

10 Vehicle Towing Instructions

Vehicle Towing Instructions

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

HIGH-VOLTAGE DANGER

Vehicles equipped with the Meritor ePowertrain utilize a high-voltage electrical system capable of producing lethal levels of voltage. Contact with the high-voltage electrical system and components including the powertrain, cables and battery packs can result in electric shock, burns or even death. Do not touch any part of the high-voltage electrical system and components for any reason. Use caution at all times and follow all instructions in this publication as directed to avoid injury or death.

HIGH-VOLTAGE DANGER

Always perform the OEM-approved, high-voltage disable procedure prior to any service, including work on the powertrain, brakes, wheel ends and other components not connected directly to orange high-voltage cables. All components in contact with the powertrain assembly have the potential to conduct high voltage to other attached components. Failure to disable the high-voltage system before working on any part of the powertrain can result in electric shock, burns, injury or death.

DANGER

Engage the parking brake to prevent the vehicle from moving before beginning maintenance or service procedures that require working under the vehicle. Serious personal injury or death can result.

DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use safety stands can result in death or serious personal injury and damage to components.

DANGER

Never place chains or straps on or across any high-voltage components or orange high-voltage cables in order to tow the vehicle. Damage, personal injury or death can result.

WARNING

Before servicing a spring chamber, carefully follow the manufacturer's instructions to compress and lock the spring to completely release the brake. Verify no air pressure remains in the service chamber before proceeding. Sudden release of compressed air can cause serious personal injury and damage to components.

WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

CAUTION

Do not use a chisel or wedge to loosen the axle shaft. A chisel or wedge can result in damage to the axle shaft, gasket and hub.

Towing Instructions

Vehicles equipped with the ePowertrain must only be towed in Neutral position. Never tow the vehicle in gear. If it is not possible to shift the vehicle into Neutral or confirm that it is in Neutral prior to towing, the vehicle must be transported using a flatbed truck.

CAUTION

Always shift the vehicle into Neutral and confirm it is Neutral position before towing. Never tow the vehicle in gear. If it is not possible to shift the vehicle into Neutral or confirm that it is in Neutral position, the vehicle must be transported using a flatbed truck. Failure to tow the vehicle in Neutral position can result in damage to the inverter, motor, and transmission that may be unreparable.

In cases where it is not possible to confirm that the vehicle is in Neutral, the shift actuator may be removed and a visual inspection of the transmission can be performed to determine if it is in the Neutral position.

If the transmission is not in the Neutral position, it can be manually shifted into the Neutral position. In order to perform the manual shift, a special tool is required to engage with the cam spline in order to move the cam into the Neutral position. Additionally, to make a manual shift, the detent should be loosened, shift should be made, then the detent should be reengaged and tightened to 52-64 lb-ft (70-90 Nm) after achieving the Neutral position.

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Axle Shaft Removal

Meritor recommends removing the axle shafts for towing as detailed in this section. Axle shaft removal protects the hypoid pinion from damage that can occur when running at higher speeds with inadequate lubrication. Also, towing angles especially within the ePowertrain system can potentially impede lubrication distribution.

NOTE: These instructions supersede all other towing instructions that may appear in other Meritor axle publications. For additional information regarding vehicle towing, refer to the OEM.

Pre-Towing Procedure

⚠ CAUTION

Always shift the vehicle into Neutral and confirm it is Neutral position before towing. Never tow the vehicle in gear. If it is not possible to shift the vehicle into Neutral or confirm that it is in Neutral position, the vehicle must be transported using a flatbed truck. Failure to tow the vehicle in Neutral position can result in damage to the inverter, motor, and transmission that may be unreparable.

1. Park the vehicle on a level surface. Set the parking brake. Block the wheels to prevent the vehicle from moving.
2. If the axle is equipped with a DCDL, the DCDL must be locked in the engaged position to allow removal of the axle shafts. A quick way to determine if the axle is equipped with DCDL is to check if an electrical connector is installed for the DCDL switch. Figure 10.1.

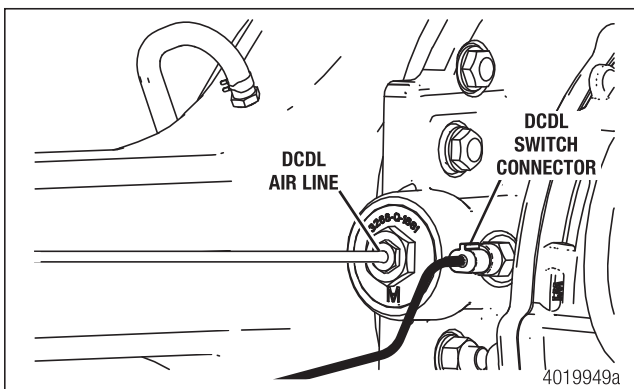


Figure 10.1

To lock the DCDL, apply air to the shift assembly fitting or remove the air line from the fitting and install a manual caging bolt. Any M10 x 1.5 x 30 bolt can be used as a caging bolt. Figure 10.2.

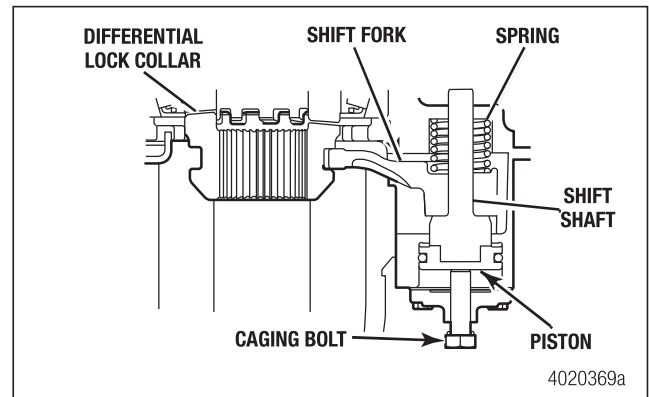


Figure 10.2

3. Remove both axle shafts from the axle(s) that will remain on the road when the vehicle is transported. Refer to the appropriate procedure in Section 4 for correct instructions.
4. Label the location of the axle shafts (left or right side) so they can be reinstalled in the same hub during reassembly. Store the axle shafts in a clean, protected location that will keep them free of dirt and other contaminants.

For 1:1 wheel ends, install a cover over the open end of each hub where an axle shaft was removed. This will prevent dirt from entering the bearing cavity and loss of lubricant.

For 2:1 wheel ends: reinstall the hub reduction wheel-end assemblies with the 18 fasteners in each hub. This will keep all parts together during transport as well as prevent dirt from entering the bearing cavity and loss of lubricant.

NOTE: If an air supply will be used for the brake system of the transported vehicle, continue with Step 5 and Step 6, otherwise continue with Step 7.

5. Connect an auxiliary air supply to the brake system of the vehicle that is being transported. Before moving the vehicle, charge the brake system with the correct amount of air pressure to operate the brakes. Refer to the instructions supplied by the vehicle manufacturer for procedures and specifications. If an auxiliary air supply is not used, continue with Step 7.
6. When the correct amount of air pressure is in the brake system, release the parking brakes of the vehicle that is being transported. Step 7 is not required.

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- If there are spring or parking brakes on the axle(s) that will remain on the road when the vehicle is transported, and they cannot be released by air pressure, manually compress and lock each spring so that the brakes are released. Refer to the manufacturer's instructions.

CAUTION

Always shift the vehicle into Neutral and confirm it is in Neutral position before towing. Never tow the vehicle in gear. If it is not possible to shift the vehicle into Neutral or confirm that it is in Neutral position, the vehicle must be transported using a flatbed truck. Failure to tow the vehicle in Neutral position can result in damage to the inverter, motor, and transmission that may be unreparable.

- Shift the vehicle into Neutral. The vehicle is now ready to be towed.

Post-Towing Procedure

- If an auxiliary air supply was used, apply the vehicle parking brakes using the switch inside the cab of the vehicle. If an auxiliary air supply was not used, begin with Step 2.
- Apply the vehicle spring or parking brakes by manually releasing each spring that was compressed before transporting started. Refer to the manufacturer's instructions.
- Disconnect the auxiliary air supply, if used, from the brake system of the vehicle that was transported. Connect the vehicle's air supply to the brake system.
- Clean off any debris and apply a coat of axle oil to the axle shafts.
- Reinstall the axle shafts and wheel-end assemblies using the appropriate procedures in Section 6.

For 1:1 wheel ends, remove the covers from the hubs. Clean the axle shaft mounting surface on the hub. Make sure it is free of debris and oil.

For 2:1 wheel ends, clean the mounting surfaces on the hub and hub reduction assembly. Ensure they are free of debris and oil.

Before reinstallation of the axle shafts, clean off any debris and apply a coat of axle oil to the axle shafts.

Make sure the axle shafts are installed into the correct hub (left or right) and the correct end of the shaft is inserted into the carrier.

If equipped with DCDL, perform Steps 5-6 when installing the axle shafts.

- If the axle is equipped with a DCDL, the DCDL must be locked in the engaged position to allow installation of the double-splined axle shaft. To lock the DCDL, apply air to the shift assembly fitting or install a manual caging bolt. Any M10 x 1.5 x 30 bolt can be used as a caging bolt. Figure 10.3.

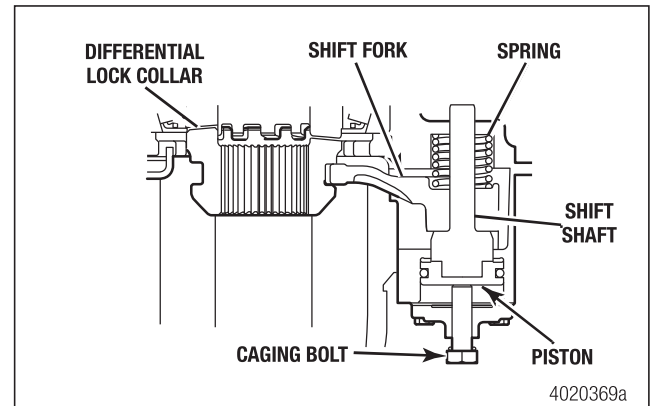
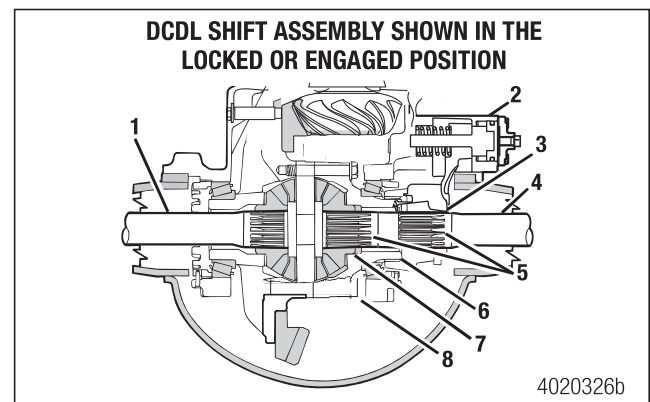


Figure 10.3

- Install the axle shaft with the double row of splines first. Once the double-splined shaft is installed, remove the shop air line or caging bolt from the fitting and reinstall the air line to the fitting. Continue installation of the remaining axle shaft. Figure 10.4.



- ROADSIDE, AXLE SHAFT WITH SINGLE-SPLINED END
- SHIFT ASSEMBLY
- SHIFT COLLAR
- CURBSIDE, AXLE SHAFT WITH DOUBLE-SPLINED END
- DOUBLE ROW OF SPLINES
- SHIFT COLLAR AND DIFFERENTIAL CASE SPLINES LOCKED
- SIDE GEAR
- DIFFERENTIAL CASE

Figure 10.4

- Add lubricant to the wheel-end assemblies as necessary. Check the lubricant level in the axle housing and add as necessary. Refer to Section 9 for correct instructions.

Specifications

Wheel Ends and Axle Shafts

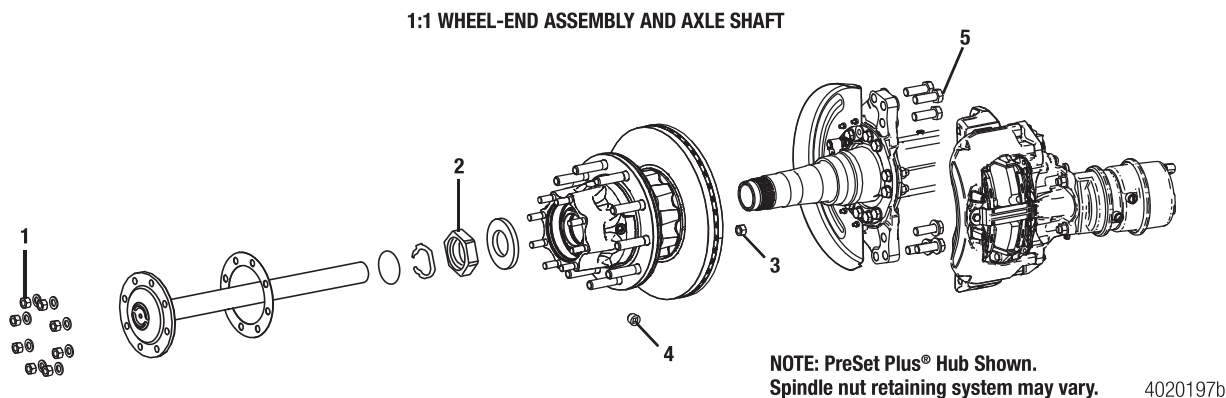
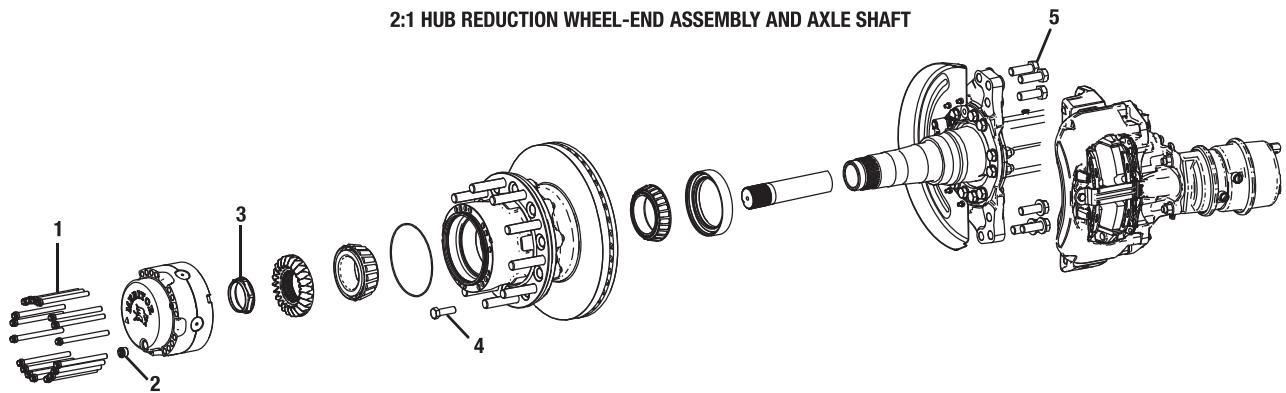


Table B: 1:1 Wheel-End Assembly and Axle Shaft Torque Specifications

	Locations/Description	Fastener Size	Lb-Ft (Nm)
1	Axle Shaft Mounting Lock Nut	5/8-18 UNF-2B	Refer to MM-0409.
2	Spindle Nut		Refer to MM-0409.
3	Rotor Mounting Fastener		Refer to MM-0409.
4	Hub Fill/Drain Plug		26±3 (35±4)
5	Caliper Assembly Mounting Fastener	M20 X 2.5	Refer to MM-0467.

11 Specifications

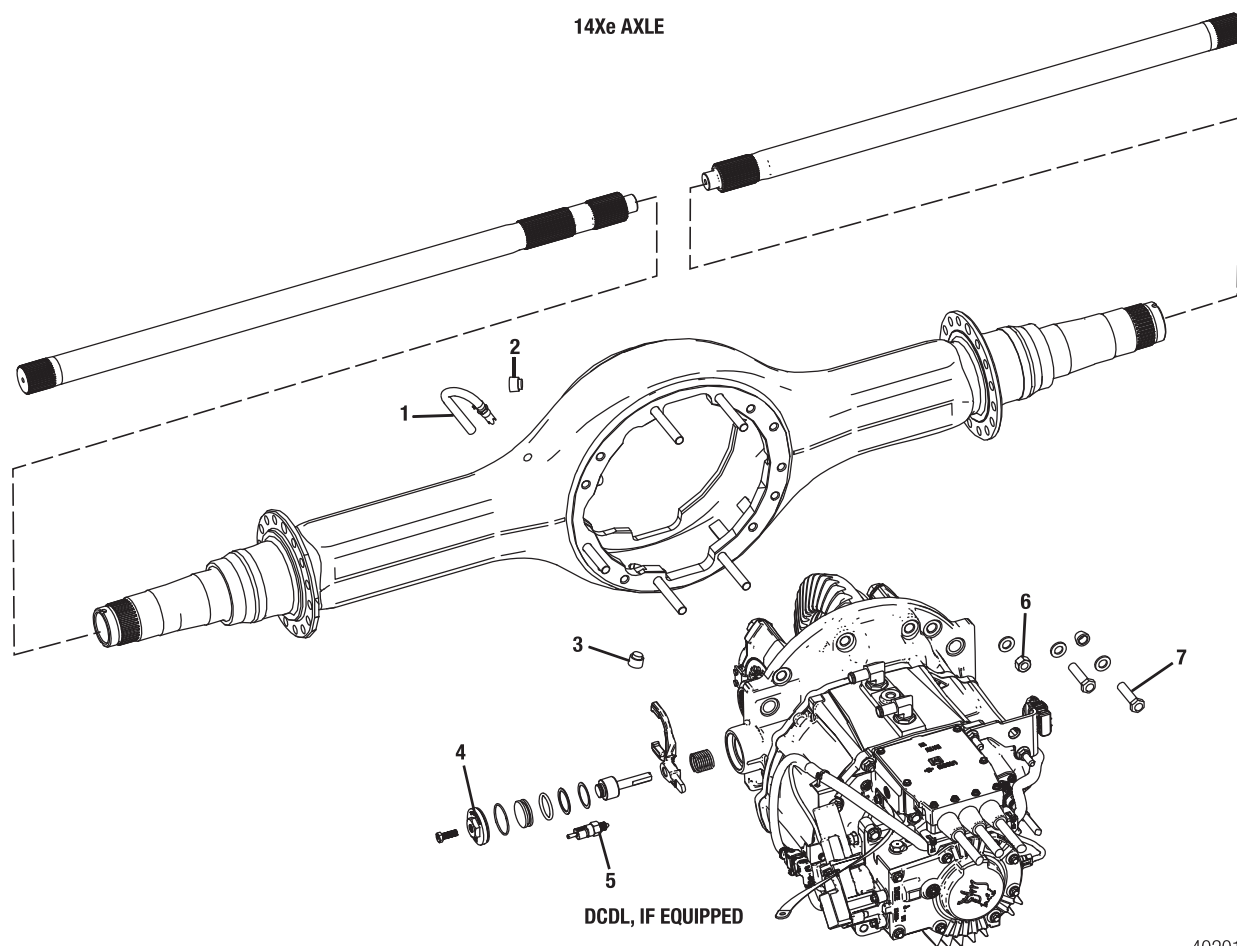


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Table C: 2:1 Hub Reduction Wheel-End Assembly and Axle Shaft Torque Specifications

	Locations/Description	Fastener Size	Lb-Ft (Nm)
1	Hub Reduction Assembly Mounting Fastener	M12 X 1.75-6	74-96 (100-130)
2	Fill/Drain Plug	M22 X 1.5	26±3 (35±4)
3	Spindle Nut	M73 X 1.5	First Tightening: 29.9-36.5 (40.5-49.5) Second Tightening: 59.7-73.0 (81-99)
4	Rotor Mounting Fastener	5/8-18	244-312 (180-230)
5	Caliper Assembly Mounting Fastener	M20 X 2.5	Refer to MM-0467.

Axle Assembly



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Table D: 14Xe Axle Torque Specifications

	Locations/Description	Fastener Size	Lb-Ft (Nm)
1	Axle Breather Assembly	3/8-18 NPTF	20-25 (27-34)
2	Fill Plug	3/4-14 NPTF	25 minimum (34 minimum) no deeper than flush
3	Drain Plug	3/4-14 NPTF	35-70 (47-95)
4	DCDL Cover	M68 X 1.5-6g	80-90 (108-122)
5	DCDL Switch	M14 X 1.5-6g	26-55 (35-75)
6	Mounting Nut	5/8-18	150-230 (203-312) Target 215 (291.5)
7	Mounting Capscrew	5/8-11	190-240 (258-325) Target 215 (291.5)