

2. To store parts, apply a special material that prevents corrosion and rust to all surfaces. Wrap them in a special paper that prevents corrosion and rust.

### Inspection After Disassembly of Axle

1. Inspect all parts carefully and completely for wear and damage. Install new parts as necessary.

### Gears

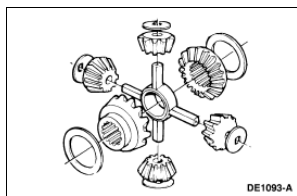
2. **⚠ CAUTION: The hypoid drive pinion and ring gear are only available in matched sets. When a drive pinion or ring gear is worn/damaged, discard both the ring gear and the drive pinion and install a new matched gearset.**

Inspect the hypoid drive pinion and ring gear for wear and damage. Install a new gearset as necessary.

3. **⚠ CAUTION: Always install thrust washers, differential side gears and pinion gears in sets.**

Inspect the differential assembly for wear and damage. Install new components as necessary.

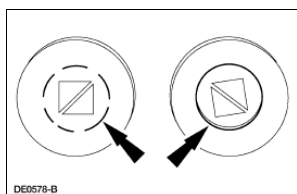
- Inside surfaces of both case halves.
- Both surfaces of all thrust washers.
- The four trunnion ends of the spider (cross).
- Teeth and splines of both differential side gears.
- Check the fit (free rotation) of the differential side gears in their counterbores.
- Teeth and bore of all differential pinions.



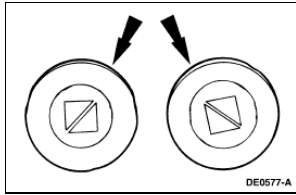
4. Inspect axle shafts for wear and cracks at the flange, shaft and splines. Install new axle shafts as necessary.

### Bearing Cups and Cone and Roller Assemblies

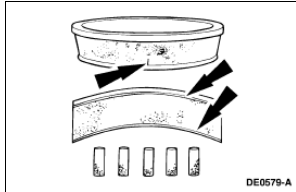
1. From the large diameter end, inspect the center of the roller for wear level to or below the outer surface.



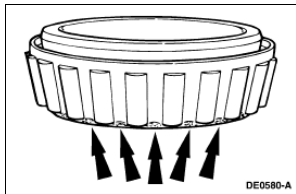
2. From the large diameter end, check if the radius has worn to a sharp edge.



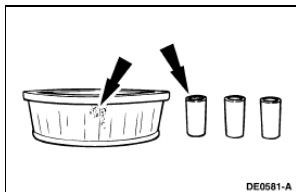
3. Look for a visible roller groove in the cup or cone inner race surfaces. The groove is visible at the small or large diameter end of both parts.



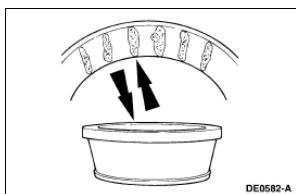
4. Check for deep cracks and breaks in the cup, cone inner race and roller surfaces.
5. Check for the presence of bright wear marks on the roller cage outer surface.



6. Inspect for etching and pitting on the rollers, the cup surfaces and the cone inner race where the rollers touch.



7. Check for spalling and flaking on the cup and cone inner race where the rollers touch.



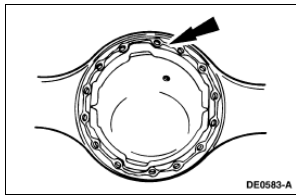
### Differential (Axle) Housing

1. **⚠ WARNING: Do not repair rear axle housings by bending or straightening them. Repair by bending or straightening the axle housing will cause poor, unsafe operation of the axle, as well as premature failure.**

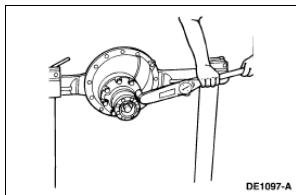
Discard all worn and damaged axle assembly components.

- Discard fasteners that have heads with worn corners.

- Discard damaged washers.
  - Discard gaskets, oil seals and grease seals removed during axle and carrier repair.
2. Remove nicks, mars and burrs from machined and ground surfaces. Use a fine file, india stone, emery cloth or crocus cloth for this purpose.
  3. **⚠ CAUTION: All fasteners and threaded holes must be clean and free of damage to assure accurate tightening specifications and adjustments.**  
  
Clean and repair threads of fasteners and holes. Use a die or tap of the correct size or a fine file for this purpose.
  4. Clean, and apply new silicone gasket material where necessary during axle and carrier assembly.



5. Tighten all fasteners to specification. For additional information, refer to Specifications in Section 205-02A or Section 205-02B and Section 205-02C .



### Carrier Housing

1. Make sure the bearing mounting hubs are smooth.
2. Carefully examine the shoulders for damage from bearing removal. The bearings will fail if they do not seat firmly against the shoulders.



### Wheel Bearing and Seal

1. For additional information, refer to Section 205-02C .
-



## Adjustments

### Special Tool(s)

 ST1897-A	Dial Indicator with Bracketry 100-002 (TOOL-4201-C) or Equivalent
 ST1489-A	Spring Scale 211-034 (T74P-3504-Y)

### End Play

1. For additional information, refer to Section 205-02C .

### U-Joint Phasing

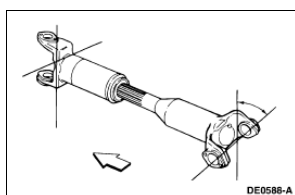
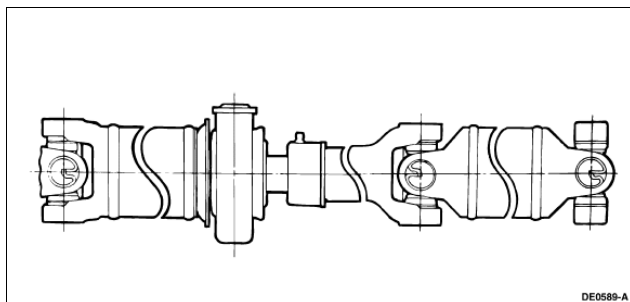
1. **⚠ CAUTION: Do not revise U-joint phasing unless approved by Ford engineering.**

**⚠ CAUTION: Index-mark the splined main driveline components prior to disassembly to maintain initial driveline balance.**

**NOTE:** U-joint yokes are in phase when assembled to their shafts in the same plane.

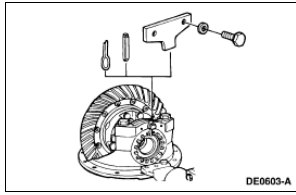
**NOTE:** The yoke end of the slip-yoke assembly is part of the coupling shaft on assemblies equipped with a slip-spline on the last coupling shaft.

The U-joints between the rear axle and transmission must be in phase. Check and, as necessary, correct U-joint phasing.



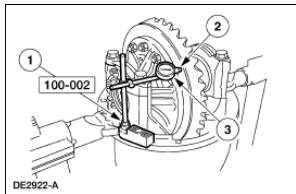
### Preload Adjustment on Differential Side Bearings    Dial Indicator Method

1. Remove the adjusting ring retainers.



2. Install the special tool.

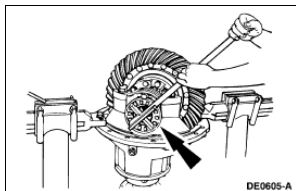
1. Attach the special tool to the carrier mounting flange.
2. Position the plunger against the back surface of the ring gear.
3. Adjust the indicator dial to zero (0).



3. **⚠ CAUTION:** Use a tool that engages two or more opposite notches in the ring, such as a "T" bar wrench. Lug damage will occur if the tool does not fit correctly into the notches.

**⚠ CAUTION:** Always align the adjusting ring teeth so that installation of the cotter key, pin or lock plate is possible.

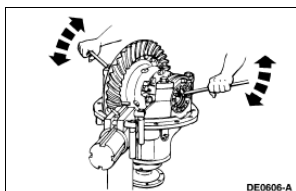
Loosen the adjusting ring opposite the ring gear slightly so that a small amount of end play will show on the dial indicator.



4. **⚠ CAUTION:** The pry bars must not touch the differential bearings.

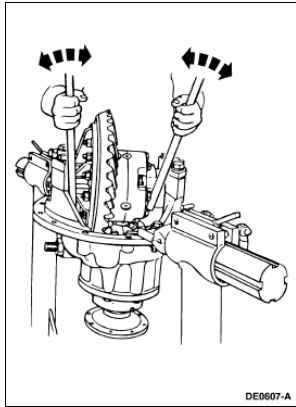
**NOTE:** Check for end play using the method shown in this step or the following step.

Insert a pry bar between each bearing adjusting ring and the end of the differential case. Move the differential and ring gear assembly left and right while reading the dial indicator.



5. **⚠ CAUTION:** The pry bars must not touch the differential bearings.

Insert a pry bar between the differential case and the carrier, and the ring gear and the carrier. Move the differential and ring gear assembly left and right while reading the dial indicator.

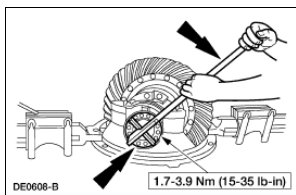


6. **⚠ CAUTION:** Always align the adjusting ring teeth so that installation of the cotter key, pin or lock plate is possible.

Tighten the bearing adjusting ring opposite the ring gear so that no end play shows on the dial indicator. Repeat Step 4 or 5.

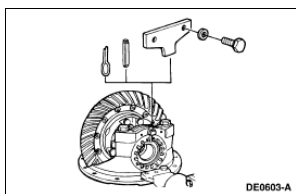
7. **⚠ CAUTION:** Always align the adjusting ring teeth so that installation of the cotter key, pin or lock plate is possible.

Tighten each bearing adjusting ring one notch from the zero end play. The differential side bearings now have a preload to the specification shown.



8. Using the following procedures, install the cotter keys, pins or lock plates that hold the bearing adjusting rings stationary.

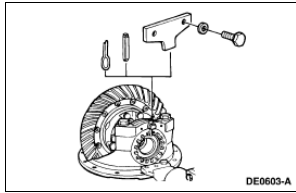
- Cotter keys Insert the cotter key between the adjusting ring lugs and through the bearing cap boss. Bend the two cotter key ends around the boss.
- Pins Insert the pin through the bearing cap boss and between the adjusting ring lugs. If necessary, use a drift and a hammer to seat the pins.
- Lock plates Position the lock plate tab between the adjusting ring lugs and tighten the capscrew.



9. Check the ring gear runout. For additional information, refer to Ring Gear Runout in this section.

### Preload Adjustment on Differential Side Bearings Micrometer Method

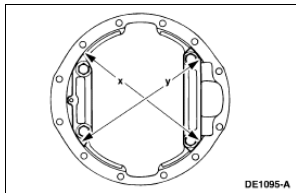
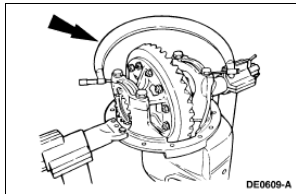
1. Remove the adjusting ring retainers.



2. **⚠ CAUTION:** Always align the adjusting ring teeth so that installation of the cotter key, pin or lock plate is possible.

Turn both adjusting rings hand-tight against the differential bearings.

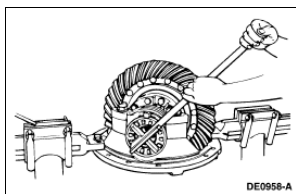
3. Using a large micrometer, measure the distances X and Y between opposite surfaces of the bearing caps. Make note of the measurements.



4. **⚠ CAUTION:** Use a tool that engages two or more opposite notches in the ring, such as a "T" bar wrench. Lug damage will occur if the tool does not fit correctly into the notches.

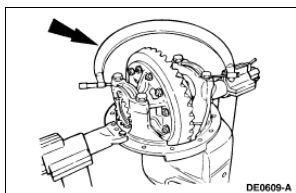
**⚠ CAUTION:** Always align the adjusting ring teeth so that installation of the cotter key, pin or lock plate is possible.

Tighten each adjusting ring one notch.

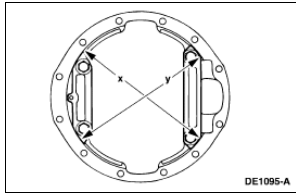


5. Measure the distances X and Y. Compare these dimensions with the dimensions measured in Step 3. The difference between the two dimensions is the amount the bearing caps expanded. Repeat Steps 4 and 5 until the dimension is within specifications. For additional information, refer to Specifications in this section.

- Example: Distances X and Y before tightening the adjusting rings = 389.00 mm (15.315 inches). Distances X and Y after tightening the adjusting rings = 389.23 mm (15.324 inches).  
 $389.23 \text{ mm (15.324 inches)} - 389.00 \text{ mm (15.315 inches)} = 0.23 \text{ mm (0.009-inch) difference.}$

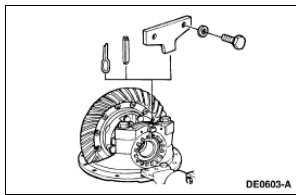






6. Using the following procedures, install the cotter keys, pins or lock plates that hold the bearing adjusting rings stationary.

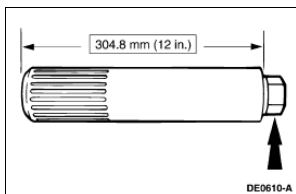
- Cotter keys Insert the cotter key between the adjusting ring lugs and through the bearing cap boss. Bend the two cotter key ends around the boss.
- Pins Insert the pin through the bearing cap boss and between the adjusting ring lugs. If necessary, use a drift and a hammer to seat the pins.
- Lock plates Position the lock plate tab between the adjusting ring lugs and tighten the capscrew.



7. Check the ring gear runout.

### Differential Gears Rotating Resistance Check

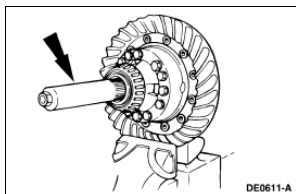
1. Fabricate a tool for checking the differential gears rotating resistance from an old axle shaft that matches the differential side gear spline size.



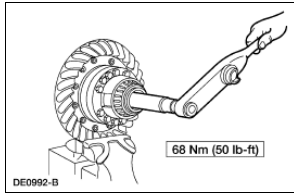
2. **⚠ CAUTION: Install soft metal covers over the vise jaws to protect the ring gear.**

Place the differential and ring gear assembly in a vise.

3. Install the tool into the differential and engage the side gear splines.



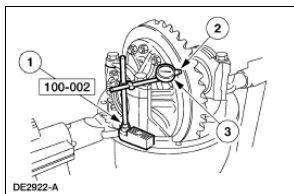
4. Attach a torque wrench to the tool nut. Rotate the differential gears and read the value on the torque wrench. If the torque value exceeds the specification, disassemble the case halves and the differential gears. For additional information, refer to [Section 205-02A](#) or [Section 205-02B](#).



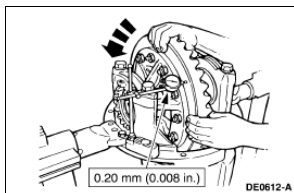
5. Check the case halves, spider, differential pinions, gears and thrust washers for the condition causing the torque value to exceed the specification. Repair as necessary. Assemble the parts and repeat Steps 3 and 4.

### Ring Gear Runout

1. Install the special tool.
  1. Attach the special tool to the carrier mounting flange.
  2. Position the plunger against the back surface of the ring gear.
  3. Adjust the dial indicator to zero (0).



2. Rotate the differential and ring gear assembly and read the dial indicator. The runout must not exceed the specification shown. If the runout exceeds the specification, remove the differential and ring gear assembly from the carrier. For additional information, refer to [Section 205-02A](#) or [Section 205-02B](#).



3. Check the differential parts, including the carrier, for the condition causing the runout of the gear to exceed the specification. Repair as necessary.
4. Install the differential and ring gear assembly into the carrier. For additional information, refer to [Section 205-02A](#) or [Section 205-02B](#).
5. Repeat the preload adjustment of the differential bearings. For additional information, refer to Preload Adjustment on Differential Side Bearings in this section.
6. Repeat Steps 1 and 2 of this procedure.

### Pinion Bearings Preload Adjustment Press Method

1. **NOTE:** Use the pinion flange method to adjust preload if a press is not available or the press does not have a pressure gauge.

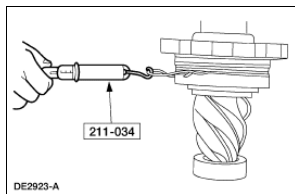
Place the drive pinion and retainer assembly in a press, gear head (teeth) toward the bottom.

2. Install a sleeve of the correct size against the inner race of the outer bearing.
3. Apply and hold the correct amount of pressure to the pinion bearings. For additional information, refer to the Pinion Bearing Preload Specifications chart. As pressure is applied, rotate the bearing retainer several times so that the bearings make normal contact.

Pinion Bearing Preload Specifications

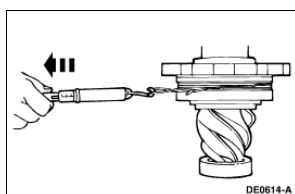
Pinion Shaft Thread Size	Necessary Press Pressure to Apply to the Bearings for Correct Preload,(kg/Metric Tons)(Pounds/Tons)
7/8 In.-20	9979/10 (22,000/11)
1 In.-20	13608/13.6 (30,000/15)
1-1/4 In.-12	24494/24.5 (54,000/27)
1-1/4 In.-18	24494/24.5 (54,000/27)
1-1/2 In.-12	24494/24.5 (54,000/27)
1-1/2 In.-18	24494/24.5 (54,000/27)
1-3/4 In.-12	22680/22.7 (50,000/25)
2 In.-12	22680/22.7 (50,000/25)
M32 x 1.5	24494/24.5 (54,000/27)
M39 x 1.5	24494/24.5 (54,000/27)
M45 x 1.5	22680/22.7 (50,000/25)

4. While pressure is held against the assembly, wind a cord around the bearing retainer several times.
5. Attach the special tool to the end of the cord.



6. **NOTE:** Do not read the starting torque. Read only the torque value after the retainer starts to rotate. The starting torque will give a false reading.

Pull the cord with the scale on a horizontal line. As the bearing retainer rotates, read the value on the scale. Make a note of the reading.



7. Measure the diameter of the bearing retainer where the cord was wound. Measure in inches or centimeters.