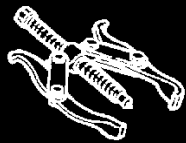
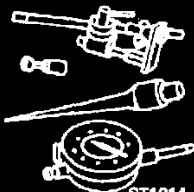





Differential Case: Service and Repair

9.75 Inch Ring Gear

Removal and Installation

 <p>ST2026-A</p>	<p>2-Jaw Puller 205-D072 (D97L-4221-A) or Equivalent</p>
 <p>ST1214-A</p>	<p>Dial Indicator with Bracketry 100-002 (TOOL-4201-C) or Equivalent</p>
 <p>ST1375-A</p>	<p>Differential Side Bearing Replacer 205-010 (T57L-4221-A2)</p>

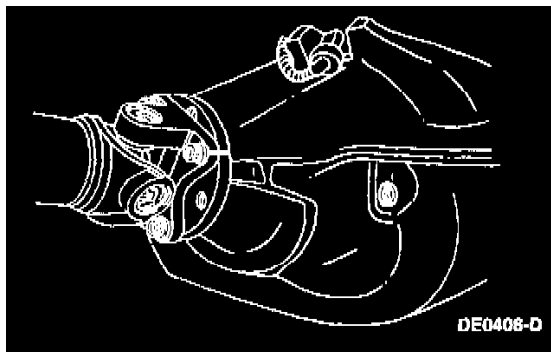
Special Tools

 <p>ST1485-A</p>	<p>Shim Driver 205-228 (T85T-4067-AH)</p>
 <p>ST1543-A</p>	<p>Step Plate 205-D019 (D80L-630-8) or Equivalent</p>

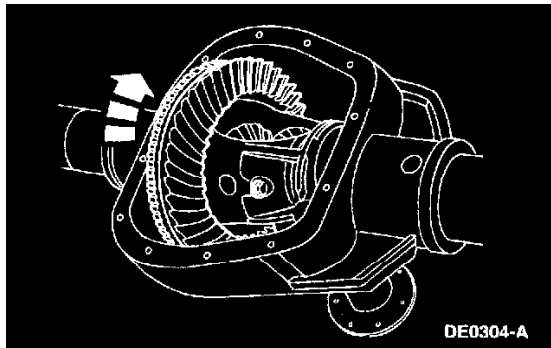
Special Tools

REMOVAL

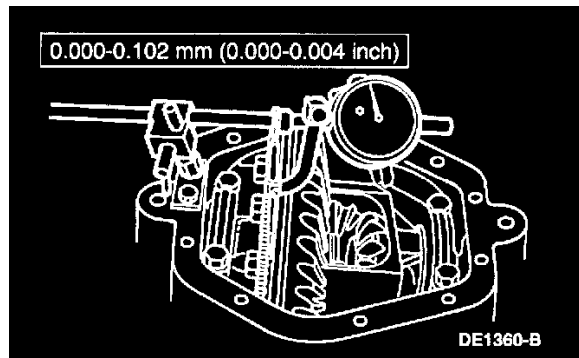
1. Remove the axle housing cover and drain the axle.
2. Remove the axle shafts.



3. Mark the driveshaft flange and the driveshaft rear axle companion flange for correct alignment during installation.
4. Wipe the lubricant from the internal working parts, and visually inspect the parts for wear or damage.

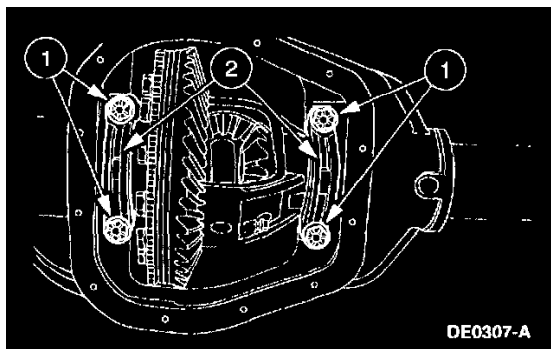


5. Rotate the differential case to see if there is any roughness which would indicate damaged bearings or gears.



6. **NOTE:** There is a space between the anti-lock speed sensor ring and the ring gear for measuring ring gear backface runout.

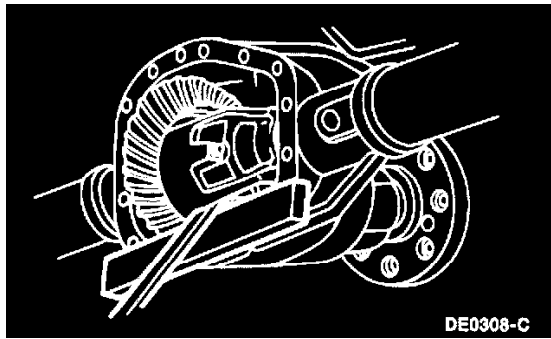
Position the Dial Indicator with Bracketry, and inspect ring gear backlash and ring gear backface runout.



7. **CAUTION:** The bearing caps must be installed in their identical locations and positions. Mark each bearing cap before removal.

Loosen the differential case.

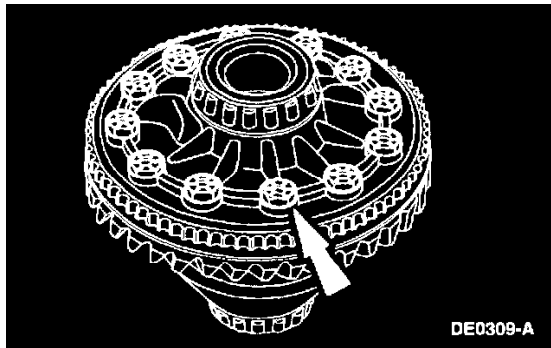
- 1 Remove the bearing cap bolts.
- 2 Remove the bearing caps.



8. **WARNING: BE CAREFUL NOT TO ALLOW THE DIFFERENTIAL CASE TO FALL.**

CAUTION: Place a wood block between the pry bar and the axle housing to protect the machined surface from damage.

Use the pry bar and the wood block to remove the differential case from the carrier.

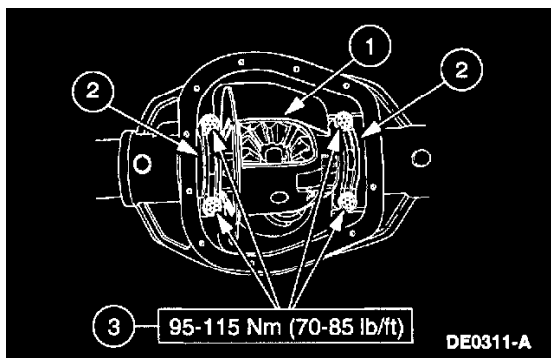


9. Remove the ring gear bolts.



10. **NOTE:** The anti-lock speed sensor ring cannot be reused once removed.

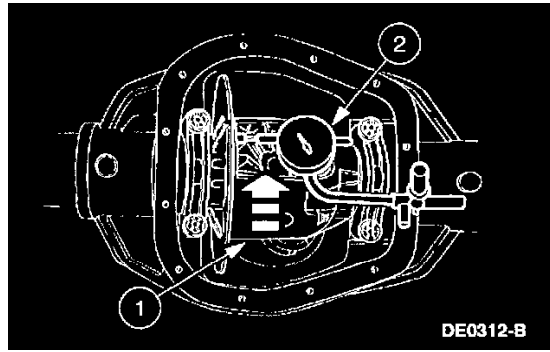
Insert a punch in the bolt holes. Drive off the ring gear and, if necessary, the anti-lock speed sensor ring.



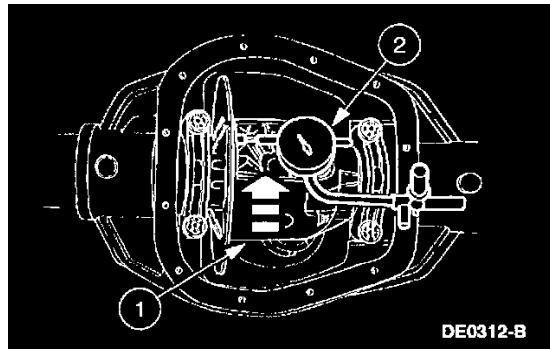
11. Install the differential case.

- 1 Position the differential case assembly, including bearing clips and shims, in the carrier.
- 2 Install the differential bearing caps.

- 3 Install the differential bearing cap bolts.



12. Position the Dial Indicator with Bracketry.
 - 1 Rotate the differential case to make sure the differential bearings are properly seated.
 - 2 Position the Dial Indicator with Bracketry.



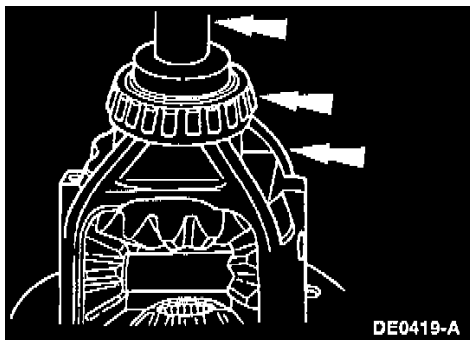
13. **NOTE:** If runout is within specification, install a new ring gear and pinion. If runout exceeds specification, the ring gear is true and the concern is due to either a damaged differential case or differential bearings. Inspect the differential bearings. If the differential bearings are not damaged, replace both the differential case and the differential bearings.

Measure the differential case runout without the ring gear.

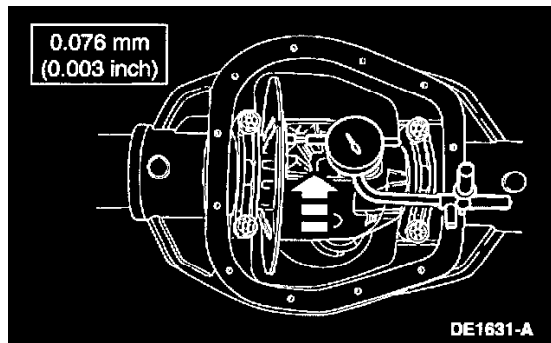
- 1 Rotate the differential case.
- 2 Check and note the differential case runout.



14. Remove the differential case from the rear axle housing, and remove the differential bearings using the 2-Jaw Puller for Differential Case Bearings and the Step Plate Adapter.

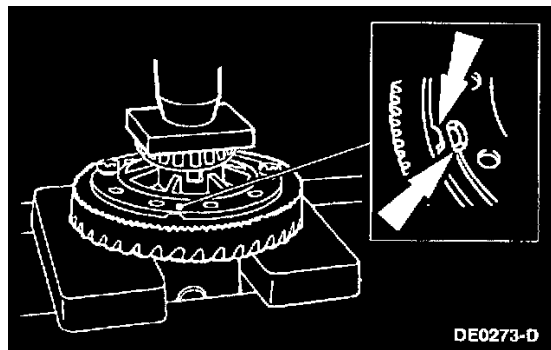


15. Use the Differential Bearing Cone Replacer to install the new differential bearings on the differential case.

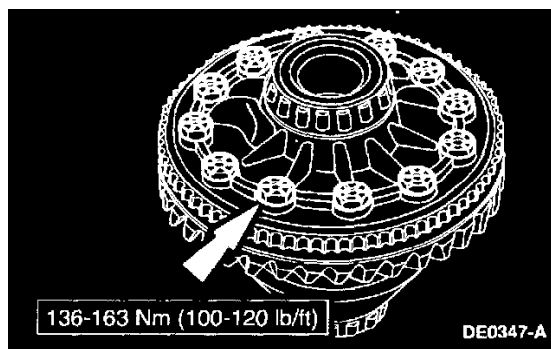


16. Measure the differential case runout without the ring gear.
 - Check the case runout again with the new differential bearings. If the runout is now at 0.076 mm (0.003 inch), use the new differential bearings for assembly. If the runout is still excessive, the differential case is damaged and must be replaced.

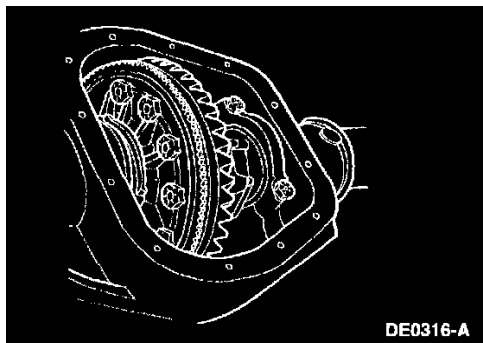
INSTALLATION



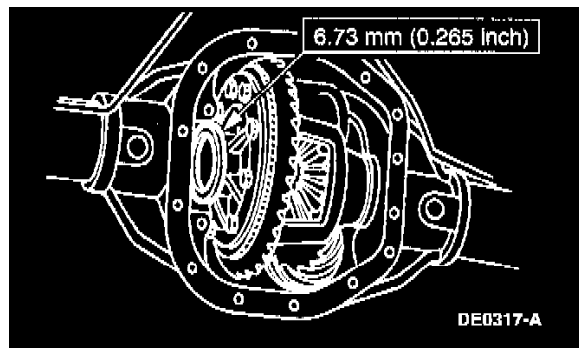
1. Press the ring gear and, if removed, a new anti-lock speed sensor on the differential case.



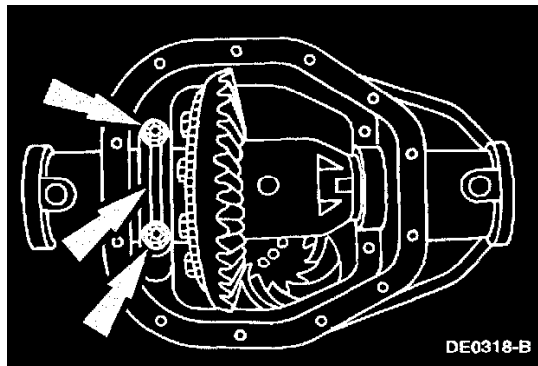
2. Install the ring gear bolts.
 - Apply Stud and Bearing Mount EOAZ-19554-BA or equivalent meeting Ford specification WSK-M2G349-A1 to the ring gear bolts.



3. With pinion depth set and the pinion installed, place the differential case in the rear axle housing.



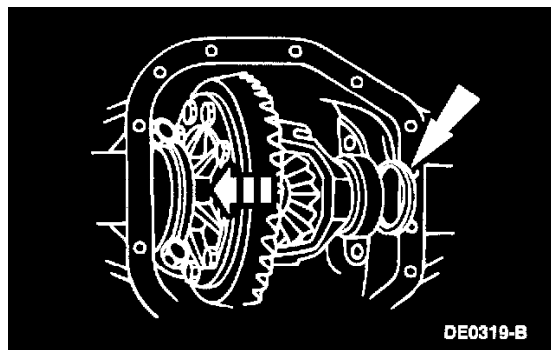
4. Install a (nominal) shim on the left side.



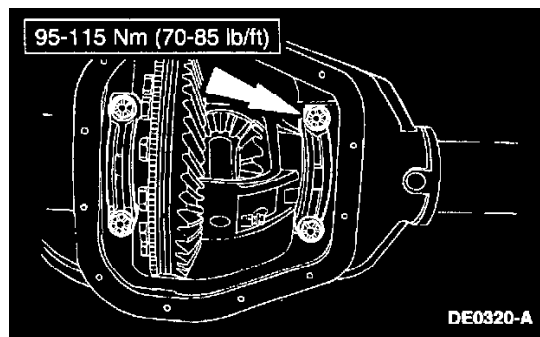
5. **CAUTION:** The bearing caps must be installed in their identical locations and positions.

NOTE: Apply pressure toward the left side to make sure the left bearing cap is seated.

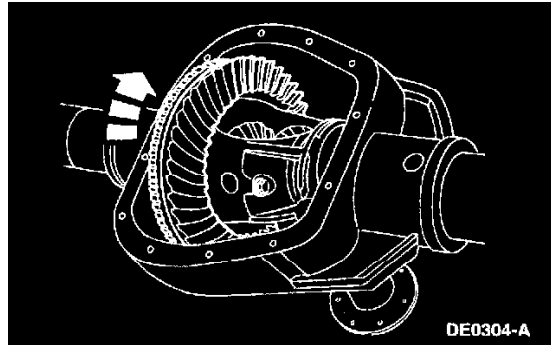
Install the left bearing cap, and loosely install the bearing cap bolts.



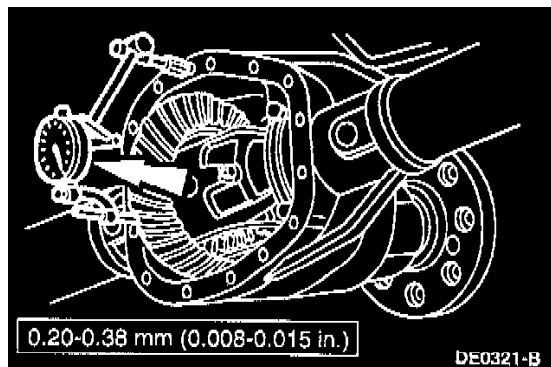
6. Install progressively larger shims on the right side until the largest shim selected can be assembled by hand.



7. Install the right side bearing cap, and tighten the bolts.



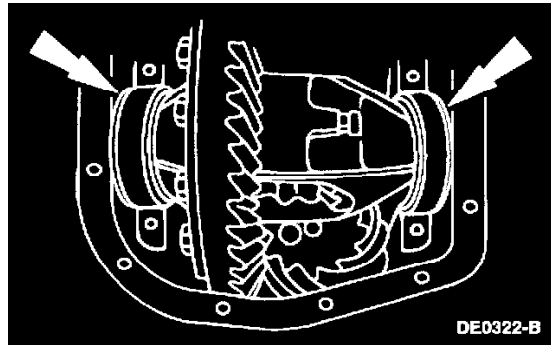
8. Rotate the differential case to make sure it rotates freely.



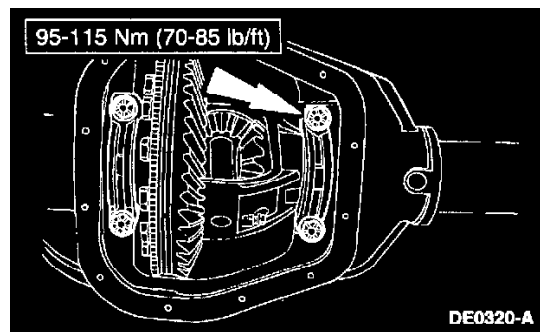
9. Use the Dial Indicator with Bracketry to measure ring gear backlash.
- If the backlash is within specification, go to Step 15. The specification shown is the full allowable range. For the preferred range, refer to Specifications.
 - If a zero backlash condition occurs, go to Step 10.
 - If the backlash is not within specification, go to Step 11.

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
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

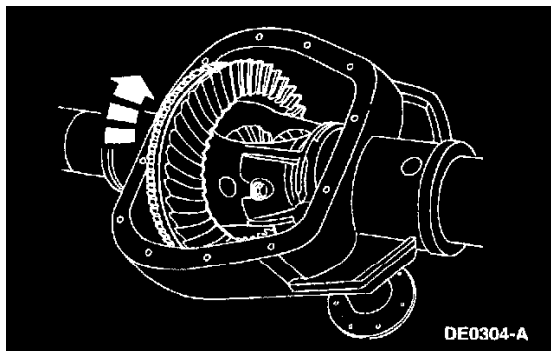
10. If a zero backlash condition occurs, add a 0.50-mm (0.020-inch) shim to the RH side and subtract 0.50 mm (0.020 inch) from the LH side to allow backlash indication. Check backlash. Repeat Step 9.



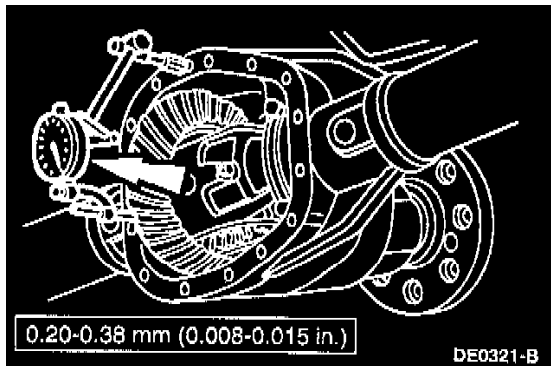
11. To increase or decrease backlash, remove the bearing caps, and install a thicker shim and a thinner shim as shown.
- If backlash is not within specification, correct by increasing the thickness of one differential bearing shim and decreasing the thickness on the other differential bearing shim by the same amount.



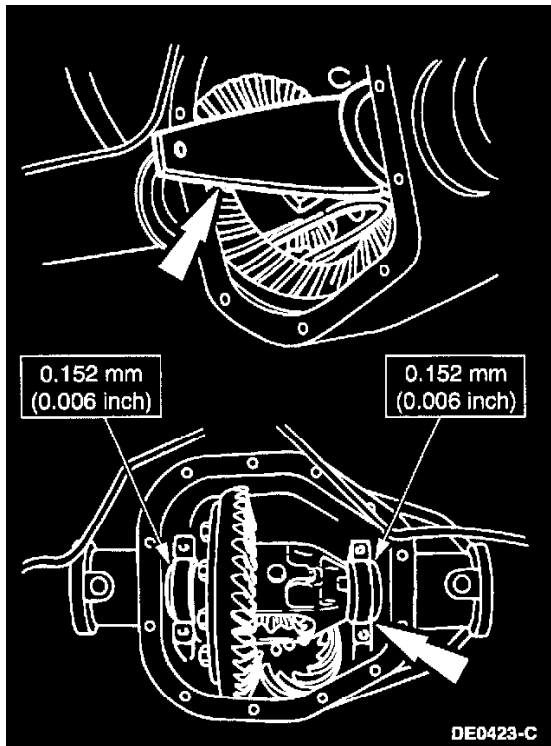
12. Install the bearing caps and bearing cap bolts.



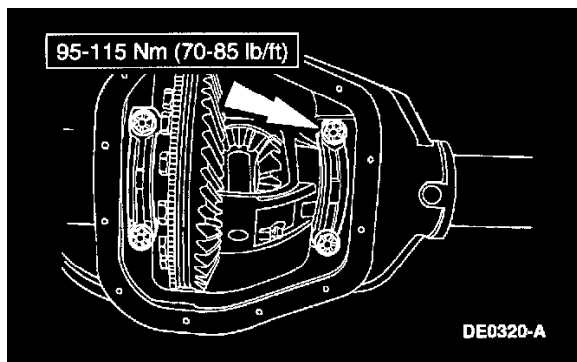
13. Rotate the differential several times to make sure the differential bearings are properly seated.



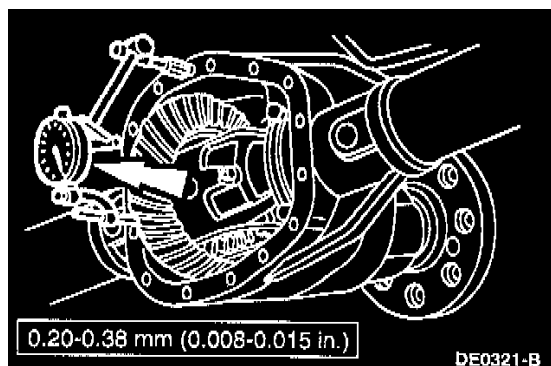
14. Use the Dial Indicator with Bracketry to recheck the backlash.
- If backlash is within specification, go to Step 15. If not, repeat Step 9.
 - The specification shown is the full allowable range. For the preferred range, refer to Specifications.



15. Remove the bearing caps and bolts.
- To establish differential bearing preload, increase both left and right shim sizes by the specification shown in the illustration.
 - Use the Shim Driver to ensure the differential bearing shims are fully seated and the assembly turns freely.

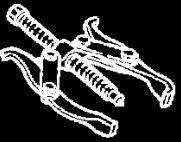




16. Install the bearing caps and bearing cap bolts.



- 17. Use the Dial Indicator with Bracketry to verify the backlash.
- 18. Install the axle shafts.
- 19. Install the axle housing cover, and refill the rear axle with specified lubricant.
- 20. Install the driveshaft.

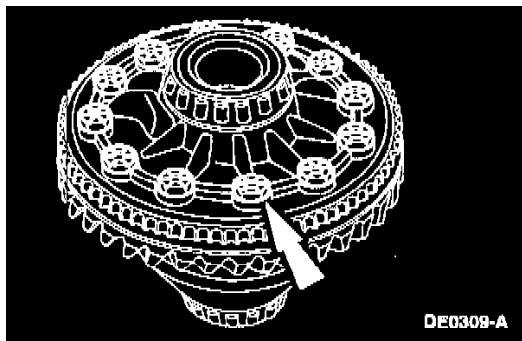
Conventional - Differential Case and Ring Gear

 <p>ST2026-A</p>	<p>2-Jaw Puller 205-D072 (D97L-4221-A) or Equivalent</p>
 <p>ST1375-A</p>	<p>Differential Side Bearing Replacer 205-010 (T57L-4221-A2)</p>
 <p>ST1543-A</p>	<p>Step Plate 205-D016 (D80L-630-5) or equivalent</p>

Special Tools

DISASSEMBLY

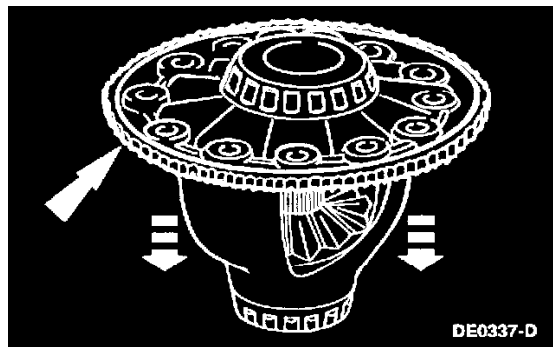
- 1. Remove the differential case.



2. Remove the ring gear bolts.



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

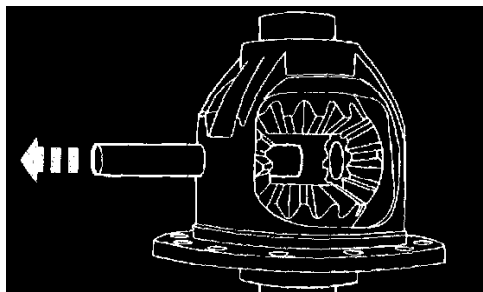


4. **NOTE:** The anti-lock speed sensor ring cannot be reused once removed.

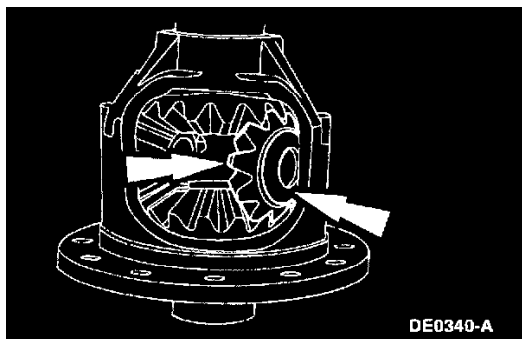
Remove the anti-lock speed sensor ring.



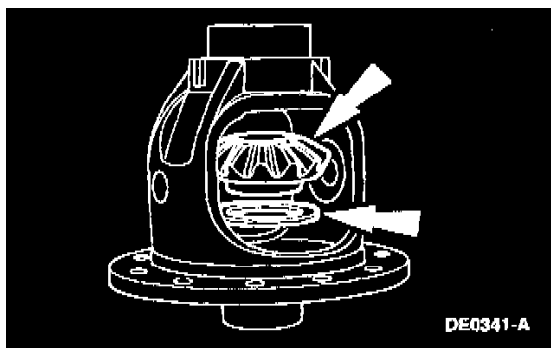
5. If required, remove the differential bearings with the 2-Jaw Puller for Differential Case Bearings and the Step Plate Adapter.



6. Remove the differential pinion shaft lock bolt and the differential pinion shaft.

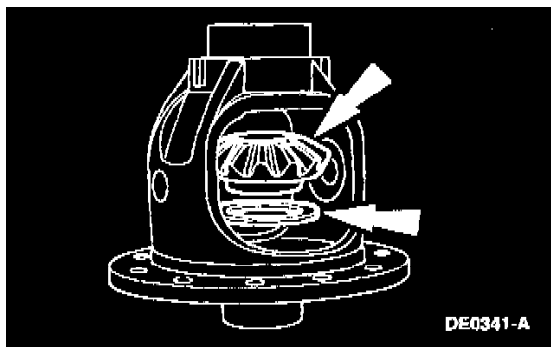


7. Rotate and remove the differential pinion gears and differential pinion thrust washers.

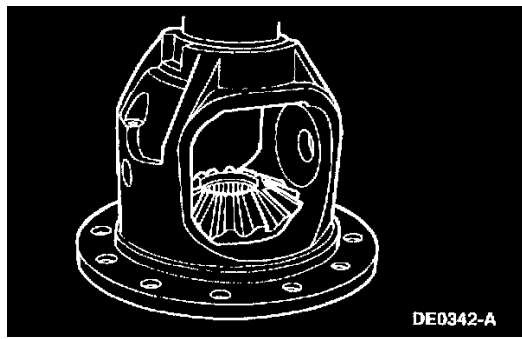


8. Remove the differential side gears and the differential side gear thrust washers.

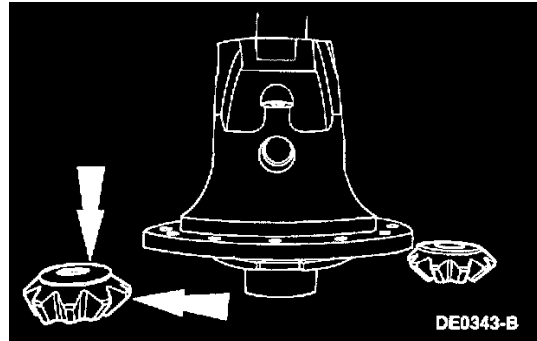
ASSEMBLY



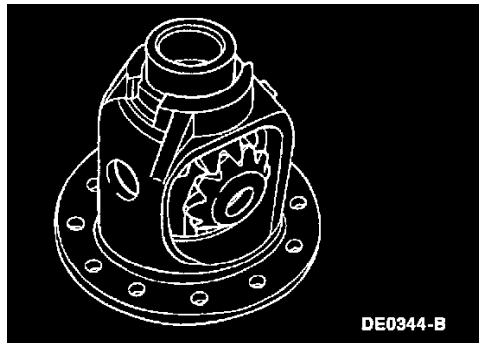
1. Position the differential side gear thrust washers on the differential side gears.
 - Use Motorcraft Synthetic Axle Lubricant FITZ-19580-B or equivalent meeting Ford specification WSL-M2C192-A to lubricate the differential side gear thrust washers and the differential side gear journals.



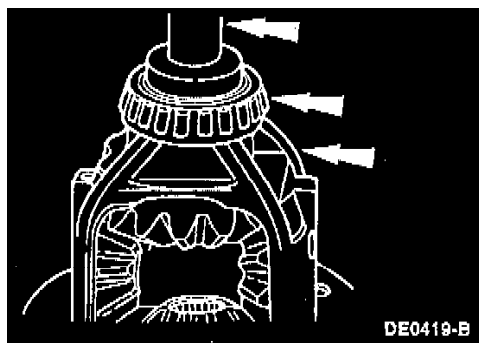
2. Position the differential side gears.



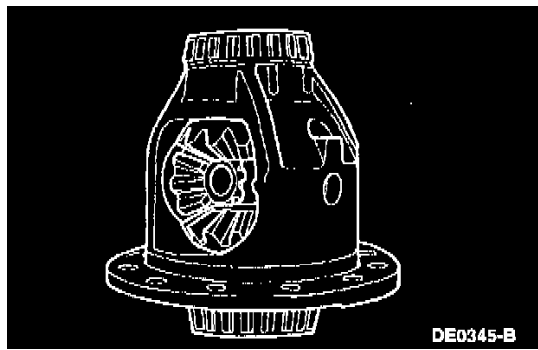
3. Assemble the differential pinion thrust washers and the differential pinion gears.
 - Lubricate with Motorcraft Synthetic Axle Lubricant FITZ-19580-B or equivalent meeting Ford specification WSL-M2C192-A.



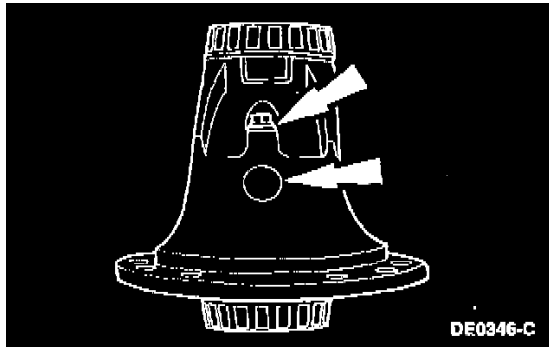
4. Engage the differential pinion gears opposite the differential side gears.



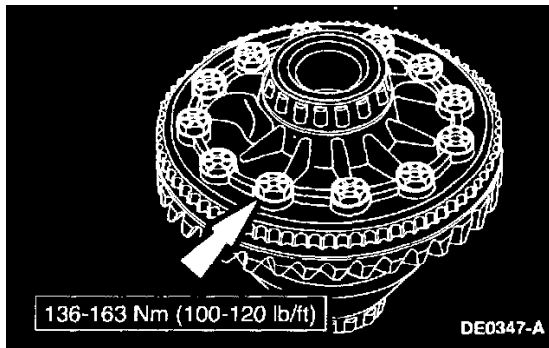
5. Install the differential bearings, using the Differential Bearing Cone Replacer.



6. Rotate the differential pinion gears to align the differential pinion shaft bore.



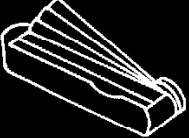



7. Insert the differential pinion shaft, and install a new differential pinion shaft lock bolt finger-tight.
8. Press the new anti-lock speed sensor ring and the ring gear on the differential case.
 - The notch on the differential case flange and the notch on the anti-lock speed sensor ring must be aligned.




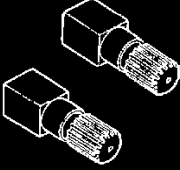


9. Install the ring gear bolts and tighten.
 - Apply Stud and Bearing Mount EOAZ-19554-BA or equivalent meeting Ford specification WSK-M2G349-A1 to the ring gear bolts.
10. Install the differential case.

Traction-Lok - Differential Case and Rear Gear

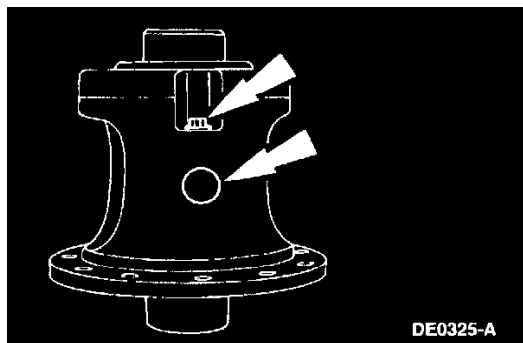
 <p>ST2026-A</p>	<p>2-Jaw Puller for Differential Case Bearings D97L-4221-A or Equivalent</p>
 <p>ST1737-A</p>	<p>Differential Bearing Cone Replacer D81T-4221-P or Equivalent</p>
 <p>ST1271-A</p>	<p>Feeler Gauge D81L-4201-A or Equivalent</p>
 <p>ST1858-A</p>	<p>Limited Slip Differential Rotating Tool T97T-4205-C</p>

Special Tools

 <p>ST1543-A</p>	<p>Step Plate 205-D019 (D80L-630-8) or Equivalent</p>
 <p>ST1374-A</p>	<p>Traction-Lok Clutch Gauge (Excluding Mandrel) 205-135 (T80P-4946-A)</p>
 <p>ST1372-A</p>	<p>Traction-Lok Clutch Gauge (Mandrel for 205-135 [T80P-4946-A]) 205-389 (T97T-4946-A)</p>
 <p>ST1857-A</p>	<p>Traction-Lok Torque Tool Set 205-384 (T97T-4205-A)</p>

Special Tools

1. Remove the differential case.

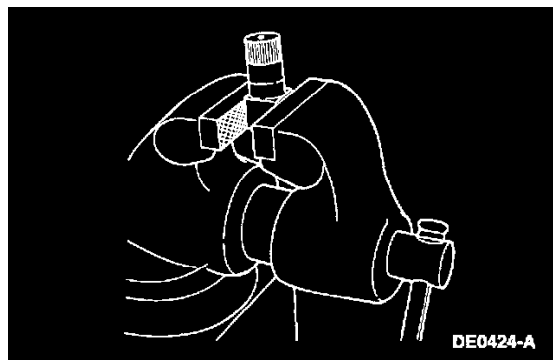


2. **NOTE:** The differential bearings need not be removed to overhaul the Ford limited slip differential. If bearing removal is required, use the 2-Jaw Puller for Differential Case Bearings and the Step Plate Adapter.

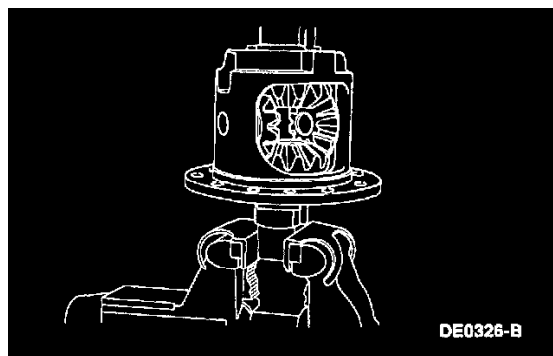
NOTE: The anti-lock speed sensor ring cannot be reused once removed.

Remove the differential pinion shaft lock bolt and remove the differential pinion shaft.

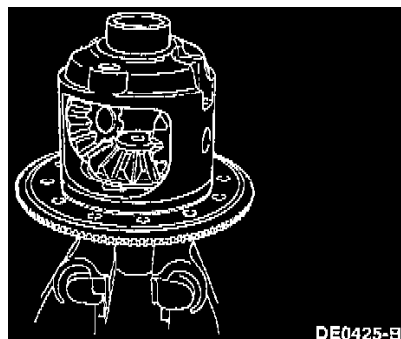
- If required, remove the ring gear and anti-lock speed sensor ring.



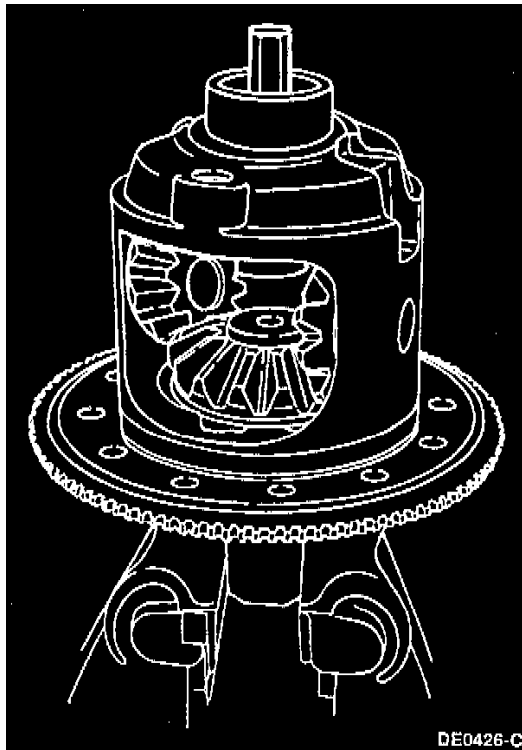
3. Install the Traction-Lok(R) Torque Tool in a suitable vise.



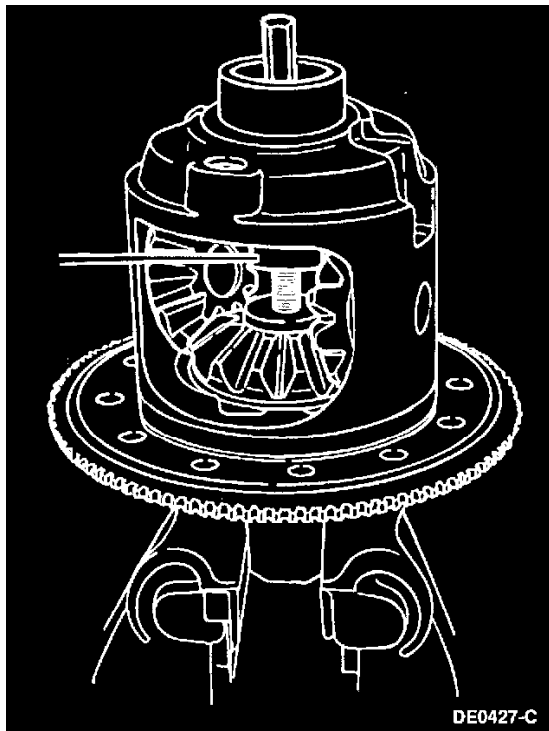
4. Install the differential case on the tool.



5. Install the Step Plate Adapter in the bottom side gear bore. Apply a small amount of grease to the centering hole of the Step Plate Adapter.

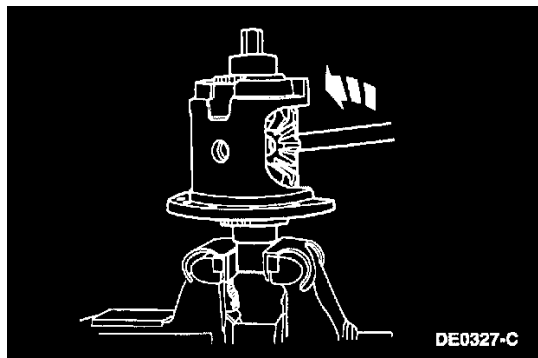


6. Install the nut in the upper differential side gear. Hold the nut in position while installing the hex screw. Tighten the hex-head screw until contact is made with the Step Plate Adapter.



7. **NOTE:** The dowel bar is used to keep the nut from turning when the forcing screw is tightened.

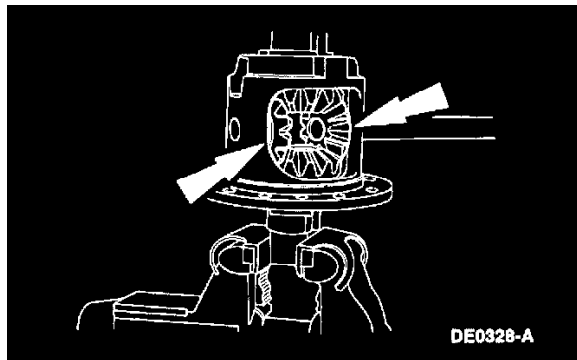
Insert a suitable dowel bar in the hole of the nut. Tighten the forcing screw to force the differential side gear away from the differential pinion gears.



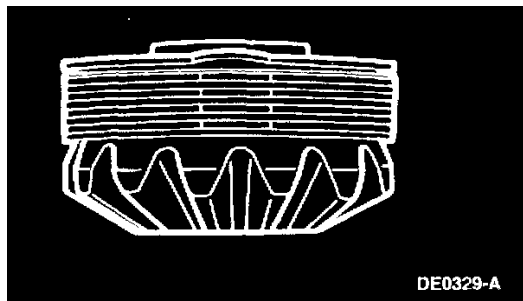
8. **WARNING: KEEP FINGERS/HANDS AWAY FROM PINION GEARS WHEN ROTATING THE DIFFERENTIAL CASE WITH THE DIFFERENTIAL ROTATING TOOL.**

NOTE: Differential pinion thrust washers cannot be removed independently of the differential pinion gears and so must be removed simultaneously with the differential pinion gears.

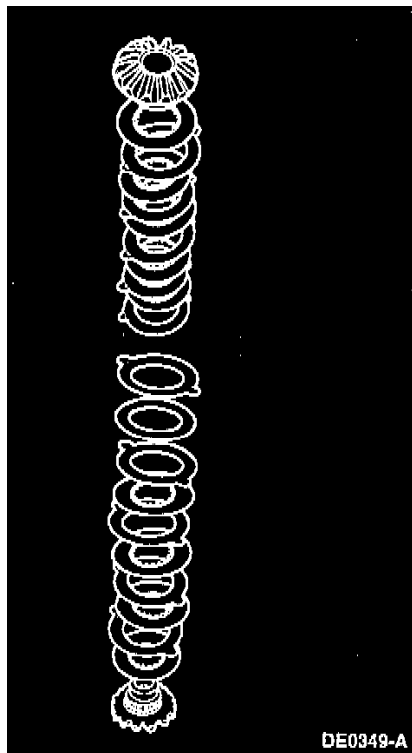
Insert the Limited Slip Differential Rotating Tool in the pinion shaft bore, and turn the differential case to "walk" the differential pinion gears and differential pinion thrust washers out to the differential case windows.



9. Remove the differential pinion gears and differential pinion thrust washers.



10. Remove the differential side gears and differential clutch packs, and tag them RIGHT and LEFT with the shim.



DE0349-A

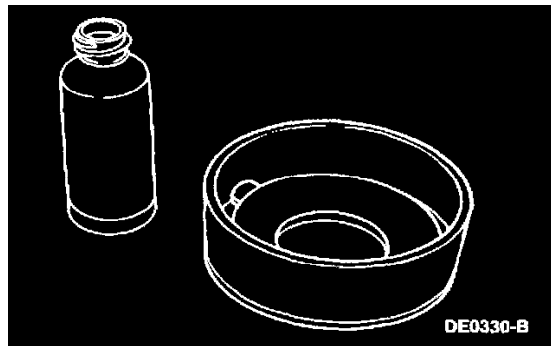
11. **CAUTION:** When separating the clutch plates and clutch discs, note the sequence in which they are disassembled. They must be reassembled in the same sequence.

CAUTION: Do not use acids or solvents when cleaning the differential clutch pack. Wipe components with a clean, lint-free cloth only.

Separate the differential clutch discs and clutch plates for cleaning and inspection.

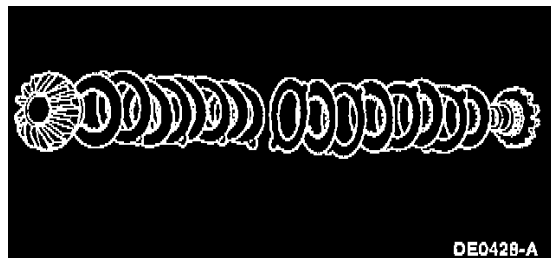
- Refer to the disassembled view of the limited slip differential case.

ASSEMBLY



DE0330-B

1. Prelubricate each steel clutch plate and soak all friction plates in Additive Friction Modifier C8AZ-19B546-A or equivalent meeting Ford specification EST-M2C118-A for at least 15 minutes.

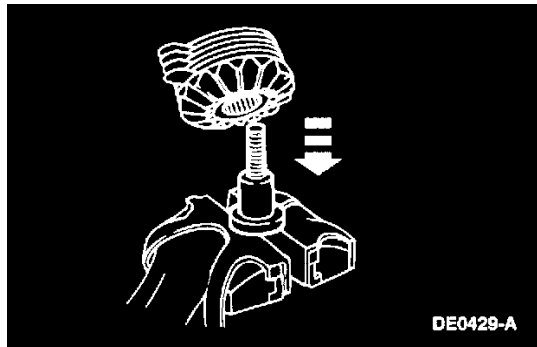


DE0428-A

2. **NOTE:** Do not mix the differential clutch packs or shims from one side with the other.

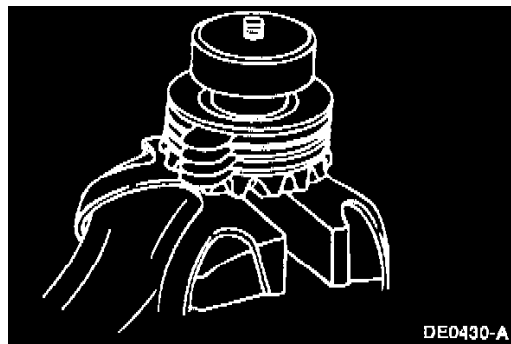
NOTE: The Belleville spring is a dished plate.

Assemble the differential clutch packs (without the shims and Belleville springs) on the respective differential side gears.

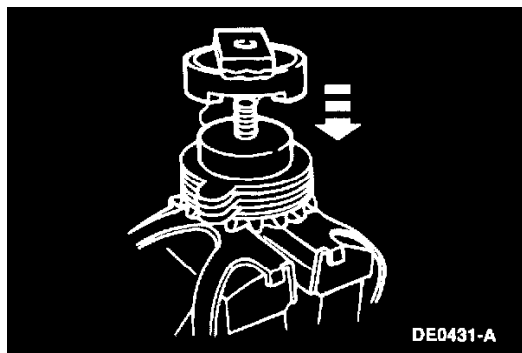


3. **NOTE:** Use the Traction-Lok(R) Clutch Gauge Mandrel for the procedure. Refer to the Special Tool(s) Chart.

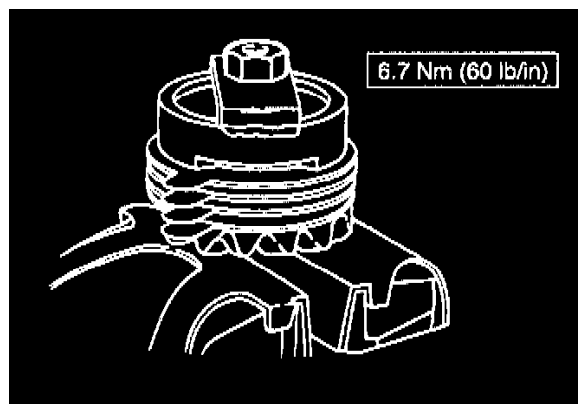
Clamp the bolt head of the Traction-Lok(R) Clutch Gauge in a vise. Install the differential clutch pack and the differential side gear (without the shim or the Belleville spring) on the gauge.



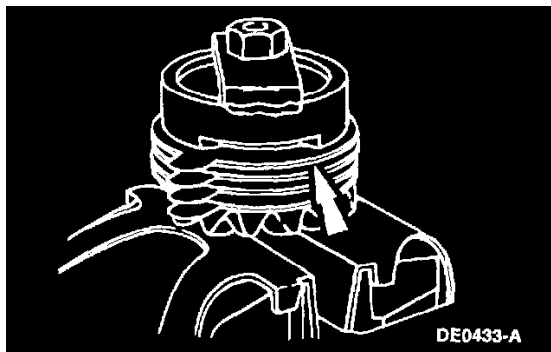
4. Position the Traction-Lok(R) Clutch Gauge on top of the differential clutch pack.



5. Install the Traction-Lok Clutch Gauge over the disc and differential clutch pack.

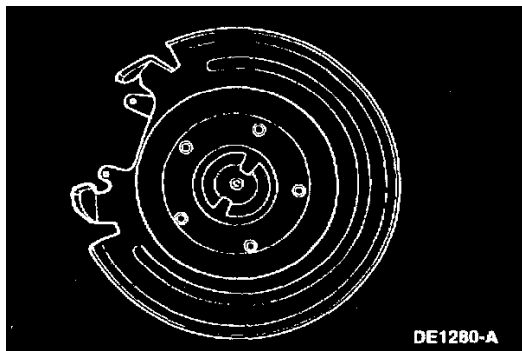


6. Install the nut of the gauge over the top and base stud.

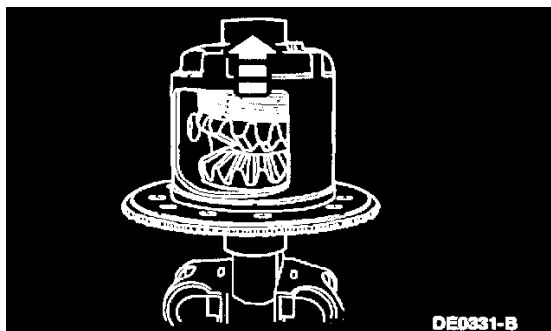


Part Number	Description
F7TW-4A324-AA	0.015 Inch
F7TW-4A324-BA	0.020 Inch
F7TW-4A324-CA	0.025 Inch
F75Z-4A324-DA	0.030 Inch
F75Z-4A324-EA	0.035 Inch
F75Z-4A324-FA	0.040 Inch
F75Z-4A324-GA	0.045 Inch
F75Z-4A324-HA	0.050 Inch
F75Z-4A324-JA	0.055 Inch
F75Z-4A324-KA	0.060 Inch

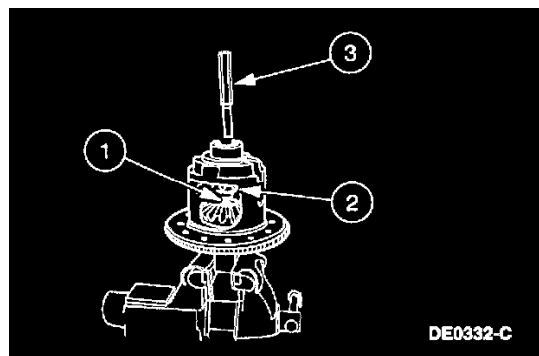
7. Use the Feeler Gauge and select the thickest blade that will enter between the tool and the differential clutch pack. The reading will be the thickness of the new clutch shim. Select the correct shim size, and remove the Traction-Lok(R) Clutch Gauge.



8. Place the shim and Belleville spring on the differential clutch pack.
- The dished or concave side of the Belleville spring must face up and against the thrust face of the differential case.
 - [] Refer to the exploded view.



9. Insert the differential clutch packs with shims and Belleville springs and differential side gears into the differential case.
- Hold the upper clutch pack and side gear assembly in place to prevent it from falling out of the differential case.

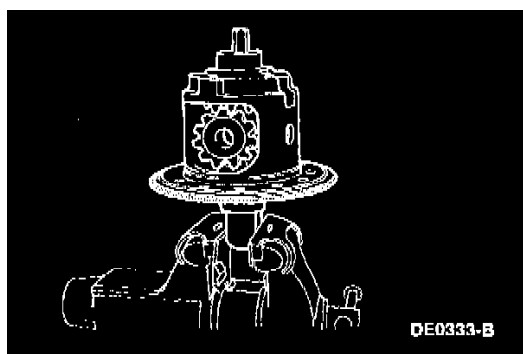


10. **NOTE:** Apply a small amount of grease to the step plate bore.

NOTE: If necessary, insert the dowel bar in the nut bore to keep the nut from turning as the hex screw is tightened.

Assemble the forcing screw, nut and step plate to the differential case.

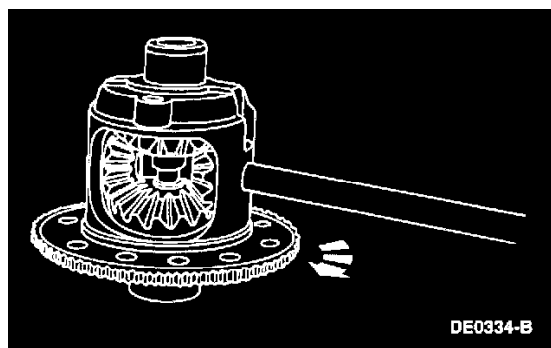
- 1 Position the Step Plate Adapter in the bottom side gear bore.
- 2 Position the nut in the top side gear bore and hold it in place.
- 3 Install the hex-head screw and tighten it two turns after it contacts the bottom step plate.



11. **NOTE:** Prelubricate both sides of the differential pinion thrust washers with Motorcraft Synthetic Axle Lubricant FITZ-19580-B or equivalent meeting Ford specification WSL-M2C192-A.

NOTE: Make sure the differential pinion gears are 180° apart so they will align correctly with the pinion shaft bore.

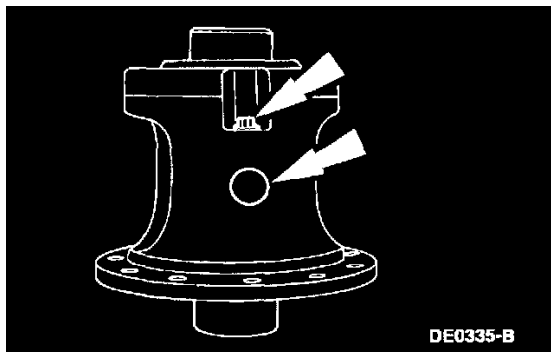
Position the differential pinion gears and differential pinion thrust washers in the window of the differential case so they mesh with the differential side gear teeth.



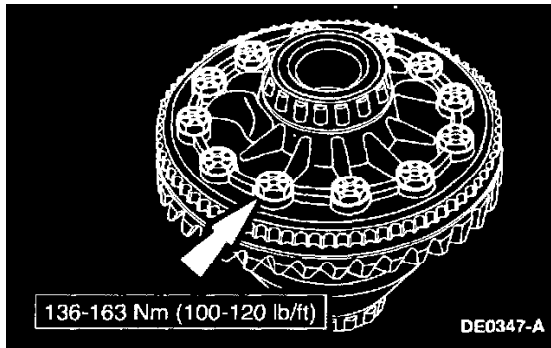
12. **WARNING: KEEP FINGERS/HANDS AWAY FROM PINION GEARS WHEN ROTATING THE DIFFERENTIAL CASE WITH THE DIFFERENTIAL ROTATING TOOL.**

NOTE: It will probably be necessary to loosen or tighten the forcing screw to allow the differential pinion gears and differential side gears to rotate.

Insert the rotating handle into the pinion shaft bore, and turn the differential case. This will cause the differential pinion gears to engage the differential side gears and "walk" into the differential case. Rotate the differential case until the pinion mating shaft holes are lined up exactly with the holes in the differential pinion gears.



13. Loosen the forcing screw, and remove the step plate and nut from the side gear bores. Install the differential pinion shaft in the differential case.
 - Install a new differential pinion shaft lock bolt finger-tight.
14. Replace the differential bearings, if removed, using the Differential Bearing Cone Replacer.



15. Using a press, install the ring gear and, if removed, a new anti-lock speed sensor ring on the differential case and tighten the retaining bolts.
 - The notch on the differential case flange and the notch on the anti-lock speed sensor ring must be aligned.
16. Install the differential case.