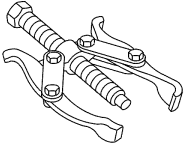
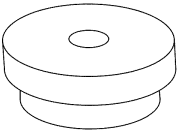
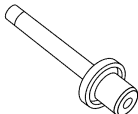
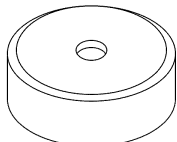
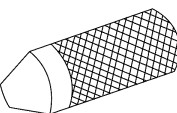
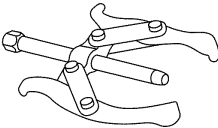


IN-VEHICLE REPAIR

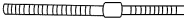
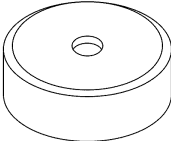
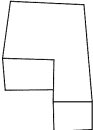
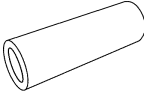
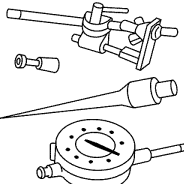
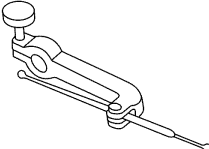

Differential Bearings

Special Tool(s)

 <p>ST2026-A</p>	<p>2-Jaw Puller 205-D072 (D79L-4221-A1) or equivalent</p>
 <p>ST1543-A</p>	<p>Step Plate 205-D061 (D83T-4205-C2) or equivalent</p>
 <p>ST1375-A</p>	<p>Installer, Differential Side Bearing 205-010 (T57L-4221-A2)</p>
 <p>ST1743-A</p>	<p>Adapter For 205-S127 205-105 (T76P-4020-A3)</p>
 <p>ST1432-A</p>	<p>Adapter For 205-S127 205-111 (T76P-4020-A11)</p>
 <p>ST1220-A</p>	<p>Remover, Differential Bearing 205-116 (T77F-4220-B1)</p>

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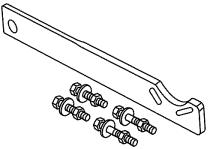
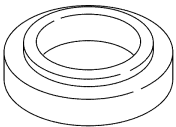
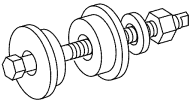
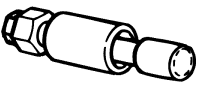
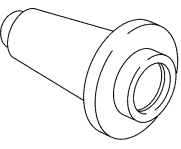
Special Tool(s)

 <p>ST1429-A</p>	<p>Adapter For 205-S127 205-109 (T76P-4020-A9)</p>
 <p>ST1743-A</p>	<p>Adapter For 205-S127 205-129 (T79P-4020-A18)</p>
 <p>ST1431-A</p>	<p>Adapter For 205-S127 205-110 (T76P-4020-A10)</p>
 <p>ST1434-A</p>	<p>Adapter For 205-S127 205-130 (T79P-4020-A19)</p>
 <p>ST1214-A</p>	<p>Dial Indicator With Holding Fixture 100-002 (TOOL-4201-C) or equivalent</p>
 <p>ST1348-A</p>	<p>Gauge, Clutch Housing 308-021 (T57L-4201-A)</p>
 <p>ST1485-A</p>	<p>Shim Driver 205-220 (T85L-4067-AH)</p>

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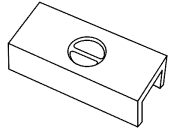
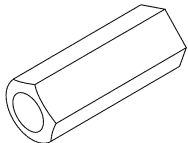
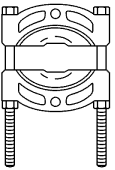
IN-VEHICLE REPAIR (Continued)

Special Tool(s)

 <p>ST1257-A</p>	<p>Holding Fixture, Drive Pinion Flange 205-126 (T78P-4851-A)</p>
 <p>ST1367-A</p>	<p>Installer, Drive Pinion Bearing Cone 205-005 (T53T-4621-C)</p>
 <p>ST1678-A</p>	<p>Installer, Drive Pinion Bearing Cup 205-024 (T67P-4616-A)</p>
 <p>ST1325-A</p>	<p>Installer, Drive Pinion Flange 205-002 (TOOL-4858-E) or equivalent</p>
 <p>ST1325-A</p>	<p>Installer, Drive Pinion Oil Seal 205-208 (T83T-4676-A)</p>

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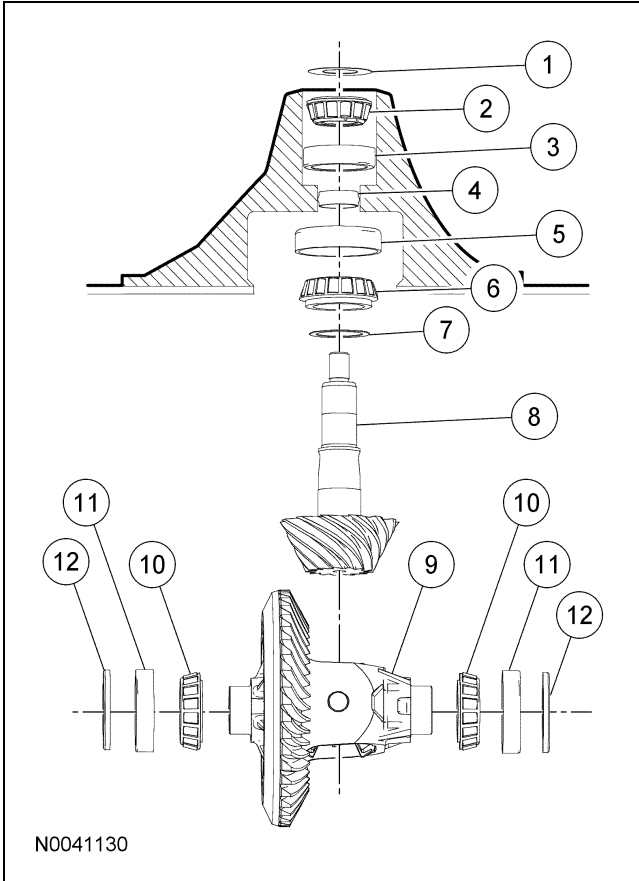
Special Tool(s)

 <p>ST1254-A</p>	<p>Plate, Bearing Oil Seal 205-090 (T75L-1165-B)</p>
 <p>ST1744-A</p>	<p>Protector, Drive Pinion Thread 205-460 or equivalent</p>
 <p>ST1368-A</p>	<p>Puller, Bearing 205-D064 (D84L-1123-A) or equivalent</p>

Material

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

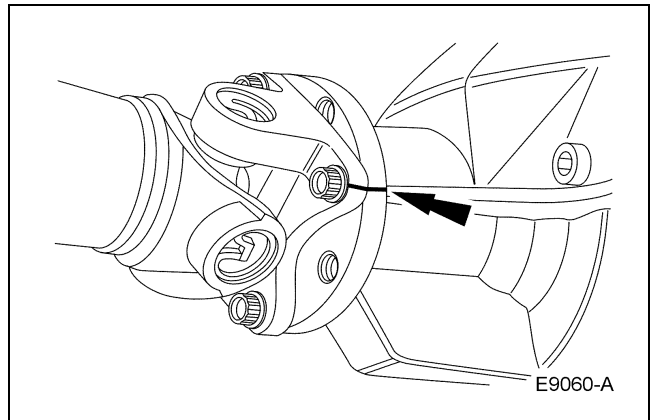
IN-VEHICLE REPAIR (Continued)



Item	Part Number	Description
11	4222	Differential bearing cup
12	4067	Differential bearing shim

Removal

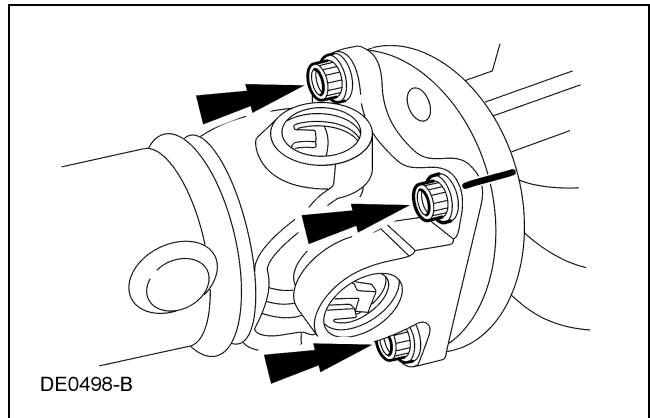
1. Remove the differential carrier assembly. For additional information, refer to Differential Carrier in this section.
2. Index-mark the driveshaft flange and pinion flange for correct alignment during installation.




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 bearing

(Continued)

3. Remove the 4 driveshaft flange bolts.

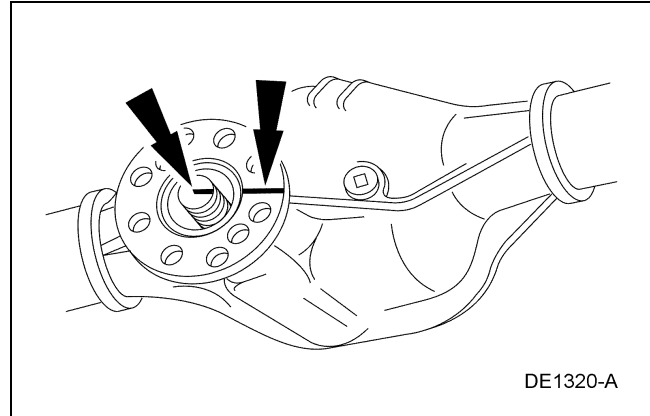
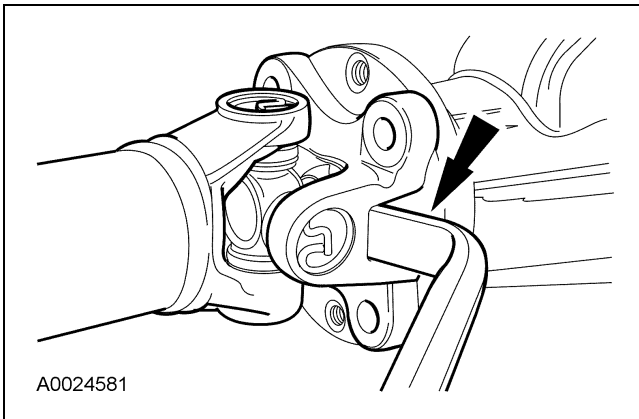


IN-VEHICLE REPAIR (Continued)

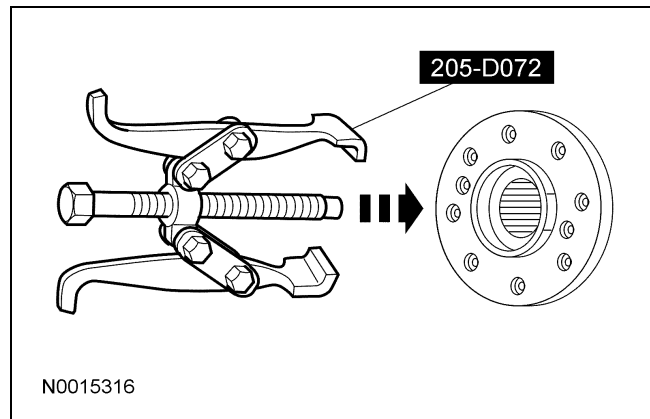
4.  **CAUTION:** The driveshaft centering socket yoke fits tightly on the pinion flange pilot. Never hammer on the driveshaft or any of its components to disconnect the driveshaft centering socket yoke from the pinion flange. Pry only in the area shown with a suitable tool to disconnect the driveshaft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

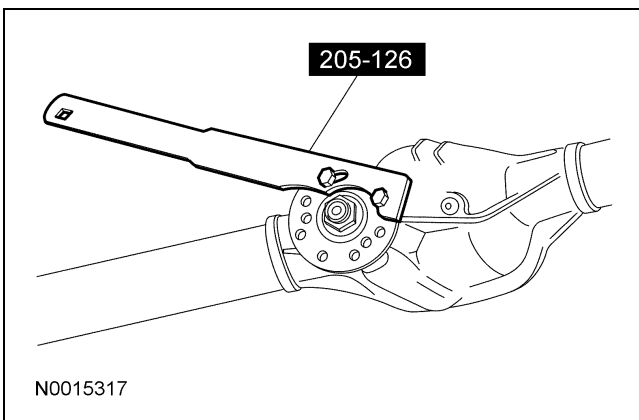


7. Using the special tool, remove the pinion flange.

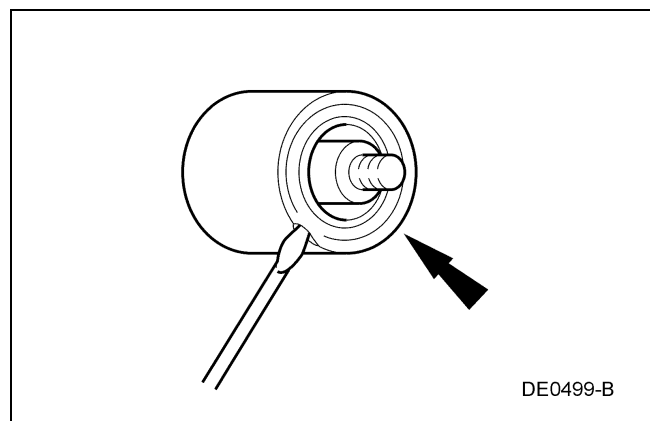


5.  **CAUTION:** Discard the nut after removal. Use a new nut during installation.

Use the special tool to hold the pinion flange while removing the drive pinion nut.



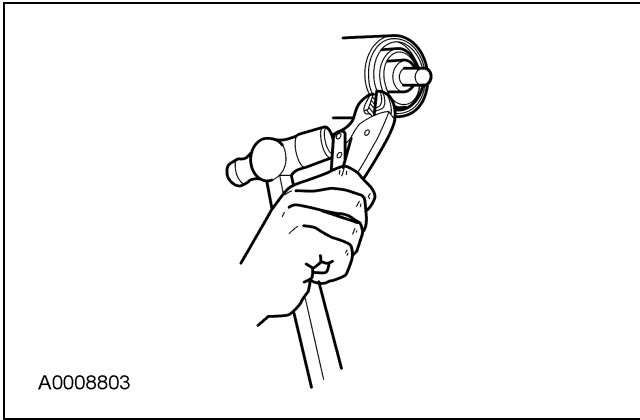
8. Using a screwdriver, force up the rear axle drive pinion seal metal flange.



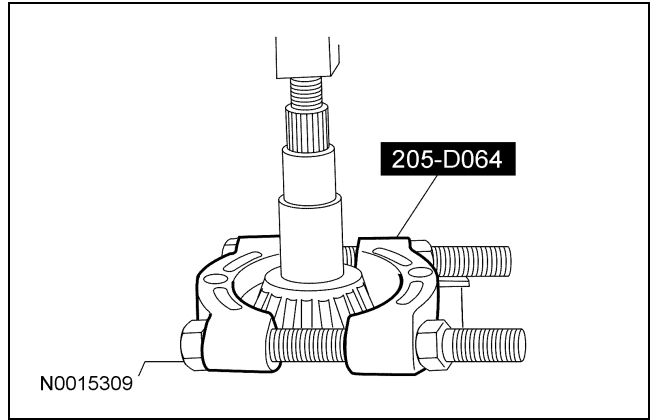
6. Index-mark the pinion flange and the drive pinion stem for correct alignment during installation.

IN-VEHICLE REPAIR (Continued)

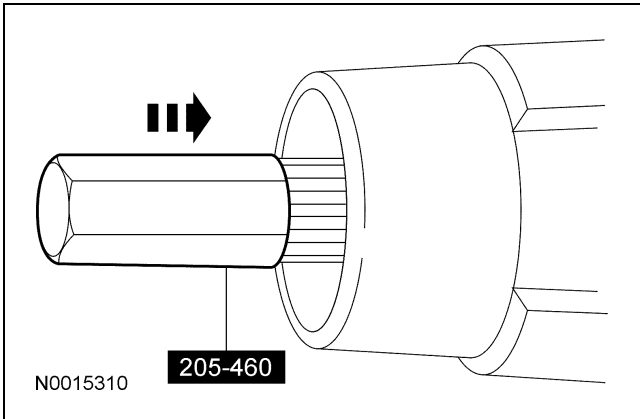
- 9. Using gripping pliers and a hammer, remove the axle drive pinion seal.



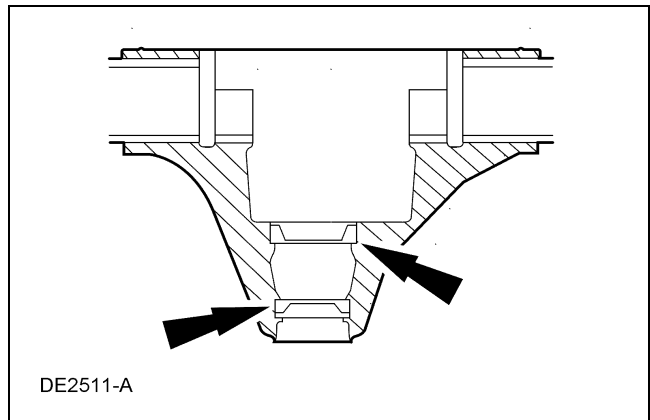
- 14. Using the special tool and a suitable press, remove the inner pinion bearing.



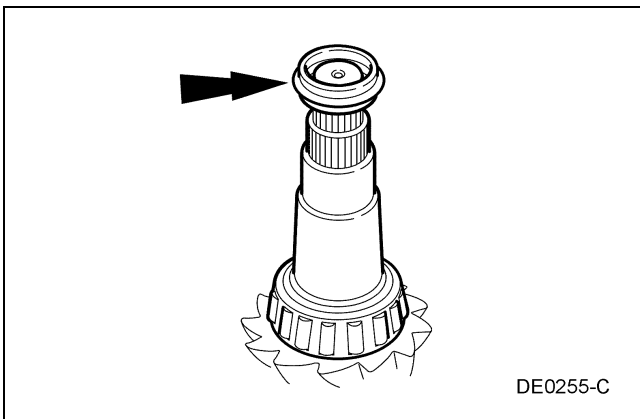
- 10. Remove the axle drive pinion shaft oil slinger.
- 11. Using the special tool and a soft-faced hammer, drive the pinion assembly out of the outer pinion bearing and remove it through the rear of the differential housing.



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

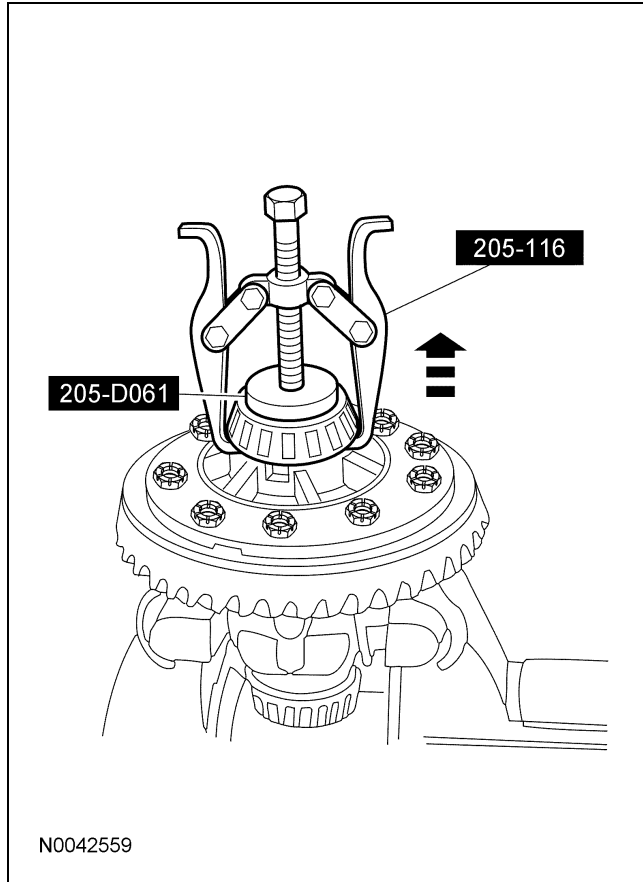


- 12. Remove the outer pinion bearing.
- 13. Remove the drive pinion collapsible spacer and discard it.



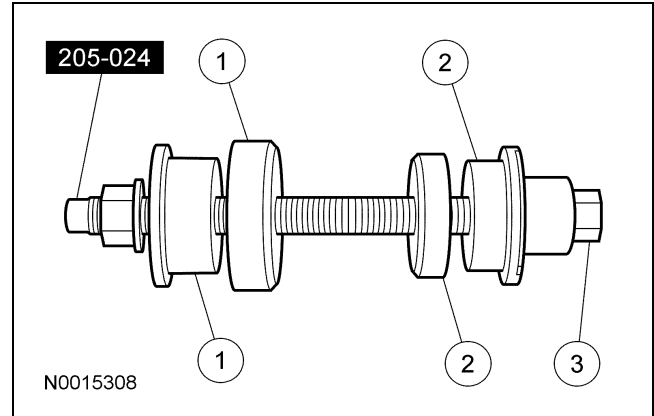
IN-VEHICLE REPAIR (Continued)

16. Using the special tools, remove the differential bearings.

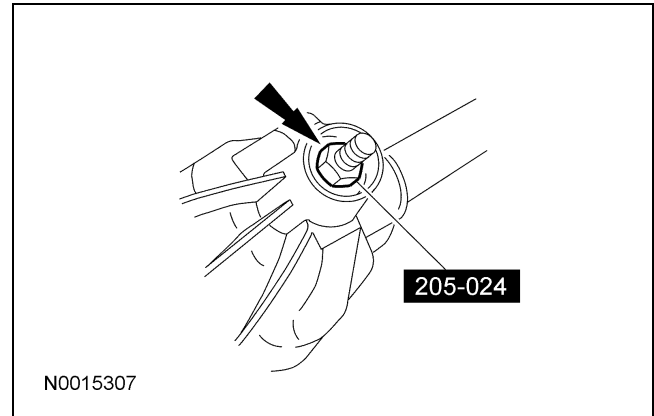


2. Position the special tool and the inner and outer bearing cups in their respective bores.

- 1 After placing the inner and outer bearing cups in their respective bores, place the special tool of the inner bearing cup.
- 2 Place the special tool on the outer bearing cup.
- 3 Install the special tool.

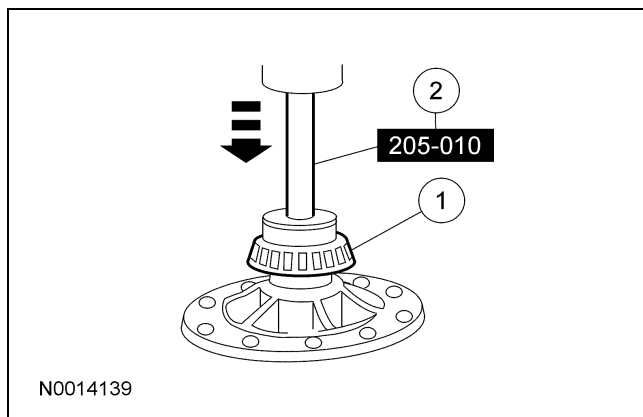


3. Tighten the special tool to seat the pinion bearing cups in their bores.



Installation

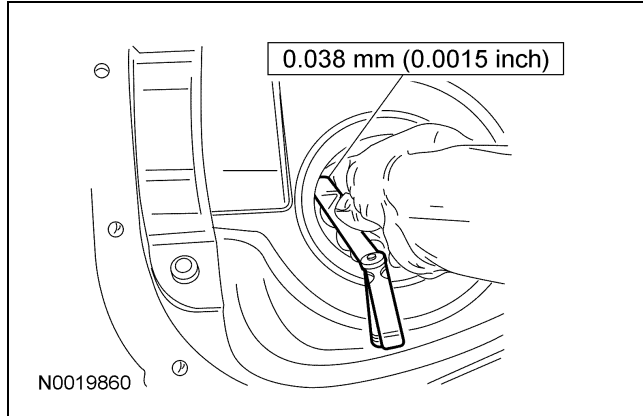
1. Press the left and right differential bearing on the differential assembly.
 - 1 Position the differential bearings.
 - 2 Using the special tool, press the differential bearings on the differential assembly.



IN-VEHICLE REPAIR (Continued)

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

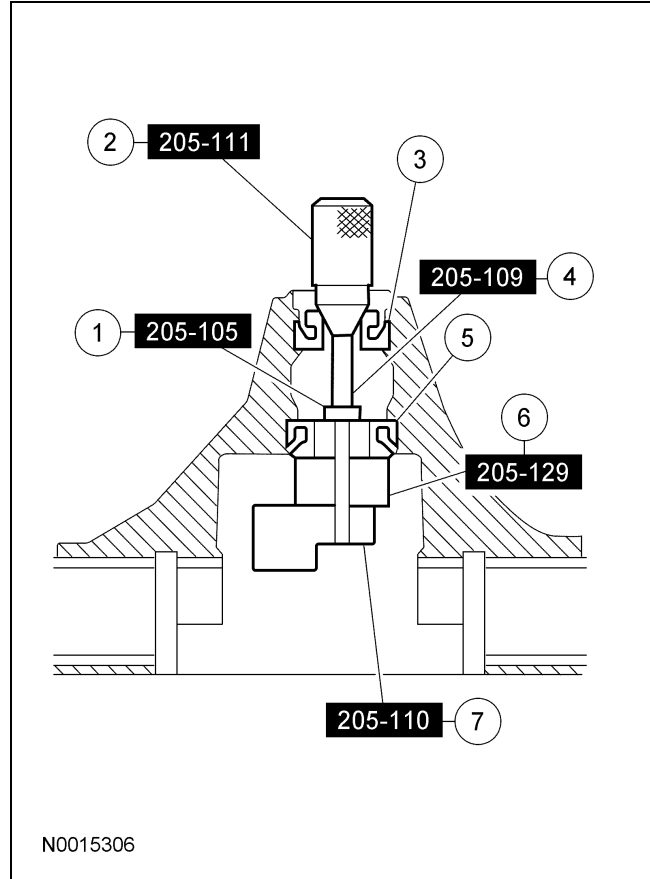
Make sure the differential pinion bearing cups are correctly seated.



5. **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.

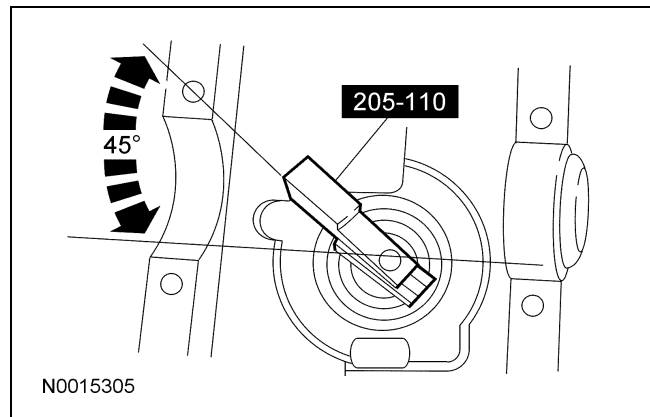
Assemble and position the drive pinion depth gauge set.

- 1 Position the screw.
- 2 Position the aligning adapter.
- 3 Position the gauge disc.
- 4 Position the gauge block.
- 5 Position the inner drive pinion bearing.
- 6 Position the outer drive pinion bearing.
- 7 Thread on the handle and tighten.
 - Tighten to 2.2 Nm (20 lb-in).



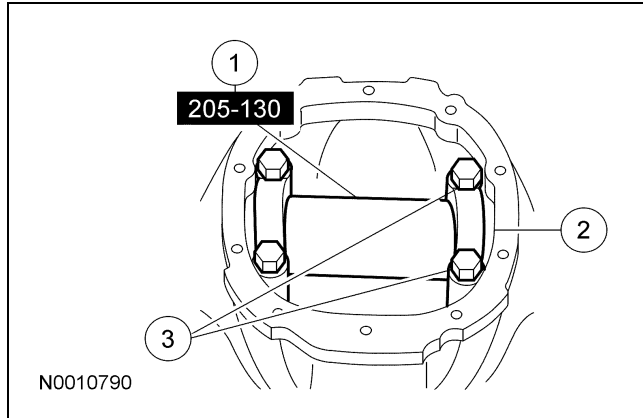
6. **NOTE:** The gauge block must be offset to obtain an accurate reading.

Rotate the gauge block several half turns to make sure of correct seating of the drive pinion bearings and position the gauge block.



IN-VEHICLE REPAIR (Continued)

7. Install the special tool.
 - 1 Position the gauge tube and the paper shipping tabs.
 - 2 Install the differential bearing caps.
 - 3 Install the differential bearing cap bolts.
 - Tighten to 105 Nm (77 lb-ft).

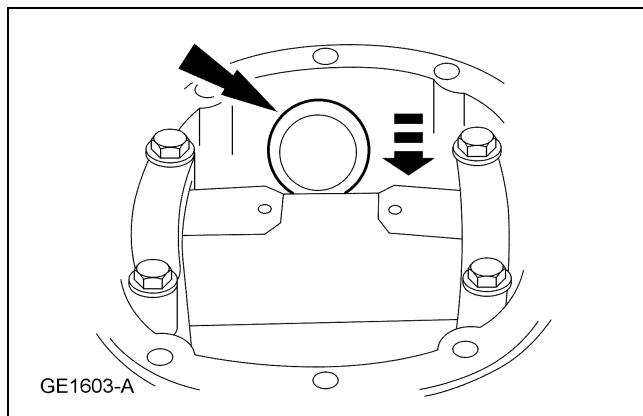


8. **NOTE:** Drive pinion bearing adjustment shims must be flat and clean.

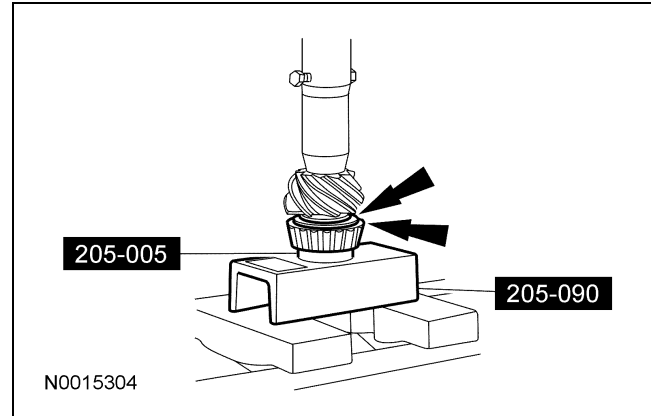
NOTE: A slight drag should be felt for correct drive pinion bearing adjustment shim selection. Do not attempt to force the drive pinion bearing adjustment shim between gauge block and gauge tube. This will minimize selection of a drive pinion bearing adjustment shim thicker than required, which results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

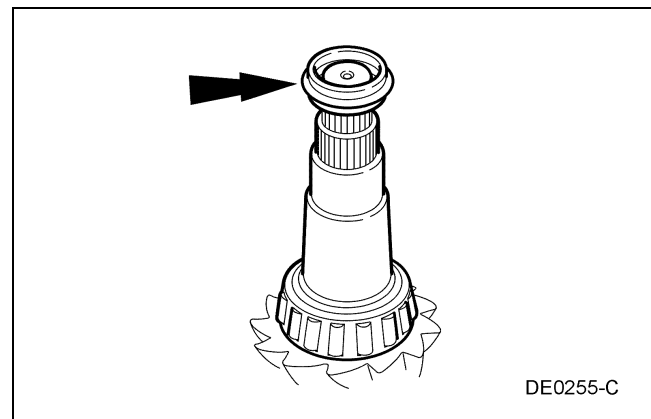
- After the correct drive pinion bearing adjustment shim thickness has been determined, remove all of the special tools.



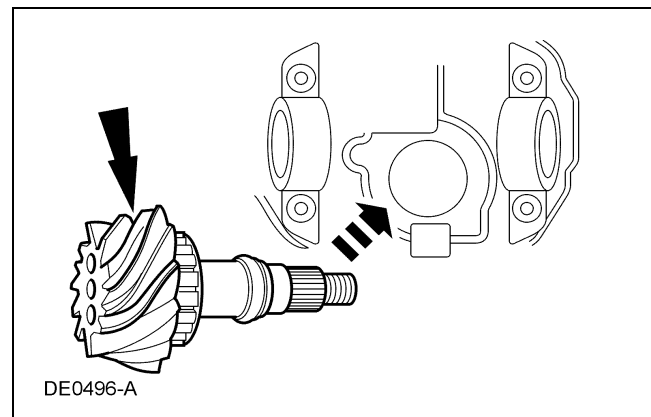
9. Using the special tool and a shop press, drive the inner drive pinion bearing and drive pinion bearing adjustment shim until they are firmly seated on the pinion shaft.



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



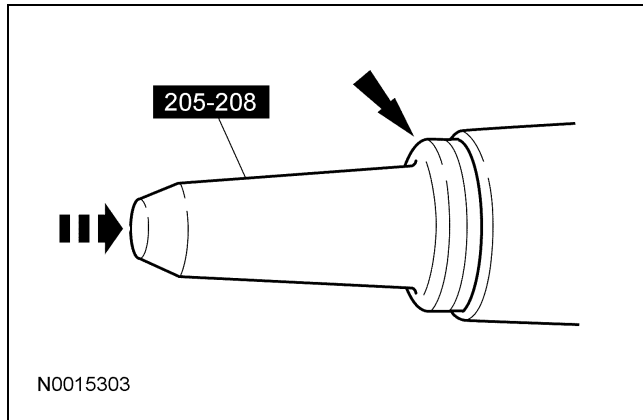
11. Install the drive pinion assembly into the axle housing.



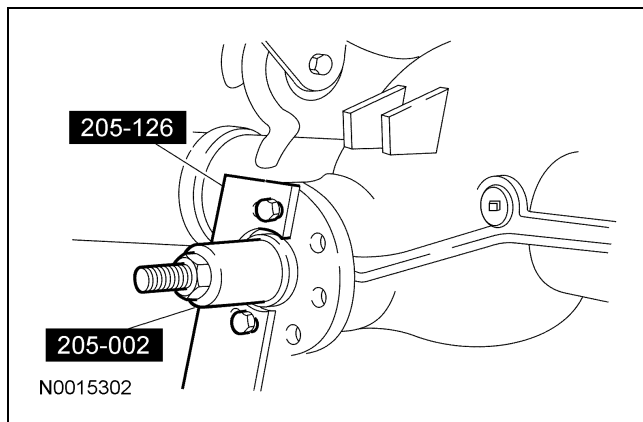
12. Install the outer drive pinion bearing and the drive pinion shaft oil slinger.

IN-VEHICLE REPAIR (Continued)

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



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

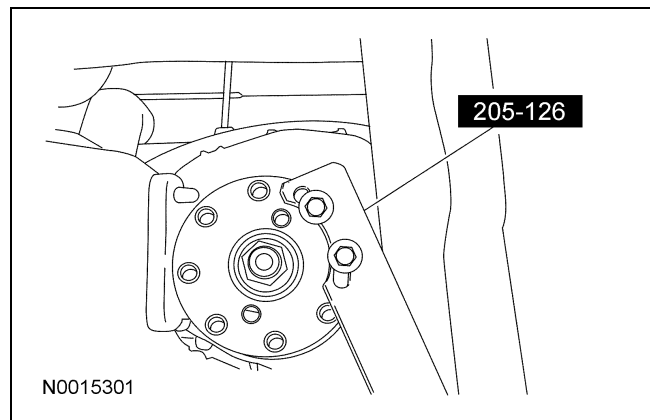


15. ⚠ **CAUTION:** Do not, under any circumstance, loosen the drive pinion nut to reduce pinion bearing preload. If it is necessary to reduce the preload, install a new drive pinion collapsible spacer and drive pinion nut.

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

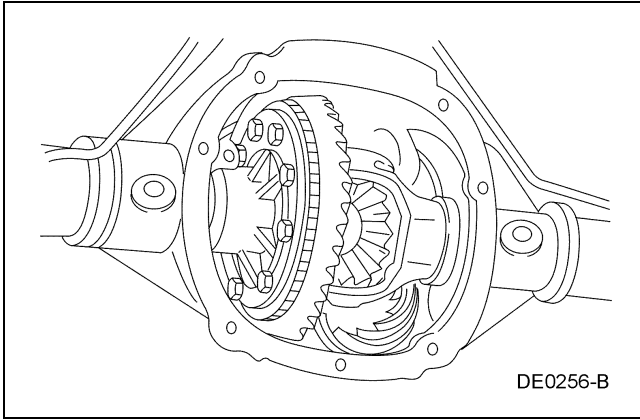
Use the special tool to hold the pinion flange while tightening the pinion nut.

- 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.

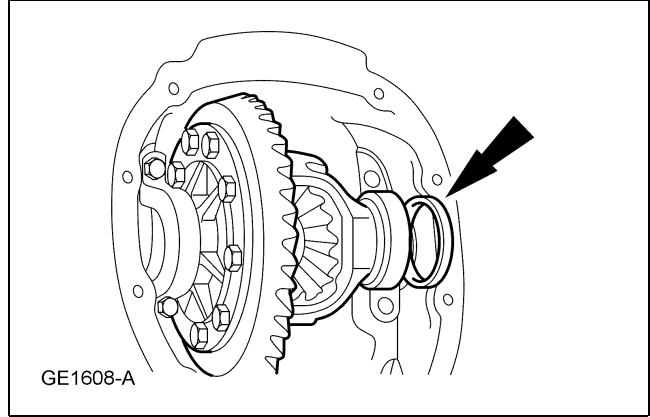


IN-VEHICLE REPAIR (Continued)

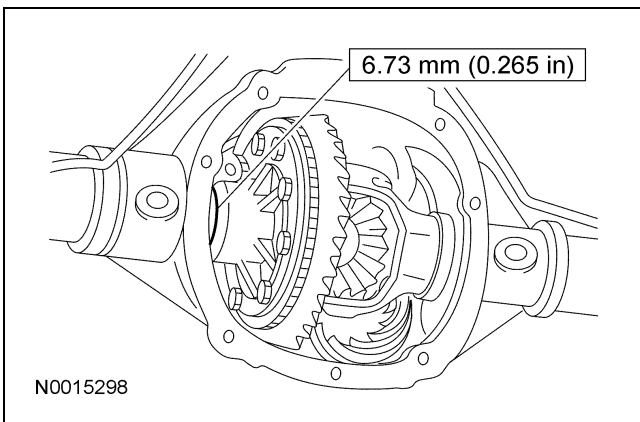
16. Place the differential carrier assembly with the new differential carrier bearing cups in the axle housing.



19. Install progressively larger differential bearing shims on the RH side until the largest differential bearing shim selected can be inserted by hand.

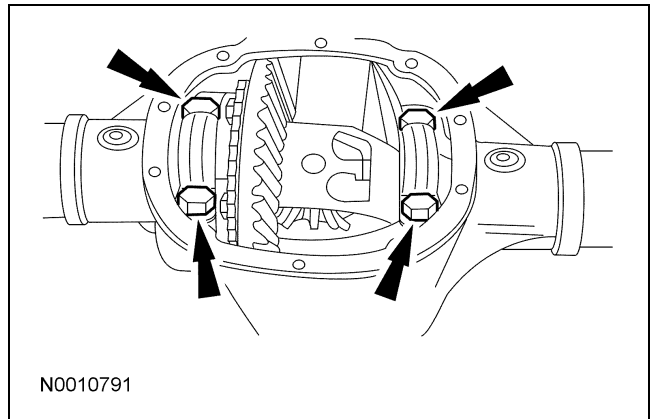


17. Install a differential bearing shim on the LH side.



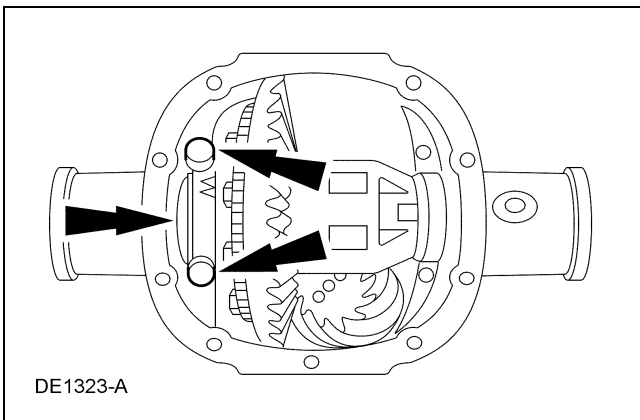
20. Install the RH side differential bearing cap and tighten the differential bearing cap bolts.

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

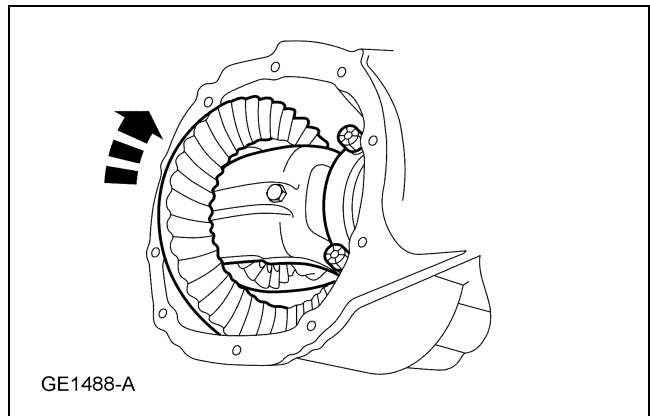


18. **NOTE:** Apply pressure toward the LH side to make sure the left differential bearing cup is seated.

Install the LH differential bearing cap and loosely install the differential bearing cap bolts.

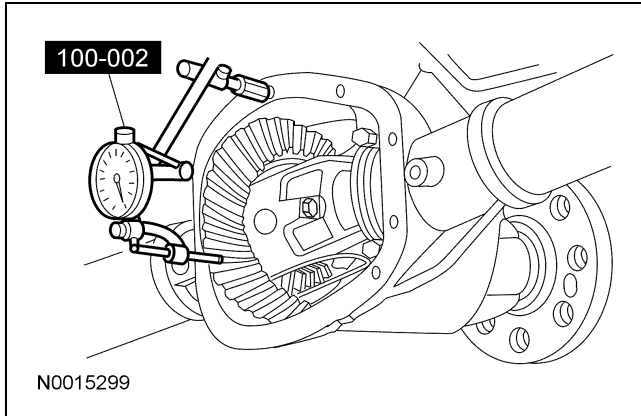


21. Rotate the differential assembly to make sure it rotates freely.



IN-VEHICLE REPAIR (Continued)

22. Install the special tools and measure the ring gear backlash.
- If the backlash is within specification, proceed to Step 25.
 - If a zero backlash condition occurs, proceed to Step 23.
 - If the backlash is not within specification, proceed to Step 24.



23. 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 22.
24. 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 specifications, proceed to Step 25.

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

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

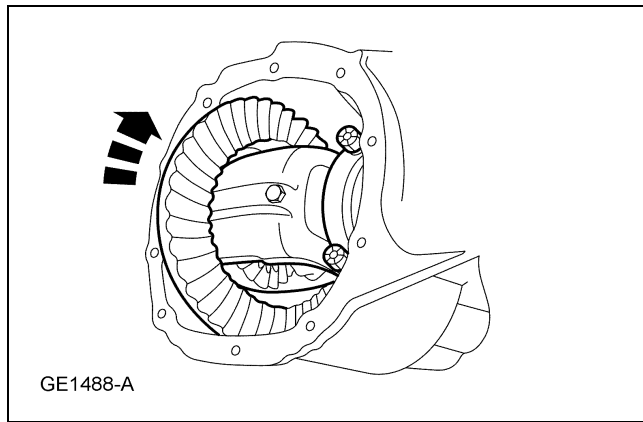
Stripes and Color Code	Dimension A	
	mm	Inch
2 — C-COAL	7.7978-7.8105	0.3070-0.3075
1 — C-COAL	7.7470-7.7597	0.3050-0.3055
5 — BLU	7.6962-7.7089	0.3030-0.3035
4 — BLU	7.6454-7.6581	0.3010-0.3015
3 — BLU	7.5946-7.6073	0.2990-0.2995
2 — BLU	7.5438-7.5565	0.2970-0.2975
5 — PINK	7.4422-7.4549	0.2930-0.2935
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

IN-VEHICLE REPAIR (Continued)

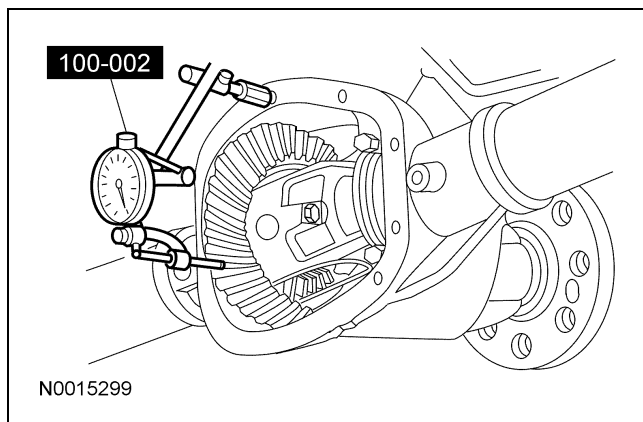
Differential Shim Size Chart 4067 (Continued)

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

25. Rotate the differential assembly several times to make sure the differential bearings are seated.

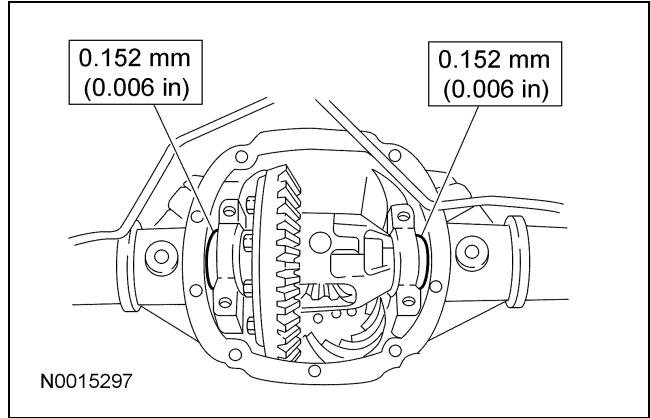


26. Using the special tools, recheck the ring gear backlash.

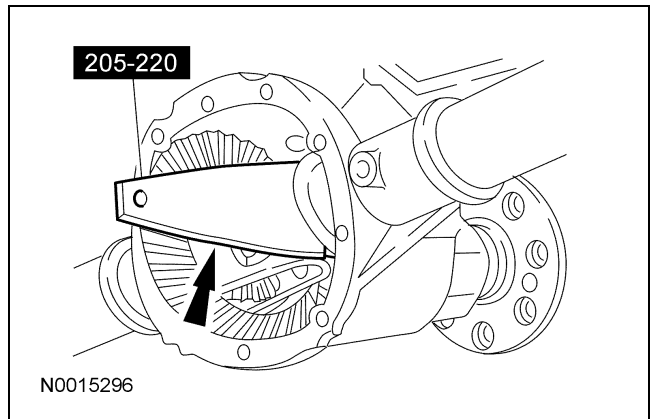


27. Remove the differential bearing cap bolts and differential bearing caps.

28. To establish differential bearing preload, increase both LH and RH differential bearing shim sizes as shown.

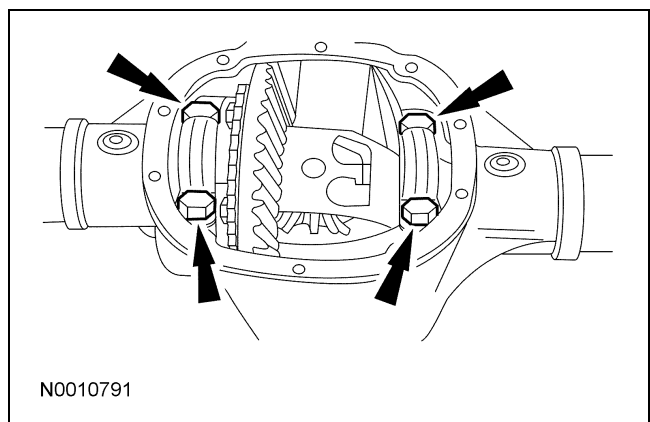


29. Using the special tool, fully seat the differential bearing shims. Make sure the assembly rotates freely.



30. Install the differential bearing caps and differential bearing cap bolts.

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

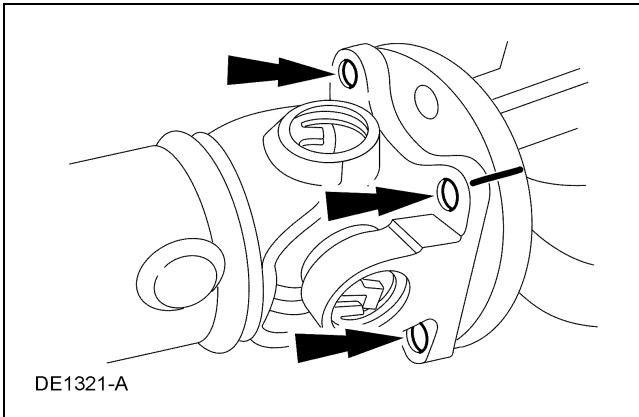



31. Using the special tools, recheck the backlash.

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

IN-VEHICLE REPAIR (Continued)

33. Check and verify an acceptable pattern.
34. Install the axle shafts. For additional information, refer to Axle Shaft in this section
35. Position the driveshaft and align the index marks on the pinion flange.



36.  **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).

