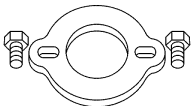
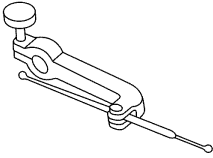
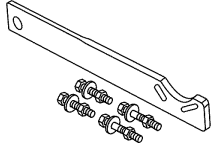
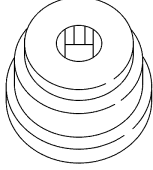
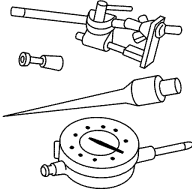


## DIAGNOSIS AND TESTING

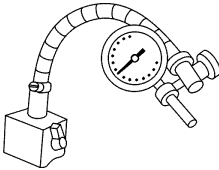
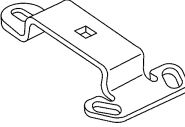
### Driveline System

#### Special Tool(s)

 ST1268-A	Clamp Plate, Driveshaft 205-320 (T92L-4851-C)
 ST1348-A	Gauge, Clutch Housing 308-021 (T75L-4201-A)
 ST1257-A	Holding Fixture, Drive Pinion Flange 205-126 (T78P-4851-A)
 ST1267-A	Runout Gauge, Drive Pinion Flange 205-319 (T92L-4851-B)
 ST1214-A	Dial Indicator Gauge with Holding Fixture 100-002 (TOOL-4201-C) or equivalent

(Continued)

#### Special Tool(s)

 ST1266-A	Dial Indicator Gauge with Holding Fixture 100-D002 (D78P-4201-B) or equivalent
 ST1863-A	Gauge, Differential (Traction-Lok®) 205-385 (T97T-4205-B)

#### Principles of Operation

The driveline system enables the power generated by the engine and transferred through the transmission and, if applicable, transfer case, to place the vehicle in motion. Rotational torque received from the transmission or transfer case is delivered to the front and rear drive axles by way of the driveshafts. The U-joints or constant velocity (CV) joints at the ends of the shafts allow the shafts to rotate smoothly in an allowable angle plane. The rotational torque is introduced into the axle drive pinion which drives the differential ring gear. The ring gear is bolted to the differential case flange on the differential. The differential divides the torque between the right and left halfshaft while permitting the halfshafts to turn at different speeds when required, such as when cornering.

#### Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical damage.

**DIAGNOSIS AND TESTING (Continued)****Visual Inspection Chart**

<b>Mechanical</b>
<ul style="list-style-type: none"> <li>• U-joints</li> <li>• Constant velocity (CV) joints</li> <li>• Center bearings</li> <li>• Driveshaft tubes</li> <li>• Mounting brackets</li> <li>• Flanges</li> <li>• Housing and cover damage</li> <li>• Differential bearings</li> <li>• Differential gear sets</li> <li>• Pinion bearings</li> </ul>

4. If the cause is not visually evident, verify the symptom and GO to the Symptom Chart — Driveline or GO to Symptom Chart — Noise, Vibration and Harshness (NVH).

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

**Symptom Chart — Driveline****Symptom Chart — Driveline**

<b>Condition</b>	<b>Possible Sources</b>	<b>Action</b>
<ul style="list-style-type: none"> <li>• Traction-Lok® does not work in snow, mud or on ice</li> </ul>	<ul style="list-style-type: none"> <li>• Differential</li> </ul>	<ul style="list-style-type: none"> <li>• CARRY OUT the Traction-Lok® Differential Operation Check in this section. REPAIR as necessary. REFER to Section 205-02A, Section 205-02B or Section 205-02C.</li> </ul>
<ul style="list-style-type: none"> <li>• Lubricant leaking from the pinion seal, axle shaft oil seals or support arm to the housing</li> </ul>	<ul style="list-style-type: none"> <li>• Vent</li> <li>• Damage in the seal contact area or dust slinger on the pinion flange dust shield</li> </ul>	<ul style="list-style-type: none"> <li>• CLEAN the axle housing vent.</li> <li>• INSTALL a new pinion flange and the pinion seal if damage is found.</li> </ul>
<ul style="list-style-type: none"> <li>• The vehicle does not shift between the different modes correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Mode switch</li> <li>• Wiring/relays</li> <li>• Shift motor</li> <li>• Transfer case</li> <li>• Generic electronic module (GEM) or 4x4 control module</li> </ul>	<ul style="list-style-type: none"> <li>• REFER to Section 308-07A.</li> </ul>
<ul style="list-style-type: none"> <li>• Front axle will not engage</li> </ul>	<ul style="list-style-type: none"> <li>• Switches</li> <li>• Wiring</li> <li>• GEM or 4x4 control module</li> <li>• Shift motor</li> </ul>	<ul style="list-style-type: none"> <li>• REFER to Section 308-07A.</li> </ul>
<ul style="list-style-type: none"> <li>• Front axle will not disengage</li> </ul>	<ul style="list-style-type: none"> <li>• Switches</li> <li>• Wiring</li> <li>• GEM or 4x4 control module</li> <li>• Shift motor</li> </ul>	<ul style="list-style-type: none"> <li>• REFER to Section 308-07A.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Driveline (Continued)**

<b>Condition</b>	<b>Possible Sources</b>	<b>Action</b>
<ul style="list-style-type: none"> <li>Differential side gears/pinion gears are scored</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient lubrication</li> <li>Incorrect or contaminated lubricant type</li> </ul>	<ul style="list-style-type: none"> <li>INSTALL new gears. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03. FILL the axle to specification.</li> <li>INSTALL new gears. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03. CLEAN and REFILL the axle to specification.</li> </ul>
<ul style="list-style-type: none"> <li>Axle overheating</li> </ul>	<ul style="list-style-type: none"> <li>Lubricant level too low</li> <li>Incorrect or contaminated lubrication type</li> <li>Bearing preload adjusted too tight</li> <li>Excessive gear wear</li> <li>Incorrect ring gear backlash</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the lubricant level. FILL the axle to specification.</li> <li>INSPECT the axle for damage. REPAIR as necessary. CLEAN and REFILL the axle to specification.</li> <li>CHECK the ring and pinion for damage. INSPECT the ring and pinion wear pattern. ADJUST the preload as necessary.</li> <li>INSPECT all the axle gears for wear or damaged. INSTALL new components as necessary.</li> <li>INSPECT the ring gear for scoring. INSPECT the ring and pinion wear pattern. ADJUST the ring gear backlash as necessary.</li> </ul>
<ul style="list-style-type: none"> <li>Broken gear teeth on the ring gear or pinion</li> </ul>	<ul style="list-style-type: none"> <li>Overloading the vehicle</li> </ul>	<ul style="list-style-type: none"> <li>INSTALL a new ring and pinion. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Halfshaft broken</li> </ul>	<ul style="list-style-type: none"> <li>Overloading the vehicle</li> <li>Misaligned axle halfshaft</li> </ul>	<ul style="list-style-type: none"> <li>INSTALL a new axle halfshaft. REFER to Section 205-04.</li> <li>INSPECT the axle for damage. CHECK axle halfshaft alignment. INSTALL a new axle halfshaft. REFER to Section 205-04.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Noise, Vibration and Harshness (NVH)****Symptom Chart — Noise, Vibration and Harshness (NVH)**

**NOTE:** Noise, vibration and harshness (NVH) symptoms should be identified using the diagnostic tools that are available. For a list of these tools, an explanation of their uses and a glossary of common terms, refer to Section 100-04. Since it is possible any one of multiple systems may be the cause of a symptom, it may be necessary to use a process of elimination type of diagnostic approach to pinpoint the responsible system. If this is not the causal system for the symptom, refer back to Section 100-04 for the next likely system and continue diagnosis.

Condition	Possible Sources	Action
<ul style="list-style-type: none"> <li>Axle howling or whine — front or rear axle</li> </ul>	<ul style="list-style-type: none"> <li>Axle lubricant low</li> <li>Axle housing damage</li> <li>Damaged or worn wheel hub bearings</li> <li>Damaged or worn differential ring and pinion</li> <li>Damaged or worn differential side or pinion bearings</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the lubricant level. FILL the axle to specification. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>INSPECT the axle housing for damage. REPAIR or INSTALL a new axle as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>CHECK for abnormal wheel hub bearing play or roughness. REFER to Section 204-01A, Section 204-01B or Section 204-02.</li> <li>INSPECT and INSTALL a new differential ring and pinion as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>INSPECT and INSTALL new differential side or pinion bearings as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Noise, Vibration and Harshness (NVH) (Continued)**

<b>Condition</b>	<b>Possible Sources</b>	<b>Action</b>
<ul style="list-style-type: none"> <li>Driveline clunk — loud clunk when shifting from REVERSE to DRIVE</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect axle lubricant level</li> <li>Excessive backlash in the axle</li> <li>Damaged or worn pinion bearings</li> <li>Damaged or worn U-joints</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the lubricant level. FILL the axle to specification. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>CHECK the axle backlash. REPAIR as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>REPAIR or INSTALL new pinion bearings as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>INSPECT the U-joints for wear or damage. INSTALL new U-joints or driveshaft as necessary. REFER to Section 205-01.</li> </ul>
<ul style="list-style-type: none"> <li>Driveline clunk — occurs as the vehicle starts to move forward following a stop</li> </ul>	<ul style="list-style-type: none"> <li>Worn driveshaft constant velocity (CV) joint or U-joints with excessive play</li> <li>Loose axle mount</li> </ul>	<ul style="list-style-type: none"> <li>INSPECT the CV joint and U-joints for a worn condition. INSTALL a new driveshaft or U-joints as necessary. REFER to Section 205-01.</li> <li>CHECK the axle for loose bolts. TIGHTEN to specification. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Driveline clunk — occurs during acceleration or from cruise to coast/deceleration</li> </ul>	<ul style="list-style-type: none"> <li>Damaged or worn CV joint</li> </ul>	<ul style="list-style-type: none"> <li>INSPECT the CV joint and boot. INSTALL a new CV joint as necessary. REFER to Section 205-04.</li> </ul>
<ul style="list-style-type: none"> <li>Clicking, popping or grinding — occurs while the vehicle is turning</li> </ul>	<ul style="list-style-type: none"> <li>Inadequate or contaminated lubrication in the CV joints</li> <li>Another component contacting the halfshaft</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the CV boots and joints for wear or damage. INSTALL new components as necessary. REFER to Section 205-04.</li> <li>CHECK the halfshafts and the area around the halfshafts. REPAIR as necessary.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Noise, Vibration and Harshness (NVH) (Continued)**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> <li>High pitched chattering — noise from the axle when the vehicle is turning</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect or contaminated lubricant</li> <li>Damaged or worn differential (differential side gears and pinion gears)</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the vehicle by driving in tight circles (5 clockwise, 5 counterclockwise). FLUSH and REFILL with the specified rear axle lubricant and friction modifier as necessary.</li> <li>REPAIR or INSTALL new differential side gears or pinion gears as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Buzz — buzzing noise is the same at cruise or coast/deceleration</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect driveline angles</li> </ul>	<ul style="list-style-type: none"> <li>CHECK for correct driveline angles. REPAIR as necessary. REFER to Driveline Angle Measurement in this section.</li> </ul>
<ul style="list-style-type: none"> <li>Rumble or boom — noise occurs at coast/deceleration, usually driveshaft speed-related and noticeable over a wide range of speeds</li> </ul>	<ul style="list-style-type: none"> <li>Driveshaft is out-of-balance</li> <li>U-joints are binding or seized</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the driveshaft for damage, missing balance weights or undercoating. REFER to Driveshaft Runout and Balancing in this section.</li> <li>ROTATE the driveshaft and CHECK for rough operation or seized U-joints. INSTALL new U-joints or driveshaft as necessary. REFER to Section 205-01.</li> </ul>
<ul style="list-style-type: none"> <li>Grunting — normally associated with a shudder experienced during acceleration from a complete stop</li> </ul>	<ul style="list-style-type: none"> <li>Driveshaft CV joint binding</li> <li>Loose axle mount bolts or suspension fasteners</li> </ul>	<ul style="list-style-type: none"> <li>CLEAN the CV joint and INSTALL a new driveshaft as necessary. REFER to Section 205-01.</li> <li>INSPECT the rear suspension and axle. TIGHTEN the fasteners to specification. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Howl — can occur at various speeds and driving conditions. Affected by acceleration and deceleration</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect ring and pinion contact, incorrect bearing preload or gear damage</li> </ul>	<ul style="list-style-type: none"> <li>INSPECT and REPAIR as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Chuckle — heard at coast/deceleration. Also described as a knock</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect ring and pinion contact or damaged teeth on the coast side of the ring and pinion</li> </ul>	<ul style="list-style-type: none"> <li>INSPECT and REPAIR as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Knock — noise occurs at various speeds. Not affected by acceleration or deceleration</li> </ul>	<ul style="list-style-type: none"> <li>Gear tooth damage to the drive side of the ring and pinion</li> </ul>	<ul style="list-style-type: none"> <li>INSTALL a new ring and pinion. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Noise, Vibration and Harshness (NVH) (Continued)**

<b>Condition</b>	<b>Possible Sources</b>	<b>Action</b>
<ul style="list-style-type: none"> <li>Scraping noise — a continuous low pitched noise starting at low speeds</li> </ul>	<ul style="list-style-type: none"> <li>Worn or damaged pinion bearings</li> </ul>	<ul style="list-style-type: none"> <li>INSPECT and REPAIR or INSTALL new pinion bearings. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> </ul>
<ul style="list-style-type: none"> <li>Driveline shudder — occurs during acceleration from a slow speed or stop</li> </ul>	<ul style="list-style-type: none"> <li>Drive axle assembly mispositioned</li> <li>Loose axle bolts</li> <li>Driveline angles out of specification</li> <li>U-joints binding or seized</li> <li>Binding or damaged driveshaft CV joint</li> </ul>	<ul style="list-style-type: none"> <li>CHECK the axle mounts and the rear suspension for damage or wear. REPAIR as necessary. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>CHECK the axle for loose bolts. TIGHTEN the bolts to specification. REFER to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03.</li> <li>CHECK for correct driveline angles. REFER to Driveline Angle Measurement in this section.</li> <li>ROTATE the driveshaft and CHECK for rough operation or seized U-joints. INSTALL new U-joints or driveshaft as necessary. REFER to Section 205-01.</li> <li>INSPECT the driveshaft CV joint and coupling shaft for wear or damage. INSTALL a new driveshaft as necessary. REPAIR as necessary. REFER to Section 205-01.</li> </ul>

**DIAGNOSIS AND TESTING (Continued)****Symptom Chart — Noise, Vibration and Harshness (NVH) (Continued)**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> <li>Driveline vibration — occurs at cruising speeds</li> </ul>	<ul style="list-style-type: none"> <li>Worn U-joints</li> <li>Worn or damaged driveshaft center bearing support</li> <li>Loose axle pinion flange bolts</li> <li>Excessive axle pinion flange runout</li> <li>Driveshaft is out-of-balance</li> <li>Binding or damaged driveshaft CV joint</li> <li>Excessive driveshaft runout</li> <li>Driveline angles out of specification</li> <li>Incorrectly seated CV joint in the wheel hub</li> </ul>	<ul style="list-style-type: none"> <li>CHECK for wear or incorrect seating. INSTALL new U-joints or driveshaft as necessary. REFER to Section 205-01.</li> <li>CHECK the insulator for damage or wear. ROTATE the driveshaft and CHECK for rough operation. INSTALL a new driveshaft as necessary. REFER to Section 205-01.</li> <li>INSPECT the axle pinion flange. TIGHTEN the pinion flange bolts to specification. REFER to Section 205-01.</li> <li>CARRY OUT a runout check. REPAIR as necessary. REFER to Component Test in this section.</li> <li>CHECK the driveshaft for damage, missing balance weights or undercoating. CHECK the driveshaft balance. CARRY OUT a driveline vibration test. REFER to Driveshaft Runout and Balancing in this section.</li> <li>INSPECT the driveshaft CV joint for wear or damage. INSTALL a new driveshaft as necessary. REFER to Section 205-01.</li> <li>CARRY OUT a runout check. REFER to Driveshaft Runout and Balancing in this section.</li> <li>CHECK for correct driveline angles. REPAIR as necessary. REFER to Driveline Angle Measurement in this section.</li> <li>CHECK the outer CV joint for correct seating into the hub. REPAIR as necessary. REFER to Section 205-04.</li> </ul>

**Analysis of Leakage**

Clean the leaking area enough to identify the exact source.

A plugged axle housing vent can cause excessive pinion seal lip wear due to internal pressure buildup.

Verify the lubricant level is at least 3-5 mm (1/8-3/16 in) below the bottom of the fill hole.

**Axle Vent**

A plugged vent will cause excessive seal lip wear due to internal pressure buildup. If a leak occurs, check the vent. If the vent cannot be cleared, install a new vent.



## DIAGNOSIS AND TESTING (Continued)

### Drive Pinion Seal

Leaks at the drive pinion seal originate from the following causes:

- Damaged seal
- Worn seal journal surface

Any damage to the seal bore (dings, dents, gouges or other imperfections) distorts the seal casing and allows leakage past the outer edge of the drive pinion seal.

The drive pinion seal can be torn, cut or gouged if it is not installed correctly. The spring that holds the drive pinion seal against the pinion flange may be knocked out and allow fluid to pass the lip.

Metal chips trapped at the sealing lip can cause oil leaks. These can cause a wear groove on the drive pinion flange and result in pinion seal wear.

When a seal leak occurs, install a new drive pinion seal and check the vent to make sure it is clean and free of foreign material.

A new drive pinion flange must be installed if any of these conditions exist.

### Drive Pinion Nut

**NOTICE:** Install the drive pinion nut to the correct torque specifications or damage to the differential components may occur.

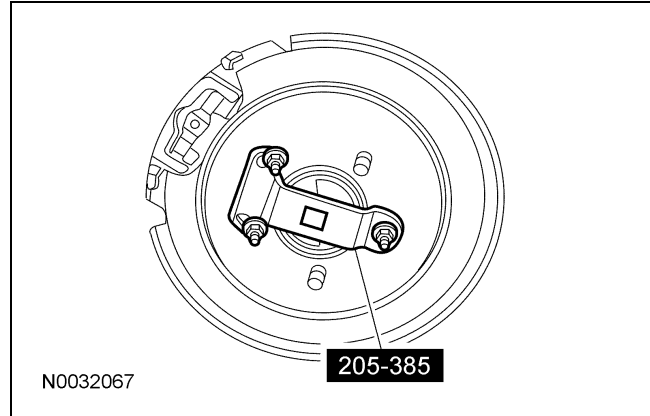
On some high-mileage vehicles, oil may leak through the threads of the drive pinion nut. This condition can be corrected by installing a new nut and applying threadlock and sealer on the threads and nut face.

### Component Tests

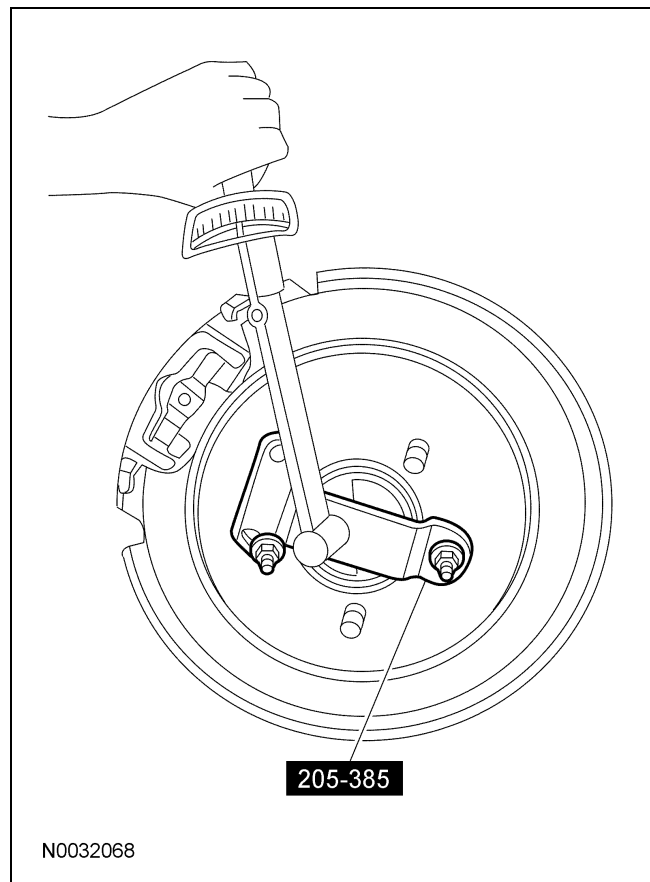
#### Traction-Lok® Differential Operation Check

A Traction-Lok® differential can be checked for correct operation without removing it from the rear axle housing.

Raise and remove only one rear wheel. Install the special tool on the wheel bolts.



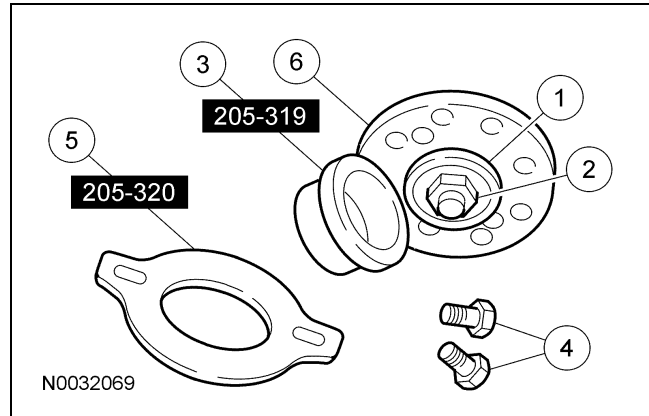
Use a torque wrench with the capacity of at least 271 Nm (200 lb-ft) to rotate the axle shaft. Make sure that the transmission is in NEUTRAL, and that one rear wheel is on the floor while the other rear wheel is raised off the floor. The breakaway torque required to start rotation must be at least 27 Nm (20 lb-ft). The initial breakaway torque may be higher than the continuous turning torque.



The axle shaft must turn with even pressure throughout the check without slipping or binding. If the torque reading is less than specified, check the differential case for incorrect assembly.

**DIAGNOSIS AND TESTING (Continued)****Traction-Lok® Differential Check Road Test**

1. Place one wheel on a dry surface and the other wheel on ice, mud or snow.
2. Gradually open the throttle to obtain maximum traction prior to break away. The ability to move the vehicle demonstrates correct performance of a Traction-Lok® rear axle assembly.
3. When starting with one wheel on an excessively slippery surface, a slight application of the parking brake may be necessary to help energize the Traction-Lok® feature of the differential. Release the brake when traction is established. Use light throttle on starting to provide maximum traction.
4. If, with unequal traction, both wheels slip, the limited slip rear axle has done all it can possibly do.
5. In extreme cases of differences in traction, the wheel with the least traction may spin after the Traction-Lok® has transferred as much torque as possible to the non-slipping wheel.



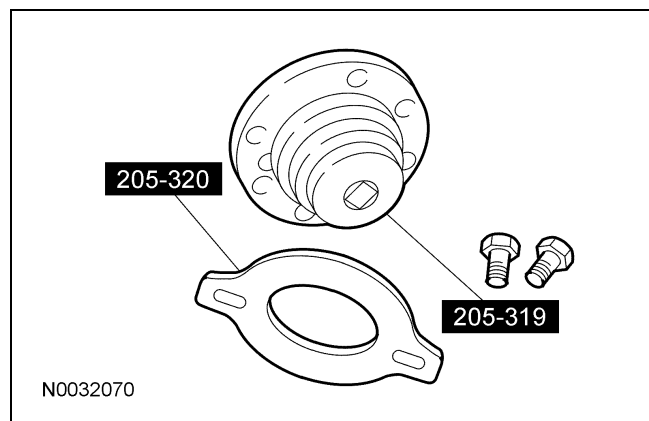
Item	Part Number	Description
1	—	Pilot (part of 205-319) (T92L-4851-B)
2	354845	Pinion nut
3	205-319	Gauge, Companion Flange Runout (T92L-4851-B)
4	—	Bolts (2 required) (part of 205-320) (T92L-4851-C)
5	205-320	Plate, Companion Flange (T92L-4851-C)
6	4851	Pinion flange

**Pinion Flange Runout Check — Circular**

**NOTICE:** Pinion bearing preload must be reset if the pinion nut has been loosened or removed for pinion flange reindexing or replacement or damage to the component may occur.

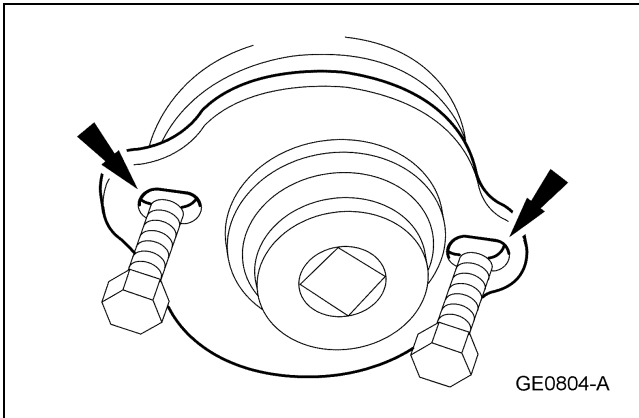
1. Raise the vehicle on a twin-post hoist that supports the rear axle.
2. Remove the driveshaft. Refer to Section 205-01.
3. Check the pinion flange for damage.
4. Position special tool on the pinion flange.

5. Position the special tools onto the pinion flange.

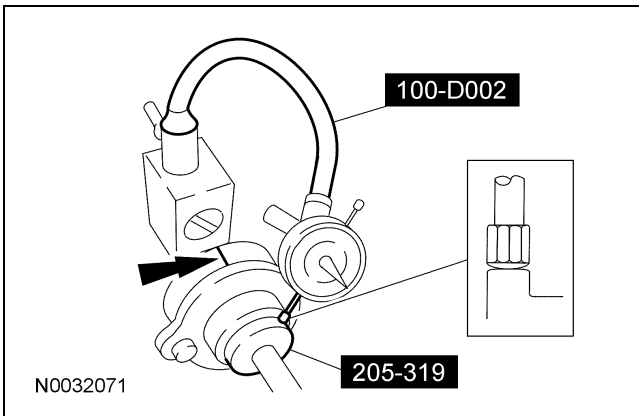


**DIAGNOSIS AND TESTING (Continued)**

6. Align the holes on the clamp plate with the holes in the pinion flange and install the bolts. Snug the bolts evenly.

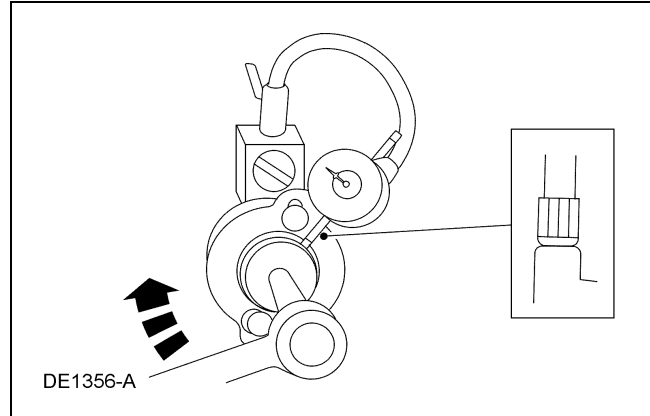


7. Position the special tool as shown. Turn the special tool, and locate and mark the high spot on the pinion flange with yellow paint.



If the flange runout exceeds 0.25 mm (0.010 in), remove the pinion flange, reindex the flange one-half turn on the pinion, and reinstall it. Refer to Section 205-02A, Section 205-02B, Section 205-02C or Section 205-03 for the flange removal and installation procedures.

8. Check the runout again. If necessary, rotate the flange until an acceptable runout is obtained. If the flange runout is still more than 0.25 mm (0.010 in), install a new pinion flange.



9. If excessive runout is still evident after replacement of the pinion flange, install a new ring and pinion. Repeat the above checks until the runout is within specifications.
10. Install the driveshaft. Refer to Section 205-01.

**Tooth Contact Pattern Check — Gearset**

1. To check the gear tooth contact, paint the gear teeth with the special marking compound. A mixture that is too wet will run and smear; a mixture that is too dry cannot be pressed out from between the teeth.
2. Use a box wrench on the ring gear bolts as a lever to rotate the ring gear several complete revolutions in both directions or until a clear tooth contact pattern is obtained.
3. Certain types of gear tooth contact patterns on the ring gear indicate incorrect adjustment. Incorrect adjustment can be corrected by readjusting the ring gear or the pinion.

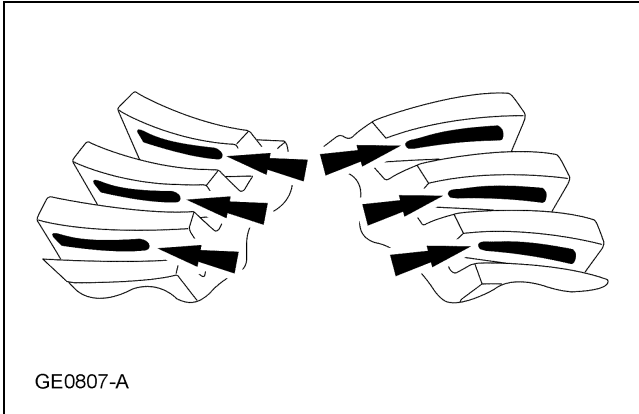
**Contact Pattern Location**

In general, desirable ring gear tooth patterns must have the following characteristics:

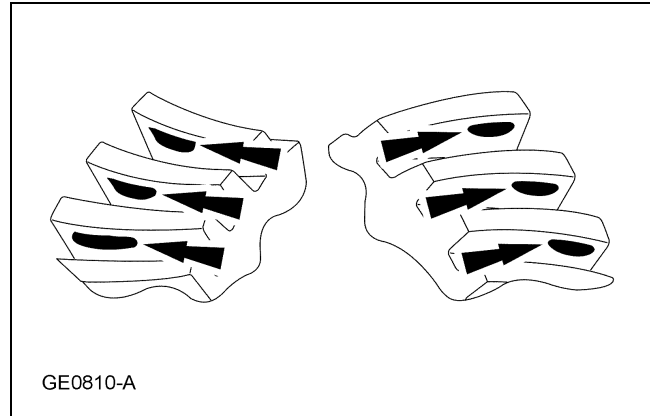
- Drive pattern on the drive side ring gear well centered on the tooth.
- Coast pattern on the coast side ring gear well centered on the tooth.
- Clearance between the pattern and the top of the tooth.
- No hard lines where the pressure is high.

**DIAGNOSIS AND TESTING (Continued)**

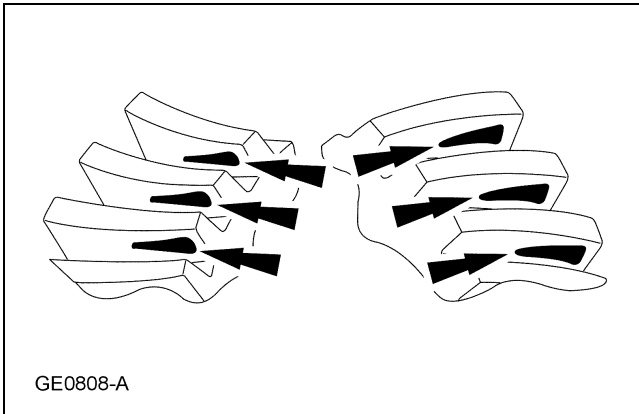
Acceptable ring gear tooth patterns for all axles.



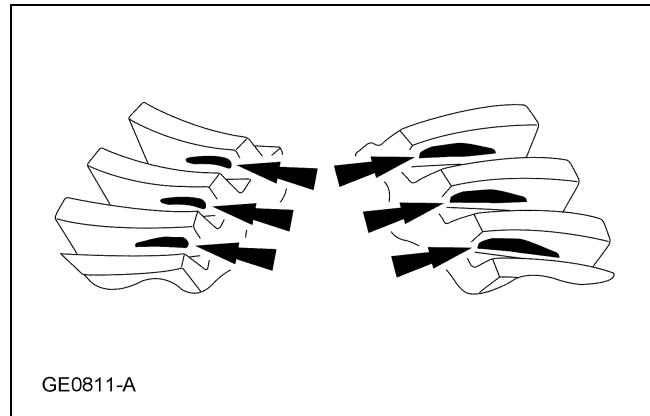
Correct pinion position shim that requires a decrease in backlash.



Correct backlash with a thinner pinion position shim required.



Correct pinion position shim that requires an increase in backlash.



Correct backlash with a thicker pinion position shim required.

