

- **NOISE/VIBRATION—WHEN DRIVING IN 4X2 MODE WITH HUBS LOCKED—4X4 MODELS**
- **DRIVELINE—VIBRATION/NOISE—WHEN DRIVING IN 4X2 MODE WITH HUBS LOCKED—4X4 MODELS**

**Article No.  
97-13-22**

**FORD:** 1987-1996 BRONCO, F-150, F-250 LD  
1987-1997 F-250 HD

This TSB article is republished in its entirety to include 1996 and 1997 model year vehicles.

### **ISSUE**

A driveline vibration or noise may occur when driving a 4X4 truck at highway speeds in a 4X2 mode with the front drive hubs locked. This can occur if the driveline angle is incorrect.

### **ACTION**

Replace the front driveshaft with one that has a double cardan joint at the transfer case and a compatible companion flange for the transfer case. Refer to the following Service Procedure for details.

### **FRONT DRIVESHAFT REMOVAL**

1. Disconnect the single cardan U-joints at the transfer case yoke and the front axle yoke. Remove the driveshaft.
2. Remove the single cardan output shaft yoke and slinger at the transfer case.
  - a. Remove the 30mm nut, steel washer, and rubber seal.
  - b. Remove the yoke and slinger together.

### **FRONT DRIVESHAFT INSTALLATION**

1. Install the double cardan yoke on the transfer case front output shaft. Place the slinger, rubber seal, steel washer, and locknut on the output shaft. Tighten the nut to 203-244 N•m (150-180 lb-ft).
2. Install the front driveshaft.
  - a. Position the double cardan U-joint end of the driveshaft to the transfer case front output yoke.
  - b. Install the four (4) bolts, Figure 1.

3. Install the driveshaft to the front axle yoke using two (2) U-bolts, four (4) washers and nuts, Figure 1.
4. Tighten the bolts at the transfer case to 27-38 N•m (20-28 lb-ft). Tighten the nuts at the front axle to 11-20 N•m (8-15 lb-ft).

### **FRONT DRIVELINE BALANCE EVALUATION AND CORRECTION**

The truck should be driven and evaluated in the 4X2 mode with the front hubs locked to determine if driveline balance disturbances are present in the 80-113 km/h (50-70 mph) drive range. If a balance adjustment is required, proceed with the following driveline field balance procedure.

### **DRIVELINE FIELD BALANCE PROCEDURE**

This procedure is equally effective for balancing front or rear drivelines. Because most trucks are more balance-sensitive at the axle end of the system, it is usually best to start there, then correct at the transmission/transfer case if necessary.

### **CAUTION**

**THE TIRES AND WHEELS MUST BE BALANCED BEFORE ADDRESSING OR FINE TUNING THE DRIVESHAFT.**

### **NOTE**

**TO USE THIS PROCEDURE PROPERLY, YOU MUST...**

1. First, locate the PLANE OF IMBALANCE on the driveshaft (sweet spot) where the correction weights should be placed.
2. After the plane of imbalance is located, the amount of WEIGHT is ADJUSTED for best results.

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## PLANE OF BALANCE

1. Mark and number four (4) equally spaced (90°) points on the driveshaft tube or slip yoke as close as possible to the U-joint.
2. Install a hose clamp at the number one (1) position.

### NOTE

**SEVERELY IMBALANCED SYSTEMS MAY REQUIRE TWO (2) CLAMPS TO SHOW A RESPONSE.**

3. Drive/evaluate and record the vibration rating with the clamp at each of the four (4) marked locations.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

### NOTE

**NONE OF THE ABOVE POINTS MAY BE PARTICULARLY GOOD, BUT THAT DOES NOT MATTER. AT THIS TIME YOU ARE MERELY TRYING TO FIND A POINT OR POINTS THAT TEND TO BE BETTER THAN THE REST.**

4. If one (1) of the above points is clearly better than the other three (3), evaluate and record your ratings with the clamp moved 45° either side of that point.

+45° \_\_\_\_\_ -45° \_\_\_\_\_

5. If Step 3 showed two (2) points that were about equal, evaluate and record your rating with the clamp moved to a point midway between these points.

Mid-point \_\_\_\_\_

6. The plane of imbalance will be located at the best point found in either Steps 3, 4 or 5. Mark this point as your reference point for the following weight adjustment steps.

## WEIGHT ADJUSTMENT

1. A second hose clamp can be added in line with the first one.
2. Two (2) hose clamps aligned 45° either side of the reference line will have the effect of one and one-half (1-1/2) hose clamps.

3. A typical hose clamp barrel weighs about 14 grams (0.5 ounce). A 7 gram (0.25 ounce) lead tire weight can be placed under the clamp opposite the barrel to cut its effect in half.

PART NUMBER	PART NAME
F1TZ-4A376-A	Driveshaft Assembly - All M5OD Transmissions - ZF Transmissions With 4.9L Or 5.8L Engines
F1TZ-4A376-C	Driveshaft Assembly - All C6 And T18 Transmissions - ZF Transmissions With 7.3L(D) Or 7.5L Engines
F1TZ-4A376-D	Driveshaft Assembly - AOD Transmissions
F1TZ-4A376-B	Driveshaft Assembly - E4OD Transmission - All Engines
E7TZ-7B214-C	Front Output Yoke - 1356 Transfer Case
E1TZ-7B214-D	Front Output Yoke - 1345 Transfer Case
F5TZ-7B214-B	Front Output Yoke - 4407 Transfer Case
E1TZ-7C016-A	Front Dust Slinger - 1345 Transfer Case
45338-S2	Nut - 5/16"-18 (Hex With Captive Conical Washer) (4 Req'd.)
385883-S100	Bolt - 5/16"-24x1.25 (Double Cardan Driveshaft) (4 Req'd.)
D3AZ-4529-C	U-Bolt - Universal Joint (Driveshaft-To-Axle) (2 Req'd.)

**OTHER APPLICABLE ARTICLES: NONE**

**SUPERSEDES: 95-1-9**

**WARRANTY STATUS:** Eligible Under The Provisions Of Bumper To Bumper Warranty Coverage For 1992-97 Models, Basic Warranty Coverage, Powertrain Warranty Coverage For All Other Model Years

OPERATION	DESCRIPTION	TIME
971322A	Replace Driveshaft Assembly And Companion Flange	0.7 Hr.
971322B	Additional Time To Balance Driveshaft Assembly (If Required)	2.4 Hrs.

## DEALER CODING

BASIC PART NO.	CONDITION
4A376	CODE
	41
<b>OASIS CODES: 508000, 597997, 702100, 703000</b>	

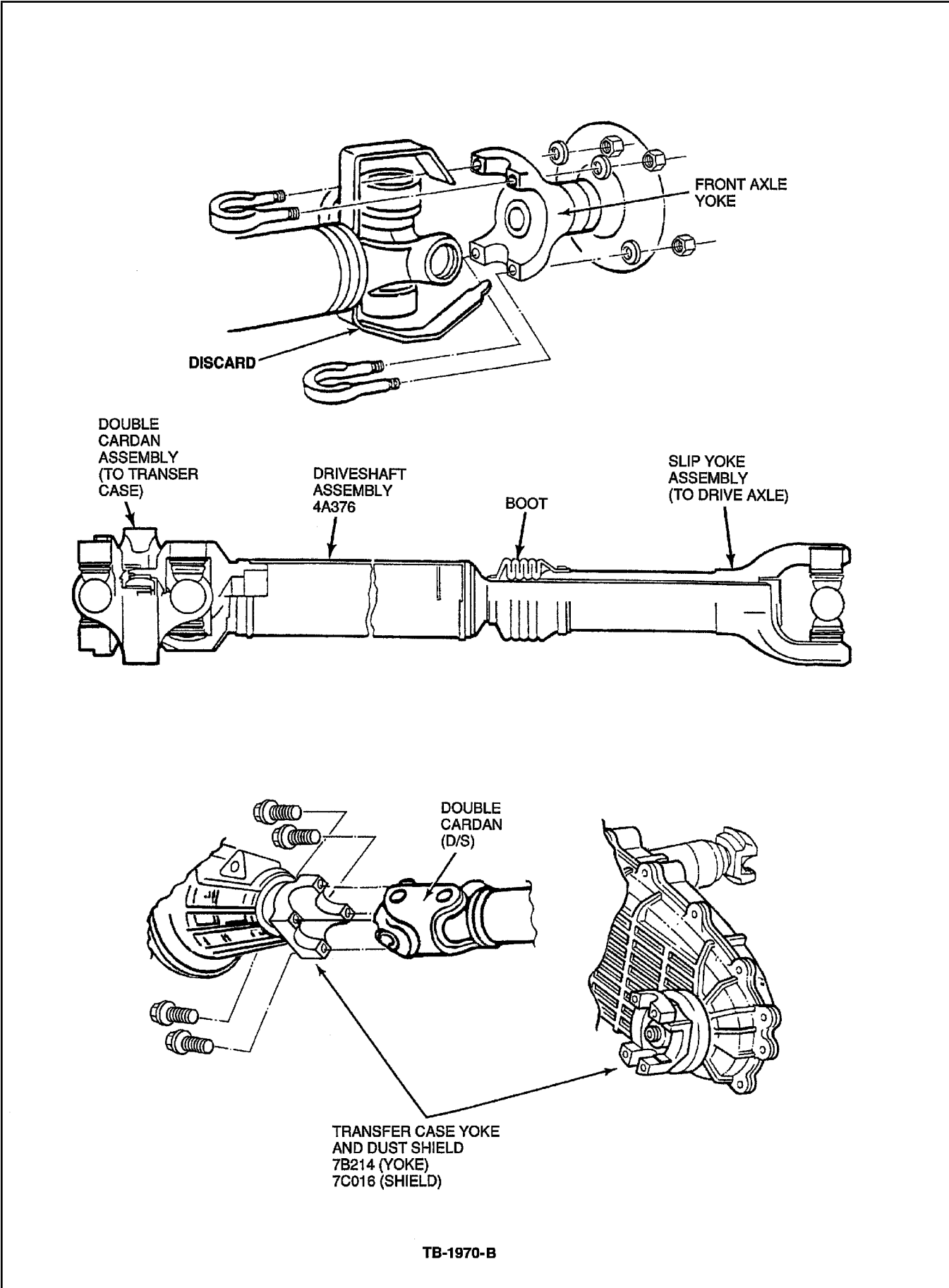


Figure 1 - Article 97-13-22