be careful not to damage the O-ring(s). Ensure they are positioned correctly once installed. Install the O-ring marked with a yellow dot into the channel around the entire circumference of the input cage. For axles with pumps, install the unmarked O-ring into the channel at the input cage-to-pump interface. Figure 5.

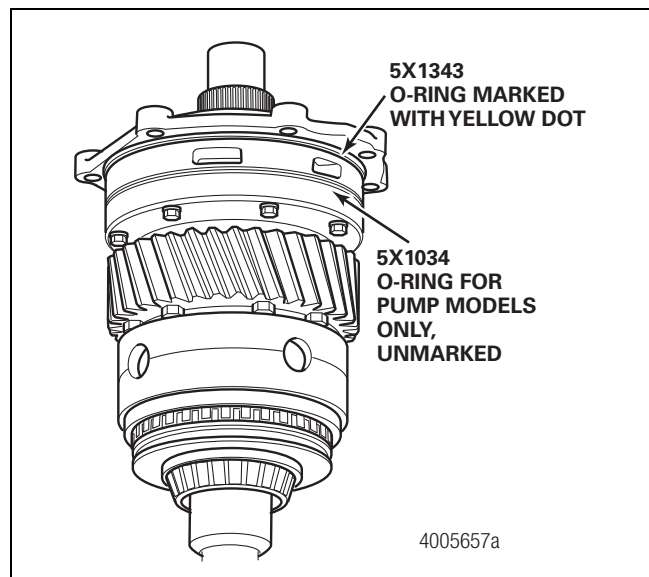



Figure 5

- Create a new shim pack to match the thickness of the original.

⚠ WARNING

Take care when you use Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into your eyes, follow the manufacturer's emergency procedures. Have your eyes checked by a physician as soon as possible.

13. **For carriers without a pump only:** Use the supplied Loctite® 518 sealant on the shims around the lubricant passage location only. Each shim leaf should be lightly coated on both sides around the lube passage only.
14. Install two guide pins in the carrier. This will assist with keeping the cage and shims aligned.
15. Push the input shaft assembly completely back into the carrier.
16. Reinstall and tighten the seven input cage fasteners to 90 lb-ft (122 N•m). 
17. Measure the input shaft endplay. It should measure the same as documented during disassembly. Adjust as necessary to achieve the specification of 0.002 inch to 0.008 inch. Refer to Maintenance Manual 5L, Single-Reduction Forward Differential Carriers on Tandem and Tridem Axles.
18. The input cage repair is complete. Use the following procedure to remove the input seal and install a new one.

Remove the Forward-Rear Axle Input Seal and Install a New One

1. Attach a flange bar or place a yoke bar over the input yoke to hold the yoke or flange while you remove the nut. Always use a flange or yoke bar during removal and installation of the flange yoke nut to prevent damage to the gearing. Figure 6.

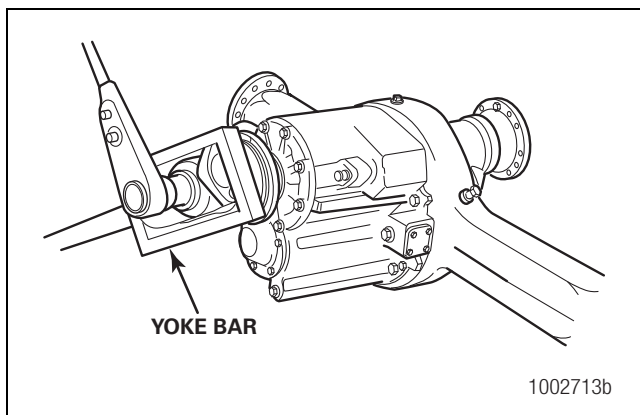


Figure 6

⚠ WARNING

Use a puller tool to remove the yoke or flange from the shaft. Do not use a hammer or mallet, which can damage components and cause vibration in the driveline. If this occurs, the driveline can separate from the vehicle during operation. Serious personal injury and damage to components can result.

2. Remove the yoke nut and washer. Use a puller tool to remove the yoke or flange from the shaft. Do not use a hammer or mallet, which can damage components. Figure 7.

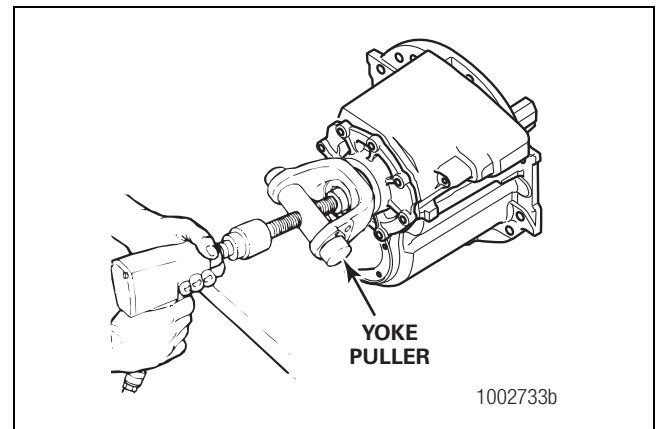


Figure 7

3. Carefully remove the pinion seal from the yoke or carrier. Do not damage the seal bore when you remove the seal. Do not allow dirt or grease to contaminate the seal bore or adjacent bearings.
4. If a seal sleeve is installed onto a yoke, remove the sleeve using a bearing puller. Do not reuse the seal sleeves.
5. Inspect the yoke seal area for damage that could cause lubricant leaks after you install the seal. Use emery paper or an equivalent product to remove scratches, nicks or burrs only.
6. Apply a light coat of axle oil to the yoke seal journal. Position the sleeve onto the forward-rear axle input yoke sleeve driver. Do not touch the greased areas of the sleeve. The sleeve must be kept clean prior to assembly into the seal.

⚠ WARNING

Observe all warnings and cautions provided by the press manufacturer to avoid damage to components and serious personal injury.

7. Use an arbor press and the appropriate driver to install the sleeve onto the yoke. Verify that the sleeve is correctly positioned on the yoke. Figure 8.

The yoke must be fully pressed into the sleeve driver until the end of the yoke bottoms out in the sleeve driver. This will correctly position the sleeve on the yoke. When correctly seated, the forward-rear input sleeve is positioned 0.030-inch \pm 0.030-inch (0.75 mm \pm 0.75 mm) from the end of the yoke. Figure 9.

- **If you do not have a press:** Position the yoke on a five-inch (127 mm) spacer on a workbench. Use a dead-blow hammer and the appropriate driver to install the sleeve onto the yoke. Figure 10.

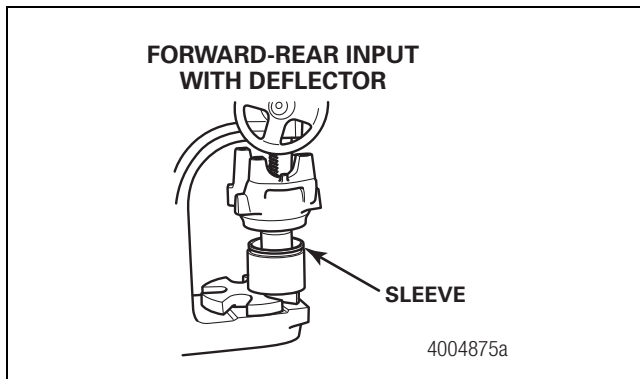


Figure 8

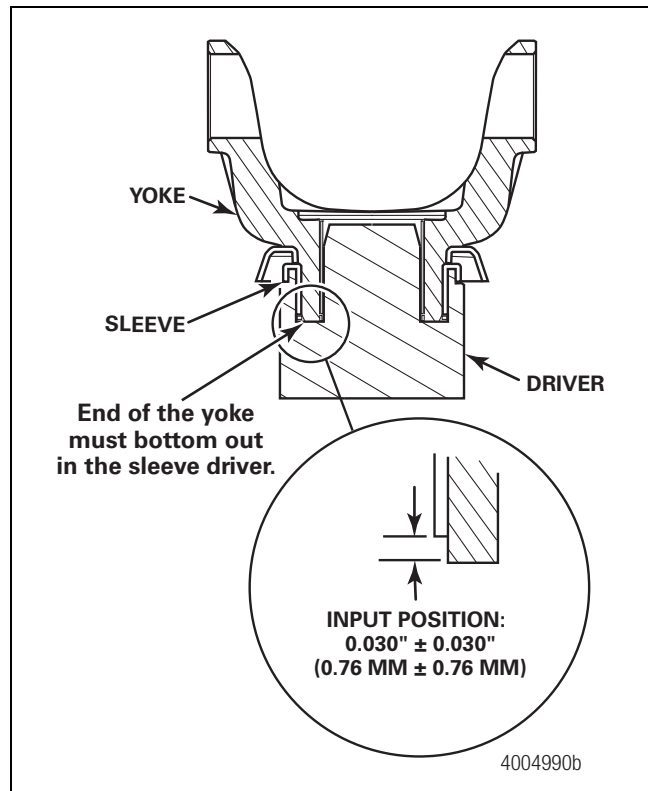


Figure 9

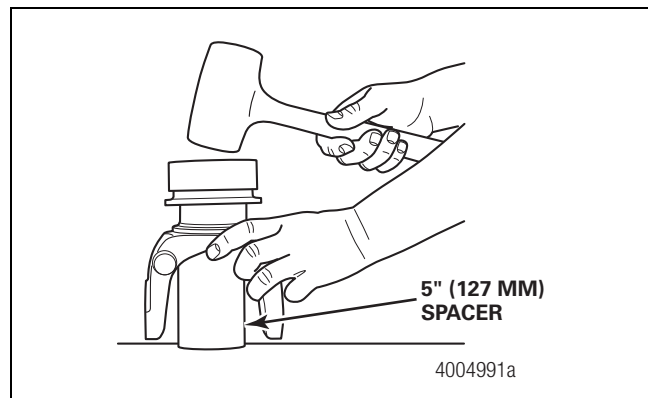


Figure 10

⚠ CAUTION

Hold the sleeve and seal only on the outer diameter. Do not touch the greased inner diameter of the seal and the greased area of the sleeve. This can contaminate the seal and cause a leak between the shaft and the seal. Damage to components can result.

8. Install the forward-rear axle input seal. Hold the sleeve and seal only on the outer diameter. Position the seal onto the seal driver and align it with the forward-rear axle input bearing cage. Do not touch the lips in the inner diameter of the seal. Use a dead-blow hammer and the appropriate driver to install the seal into the bearing cage. Figure 11.

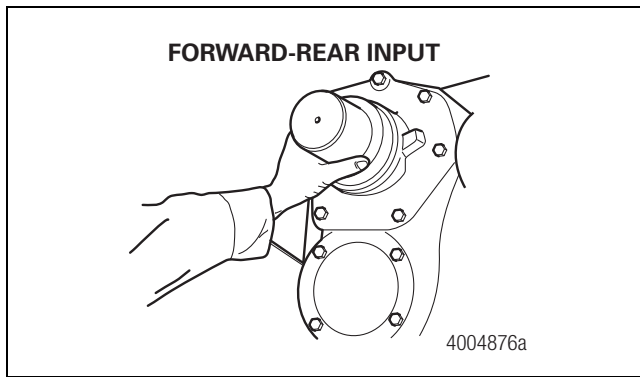


Figure 11

9. Use a feeler gauge to check the seal gap. The seal is correctly installed if the gap is less than 0.005-inch (0.127 mm) around the circumference of the seal flange. Figure 12.
 - **If the gap is more than 0.005-inch (0.127 mm):** Use a dead-blow hammer and the appropriate driver to completely install the seal.

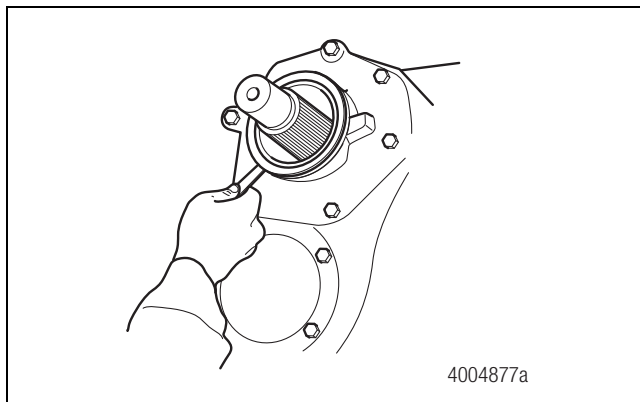



Figure 12

10. If you're using a seal that does not require a yoke-installed sleeve, apply a light coat of axle oil to the yoke seal journal. Install the yoke.

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11. Apply Loctite® 270 adhesive (part number 2297M5213) or Loctite® 277 adhesive (part number 1199Y3795) at the top of the input shaft threads from inboard to outboard in a single bead 0.120-inch (3.05 mm) wide.

12. Install the yoke nut and tighten it to 750-850 lb-ft (1020-1150 N•m) and connect the drive shafts. 

Procedure Timing

- This technical bulletin provides the recommended input cage leak repair procedure for Meritor RP 140 and 160 Series forward tandem drive axles with a pump, and MD and RD 140 and 160 Series forward tandem drive axles without a pump.
- Labor time allowances in this document result from labor time studies.
- Time study procedures were performed according to industry standards and developed by an experienced, independent firm that specializes in heavy- and medium-duty trucks, automotive service publications and labor standards development.
- Labor time allowances in this bulletin can be used to address warranty issues that relate to repairs on Meritor axles.
- Each timed step reflects the actual repair time incurred for that step.
- A technician who is familiar with a procedure can perform that procedure more quickly. In these instances, the timed steps were repeated to obtain an average time.
- Labor allowance times provided are repair time, parts cleaning time, and adjustment and inspection times required to correctly complete the repair.

Allowances

The labor time allowances published in this bulletin are adjusted upward by 40 percent from the "actual repair time" to allow for usual variations in equipment, facilities, the technician's personal time, normal work interruptions, and parts and tool procurement time. This 40 percent allowance represents a typical allowance for the truck industry.

Labor Time Guidelines

Labor allowance times provided are repair time, parts cleaning time, and adjustment and inspection times required to correctly complete the repair. Refer to the table in this bulletin.

Table A: Time Guidelines

| Step | Description |
|-----------------|---|
| 1 | Disconnect drive shaft from forward-rear axle. |
| 2 | Check and document input shaft endplay. |
| 3 | Remove the seven input bearing cage capscrews and pull back the input shaft assembly. |
| 4 | Remove, measure and record shim pack thickness. |
| 5 | Remove O-ring and clean sealant from input bearing cage and carrier casting. |
| 6 | Install new O-ring, apply sealant and install input bearing cage assembly. |
| 7 | Tighten input bearing cage bolts. |
| 8 | Measure the input shaft endplay. |
| 9 | Remove and install new input seal. |
| 10 | Connect drive shaft and tighten bolts. |
| Total Hours 2.1 | |



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