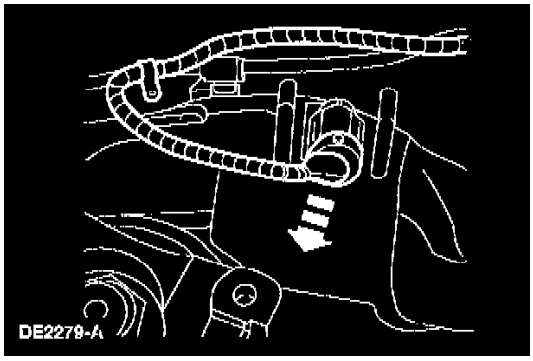
Differential Assembly: Service and Repair
Rear Drive Axle/Differential-Ford 10.50 Inch Ring Gear

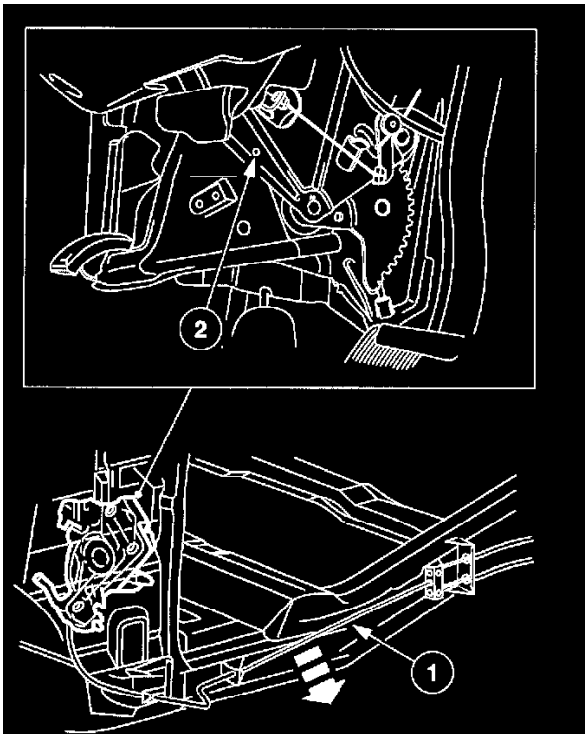
Removal and Installation
Axle Assembly

Removal

1. Raise the vehicle on a hoist.
2. Remove the wheels and tires.
3. Remove the driveshaft.

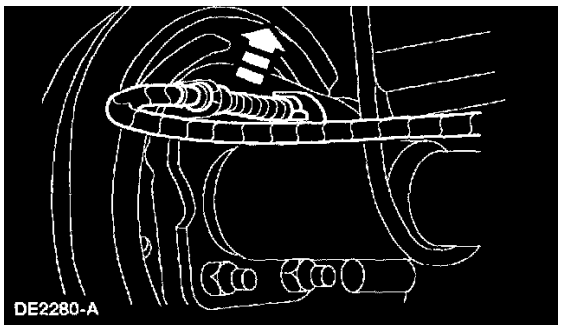


4. Disconnect the rear anti-lock brake sensor.

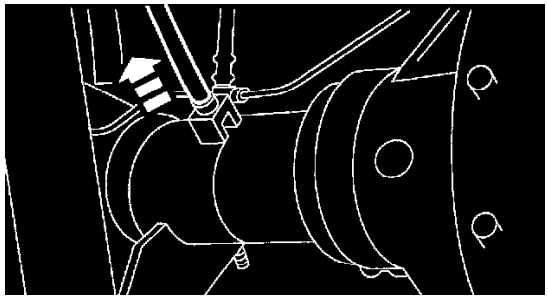


5. **NOTE:** Make sure the parking brake control is fully released.

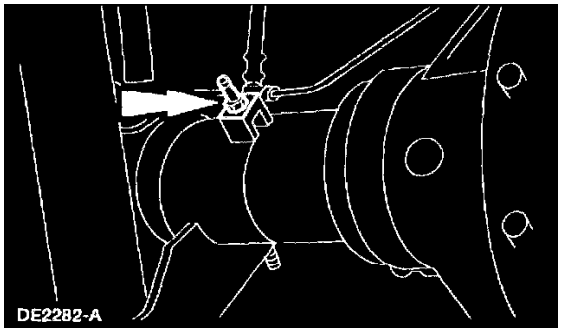
   Release the tension on the parking brake system.
   1 Have an assistant pull the front parking brake cable and conduit to its full range.
   2 Insert a suitable retainer.



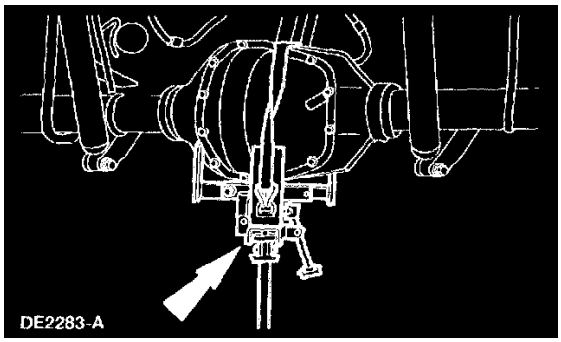
6. Disconnect the parking brake cable at the parking brake lever.



7. Remove the vent hose at the brake hose junction block.

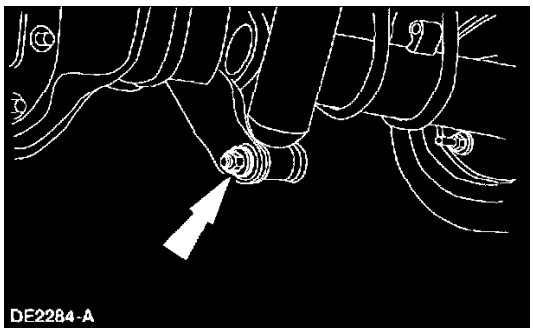


8. Remove the brake hose junction block from the rear axle housing and let it hang.
9. Remove the brake lines from the rear axle housing but not from the disc bake calipers and let the tubing hang.
10. Remove the disc brake calipers from the rear disc brake rotors and wire them aside.

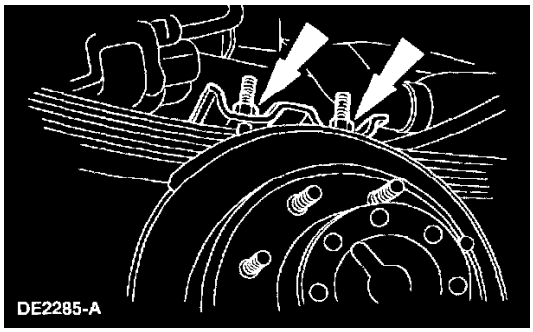


11. **WARNING: Strap the axle securely to the jack.**

    Use a suitable transmission jack to support the axle.



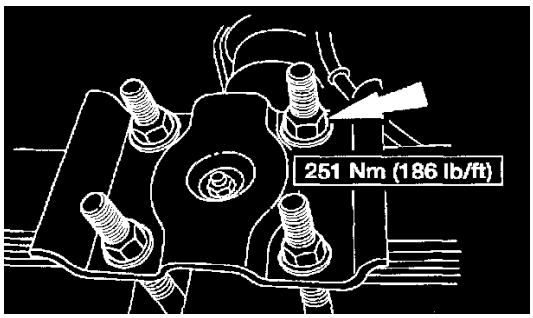
12. Remove the lower shock absorber nuts and bolts.

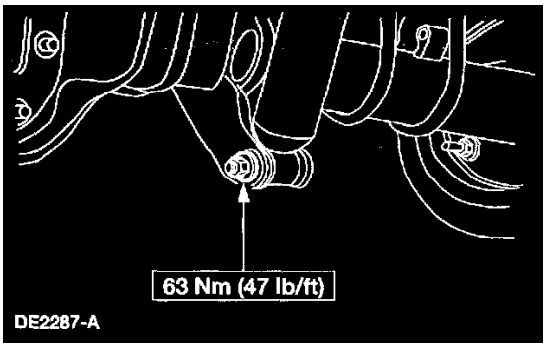


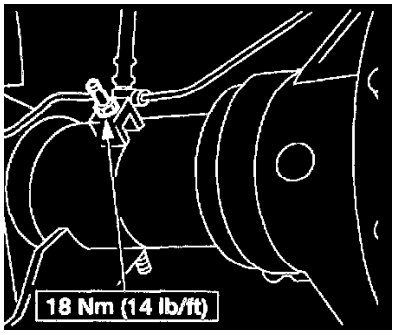
13. **NOTE:** Once the rear spring plate nuts and bolts are removed, they must be replaced.

    Remove the rear spring plate U-bolts and nuts.
14. Lower the axle from the vehicle.

Installation



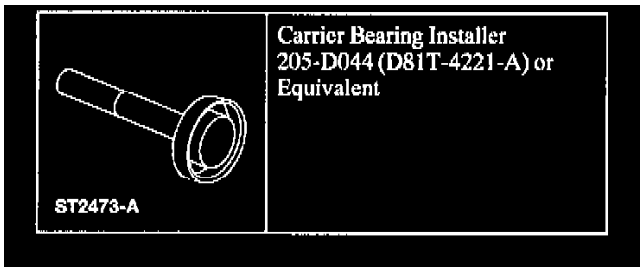




1. Follow the removal procedure in reverse order.
   - Install the brake calipers.

Differential Case and Ring Gear-One Piece, Conventional

Differential Case and Ring Gear-One Piece, Conventional

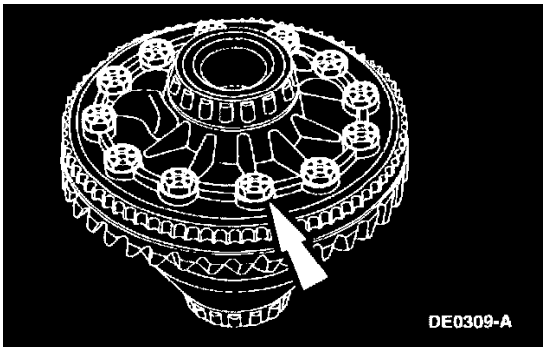


Special Tools

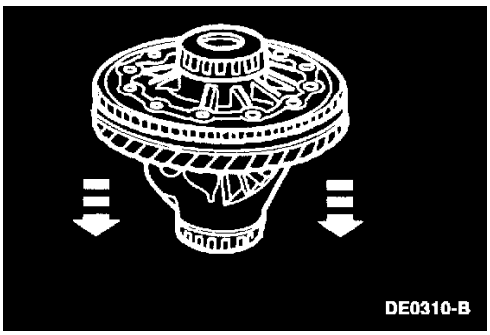
Special Tool(s)

Disassembly

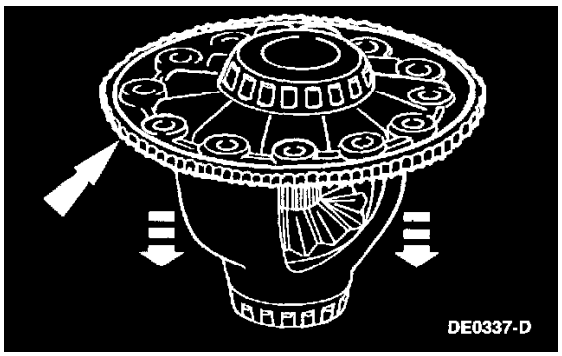
1. Remove the differential case.



2. Remove the ring gear bolts.

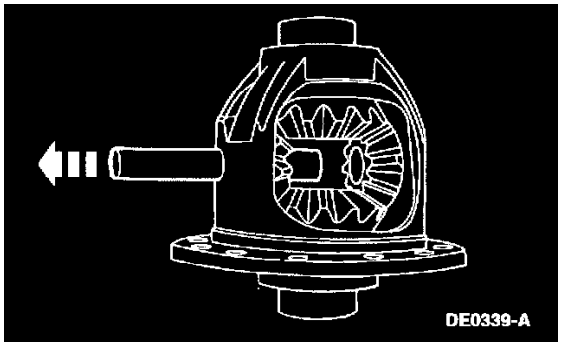


3. Insert a punch in the bolt holes and drive the ring gear off.

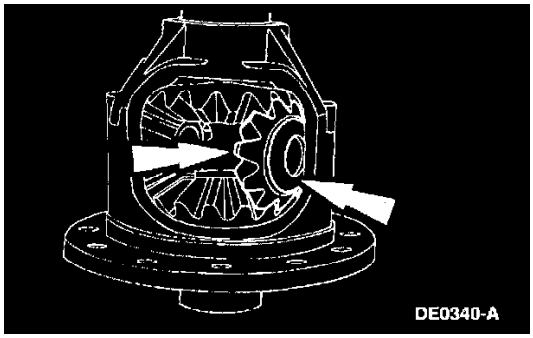


4. **NOTE:** The anti-lock speed sensor ring cannot be reused once removed.

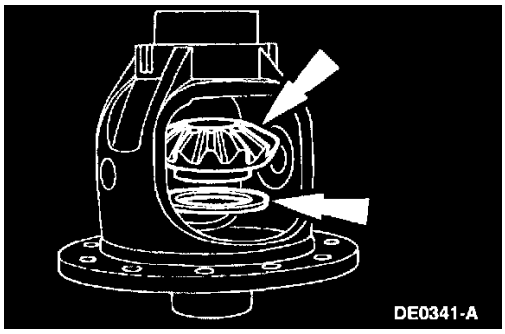
   Remove the anti-lock speed sensor ring.
5. If required, remove the differential bearings.



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

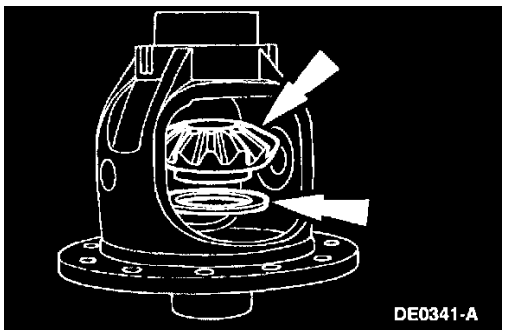


7. Rotate and remove the differential pinion gears and differential pinion thrust washers.

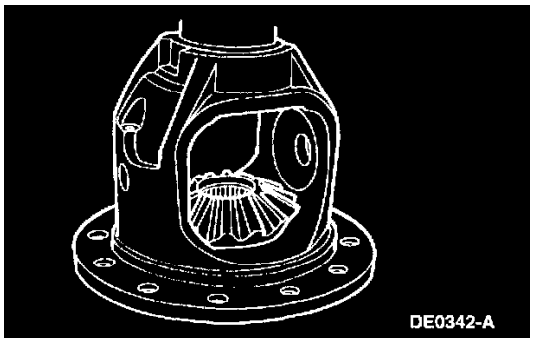


8. Remove the differential side gears and the differential side gear thrust washers.

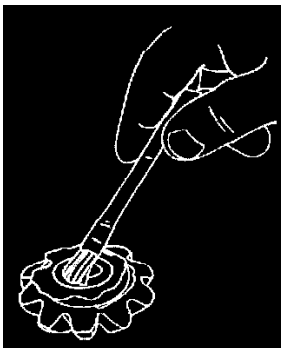
Assembly



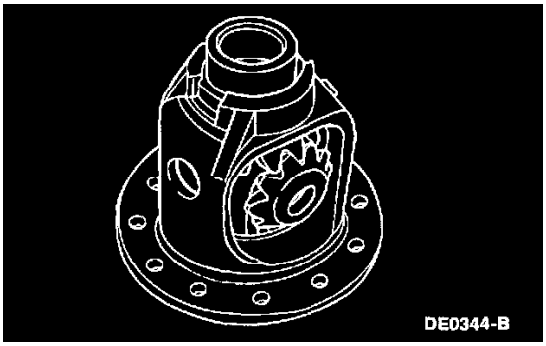
1. Position the differential side gear thrust washers on the differential side gears.
   - Use Premium Long-Life Grease XG-1-C or equivalent meeting Ford specification ESA-M1C75-B to lubricate the differential side gear thrust washers and the differential side gear journals.



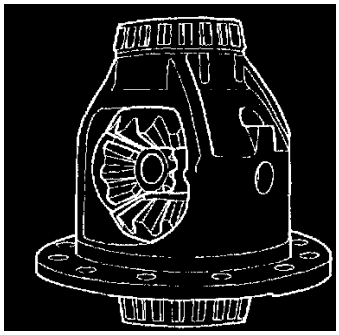
2. Position the differential side gears.



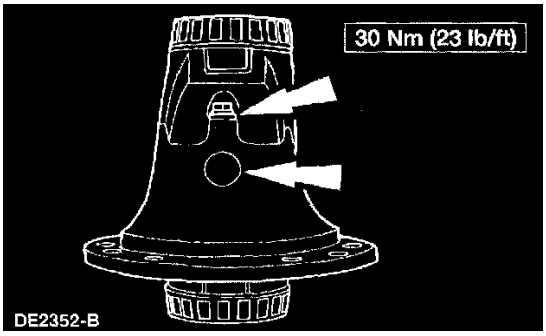
3. Assemble the differential pinion thrust washers and the differential pinion gears.
   - Lubricate with Premium Long-Life Grease XG-1-C or equivalent meeting Ford specification ESA-M1C75-B.



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

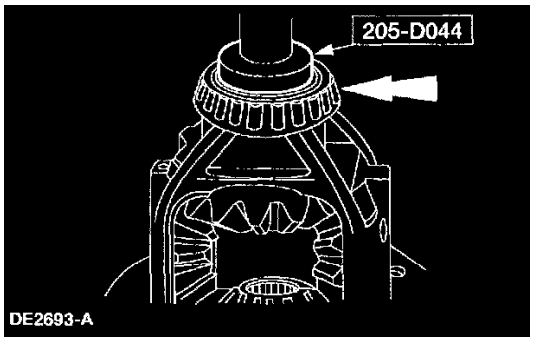


5. Rotate the differential pinion gears to align the differential pinion shaft bore.

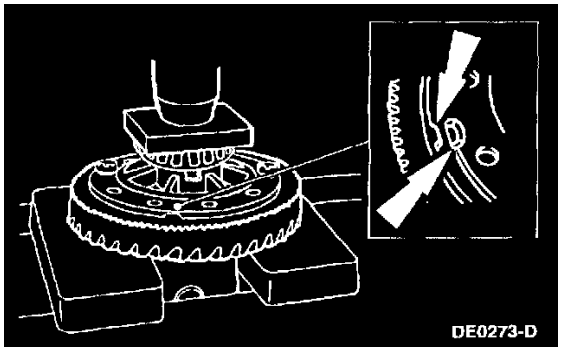


6. **CAUTION:** If a new pinion shaft lock bolt is not available, use Stud and Bearing Mount EOAZ-19554-BA or equivalent meeting Ford specification WSK-M2G349-A1 and tighten to specification.

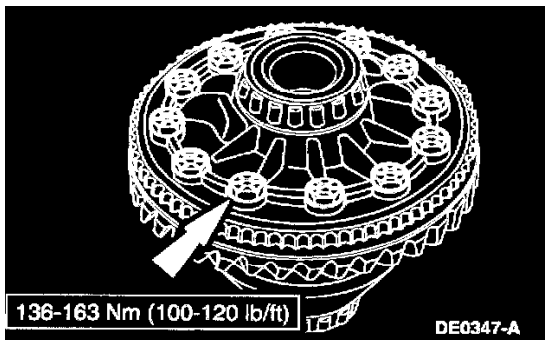
   Insert the differential pinion shaft, and install a new differential pinion shaft lock bolt.



7. Using the special tool, install the differential bearings.



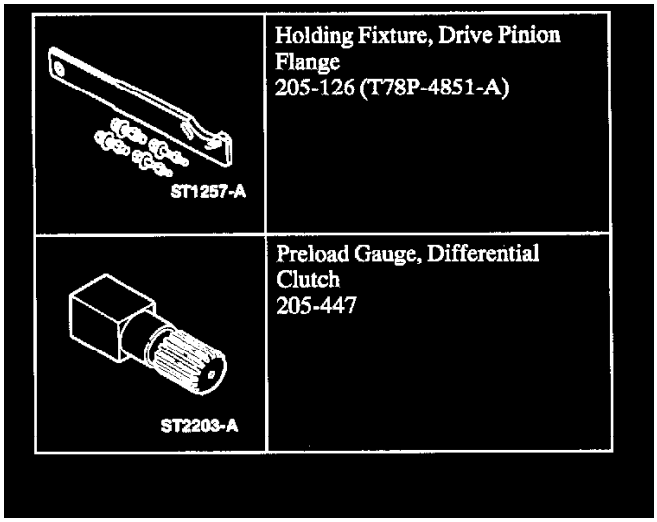
8. Press the new anti-lock speed sensor ring and the ring gear on the differential case.



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.

Differential Case and Ring Gear-Two-Piece, Conventional

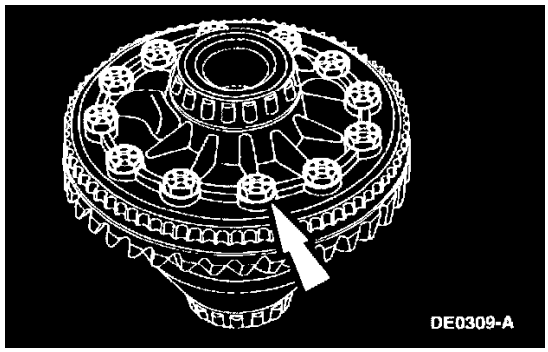
Differential Case and Ring Gear-Two-Piece, Conventional



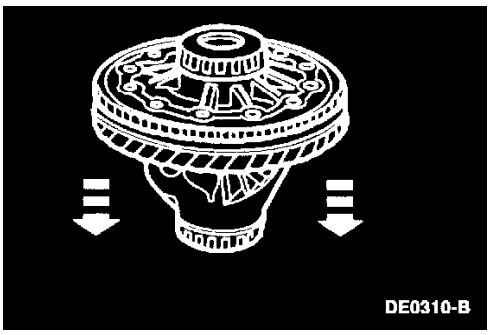
Special Tool(s)

Disassembly

1. Remove the differential case.



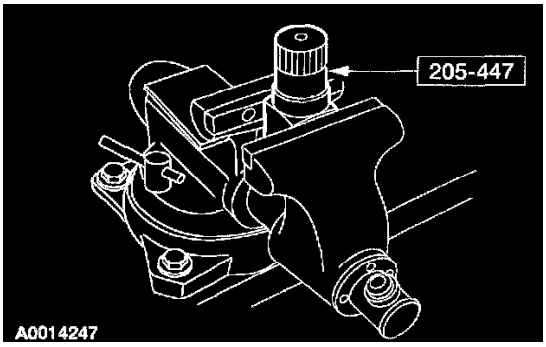
2. Remove the ring gear bolts.



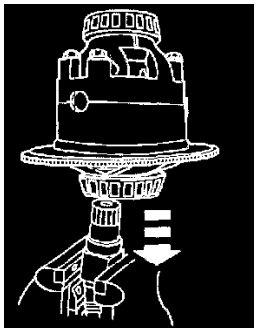
3. Insert a punch in the bolt holes and drive off the ring gear.
4. **CAUTION:** The anti-lock speed sensor ring cannot be reused once removed.

   NOTE: Remove the anti-lock speed sensor ring only if required.

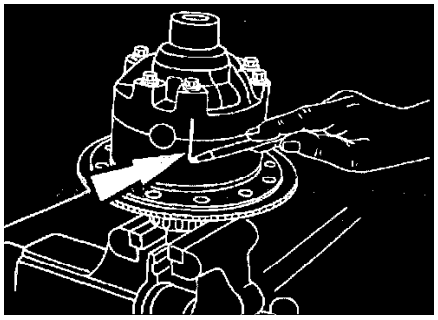
   Remove the anti-lock speed sensor ring.



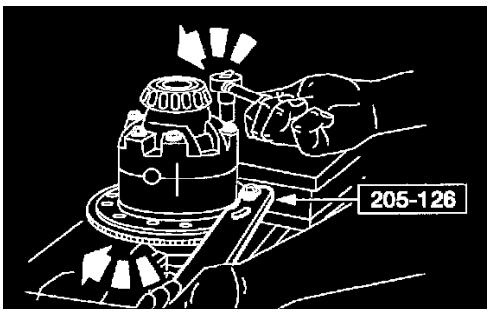
5. Position the special tool in a vise.



6. Position the differential case on the special tool.

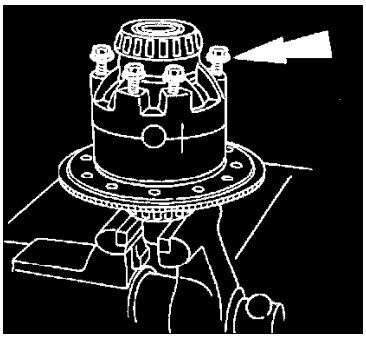


7. Index mark the differential case halves.

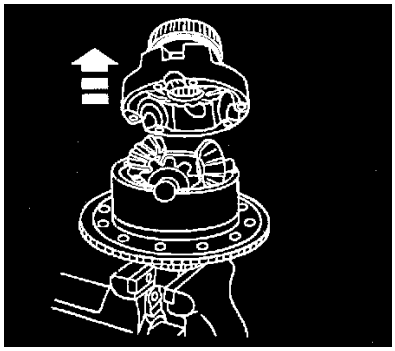


8. **NOTE:** Attach the special tool with a bolt and nut.

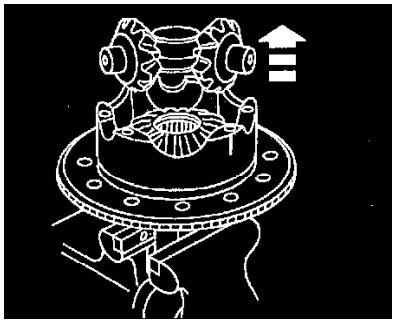
   Install the special tool on the differential case as shown and loosen the differential case bolts.



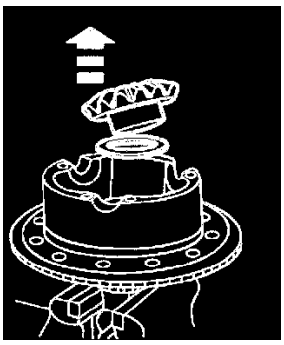
9. Remove the differential case bolts.



10. Remove the right differential case half and differential side gear.

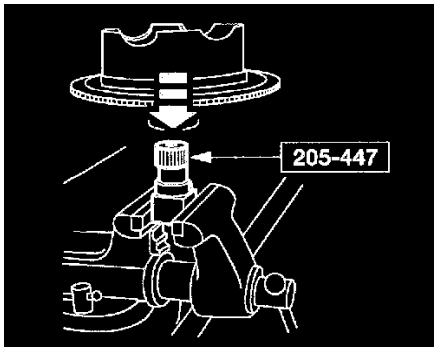


11. Remove the differential pinion shaft and differential pinion gears.

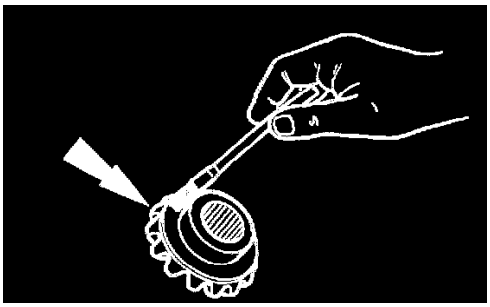


12. Remove the left differential side gear and the differential side gear thrust washers.

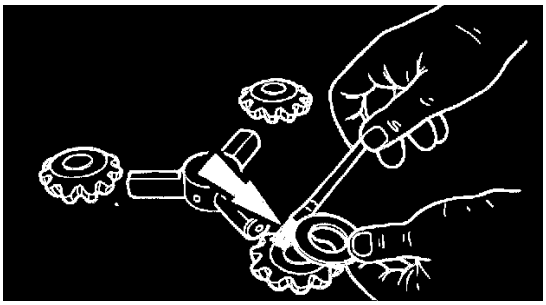
Assembly



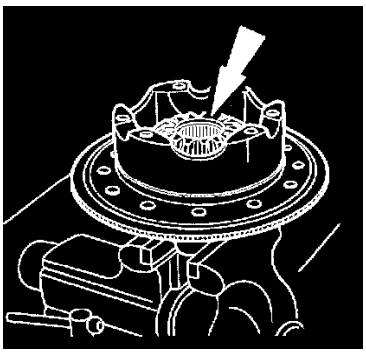
1. Position left differential case half (ring gear side) on the special tool.



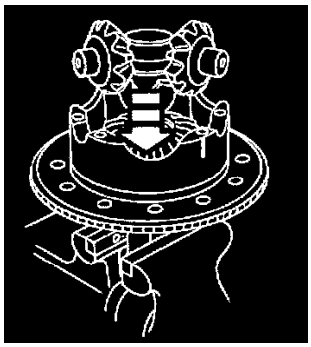
2. Lubricate the differential side gears and the differential side gear thrust washers with Premium Long-Life Grease XG-1-C or equivalent meeting Ford specification ESA-M1C75-B.



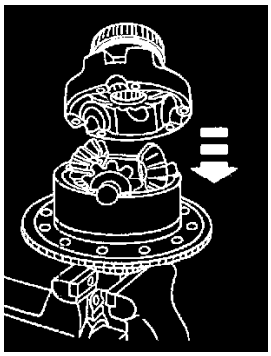
3. Lubricate the differential pinion gears, pinion gear thrust washers and the differential pinion shaft with Premium Long-Life Grease XG-1-C or equivalent meeting Ford specification ESA-M1C75-B.



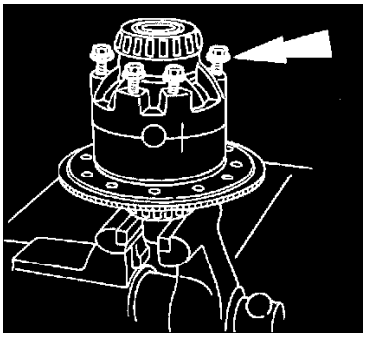
4. Install the left differential side gear.



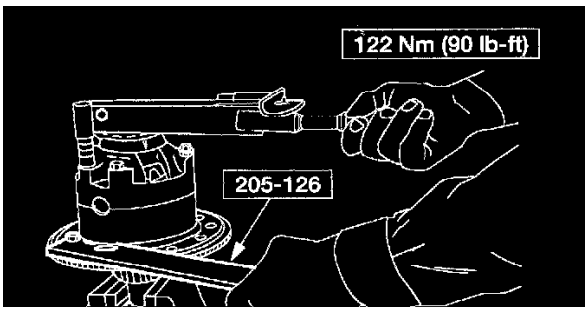
5. Install the differential pinion shaft and the differential pinion gears.



6. Position the right differential case half with the index marks aligned.

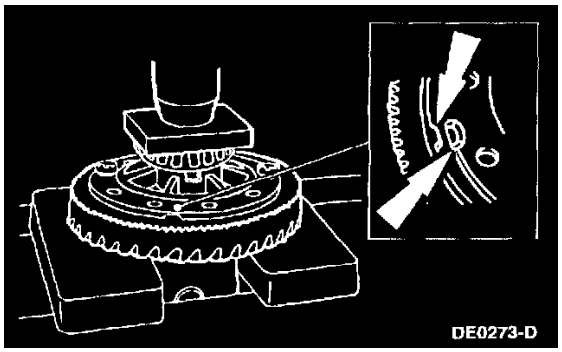


7. Position the differential case retaining bolts.

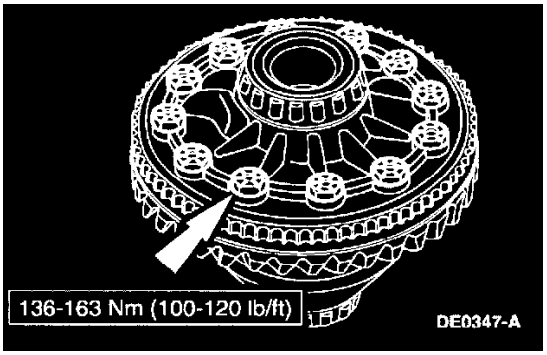


8. **NOTE:** Use the special tool as shown to keep the differential case from turning.

   Tighten the retaining bolts.



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

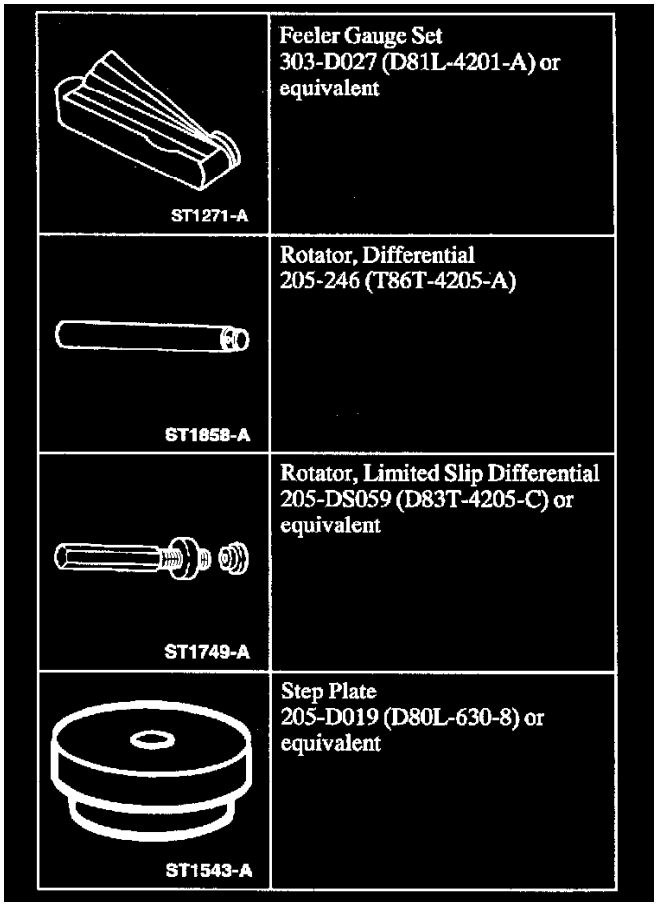


10. **NOTE:** Apply Stud and Bearing Mount EOAZ-19554-BA or equivalent meeting Ford specification WSK-M2G349-A1 to the ring gear bolts.

    Install the ring gear bolt and tighten.
11. Install the differential case.

Differential Case and Ring Gear-One-Piece, Traction-LOK

Differential Case and Ring Gear-One-Piece, Traction-Lok

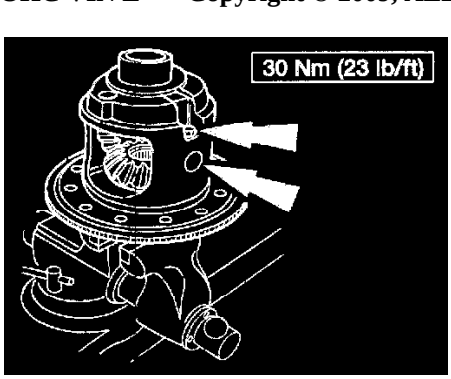


Special Tools

Special Tool(s)

Disassembly

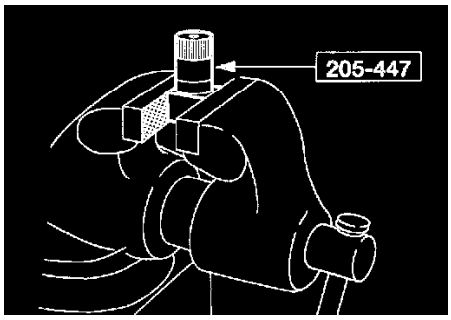
1. Remove the differential case.



2. **NOTE:** The differential bearings need not be removed to overhaul the Ford limited slip differential.

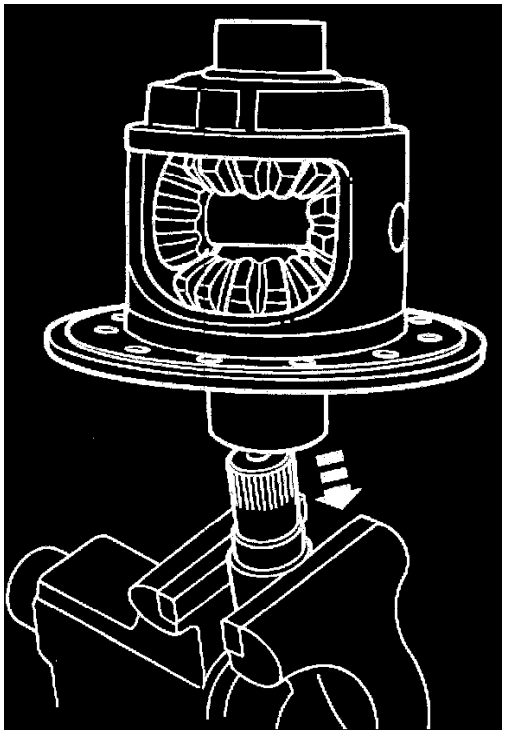
   NOTE: The anti-lock speed sensor ring cannot be reused once removed.

   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.

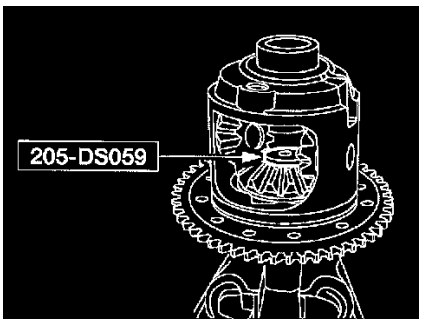


3. **NOTE:** This tool does not have the 1/2-inch drive hole.

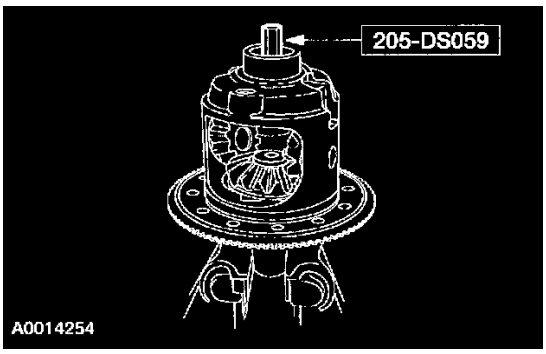
   Install the special tool in a suitable vise.



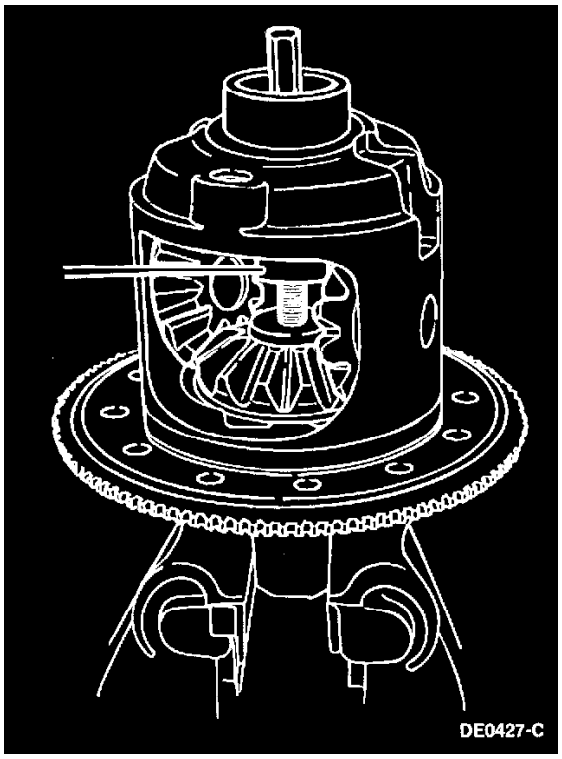
4. Install the differential case on the tool.



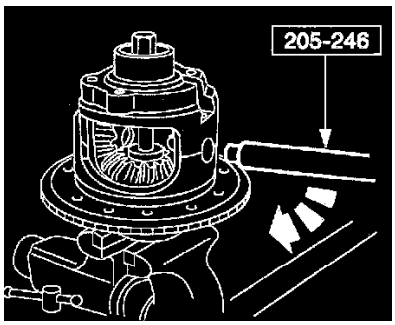
5. Install the special tool in the bottom side gear bore.
   - Apply a small amount of grease to the centering hole of the special tool.



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.



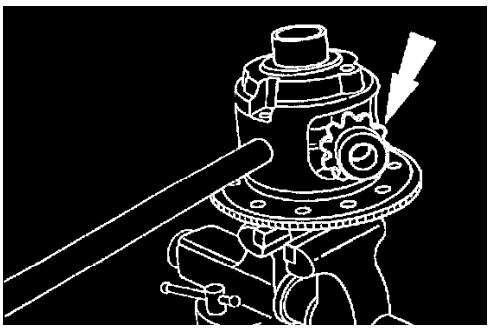
7. Insert a suitable dowel bar in the hole of the nut.
   Tighten the forcing screw to force the differential side gear away from the differential pinion gears. The dowel bar is used to keep the nut from turning when the forcing screw is tightened.



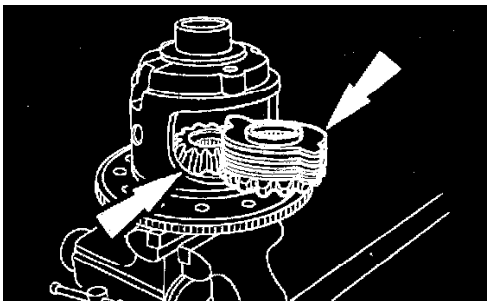
8. **WARNING: Keep fingers/hands away from pinion gears when rotating the differential case with the differential rotating tool.**

   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.

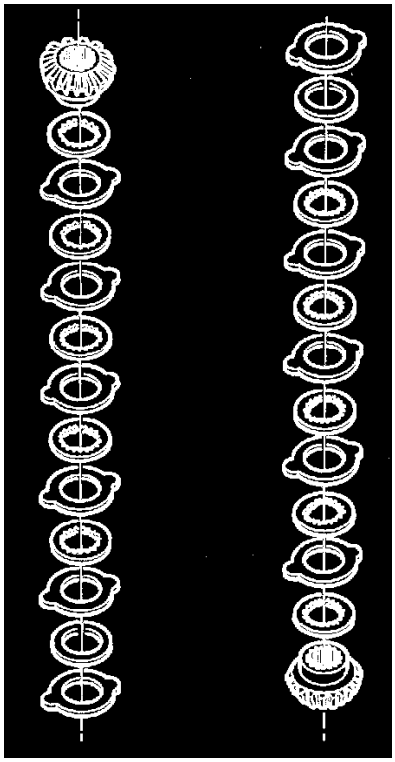
   Insert the special tool in the pinion shaft bore, and turn the differential case to "walk" the differential pinion gears and differential pinion thrust washers out to the differential case windows.



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.

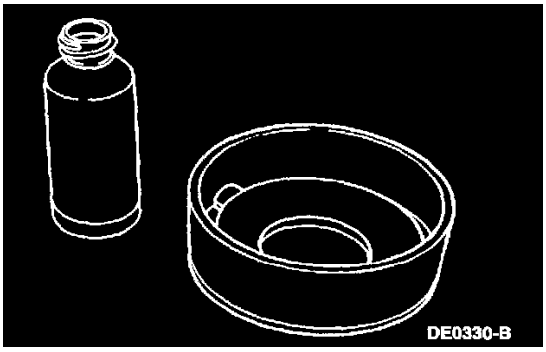


11. **CAUTION:** When separating the clutch plates and clutch discs, note the sequence in which they are disassembled. They must be reassembled in the same sequence.

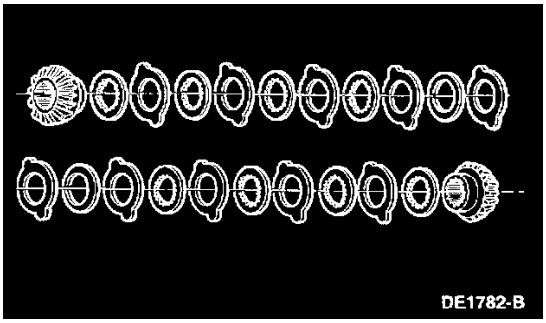
    CAUTION: Do not use acids or solvents when cleaning the differential clutch pack. Wipe components with a clean, lint-free cloth only.

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

Assembly



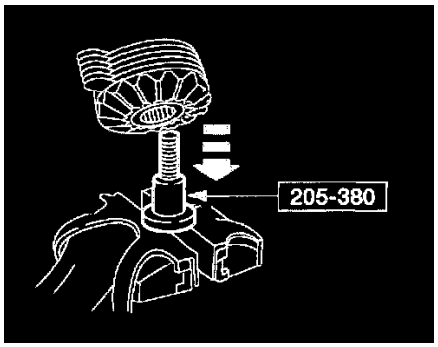
1. Prelubricate each steel clutch plate and soak all friction plates in Additive Friction Modifier C8AZ-19B546-A or equivalent meeting Ford specification EST-M2C118-A for at least 15 minutes.



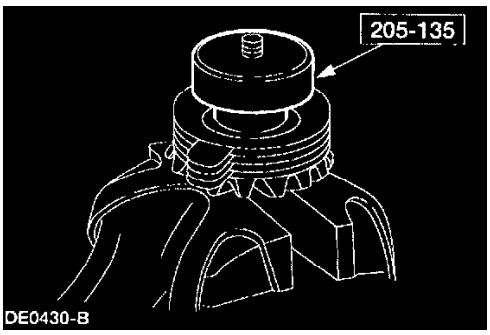
2. **NOTE:** Do not mix the differential clutch packs or shims from one side with the other.

    NOTE: The Belleville spring is a dished plate.

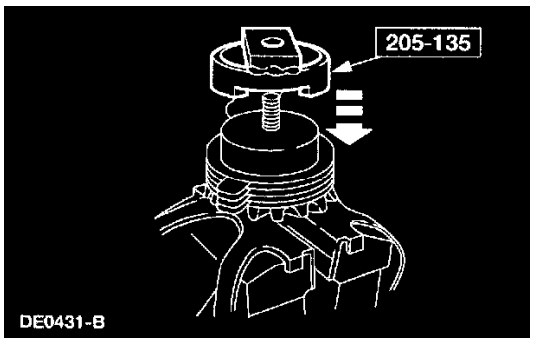
Assemble the differential clutch packs (without the shims and Belleville springs) on the respective differential side gears.



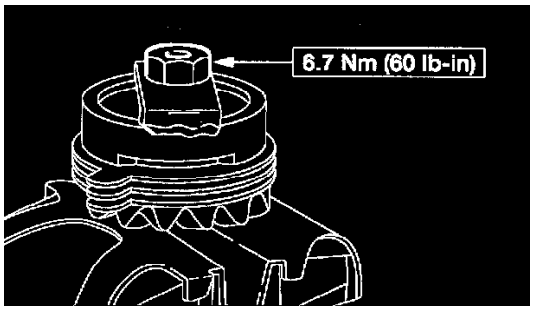
3. Clamp the bolt head of the special tool in a vise. Install the differential clutch pack and the differential side gear (without the shim or the Belleville spring) on the gauge.



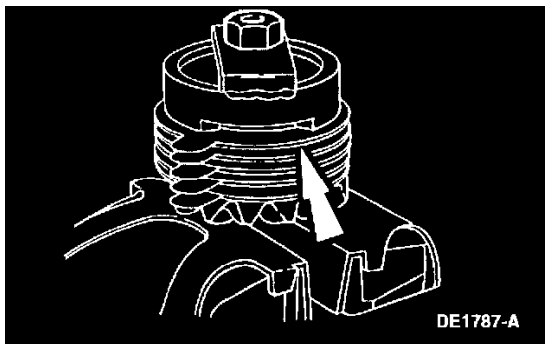
4. Position the special tool on top of the differential clutch pack.

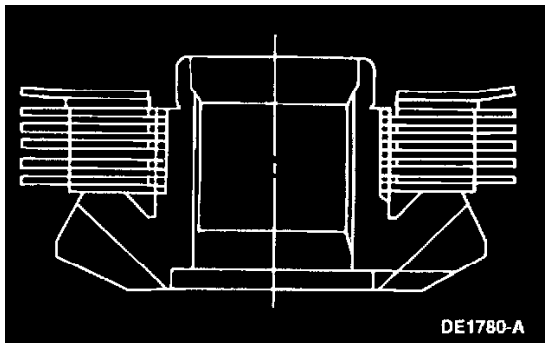


5. Install the special tool over the disc and differential clutch pack.



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

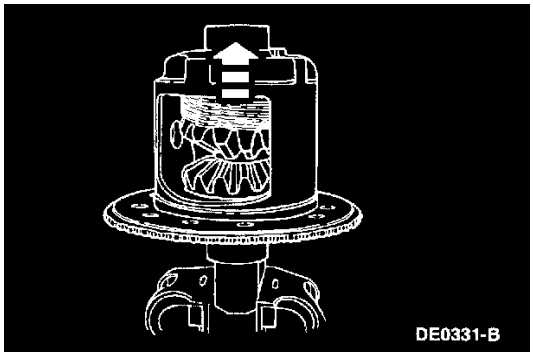




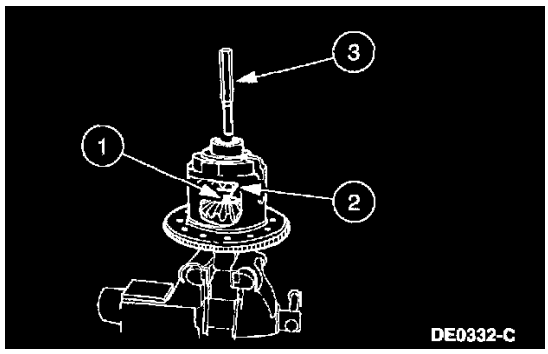
7. Use the Feeler Gauge Set and select the thickest blade that will enter between the tool and the differential clutch pack. The reading will be the thickness of the new clutch shim. Select the correct shim size, and remove the special tools.

Part Number	Description
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

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.



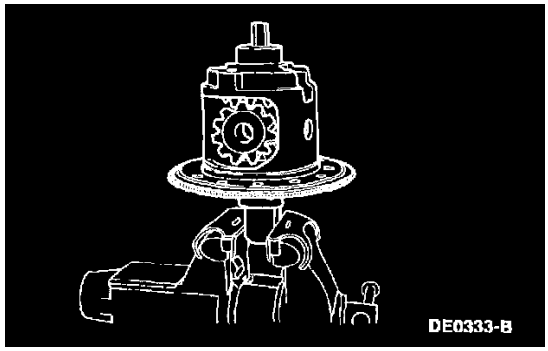
9. Insert the differential clutch packs with shims and Belleville springs and differential side gears into the differential case.
   - Hold the upper differential clutch pack and side gear assembly in place to prevent it from falling out of the differential case.



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.

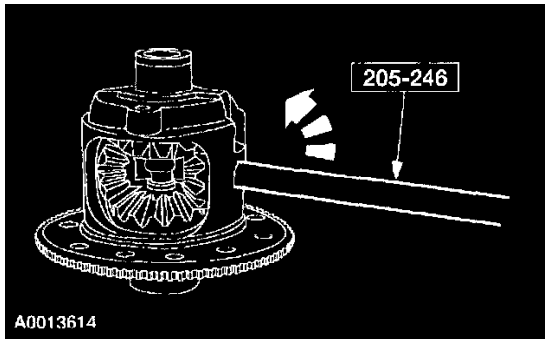
    Assemble the forcing screw, nut and Step Plate to the differential case.
    1 Position the Step Plate in the bottom side gear bore.
    2 Position the nut in the top side gear bore and hold it in place.
    3 Install the hex-head screw and tighten it two turns after it contacts the bottom Step Plate.



11. **NOTE:** Prelubricate both sides of the differential pinion thrust washers with SAE 75W-140 High Performance Rear Axle Lubricant FITZ-19589-B or equivalent meeting Ford specification WSL-M2C192-A.

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

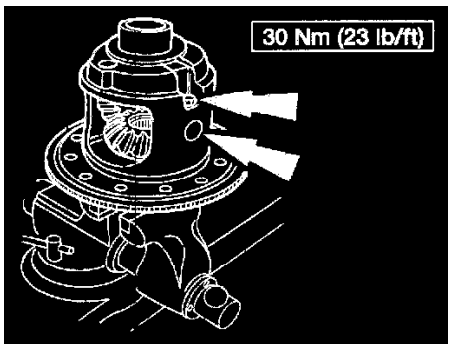
    Position the differential pinion gears and differential pinion thrust washers in the Window of the differential case so they mesh with the differential side gear teeth.



12. **WARNING: Keep fingers/hands away from pinion gears when rotating the differential case with the differential rotating tool.**

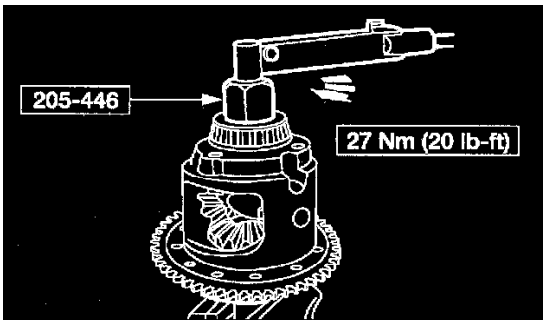
    NOTE: It will probably be necessary to loosen or tighten the forcing screw to allow the differential pinion gears and differential side gears to rotate. Insert the special tool into the pinion shaft bore, and turn the differential case. This will cause the differential pinion gears to engage the differential 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.

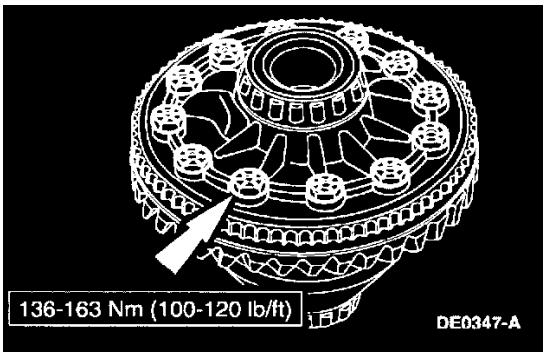


13. **CAUTION:** If a new pinion shaft lock bolt is not available, use Stud and Bearing Mount E0AZ-19554BA or equivalent meeting Ford specification WSK-M2G349-A1 and tighten to specification.

    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.
14. Replace the differential bearings, if removed.



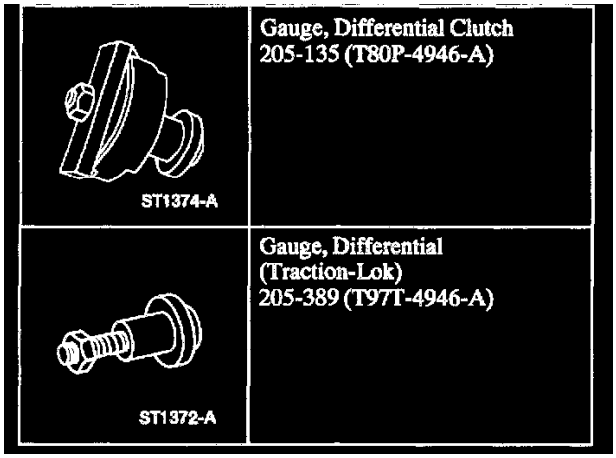
15. Check the torque required to rotate one differential side gear.
    - Install the special tool with the (1/2 inch drive hole) as shown.
    - The initial break-away torque, if original clutch plates are used, must be within specification. The rotating torque required to keep the differential side gear turning with new clutch plates may vary.

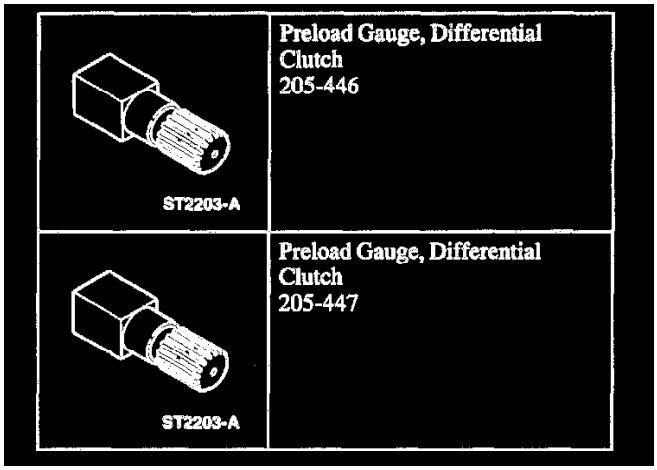


16. Install the ring gear and, if removed, a new anti-lock speed sensor ring on the differential case and tighten the retaining bolts.
17. Install the differential case.

Differential Case and Ring Gear-Two-Piece, Traction-LOK

Differential Case and Ring Gear-Two-Piece, Traction-Lok

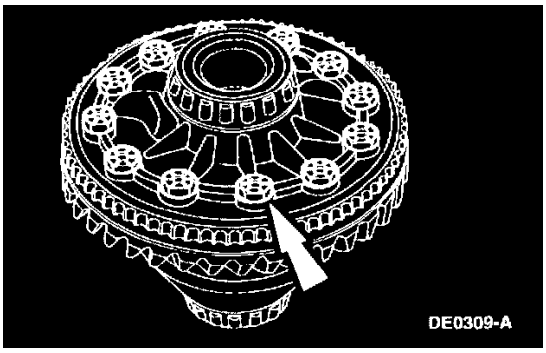




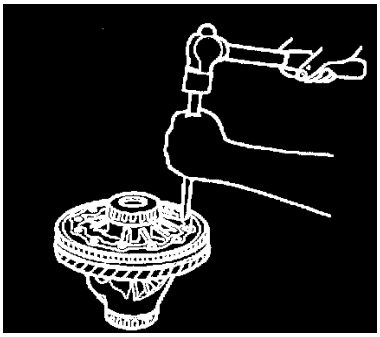
Special Tool(s)

Disassembly

1. Remove the differential case.



2. Remove the ring gear bolts.

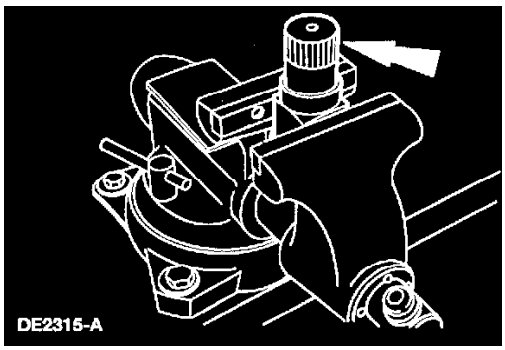


3. **NOTE:** The anti-lock speed sensor ring cannot be reused once removed.

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

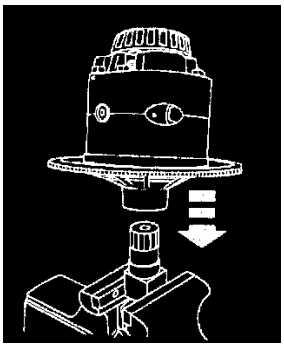
- If necessary, remove the anti-lock speed sensor ring and discard it.

4. If the differential bearings require removal, refer to Differential Case.

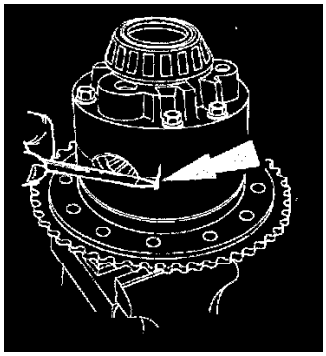


5. **NOTE:** This tool does not have the 1/2 inch drive hole.

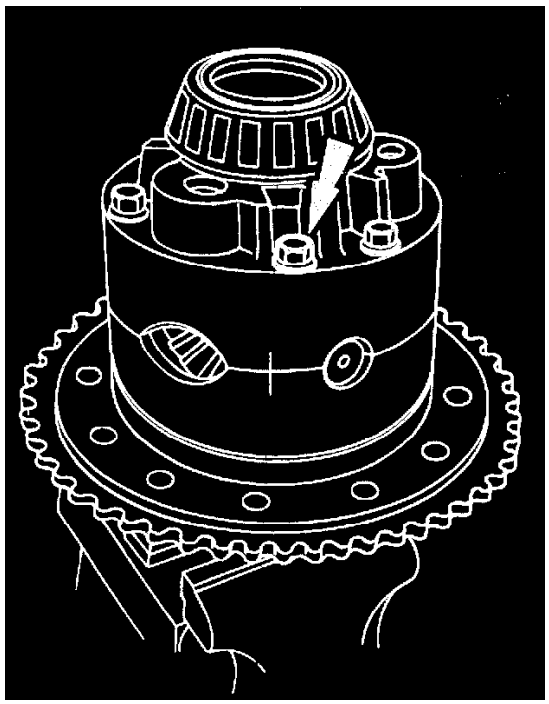
   Position the Traction-Lok Torque Tool Set in a vise.



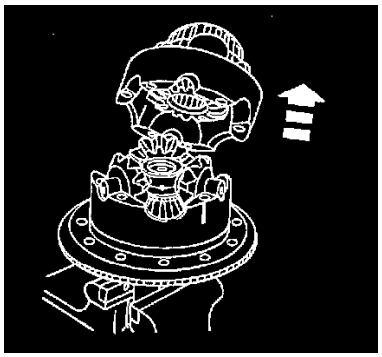
6. Position the differential case on the Traction-Lok Torque Tool Set.



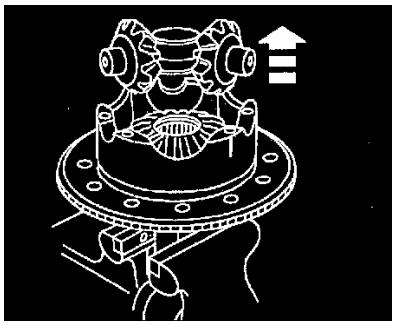
7. Index mark the differential case halves.



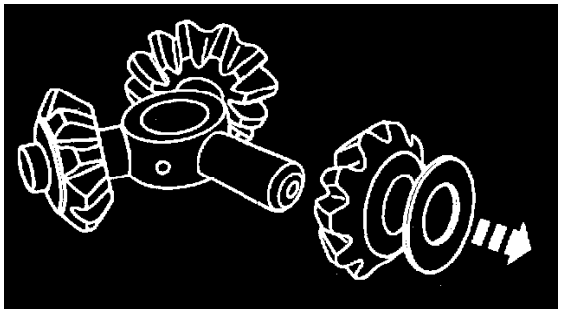
8. Remove the differential case bolts.



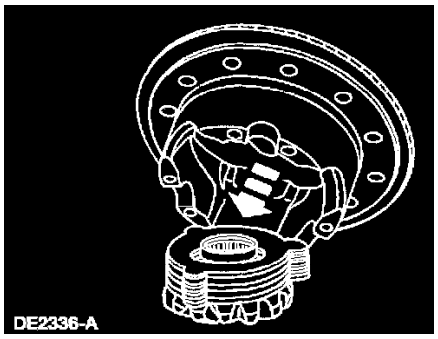
9. Remove the right differential case half and differential side gear.



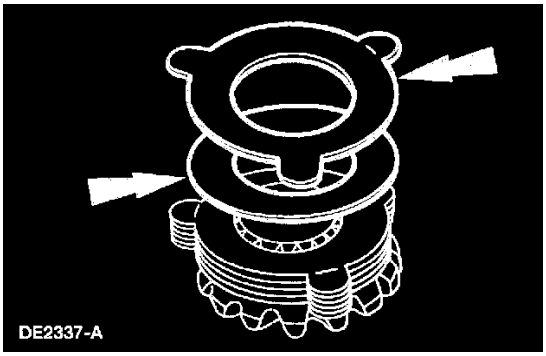
10. Remove the differential pinion shaft and differential pinion gears.



11. Remove the differential pinion gears from the differential pinion shaft.



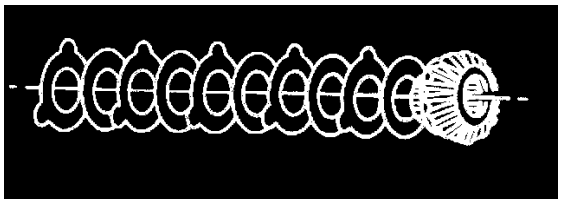
12. Remove both differential side gears and differential clutch packs from each differential case half.



13. Remove the Belleville spring and shim(s) from both differential clutch packs.

Assembly

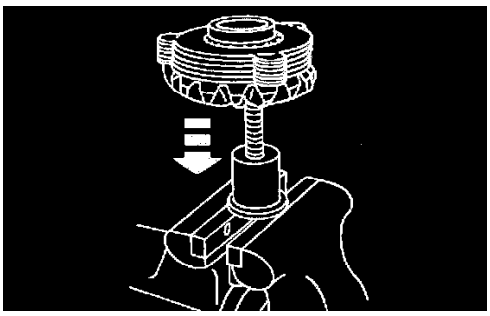
1. Prelubricate each clutch disc and soak the clutch friction plate for at least 15 minutes in Additive Friction Modifier C8AZ-19B546-A or equivalent meeting Ford specification EST-M2C118-A.



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

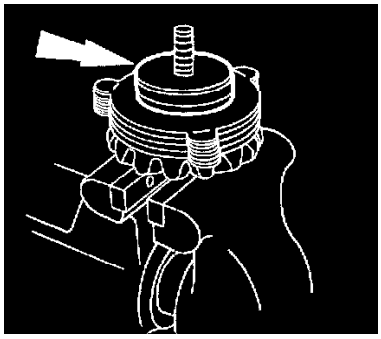
   NOTE: The Belleville spring is a dished plate.

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

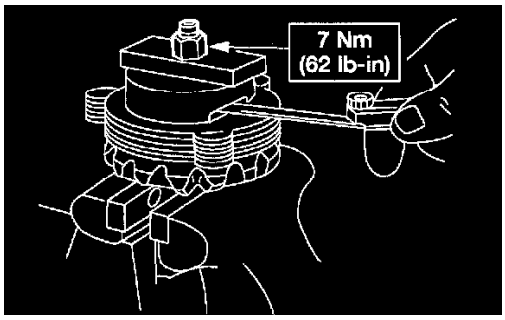


3. **NOTE:** Use the Traction-Lok Clutch Gauge Mandrel for the procedure. Refer to the Special Tool(s) Chart.

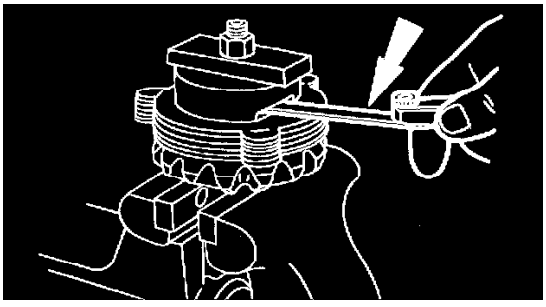
   Clamp the bolt head of the Traction-Lok Clutch Gauge in a vise.
   - Install the differential clutch pack and the differential side gear (without the shim or the Belleville spring) on the gauge.



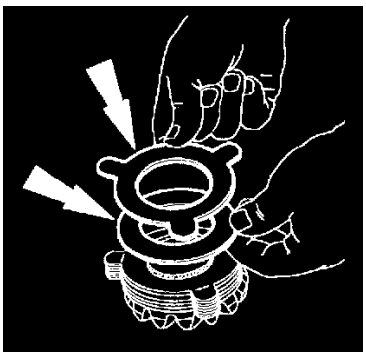
4. Position the Traction-Lok Clutch Gauge disc on top of the differential clutch pack.



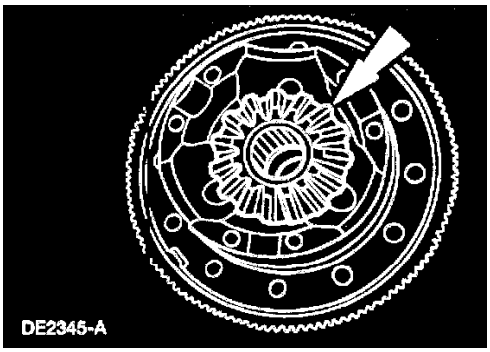
5. Install the Traction-Lok Clutch Gauge housing over the disc and tighten the nut.



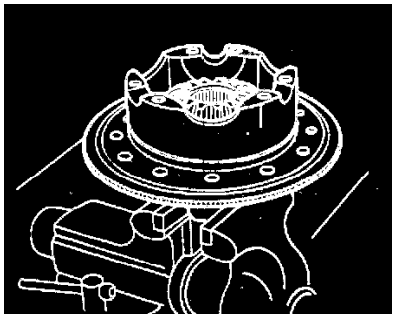
6. Use a feeler gauge and select the thickest blade that will enter between the tool and the differential clutch pack.
   - The reading will be the thickness of the new clutch shim.
   - Select the correct shim size, and remove the Traction-Lok Clutch Gauge.



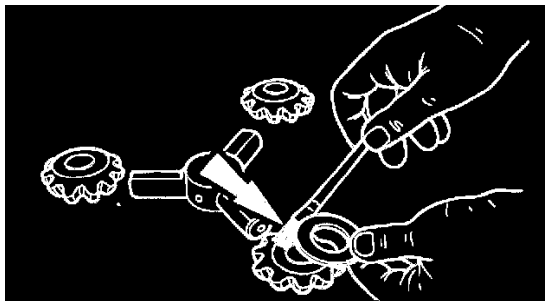
7. Place the selected shim and Belleville spring on the differential clutch pack.
   - The dished or concave side of the Belleville spring must be face up and against the thrust face of the differential case.



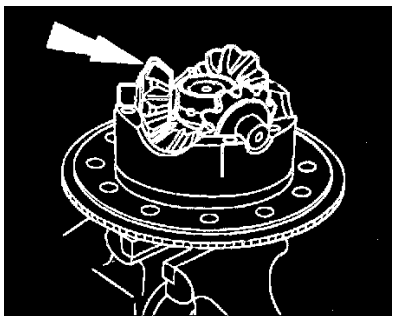
8. Install the differential side gear and differential clutch pack into the left case half (ring gear side).



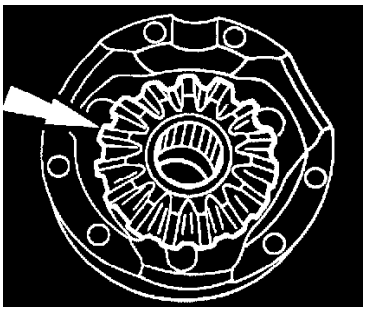
9. Position left differential case half on the Traction-Lok Torque Tool Set.



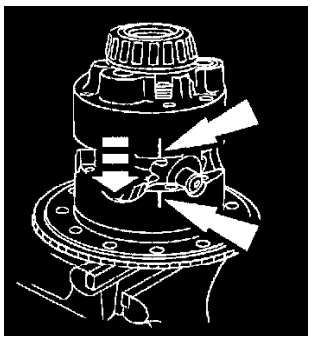
10. Lubricate the differential pinion gears, pinion gear thrust washers and the differential pinion shaft with Premium Long-Life Grease XG-1-C or equivalent meeting Ford specification ESA-M1C75-B.
    - Install the differential pinion gears in the differential pinion shaft.



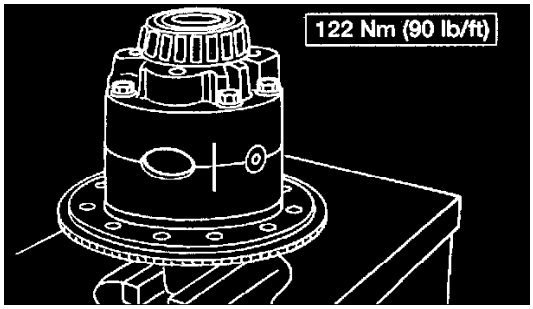
11. Install the differential pinion shaft and the differential pinion gears.



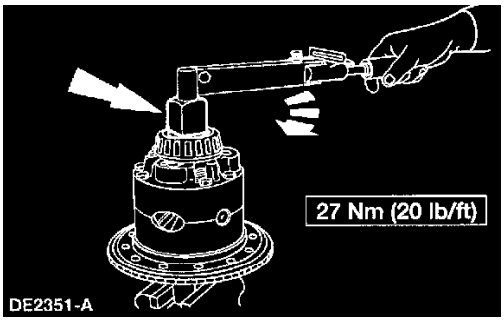
12. Install the right differential clutch pack and differential side gear into the right case half.



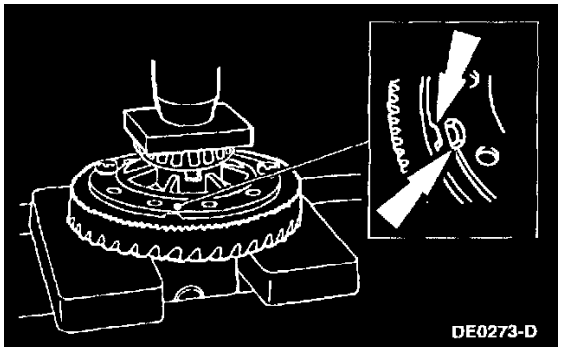
13. Position the right differential case half with the index marks aligned.

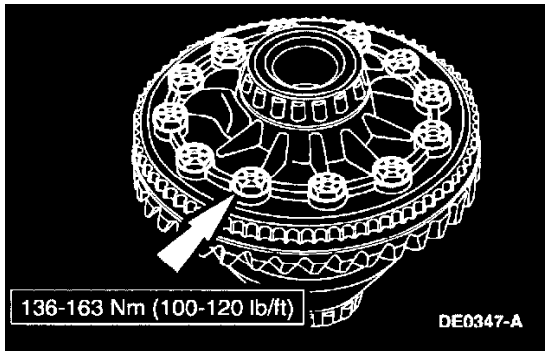


14. Install the retaining bolts and tighten.



15. Check the torque required to rotate one differential side gear.





16. Install the Traction-Lok Torque Tool Set with the 1/2-inch drive hole as shown.
    - The initial break-away torque, if the original clutch plates are used, must be within specification. The rotating torque required to keep the differential side gear turning with new clutch plates may vary.
16. Install the ring gear and, if removed, a new # anti-lock speed sensor ring on the differential case and tighten the retaining bolts.
17. Install the differential case.