Service Notes

About This Manual
This manual provides maintenance and service procedures for the Meritor MTC-4208, -4210 and -4213 G/C/S model transfer cases with internal pumps only. See TP-06103 for information on installing an external pump.

Transfer Case Interchangeability
All X/XL/XP models feature an increased sump capacity and thus a slight change to the exterior housing geometry that could potentially impact clearance to surrounding components.

The MTC-4208X/XL and MTC-4210X/XL transfer case models are not directly interchangeable with MTC-4208G/C/S and MTC-4210G/C/S transfer case specifications.

The XL model will have different interface points for the oil cooler inlet and outlet lines, if equipped. This will require different length cooler lines.

Both X and XL model lubrication lines have changed locations from previous models as well. This could potentially impact clearance to surrounding components.

The MTC-4208XP, MTC-4210XP and MTC-4213X transfer case models are backwards-compatible with MTC-4208G/C/S, MTC-4210G/C/S and MTC-4213G/C/S transfer case specifications respectively.

Any G/C/S model transfer case cannot be used in place of the X/XL/XP models if the application utilizes “engage-on-the-fly” or a mid-ship pump.

Before You Begin
1. Read and understand all instructions and procedures before you begin to service components.
2. 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.
3. Follow your company’s maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Hazard Alert Messages and Torque Symbols

⚠️ WARNING
A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

⚠️ CAUTION
A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components.

 aç This symbol alerts you to tighten fasteners to a specified torque value.

How to Obtain Additional Maintenance, Service and Product Information
Visit Literature on Demand at meritor.com to access and order additional information.

Contact the Meritor OnTrac™ Customer Call Center at 866-668-7221 (United States and Canada); 001-889-1834 (Mexico); or email OnTrac@Meritor.com.

How to Obtain Tools and Supplies Specified in This Manual
Call Meritor’s Commercial Vehicle Aftermarket at 888-725-9355 to obtain Meritor tools and supplies.

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<td>Transfer Case Front Case</td>
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1 Vehicles not equipped with a transfer case neutral air control may be equipped with a neutral breather which allows the shift cavity to exhaust. On vehicles equipped with a neutral air control, the solenoid allows this cavity to exhaust.

**MTC-4208 Transfer Case Front Case**
<table>
<thead>
<tr>
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<td>Bearing Cage Capscrew and Washer</td>
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<td>Relief Valve</td>
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## Exploded Views

### MTC-4210 Transfer Case Rear Cover

<table>
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<td>12</td>
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<td>Special Orifice Plug</td>
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</table>

¹ Neutral Breather: This part is used for air filtration in the vehicle's rear output area. It helps prevent foreign particles from entering the system, ensuring smooth operation and longevity of the transfer case. The diagram illustrates its placement and role in the assembly, highlighting its importance in maintaining proper vehicle function and performance.
<table>
<thead>
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<td>31</td>
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<td>Snap Ring</td>
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<td>33</td>
<td>Transfer Case Front Case</td>
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</table>

1 Vehicles not equipped with a transfer case neutral air control may be equipped with a neutral breather which allows the shift cavity to exhaust. On vehicles equipped with a neutral air control, the solenoid allows this cavity to exhaust.

**MTC-4210 Transfer Case Front Case**
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# MTC-4213 Transfer Case Rear Cover

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\(^1\) Because the MTC-4213 model is not equipped with neutral capability, the neutral shift port may be plugged with a breather that allows the shift cavity to exhaust.

\(^2\) Use as needed. Refer to Parts Catalog PB-0229, MTC-4213 Transfer Case, for usage.
OIL COOLER READY COMPONENTS

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<td>51</td>
<td>Push Rod</td>
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<td>52</td>
<td>Shift Fork Tube</td>
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<td>53</td>
<td>Front Output Shift Fork</td>
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<td>54</td>
<td>Spring</td>
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<td>55</td>
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<td>Breather Assembly</td>
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**MTC-4208 and -4210 Declutch/PTO**
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<td>PTO Shaft</td>
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<td>Push Rod</td>
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<td>7</td>
<td>Shifter Piston</td>
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<td>O-Ring</td>
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<td>Shifter Spring</td>
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<td>Cap</td>
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<td>Connector Switch Assembly — Disengage, Optional</td>
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<td>19</td>
<td>Connector Switch Assembly — Engage</td>
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Model Nomenclature

Meritor Transfer Case — Model Nomenclature

Transfer case model nomenclature is illustrated in the following example.
Description

Meritor MTC-4208, -4210 and -4213 transfer cases are four-shaft designs with two-speed front and rear output having a 1:1 and a 1:2.05 ratio for use with 4x4 and 6x6 vehicles. The MTC-4208 and -4210 are designed specifically for use in 4x4 vehicles (the MTC-4213 is designed specifically for 6x6) as part of the Meritor medium-duty 4x4 system. Figure 2.3.

The air-actuated front-axle declutch (if equipped), high and low shifter and full-torque power take-off (PTO) lockup are controlled from the cab. An air plunger or electric switch, usually mounted on the instrument panel, engages or disengages a mechanical clutch.

An optional speed sensor measures transfer case output driveline rpm. Optional switches indicate when the front axle declutch is fully engaged or disengaged.

These transfer cases provide for two-speed output (high range and low range) and a neutral position that is used for PTO-equipped transfer cases only. Non-PTO cases have this neutral position plugged. Figure 2.4.

The front axle declutch permits shifting from part-time 4x4 or 6x6 to rear-wheel drive (RWD). Figure 2.5.
The full-torque PTO option provides an outlet to drive auxiliary power devices. Figure 2.6.

Optional switches for full-torque PTOs indicate full engagement or disengagement.

---

**WARNING**

Do not engage the front axle declutch when the vehicle’s wheels are slipping or when moving up or down a steep hill or grade, which can cause the vehicle to lose stability. Serious personal injury and damage to components can result.

Operation of the front axle should occur only on off-road or poor traction conditions. Engaging the declutch affects the vehicle’s turning and steering responsiveness. Do not engage the declutch or low gear range under normal operating conditions. Serious personal injury and damage to components can result.

Engage the declutch when the vehicle is stationary or operating at constant low speed, below 10 mph or 4 km/h.

Operate the vehicle at speeds less than 25 mph (40 km/h) when part-time 4x4 or 6x6 operation is engaged off-road.
High-Low Shifting
Shift the transfer case into low from high gear or from high to low gear when the vehicle is stationary. Apply the parking brake with the transmission in Neutral, automatic transmission only.

You will know that engagement occurs by hearing it, noticing improved vehicle performance, or observing the optional indicator light in the cab.

- If the clutch does not fully engage: Turn the steering wheel in one direction and rock the vehicle back and forth until engagement occurs.

Oil Cooler Option
Vehicle configuration can have a significant impact on MTC model transfer cases. Vehicles with overdrive transmissions used primarily for high-speed highway routes run at higher transfer case input speeds. Transfer case running temperature is primarily affected by input speed, regardless of rear-wheel-drive only or 4x4/6x6 operation.

A transfer case oil cooler reduces operating temperatures which will improve yoke seal life, reduce oil degradation and reduce the likelihood for other oil and air leaks.

Meritor has options available to add an oil cooler to any MTC transfer case regardless of vintage or model. Product information can be found on the transfer case nameplate located on the front of its housing.

- Part numbers such as MTC-4210-6CS-100-100-205 with a “C”, which stands for “Cooler Ready”, can be fitted with a cooler by removing the loop line. Figure 2.7.
- Part numbers such as MTC-4210-6S-100-100-205 are not cooler ready.

Figure 2.7

4005169a
The following are options for adding an oil cooler to non-cooler-ready units.

- Installing a new transfer case. All new transfer cases are cooler ready and many models are directly interchangeable. Refer to the Service Notes page on the front inside cover for more information.

- Installing KIT 2832 (rear-mounted pump retrofit kit) will add fittings at the pump location which allow a cooler to be installed. Refer to Technical Publication TP-06103, Cooler-Ready Kit for Meritor MTC-4208 and MTC-4210 Series Transfer Cases, for more information.

- Installing KIT 2592 (oil cooler retrofit kit). This kit is for non-cooler-ready units in which a rear-mounted pump cannot be installed (4213 models or PTO-equipped units). The kit includes a new transfer case housing with the fittings needed to install an oil cooler. Refer to Technical Publication TP-0468, Connecting an Oil Cooler to MTC-4208, -4210 and -4213 Transfer Cases, for more information.

**Blow-by Breather**

The rear cover portion of the housing on models built fall of 2004 forward is equipped with a blow-by breather. The breather, which points sideways on the driver side of the housing, prohibits pressurization of the housing if an O-ring becomes damaged. Because all range shifts require full time pressurization, a damaged O-ring would allow air to fill the housing which could further damage the yoke seals or blow oil from the housing.

**Full-Torque Power Take-Off (PTO)**

⚠️ **CAUTION**

Do not engage the full-torque power take-off (PTO) when the transfer case prop shafts are turning. Damage to the transfer case will result.

Engage or disengage the PTO when the vehicle is stationary, the transmission is in Neutral, and the transfer case prop shafts are not turning. Do not load the driven auxiliary device when PTO is initially engaged. Use the transfer case in-cab switches to place the transfer case into Neutral.

You will know that engagement occurs by hearing it or observing the optional indicator light in the cab.

The PTO may be operated in high/low/Neutral range.

When operating the PTO in Neutral range, do not exceed 2,000 rpm. Control the transmission shift range and engine rpm to ensure you do not exceed this limit.

**Breather Location**

On older transfer case models, the breather assembly was located on the front case. On current transfer case models, the breather assembly is located on the rear cover. Figure 2.8.

If the breather is found in either of the old positions, it is recommended that the breather be repositioned.
Figure 2.8

OLD BREATHER POSITIONS

NEW BREATHER POSITION

FRONT CASE

REAR COVER
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.

⚠️ 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.

Remove the Transfer Case Assembly

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Place blocks under the wheels not being raised to keep the vehicle from moving.
3. Raise the vehicle so that the area to be serviced is off the ground. Support the vehicle with safety stands.
4. Place a large container under the transfer case.
5. Remove the magnetic drain plug from the bottom of the transfer case. Drain and discard the oil correctly. Clean the magnetic drain plug. Figure 3.1.
6. Disconnect the drivelines from the input and output yokes or flanges of the transfer case.
7. Disconnect the cooler lines.
8. Disconnect the air lines at the shift cylinders of the transfer case.
9. Disconnect the harness for the indicator switch wires.
10. Use a hydraulic roller jack to support the transfer case. Remove the mounting bolts that hold the transfer case to the vehicle.
11. Carefully remove the transfer case with the hydraulic jack.

⚠️ CAUTION
Close or cover all openings, including the breather, oil drain and speed sensor, before steam cleaning the outside of the transfer case. Steam can damage components.

12. Close or cover all openings before steam cleaning. These openings include the breather, oil drain and speed sensor.
13. Steam clean the outside of the transfer case to remove heavy amounts of dirt.
14. Construct suitable mounting brackets or similar fixtures. Attach the brackets to the front half of the transfer case by installing bolts through the mounting holes in the transfer case. Figure 3.2.

NOTE: Eye-bolts permit easier lifting of the transfer case.

Figure 3.1

Figure 3.2
15. Install eye-bolts in the lifting holes located in either half of the transfer case housing. Lifting holes are located at the top and bottom of each half of the transfer case near the center. Figure 3.3.

WARNING
Support the transfer case with a lifting strap before mounting the transfer case into the repair stand. A transfer case that is not supported correctly can fall. Serious personal injury and damage to components can result.

NOTE: The transfer case weighs approximately 670 lbs (304.2 kg) without the PTO.

16. Attach a suitable lifting device to the eye-bolts to lift the transfer case. Use the brackets to mount the case in the repair stand. Figure 3.2.
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.

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

Remove the Input Shaft Assembly from an Assembled Transfer Case (for input shaft repairs only)

If necessary, the input shaft may be removed without separating the transfer case halves. Once you’ve removed the transfer case from the vehicle and drained the oil, Meritor recommends that you check and record the end play for the input shaft, output shafts and idler gears before you begin this procedure. Refer to the procedures in Section 3 and Section 6.

1. MTC-4208 and MTC-4210 transfer cases only:
   A. Disconnect the transfer case oil inlet line from the input cage. Figure 4.1.
   B. Remove the PTO air lines, if equipped.
   C. Remove the PTO-to-transfer case or cover-to-transfer case capscrews.
   D. Remove the PTO or cover.

2. Remove the 3-inch (76 mm) diameter locknut and washer from the rear half of the input shaft.

3. Apply shop air to the high range shift cylinder air port to engage the clutch collar in the high range position. This will prevent the high range gear and bearing from falling out of position when you remove the input shaft from the transfer case assembly.

4. Rotate the transfer case so that it is in the normal operating position.

5. Remove the input bearing cage capscrews and washers.

6. Remove the input bearing cage and input shaft assembly from the transfer case. If necessary, use a yoke puller or an appropriate lifting device. It may be necessary to gently pry the input bearing cage up to dislodge it from the transfer case. Figure 4.2.

7. Remove the shims.

8. Remove the input bearing cage oil seal (O-ring) and discard it.

9. Remove the air line from the high range port. The high/low shift is air actuated and will remain in the high position.

NOTE: For disassembly of the input shaft, refer to the procedure in this section.
MTC-4213 Only

1. Disconnect the oil line from the input bearing cage. Figure 4.1.
2. Apply shop air to the high range shift cylinder air port to engage the high range gear. This will prevent the clutch collar from falling into the transfer case half.
3. Rotate the transfer case so that it is in the normal operating position.
4. Remove the input bearing cage capscrews and washers.
5. Remove the input bearing cage and input shaft assembly from the transfer case. If necessary, use a yoke puller or an appropriate lifting device. It may be necessary to gently pry the input bearing cage up to dislodge it from the transfer case.
6. Remove the shims.

NOTE: The MTC-4213 has a two-piece through shaft. Because of this design, only the forward half of the input shaft will be removed while the upper rear output shaft will remain in place.

Disassemble the Transfer Case

Front and Rear Output Yokes

1. Rotate the transfer case in the repair stand so that the yoke being removed faces UPWARD.
2. Use a yoke holder to secure the yokes from turning. Remove the yoke locknuts and washers from the front and rear output shafts. Figure 4.3.

Optional PTO Assembly on MTC-4208 and MTC-4210 Transfer Cases

1. Rotate the transfer case in the repair stand so that the PTO assembly, if so equipped, is facing UPWARD. Figure 4.4.

2. Remove the yoke nut, washer and yoke. Use a yoke puller to remove the yoke.
3. Remove the PTO indicator switch from the shift plate, if equipped.
4. Remove the cage mounting capscrews and washers from the PTO. Lift the PTO assembly off the transfer case.

Remove the Front Input Shaft, Input Bearing Cage and Internal Pump Assembly

1. On transfer cases with an internal oil pump, remove the inlet oil tube from the transfer case by loosening the fittings at the lower front case and input-bearing cage. Figure 4.5.
2. Remove the PTO cover or PTO, whichever applies. Use a three-inch socket to remove the large retaining nut and washer from the rear half of the input shaft. Use a yoke tool on the input shaft yoke to prevent the shaft from rotating when you remove the retaining nut.

   If you are not able to remove the input shaft retaining nut, you will not be able to remove the front input shaft before you open the housing. Skip this procedure.

   **NOTE:** The MTC-4213 has a split shaft design. It is only necessary to remove the front half of the input shaft during disassembly. The rear half of the input shaft is pressed into the rear case half and cannot be removed until after the transfer case halves are separated.

3. Remove the capscrews securing the input bearing cage and internal pump assembly.

   **NOTE:** The high and low range clutch collar becomes loose on the shift fork as the input bearing cage and pump assembly is removed and may drop into the case. Shifting the transfer case into high range keeps the shift collar on the high range gear, which keeps it in place. Also, shifting into high range allows easier rear cover removal on the MTC-4208 and MTC-4210 transfer cases.

4. Shift the transfer case into high range using compressed air at the high range port of the shift cylinder. Figure 4.6 and Figure 2.4.

   **CAUTION**

   Use a pry bar and mallet to remove the input cage cover. Take care not to damage the shim pack. Damage to the transfer case will result.

5. Use a pry bar and mallet to loosen the input cage cover and internal pump assembly, if equipped. Figure 4.7.

6. Remove the shim pack. Figure 4.7.

7. With the front input yoke still installed, remove the yoke, input shaft, input bearing cage and pump, if equipped, as an assembly. Figure 4.8.
4 Disassembly

High/Low Shift Cylinder Components
Use the following procedure to disassemble the high/low shift components before you separate the case halves.

1. Rotate the transfer case so the shift cylinder is facing UP.

NOTE: After the air source is removed, the high range gear may move out of position.

2. Disconnect the air lines used to shift in the previous steps. Figure 4.9.

3. Remove the high and low range shift cylinder from the rear cover of the transfer case.

4. Remove the outer shift piston snap ring from the shift shaft. Remove the shift piston. Figure 4.10.

5. To remove the inner piston, reinstall and hand tighten the shift cylinder. Apply air to the high range gear input port. When the air pressure pushes the inner piston UP, remove the snap ring and inner piston. Figure 4.11.

Split the Case Halves
1. Remove the capscrews securing the rear cover to the front case.
2. Use a pry bar to separate the two halves of the transfer case at the pry tab locations around the case.

3. Place eye-bolts into the rear cover lift holes located at the top and bottom of the cover.

⚠️ CAUTION
As the rear cover is lifted, apply DOWNWARD pressure on the shift rod to prevent the gears from dropping out of the rear transfer case half.

4. Attach a suitable lifting device to the eye-bolts. Lift the rear cover from the front case. Figure 4.12.

5. As the rear cover is lifted, verify that the high and low shift shaft remains in the case by placing pressure on the shaft while separating the transfer case halves.

6. **MTC-4213 transfer case only:** The rear output shaft and high range gear are removed as an assembly along with the rear cover. The shaft is pressed into the bearing assembly which keeps the shaft retained in the housing. Refer to the MTC-4213 rear output shaft disassembly procedure in this section.

7. **MTC-4208 and MTC-4210 transfer cases only:** Remove the high range helical gear.

8. Remove the high and low shift fork, shift shaft and clutch collar from the front case. Figure 4.13.

9. Remove the single-gear idler shaft on MTC-4213, or rear output on MTC-4208 and MTC-4210, and the double-gear idler shaft from the case. Figure 4.14.

10. Remove the front output shaft, clutch collar, shift fork and spring as an assembly.

11. Remove the shift cylinder and push rod from the front case.

12. Remove the two locating dowel pins. Note their correct location.

**Disassemble the Front Output Shaft Assembly**

1. Temporarily install the yoke and nut. Secure the yoke to prevent the shaft from rotating when you remove the rear nut. Support the shaft correctly.
2. Remove the rear nut and washer.
3. Remove the yoke.
4. Prepare the shaft for bearing and gear removal. Install the front output shaft into a press with the rear of the output shaft facing UP. Support the shaft correctly. Figure 4.15.

**Figure 4.15**

5. Press the shaft DOWNWARD to remove the rear tapered roller bearing, helical gear, clutch collar and needle bearing from the assembly.
6. Install a bearing separator or other suitable tool below the forward roller bearing. Figure 4.16.

**Figure 4.16**

7. Install the output shaft assembly into a press and support it correctly. Figure 4.16.
8. Press the output shaft DOWNWARD to remove the front roller bearing.

**Disassemble the Rear Output Shaft Assembly on MTC-4213**

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

Use a chain and suitable lifting device to secure the rear cover in the press to prevent serious personal injury and damage to components.

1. Set the rear cover with the rear output shaft as an assembly into a suitable press. Figure 4.17.

**Figure 4.17**

2. Press the rear output shaft assembly out of the rear cover. Figure 4.17.
3. Use a suitable puller to remove the rear output shaft outer bearing cup from the rear cover if required. Discard the cone and cup.
4. Inspect the rear output shaft inner bearing cone and cup for wear or damage. Replace a worn or damaged bearing cone and cup.
5. Remove the high range helical gear from the upper rear output shaft. The gear is splined to the shaft.
6. Turn the shaft assembly over. Install a bearing separator or suitable tool under the bearing.

7. Install the shaft assembly into a press.

8. Press the shaft assembly DOWNWARD until the bearing is free from the shaft.

Disassemble the Front Input Shaft, Input Shaft Bearing Cage and Internal Oil Pump, If Equipped

1. Support the front input shaft and bearing cage assembly at the workbench. Figure 4.18.

2. Remove the yoke nut and washer.

3. Use a yoke puller to remove the front input yoke. Figure 4.19.

4. Lift the front input bearing cage and internal oil pump assembly off the input shaft. Figure 4.20.

5. Remove the spiral snap ring that retains the small helical gear on the input shaft. Lift the small helical gear off the shaft. Figure 4.21.

6. Remove the internal pump from the input-bearing cage to service the front input shaft tapered roller bearing cone and cup.
   A. Remove the six bolts retaining the oil pump to the input-bearing cage.
   B. Mark the position of the pump to the cage for reassembly. Figure 4.22.
C. Inspect the pump inner rotor in the spline area for cracks or other damage. The entire pump must be replaced if the pump or inner gear rotor is damaged in any way. The bearing cup is pressed into the bearing cage.

D. Remove the relief valve and spring.

7. Replace the bearing cone and cup as necessary.

**Idler Gear and Rear Output Shaft Disassembly**

1. Use a suitable bearing cone puller to remove the bearing cones as necessary from the single idler-gear shaft, rear output shaft on MTC-4208 and MTC-4210 transfer cases, or double idler-gear shaft assemblies.

2. Inspect and replace bearing cones with new as needed. Replace bearing cones and cups as a set.

3. Inspect the shafts and gears for wear or damage.

**Remove the Bearing Cups**

1. Fully support the transfer case half.

2. Use a suitable puller to remove the bearing cups from the transfer case half. Figure 4.23.

3. Clean and save the shims so they can be used to measure the shim pack thickness during reassembly, if necessary.
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.

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

Clean, Dry and Inspect Parts

Ground and Polished Parts

⚠️ 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.

⚠️ CAUTION
Do not use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Damage to parts can result.

If required, use a sharp knife to remove gasket material from parts. Be careful not to damage the ground or polished surfaces.

1. Use a cleaning solvent to clean ground or polished parts or surfaces. NEVER USE GASOLINE.
2. Remove gasket material from the parts. Take care not to damage the ground surfaces.

3. DO NOT clean ground or polished parts in a hot solution tank, water, steam or alkaline solution.

Parts with a Rough Finish
1. Use a cleaning solvent or a hot solution tank with a weak alkaline solution to clean parts with a rough finish.
2. Leave the parts in the hot solution tank until they are completely cleaned and heated. When the parts are clean, remove them from the tank.
3. Wash the parts with water until you completely remove the alkaline solution.
4. Clean the three internal magnets attached to the bottom of the front case.
5. Remove and clean the magnetic drain plug.

Transfer Case Assemblies

⚠️ CAUTION
Close or cover all openings before steam cleaning. Steam can cause component damage.

1. Steam clean transfer cases on the outside to remove heavy amounts of dirt.
2. Before steam cleaning the transfer case, close or put a cover over all openings in the case.
3. Remove any remaining silicone sealant from the transfer case halves using a suitable scraper or wire wheel.

Dry Cleaned Parts

⚠️ CAUTION
Dry bearings with clean paper or rags. Do not use compressed air, which can cause abrasive particles to contaminate the bearings. Damage to the components and reduced lining life can result.

Immediately after cleaning, use clean paper, rags or compressed air to dry the parts.

Prevent Corrosion

NOTE: Parts must be clean and dry before you lubricate them.

1. If you assemble the parts immediately after you clean them, lubricate the clean, dry parts with grease to prevent corrosion.
2. If you store the parts after you clean them, apply a corrosion-preventive material to all machined surfaces. Store the parts in a special paper or other material that prevents corrosion.

**Oil Seals and O-Rings**

Discard all oil seals and O-rings. Replace with new parts.

**Inspect Parts**

It is very important to inspect all parts carefully and completely before the transfer case is assembled. Check all parts for wear and stress. Replace all damaged parts.

1. Inspect the tapered roller bearings. Inspect the cup, cone, rollers and cage of all tapered roller bearings in the assembly. If any of the following conditions exist, the bearing must be replaced:

- The center of the large diameter end of the rollers is worn level with or below the outer surface.
- The radius at the large diameter end of the rollers is worn to a sharp edge. Figure 5.1.
- A visible roller groove is worn in the inner race surfaces of the cup or cone. The groove can be seen at the small or large diameter end of both parts.
- Deep cracks or breaks appear in the surfaces of the cup, cone inner race or rollers. Figure 5.2.
- Bright wear marks appear on the outer surface of the roller cage. Figure 5.3.
- The rollers and surfaces of the cup and cone inner race that touch the rollers are damaged. Figure 5.4.
- The cup and cone inner race surfaces that touch the roller are damaged. Figure 5.5.
2. Inspect the gears for wear or damage. Replace worn or damaged gears.

3. Inspect the housing.
   A. Remove all dirt from the housing and oil lubrication passages, troughs, slots and holes.
   B. Inspect machined surfaces for cracks and damage. Repair or replace damaged parts.

4. Inspect all shafts, flanges and yokes for wear, stress and cracks at the splines, shaft and yoke ears. Replace shafts, flanges and yokes that are worn or cracked.

5. Verify that any oil passages in the shafts are clean and free of debris.

6. Inspect the declutch and output shaft components, if applicable.
   A. Inspect the clutch collar internal splines, external declutch teeth and shift for grooves. Replace worn, cracked or damaged collars.
   B. Inspect the collar pads of the shift fork for wear. If the pads are worn, replace the shift fork.
   C. Inspect the declutch shaft and yoke for wear, stress and cracks at the splines, shaft and yoke ears. Replace worn or cracked shafts and yokes.
   D. Inspect the declutch or PTO push rod and piston for wear or damage. Replace worn or damaged parts.

7. Inspect the splines on the pump inner rotor for cracks along the spline area. Also, check for excessive wear. Replace the pump if these conditions exist.

8. Remove and inspect the restrictor plug at the end of the input shaft.

9. Verify that the orifice is clear of debris.

### Helical Gears

Inspect the helical gear teeth, splines and journals. If any of the following conditions exist, replace the gear.

- A crack in the root of a tooth or along the tooth flank. Figure 5.6.
- Severe scoring or fretting on the surface of a tooth. Gears with scoring and fretting on the teeth, but without cracks, may continue to operate satisfactorily with higher noise. Figure 5.7.
- Cracks along the internal journal of the input gears. Figure 5.8.
- Deep gouges or metal transfer along the input gear journals. Figure 5.9.
- Chipped or severely worn shifting splines on the input gears.
- Chipped or cracked splines on the output gears.
Shafts

Inspect the input and output shafts for damage to the gear journals, shifting splines, threads and gear retaining splines. If any of the following conditions exist, replace the shaft.

- Deep gouges or metal transfer along the input shaft journals. Figure 5.10.
- Chipped or worn shifting splines on the input shaft.
- Chipped or cracked splines on the output shaft. Figure 5.11.
- Cracks along the yoke splines, bearing journal abutments or cross-drilled holes. Magnaflux may be necessary to see small cracks.
5 Prepare Parts for Assembly

PTO Components
Inspect the PTO housing, shaft, taper bearings, shift collar, shift fork and sensors for damage. If any of the following conditions exist, replace the component.

- Cracks in the housing.
- Cracks along the shaft yoke spline or ball bearing abutment. Magnaflux may be necessary to see small cracks.
- Chipped or cracked shifting splines on the shift collar or shaft.
- The rollers of the taper bearings do not roll easily or lack lubrication. The raceway is cracked or dented.
- Cracked or missing tangs on the shift fork arms.
- The sensor ball sticks or does not return to its resting position. The sensors do not complete a circuit when tested with a volt-ohm meter (VOM).

High and Low Shifting Components
Inspect the shift collar, shift fork, shift shaft, retaining pins, shift cylinder, piston, O-ring and case halves for damage. If any of the following conditions exist, replace or repair the component.

- Cracked or missing tangs on the shift fork arms.
- Chipped or cracked shifting splines on the shift collar.
- Cracks or deep gouges on the shift shaft.
- The retaining pins in the shift shaft are not 0.100-inch (2.54 mm) above the shaft diameter. Remove and set to the correct position.
- Gouges on the inside of the shift cylinder.
- Torn or feathered areas on the O-ring.
- Deep gouges in the shifting bores of the case halves.

Oil and Lubrication System
The lubrication system is extremely important to the performance of the transfer case. Inspect all parts closely for excessive wear or damage. Perform the following checks.

1. Inspect the oil for metal shavings, dirt and consistency. Perform an analysis if the oil appears contaminated.
2. Check the magnets for metal shavings. A small amount of metal shavings is normal. However, excessive build-up indicates gear and bearing damage. Thoroughly remove all metal shavings from the magnets. The magnets must be firmly fastened to the case.

3. Check the sump screen. Remove any material that may restrict oil flow through the mesh.
4. Inspect the seals closely. Look for nicks and tears on all sealing lips. Any damage is likely to result in a seal leak.
5. Check the pump for easy rotation. If the internal gear does not spin easily or jams when rotating the crescent plate, replace the pump. Also inspect for signs of heat/discoloration.
6. Check the oil line for damage. Replace if it is dented or kinked.
7. Inspect the input shaft and oil pump splines for damage.
8. Verify the relief valve spring and bushing are in good condition and replace if necessary.

Transfer Case Halves
Inspect the case halves for cracks and internal wear. If any of the following conditions exist, replace the damaged parts.

- A crack in either case half.
- Deep gouges in the shifting bores.
- Signs of bearing cup rotation.

Preparing the Case and Cover and Seal Replacement

1. Pry out all oil seals using a suitable pry bar.
2. As necessary, use a suitable puller to remove the bearing cups pressed into the transfer case halves.
3. Clean and inspect the transfer case and cover for cracks, worn threaded holes or other wear or damage. Clean the gasket surfaces of both transfer case halves using a suitable gasket scraper or wire wheel.
4. Press new bearing cups into the case halves as necessary. Refer to Section 6 for bearing setting procedures.
5. Inspect the bearing end play to ensure that it’s within specification. Adjust the end play, if required. Refer to Section 6.
6. Install new oil seals into the case halves. Use the correct Meritor seal driver and seal. Refer to Section 10 for more information. Refer to the Service Notes page on the front inside cover of this manual to obtain any special tools needed.
**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.

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

When you apply some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure that the work area is well-ventilated. Read the manufacturer’s instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into your eyes, follow the manufacturer’s emergency procedures. Have your eyes checked by a physician as soon as possible.

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.

Install the Input Shaft Assembly into an Assembled Transfer Case (for input shaft repairs only)

1. Apply shop air to the high range shift cylinder port to engage the clutch collar in the high range position. This will prevent the high range gear and bearing from falling out of position when you install the input shaft into the transfer case assembly.

2. Install the input bearing cage O-ring and shims onto the input shaft assembly.

3. Use SAE Grade full-synthetic 40W oil, Meritor specification O-81, to lubricate the input bearing cage O-ring, oil pump, helical drive gear, and bearing cone before installation.

4. Install the input shaft assembly into the transfer case. Make sure to position the bearing cage so that the inlet oil tube fitting is facing the correct direction. Figure 6.1.

5. Install at least three input bearing cage-to-housing capscrews. Tighten the capscrews to 85-115 lb-ft (115-156 N·m).

6. Install the 3-inch (76 mm) diameter nut and washer onto the rear end of the input shaft. Tighten the nut to 700-900 lb-ft (949-1220 N·m).

7. Apply a thin coating of Loctite® 518 gasket sealant to the entire PTO mounting surface.

8. Install the PTO cover or PTO, if equipped. Refer to Section 7 for further instructions.

9. Install the washers and mounting bolts. Tighten the bolts to 60-75 lb-ft (81-102 N·m).

10. Reconnect the transfer case oil input line to the input cage. Tighten to 25 lb-ft (34 N·m).

**Gear and Shaft Subassembly Build Up**

**Assemble the Front Output Shaft Subassembly**

1. Use an appropriate holding fixture to fully support the shaft assembly. Refer to tool number 905473-140 in Section 13.
**WARNING**

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

2. Use a press and sleeve, tool number 905473-82, to press the forward bearing DOWN onto the output shaft until it is fully seated. Refer to Section 13 for the tool drawing. Press DOWN only on the inner race of the bearing during installation. Use a 0.002-inch shim or feeler gauge to check that the bearing is correctly seated. Figure 6.2.

![Figure 6.2](image1.png)

3. Turn the shaft over and reinstall it into the holding fixture. Refer to tool number 905473-140 in Section 13.

4. Install the clutch collar. Figure 6.3.

![Figure 6.3](image2.png)

5. Install the helical gear onto the shaft. The helical gear is a slip fit gear.

6. Remove the shaft from the holding fixture and install it into a press. Correctly support the shaft in the press.

7. Use tool number 905473-92 to install the bearing onto the top of the output shaft with the small tapered end UP. Use a press and sleeve to push the bearing DOWN onto the output shaft until it is fully seated. Refer to Section 13 for tool drawings. Press DOWN only on the inner race of the bearing during installation. Use a 0.002-inch shim or feeler gauge to check that the bearing is correctly seated. Figure 6.4.

![Figure 6.4](image3.png)

**WARNING**

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

8. Remove the output shaft from the press and reinstall it into the holding fixture. Refer to tool number 905473-140 in Section 13. Use an appropriate lifting device to lift the shaft.

9. Lubricate the output shaft threads with SAE Grade full-synthetic 40W oil, Meritor specification O-81.

10. Install the washer and the locknut onto the shaft. Tighten the locknut to 700-900 lb-ft (949-1220 N·m). Figure 6.5.
Assemble the Single Idler Gear Subassembly (MTC-4213 Only)

1. Install the shaft assembly into a press and support it correctly with the forward end facing UP.

2. Place the bearing onto the forward end of the shaft assembly. Use a sleeve, tool number 905473-82, and press to push the forward bearing cone DOWN until it is fully seated. Refer to Section 13 for tool drawings. Only press on the inner race of the bearing cone. Use a 0.002-inch shim or feeler gauge to ensure the bearing cone is correctly seated.

3. Rotate the shaft so the rear half of the shaft is facing UP. Use a sleeve, tool number 905473-92, and press to push the rear bearing cone DOWN until it is fully seated. Refer to Section 13 for tool drawings. Only press on the inner race of the bearing cone. Use a 0.002-inch shim or feeler gauge to ensure the bearing cone is correctly seated.

Assemble the Rear Output Shaft Subassembly (MTC-4208 and MTC-4210 Only)

1. Install the shaft assembly into a press and support it correctly.

2. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, tool number 905473-92, and press to push the rear bearing cone DOWN until it is fully seated. Refer to Section 13 for tool drawings. Only press on the inner race of the bearing cone. Use a 0.002-inch shim or feeler gauge to ensure the bearing cone is correctly seated.

3. Turn the shaft assembly over and install the bearing cone on the other end using Steps 1-2.

Assemble the Double Idler Gear Subassembly (All Models)

1. Install the shaft assembly into a press and support it correctly.

2. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, tool number 905473-82, and press to push the bearing cone DOWN until it is fully seated. Refer to Section 13 for tool drawings. Only press on the inner race of the bearing cone. Use a 0.002-inch shim or feeler gauge to ensure the bearing cone is correctly seated.

3. Turn the shaft assembly over and install the bearing cone on the other end using Steps 1-2.

Assemble the Input Shaft Subassembly (MTC-4213 Only)

1. Press the bearing cup into the input bearing cage until it is fully seated.

2. Place the large O-ring around the groove on the bearing cage. Figure 6.6.

3. Insert the relief valve and spring into the relief port of the input bearing cage. Install the large diameter end of the spring down. The plunger should be seated into the relief valve orifice. Figure 6.6.

4. Install the internal oil pump using the following procedure.

   A. Pack grease into the pump oil inlet port before assembling the oil pump to the input bearing cage.

   B. Place the bearing cone in the bearing cage. Figure 6.6.

   C. Align the oil pump inlet with the oil inlet port of the input bearing cage. Figure 6.7.
D. Install the six pump-to-inlet bearing cage capscrews and washers. Apply Loctite® 277 sealant to the capscrews. Tighten the capscrews to 35-50 lb-ft (48-68 N·m).

E. Lubricate the sealing rings on the inside diameter of the pump and the shaft journal adjacent to the pump splines.

5. Place the small helical gear over the input shaft with the spline side of the gear down and install the spiral snap ring. The gear is a slip fit.

6. Install the shaft assembly into a press and support it correctly.

7. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, tool number 905473-82, and press to push the bearing cone DOWN until it is fully seated. Refer to Section 13 for tool drawings. Only press on the inner race of the bearing cone. Use a 0.002-inch shim or feeler gauge to ensure the bearing cone is correctly seated.

8. Apply Loctite® 592 threadlocker to the restrictor plug and install it into the end of the bearing cone. Tighten the plug to 15 lb-ft (20 N·m).

Assemble the Front Input Shaft, Input Shaft Bearing Cage and Internal Oil Pump Subassemblies (MTC-4208 and MTC-4210 Only)

1. Use tool number 910203-37 to press the bearing cup into the input bearing cage until it is fully seated. Refer to Section 13 for tool drawings.

2. Place the large O-ring around the groove on the bearing cage. Figure 6.6.

3. Install the internal oil pump, using the following procedure.
   A. Pack grease into the pump oil inlet port before assembling the oil pump to the input bearing cage. Figure 6.7.
   B. Place the bearing cone on the race in the bearing cage.
   C. Insert the relief valve and spring into the relief port of the input bearing cage. Install the large diameter end of the spring down. Figure 6.6. Align the oil pump inlet with the oil inlet port of the input bearing cage. Figure 6.7.
   D. Install the six pump-to-inlet bearing cage capscrews and washers. Apply Loctite® 277 sealant to the capscrews. Tighten the capscrews to 35-50 lb-ft (48-68 N·m).
   E. Lubricate the sealing rings on the inside diameter of the pump and the shaft journal adjacent to the pump splines.

Figure 6.8
4. Place the small helical gear over the input shaft with the spline side of the gear down and install the spiral snap ring. The gear is a slip fit.

5. Lubricate the gear and shaft before assembly.

⚠️ CAUTION
Exercise care when assembling the input shaft to the pump. Line up and slowly direct the input shaft into the pump opening. Misalignment during assembly can cause the shaft to “hang up” on the pump sealing rings resulting in damage to the rings.

**NOTE:** Use care when you install the input bearing cage to prevent damage to the O-ring.

6. Place the oil pump and input bearing cage assembly over the input shaft. The drive teeth on the inner pump rotor must engage the teeth on the input shaft. Do not use force to engage the splines. If a sealing ring is broken, remove and replace the pump.

7. Place the assembly into a holding fixture, tool number 905043-140, and install the yoke assembly. Refer to Section 13 for tool drawings.

8. Install the washer and yoke nut. Tighten the yoke nut to 700-900 lb-ft (949-1220 N·m).

### Assemble the Upper Rear Output Shaft (MTC-4213 Only)

1. Place the shaft into a holding fixture with the larger end facing UP.

2. Align the internal splines of the high range helical gear with the shaft splines and install the gear onto the shaft. Ensure that the clutch collar gears are facing UP. Figure 6.10.

3. Turn the shaft assembly over and secure it in a holding fixture.

4. Use a press and sleeve to press the bearing DOWNWARD onto the output shaft until it bottoms out against the helical gear. Refer to Section 13 for tool number 905473-82. Use a 0.002-inch shim or feeler gauge to check that the bearing is fully seated against the gear. Figure 6.11.

5. Continue with the procedures for checking and adjusting end play and final assembly of the transfer case. Refer to the procedures in this section.

### Gear and Shaft Installation into the Transfer Case Halves

Before you install the gear shafts, refer to the end play check information in this section for the correct shim pack starting thickness.

### Install the Gear Shafts and Assemble the Case Halves

1. Lubricate all bearing cups and cones, gears and shaft assemblies before installation into the case. Use SAE Grade full-synthetic 40W oil, Meritor specification O-81.

2. Place the required shims into the recessed bores in the cover.

3. Use a mallet or press and sleeve to install the bearing cups into the bore until correctly seated. Refer to Section 13 for the correct sleeve. Refer to the end play procedures for initial shim stack up requirements. Figure 6.12.
4. With the inside of the front case facing UPWARD, install the single idler shaft (MTC-4213 only), or rear output shaft (MTC-4208 and MTC-4210), and double-gear idler shaft assemblies (all models). Figure 6.13.

5. Position the clutch collar onto the shift fork. Position the shift fork and clutch collar onto the front output shaft clutch hub.

6. Install the push rod into the transfer case.

7. Install the front output shaft, shift fork and clutch collar in the front case. The shift fork will slide over the push rod. Figure 6.14 and Figure 6.15.

8. Install the release spring over the push rod and shift fork.

9. Temporarily install the shift cylinder onto the case to secure the push rod in place.

10. The shift cylinder requires Loctite® 272 sealant for final assembly.

11. Install the high and low shift fork and shift shaft assembly into position in the front case. Figure 6.16.
12. Install the input shaft, input bearing cage and internal oil pump, if equipped. Refer to the procedure in this section.

13. For MTC-4213 transfer cases, install the upper rear output shaft into the rear transfer case half. Refer to the procedure in this section.

14. Install the pocket bearing into the recess in the input shaft.

**NOTE:** You must determine all shaft bearing end plays before final assembly. Refer to the end play check and adjustment procedures in this section.

15. Install the two locating dowel pins into the corresponding holes in the front case.

**NOTE:** Do not install sealant at this time.

16. Use a suitable lifting device to install the rear cover and output shaft as an assembly over the front case. Figure 6.17. Guide the cover over the shift fork and push rod as the cover is being set into place over the case.

**Install the Front Input Shaft, Input Bearing Cage and Internal Oil Pump Assembly**

1. Rotate the transfer case so that the front is facing UPWARD.

2. Position the shim pack for the input bearing cage and internal oil pump assembly over the front input opening. Position so that the open areas of the shims face the bottom of the transfer case.

   - **For MTC-4208 and MTC-4210 models:** The initial input bearing cage shim pack thickness is 0.036 inch.
   - **For MTC-4213:** The initial input bearing cage shim pack thickness is 0.056 inch.

3. Lubricate the input bearing cage large O-ring, internal oil pump, helical drive gear and bearing cone before installation. Use SAE Grade full-synthetic 40W oil, Meritor specification 0-81.

4. Install the input shaft with the bearing cage and internal oil pump assembly into the transfer case. Position the assembly so that the inlet oil tube fitting is facing the correct direction.

5. Install at least three input bearing cage-to-housing capscrews. Tighten the capscrews to 85-115 lb-ft (115-156 N·m).
NOTE: For MTC-4208 and MTC-4210 models, continue with the steps in this procedure. For MTC-4213 shaft completion, proceed to the upper rear output shaft procedure and the input shaft procedure in this section.

6. Install the high range helical gear and bearing cone onto the input shaft. The gear and bearing are a slip-type fit.

7. **MTC-4208 and MTC-4210 transfer cases only:** Install the 3-inch (76 mm) diameter nut and washer onto the rear end of the input shaft. Tighten the nut to 700-900 lb-ft (949-1220 N·m).

8. If not done previously, after installing all gearing and shaft assemblies into the transfer case half, continue the assembly of the transfer case by installing the rear cover. Refer to the end play check and adjustment procedures in this section.

### Install the Upper Rear Output Shaft (MTC-4213 Only)

1. Position the output shaft under the rear transfer case half. Use an appropriate lifting device to place the shaft and transfer case into a press.

2. Use bar stock or other material to support the rear output shaft underneath the rear transfer case half. Ensure the bar stock does not rest under the transfer case mounting flange, but only supports the gear and shaft assembly. Figure 6.18.

3. Check that the inner bearing is seated in the bearing cup and that the gear is vertical and not leaning.

4. Install the shims and spacer over the shaft. If you are replacing the bearings, install a starting shim pack thickness of 0.036 inch (0.91 mm) or use the same thickness that was removed. Figure 6.19.

5. Use a bearing cone driver, tool number 905473-82, and a press to press the bearing DOWN on the shaft until it is fully seated. Press only on the inner race of the bearing during installation. Figure 6.20.

6. Install the yoke, washer and locknut. Tighten the locknut to 700-900 lb-ft (949-1220 N·m).

7. Use a dial indicator to check the end play on the rear upper output shaft. Refer to the procedure in this section. The end play must be 0.001-0.003-inch (0.025-0.076 mm). To adjust the end play, you will need to remove the rear output shaft and outer bearing cone and add or remove shims as necessary to achieve the correct end play.

NOTE: The end play for the MTC-4213 upper rear output can be completed before installing the rear case half onto the front case half.
End Play Check and Adjustment

Shim Pack Starting Thickness Requirements

End play must be checked and adjusted at all shaft positions before final assembly. Start with the following shim pack thicknesses to begin this process.

- MTC-4213 input shaft starting thickness must be equal to or greater than 0.056 inch.
- MTC-4213 upper output starting thickness is 0.039 inch.
- MTC-4213 begins by setting the upper rear output end play first with a starting shim pack size of 0.039 inch. Set the end play to 0.001-0.003 inch (0.025-0.076 mm). After setting the MTC-4213 upper rear output, rotate the transfer case and set the input shaft end play to 0.001-0.003 inch (0.025-0.076 mm). All other MTC-4213 shaft end plays are 0.001-0.005 inch (0.025-0.127 mm).
- MTC-4208 and MTC-4210 input shaft initial starting shim pack thickness is 0.036 inch.
- MTC-4208 and MTC-4210 upper rear output (PTO) yoke does not require an end play check.

For all other locations, determine the starting shim pack size by cleaning and measuring the thickness of shims removed from the respective bearing cup location. Use new shims to obtain the same thickness as the original shim pack. This will be the starting shim pack thickness to use when setting the respective shaft’s end play.

MTC-4208 and MTC-4210 Lower Rear Output Shaft End Play

Determine the rear output shaft bearing end play before final assembly. Seals should not be installed until the end plays are set.

1. Install the rear output shaft yoke. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 N·m).
2. Rotate the output shaft several times to seat the bearings.
3. Use a dial indicator to check output shaft bearing end play. Center the dial indicator over the shaft using a ball bearing for accuracy. Figure 6.21.

4. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft. The end play should be 0.001-0.005-inch (0.025-0.127 mm).

- If the end play reading is not within 0.001-0.005-inch (0.025-0.127 mm): Add shims to reduce end play or remove shims to increase end play. Bearing shims come in 0.003-, 0.005- and 0.010-inch (0.08, 0.13 and 0.25 mm) thicknesses.

5. If rear output shaft bearing end play requires adjustment, remove the rear output shaft yoke so that the case and cover can be easily separated.
6. Measure the end play on the remaining shafts before splitting the case to make adjustments.
7. After performing the rear output shaft bearing end play measurement, separate the transfer case halves as necessary to adjust shims and achieve correct the end play on the shaft requiring adjustment.
8. Adjust shims to achieve the correct bearing end play on all shafts as required. Refer to the procedure in this section.

Front Output Shaft End Play (All Models)

Determine the front output shaft bearing end play before final assembly. Seals should not be installed until the end plays are set.

1. Install the front output shaft yoke. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 N·m).
2. Rotate the output shaft several times to seat the bearings.
3. Set up a dial indicator to check the output shaft bearing end play. Center the dial indicator over the shaft using a ball bearing for accuracy. Figure 6.21.

4. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft.

- If the end play reading is greater than 0.001-0.005-inch (0.025-0.127 mm): Add shims to reduce end play.
- If the end play reading is less than specification: Remove shims to increase end play. Bearing shims come in 0.003-, 0.005- and 0.010-inch (0.08, 0.13 and 0.25 mm) thicknesses.
- If the front output shaft bearing end play requires adjustment: Remove the front output shaft yoke so that the case and cover can be easily separated.

5. Measure the end play on the remaining shafts before splitting the case to make adjustments.

6. After performing all bearing end play measurements, separate the transfer case halves as necessary to adjust the shims and achieve the correct end play on the shaft requiring adjustment.

7. Adjust the shims to achieve the correct bearing end play on all shafts as required and recheck.

8. Before installing the yoke, clean the splines of old silastic. Apply a 1/8-inch (3.175 mm) bead of RTV 732 sealant 360 degrees around the outer two-inches (50.8 mm) of the yoke splines. Figure 6.22.

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**Idler Shaft (Single or Double) Bearing End Play**

Determine the shaft bearing end play before final assembly. The MTC-4213 has both single idler and doubler idler gear shafts while all other models have a double idler gear shaft. Seals should not be installed until the end plays are set. At least six case-to-case bolts must be installed to correctly check end play.

1. Rotate the transfer case so that the front of the case faces UPWARD.

2. Remove the 3/8-inch (9.5 mm) pipe plugs at the shaft locations on the front of the case.

3. To prepare to check shaft bearing end play, insert a 1/2"-13 bolt into the shaft through the pipe plug hole, until the bolt is fully seated. The bolt should extend out of the transfer case enough for you to use it to lift the idler shaft.

4. Tighten the bolt so that it bottoms in the shaft for an accurate end play measurement.

5. Rotate the idler shaft several times to help seat the bearing cones.

6. Set up the dial indicator to check the idler shaft bearing end play. Center the dial indicator on the bolt head. Zero the indicator. Figure 6.23.

7. Use pry bars to lift up on the bolt head to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft.
8. Remove the bolt from the shaft. Install the 3/8-inch pipe plug or breather assembly depending on shaft measured. Tighten the bolt to 20-25 lb-ft (27-34 N·m).

9. After performing all bearing end play measurements, if adjustment is required, separate the transfer case halves.

10. Adjust the shims to achieve the correct bearing end play on all shafts as required and recheck. Refer to the procedure in this section.

MTC-4213 Rear Output Shaft End Play

**NOTE:** Determine the rear output shaft bearing end play before installing the rear cover onto the front case.

1. If the rear output shaft and cover assembly has been disassembled, install the rear output shaft, bearing cones, spacer, shims and yoke into the rear cover. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 N·m). Place the rear cover on the bench to measure bearing end play. Refer to the bearing cup and shim installation procedures in this section. Figure 6.24.

2. Rotate the output shaft several times to seat the bearings.

3. Use a suitable dial indicator setup and pry UP on the yoke to determine bearing end play. End play should be 0.001-0.003-inch (0.025-0.076 mm). To obtain a consistent reading, perform this operation two or three times. Record the reading for this shaft. Figure 6.25.

   - **If the bearing end play is within specification:** The rear cover assembly is ready for installation.
   - **If the bearing end play is out of specification:** Remove the rear output shaft and install an appropriate spacer and shim combination between the bearing cones.

4. If necessary, remove the rear output shaft. Add shims to increase end play or remove shims to reduce end play. Reinstall the rear output shaft assembly.

5. Recheck the end play.
Front Input Shaft End Play Check and Adjustment (All Models)

1. Set up a dial indicator to check input shaft bearing end play. Center the dial indicator over the shaft using a ball bearing for accuracy. Figure 6.26.

2. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for the input shaft.

   - If the end play reading is greater than 0.001-0.005-inch (0.025-0.127 mm) for MTC-4208 and MTC-4210 transfer cases, or 0.001-0.003-inch (0.025-0.076 mm) for the MTC-4213 transfer case: Remove shims to decrease end play.

   - If the end play reading is less than specification: Add shims to increase end play. Bearing shims come in 0.003-, 0.005- and 0.010-inch (0.08, 0.13 and 0.25 mm) thicknesses.

3. If it is necessary to add or remove shims, remove the input bearing cage and oil pump assembly capscrews and lift the assembly enough to insert or remove shims.

   - This can be done without completely removing the pump and shaft assembly from the housing.

   - The nut on the rear end of the shaft on MTC-4208 and MTC-4210 transfer cases must be removed first. Refer to the exploded views in this manual.

4. When the correct shim pack is chosen, reinstall all seven input bearing cage and oil pump assembly capscrews. Tighten the capscrews to 85-115 lb-ft (115-156 Nm).

5. Recheck the input shaft bearing end play. Adjust the end play as necessary.

Shim Assembly

In order to adjust the end play on any shaft, it is necessary to split the transfer case.

**NOTE:** The exception is the input shaft which can have the horseshoe-style shims removed or added by loosening or removing the input bearing cage capscrews.

1. Rotate the transfer case in the stand so that the rear cover is facing UP. Remove the case-to-cover capscrews.

2. Use a suitable lift to remove the rear cover. Mount the cover so that the pressed-in bearing cups can be removed.

3. Use a bearing puller to remove the bearing cups from the cover. Shims are placed between the cover and the cup. Refer to the disassembly procedure.

4. Select the correct shim or shims to achieve the correct end play. If the end play measurement is below 0.001-inch (0.03 mm), which indicates a pre-loaded shaft, start by removing shims until some measurable end play is observed.

**Table A: Example of shim selection:**

<table>
<thead>
<tr>
<th>Initial measurement (idler shaft)</th>
<th>Specification</th>
<th>Required shim stack</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.018-inch (0.46 mm)</td>
<td>0.001-0.005-inch (0.03-0.13 mm)</td>
<td>0.017-0.013-inch (0.43-0.33 mm)</td>
</tr>
</tbody>
</table>

**Table B: Possible combinations that meet required shim stack:**

<table>
<thead>
<tr>
<th>1 (0.010)</th>
<th>2 (0.005)</th>
<th>1 (0.010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (0.005)</td>
<td>1 (0.003)</td>
<td>2 (0.003)</td>
</tr>
<tr>
<td>0.015-inch</td>
<td>0.013-inch</td>
<td>0.016-inch</td>
</tr>
<tr>
<td>1 (0.25 mm)</td>
<td>2 (0.13 mm)</td>
<td>1 (0.25 mm)</td>
</tr>
<tr>
<td>1 (0.13 mm)</td>
<td>1 (0.08 mm)</td>
<td>2 (0.08 mm)</td>
</tr>
<tr>
<td>0.38 mm</td>
<td>0.34 mm</td>
<td>0.41 mm</td>
</tr>
</tbody>
</table>
5. After selecting the correct shim combination, place the shims in the bottom of the bearing bore. Refer to the exploded views in this manual.

6. Press the bearing cup into the bore until it is completely seated. The shims must be centered in the bore while pressing in the bearing cup.

7. Repeat Step 3 through Step 6 for each bearing needing an end play adjustment.

**NOTE:** Before final assembly, verify that each shim selection procedure results in the correct end play specification. Repeat the end play measurement steps, as necessary, to obtain the correct end play specification on all shafts.

8. Reassemble the cover to the case. Install at least six case-to-cover capscrews.

9. Recheck the end play. Once the measurements are correct, remove the cover and prepare for final assembly.

**Final Assembly**

1. Lubricate and install the O-ring into the rear cover push rod journal. Use a light coat of lithium-based grease, Meritor specification O-668, prior to cover installation. Figure 6.27.

2. Apply Loctite® 518 sealant to the case-to-cover flange. Apply a 1/8-inch (3 mm) bead of sealant around the entire flange between each bolt hole making sure to encircle each hole.

3. Reinstall the rear cover over the front case. Guide the high and low shift shaft and push rod through the cover as necessary. Verify that the cover is aligned with the locating dowel pins and correctly seated.

4. If the capscrews are not pre-covered, apply Loctite® 272 sealant to the first three threads of the cover-to-case capscrews.

5. Install all cover-to-case capscrews and flat washers. Tighten the capscrews to 60-75 lb-ft (81-102 N·m).

**High and Low Shifter**

1. Grease all O-ring seals. Use a light coat of lithium-based grease, Meritor specification O-668. Refer to Figure 6.28 for shifter component arrangement.

2. Install O-rings onto the inside diameter and outside diameter of the inner piston. Install the inner shift piston and snap ring onto the shift shaft. Figure 6.29.
3. Install O-rings onto the inside diameter and outside diameter of the outer piston. Install the outer shift piston with the O-ring end first to ensure the piston is facing the correct direction.

4. Install the outer shift piston outer snap ring onto the shift shaft. Figure 6.30.

5. Apply a 1/8-inch (3 mm) bead of Loctite® 277 sealant to the first three threads of the shift cylinder.

6. Install the high and low shift cylinder. Tighten the cylinder to 85-95 lb-ft (115-129 N·m).

---

**Input Shaft Oil Seal and Yoke**

- **For all transfer cases:** Install the input seal and sleeve using Meritor kits 2728T1 and 2728T2 respectively.

---

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

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. 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.

4. 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.

---

**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.
5. Apply a light coat of lubricant to the yoke seal journal. 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 6.31.

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 sleeve is positioned 0.030-inch ± 0.030-inch (0.76 mm ± 0.76 mm) from the end of the yoke. Figure 6.32.

- 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 6.33.

6. Install the input seal. Hold the sleeve and seal only on the outer diameter. Position the seal onto the input seal driver and align it with the shaft. 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 onto the input bearing cage. Figure 6.34.
7. 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.
   - **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.

8. Clean the splines of the old Silastic before you install the yoke. Apply a light coat of transfer case oil to the yoke seal journal and then use a mallet to install the yoke.

9. Make sure that the yoke is fully seated before applying a 1/8-inch (3.175 mm) bead of Silastic RTV 732 sealant 360 degrees around the inner surface of the yoke. Figure 6.35.

10. Install the rear output shaft yoke washer and yoke nut. Tighten the nut to 700-900 lb-ft (949-1220 N·m).

---

### Front Axle Shifter

1. Rotate the transfer case to install the front axle shift cylinder.
2. Remove the front axle shift cylinder used to temporarily hold the shift shaft in place.
3. Grease the O-ring on the piston and install the piston into the cylinder.
4. Apply a 1/8-inch (3 mm) bead of Loctite® 277 sealant to the first three threads of the shift cylinder.
5. Install and tighten the shift cylinder to 85-95 lb-ft (115-129 N·m).

### Output Shaft Oil Seal and Yoke

- **For all transfer cases:** Install the forward output shaft seal using Meritor Kit 4454.
- **For MTC-4208 and MTC-4210 transfer cases:** Install the rear output shaft seal using Meritor Kit 4454.
- **For MTC-4213 transfer case:** Install the rear output shaft seal using Meritor Kit 4454.

1. Install the front output shaft oil seal using the appropriate seal driver. Drive the seal until it is fully seated. Figure 6.36.
2. Apply a light coat of transfer case oil to the yoke journal. Install the front output shaft washer, yoke and nut. Tighten the yoke nut to 700-900 lb-ft (949-1220 N·m).
3. Repeat Steps 1 and 2 for the rear output seal and yoke.
Breather, Speed Sensor and Plugs

1. If necessary, apply Loctite® 592 threadlocker to the threads and install the breather into the rear cover. Figure 6.37. Tighten to 20-30 lb-ft (27-41 N⋅m).

2. Install the oil inlet tube to the lower and upper fittings. Tighten the fitting nuts to 25 lb-ft (34 N⋅m) minimum. Figure 6.38 and Figure 6.39.

3. If removed, install the speed sensor into the top of the transfer case. Figure 6.40. Apply Loctite® 242 threadlocker to the threads, install the cap screw with a washer and tighten to 10-15 lb-ft (14-20 N⋅m).

4. If equipped, install the PTO engagement and disengagement switch assemblies. Otherwise, install a nut and washer into the open port.

5. Reinstall all other pipe threaded plugs using Loctite® 592 threadlocker.
Oil Cooler Ready Models

1. Reinstall the male connector fittings, if removed. Apply Loctite® 592 threadlocker to the pipe threads. Tighten the fittings to 25 lb-ft (34 N·m).

2. Connect the oil cooler lines. Refer to Section 8.
   - **If the vehicle is not equipped with an oil cooler:**
     Reconnect the loop line. Tighten the fittings to 20 lb-ft (27 N·m).

Transfer Case Shifting Check

1. Apply 60 psi (4.14 bar) or greater of air pressure to the front axle declutch. Figure 6.40.

2. Turn the input shaft by hand to verify that the front output turns at same rate as the rear output.

3. Remove the air pressure.

4. Apply 60 psi (4.14 bar) or greater of air pressure to the high range shift air port. Figure 6.41.

5. Turn the input shaft by hand to verify that the rear output turns at same rate as the input.

6. Remove the air pressure.

7. Apply 60 psi (4.14 bar) or greater of air pressure to the low range shift cylinder air port. Figure 6.41.

8. Turn the input shaft by hand to verify that the rear output turns at approximately half the rate as the input.

9. Remove the air pressure.

10. For PTO-equipped cases, apply 60 psi (4.14 bar) or greater of air pressure to the neutral shift location. Figure 6.41.

11. Turn the input shaft by hand to verify that the rear output does not turn at all. Have someone hold the output shafts to prevent them from turning while spinning the input.

12. Remove the air pressure.

13. Remove the transfer case from the stand.

Transfer Case Assembly Test

**CAUTION**
The air pressure must not exceed 10 psi (0.69 bar). Damage to components can result.

1. Pressure test the transfer case assembly for air leakage.

2. Check that the fittings are installed correctly.

3. Remove the breather assembly. Figure 6.37.

4. With the correct fitting installed into the breather port, apply a pressure of 8-10 psi (0.55-0.69 bar).

5. Shut the air supply off.

   - **If the pressure decreases by more than 2 psi (0.14 bar) in 10 minutes:** Check for external leaks at the fittings.

6. Correct the leakage problem and retest.

7. Apply Loctite® 592 threadlocker to the threads and install the breather into the rear cover. Tighten to 20-30 lb-ft (27-41 N·m).

Optional Oil Pressure Test

1. Park the vehicle on a level surface and set the parking brake.

2. The transfer case and oil lines may be hot. With the vehicle on a level surface, fill the transfer case to the bottom of the fill hole with SAE Grade full-synthetic 40W oil, Meritor specification O-81.

3. Remove the oil cooler loop or lines and connect a tee fitting between the oil cooler inlet and outlet ports. For non-cooler-ready transfer cases, the test gauge can be connected by removing the 3/8-18 NPT plug located at the 9 o’clock position. Figure 6.42.
4. Install the 3/8-inch female JIC fitting onto one end of the 10-foot (3.05 meter) pressure hose and the pressure gauge onto the other end.

5. Connect the female fitting to the tee fitting installed during Step 3.

6. Route the gauge to a position where it can be viewed in the cab of the vehicle.

7. Verify the parking brake is set.

8. Start and idle the vehicle for one minute with the pressure gauge connected. If necessary, refer to the original equipment manufacturer (OEM) instructions to start the vehicle.

9. Verify that the vehicle primary and secondary air pressures are at least 90 psi (6.2 bar).

10. For the MTC-4208 and MTC-4210 transfer cases, move the transfer case toggle switch to the Neutral (middle) position. The transfer case will not shift into Neutral if the air pressure is below 90 psi (6.2 bar). If necessary, refer to the original equipment manufacturer (OEM) instructions to start the vehicle.

11. Place the transmission into drive.

12. Verify that the transmission is in the highest range possible. If not, refer to the vehicle operator’s manual for shifting instructions.

**WARNING**
Keep clear from under the vehicle when you check the input shaft to prevent serious personal injury.

13. With the transmission in High, have an assistant outside the vehicle verify the input shaft to the transfer case is turning. Keep clear from under the vehicle when you check the input shaft. If the input shaft is not turning, the transfer case is not in Neutral. If the transfer case is not in Neutral, perform the following procedure.

A. Shift the transmission back into Neutral.

B. Shift the transfer case to high and low range and back to Neutral.

C. Attempt to place the vehicle back into drive and repeat the procedure until the transfer case goes into Neutral.
**CAUTION**

Run the engine for no longer than one minute. Do not repeat the test or damage to components can result.

When performing the optional oil pump pressure diagnostic check, test the system for no longer than one minute. If the oil pressure is not at least 20 psi (1.38 bar) after one minute, turn the vehicle OFF. Do not repeat the test. Damage to components can result. Call the Meritor OnTrac™ Customer Call Center at 866-668-7221 for assistance.

14. Once the transfer case is in Neutral and the transmission is in High, press the accelerator and run the engine at 1800-2200 rpm for no longer than one minute or until oil pressure reaches 30 psi (2.07 bar), whichever occurs first. With the transmission in High, observe the reading on the pressure gauge. The reading should be 20-55 psi (1.38-3.79 bar).

- **If the oil pressure is not at least 20 psi (1.38 bar) after one minute:** Turn the vehicle off. Do not repeat the test or damage to components can result. Call the Meritor OnTrac™ Customer Call Center at 866-668-7221 for further assistance.

15. Once the test is complete, allow the engine to idle back down. Shift the transmission back to Low.

16. Shift the transmission back to Neutral.

**WARNING**

Shift the transfer case into high range for this procedure. Refer to the vehicle operator's manual instructions. If you do not shift into high range, serious personal injury and damage to components can result.

17. Shift the transfer case back into high range. If necessary, refer to the vehicle operator's manual instructions.

18. Turn the vehicle off. If necessary, refer to the original equipment manufacturer (OEM) instructions.

19. Remove the diagnostic equipment.

20. Reinstall the cooler loop or lines. Tighten to 20 lb-ft (27 N·m). 🛠

**Oil Level Check**

1. If the optional oil pressure test was not completed, test drive the vehicle for at least one mile (1.6 km).

2. While allowing the oil to settle for at least 5 minutes, check the system for leaks at all fitting connections and transfer case oil ports.

3. Check the oil fill level in the transfer case. The level should be below the fill hole following the pressure check/test drive.

4. Refill the transfer case to the bottom of the fill hole.
Hazard Alert Messages

Read and observe all Caution and Warning safety alerts below and those that precede instructions or procedures you will perform.

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

When you apply some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure that the work area is well-ventilated. Read the manufacturer’s instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into your eyes, follow the manufacturer’s emergency procedures. Have your eyes checked by a physician as soon as possible.

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.

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

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.

Installation

This section provides instructions on installing a power take-off (PTO) assembly onto Meritor MTC-4208 and -4210 transfer cases using Kit 2540. Refer to Table C and Figure 7.1. Refer to the Service Notes page on the front inside cover of this manual to obtain this Kit.

Table C: Kit 2540

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty.</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTO Assembly</td>
<td>1</td>
<td>MDP-10-AF-100</td>
<td>10,000 lb-ft (13 500 N·m) torque rating</td>
</tr>
<tr>
<td>Washer</td>
<td>8</td>
<td>1229-E-1513</td>
<td>0.81“ O.D. x 0.47” I.D. x 0.09” thickness</td>
</tr>
<tr>
<td>Capscrew</td>
<td>6</td>
<td>S-2710-2</td>
<td>7/16“ - 14 thread x 1.25” long</td>
</tr>
<tr>
<td>Capscrew</td>
<td>2</td>
<td>S-2746-2</td>
<td>7/16“ - 14 thread x 5.75” long</td>
</tr>
<tr>
<td>Washer</td>
<td>1</td>
<td>1229-T-1736</td>
<td>2.36” x 1.56 I.D. x 0.12” thickness</td>
</tr>
<tr>
<td>Locknut</td>
<td>1</td>
<td>40-X-1237</td>
<td>M39 x 1.5 thread</td>
</tr>
<tr>
<td>Dowel Pin</td>
<td>2</td>
<td>1246-T-1190</td>
<td>3/8” diameter x 1” long</td>
</tr>
</tbody>
</table>
### Figure 7.1

**PTO MDP-10-AF-100**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing Cage</td>
<td>1</td>
<td>3226-A-1379</td>
</tr>
<tr>
<td>2</td>
<td>Bearing Assembly</td>
<td>1</td>
<td>Kit 2593</td>
</tr>
<tr>
<td>3</td>
<td>PTO Shaft</td>
<td>1</td>
<td>3297-B-1432</td>
</tr>
<tr>
<td>4</td>
<td>Push Rod</td>
<td>1</td>
<td>2244-N-1184</td>
</tr>
<tr>
<td>5</td>
<td>Shift Fork</td>
<td>1</td>
<td>3296-A-1301</td>
</tr>
<tr>
<td>6</td>
<td>Differential Lockout Collar</td>
<td>1</td>
<td>3107-D-1018</td>
</tr>
<tr>
<td>7</td>
<td>Shifter Piston</td>
<td>1</td>
<td>2230-T-1190</td>
</tr>
<tr>
<td>8</td>
<td>O-Ring, 1.46-inch (37 mm) Diameter</td>
<td>1</td>
<td>5-X-1326</td>
</tr>
<tr>
<td>9</td>
<td>O-Ring, 1.80-inch (46 mm) Diameter</td>
<td>1</td>
<td>5-X-1267</td>
</tr>
<tr>
<td>10</td>
<td>Cover Plate</td>
<td>1</td>
<td>2205-N-1132</td>
</tr>
<tr>
<td>11*</td>
<td>Switch Assembly (Standard)</td>
<td>1</td>
<td>Kit 4429</td>
</tr>
<tr>
<td>12</td>
<td>Capscrew</td>
<td>8</td>
<td>S-248-2</td>
</tr>
<tr>
<td>13</td>
<td>Shifter Spring</td>
<td>1</td>
<td>2258-N-1262</td>
</tr>
<tr>
<td>14</td>
<td>Cap</td>
<td>1</td>
<td>2205-P-1134</td>
</tr>
</tbody>
</table>
Remove the Transfer Case Rear Access Cover

1. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.

2. Remove the air from the vehicle’s system.

3. Place a suitable container under the transfer case to catch the hydraulic fluid that will drain when you remove the rear access cover.

4. Remove the eight mounting bolts and washers that secure the transfer case rear access cover. Remove the cover. Figure 7.2.

5. Clean the PTO mounting surface to remove all sealant.
## MTC-4210 TRANSFER CASE AND KIT 2540 COMPONENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transfer Case</td>
</tr>
<tr>
<td>2†</td>
<td>PTO Assembly</td>
</tr>
<tr>
<td>3†</td>
<td>Washer, 0.47-inch (12 mm) Inside Diameter</td>
</tr>
<tr>
<td>4†</td>
<td>Capscrew, 1.25-inch (32 mm) Long</td>
</tr>
<tr>
<td>5†</td>
<td>Capscrew, 5.75-inch (146 mm) Long</td>
</tr>
<tr>
<td>6</td>
<td>Yoke</td>
</tr>
<tr>
<td>7†</td>
<td>Washer, Yoke Mounting</td>
</tr>
<tr>
<td>8†</td>
<td>Locknut, Yoke Mounting</td>
</tr>
<tr>
<td>9</td>
<td>Switch and Connector Assembly</td>
</tr>
<tr>
<td>10†</td>
<td>Dowel Pin</td>
</tr>
</tbody>
</table>

† Kit 2540 component
Install the Yoke Onto the PTO

You must install a Meritor yoke with the spline code “RAI” onto the PTO. For yoke options, refer to Table D and Figure 7.3.

Table D: PTO Yoke Options and Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Yoke Description</th>
<th>Dimensions (Inches)</th>
<th>Dimensions (Millimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17NYS32-10 0A1</td>
<td>Full Round</td>
<td>A</td>
<td>Center to End</td>
</tr>
<tr>
<td>17TYS32-68 A1</td>
<td>Easy Service™</td>
<td>B</td>
<td>Spline Length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>Hub Diameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D</td>
<td>Bearing Diameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E</td>
<td>Across Ears</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Spline Size</td>
</tr>
</tbody>
</table>

1. Use a press and an applied press force of 500-1500 lbs (227-680 kg) to install a Meritor yoke, spline code RAI, onto the PTO shaft. Figure 7.2.
2. Apply a 1.8-inch (46 mm) bead of RTV silicone gasket material around the end of the yoke spline under the washer surface.
3. Install the washer and locknut supplied in the kit. Tighten the locknut to 700-900 lb-ft (949-1220 N·m).

Install the Optional Indicator Switch

You must install the optional PTO switch listed in Table E.

Table E: PTO Switch Option

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty.</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch and Connector</td>
<td>1</td>
<td>3237-W-1167</td>
<td>2 Amp x 12 VDC, M16 x 1&quot; thread</td>
</tr>
</tbody>
</table>

1. Remove the screw and washer from the end of the PTO cap. Figure 7.4.
2. Apply Loctite® 518 gasket sealant to the indicator switch threads.

3. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-41 N·m). Figure 7.5.

Install the PTO Onto the Transfer Case

1. Install two dowel pins into the transfer case PTO flange.

2. Apply a thin coating of Loctite® 518 gasket sealant to the entire PTO flange mounting surface. Figure 7.2.

3. Slide the PTO assembly onto the output shaft spline. Align the assembly to the two dowel pins.

4. Install the washers and mounting bolts. Tighten the bolts to 60-75 lb-ft (81-102 N·m).

5. Install the PTO air control line and fitting. Follow the vehicle manufacturer’s instructions.

Test the PTO Installation

⚠️ CAUTION

The PTO clutch must be engaged to operate the drive. Always engage and disengage the PTO with the vehicle stationary and in Neutral. Do not apply a load to the PTO drive until the drive has been engaged. Damage to components can result.

The air pressure must not exceed 90 psi (6.2 bar). Damage to components can result.

1. Connect a regulated air pressure line to the air control port. Figure 7.6.

2. Apply 90 psi (6.2 bar) of air pressure.

3. Check for leaks in the PTO air control line.

4. Cycle the air control pressure. Follow the procedures below to check that the PTO clutch engages correctly.

PTO Without an Optional Indicator Switch

1. Remove the switch port screw and washer. Figure 7.4.

2. Measure the PTO push rod travel to verify that the travel is 0.75-inch (19 mm) and that the clutch is fully engaged.

   - If the push rod travel is not at 0.75-inch (19 mm) and the PTO clutch is not fully engaged: Disengage the clutch by releasing the air pressure. Rotate the clutch output shaft by hand and retest.

   - If the clutch still is not fully engaged: Remove the PTO assembly. Check the transfer case output shaft splines and the PTO clutch collar splines. Replace worn or damaged parts. Repeat the assembly procedures.
PTO with an Optional Indicator Switch

1. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-40.8 N·m).
2. Verify that the indicator switch closes when the PTO completes a shift to engage the drive. Figure 7.5.
   - If the indicator switch does not close to fully engage the drive: Measure the PTO push rod travel to verify that the travel is 0.75-inch (19 mm) and that the clutch is fully engaged.
   - If the push rod travel is not at 0.75-inch (19 mm) and the PTO clutch is not fully engaged: Disengage the clutch by releasing the air pressure. Rotate the clutch output shaft by hand and retest.
   - If the clutch still is not fully engaged: Remove the PTO assembly. Check the transfer case output shaft splines and the PTO clutch collar splines. Replace worn or damaged parts. Repeat the assembly procedures.

Test the Transfer Case with the PTO Assembly Installed

⚠️ CAUTION
The air pressure must not exceed 10 psi (0.69 bar). Damage to components can result.

1. Connect a regulated air pressure line to the air transfer case breather. Figure 7.7.
2. Check that the air pressure line fittings are installed correctly.
3. With the correct fitting installed into the breather port, apply a pressure of 8-10 psi (0.55-0.69 bar).
4. Turn the air supply OFF. Check the pressure.
   - If the pressure decreases by more than 2 psi (0.14 bar) in 10 minutes: Check for external leaks at the fittings. Correct any leaks. Recheck the pressure.
5. Install the breather.

PTO Disassembly

Once you’ve removed the PTO according to the procedure in Section 4, use the following procedure for disassembly.

⚠️ WARNING
Take care when you remove the spring-loaded PTO cap. Serious personal injury and damage to components can result.

1. Carefully remove the spring-loaded PTO cap by turning each bolt a few turns at a time until all the bolts can be removed at once.
2. Remove the capscrews from the cover of the declutch piston. Remove the cover.
3. Remove the PTO piston push rod and the return spring. Remove the O-ring seal from the PTO piston.
4. Remove the O-ring seal on the cover. Discard the seal. Remove the shift fork and clutch collar.
5. Remove the oil and dirt seals from the bearing cage assembly. Discard the seals.
6. Press the shaft out of the bearing cage. Remove the bearing assembly.
7. Remove the bearing cups as a unit with the bearing spacer by pressing the cups out of the bearing cage. Do not separate these parts. They are a matched set.

PTO Assembly

1. Rotate the transfer case in the repair stand so that the output shaft to the PTO is facing UPWARD.
**CAUTION**
The cups must fit securely in the housing bores. Damage to the components can result.

2. Assemble the PTO components by performing the following steps.
   A. Install the bearing cups into the PTO bearing cage housing. This is an interference fit. Freeze the bearing to −65°F (−54°C) and position the two cups into the housing bores. Figure 7.8.
   - If the cups are loose after the cup temperature warms: Replace the housing.
   B. Preheat the first bearing cone to 200°F (93°C). Support the shaft and slide the heated cone in place onto the output shaft. Figure 7.9.
   C. Install the shaft assembly into the housing. Slide the bearing spacer onto the splined end of the shaft.
   D. With the bearing spacer in position, the second bearing cone can be heated to 200°F (93°C) and installed onto the shaft. Figure 7.10.
   E. Support the shaft and apply a press of 50-60 lbs (23-27 kg) to the bearing cone to set the bearing in place while the bearing cools.
   F. Apply a light film of SAE Grade full-synthetic 40W oil, Meritor specification O-81.
   G. Assemble the shift fork to the clutch collar. Install this unit into the bearing cage housing.
   H. Install the push rod into the housing and through the shift fork assembly.
   I. Apply 20-30 lbs (9-14 kg) of pressure to insert the piston into the housing. Figure 7.11.
   J. Apply grease to the O-rings.
**WARNING**  
Do not draw down the capscrews to seat the cover plate. Serious personal injury and damage to components can result.

K. To install the cover plate, press firmly until the cover plate bottoms out on the housing. Rotate the plate one complete revolution to ensure that the O-ring is seated.

L. Lightly lubricate all parts with SAE Grade full-synthetic 40W oil, Meritor specification O-81.

M. Install the 1/4-20 screws using Loctite® 242 sealant. Tighten the screws to 10-14 lb-ft (14-19 N·m).  

N. Insert the spring into the housing over the push rod.  

Figure 7.12

O. Apply a thin film of Loctite® 518 gasket material to the cap surface. Install the cap with the 1/4-20 screws using Loctite® 242 sealant. Tighten the screws to 10-14 lb-ft (14-19 N·m). Figure 7.12.  

P. Install the PTO shaft seal into the housing.  

Q. Press the seal into position until the seal is seated on the housing.  

3. Install the PTO assembly onto the transfer case.  
4. Apply a thin film of Loctite® 518 gasket material to the housing.  
5. Slide the housing onto the output shaft of the transfer case, aligning the splines of the clutch to the shaft.  

6. Install the eight 7/16-inch (11 mm) diameter screws and washers using Loctite® 277 sealant. Tighten the screws to 60-75 lb-ft (81-102 N·m).  

7. Check that the clutch engages and disengages correctly.  
8. Pressure test the PTO shifter for air leakage by performing the following steps.  
   a. With the correct fitting installed into the air control port, apply a pressure of 90 psi (6.2 bar).  
   b. Shut off the air supply.  

**CAUTION**  
Check for external leaks at the cover plate joint and fitting if the pressure decreases more than 5 psi (0.3 bar) in 10 minutes. Leaks can cause component damage.

C. Check for external leaks at the cover plate joint and fitting if the pressure decreases more than 5 psi (0.3 bar) in 10 minutes.

- If the external joints are sealed and the leakage is still more than 5 psi (0.3 bar): Remove the piston and inspect the O-ring and housing bore for damage. Repair parts as necessary.

9. Apply a thin film of Loctite® 518 gasket material to the indicator switch. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-40 N·m). Figure 7.13.  

- If a switch is not used: Install the special plug and washer used to cap the access hole. Tighten the plug to 25-30 lb-ft (34-40 N·m). Figure 7.13.  

10. Repeat Step 1 through Step 9 for each remaining declutch and PTO assembly.
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.

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

Install the Transfer Case

⚠️ WARNING
Support the transfer case with a lifting device before moving the transfer case. A transfer case that is not supported correctly can fall. Serious personal injury and damage to components can result.

1. Use a lifting device to move the transfer case from the repair stand to a hydraulic roller jack. If used, remove the temporary eye-bolts and angle iron brackets from the transfer case housing.
2. Move the transfer case into position under the vehicle with the hydraulic roller jack.
3. Install the transfer case into the vehicle with the mounting bolts. Tighten the bolts to the torque specification supplied by the vehicle manufacturer.
4. Connect the drivelines to the input and output yokes of the transfer case.
5. Connect any switch or speed sensor wiring.
6. Fill the transfer case with correct quantity of specified lubricant. Refer to Section 10 for more information.

Oil Cooler Line Connections for MTC-4213, or MTC-4208 and MTC-4210 with Oil Cooler

NOTE: There are different transfer case lubrication systems available. First, familiarize yourself with which model transfer case you have in order to identify cooler adaptation ports.

MTC-4213, or MTC-4208 and MTC-4210 Models with PTO

1. Disconnect the loop line on top of the transfer case connecting the pump exit and return ports on the transfer case. Figure 8.1.
Troubleshooting

Transfer Case Lubrication Diagnostics

Figure 9.1

1. Replace the breather.
2. Determine if the breather is mounted in the correct location. Call the Meritor OnTrac™ Customer Call Center at 866-OnTrac1 (668-7221) for additional information.

Does oil blow-out from the breather?

Yes

Inspect seals for leaks.

Fill the transfer case with the correct type and amount of oil.

No

Inspect transfer case housing damage and joint seal leak.

Yes

No

Road test the vehicle, then check for leaks. Return vehicle to service.

1. Check the transfer case oil level.
2. Check the transfer case for air leaks.

Remove transfer case from vehicle and disassemble. Inspect parts for damage and replace as needed. Reassemble transfer case.

Clean transfer case and operate vehicle.

Inspect breather for clog or oil blowing out.

Breather clogged?

Yes

No

1. Check the transfer case oil level.
2. Check the transfer case for air leaks.

Continue to next page.
Figure 9.2

1. Check the shaft for excessive movement. Repair as necessary.
2. Determine if the transfer case requires an oil cooler. Call the Meritor OnTrac™ Customer Call Center at 866-OnTrac1 (866-668-7221) for additional information.

Check the oil level in the transfer case.

Seal leaking?

Oil level too high?

Yes

Too much oil or the incorrect type of oil can cause the transfer case to overheat, which may cause seal damage.

No

Check the transfer case for leaks.

Check the yoke journal for burrs, rough edges or wear grooves. Rub down any burrs or rough spots. If a wear groove is present, replace the yoke.

Install a new seal using the correct seal driver. NOTE: An incorrect installation can cause a seal leak.

Check the oil level, adjust if necessary, then return the vehicle to service.

Check oil level, adjust if necessary, then return the vehicle to service.

Road test the vehicle, then check for leaks. Return vehicle to service.

Fill the transfer case with the correct type and amount of oil.

NOTE:

- Oil level too high?
- Seal leaking?
Excessive Noise and Vibration Diagnostics

Determine all driveline angles. Angles should not exceed five degrees and the difference between any of the angles should not be greater than 1-1/2 degrees.

- Check all drivelines for adequate balancing.
- Replace or rebalance driveline.
- Balanced?
  - Yes: Check transfer case mounting fasteners for correct torque. Refer to vehicle manufacturer’s specifications.
  - No: Are angles excessive?
    - Yes: Excessive driveline angles are the leading cause of drivetrain vibration and noise. Consult the vehicle manufacturer.
    - No: Check U-joints for excessive wear and damaged rollers.
      - Wear or damage?
        - Yes: Replace worn bearings or damaged components.
        - No: Check for loose or broken case-to-vehicle mounting brackets and fasteners.

- Loose fasteners or broken bracket?
  - Yes: Replace broken brackets and/or tighten all fasteners to specified torque.
  - No: Road test the vehicle to determine if noise/vibration is still present.

- Problem corrected?
  - Yes: Return the vehicle to service.
  - No: Check all declutch and all transfer case shafts for excessive wear. Repair as necessary.

Replace worn bearings or damaged components.
PTO Does Not Engage/Disengage Diagnostics

Check indicator light, and engagement and disengagement sensors for correct operation.

- Yes
  - Replace faulty indicator light or sensor, then try to shift PTO.
  - No
  - Air system contaminated?
    - Yes
      - Check the piston cylinder on the PTO. Clean the air supply system. Refer to vehicle manufacturer’s instructions. Check that the PTO engages correctly.
    - No
      - Air pressure 65 psi (4.48 bar) or more?
        - Yes
          - Correct system air pressure. Refer to the vehicle manufacturer’s instructions.
        - No
          - Remove the PTO from the transfer case. Disassemble the PTO and inspect the bearings, shift collar, shift fork declutch bore and return spring for damage. Repair all damaged components.

- No
  - Check air connection to PTO shift port.
    - Yes
      - PTO shifts correctly?
        - Yes
          - Return the vehicle to service.
        - No
          - Return the vehicle to service.
    - No
      - PTO shifts correctly?
        - Yes
          - Return the vehicle to service.
        - No
          - Check the available air pressure. The transfer case requires at least 60 psi (4.14 bar) at all times to operate correctly.

- Light or sensor faulty?
  - Yes
    - Replace faulty indicator light or sensor, then try to shift PTO.
  - No
    - Check indicator light, and engagement and disengagement sensors for correct operation.

Return the vehicle to service.
Front Axle Declutch Does Not Engage/Disengage Diagnostics

- Turn wheels left and right several times, then try to shift declutch.
  - Check indicator light, and engagement and disengagement sensors for correct operation.
    - Light or sensor faulty?
      - Yes: Replace faulty indicator light or sensor, then try to shift declutch.
      - No: Check the available air pressure. The transfer case requires at least 60 psi (4.14 bar) at all times to operate correctly.
        - Air pressure 65 psi (4.48 bar) or more?
          - Yes: Correct system air pressure. Refer to the vehicle manufacturer’s instructions.
          - No: Air system contaminated?
            - Yes: Check the piston cylinder on the declutch. Clean the air supply system. Refer to vehicle manufacturer’s instructions. Check that the transfer case shifts correctly.
            - No: Remove the transfer case from the vehicle. Follow disassembly procedures. Inspect front axle drive gear, shaft, shift collar, collar engagement teeth on gear, shift fork, shift fork bore, piston, O-ring and return spring for damage. Repair all damaged components.
          - No: Declutch shifts correctly?
            - Yes: Return the vehicle to service.
            - No: Declutch shifts correctly?
              - Yes: Return the vehicle to service.
              - No: Return the vehicle to service.

- Check the PTO for leaks.

- Reinstall the transfer case onto the vehicle. Road test the vehicle to confirm the problem is corrected.

- Return the vehicle to service.
High/Low Gear Shifting Diagnostics

Turn wheels left and right several times, then try to shift into high or low gear.

- **Yes**
  - Problem fixed?
  - **Yes**
    - Return the vehicle to service.
  - **No**
    - **Vehicle stationary**
    - **Yes**
      - Return the vehicle to service.
    - **No**
      - **Problem fixed?**
      - **Yes**
        - Return the vehicle to service.
      - **No**
        - Shift transmission to neutral. Shift transfer case to neutral. Shift transmission into first gear, press lightly on accelerator. (PTO models only)

Check the available air pressure. The transfer case requires at least 60 psi (4.14 bar) at all times to operate correctly.

- **Yes**
  - Air pressure 65 psi (4.48 bar) or more?
  - **Yes**
    - Correct system air pressure. Refer to the vehicle manufacturer’s instructions.
  - **No**
    - Return the vehicle to service.

- **No**
  - Air system contaminated?
  - **Yes**
    - Check the piston cylinder. If dirty, disassemble shifter components for cleaning. Clean the air supply system. Refer to vehicle manufacturer’s instructions. Check that the transfer case shifts correctly.
  - **No**
    - Air blowing out the housing breather.
    - **Yes**
      - Remove the transfer case from the vehicle. Disassemble and replace housing O-ring and piston O-rings. Reassemble and check that transfer case shifts correctly.
    - **No**
      - Air blowing out the neutral breather or port.
      - **Yes**
        - Remove the shift cylinder and pistons. Inspect O-rings, pistons, snap rings and shift bore. Repair any damaged components. Reassemble and check that transfer case shifts correctly.
      - **No**
        - Problem fixed?
        - **Yes**
          - Reinstall transfer case in vehicle and return vehicle to service.
        - **No**
          - Disassemble transfer case and inspect shift shaft, shift fork, shift collar and shift bore. Repair any damaged components. Reassemble and check that the transfer case shifts correctly.

Contact OnTrac™ Customer Call Center at 866-OnTrac1 (668-7221).
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.

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

Lubricant Temperatures

Meritor MTC-4208, MTC-4209 and MTC-4210 Series Transfer Cases

⚠️ CAUTION
Meritor MTC-4208, MTC-4209 and MTC-4210 Series transfer cases may operate with an oil temperature above 300°F (148°C). However, if the oil temperature reaches 350°F (177°C), stop the vehicle immediately. Check for the cause of overheating to prevent damage to components.

Meritor MTC-4208, MTC-4209 and MTC-4210 Series transfer cases may operate with an oil temperature above 300°F (148°C). However, if the oil temperature reaches 350°F (177°C), stop the vehicle immediately and check for the cause of overheating. Oil temperatures at this range should only occur in linehaul or utility applications that operate under high speed for long periods of time.

Do Not Install API GL-5 Oils

⚠️ CAUTION
Meritor does not approve petroleum-based and multiviscosity oil. Do not install API GL-5 oils, which contain extreme-pressure (EP) additives. These additives can form sludge at normal operating temperatures. Damage to components can result. Use only SAE Grade full-synthetic 40W oil, Meritor specification O-81, in the transfer case.

Use only SAE Grade full-synthetic 40W oil, Meritor specification O-81, in the transfer case.

Do not install API GL-5 oils in a transfer case. This specification contains extreme pressure (EP) additives that can form sludge at normal operating temperatures and damage transfer case components.

Petroleum-Base and Multi-Viscosity Oils

Meritor does not approve the use of petroleum-base and multi-viscosity motor oils. Refer to Maintenance Manual 1, Preventive Maintenance and Lubrication; or TP-90114, Transmission Lubricant Specifications, for a list of approved oils.

Meritor does approve the use of synthetic-base oils.

Operating Information

Magnets and Magnetic Drain Plugs

Most Meritor transfer cases are equipped with magnetic drain plugs with a minimum pick-up capacity of 20 ounces (0.57 kg) of low carbon steel. Replace the magnetic drain plug each time you change the oil. Use the correct part. If you use a pipe plug instead of a drain plug, the pipe plug will leak.

You can reuse a drain plug you removed if it has a minimum pick-up capacity of 20 ounces (0.57 kg) of low carbon steel after you clean it.

Breather

⚠️ CAUTION
Cover the breather when steam cleaning the housing. If the breather is not covered, water can enter the housing and contaminate the oil.

The breather releases pressure that builds up inside the transfer case during vehicle operation. Figure 10.1 and Figure 10.2.
Seals

**CAUTION**
Always use the correct tools and procedures when you replace a seal. A seal that is not correctly installed can leak. Damage to components can result.

Seals keep lubricant in and dirt out of a component. When they are worn or damaged, seals leak and produce low lubricant levels which may damage components.

Always replace unitized seals after yokes have been removed. MLS seals may be reused if they are not damaged or leaking.

Meritor has released the multiple-lip seal (MLS) for use in the INPUT POSITION ONLY on the MTC-4208, -4210 and -4213 transfer cases. The multiple-lip seal is compatible with the current input shaft seal and can be used in service. Refer to Figure 10.3 for the INPUT position and front OUTPUT position. Refer to Figure 10.1 for the MTC-4208 and -4210 rear OUTPUT position. Refer to Figure 10.2 for the MTC-4213 rear OUTPUT position.

**CAUTION**
Only install the Meritor multi-lip unidirectional seal at the input position from the transmission in an MTC-4208, MTC-4210 or MTC-4213 Series transfer case. If you install the multi-lip seal in either the rear output position or forward output position on these transfer cases, loss of lubricant and damage to components can occur.

The multiple-lip seal 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.

**Special Tools and Installation Procedure**
Refer to Section 6 in this manual for the correct seal installation procedure. To obtain these sleeves, seals and drivers, call Meritor’s Commercial Vehicle Aftermarket at 888-725-9355.

**Check and Adjust the Oil Level**

**CAUTION**
Only use new lubricant when you change or adjust the oil in the transfer case. Do not reuse lubricant, which can contain metallic particles and other contaminants. Damage to components can result.

Meritor does not approve petroleum-based and multiviscosity oil. Do not install API GL-5 oils, which contain extreme-pressure (EP) additives. These additives can form sludge at normal operating temperatures. Damage to components can result. Use only SAE Grade full-synthetic 40W oil, Meritor specification O-81, in the transfer case.

Do not operate the transfer case if the oil level is below the bottom of the fill hole, which may be an indication that the transfer case is leaking. Damage to components can result. If the transfer case is leaking, repair the leak. Adjust the oil level before returning the transfer case to service.

When servicing the transfer case, add the specified lubricant until the oil level is even with the fill hole. Do not overfill the transfer case, which can cause the transfer case to overheat. Damage to components can result.

1. Park the vehicle on a level surface.
2. Clean the area around the fill plug. Remove the fill plug from the transfer case. Figure 10.4 and Figure 10.5. The oil level must be even with the bottom of the fill plug hole.

- If oil flows from the hole when you loosen the plug: The oil level is high. Drain the oil to the bottom of the fill hole.

**NOTE:** Oil can drain back from the oil cooler, giving the appearance of an overfull condition.

- If the oil level is below the bottom of fill/level plug hole: Add SAE Grade full-synthetic 40W oil, Meritor specification O-81, into the transfer case until oil is even with the bottom of the fill hole.

4. Test drive the vehicle for at least one mile (1.6 km). Allow the oil to settle for five minutes and recheck the fluid level. Top off the oil level by adding oil to the fill opening. Apply Loctite® 592 threadlocker, install the fill plug and tighten the plug to 35-50 lb-ft (47-68 N·m).

**Drain and Replace the Oil**

1. Park the vehicle on a level surface. Place a large container under the transfer case.

2. Remove the magnetic drain plug from the bottom of the transfer case. Drain and discard the oil correctly. Clean the plug. Figure 10.4.

3. Apply Loctite® 592 threadlocker, install the drain plug and tighten the plug to 35-50 lb-ft (47-69 N·m). Clean the area around the fill plug. Remove the fill plug from the transfer case.

4. Add SAE Grade full-synthetic 40W oil, Meritor specification O-81, into the transfer case until the oil level is even with the bottom of the fill plug hole. Apply Loctite® 592 threadlocker, install the fill plug and tighten the plug to 35-50 lb-ft (47-68 N·m).

5. Test drive the vehicle for at least one mile (1.6 km). Allow the oil to settle for five minutes and recheck the fluid level. Top off the oil level by adding oil to the fill opening. Reinstall and tighten the fill plug to 35-50 lb-ft (47-68 N·m).

**Inspection**

**Meritor MTC-4208, -4210 and -4213 Transfer Case Inspection**

Visually inspect the Meritor MTC-4208, -4210 and -4213 transfer cases daily for any leaks. The oil level should be inspected every 1,000 miles (1069 km), 100 hours or every month, whichever comes first. In addition, the transfer case should be inspected for leaks and the correct oil level before and after extended time high speed road trips. Areas to inspect are:

- Cooler lines and fittings
- Seals
- Breather
- Fill and drain plugs
- Pump inlet tube and fittings
- Gaskets and shims
During the inspection visually check to ensure the transfer case oil level is to the bottom of the oil fill hole.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect for oil leaks</td>
<td>Daily</td>
</tr>
<tr>
<td>Check oil level</td>
<td>1,000 miles (1609 km), 100 hours or every month, whichever occurs first</td>
</tr>
<tr>
<td>Check oil level</td>
<td>Before and after extended time high speed road trips</td>
</tr>
<tr>
<td>Initial oil change</td>
<td>2,500 miles (4000 km) or 125 hours, whichever occurs first</td>
</tr>
<tr>
<td>Synthetic oil change</td>
<td>Every 25,000 miles (40,000 km), 1,250 hours or every 12 months, whichever</td>
</tr>
</tbody>
</table>

Table F: Transfer Case Oil Specifications

<table>
<thead>
<tr>
<th>Oil Description12</th>
<th>Meritor Specification</th>
<th>A.P.I. Specification</th>
<th>Military Specification</th>
<th>SAE Grade</th>
<th>Outside Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Synthetic Oil3</td>
<td>0-81</td>
<td>—</td>
<td>SAE J2360</td>
<td>40W</td>
<td>Above −40°F (−40°C)</td>
</tr>
<tr>
<td>A.P.I. GL-5 (Axle Lube)4</td>
<td>DO NOT USE IN TRANSFER CASES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1. Do not mix or switch oil types. Use the same oil that initially filled the transfer case.
2. Do not use multi-viscosity oils.
3. Meritor-approved full-synthetic oil for Meritor manual transmissions is also approved for Meritor transfer cases. Refer to publication TP-90114, Transmission Lubricant Specifications, for a list of approved distributors. Use synthetic oil only if the transfer case was initially filled with synthetic oil.
4. Do not use multi-viscosity (i.e., 80/90W) GL-5 Gear Oil, axle lube.

Table G: Transfer Case Oil Capacities

<table>
<thead>
<tr>
<th>Transfer Case Model</th>
<th>Oil Capacity</th>
<th>Pints12</th>
<th>Liters12</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTC-4213</td>
<td>9.0</td>
<td>4.26</td>
<td></td>
</tr>
<tr>
<td>MTC-4210</td>
<td>9.0</td>
<td>4.26</td>
<td></td>
</tr>
<tr>
<td>MTC-4208</td>
<td>9.0</td>
<td>4.26</td>
<td></td>
</tr>
</tbody>
</table>

---

1. Due to the varied transfer case configurations, these fill quantities are for reference only. The fill procedure for all transfer cases is in this section.
2. Oil cooler equipped vehicles will use additional oil to compensate for the cooler and cooler lines.
### Table I: Transfer Case Model

<table>
<thead>
<tr>
<th>Transfer Case Model</th>
<th>Seal Position</th>
<th>Seal Service Part Number</th>
<th>Previous Seal Part Number</th>
<th>Seal Driver</th>
<th>Sleeve Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTC-4208, -4210 and -4213</td>
<td>Input Shaft</td>
<td>A1-1205X2728</td>
<td>R945007</td>
<td>2728T1</td>
<td>2728T2</td>
</tr>
<tr>
<td>MTC-4208 and -4210</td>
<td>Forward and Rear Output</td>
<td>R945007</td>
<td>A 1205R2592</td>
<td>KIT 4454</td>
<td>NA</td>
</tr>
<tr>
<td>MTC-4213</td>
<td>Forward Output</td>
<td>R945007</td>
<td>A 1205R2592</td>
<td>KIT 4454</td>
<td>NA</td>
</tr>
<tr>
<td>MTC-4213</td>
<td>Rear Output</td>
<td>R945010</td>
<td>A 1205Q2591</td>
<td>KIT 4454</td>
<td>NA</td>
</tr>
<tr>
<td>MTC-4208 and -4210</td>
<td>PTO Seal</td>
<td>R945008</td>
<td>A 1205P2590</td>
<td>KIT 4454</td>
<td>NA</td>
</tr>
</tbody>
</table>
Torque Specifications

Figure 11.1

OIL COOLER READY MODEL

STANDARD MODEL

Meritor Maintenance Manual MM-0146 (Revised 01-20)
## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Torque lb-ft (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing Cage Cover Capscrews</td>
<td>85-115 (115-156)</td>
</tr>
<tr>
<td>2</td>
<td>Loop Tube Fittings</td>
<td>20 (27)</td>
</tr>
<tr>
<td>3</td>
<td>Oil Cooler Male Connectors¹</td>
<td>25 (34)</td>
</tr>
<tr>
<td>4</td>
<td>Yoke Locknuts</td>
<td>700-900 (949-1220)</td>
</tr>
<tr>
<td>5</td>
<td>Magnetic Drain Plug²</td>
<td>35-50 (48-68)</td>
</tr>
<tr>
<td>6</td>
<td>3/8-Inch (9.5 mm) Plug²</td>
<td>20 (27)</td>
</tr>
<tr>
<td>7</td>
<td>Fill Plug²</td>
<td>35 (48)</td>
</tr>
<tr>
<td>8</td>
<td>Cover-to-Case Capscrews</td>
<td>60-75 (81-102)</td>
</tr>
<tr>
<td>9</td>
<td>Shaft Locknut</td>
<td>700-900 (949-1220)</td>
</tr>
<tr>
<td>10</td>
<td>Bearing Cage Capscrews</td>
<td>85-115 (115-156)</td>
</tr>
<tr>
<td>11</td>
<td>Shaft Locknut</td>
<td>700-900 (949-1220)</td>
</tr>
<tr>
<td>12</td>
<td>Oil Pump Capscrews³</td>
<td>22-29 (29-39)</td>
</tr>
<tr>
<td>13</td>
<td>Shift Cylinders⁴</td>
<td>80-100 (108-136)</td>
</tr>
<tr>
<td>14</td>
<td>Male Connector</td>
<td>36 (49)</td>
</tr>
<tr>
<td>15</td>
<td>Fitting — Screen</td>
<td>35-50 (48-68)</td>
</tr>
<tr>
<td>16</td>
<td>Neutral Breather/Bushing</td>
<td>10 (14)</td>
</tr>
<tr>
<td>17</td>
<td>Female Connector</td>
<td>25 (34)</td>
</tr>
<tr>
<td>18</td>
<td>3/8-Inch (9.5 mm) Plug²</td>
<td>20 (27)</td>
</tr>
<tr>
<td>19</td>
<td>Elbow²</td>
<td>20 (27)</td>
</tr>
</tbody>
</table>

¹ Apply Loctite® 582 threadlocker to pipe threads.
² Apply Loctite® 592 threadlocker.
³ Apply Loctite® 242 threadlocker.
⁴ Apply Loctite® 518 threadlocker to the first three threads.
Guidelines

⚠️ CAUTION
Follow towing procedures recommended by Meritor to prevent internal damage to the transfer case.

Meritor recommends that you use one of the two methods below when towing a vehicle equipped with an MTC-4208, -4210 or -4213 transfer case to prevent damage to the transfer case.

**NOTE:** For complete towing information and instructions on axle shaft removal, refer to Technical Bulletin TP-9579, Driver Instruction Kit.

**Method 1**
Remove both axle shafts from the axles that will remain on the road when the vehicle is transported.

**Method 2**
Remove the drive shafts from axles that contact the ground.
OPTIONAL FABRICATION METHOD:
Use standard 1” square drive 3” hex socket, splice drive section apart from hex section, weld a tubular section (3.00 ID x 4.75 OD x 2.50 length) between hex and drive sections.
**Figure 13.2**

**HOLDING FIXTURE, TOOL NUMBER 905473-140**

Dimensions in inches:

- Ø3.00
- 2.360
- 2.00
- 0.50
- 4.00
- 0.50
- 8.00
- 5.59
- 10.00

YOKE #17TYS38-76

Drill thru for 1/2-20 SOC head screw (4) places

**Figure 13.3**

**BEARING CONE DRIVER**

**TOOL NUMBER 905473-92**

Dimensions in inches:

- 0.18 X 45° Typ.
- 1.85
- 0.25
- 0.03 X 45° Typ.
- 0.41 Dia.
- 3.50 Dia.
- 2.50 Dia.
- 2.56 Dia.
- 2.440 Dia.
- 3.00 Dia.
- 0.13 X 45°
- 2.0 Knurled
- 0.50
- 4.00
Figure 13.4

BEARING CONE DRIVER
TOOL NUMBER 905473-82

NOTE: Not available from Meritor.

4.0 DIA.

0.09 X 45° TYP.

0.03 R

0.12 R

4.0 KNURL

0.50

6.88

6.23

2.25

0.03 R

2.6400 DIA.

3.25 DIA.

2.70 DIA.

0.03 X 45° (2) PLCS.

0.90

6.88

4007160a
Figure 13.5

BEARING CUP DRIVER
TOOL NUMBER 910203-36

4.810
4.808
DIA.

4.450
4.0
DIA.

1.76

45°

0.250

1.35

1.15

0.09 RAD. TYP.

MIN. UNDERCUT

4.15

3.65

3.48

3.980

3.978

DIA.

DIA.
Figure 13.6

BEARING CUP DRIVER
TOOL NUMBER 910203-37

- 0.09 RAD. TYP.
- 0.50
- MIN. UNDERCUT
- 4.997
- 4.995 DIA.
- 4.637 DIA.
- 4.0 DIA.
- 3.48 DIA.
- 3.980
- 3.978 DIA.
- 4.980
- 4.976 DIA.
- 45°
- 4.34
- 1.09
- 1.50
- 1.56
- 0.250
- 4007158a
Figure 13.7

PTO BEARING CONE DRIVER

- Dimensions:
  - 8.00
  - 4.00
  - 3.500
  - 3.000
  - 0.250
  - 0.38
  - 5.375
  - 4.50
  - 0.44

- Tolerances:
  - R 0.38