

Single Axle or Rearmost Tandem Axle Removal and Installation

Removal

For rear axle components, see [Fig. 1](#).

1. Park the vehicle on a level surface, shut down the engine, set the parking brake, and chock the tires. Put the transmission in neutral.
2. Using a suitable jack, raise the vehicle enough to take the weight off the axles, but not enough to raise the tires off the ground.
3. At both ends of the axle, loosen all the wheel nuts.
4. Continue to raise the vehicle evenly until there is room to fit a jack underneath the axle housing.

**⚠ WARNING**

Never work around or under a vehicle that is supported only by a jack. Always support the vehicle with safety stands. Jacks can slip, allowing the vehicle to fall, which could result in serious injury or death.

5. Support the vehicle with safety stands.
6. Remove the tire and wheel assemblies.
7. Drain the oil from the differential housing. Install the drain plug.
8. Disconnect the driveshaft from the differential carrier. For instructions, see [Section 41.00, Subject 120](#). Using suitable straps, support the end of the driveshaft by attaching it to the frame rail.

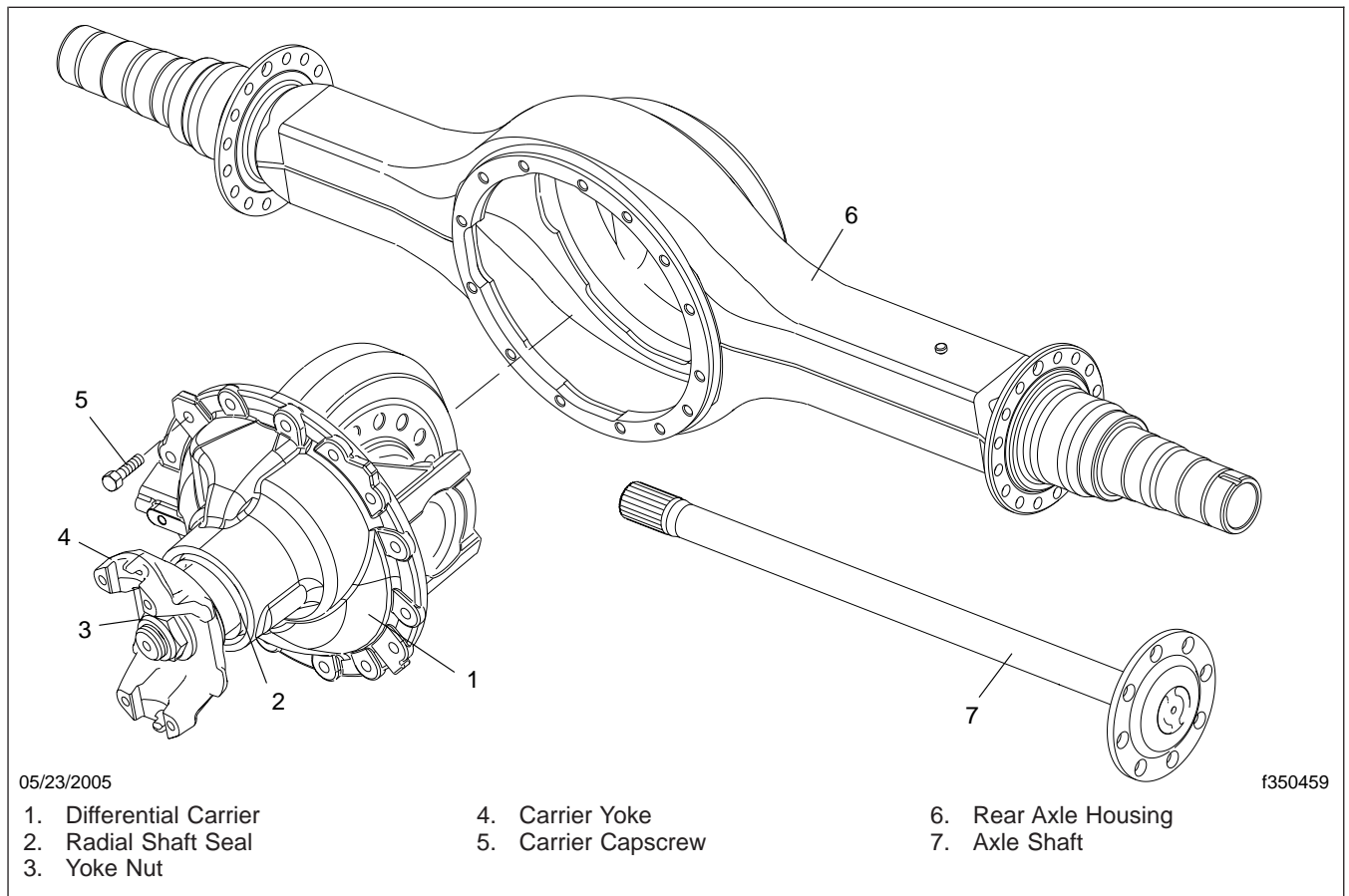


Fig. 1, Rear Axle Components

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9. Release the parking brakes.
10. Cage the parking brake springs to prevent the parking brakes from engaging. For instructions, see [Group 42](#).
11. If DCDL is installed on the vehicle, use the DCDL switch in the cab to engage the lock. An indicator light comes on when the differential lock is engaged. Turn the appropriate hubs to ensure the lock is fully engaged.
12. Place a basin under the axle shaft flanges to catch any oil, then remove the axle shafts. For instructions, see [Subject 120](#).
13. Drain the air system.
14. Disconnect the DCDL air line from the carrier housing.
15. If necessary, back off the slack adjusters, then remove the brake drums.
16. Remove the hubs from the axle spindles. For instructions, see [Section 35.00](#), [Subject 100](#).
17. Remove the brake shoes. For instructions, see the applicable service brake section in [Group 42](#).
18. If applicable, disconnect the leveling valve rod(s) from the suspension.
19. Disconnect the air lines from the rear brake chambers. Then remove the brake air chambers and the slack adjusters from the axle housing. For instructions, see [Group 42](#).
20. Remove the brake spiders from the axle flanges, as follows.
  - 20.1 At the frame rail or crossmember, disconnect the wiring for the ABS sensors. Remove any tie straps that hold the wires to the frame rails.
  - 20.2 Remove the ABS sensors and wiring.
  - 20.3 Remove the fasteners that hold the brake spiders to the axle flanges. Remove the spiders from the axle.
21. Using a suitable jack, support the axle housing.
22. If applicable, remove the hexnuts that hold the bottom of each suspension air bag to its suspension bracket.
23. Remove the suspension components that attach the axle to the vehicle. If applicable, remove the

U-bolt nuts from the U-bolts. Discard the U-bolt nuts and U-bolts.

24. Lower the axle enough to clear the suspension components.
25. Remove the axle from the vehicle.
26. If you are going to replace the differential carrier, place the axle on a secure axle stand.

## Installation

1. Position the axle underneath the vehicle.
2. Install the suspension components that attach the axle to the vehicle, as follows.

**NOTE:** U-bolts and U-bolt nuts cannot be reused.

- 2.1 On vehicles with conventional suspensions, install the upper U-bolt brackets, new U-bolts, lower U-bolt brackets, and new U-bolt nuts.

On vehicles with air suspensions, in addition to the U-bolts, install the hexnuts that attach the air springs to the suspension brackets. For torque values, see [Group 32](#).

On vehicles without U-bolts, install the walking beams.

- 2.2 If applicable, tighten the new U-bolt nuts in a diagonal pattern. For torque values, see [Group 32](#).

3. Connect the driveshaft to the differential carrier yoke. For instructions, see [Section 41.00](#), [Subject 100](#).
4. Install the brake spiders on the axle flanges. For instructions, see the applicable service brake section in [Group 42](#).
5. Install the ABS sensors and connect the wiring at the frame rail. Secure the wiring with tie straps as needed.
6. Install the brake air chambers and slack adjusters on the axle housing brackets. For instructions, see [Group 42](#).
7. Connect the air lines to the brake air chambers.

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8. Install the brake shoes, as removed. For instructions, see the applicable service brake section in [Group 42](#).
9. Fill each hub with enough 80W/90 gear oil until you can see a little amount of oil trickling out of the back of the hub (fill with about 0.8 quart, or 0.75 liter). Install the hubs on the axle spindles, and adjust the wheel bearings. For instructions, see [Section 35.00, Subject 100](#).
10. If DCDL is installed on the vehicle, connect the DCDL air line, fill the air system, and use the DCDL switch in the cab to engage the lock. An indicator light comes on when the differential lock is engaged.
11. Using new gaskets, install the axle shafts. For instructions, see [Subject 120](#).
12. Install the brake drums on the hubs.
13. Install the wheels and tires. For instructions, see [Group 40](#).
14. Adjust the brakes. For instructions, see the applicable service brake section in [Group 42](#).
15. Uncage the parking brake springs.
16. Using approved axle oil, fill the axle housing to the bottom of the fill hole, or until filled to capacity as shown in [Table 1](#).
17. If the hubs are dry, raise one side of the vehicle about 8 inches (20 cm) to let the oil flow into the hub on the opposite side, then raise the other side in the same manner. On each side, hold the tilted position for three minutes to allow oil to run into the wheel end.
18. Turn the wheels, wait one minute, and check the lubricant level.
19. Raise the vehicle, remove the safety stands, then lower the vehicle.
20. If applicable, connect the suspension leveling valve(s). Start the engine, build the air pressure, and make sure the suspension air bags inflate correctly. Make sure the ride height is correct. For instructions, see [Group 32](#).
21. Check the oil level in the axle housing. The level should be up to the bottom of the fill hole. Add approved axle oil, if needed.
22. Set the parking brake, then remove the chocks from the tires.

Approved Single Rear Axle Oil Type and Capacity				
Model	Oil Type		Capacity: quarts (liters)	
	Mineral	Synthetic	Hubs Full	Hubs Dry
2	80W-90	75W-90	5.8 (5.5)	7.4 (7.0)
4			10.6 (10.0)	12.2 (11.5)

**Table 1, Approved Single Rear Axle Oil Type and Capacity**

17. If the hubs are dry, raise one side of the vehicle about 8 inches (20 cm) to let the oil flow into the hub on the opposite side, then raise the other side in the same manner. On each side, hold the tilted position for three minutes to allow oil to run into the wheel end.

**NOTICE**

**Make sure the hubs are filled. Driving with the hubs dry will cause bearing damage.**

## Single Axle or Rearmost Tandem Axle Differential Carrier Removal and Installation

When the wheel lock is removed, inspect the carrier for damage and replace it if damage is found. If no damage is found, install the carrier again.

### Removal

NOTE: The differential carrier can be removed either with the rear axle installed on the vehicle or with the rear axle removed from the vehicle.

### Axle Installed on Vehicle

1. Park the vehicle on a level surface, shut down the engine, set the parking brake, and chock the tires.
2. Put the transmission in neutral.
3. If applicable, release the suspension air pressure.
4. Using suitable jacks, raise the vehicle evenly until there is room to fit a jack underneath the axle housing.
5. Remove the tire and wheel assemblies.
6. Drain the oil from the axle housing.
7. Disconnect the driveshaft from the carrier yoke. For instructions, see [Section 41.00, Subject 100](#). Using suitable straps, support the end of the driveshaft by attaching it to the frame rail.
8. If DCDL is installed on the vehicle, use the DCDL switch in the cab to engage the lock. An indicator light comes on when the differential lock is engaged. Turn the appropriate hubs to ensure the lock is fully engaged.
9. Place a basin under the axle shaft flanges, then remove the axle shafts. For instructions, see [Subject 120](#).
10. Do the steps under the heading, "Axle Removed from Vehicle."

### Axle Removed from Vehicle

1. Using a suitable jack, support the differential carrier. Chain the differential carrier to the jack.
2. If DCDL is installed on the vehicle, ensure the lock is engaged. Turn the appropriate hubs to verify it is fully engaged.
3. Remove the carrier capscrews that hold the differential carrier to the axle housing. See [Fig. 1](#).

### WARNING

The differential carrier is heavy. Do not try to move it without a suitable support. To do so could result in the carrier falling, which could cause serious personal injury and component damage. Support the carrier with a suitable jack and chain it to the jack, or use a hoist if the axle has been removed from the vehicle.

4. With the differential carrier securely supported, remove it from the axle housing.

### Installation

IMPORTANT: If you replace the yoke on the differential carrier, use a *new* nut when installing the new yoke.

NOTE: Use a cleaning solvent and clean rags to remove dirt. Blow dry the cleaned areas with air.

1. Remove any old sealant material from the mating surfaces of the axle housing. Clean the inside of the rear axle housing and the forward carrier mating surface.
2. Inspect the axle housing for damage. Repair or replace the axle housing as necessary.
3. Apply a thin bead of Loctite® 5900 sealant all the way around the mating surface of the axle housing, and around each bolt hole.

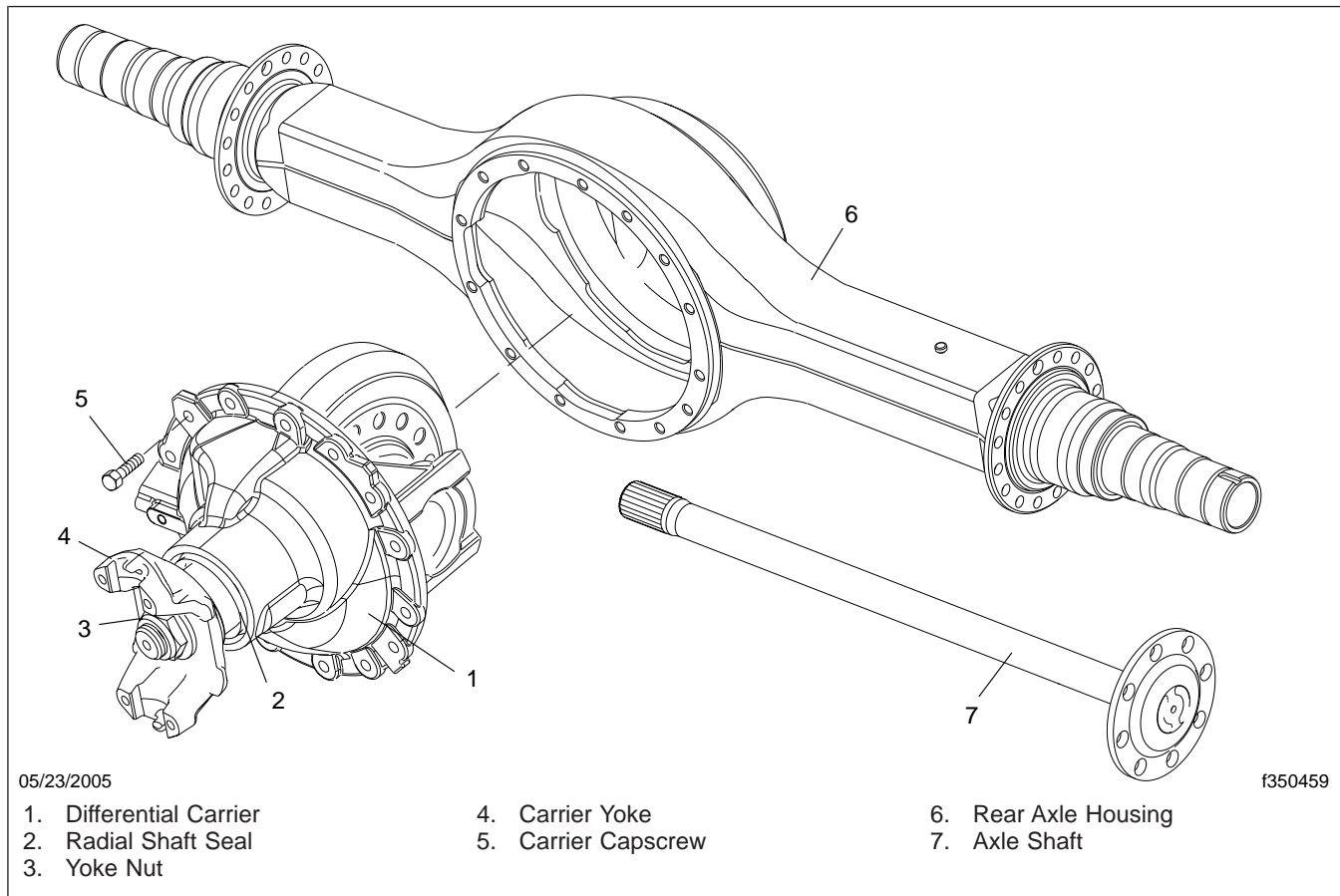
NOTE: Alignment dowels for installing the differential carrier can be made by sawing off the heads of two M12 x 1.5 x 100 mm bolts (for Model 2 axles) or M16 x 1.5 x 100 mm bolts (for Model 4 axles).

4. Install alignment dowels 180 degrees apart at the 3 o'clock and 9 o'clock positions on the axle housing flange.
5. If DCDL is installed on the vehicle, ensure it is engaged.

### NOTICE

**Make sure the differential carrier is centered and straight on the axle housing before you install the mounting capscrews. Attempting to install the carrier when it is not centered or straight may cause damage to the carrier.**

## Single Axle or Rearmost Tandem Axle Differential Carrier Removal and Installation



**Fig. 1, Rear Axle Components**

6. Using a hoist (if the axle is removed from the vehicle) or a suitable transmission jack, install the differential carrier into the axle housing. Use the alignment dowels to center the carrier on the axle housing.
  - 7.1 For the last 3/4 inch (19 mm) or so of travel, walk the carrier slowly into the housing.

**IMPORTANT:** The end caps fit tightly into the axle housing. Be very careful not to cock the carrier.

  - 7.2 Install the carrier capscrews finger-tight. Make sure the carrier capscrews turn easily in the axle housing.
  - 7.3 In a star pattern, gradually tighten the carrier capscrews to the values given.
    - M12 capscrews: 115 lbf-ft (156 N·m)
    - M16 capscrews: 200 lbf-ft (270 N·m)
8. If removed, install the axle on the vehicle. For instructions, see [Subject 100](#).  
If the axle is already on the vehicle, go to the next step.
9. Connect the driveshaft to the carrier yoke. For instructions, see [Section 41.00, Subject 100](#).
10. Using new gaskets, install the axle shafts. For instructions, see [Subject 120](#).
11. Install the wheels and tires. For instructions, see [Group 40](#).
12. Using 80W/90 gear oil, fill the axle housing to the bottom of the fill hole, or until a small amount of