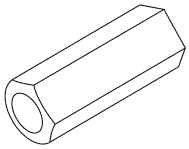
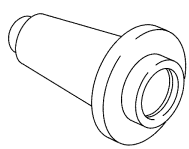
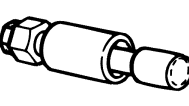
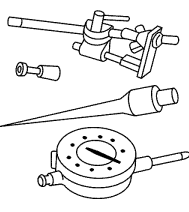
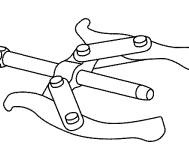
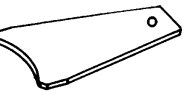


IN-VEHICLE REPAIR

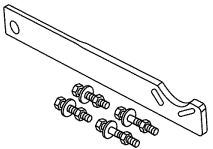
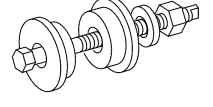
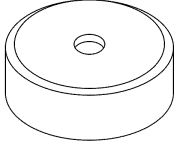
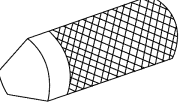
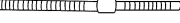
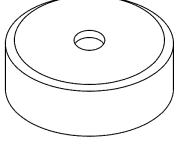
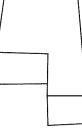
Differential Ring and Pinion

Special Tool(s)

 ST1744-A	Protector, Drive Pinion Thread 205-460 or equivalent
 ST1325-A	Installer, Drive Pinion Oil Seal 205-208 (T83T-4676-A)
 ST1743-A	Installer, Drive Pinion Flange 205-002 (TOOL-4858-E) or equivalent
 ST1214-A	Dial Indicator Gauge With Bracketry 100-002 (TOOL-4201-C) or equivalent
 ST1220-A	Remover, Differential Bearing 205-116 (T77F-4220-B1)
 ST1485-A	Installer, Differential Shim 205-220 (T85L-4067-AH)

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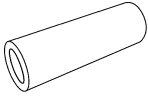
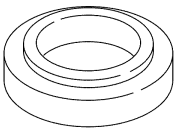
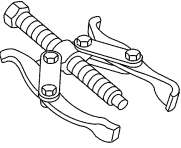
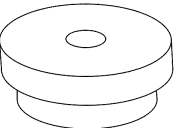
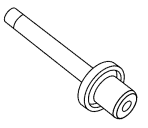
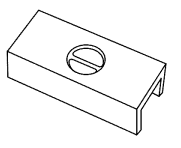
Special Tool(s)

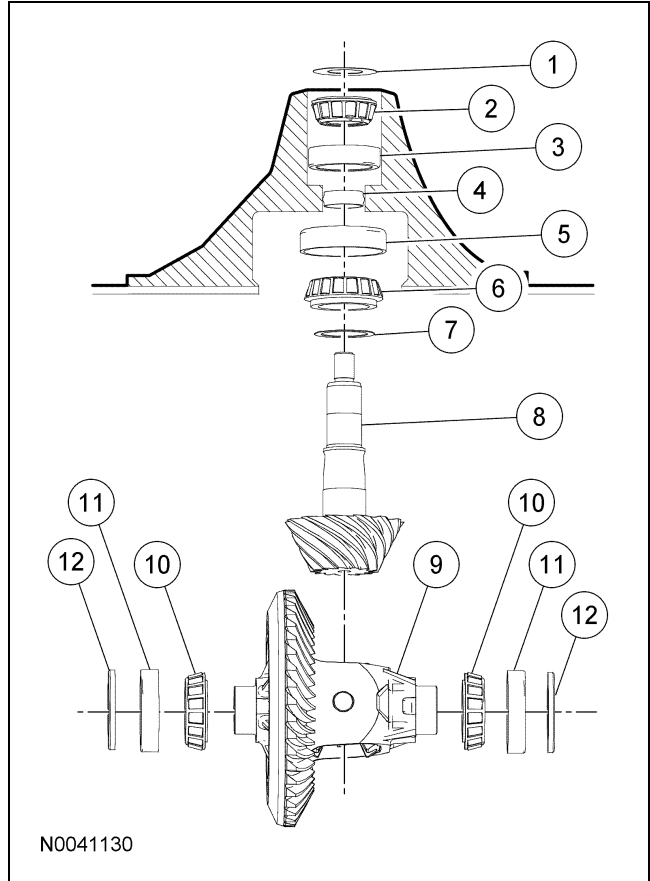
 ST1257-A	Holding Fixture, Drive Pinion Flange 205-126 (T78P-4851-A)
 ST1678-A	Installer, Drive Pinion Bearing Cup 205-024 (T67P-4616-A)
 ST1743-A	Adapter For 205-S127 205-105 (T76P-4020-A3)
 ST1432-A	Adapter For 205-S127 205-111 (T76P-4020-A11)
 ST1429-A	Adapter For 205-S127 205-109 (T76P-4020-A9)
 ST1743-A	Adapter For 205-S127 205-129 (T79P-4020-A18)
 ST1431-A	Adapter For 205-S127 205-110 (T76P-4020-A10)

(Continued)

IN-VEHICLE REPAIR (Continued)

Special Tool(s)

 <p>ST1434-A</p>	<p>Adapter For 205-S127 205-130 (T79P-4020-A19)</p>
 <p>ST1367-A</p>	<p>Installer, Drive Pinion Bearing Cone 205-005 (T53T-4621-C)</p>
 <p>ST2026-A</p>	<p>2-Jaw Puller 205-D072 (D79L-4221-A1) or equivalent</p>
 <p>ST1543-A</p>	<p>Step Plate 205-D016 (D80L-630-5) or equivalent</p>
 <p>ST1375-A</p>	<p>Installer, Differential Side Bearing 205-010 (T57L-4221-A2)</p>
 <p>ST1254-A</p>	<p>Plate, Bearing Oil Seal 205-090 (T75L-1165-B)</p>



Item	Part Number	Description
1	4670	Oil slinger
2	4621	Outer pinion bearing
3	4616	Outer pinion bearing cup
4	4662	Collapsible spacer
5	4628	Inner pinion bearing cup
6	4630	Inner pinion bearing
7	4663	Pinion bearing adjustment shim
8	4209	Drive pinion
9	4209	Ring gear
10	4221	Differential bearings
11	4222	Differential bearing cups
12	4067	Differential bearing shims

Removal

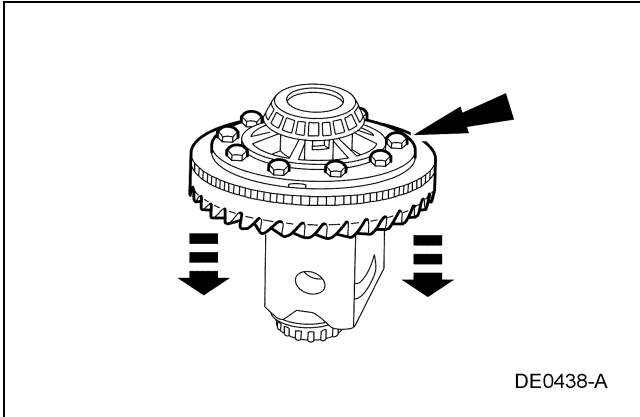
1. Remove the differential carrier assembly. For additional information, refer to Differential Carrier in this section.

Material

Item	Specification
Motorcraft SAE 75W-140 High Performance Rear Axle Lubricant XY-75W140-QL	WSL-M2C192-A
Additive Friction Modifier XL-3	EST-M2C118-A

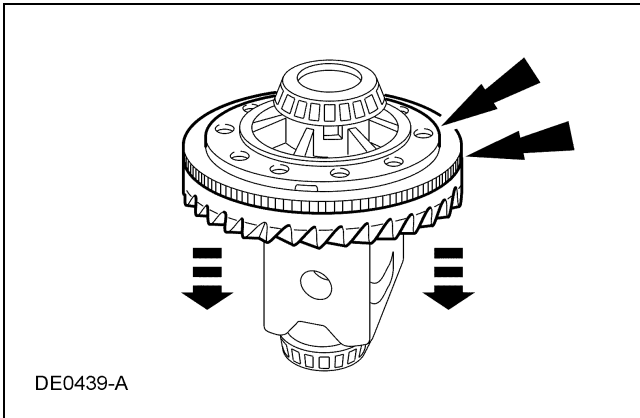
IN-VEHICLE REPAIR (Continued)

- 2. Remove the 10 differential ring gear bolts.



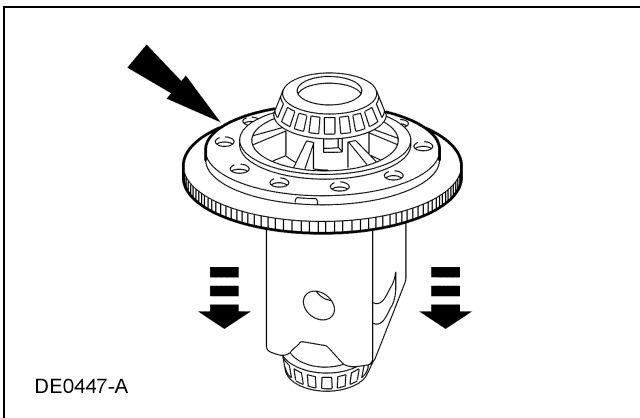
- 3. **CAUTION:** Care should be taken not to damage the differential ring gear bolt hole threads.

Insert a punch in the differential ring gear bolt holes and drive the differential ring gear off.

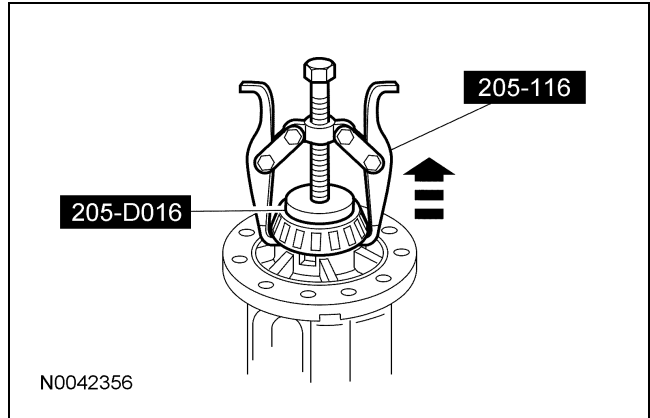


- 4. **NOTE:** The anti-lock ring cannot be reused once removed. Remove the anti-lock ring only if damaged.

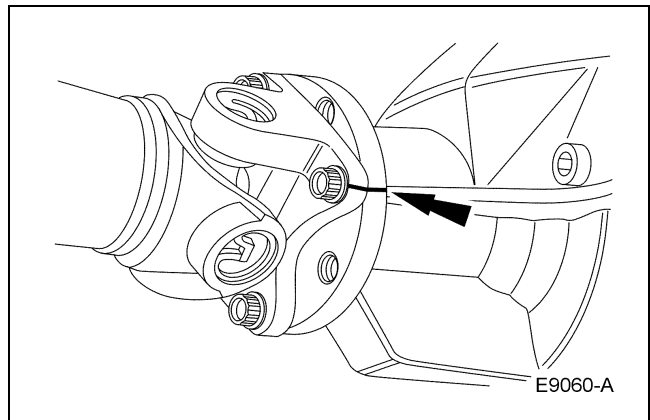
If necessary, remove the anti-lock ring.



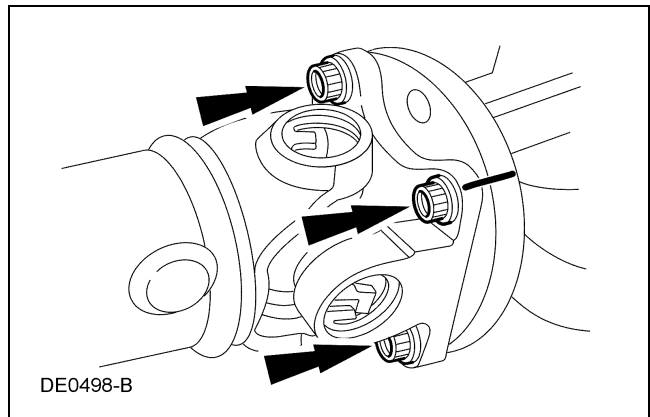
- 5. Using the special tools, remove the differential bearings.




- 6. Index-mark the driveshaft flange and pinion flange for correct alignment during installation.



- 7. Remove the 4 driveshaft flange bolts.

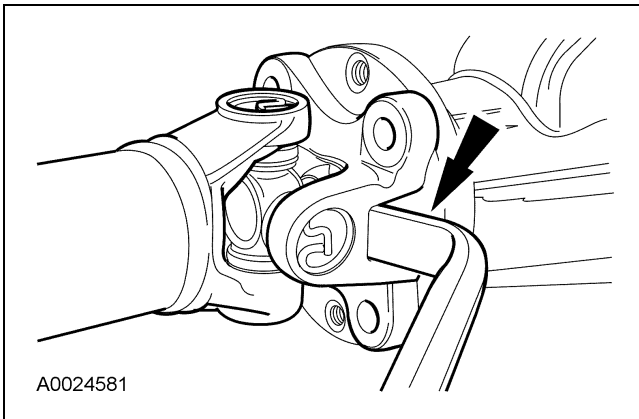


IN-VEHICLE REPAIR (Continued)

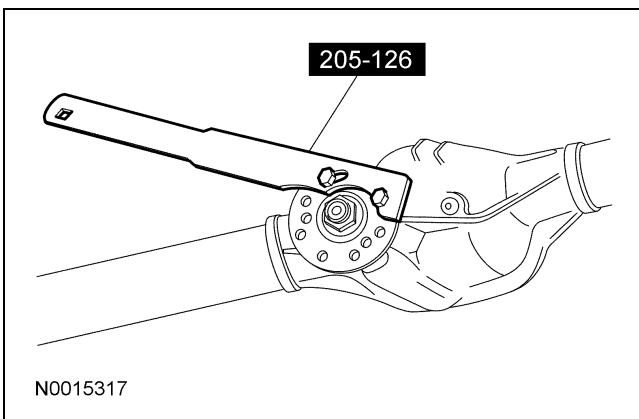
8.  **CAUTION:** The driveshaft centering socket yoke fits tightly on the pinion flange pilot. Never hammer on the driveshaft or any of its components to disconnect the driveshaft centering socket yoke from the pinion flange. Pry only in the area shown with a suitable tool to disconnect the driveshaft centering socket yoke from the pinion flange.

Using a suitable tool as shown, disconnect the driveshaft centering socket yoke from the pinion flange.

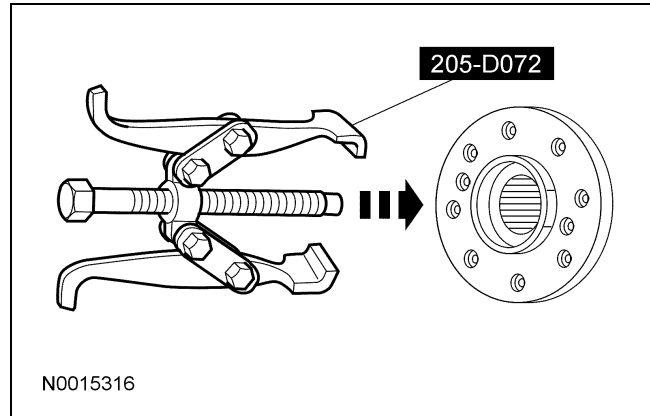
- Using mechanic's wire, position the driveshaft aside.



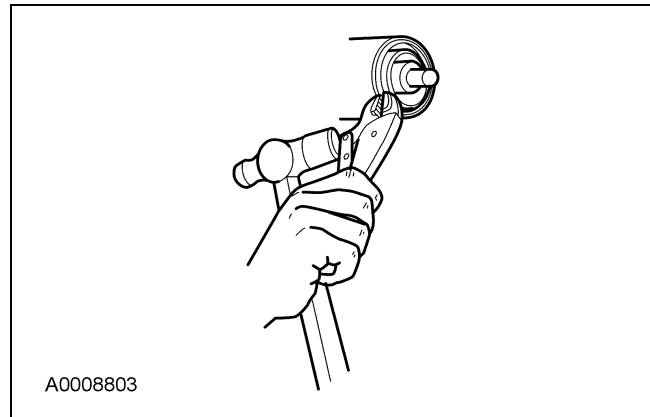
9. Using the special tool to hold the pinion flange, remove and discard the pinion nut.



10. Using the special tool, remove the pinion flange.

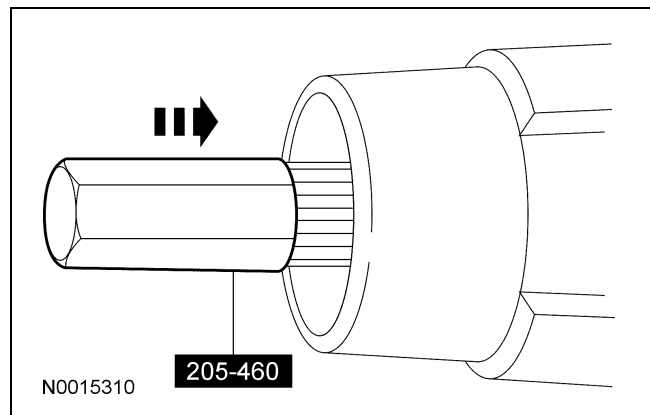


11. Force up on the metal flange of the drive pinion seal. Install gripping pliers and strike with a hammer until the drive pinion seal is removed.



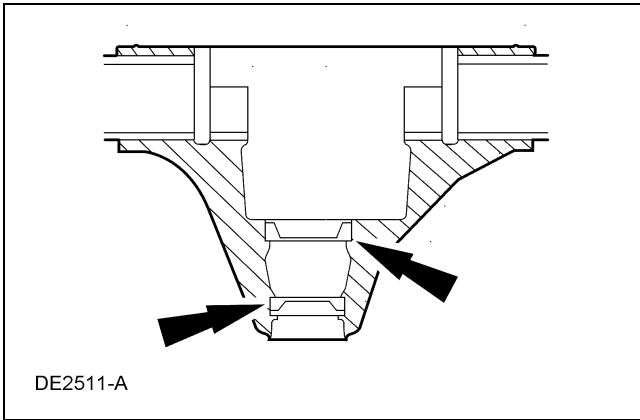
12. Remove the drive pinion shaft oil slinger and the outer drive pinion bearing.

13. Install the special tool. Using a soft-faced hammer, drive the pinion assembly out of the axle housing.



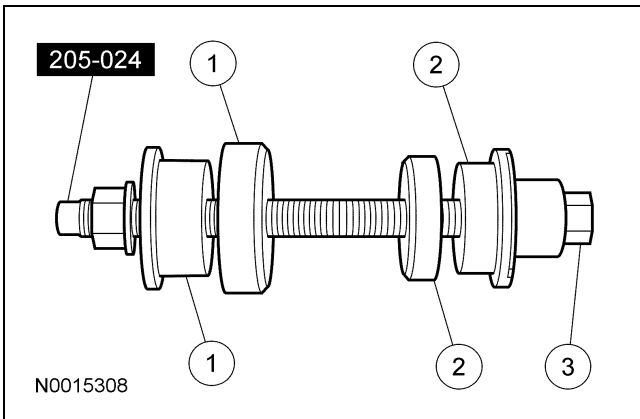
IN-VEHICLE REPAIR (Continued)

- Using a brass drift, remove the drive pinion bearing cups by tapping alternately on opposite sides of the drive pinion bearing cups.

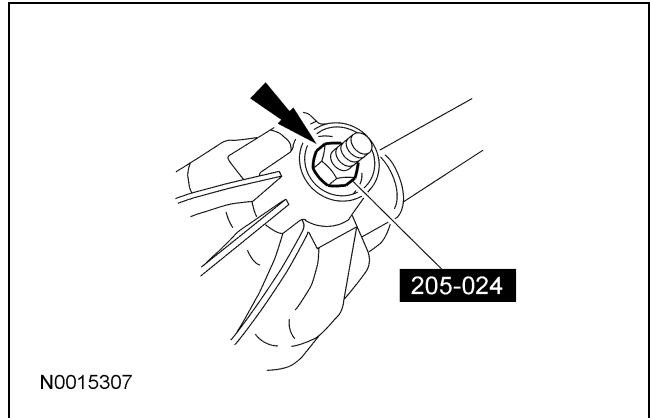


Installation

- Position the special tool and the inner and outer drive pinion bearing cups in their respective bores.
 - After placing the inner and outer drive pinion bearing cups in their bores, place the special tool (inner) on the inner drive pinion bearing cup.
 - Place the special tool (outer) on the outer drive pinion bearing cup.
 - Install the special tool.

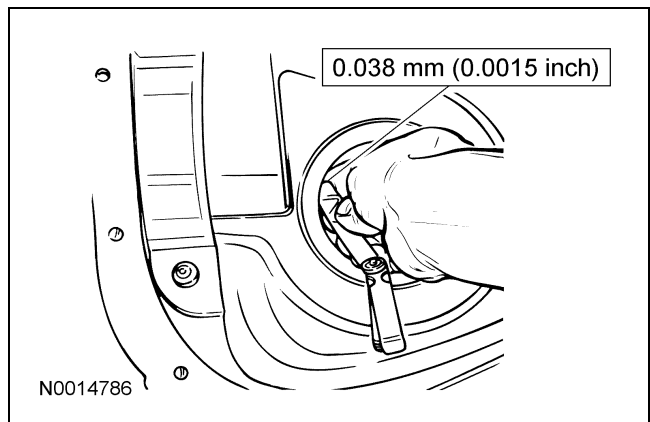


- Tighten the special tool to seat the drive pinion bearing cups into their bores.



- NOTE:** If a feeler gauge can be inserted between a drive pinion bearing cup and the bottom of its bore at any point around the drive pinion bearing cup, the drive pinion bearing cup is not correctly seated.

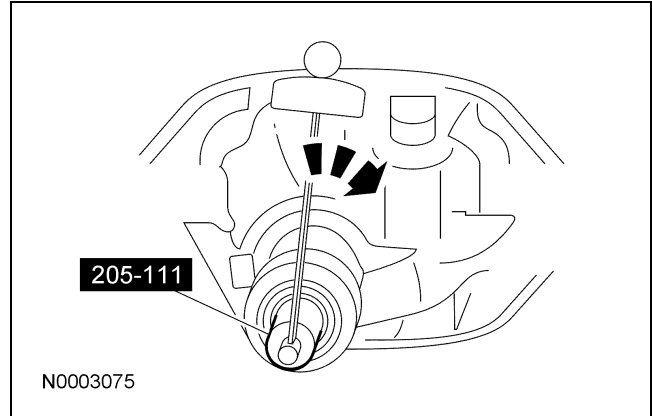
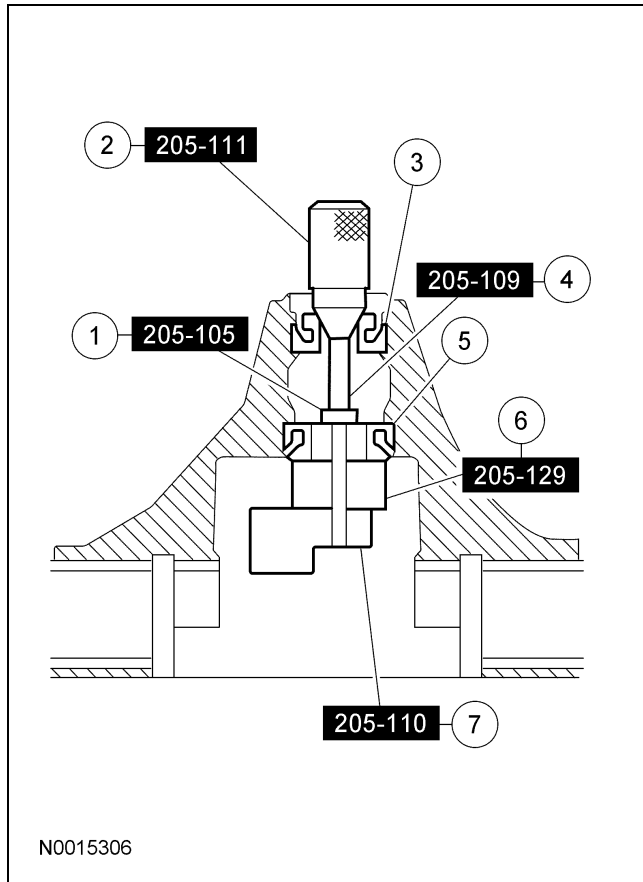
Make sure the drive pinion bearing cups are correctly seated in their bores.



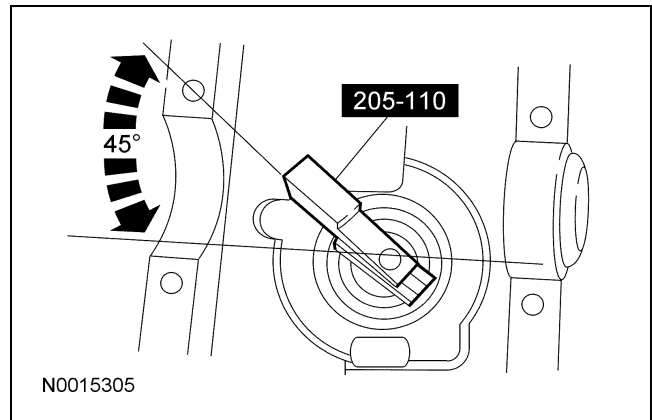
IN-VEHICLE REPAIR (Continued)

4. **NOTE:** Install new drive pinion bearings without any additional lubricant since the anti-rust oil provides adequate lubricant without upsetting the drive pinion bearing preload settings.

Assemble and position the special tools.



6. **NOTE:** The special tool must be offset to obtain an accurate reading.
 Rotate the special tool several half-turns to make sure of correct seating of the drive pinion bearings and position the special tool.



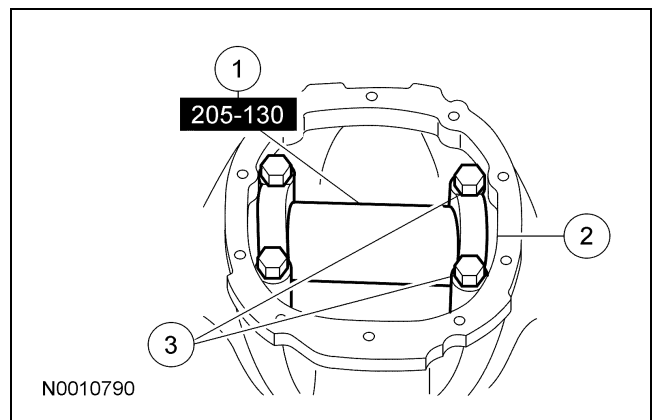
7. Install the special tool.
- 1 Position the special tool.
 - 2 Install the differential bearing caps.
 - 3 Install the 4 differential bearing cap bolts.
 - Tighten to 105 Nm (77 lb-ft).

Item	Part Number	Description
1	205-105	Adapter for 205-S127 (1.612 inch O.D.) (T76P-4020-A3)
2	205-111	Adapter for 205-S127 (T76P-4020-A11)
3	4621	Drive pinion bearing (outer)
4	205-109	Adapter for 205-S127 (T76P-4020-A9)
5	4630	Drive pinion bearing (inner)
6	205-129	Adapter for 105-S127 (1.1884 inch thick) (T79P-4020-A18)
7	205-110	Adapter for 205-S127 (1.7 inch thick) (T76P-4020-A10)

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

Tighten the special tool.

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



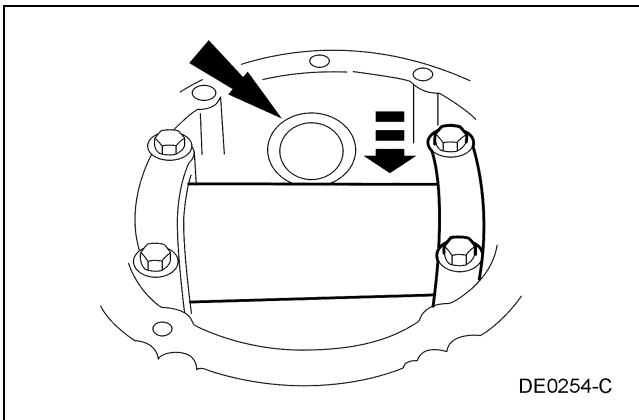
IN-VEHICLE REPAIR (Continued)

8. **NOTE:** Drive pinion bearing adjustment shims must be flat and clean.

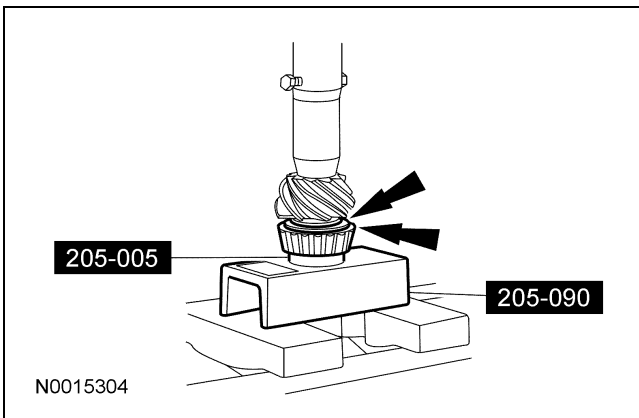
NOTE: A slight drag should be felt for correct drive pinion bearing adjustment shim selection. Do not attempt to force the drive pinion bearing adjustment shim between the gauge block and the gauge tube. This will minimize selection of a drive pinion bearing adjustment shim thicker than required, which results in a deep tooth contact in final assembly of integral axle assemblies.

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

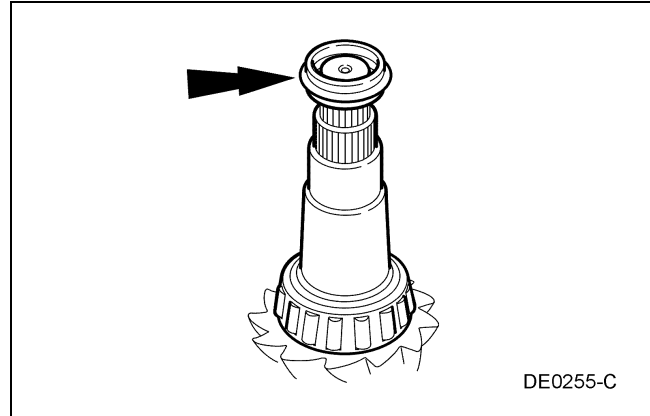
- After the correct drive pinion bearing adjustment shim thickness has been determined, remove all of the special tools.



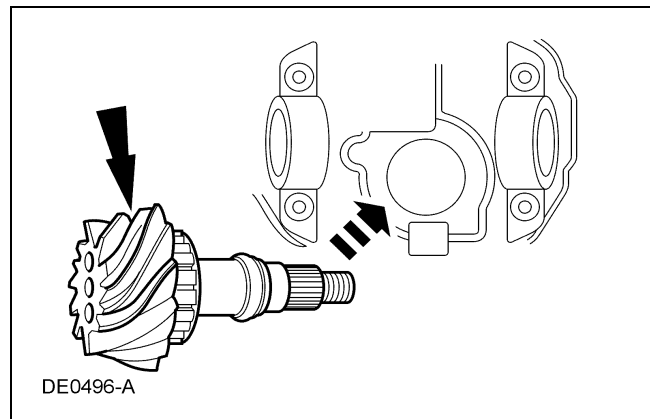
9. Using the special tool and a shop press, drive the inner drive pinion bearing and the selected drive pinion bearing adjustment shim until they are firmly seated on the pinion shaft.



10. Install a new drive pinion collapsible spacer on the pinion shaft against the pinion shaft shoulder.

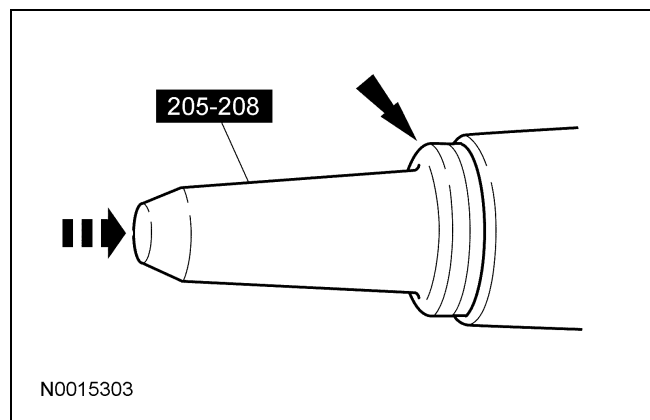


11. Install the drive pinion assembly into the axle housing.



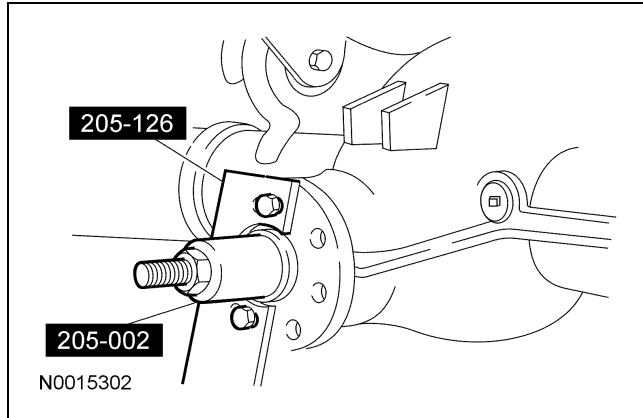
12. Install the outer drive pinion bearing and the drive pinion shaft oil slinger.

13. Using the special tools, install the drive pinion seal.



IN-VEHICLE REPAIR (Continued)

14. Using the special tools, install the drive pinion flange.

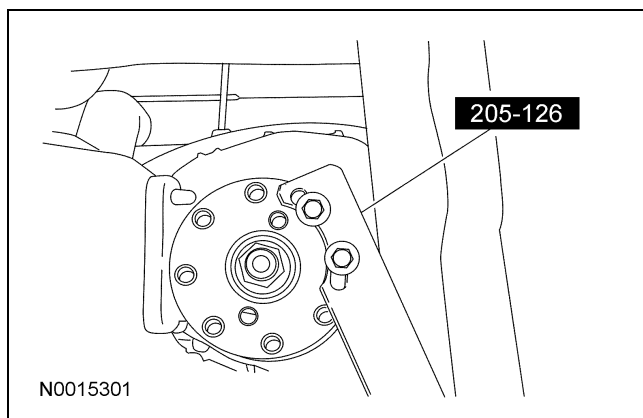


15. **⚠ CAUTION:** Do not, under any circumstance, loosen the drive pinion nut to reduce pinion bearing preload. If it is necessary to reduce the preload, install a new drive pinion collapsible spacer and drive pinion nut.

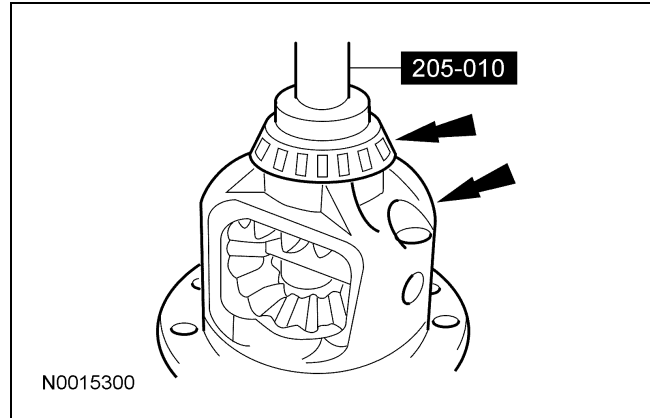
⚠ CAUTION: Remove the special tool while taking rotational pinion bearing preload checks with the Nm (lb-in) torque wrench.

Use the special tool to hold the pinion flange while tightening the pinion nut.

- Rotate the pinion occasionally to make sure the differential pinion bearings are seating correctly. Take frequent differential pinion bearing preload checks by rotating the differential pinion with a Nm (lb-in) torque wrench. Tighten the pinion nut in small increments to avoid excessive pinion bearing preload. Tighten the pinion nut until the drive pinion bearing preload is in specification.



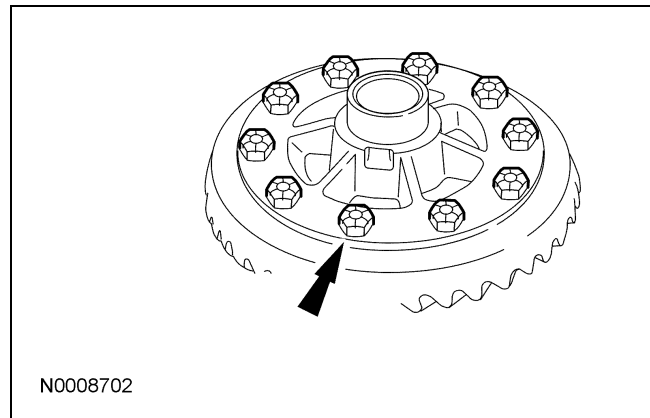
16. Using the special tool, install the new differential bearings.



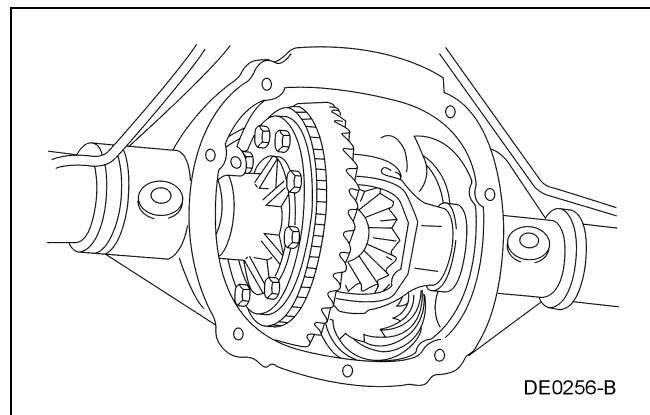
17. **NOTE:** Apply stud and bearing mount to the differential ring gear bolts.

Install the differential ring gear bolts.

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

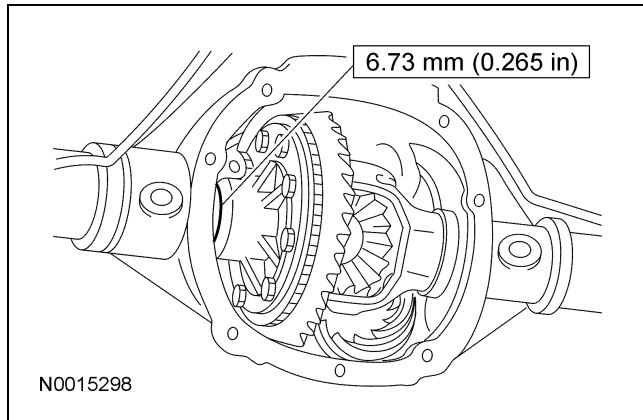


18. Position the differential carrier assembly and the new differential bearing cups in the differential housing.



IN-VEHICLE REPAIR (Continued)

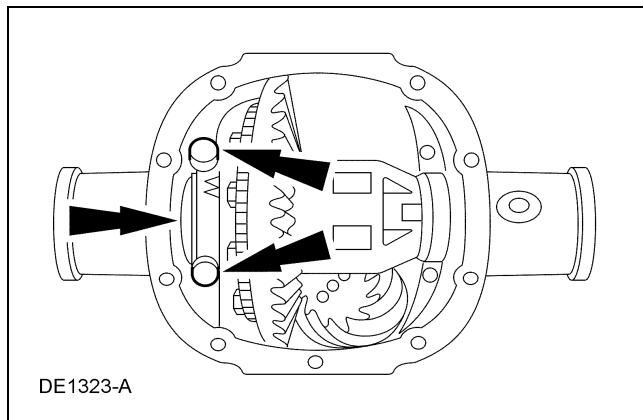
19. Install a differential bearing shim of the shown dimension on the left side.



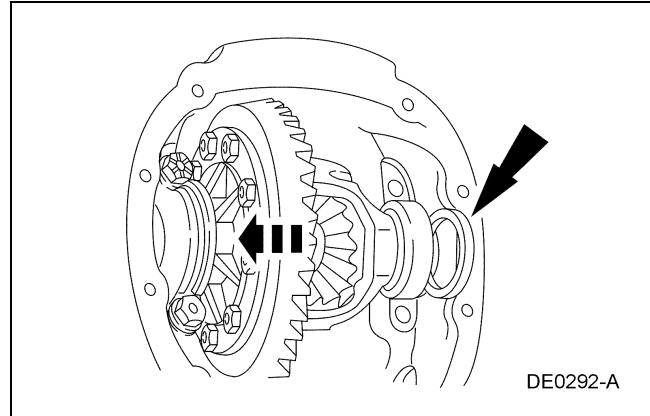
20.  **CAUTION: Always install the bearing caps in their original locations and positions.**

NOTE: Apply pressure toward the LH side to make sure the left differential bearing cup seats correctly.

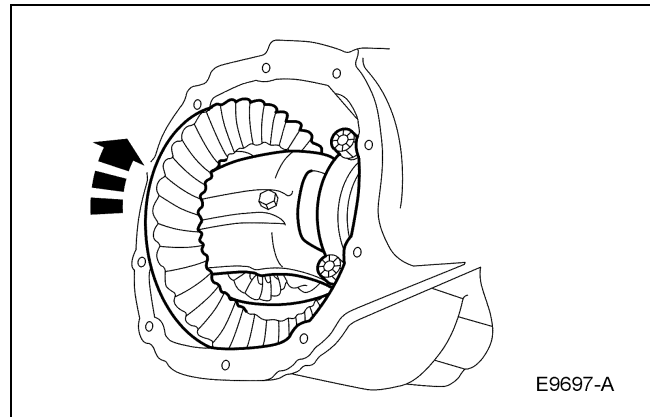
Install the LH bearing cap and loosely install the bolts.



21. Install progressively larger differential bearing shims on the RH side until the largest shim is installed by hand.

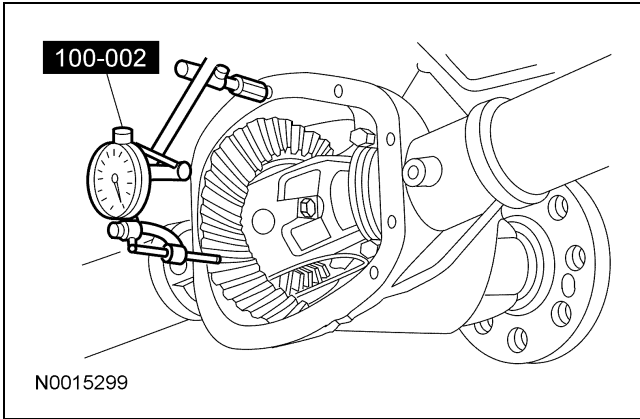


22. Install the right side bearing cap and bolts. Tighten the LH and RH bearing cap bolts.
- Tighten to 105 Nm (77 lb-ft).
23. Rotate the differential carrier several times to verify the differential bearings have seated correctly.



IN-VEHICLE REPAIR (Continued)

24. Install the special tools and measure the ring gear backlash.
- If the backlash is within specification, proceed to Step 27.
 - If a zero backlash condition occurs, proceed to Step 25.
 - If the backlash is not within specification, proceed to Step 26.



25. If a zero backlash condition occurs, add 0.50 mm (0.020 in) to the RH side shim and subtract 0.50 mm (0.020 in) from the LH side shim to allow a backlash indication. Go back to Step 24.
26. To correct for high or low backlash, increase the thickness of one differential bearing shim and decrease the thickness of the other differential bearing shim by the same amount. Refer to the following tables when adjusting the backlash. When the backlash is within specification, proceed to Step 27.

Backlash Change Required		Thickness Change Required	
mm	Inch	mm	Inch
0.254	0.010	0.355	0.014
0.279	0.011	0.355	0.014
0.304	0.012	0.406	0.016
0.330	0.013	0.457	0.018
0.335	0.014	0.457	0.018
0.381	0.015	0.508	0.020

Differential Shim Size Chart 4067

Stripes and Color Code	Dimension A	
	mm	Inch
2 — C-COAL	7.7978-7.8105	0.3070-0.3075
1 — C-COAL	7.7470-7.7597	0.3050-0.3055
5 — BLU	7.6962-7.7089	0.3030-0.3035
4 — BLU	7.6454-7.6581	0.3010-0.3015
3 — BLU	7.5946-7.6073	0.2990-0.2995
2 — BLU	7.5458-7.5565	0.2970-0.2975
5 — PINK	7.4422-7.4549	0.2930-0.2935
4 — PINK	7.3914-7.4041	0.2910-0.2915
3 — PINK	7.3406-7.3533	0.2890-0.2895
2 — PINK	7.2898-7.3025	0.2870-0.2875
1 — PINK	7.2390-7.2517	0.2850-0.2855
5 — GRN	7.1882-7.2009	0.2830-0.2835
4 — GRN	7.1374-7.1501	0.2810-0.2815
3 — GRN	7.0866-7.0993	0.2790-0.2795
2 — GRN	7.0358-7.0485	0.2770-0.2775
1 — GRN	6.9850-7.0485	0.2750-0.2755
5 — WH	6.9342-6.9469	0.2730-0.2735
4 — WH	6.8834-6.8961	0.2710-0.2715
3 — WH	6.8326-6.8453	0.2690-0.2695
2 — WH	6.7818-6.7945	0.2670-0.2675
1 — WH	6.7310-6.7437	0.2650-0.2655
5 — YEL	6.6802-6.6929	0.2630-0.2635
4 — YEL	6.6294-6.6421	0.2610-0.2615
3 — YEL	6.5786-6.5913	0.2590-0.2595
2 — YEL	6.5278-6.5405	0.2570-0.2575
1 — YEL	6.4770-6.4897	0.2550-0.2555
5 — ORNG	6.4262-6.4389	0.2530-0.2535
4 — ORNG	6.3754-6.3881	0.2510-0.2515
3 — ORNG	6.3246-6.3373	0.2490-0.2495

Backlash Change Required		Thickness Change Required	
mm	Inch	mm	Inch
0.025	0.001	0.050	0.002
0.050	0.002	0.050	0.002
0.076	0.003	0.101	0.004
0.101	0.004	0.152	0.006
0.127	0.005	0.152	0.006
0.152	0.006	0.203	0.008
0.177	0.007	0.254	0.010
0.203	0.008	0.254	0.010
0.228	0.009	0.304	0.012

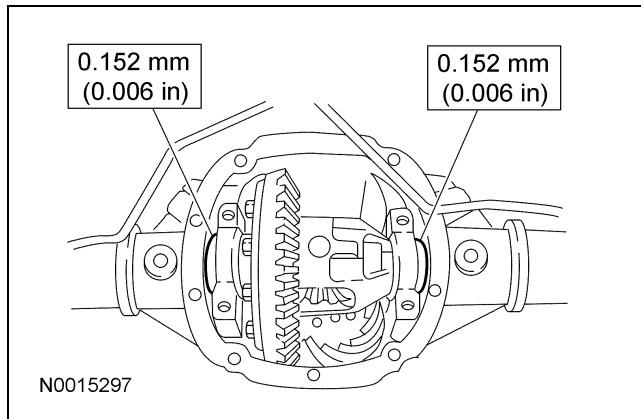
IN-VEHICLE REPAIR (Continued)

Differential Shim Size Chart 4067 (Continued)

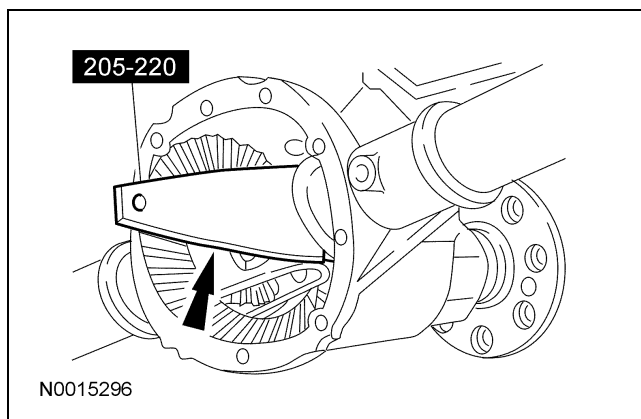
Stripes and Color Code	Dimension A	
	mm	Inch
2 — ORNG	6.2738-6.2865	0.2470-0.2475
1 — ORNG	6.2223-6.2357	0.2450-0.2455
2 — RED	6.1722-6.1849	0.2430-0.2435
1 — RED	6.1214-6.1341	0.2410-0.2415

27. Remove the bearing cap bolts and bearing caps.

28. To establish differential bearing preload, increase both LH and RH differential bearing shim size by the thickness shown.

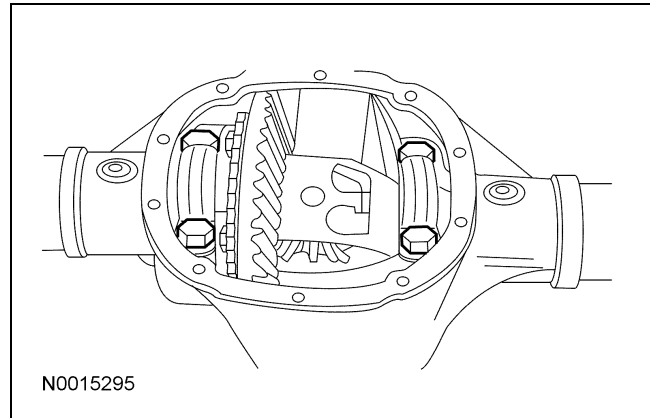


29. Using the special tool, fully seat the differential bearing shims. Make sure the assembly rotates freely.



30. Install the bearing caps and bolts.

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



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

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

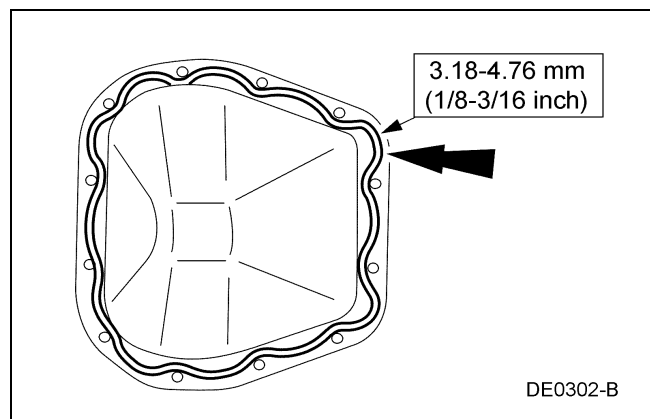
33. Check for an acceptable pattern.

34. Install the axle shafts. For additional information, refer to Axle Shaft in this section.

35. **⚠ CAUTION: Make sure the machined surfaces on both the axle housing and the differential housing cover are clean and free of oil before applying the new silicone sealant. The inside of the axle must be covered when cleaning the machined surface to prevent contamination.**

Clean the gasket mating surface of the axle and the differential housing cover.

36. Apply a new, continuous bead of sealant to the differential housing cover.



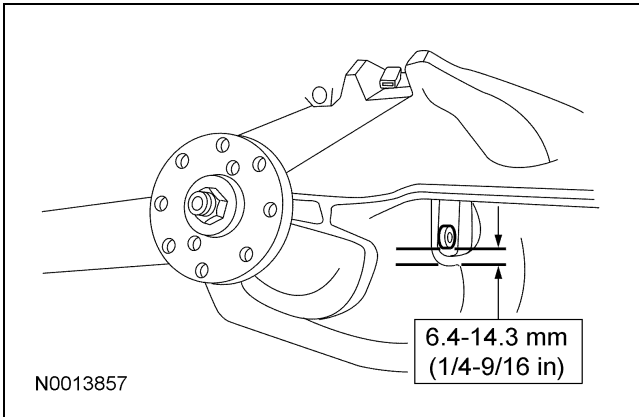
IN-VEHICLE REPAIR (Continued)

37. ⚠ **CAUTION:** For Traction-Lok® axles, first fill the axle with 118 ml (4 ounces) of friction modifier.

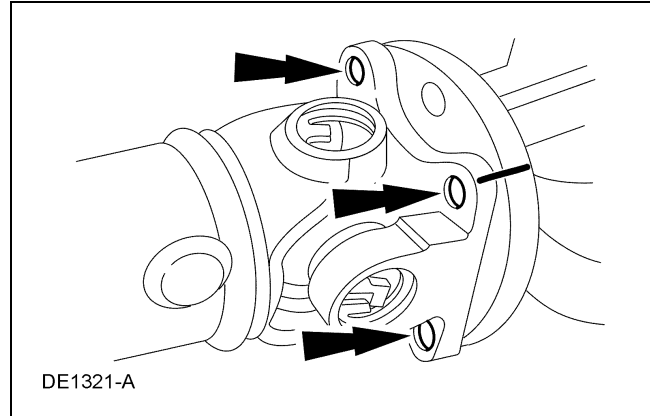
NOTE: Service refill capacities are determined by filling the axle with the specified lubricant to the specified level below the bottom of the filler hole.

Fill the axle to the level shown with axle lubricant and install the filler plug.

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



38. Position the driveshaft and align the index marks on the pinion flange.



39. ⚠ **CAUTION:** The driveshaft centering socket yoke fits tightly on the pinion flange pilot. To make sure that the driveshaft centering socket yoke seats squarely on the pinion flange, tighten the driveshaft flange bolts evenly in a cross pattern.

Install the driveshaft flange bolts.

- Tighten to 103 Nm (76 lb-ft).

