



## Installing a Multiple-Lip Seal (MLS) onto Meritor Single and Tandem Drive Axles

140, 160, 180 and 14X Series Single Drive Axles  
140, 160, 180, 380, 13X and 14X Series  
Tandem Drive Axles

MTC-4208/4210/4213 Transfer Cases

Does Not Apply to Meritor Front Drive Steer Axles, Other  
Drive Axles or Transfer Cases Not Listed in This Bulletin

### 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 the Multiple-Lip Seal (MLS) Installation CD (order TP-0531); Maintenance Manual 5A, Single-Reduction Rear Differential Carriers: Single Rear Drive Axles, Rear-Rear Tandem Drive Axles and Front Drive Steer Axles; Maintenance Manual 5L, Single-Reduction Forward Differential Carriers on Tandem and Tridem Axles; Maintenance Manual MM-0970, MT-14X Series Single-Reduction Forward Differential Carriers on Tandem Axles; Maintenance Manual MM-0990, Amboid Rear Differential Carrier: Rear/Rear Carrier on MT-40-14X Series Tandem Drive Axles; and Maintenance Manual MM-0146, Transfer Cases. To obtain these publications, visit Literature on Demand at meritor.com.

### How to Obtain Kits

To obtain driver kit 4463 or individual drivers and parts, call Meritor's Commercial Vehicle Aftermarket at 888-725-9355, or order through your regular parts ordering channel.

### Important Information

This technical bulletin provides the recommended procedure for installing Meritor multiple-lip seals (MLS) on Meritor 140, 160, 180 and 14X series single and 140, 160, 180, 380 and 14X series tandem drive axles as well as MTC-2408/4210/4213 series transfer cases at the input position only. These instructions do not apply to front drive steer axles, other transfer cases or other drive axles not listed in this publication.

Two-piece multiple-lip seals are used at the tandem forward-rear input and output positions and transfer case input position. This style seal features a separable sleeve which is installed on the yoke. One-piece unitized multiple-lip seals are used on the rear-rear axles and do not require a sleeve.

Refer to the following table for correct driver and seal part numbers. The seal and sleeve drivers can be purchased individually or all together in kit 4463.

### Driver and Sleeve Part Numbers

Axle Model and Position	Seal Service Part Number	Seal Drivers	Sleeve Drivers
140, 160, 180, 380 and 14X Series Forward-Rear Unit Input (FUI)	A1-1205X2728	2728T1	2728T2
140, 160 and 14X Series Forward-Rear Unit Output (FUO)	A1-1205Y2729	2729T1	2729T2
140, 13X and 14X Series Rear-Rear Unit Input (RUI) — 2.47-7.17 Ratios	A1-1205Z2730	2730T1	Not Required — Sleeve is unitized
14X Series Rear-Rear Unit Input (RUI) — 2.28 Ratio	A1-1205Z2730	2730T1A	Not Required — Sleeve is unitized
160 and 180 Series Rear-Rear Unit Input (RUI)	A1-1205A2731	2731T1	Not Required — Sleeve is unitized
MTC 4208/4210/4213 Input Shaft Only (Transfer Case)	A1-1205X2728	2728T1	2728T2

**NOTE:** Series refers to all related carrier models in the series. For example, 140 series applies to carrier models 143, 145, etc.

Forward input and output seals must be serviced with the seal and sleeve. The service part number provides both when required. Check your application carefully before installing the multiple-lip seal.

## Removal

### ⚠ 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.

### ⚠ CAUTION

On a rear-rear input, if you partially or fully install a yoke and then remove it for any reason, remove, discard and replace the seal with a new seal. If a seal or sleeve is removed after partial or full installation, discard the seal or sleeve and replace it with a new seal or sleeve. Damage to components can result.

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Set the parking brake. Block the wheels to prevent the vehicle from moving.
3. Use a jack to raise the vehicle so that the wheels to be serviced are off the ground. Support the vehicle with safety stands.
4. Disconnect the drive shafts.
5. Attach a flange bar or place a yoke bar over the input or output 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 1.

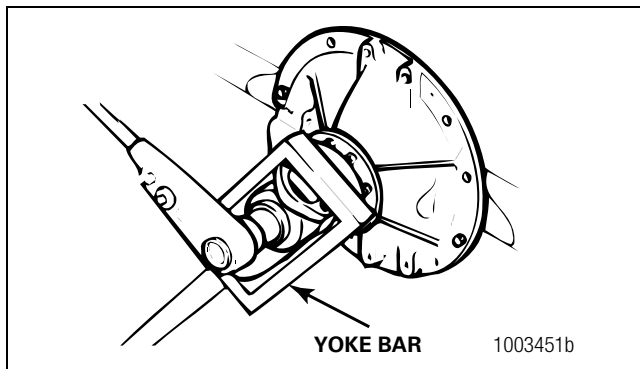


Figure 1

### ⚠ 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.

6. 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 2.

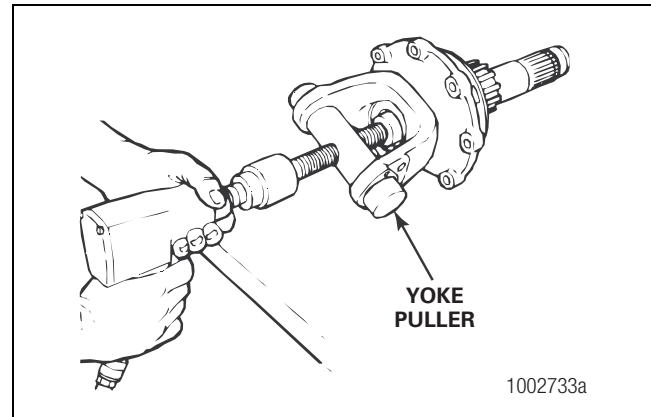


Figure 2

### ⚠ CAUTION

On axles that have the bolt-on deflector on the forward-rear output shaft bearing cage, the deflector must be removed and discarded. The new forward output sleeve will not assemble correctly to the new output seal with the bolt-on deflector in place. Remove the deflector from the output shaft bearing cage and reassemble the output cage hex-head capscrews and washers according to the appropriate maintenance manual instructions. Damage to components can result.

7. 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.
8. If a seal sleeve is installed onto a yoke, remove the sleeve using a bearing puller. Do not reuse the seal sleeves.
9. 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.

# Installation

## Two-Piece Seals and Sleeves on Forward-Rear Axles (Input and Output Positions), and MTC-4208/4210/4213 Transfer Cases (Input Position Only)

### ⚠ WARNING

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear safe eye protection.
  - Wear clothing that protects your skin.
  - Work in a well-ventilated area.
  - Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
  - You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.
1. Clean the ground and polished surface of the yoke journal using a clean shop towel and a safe cleaning solvent. Do not use abrasive cleaners, towels or scrubbers to clean the yoke or flange surface. Do not use gasoline.
  2. 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.
  3. Install the deflector, if equipped, onto the yoke. You must install the deflector before you install the sleeve into the yoke. Figure 3.

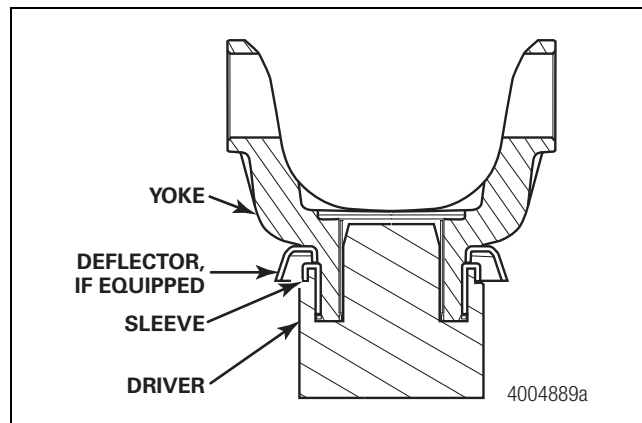


Figure 3

### ⚠ WARNING

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

Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

4. Apply a small amount of axle oil, only a few drops, to the yoke seal journal. Do not use an excess amount of oil for sleeve installation. The use of too much oil can give the appearance of a leaking seal once the vehicle is returned to service. Position the sleeve into the yoke sleeve driver. Do not touch the greased areas of the sleeve. The sleeve must be kept clean prior to assembly into the seal. Use an arbor press and the appropriate driver to install the sleeve into the yoke. Verify that the sleeve is fully-seated in the yoke to prevent damage to components. Figure 4.

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 output sleeve will be positioned 0.200-inch  $\pm$  0.030-inch (5 mm  $\pm$  0.76 mm) from the end of the yoke. The forward-rear input and transfer case input sleeve will be positioned 0.030-inch  $\pm$  0.030-inch (0.76 mm  $\pm$  0.76 mm) from the end of the yoke. Figure 5.

- **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 into the yoke. Figure 6.

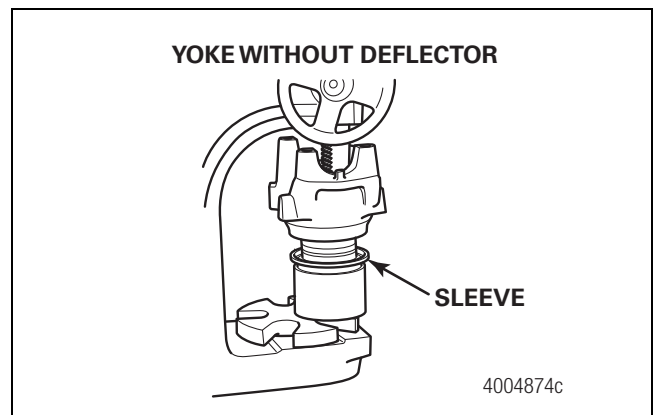
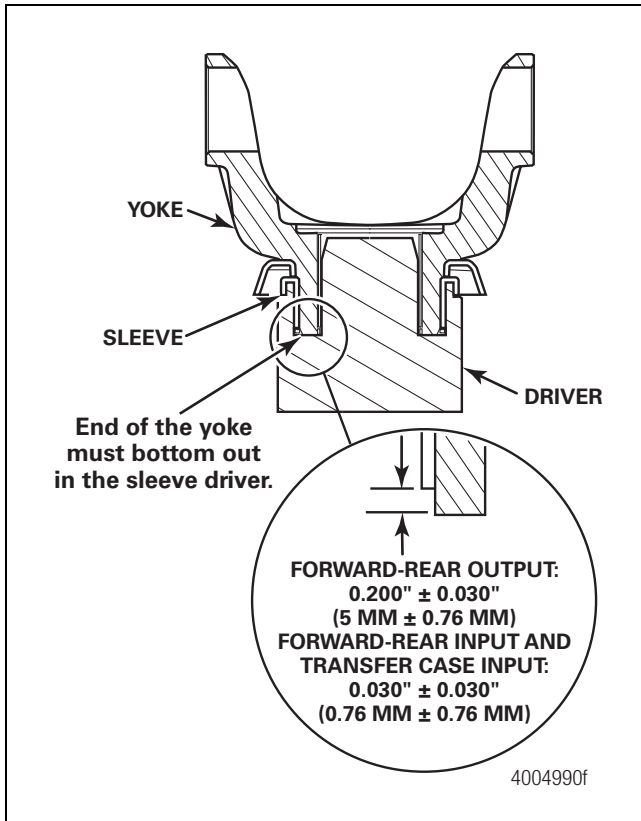
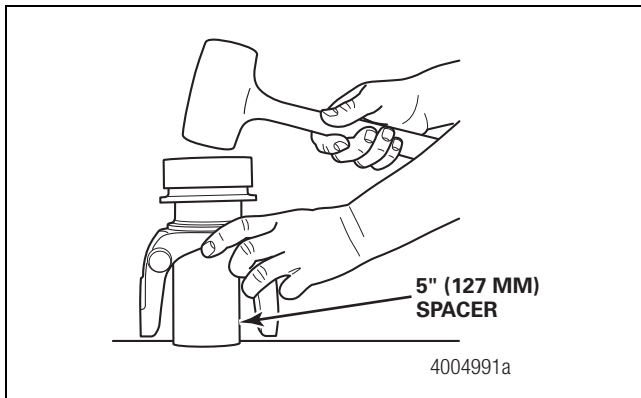


Figure 4



**Figure 5**

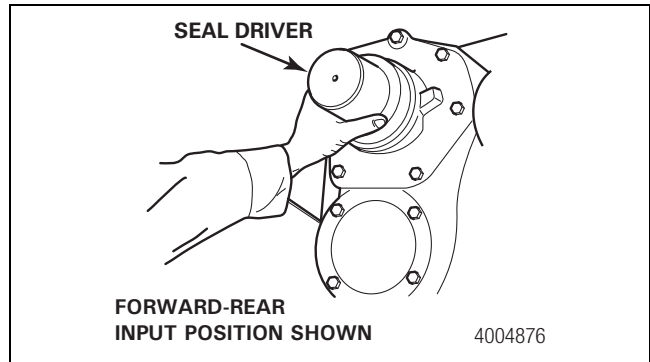


**Figure 6**

**⚠ 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.

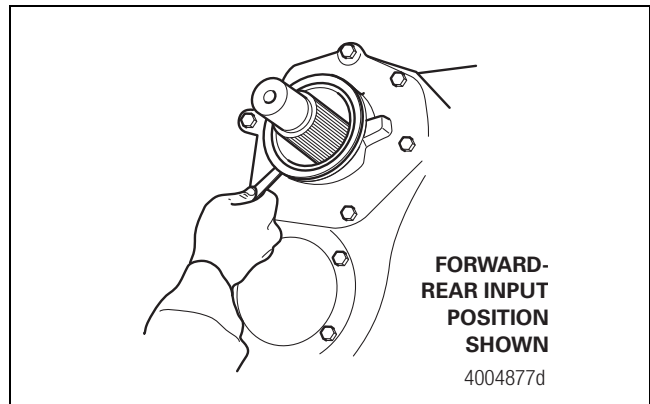
5. Install the seal. Hold the sleeve and seal only on the outer diameter. Position the seal into the seal driver and align it with the bearing cage. Do not touch the lips in the inner diameter of the seal. Use a dead-blow hammer and the appropriate driver to install the seal into the bearing cage. Figure 7.



**Figure 7**

6. Use a feeler gauge to check the seal gap at all axle positions. 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 8.

- **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 8**

## One-Piece Unitized Seal on Rear-Rear Axles

### **⚠️ WARNING**

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear safe eye protection.
  - Wear clothing that protects your skin.
  - Work in a well-ventilated area.
  - Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
  - You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.
1. Clean the ground and polished surface of the yoke journal using a clean shop towel and a safe cleaning solvent. Do not use abrasive cleaners, towels or scrubbers to clean the yoke or flange surface. Do not use gasoline.
  2. 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.
  3. Install the deflector, if equipped, onto the yoke.
  4. Apply a light coat of axle oil to the yoke seal journal.

### **⚠️ WARNING**

Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

### **⚠️ CAUTION**

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

5. Install the rear-rear axle input seal. Hold the seal only on the outer diameter. Position the seal into the seal driver and align it with the rear-rear axle input bearing cage. Use a dead-blow hammer and the appropriate driver to install the seal into the bearing cage. Figure 9.

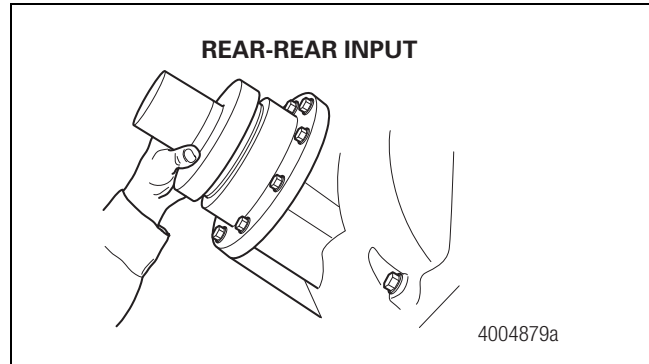


Figure 9

6. 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 10.
  - **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.

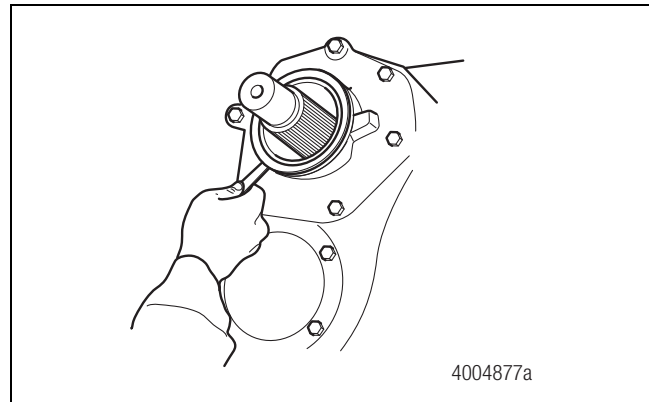


Figure 10

7. Apply a light coat of axle oil to the yoke seal journal. Install the yokes and connect the drive shafts. Refer to the manuals specified in this bulletin for the correct procedures.



Meritor Heavy Vehicle Systems, LLC  
2135 West Maple Road  
Troy, MI 48084 USA  
866-OnTrac1 (668-7221)  
meritor.com

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