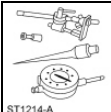



Driveshaft Runout and Balancing

Special Tool(s)

 ST1214-A	Dial Indicator Gauge with Holding Fixture 100-002 (TOOL-4201-C)
 ST3025-A	Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix) 257-00018 or equivalent

Driveshaft Inspection

⚠ WARNING: If equipped with fire suppression system, refer to [Section 419-03](#) for Important Safety Warnings. Failure to follow this instruction may result in serious personal injury.

NOTE: Driveline vibration exhibits a higher frequency and lower amplitude than high-speed shake. Driveline vibration is directly related to the speed of the vehicle and is noticed at various speeds. Driveline vibration can be perceived as a tremor in the floorpan or heard as a rumble, hum or boom.

NOTE: Refer to Specifications in this section for all runout specifications.

1. **NOTE:** Do not make any adjustments before carrying out a road test. Do not change the tire pressure or the vehicle load.

Carry out a visual inspection of the vehicle. Operate the vehicle and verify the condition by reproducing it during the road test.

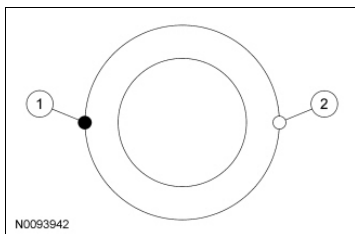
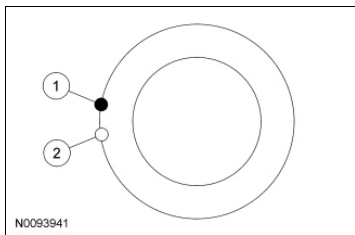
- The concern should be directly related to vehicle road speed, not affected by acceleration or deceleration, or could not be reduced by coasting in NEUTRAL.
2. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02A](#) .
 - The driveshaft should be kept at an angle equal to or close to the curb weighted position. Use a twin post hoist or a frame hoist with jackstands.
 3. Inspect the driveshaft for damage, undercoating or incorrectly seated U-joints. Rotate the driveshaft slowly by hand and feel for binding or end play in the U-joint trunnions. Remove and inspect the slip yoke splines for any galling, dirt, rust or incorrect lubrication. Clean the driveshaft or install new U-joints as necessary. Install a new driveshaft if damaged. After any corrections or new components are installed, recheck for the vibration at the road test speed.
 - If the vibration is gone, test drive the vehicle.
 - If the vibration persists or the driveshaft passes visual inspection, measure the driveshaft runout.

Driveshaft Runout

1. Install a Dial Indicator Gauge with Holding Fixture. Rotate the driveshaft by turning the axle and measure the runout at the front, the center and the rear of the driveshaft.
 - If the runout exceeds specifications at the front or center, install a new driveshaft.
 - If the front and center is within specification, but the rear runout is not, index-mark the rear runout high point and proceed to Step 2.
 - If the runout is within specification at all points, recheck for vibration at road test speed. If the vibration persists, balance the driveshaft. Proceed to Driveshaft Balancing in this procedure.
2. **NOTE:** Circular pinion flanges can be turned in 90 degree or one-fourth increments. Half round pinion flanges are limited to 2 positions.

Index-mark the driveshaft to the pinion flange. Disconnect the driveshaft and rotate it 180 degrees. Reconnect the driveshaft. Recheck the runout at the rear of the driveshaft.

- If the runout is still over specification, mark the high point and proceed to Step 3.
 - If the runout is within specification, check for the vibration at the road test speed. If the vibration is still present, balance the driveshaft. Proceed to Driveshaft Balancing in this procedure.
3. Excessive driveshaft runout can originate in the driveshaft itself or from the pinion flange. To find the source, compare the 2 high points previously determined.
 1. Original high runout point.
 2. High runout point after indexing.
 - ◆ If the index marks are close together, within 25 mm (1 in), the driveshaft is eccentric. Install a new driveshaft.
 - ◆ If the marks are on opposite sides of the driveshaft, 180 degrees apart, the slip yoke or pinion flange is responsible. Check the pinion flange runout. If the pinion flange runout exceeds specifications, a bent pinion is indicated.
 - ◆ If the pinion flange and pinion runouts are within specifications, road test and check for the vibration at the road test speed. If the vibration persists, balance the driveshaft. Proceed to Driveshaft Balancing in this procedure.

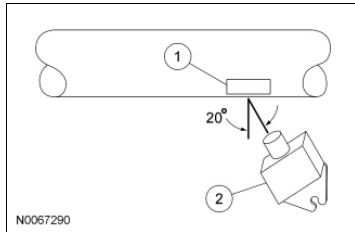


Driveshaft Balancing - Using the MTS 4000

All vehicles

1. Install the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix) to the vehicle.

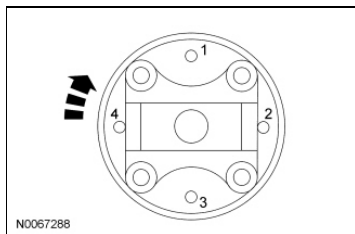
2. Working under the vehicle, install an accelerometer. The accelerometer can be attached and mounted near either the transmission or differential end of the driveshaft.
3. Clean an area of the driveshaft and install the reflective tape, then install the photo-tachometer sensor. The sensor should be placed at approximately a 20 degree angle from perpendicular to the surface of the reflective tape.
 1. Reflective tape.
 2. Photo-tachometer sensor.



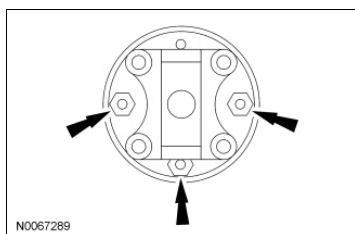
4. Using the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix), run a driveshaft balance test with the driveshaft unmodified.

Vehicles with tapped pinion flanges

5. Label the tapped holes in the pinion flange numerically, starting at the top hole as 1. Mark the remaining holes 2, 3 and 4. Label in the direction of rotation.



6. Using the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix), run a second test with the 12 mm (0.47 in) test weight set screw in the No. 1 hole, previously marked on the pinion flange.
7. Remove the test weight, then install the weight combination directed by the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix).

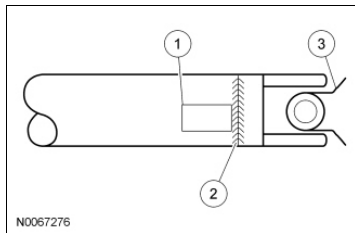


Vehicles without tapped pinion flanges

8. Using the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix), run a second test with a test weight. Using a metal band, secure the test weight to the end of the driveshaft. The weight should be placed at the end of the driveshaft tube, as close to the tube-to-yoke weld seam as possible. Mark the location of the test weight on the driveshaft.
 1. Test weight.
 2. Tube-to-yoke weld seam.

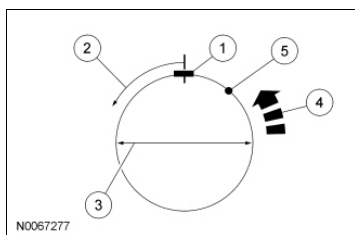
3. Driveshaft pinion flange.

- Select the test weight based on driveshaft size. Larger driveshafts use 10 grams. Smaller driveshafts use 5 grams.



9. Remove the test weight, then install the recommended weight at the position directed by the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix). Using a metal band and epoxy, secure the test weight to the driveshaft.

1. Test weight.
 2. Measure in this direction.
 3. Driveshaft diameter.
 4. Directional rotation.
 5. Balance weight relative to test weight centerline.
- The results are displayed with respect to the location to where the test weight was placed.

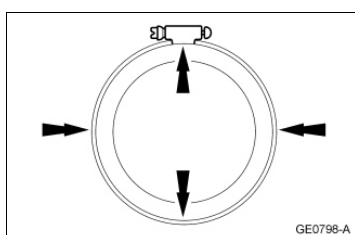


All vehicles

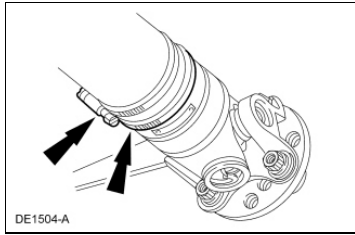
10. Using the Mastertech® Series MTS 4000 Driveline Balance and NVH Analyzer (Vetronix), run a third test to verify the repair.

Driveshaft Balancing - Hose Clamp Method

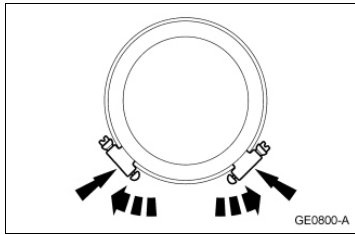
1. Install 1 or 2 hose clamps on the driveshaft, near the rear. Position of the hose clamp head(s) can be determined through trial and error.
2. Mark the rear of the driveshaft into 4 approximately equal sectors and number the marks 1 through 4. Install a hose clamp on the driveshaft with its head at position No. 1. Check for vibration at road speed. Recheck with the clamp at each of the other positions to find the position that shows minimum vibration. If 2 adjacent positions show equal improvement, position the clamp head between them.



3. If the vibration persists, add a second clamp at the same position and recheck for vibration.



4. If no improvement is noted, rotate the clamps in opposite directions, equal distances from the best position determined in Step 2. Separate the clamp heads about 13 mm (1/2 in) and recheck for vibration at the road speed.



5. Repeat the process with increasing separation until the best combination is found or the vibration is reduced to an acceptable level.
-

Material

Item	Specification	Fill Capacity
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B	-
Threadlock and Sealer TA-25	WSK-M2G351-A5	-

Torque Specifications

Description	Nm	lb-ft
Driveshaft flange bolts	112	83

Driveshaft

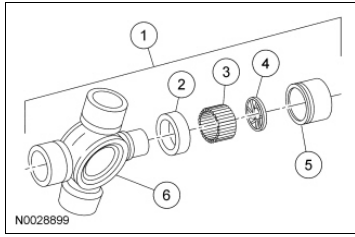
NOTE: Use caution when handling the driveshaft. Any slight dent in the driveshaft could result in a vibration.

The driveshaft has the following features:

- a fully retained U-joint pinion flange for a positive engagement with the rear axle.
- a splined slip-yoke permits the driveshaft to move forward and rearward on the transmission output shaft during drivetrain movement to maintain the required varying driveshaft length during normal vehicle operation.
- conventional U-joints that allow a smooth rotation of the driveshaft through the constantly varying angles the driveshaft encounters during jounce and rebound.

The driveshaft is a tubular shaft that transfers the rotational torque from the transmission to the rear drive axle. The tube can be aluminium or steel and the diameter of the tubes can vary, depending on the application. All driveshafts are balanced as assemblies. If the vehicle is to be undercoated, cover the driveshaft assembly to prevent overspray of any undercoating material.

Universal Joints



Item	Part Number	Description
1	4635	U-joint
2	-	Grease seal (part of 4635)
3	-	32 needle bearings (part of 4635)
4	-	Thrust washer (part of 4635)
5	-	Bearing cup (part of 4635)
6	-	Spider (part of 4635)

U-joints have:

- a lubed-for-life design.
- nylon thrust washers, located at each base of the bearing cup, which control end play, position the needle bearings and improve grease movement.
- 1350 series U-joints (standard) with a 92.07 mm (3-5/8 in) span (span measurements are with bearing cups fully seated on the spider) and 30.18 mm (1-3/16 in) bearing cups.
- snap rings that fit into grooves in the U-joints housing for accurate alignment of the spider and the center of the driveshaft tube.

U-joints maintain a smooth rotational transition through an allowable angle variation during normal vehicle operation. The acceleration and deceleration of the driveshaft is controlled by needle bearings found in the cup.

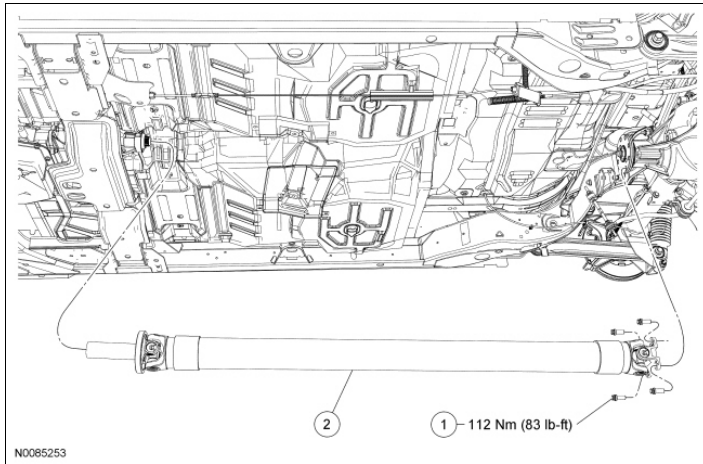
Driveshaft

Refer to Section 205-00 .

Driveshaft

Material

Item	Specification
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B



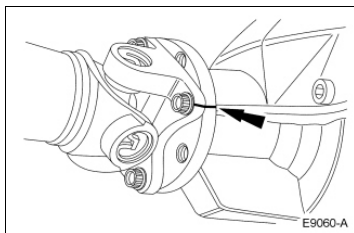
Item	Part Number	Description
1	N800594	Driveshaft attaching bolt (4 required)
2	4602	Driveshaft

Removal and Installation

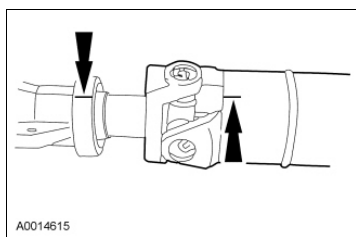
1. **⚠ WARNING:** Before servicing a vehicle equipped with a fire suppression system, depower the system by following the procedure in [Section 100-02B](#) . Failure to follow the instructions may result in serious personal injury.

With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02A](#) .

2. Index-mark the rear axle pinion flange and the driveshaft centering socket yoke.



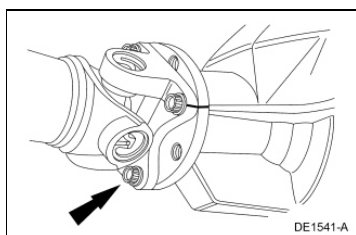
3. Index-mark the transmission extension housing and driveshaft tube.



4. **NOTE:** If new driveshaft flange bolts are not available, coat the threads of the original bolts with the threadlock and sealer.

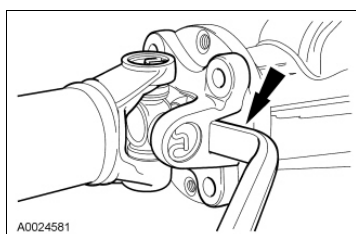
Remove and discard the 4 bolts.

- To install, tighten to 112 Nm (83 lb-ft).



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

Using a suitable tool as shown, disconnect the driveshaft centering socket yoke from the rear axle pinion flange.



6. **NOTE:** Align index marks before removing the driveshaft.

Lower the rear end of the driveshaft to clear the rear axle housing. Pull the driveshaft rearward until the driveshaft slip yoke clears the transmission extension housing.

- Plug the extension housing to prevent fluid loss.

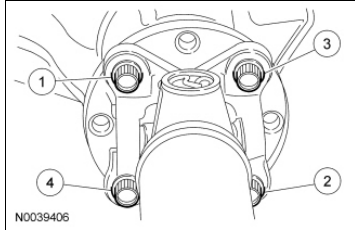
7. **NOTICE:** The driveshaft centering socket yoke fits tightly on the rear axle pinion flange pilot. To make sure that the yoke seats squarely on the flange, tighten the bolts evenly in a cross pattern as shown or damage to the component may occur.

NOTE: Lubricate the slip-yoke spline with long-life grease.

NOTE: If, after installing a new driveshaft, a vibration is encountered, align the factory-made yellow paint mark at the rear of the driveshaft tube with the factory-made yellow paint mark on the rear axle pinion flange as closely as possible. If the paint marks are not visible, refer to [Section 205-00](#) for driveshaft balancing.

NOTE: Inspect the mating surfaces on the rear axle pinion flange and the driveshaft centering socket yoke for foreign material and for damage from nicks or burrs that could prevent the flanges from fitting tightly together. Repair damaged areas or install new components as necessary to make sure a tight fit is obtained.

To install, reverse the removal procedure.

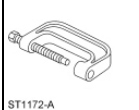


8. **⚠ WARNING: If the vehicle is equipped with a fire suppression system, repower the system. For important safety warnings and procedures, refer to Section 100-02B . Failure to follow these instructions may result in serious personal injury.**

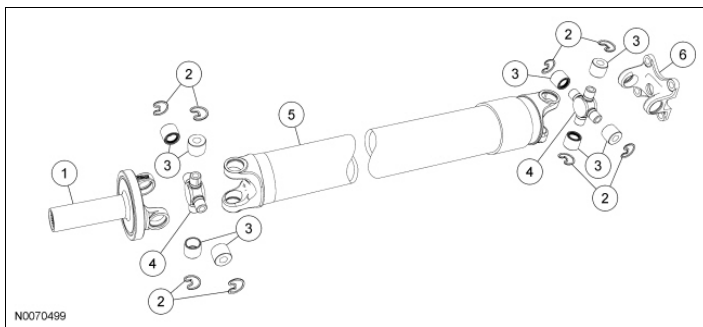
Repower the fire suppression system.

Driveshaft Universal Joint

Special Tool(s)

	Installer/Remover, C-Frame and Screw 205-086 (T74P-4635-C)
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Universal Joint



Item	Part Number	Description
1	4841	Driveshaft slip yoke
2	-	Snap rings (4 required) (part of 4635)
3	-	Bearing cups (part of 4635)
4	-	Spiders (part of 4635)
5	4602	Driveshaft
6	4782	Driveshaft centering socket flange

Disassembly

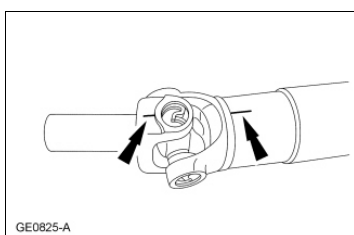
1. Remove the driveshaft. For additional information, refer to Driveshaft in this section.

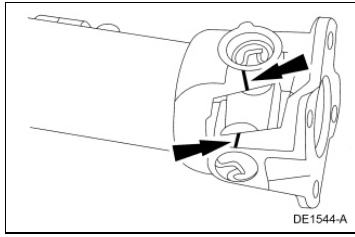
2. **NOTE:** Do not clamp the driveshaft in the jaws of a vise or a similar holding fixture.

Place the driveshaft on a suitable workbench.

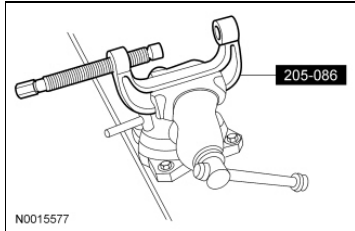
3. **NOTE:** Mark the positions of the driveshaft components relative to the driveshaft tube. Make sure all components are reassembled in the same relationship to maintain correct balance.

Index-mark the driveshaft and driveshaft components.

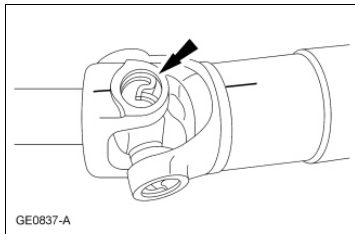




4. Clamp the C-Frame and Screw Installer/Remover in a vise.



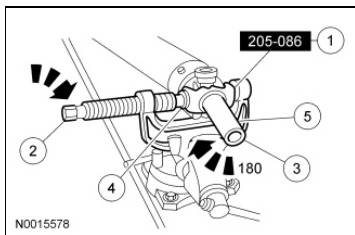
5. Remove the snap rings.



6. **NOTE:** If the bearing cup cannot be pressed all the way out, remove it with vise grips.

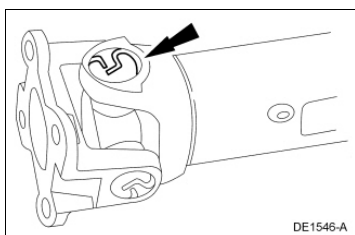
Remove the driveshaft slip yoke.

1. Position the driveshaft in the C-Frame and Screw Installer/Remover.
2. Press out a bearing cup.
3. Rotate the driveshaft 180 degrees.
4. Press on the spider to remove the bearing cup from the opposite side.
5. Remove the driveshaft slip yoke.



7. Remove the remaining bearing cups and the spider.

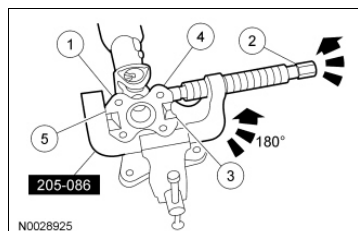
8. Remove the snap rings from the driveshaft centering socket yoke end.



9. **NOTE:** If the bearing cup cannot be pressed all the way out, remove it with vise grips.

Remove the driveshaft centering socket yoke.

1. Position the driveshaft in the C-Frame and Screw Installer/Remover.
2. Press out a bearing cup.
3. Rotate the driveshaft 180 degrees.
4. Press on the spider to remove the bearing cup from the opposite side.
5. Remove the driveshaft centering socket yoke.



10. Remove the remaining bearing cups and the spider.

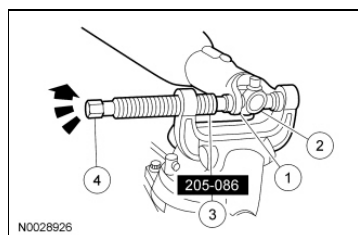
11. Clean the driveshaft yoke area at each end of the driveshaft.

- Inspect the driveshaft and driveshaft components for wear or damage.

Assembly

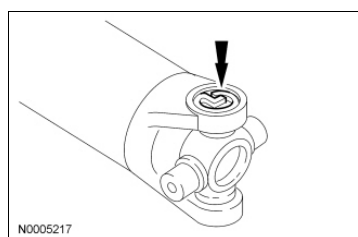
NOTE: U-joint service kits are to be installed as complete assemblies only. Do not use components from other U-joints.

1. Install a new bearing cup.
 1. Start a new bearing cup into the driveshaft yoke.
 2. Position a new spider in the driveshaft yoke.
 3. Install the driveshaft into the C-Frame and Screw Installer/Remover.
 4. Press the bearing cup below the yoke surface.



2. **NOTE:** Use the yellow snap rings supplied in the universal kit. If difficulty is encountered installing the yellow snap rings, install the black snap rings also supplied in the kit.

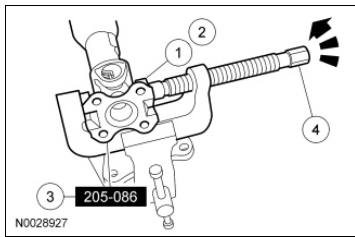
Remove the driveshaft from the C-Frame and Screw Installer/Remover and install the snap ring.



3. Repeat Steps 1 and 2 for the opposite side.

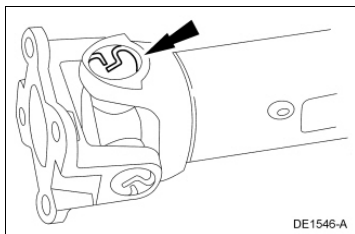
4. Install a new bearing cup.

1. Start a new bearing cup into the driveshaft centering socket yoke.
2. Position a new spider in the driveshaft yoke.
3. Install the driveshaft into the C-Frame and Screw Installer/Remover.
4. Press the bearing cup below the yoke surface.



5. **NOTE:** Use the yellow snap rings supplied in the universal kit. If difficulty is encountered installing the yellow snap rings, install the black snap rings also supplied in the kit.

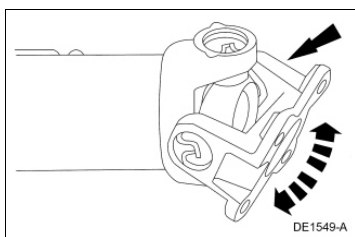
Remove the driveshaft from the C-Frame and Screw Installer/Remover and install the snap ring.



6. Repeat Steps 4 and 5 for the opposite side.

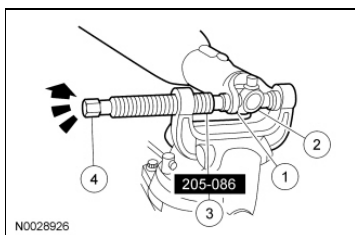
7. **NOTE:** Do not strike the bearings. If binding, strike the yoke with a brass or plastic hammer.

Check the U-joint for freedom of movement.



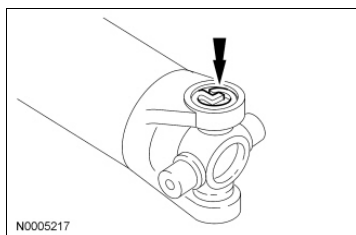
8. Install a new bearing cup.

1. Start a new bearing cup into the driveshaft yoke.
2. Position a new spider in the driveshaft yoke.
3. Install the driveshaft into the C-Frame and Screw Installer/Remover.
4. Press the bearing cup 6.3 mm (0.25 in) below the yoke surface.



9. **NOTE:** Use the yellow snap rings supplied in the universal kit. If difficulty is encountered installing the yellow snap rings, install the black snap rings also supplied in the kit.

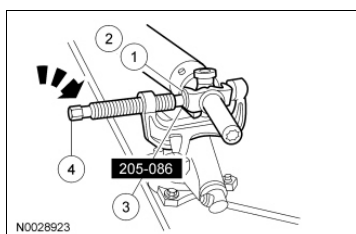
Remove the driveshaft from the C-Frame and Screw Installer/Remover and install the snap ring.



10. Repeat Steps 8 and 9 for the opposite side.

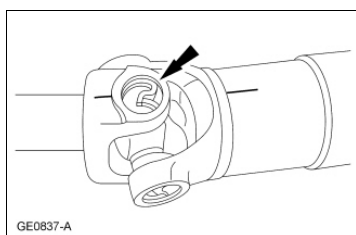
11. Install a new bearing cup.

1. Start a new bearing cup into the driveshaft slip yoke.
2. Position the slip yoke on the spider.
3. Install the driveshaft into the C-Frame and Screw Installer/Remover.
4. Press the bearing cup 6.3 mm (0.25 in) below the yoke surface.



12. **NOTE:** Use the yellow snap rings supplied in the universal kit. If difficulty is encountered installing the yellow snap rings, install the black snap rings also supplied in the kit.

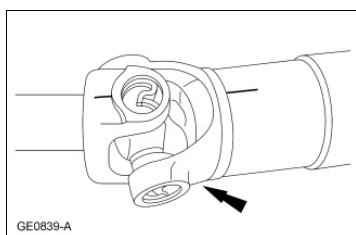
Remove the driveshaft from the C-Frame and Screw Installer/Remover and install the snap ring.



13. Repeat Steps 11 and 12 for the opposite side.

14. **NOTE:** Do not strike the bearings. If binding, strike the yoke with a brass or plastic hammer to seat the bearing cups.

Check the U-joint for freedom of movement.



Material

Item	Specification	Fill Capacity
Additive Friction Modifier XL-3 (US); CXL-3 (Canada)	EST-M2C118-A	118 ml (4 oz)
Motorcraft® High Contrast Hypoid Gear Marking Compound XG-14	-	-
Motorcraft® SAE 75W-140 Synthetic Rear Axle Lubricant XY-75W140-QL (US); CXY-75W140-1L (Canada)	WSL-M2C192-A and GL-5	2.37L (5.0 pt)
Motorcraft® SAE 80W-90 Premium Rear Axle Lubricant XY-80W90-QL (US); CXY-80W90-1L (Canada)	WSP-M2C197-A	2.37L (5.0 pt)
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B	-
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4	-
Threadlock and Sealer TA-25	WSK-M2G351-A5	-

General Specifications

Item	Specification
Clearance, Tolerance and Adjustments	
Backlash between differential ring gear and pinion teeth	0.203-0.305 mm (0.008-0.012 in)
Maximum axle shaft end play	0.762 mm (0.030 in)
Maximum differential case runout	0.076 mm (0.003 in)
Maximum differential ring gear backlash variation between teeth	0.102 mm (0.004 in)
Maximum pinion runout (Total Indicated Runout (TIR))	0.25 mm (0.010 in)
Pinion bearing preload	1.8-3.3 Nm (16-29 lb-in)

Torque Specifications

Description	Nm lb-ft lb-in		
	Nm	lb-ft	lb-in

Differential bearing cap bolt	105	77	-
Differential housing cover bolt ^a	-	-	-
Differential housing cover tag bolt	31	23	-
Differential pinion bearing preload ^a	-	-	-
Differential pinion shaft lock bolt	30	22	-
Differential ring gear bolt ^a	-	-	-
Driveshaft bolts	112	83	-
Fill plug	30	22	-
Handle for Pinion Depth Gauge	2.2	-	20
Lower arm-to-axle nut	150	111	-
Parking brake cable wireform bracket bolts	17	-	150
Rear brake anti-lock sensor bolt	7	-	62
Shock absorber lower nut	90	66	-
Traction-Lok gauge nut	7	-	62
Upper arm-to-axle bolt	90	66	-
Watts linkage pivot nut	250	184	-
Wheel speed sensor bolts	7	-	62

^a Refer to the procedure in this section.

Rear Drive Axle and Differential

The 8.8-in rear axle assembly contains the following features:

- integral-type housing hypoid gear design with the centerline of the pinion set below the centerline of the ring gear.
- hypoid ring and pinion, which consists of a ring gear and an overhung drive pinion which is supported by 2 opposed pinion bearings.
- pinion bearing preload that is maintained by a drive pinion collapsible spacer on the pinion stem and adjusted by the pinion nut.
- differential housing assembly of a cast center section, 2 steel tube assemblies, a steel differential housing cover and a Watts linkage assembly.
- differential housing cover that uses a silicone sealant rather than a gasket.
- differential case that is a 1-piece design with 2 openings to allow for assembly of internal components and lubricant flow.
- differential pinion shaft that is retained by a differential pinion shaft lock bolt assembled to the differential case.
- differential case that is mounted in the rear axle housing between 2 opposed tapered roller differential bearings.
- differential bearing cups that are retained in the rear axle housing by removable bearing caps.
- differential bearing preload and ring gear backlash adjusted by the differential bearing shim located between the differential bearing cup and the rear axle housing.
- differential which comes in either the conventional open style or a Traction-Lok design.
- semi-floating axle shafts that are held in the housing by U-washers positioned in the slot on the axle shaft splined end.
- U-washers that fit into a recess in the differential side gears within the differential case.

The rear axle assembly receives rotational input from the driveshaft through a piloted pinion flange. The drive pinion drives the ring which is bolted to the differential case. The design of the differential allows the side gears in the case to rotate at different speeds. The axle shafts are splined to the side gears permitting the vehicle to manipulate corners without sliding the inside tire. The weight of the vehicle is carried through the axle shaft bearing located in the tubes of the axle housing.

SECTION 205-02: Rear Drive Axle/Differential - Ford
8.8-Inch Ring Gear
DIAGNOSIS AND TESTING

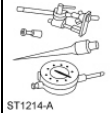
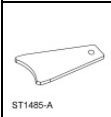
2011 Crown Victoria, Grand Marquis
Workshop Manual
Procedure revision date: 04/19/2011

Rear Drive Axle and Differential

Refer to Section 205-00.

Ring Gear Backlash Adjustment

Special Tool(s)

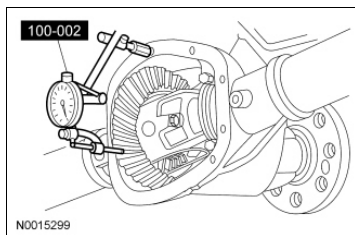
 <p>ST1214-A</p>	Dial Indicator Gauge With Holding Fixture 100-002 (TOOL-4201-C)
 <p>ST1485-A</p>	Installer, Differential Shim 205-220 (T85L-4067-AH)

Material

Item	Specification
Motorcraft® High Contrast Hypoid Gear Marking Compound XG-14	-

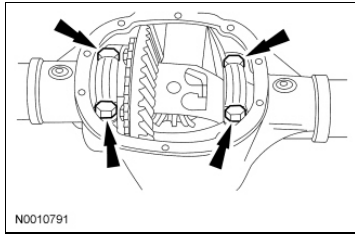
⚠ WARNING: Before servicing a vehicle equipped with a fire suppression system, depower the system by following the procedure in **Section 100-02B** . Failure to follow the instructions may result in serious personal injury.

1. Remove the differential housing cover. For additional information, refer to Differential Housing Cover in this section.
2. Install the Dial Indicator Gauge with Holding Fixture and measure the ring gear backlash.
 - If a zero backlash condition occurs or the backlash is not within specification, proceed to Step 3.
 - If the backlash is within specification, proceed to Step 14.



3. Remove the axle shafts. For additional information, refer to Axle Shaft in this section.
4. **NOTE:** Index-mark the position of the differential bearing caps, as arrows may not be visible. The differential bearing caps must be installed in their original locations and positions.

Remove the 4 bearing cap bolts and 2 caps.



5. If a zero backlash condition had occurred, add 0.50 mm (0.020 in) to the RH side shim and subtract 0.50 mm (0.020 in) from the LH side shim to allow a backlash indication. Install the 2 bearing caps and 4 bolts.
 - Tighten to 105 Nm (77 lb-ft).
 - Go back to Step 2.

6. To correct for high or low backlash, increase the thickness of one differential bearing shim and decrease the thickness of the other differential bearing shim by the same amount. Refer to the following tables when adjusting the backlash.

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

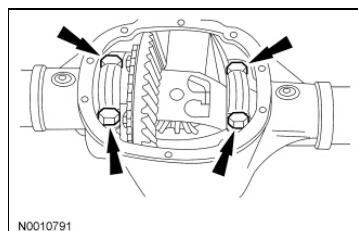
Differential Shim Size Chart 4067

Stripes and Color Code	Dimension A	
	mm	Inch
2 - C-COAL	7.7978-7.8105	0.3070-0.3075
1 - C-COAL	7.7470-7.7597	0.3050-0.3055
5 - BLU	7.6962-7.7089	0.3030-0.3035
4 - BLU	7.6454-7.6581	0.3010-0.3015

3 - BLU	7.5946-7.6073	0.2990-0.2995
2 - BLU	7.5458-7.5565	0.2970-0.2975
5 - PINK	7.4422-7.4549	0.2930-0.2935
4 - PINK	7.3914-7.4041	0.2910-0.2915
3 - PINK	7.3406-7.3533	0.2890-0.2895
2 - PINK	7.2898-7.3025	0.2870-0.2875
1 - PINK	7.2390-7.2517	0.2850-0.2855
5 - GRN	7.1882-7.2009	0.2830-0.2835
4 - GRN	7.1374-7.1501	0.2810-0.2815
3 - GRN	7.0866-7.0993	0.2790-0.2795
2 - GRN	7.0358-7.0485	0.2770-0.2775
1 - GRN	6.9850-7.0485	0.2750-0.2755
5 - WH	6.9342-6.9469	0.2730-0.2735
4 - WH	6.8834-6.8961	0.2710-0.2715
3 - WH	6.8326-6.8453	0.2690-0.2695
2 - WH	6.7818-6.7945	0.2670-0.2675
1 - WH	6.7310-6.7437	0.2650-0.2655
5 - YEL	6.6802-6.6929	0.2630-0.2635
4 - YEL	6.6294-6.6421	0.2610-0.2615
3 - YEL	6.5786-6.5913	0.2590-0.2595
2 - YEL	6.5278-6.5405	0.2570-0.2575
1 - YEL	6.4770-6.4897	0.2550-0.2555
5 - ORNG	6.4262-6.4389	0.2530-0.2535
4 - ORNG	6.3754-6.3881	0.2510-0.2515
3 - ORNG	6.3246-6.3373	0.2490-0.2495
2 - ORNG	6.2738-6.2865	0.2470-0.2475
1 - ORNG	6.2223-6.2357	0.2450-0.2455
2 - RED	6.1722-6.1849	0.2430-0.2435
1 - RED	6.1214-6.1341	0.2410-0.2415

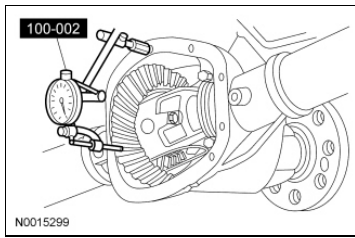
7. Install the 2 bearing caps and 4 bolts.

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



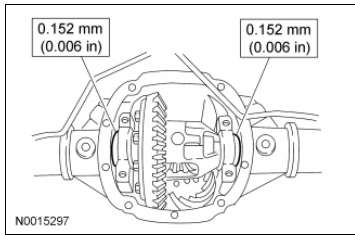
8. Using the Dial Indicator Gauge with Holding Fixture, recheck the ring gear backlash.

- If backlash is now within specification, proceed to Step 9.
- If backlash is not within specification, go back to Step 4.

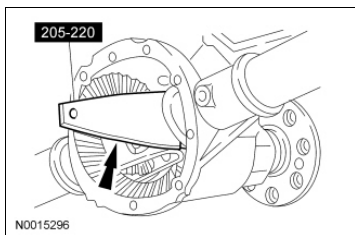


9. Remove the 4 bearing cap bolts and 2 bearing caps.

10. To establish differential bearing preload, increase both LH and RH differential bearing shim size by the thickness shown.

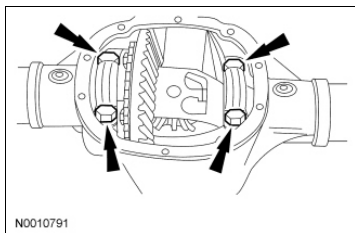


11. Using the Differential Shim Installer, fully seat the differential bearing shims. Make sure the assembly rotates freely.

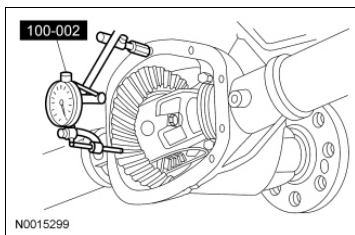


12. Install the 2 bearing caps and 4 bolts.

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



13. Using the Dial Indicator Gauge with Holding Fixture, do a final check of the ring gear backlash.



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

15. Verify an acceptable pattern check. For additional information, refer to Tooth Contact Pattern Check in [Section 205-00](#).

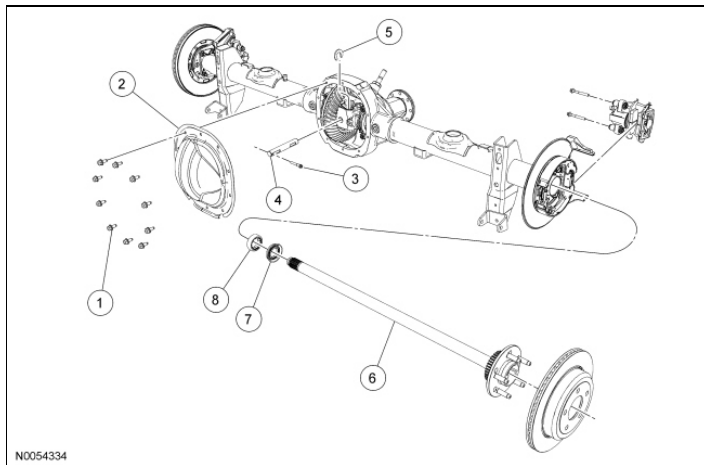
16. Install the axle shafts. For additional information, refer to Axle Shaft in this section.
17. Install the differential housing cover. For additional information, refer to Differential Housing Cover in this section.
18. **⚠ WARNING: If the vehicle is equipped with a fire suppression system, repower the system. For important safety warnings and procedures, refer to Section 100-02B . Failure to follow these instructions may result in serious personal injury.**

Repower the system.

Axle Shaft

Material

Item	Specification
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B



Item	Part Number	Description
1	4346	Differential housing cover bolt (10 required)
2	4033	Differential housing cover
3	4241	Differential pinion shaft lock bolt
4	4211	Differential pinion shaft
5	4N237	Axle shaft U-washer
6	4234	Axle shaft
7	1177	Wheel bearing oil seal
8	1225	Rear wheel bearing

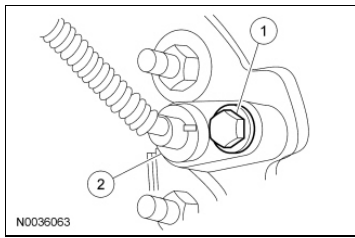
Removal

1. **⚠ WARNING:** Before servicing a vehicle equipped with a fire suppression system, depower the system by following the procedure in [Section 100-02B](#) . Failure to follow the instructions may result in serious personal injury.

NOTE: When removing the rear brake caliper in this procedure, it is not necessary to disconnect the hydraulic lines.

Remove the brake disc. For additional information, refer to [Section 206-04](#) .

2. Position the rear brake anti-lock sensor aside.
 1. Remove the bolt.
 2. Remove the sensor and position it aside.

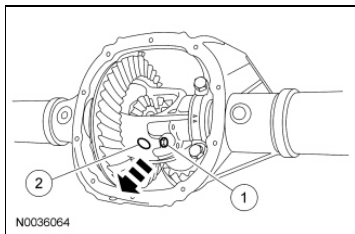


3. Remove the differential housing cover. For additional information, refer to Differential Housing Cover in this section.

4. **NOTICE:** Once the differential pinion shaft has been removed, turning the differential case or an axle shaft can cause the differential pinion gears to fall out of the assembly. This may result in damage to the component.

Remove the differential pinion shaft.

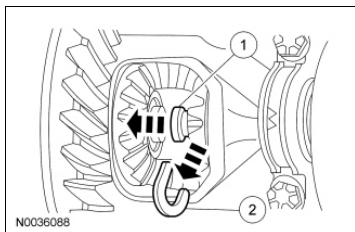
1. Remove the differential pinion shaft lock bolt.
2. Remove the differential pinion shaft.



5. **NOTE:** Do not damage the rubber O-ring in the axle shaft U-washer groove.

Remove the axle shaft U-washer.

1. Push the axle shaft inboard.
2. Remove the U-washer.



6. Reinstall the differential pinion shaft.

1. Push the axle shaft outboard.
2. Install the differential pinion shaft.
3. Install the differential pinion shaft lock bolt finger-tight.

