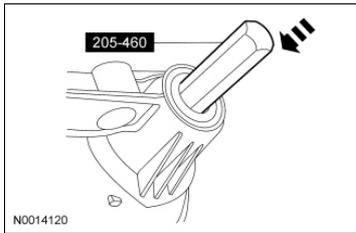
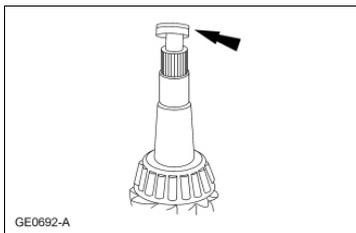


17. Remove the nut and the flange.
- Discard the pinion nut.

18. Using the special tool and a soft hammer, remove the pinion gear.



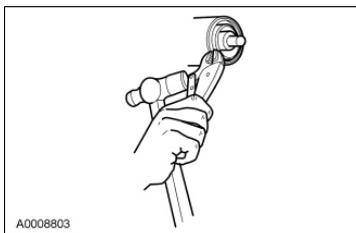
19. Discard the drive pinion collapsible spacer.



20. **NOTICE:** Do not damage the carrier housing while removing the pinion seal.

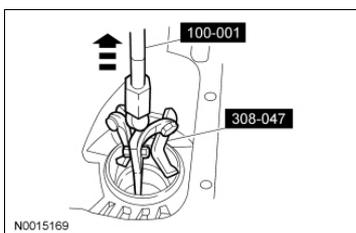
Remove the pinion seal and slinger.

- Pry up on the seal flange. Install gripping pliers, and strike with a hammer to remove the seal.



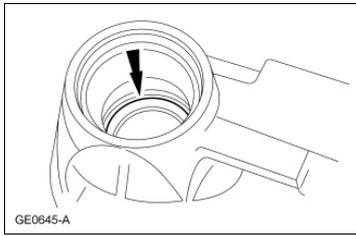
21. Remove the outer pinion bearing.

22. Using the special tools, remove the inner pinion bearing cup.

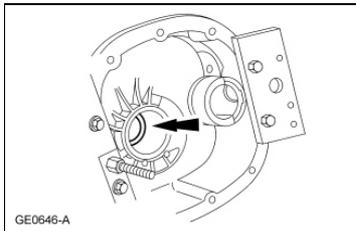


23. **NOTE:** The pinion bearing oil baffle aids in bearing lubrication. Normally, it is not necessary to remove the baffle.

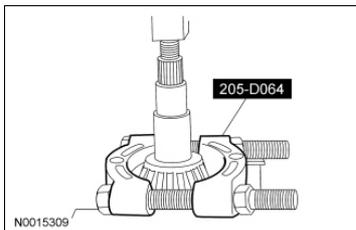
If necessary, remove the pinion bearing oil baffle.



24. Remove the outer pinion bearing cup by tapping alternately on each side to prevent the cup from cocking.

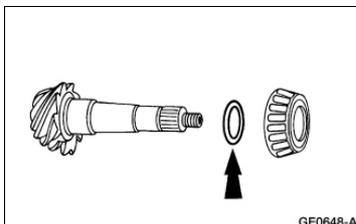


25. Using the special tool and a suitable press, remove the pinion bearing.

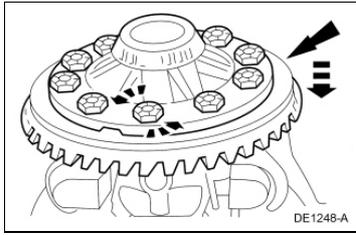


26. **NOTE:** A drive pinion bearing adjustment shim sits under the pinion bearing. Use a micrometer to measure the shim thickness. Record the measurement for comparison to the shim gauge reading taken prior to installing the pinion bearing.

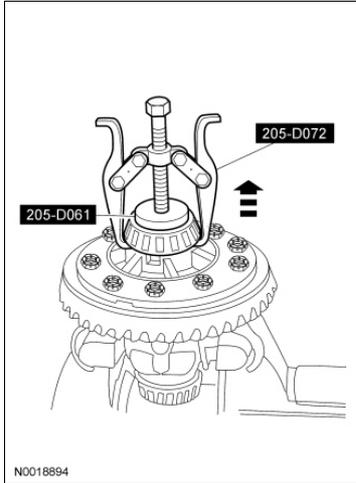
Remove and measure the drive pinion bearing adjustment shim.



27. Remove the 10 bolts and the ring gear.
- Use a drift punch to separate the ring gear from the differential case.
 - Discard the ring gear bolts.



28. Using the special tools, remove the RH and LH differential bearings.

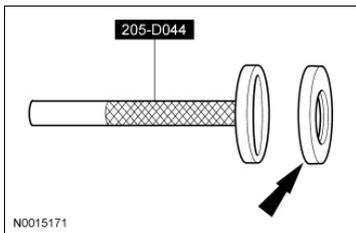


Assembly

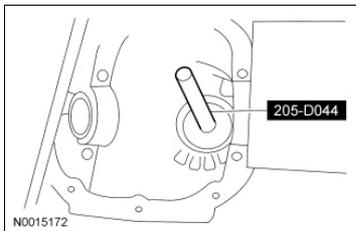
All axles

1. **NOTICE:** Do not omit the pinion bearing oil baffle or bearing damage may occur.

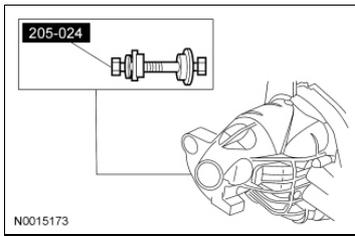
If removed, position the baffle on the special tool.



2. Using the special tool, install the baffle.



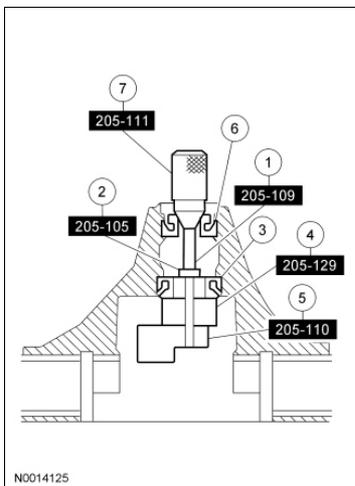
3. Using the special tool, install the bearing cups.



4. **NOTE:** You must use the pinion bearings assembled in this procedure step at final assembly.

Assemble and position the special tools and the pinion bearings in the carrier housing.

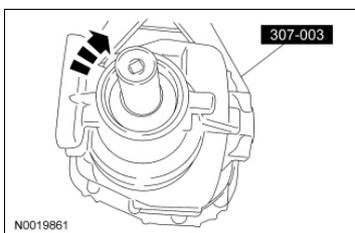
1. Position the screw adapter.
2. Position the aligning adapter.
3. Position the pinion bearing.
4. Position the gauge disc adapter.
5. Position the gauge block adapter.
6. Position the pinion bearing.
7. Thread on the handle adapter.



5. **NOTE:** This step duplicates final pinion bearing preload.

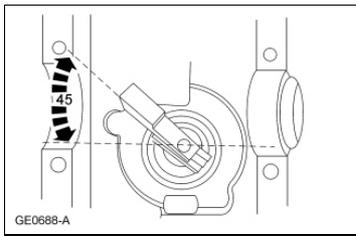
Tighten the special tool.

- Tighten to 2.2 Nm (20 lb-in) rotational torque.

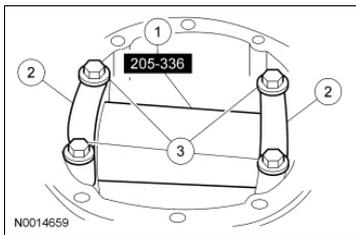


6. **NOTE:** Offset the gauge block adapter to obtain an accurate reading.

Rotate the gauge block adapter several half-turns to make sure the pinion bearings seat correctly, and position the gauge block adapter.



7. Install the special tool.
1. Position the special tool.
 2. Install the 2 differential bearing caps.
 3. Install the 4 bolts.
 - ◆ Tighten to 105 Nm (77 lb-ft).

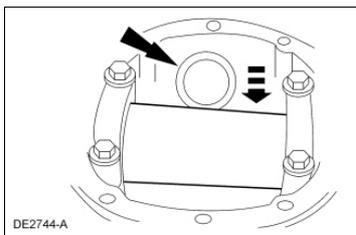


8. **NOTE:** Use only flat, clean drive pinion bearing adjustment shims.

NOTE: Do not attempt to force the shim between the gauge block adapter and the gauge tube adapter. A slight drag indicates correct shim selection.

Use a drive pinion bearing adjustment shim as a gauge for shim selection.

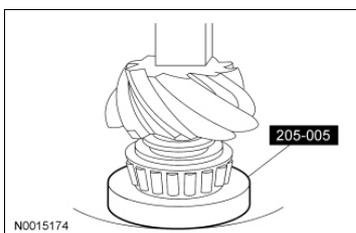
- Check the adjustment shim thickness between the gauge block adapter and the gauge tube adapter.
- After determining the correct shim thickness, remove the special tools.



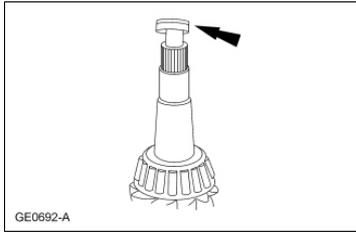
9. **NOTE:** You must use the same pinion bearings from the previous steps.

Install the pinion bearing.

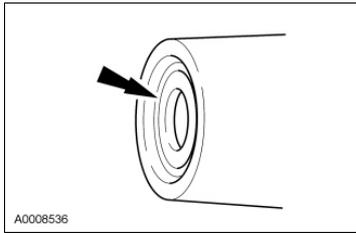
- Place the selected drive pinion bearing adjustment shim on the pinion gear.
- Using a suitable press and the special tool, press the pinion bearing until it is firmly seated on the pinion gear.



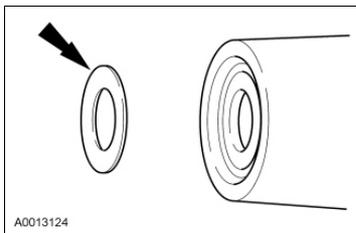
10. Place a new drive pinion collapsible spacer on the pinion stem.



11. Install the outer pinion bearing.



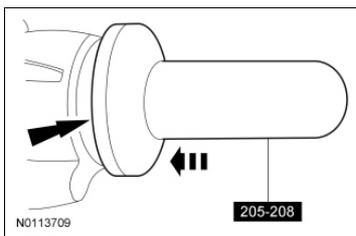
12. Install the slinger.



13. **NOTE:** Coat the lips of the pinion seal with front axle lubricant.

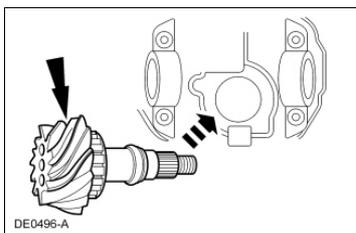
Place the pinion seal on the special tool.

14. Place the special tool and seal in the pinion seal bore and drive the seal into place.



15. Lightly lubricate the pinion gear splines with front axle lubricant.

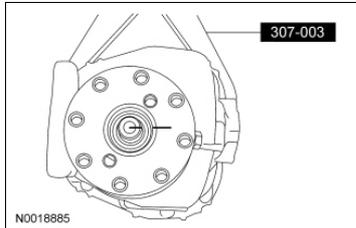
16. Position the drive pinion in the housing.



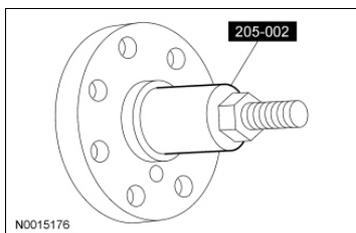
17. **NOTICE:** Never install the drive pinion U-joint flange with a hammer or power tools or damage to the component may occur.

NOTE: Disregard the scribe marks if installing a new flange.

Align the index marks and position the U-joint flange on the drive pinion.



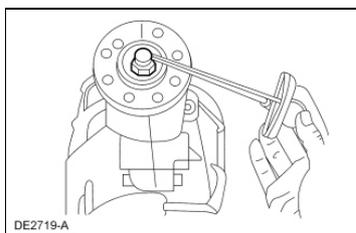
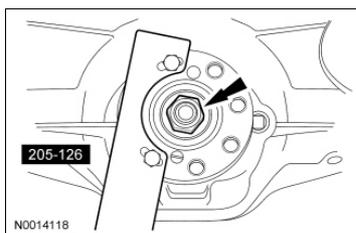
18. Using the special tool, install the drive pinion U-joint flange.



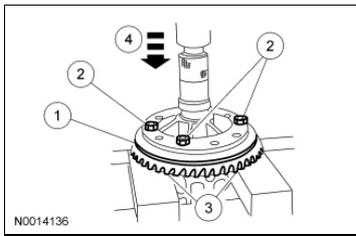
19. **NOTICE:** Do not loosen the pinion nut to reduce preload under any circumstance. If it is necessary to reduce preload, install a new drive pinion collapsible spacer and pinion nut.

Install the special tool and tighten the pinion nut. For additional information, refer to the torque specifications in the Specifications portion of this section.

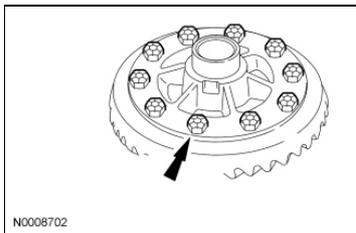
- Rotate the pinion gear occasionally to make sure the pinion bearings are seating correctly. Take frequent pinion bearing torque preload readings by rotating the pinion gear with a Nm (lb-in) torque wrench.



20. Install the ring gear.
1. Place the ring gear on the differential assembly.
 2. Position 3 bolts to align the holes in the ring gear and the differential case.
 3. Using a suitable press, position the ring gear.
 4. Press the ring gear into place.



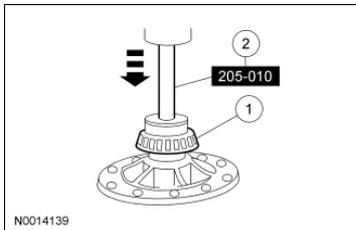
21. Install the 10 new ring gear bolts.
 - Tighten to 105 Nm (77 lb-ft).



22. **NOTICE:** Press against the bearing inner core only.

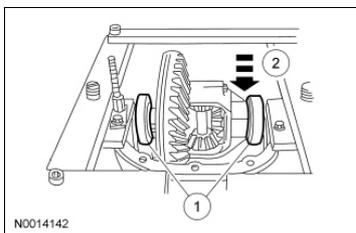
Using a suitable press and the special tool, install the 2 differential bearings.

1. Position the differential bearing.
2. Using a suitable press and the special tool, install the differential bearing.
 - Repeat the procedure for the other differential bearing.

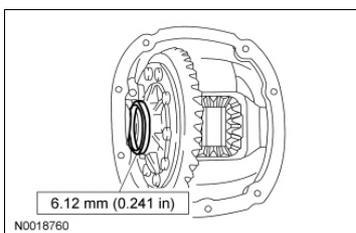


23. Position the differential case assembly.

1. Position the differential bearing cups on the differential bearings.
2. Lower the differential case assembly in place.

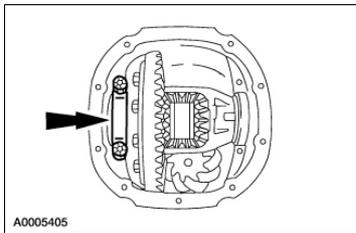


24. Install the differential bearing shim of the thickness shown on the LH side of the differential bearing.

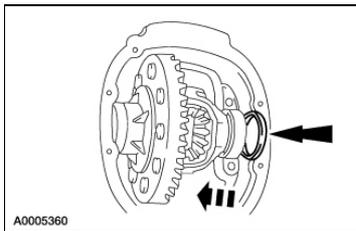


25. **NOTE:** Apply pressure toward the left side to make sure the left bearing cup is seated.

Install the left bearing cap and loosely install the 2 bearing cap bolts.



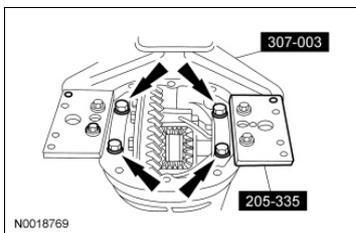
26. Install progressively thicker differential bearing shims on the right side until the thickest differential bearing shim can be inserted by hand.



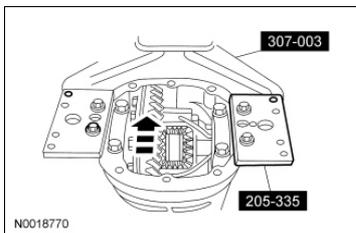
27. Install the right bearing cap and 2 bolts.

28. Tighten the 4 differential bearing cap bolts.

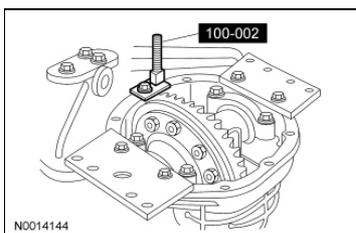
- Tighten to 105 Nm (77 lb-ft).



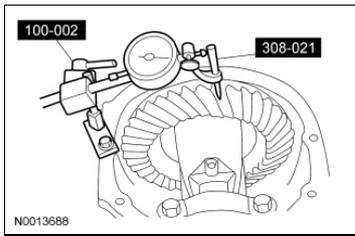
29. Rotate the differential carrier to make sure it turns freely.



30. Install the special tool.

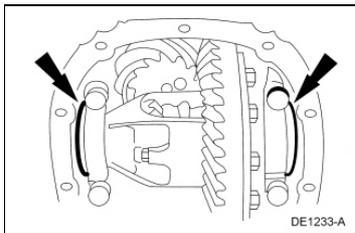


31. Measure the ring gear backlash at 4 places to obtain a consistent reading.

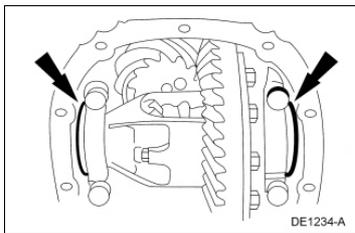


32. **NOTE:** If the backlash is not within the specifications, correct it by increasing the thickness of one differential bearing shim and decreasing the thickness on the other differential bearing shim by the same amount.

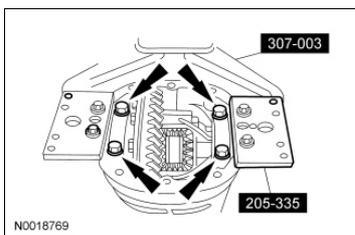
To increase the backlash, install a thicker differential bearing shim and a thinner differential bearing shim as shown.



33. To decrease the backlash, install a thicker differential bearing shim and a thinner differential bearing shim as shown.



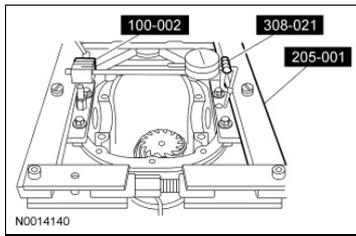
34. Remove the 4 differential bearing cap bolts and 2 bearing caps.
- Remove the differential carrier.



35. Measure the thickness of the selected right and left bearing shims.

36. To establish differential bearing preload, increase both the left and right differential bearing shim thickness by 0.203 mm (0.008 in).

37. Install the special tools.

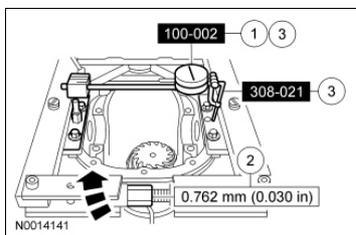


38. **NOTICE:** Overspreading may damage the differential housing.

NOTE: Tighten and loosen the differential carrier spreader screw to normalize the housing spreader adapters, prior to taking the final dial indicator reading.

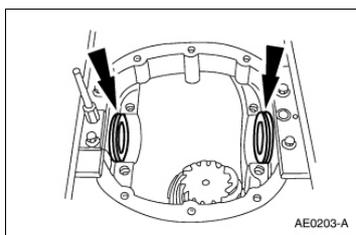
Spread the differential housing to specification.

1. Adjust the special tool to zero.
2. Tighten the screw until spreading the differential housing to specification.
3. Remove the special tools.



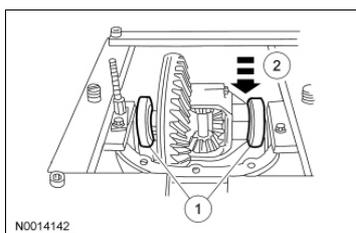
39. **NOTICE:** To avoid galling the case, insert shims with a light coating of grease before installing the differential assembly. If not carried out in this order, the aluminum housing can be damaged.

Place the differential bearing shims in the differential housing.



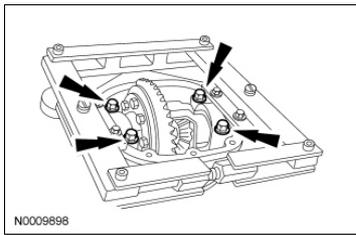
40. Install the differential carrier.

1. Position the 2 differential bearing cups on the 2 differential bearings.
2. Lower the differential carrier in place between the 2 differential bearing shims.

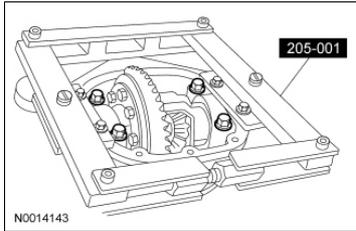


41. **NOTE:** Hand-tighten the differential bearing cap bolts prior to releasing the carrier spreader.

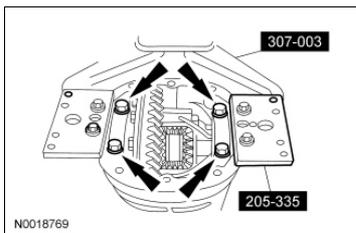
Install the 2 differential bearing caps and the 4 differential bearing cap bolts in their original locations and positions.



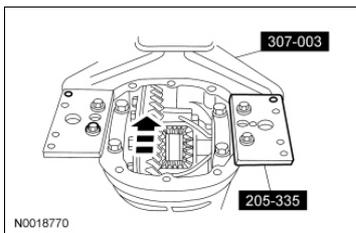
42. Loosen and remove the special tool.



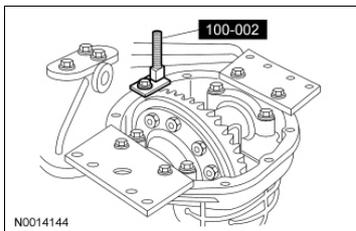
43. Tighten the 4 differential bearing cap bolts.
• Tighten to 105 Nm (77 lb-ft).



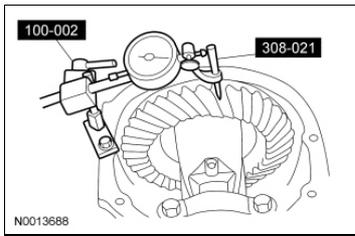
44. Rotate the differential carrier to make sure it turns freely.



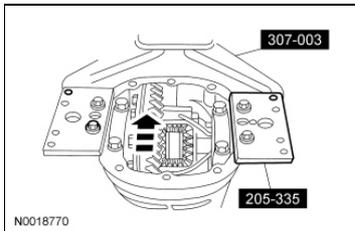
45. Install the special tool at the 12 o'clock position.



46. Using the special tools, recheck the ring gear backlash.



47. Apply marking compound and rotate the differential assembly 5 complete revolutions.



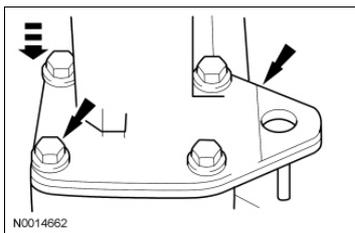
48. Verify an acceptable pattern check. For additional information, refer to [Section 205-00](#) .

49. **NOTE:** Remove all of the old liquid gasket, and make sure the machined surfaces are free of oil before applying the new silicone rubber.

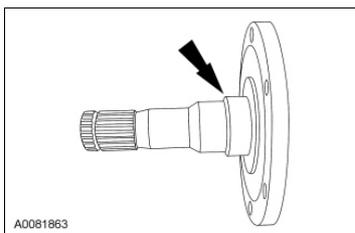
NOTE: Install the axle housing tube within 15 minutes of applying the silicone or it will be necessary to remove and reapply new sealant. If possible, allow one hour before filling with lubricant to make sure the silicone sealant has cured.

Assemble the axle housing tube.

- Align the bolt holes and position the axle tube.
- Position the axle identification tag.
- Install the 4 bolts.
 - ◆ Tighten to 73 Nm (54 lb-ft).



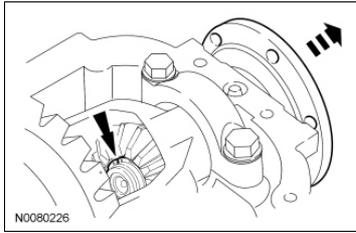
50. Examine the axle shaft seal and bearing surface for damage. If necessary, polish the bearing surface with fine crocus cloth.



Axles with a snap ring

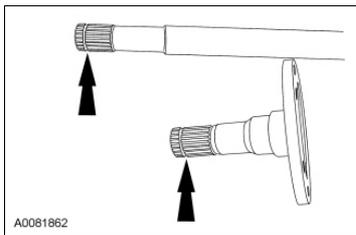
51. Insert the axle shafts through the side gears and install the snap rings in the snap ring grooves.

- Pull the axle shafts outboard after installing the snap rings.

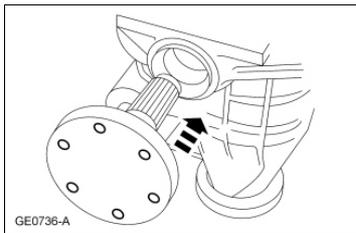


Axles with circlips

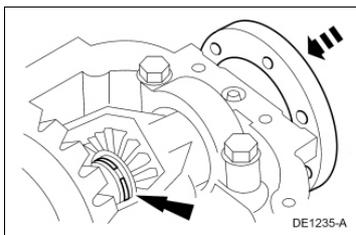
52. Install a new retainer circlip on each axle shaft.



53. Insert the axle shafts and engage them with the side gears.



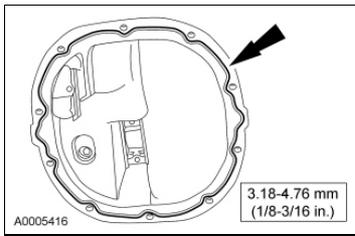
54. Push in on the axle shafts until the retaining circlips expand in the side gears.



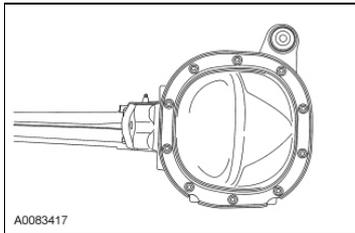
All axles

55. Remove the axle assembly from the Holding Fixture and place it on the bench.
56. **NOTE:** Install the differential housing cover within 15 minutes of applying the silicone, or it will be necessary to remove and reapply new sealant. If possible, allow one hour before filling with lubricant to make sure the silicone sealant has cured.

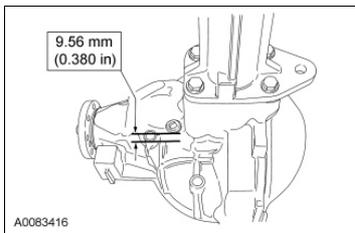
Fill the sealing groove on the differential housing cover with silicone gasket and sealant.



57. Install the differential housing cover and 10 differential housing cover bolts.
- Tighten to 32 Nm (24 lb-ft).



58. Remove the fill plug, fill the differential carrier housing, and install the fill plug.
- Tighten to 25 Nm (18 lb-ft).

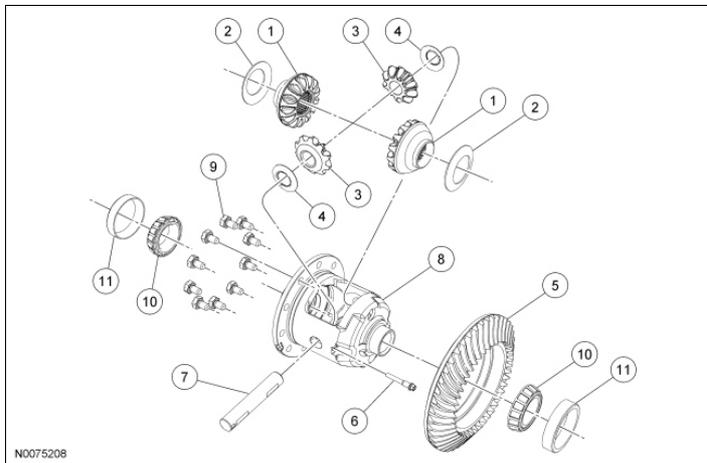


59. Install the front drive axle assembly. For additional information, refer to [Axle Assembly](#) in this section.
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Differential Case

Material

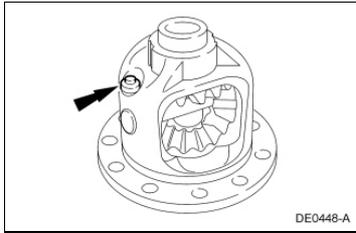
Item	Specification
Motorcraft SAE 80W90 Premium Rear Axle Lubricant XY-80W90-QL (US); CXY-80W90-1L (Canada)	WSP-M2C197-A
Threadlock and Sealer TA-25	WSK-M2G351-A5



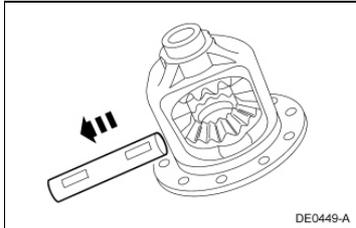
Item	Part Number	Description
1	4236	Differential side gears
2	4228	Differential side gear thrust washers
3	4215	Differential pinion gears
4	4230	Differential pinion thrust washers
5	4209	Differential ring gear
6	4241	Differential pinion shaft lock bolt
7	4211	Differential pinion shaft
8	4204	Differential case
9	4216	Differential ring gear bolt (10 required)
10	4221	Differential bearings (2 required)
11	4222	Differential bearing cups (2 required)

Disassembly

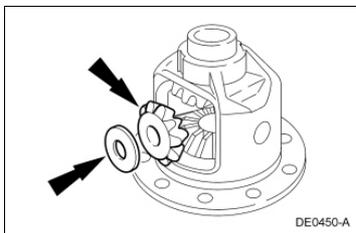
1. Remove the differential pinion shaft lock bolt.



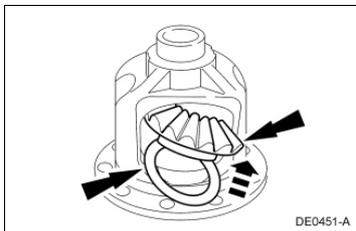
2. Remove the differential pinion shaft.



3. Rotate and remove the differential pinion gears and differential pinion gear thrust washers.

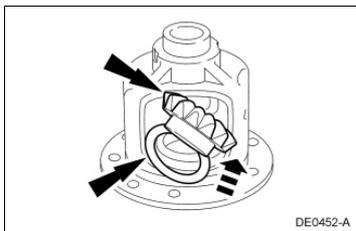


4. Remove the differential side gears and the differential side gear thrust washers.

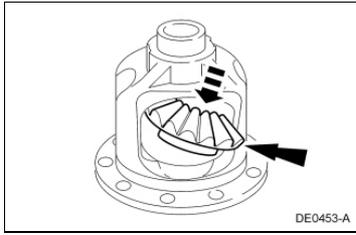


Assembly

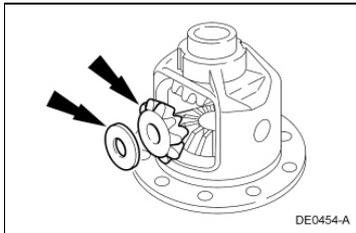
1. Use axle lubricant to lubricate the differential side gear thrust washer and the differential side gear journals.
 - Position the differential side gear thrust washers on the differential side gears.



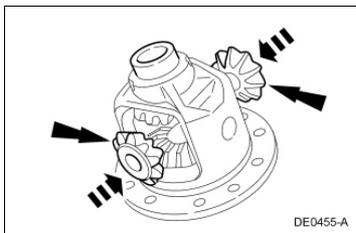
2. Install the differential side gears.



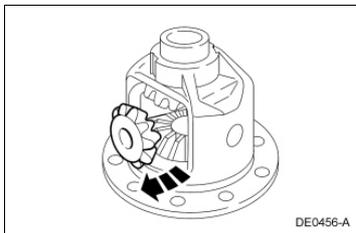
3. Use axle lubricant to lubricate the differential pinion gear thrust washers and the differential pinion gears.



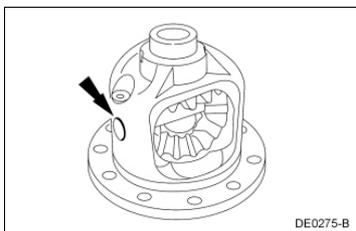
4. Install the differential pinion gears and differential pinion gear thrust washers opposite the differential side gears.



5. Rotate the differential pinion gears to align with the differential pinion shaft bore.



6. Install the differential pinion shaft.
 - Align the hole in the differential pinion shaft with the hole in the differential case.



7. **NOTE:** If a new pinion shaft lock bolt is unavailable, coat the threads with threadlock and sealer prior to installation.

Install a new differential pinion shaft lock bolt.

- Tighten to 30 Nm (22 lb-ft).