

Driveline/Axle

Propeller Shaft - CTS Coupe & Wagon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Propeller Shaft		
Propeller Shaft C/V Flange Bolts	30 N.m	22 lb ft
Rear Propeller Shaft		
Center Bearing Mounting Bolt (with metal shims)	50 N.m	37 lb ft
Center Bearing Mounting Bolt (with rubber insulators)	35 N.m	26 lb ft
Rubber Couplings to Flanges	90 N.m	66 lb ft
V 8 Propeller Shaft C/V Flange Bolts	65 N.m	48 lb ft
V 6 Propeller Shaft C/V Flange Bolts	40 N.m	29 lb ft

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Adhesives, Fluids, Lubricants, and Sealers

Application	Type of Material	GM Part Number	
		United States	Canada
Centering Bushing	Lubricant	1051344	993037
Propeller Shaft-to-Flange Bolts	Threadlocker	89021297	10953488

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - PROPELLER SHAFT

Before beginning diagnosis, review the system description and operation in order to familiarize yourself with the system function. Refer to **Propeller Shaft Description and Operation**.

Classifying the Symptom

Propeller Shaft symptoms can usually be classified into the following categories:

- Noises
- Vibrations

Noise related symptoms are diagnosed within the Propeller Shaft section. For vibration related symptoms, refer to **Diagnostic Starting Point - Vehicle**.

Visual/Physical Inspection

- Inspect the system for aftermarket devices which could affect the operation of the Propeller Shaft.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect any and all fasteners for damage or excessive wear.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Universal Joint Noise**
- **Ping, Snap, or Click Noise**
- **Knock or Clunk Noise**
- **Scraping Noise**
- **Squeak Noise**
- **Shudder on Acceleration at Low Speed**

UNIVERSAL JOINT NOISE

Universal Joint Noise

Problem	Action
One or more of the universal joints are worn or damaged.	Replace the propeller shaft assembly.
One or more of the universal joints have lost lubricant.	Replace the propeller shaft assembly.
Rubber coupling bolts loose at transmission or axle flange.	Tighten the bolts to specifications. Refer to <u>Fastener Tightening Specifications</u> .
Bolts loose at propeller shaft flange and coupling.	Tighten the bolts to specifications. Refer to <u>Fastener Tightening Specifications</u> .

PING, SNAP, OR CLICK NOISE

Ping, Snap, or Click Noise

Checks	Action
DEFINITION: A ping, snap or click is usually heard on initial load after the transmission is in gear, either in forward or reverse.	
A loose pinion yoke or companion flange	Tighten the bolts and the pinion nut to specified torque. Refer to <u>Fastener Tightening Specifications</u> .
Loose rubber coupling	Tighten the bolts to specified torque. Refer to <u>Fastener Tightening Specifications</u> .
One or more of the universal joints are worn or damaged	Replace the propeller shaft assembly.
Heat shield interference	Eliminate interference.

KNOCK OR CLUNK NOISE

Knock or Clunk Noise

Cause	Correction
DEFINITION: Knocking or clunking noise occurs when operating the vehicle in high gear or coasting in neutral at 16 km/h (10 mph).	
C/V joint worn or loose/ripped boot	Replace the propeller shaft assembly.
The side gear hub counterbore in the differential is worn oversize.	Replace the differential case and/or the side gears. Refer to <u>Differential Replacement</u> .

SCRAPING NOISE

Scraping Noise

Checks	Action
DEFINITION: A scraping noise occurs when driving the vehicle at various speeds.	
The pinion flange deflector or the center bearing is rubbing.	Correct the interference as necessary.
Center bearing heat shield	Correct the interference as necessary.
Exhaust pipe contact	Correct the interference as necessary.

SQUEAK NOISE

Squeak Noise

Checks	Action
DEFINITION: When driving the vehicle at various speeds a squeaking sound occurs.	
One or more of the universal joints have lost lubricant.	Replace the driveshaft complete.
C/V boot worn or torn	Replace the driveshaft complete.

SHUDDER ON ACCELERATION AT LOW SPEED

Shudder on Acceleration at Low Speed

Checks	Action
DEFINITION: When the vehicle is accelerating at low speed a shudder occurs.	
The driveline center bearing splined shaft angle is excessive or incorrectly set.	Determine if the driveline angle is incorrect then correct as necessary. Refer to <u>Diagnostic Starting Point - Vehicle</u> .
One or more of the universal joints are worn or damaged.	Replace the driveshaft complete.
Rubber coupling bolts loose	Tighten the bolts to specifications. Refer to <u>Fastener Tightening Specifications</u> .

REPAIR INSTRUCTIONS

FRONT PROPELLER SHAFT REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the lower engine shield.
3. Remove the right catalytic convertor. Refer to Catalytic Converter Replacement - Right Side (LFW,LFX) , Catalytic Converter Replacement - Right Side (LSA) .
4. Remove the front propeller shaft heat shield. Refer to Front Axle Propeller Shaft Heat Shield Replacement .

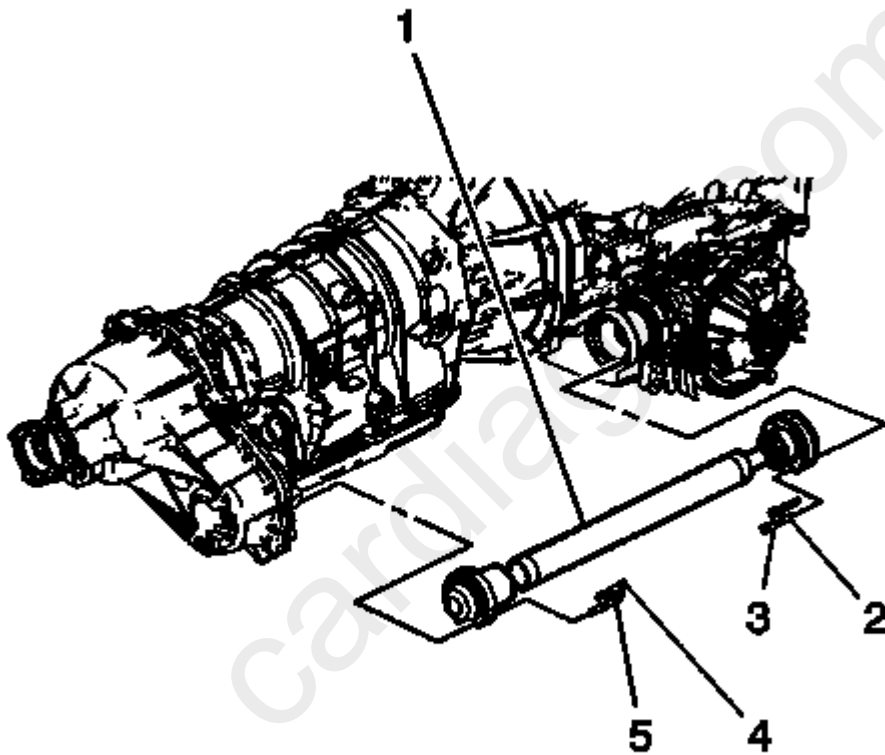


Fig. 1: Identifying Propeller Shaft Components
Courtesy of GENERAL MOTORS COMPANY

NOTE: Mark the relationship of the propeller shaft to the front drive axle and transfer case flanges.

5. Remove the front propeller mounting bolts (4) and locks (4) from the transfer case drive flange.
6. Remove the front propeller shaft mounting bolts (2) and locks (3) from the front drive axle.
7. Using a flat bladed screw driver, remove the front propeller shaft front from the transfer case and front

drive axle drive flanges.

8. Remove the front propeller shaft (1) from the vehicle.

Installation Procedure

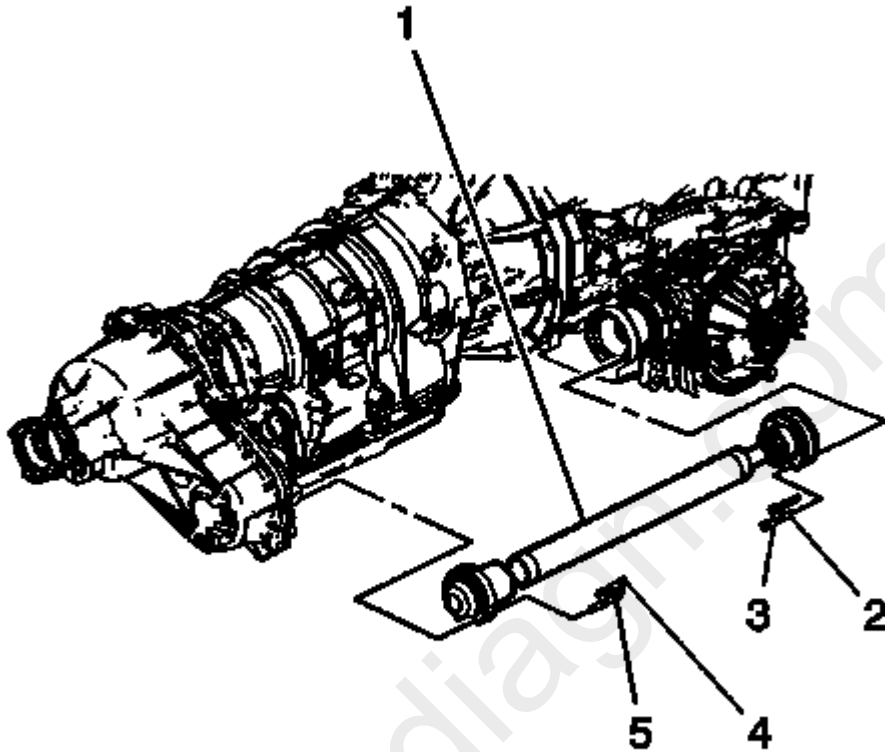


Fig. 2: Identifying Propeller Shaft Components
Courtesy of GENERAL MOTORS COMPANY

NOTE: In the following service procedures, ensure that cones on either end of the propeller shaft are properly seated in the drive flanges.

NOTE: Align the reference marks on the propeller shaft to the drives on the transfer case and the front drive axle.

1. Install the propeller shaft (1) in the front drive axle flange.
2. Install the propeller (1) shaft in the transfer case drive flange.

CAUTION: Refer to Fastener Caution .

NOTE: In steps 3 and 4, secure the bolt at the 12 o'clock first then the bolt at the 6 o'clock position before securing the remaining bolts and locks.

3. Install the mounting bolts (2) and the locks (3) to the front drive axle flange and tighten to 30 N.m (22 lb ft).
4. Install the mounting bolts (4) and the locks (5) to the rear drive axle flange and tighten to 30 N.m (22 lb ft).
5. Install the front propeller shaft axle heat shield. Refer to **Front Axle Propeller Shaft Heat Shield Replacement** .
6. Install the right catalytic convertor. Refer to **Catalytic Converter Replacement - Right Side (LFW,LFX)** , **Catalytic Converter Replacement - Right Side (LSA)** .
7. Install the lower engine shield.
8. Remove the support and lower the vehicle.

REAR PROPELLER SHAFT REPLACEMENT (RPO LSA)

CAUTION: The propeller shaft must be supported during removal and/or installation so that the CV joint does not articulate more than 8 degrees. Allowing the propeller shaft to articulate greater than 8 degrees could cause damage to the CV boot. Damage to boot could lead to contamination or loss of lubrication which could lead to CV joint damage.

Removal Procedure

NOTE: Before removing the propeller shaft from the vehicle, paint or scribe references marks on the transfer case or transmission flange to the propeller shaft and the rear differential drive flange to ensure minimal driveline system imbalance.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the rear muffler. Refer to **Exhaust System Replacement (LSA-Coupe)** , **Exhaust System Replacement (LSA-Wagon)** .
3. Remove the floor pan mid tunnel insulator.

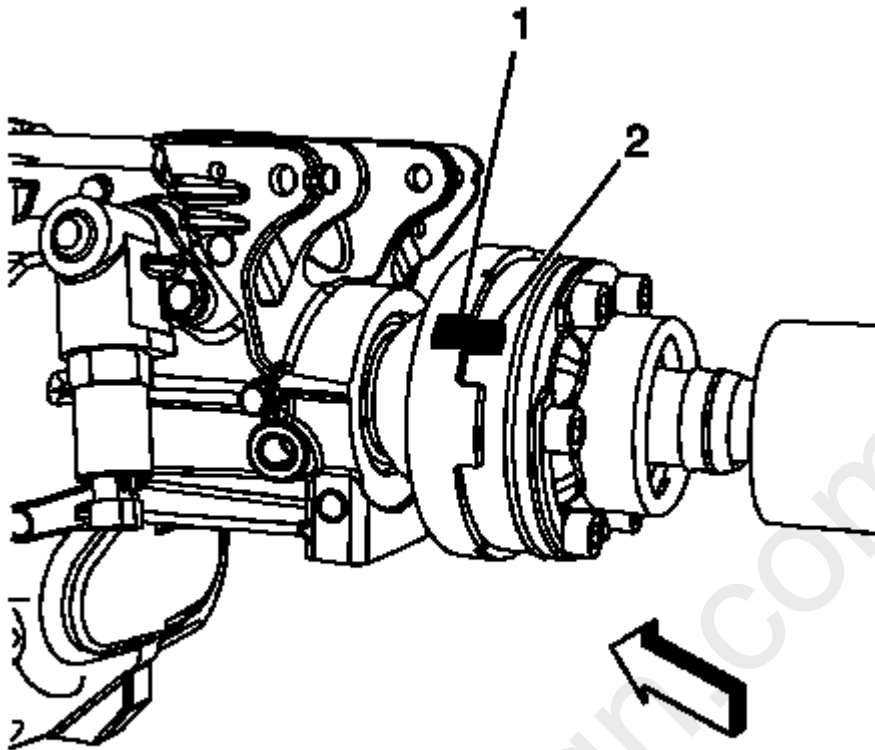


Fig. 3: Marking Relationship Of Propeller Shaft To Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

4. Mark the relationship of the propeller shaft (1) to the transmission flange (2).

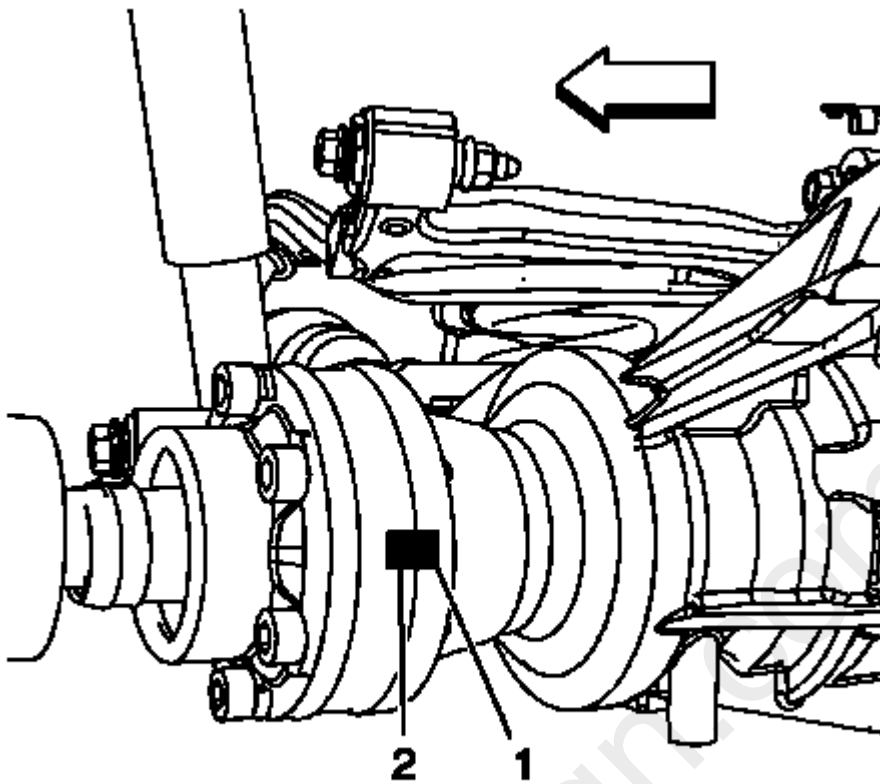


Fig. 4: Marking Relationship Of Propeller Shaft To Rear Differential Flange
Courtesy of GENERAL MOTORS COMPANY

5. Mark the relationship of the propeller shaft (2) to the rear differential flange (1).
6. Using a suitable jack stand, support the propeller shaft at the center support bearing.

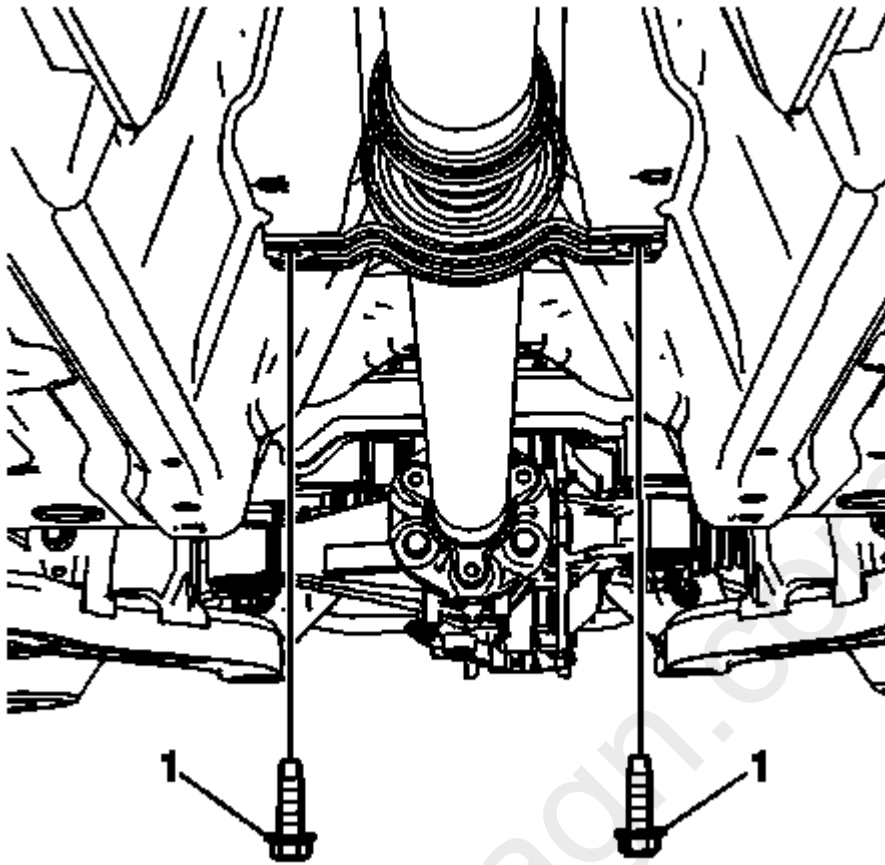


Fig. 5: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Some vehicles are equipped with shims or rubber insulators between the center support bearing and the mounting bracket for the center support bearing for the proper driveshaft angle. DO NOT discard these shims or rubber insulators. If the shims or rubber insulators are present, they must be reused.

7. Remove the mounting bolts (1) for the center support bearing.

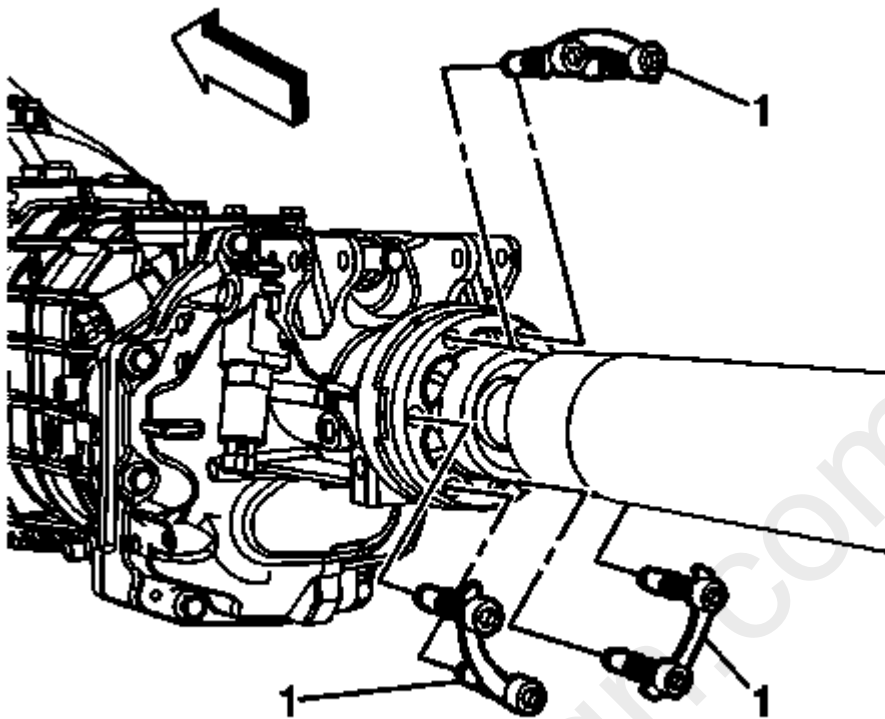


Fig. 6: Identifying Propeller Shaft Bolts & Washers
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the bolts and washers are found to be damaged or are excessively worn, DO NOT reuse the bolts and washers. Replace with new.

8. Remove the bolts and washers (1) from the propeller shaft.

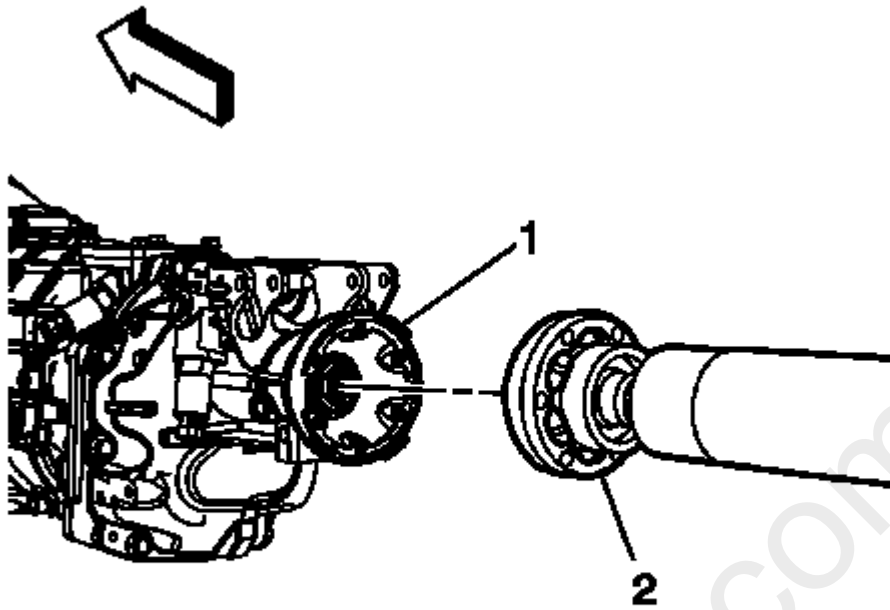


Fig. 7: Removing/Installing propeller shaft At Transmission
Courtesy of GENERAL MOTORS COMPANY

9. Using the appropriate tool, remove the propeller shaft (2) from the transmission (1).
10. Support the propeller shaft at the transmission.

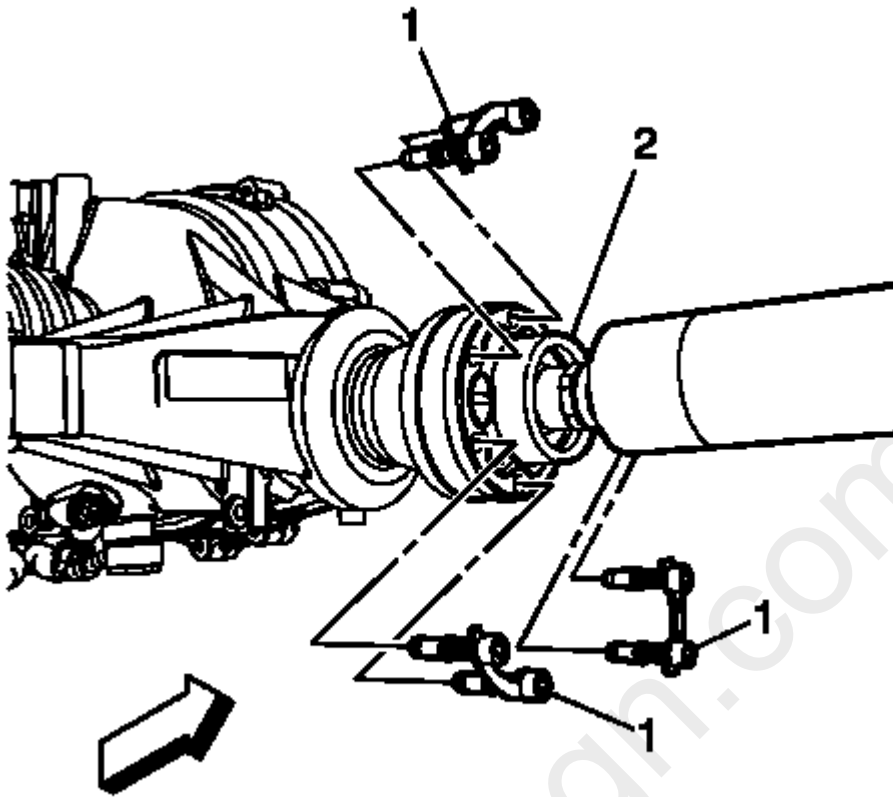


Fig. 8: Identifying Propeller Shaft Bolts & Washers
Courtesy of GENERAL MOTORS COMPANY

NOTE: If removing the propeller shaft from the rear differential to service driveline other components, relocate the propeller shaft and support with mechanics wire or equivalent.

11. Remove the bolts and washers (1) from the propeller shaft (2).

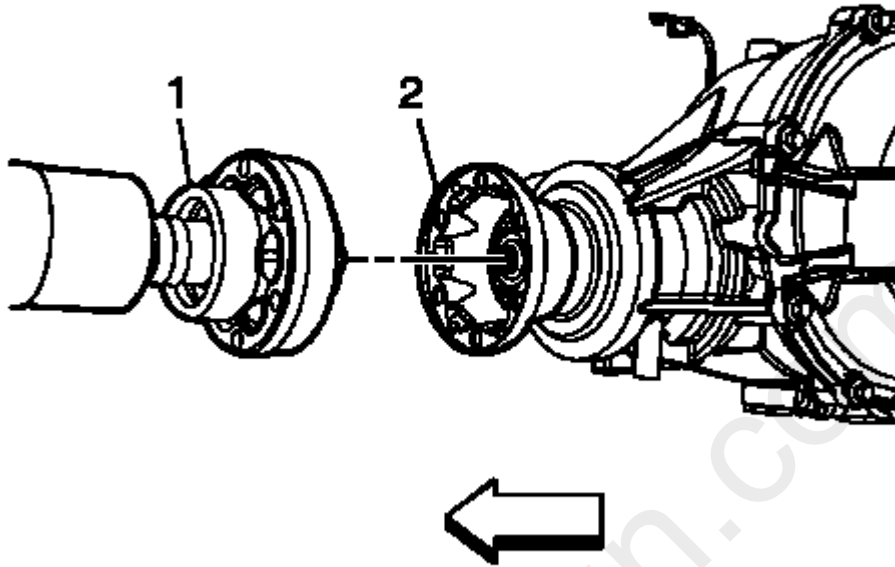


Fig. 9: Removing/Installing Propeller Shaft At Rear Differential
Courtesy of GENERAL MOTORS COMPANY

12. Remove the propeller shaft (1) from the rear differential (2).
13. With the aid of an assistant, remove the propeller shaft from the vehicle.

Installation Procedure

NOTE:

- Align the paint or scribe marks on the transfer case or the transmission flange and the rear differential flange to ensure minimal driveline system balance.
- When installing the propeller shaft, install the propeller shaft to the transmission drive flange and the rear differential flange prior to install the center support bearing.

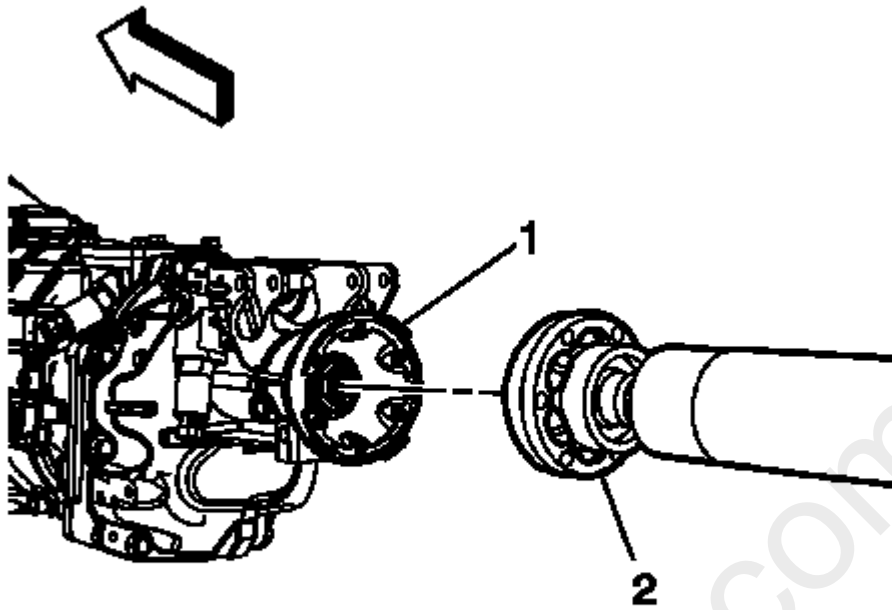


Fig. 10: Removing/Installing propeller shaft At Transmission
Courtesy of GENERAL MOTORS COMPANY

1. With the aid of an assistant, position the propeller shaft (2) in the transmission flange (1).

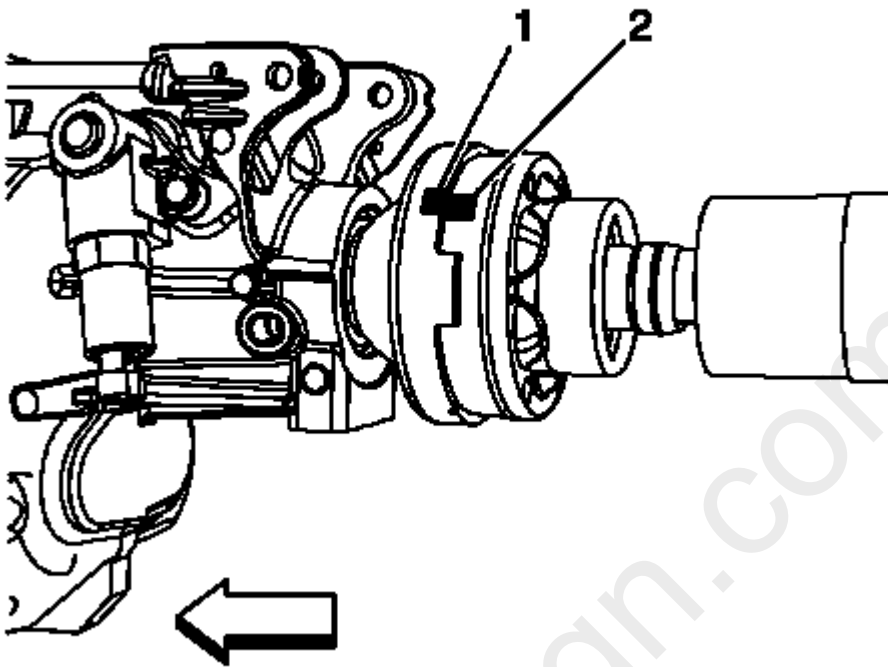


Fig. 11: Aligning Marks Of Propeller Shaft To Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

2. Align the reference marks on the propeller shaft (2) and the transmission flange (1).

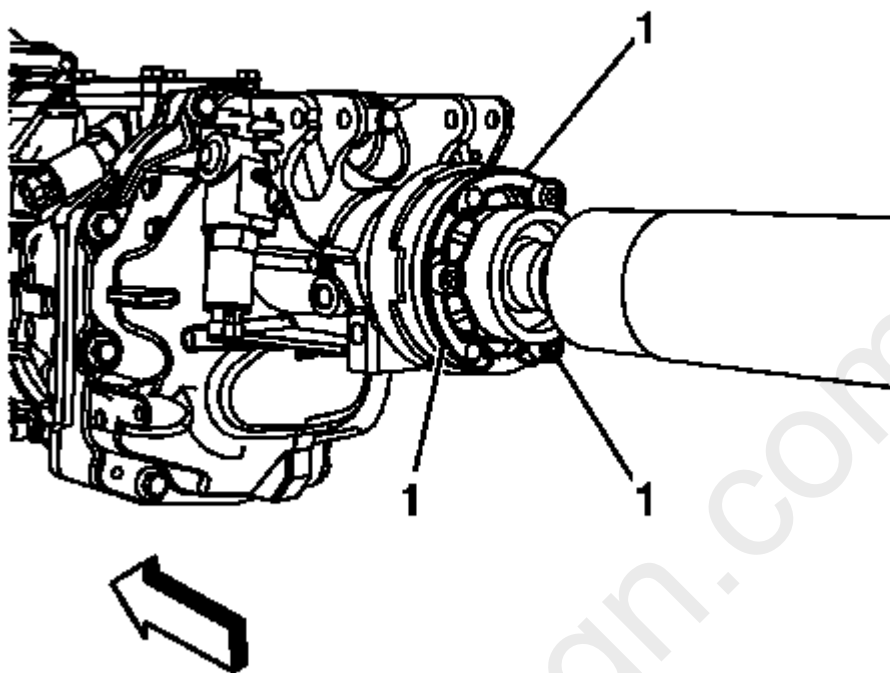


Fig. 12: Identifying Propeller Shaft Bolts & Washers
Courtesy of GENERAL MOTORS COMPANY

3. Install 3 of the bolt and washers (1) to hold the propeller shaft in place.

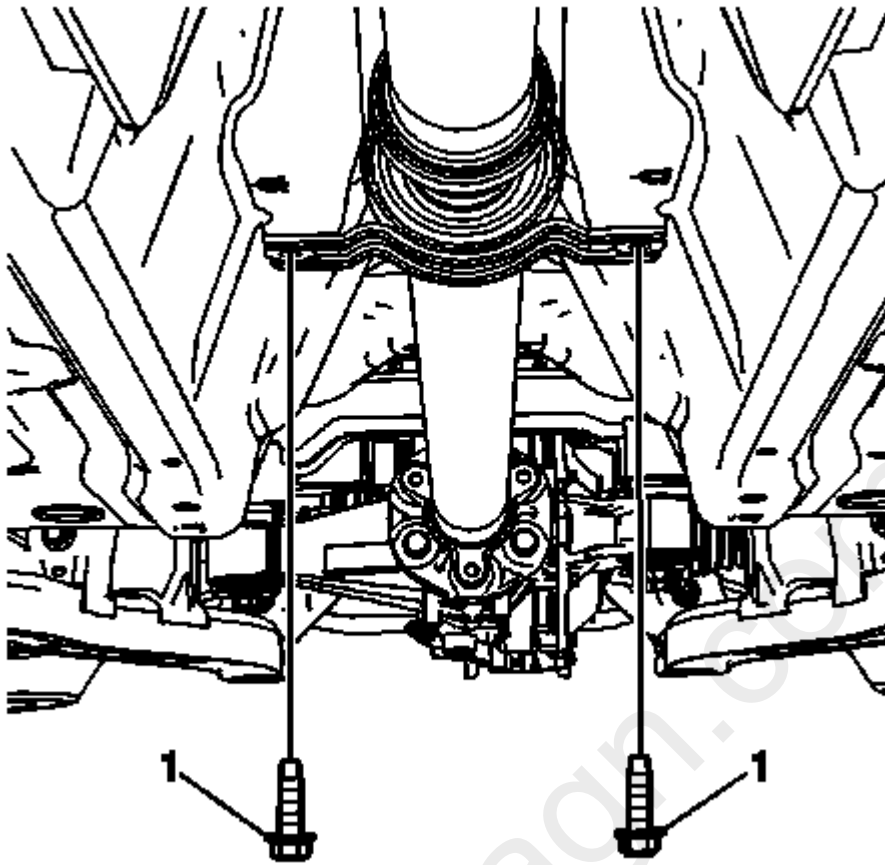


Fig. 13: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: If the vehicle has shims between the center support bearing and the mounting bracket, mark the location of the shims to ensure the proper re-installation of the shims to retain the proper driveshaft angle. **DO NOT** discard the shims. If there shims are present, they must be reused.

4. Install the propeller shaft center support bearing and the shims, if equipped.

NOTE: **DO NOT** tighten the bolts at this time. The center bearing has to be centered before tightening the bolts to the proper specifications.

5. Install the mounting bolts (1) for the center support bearing.

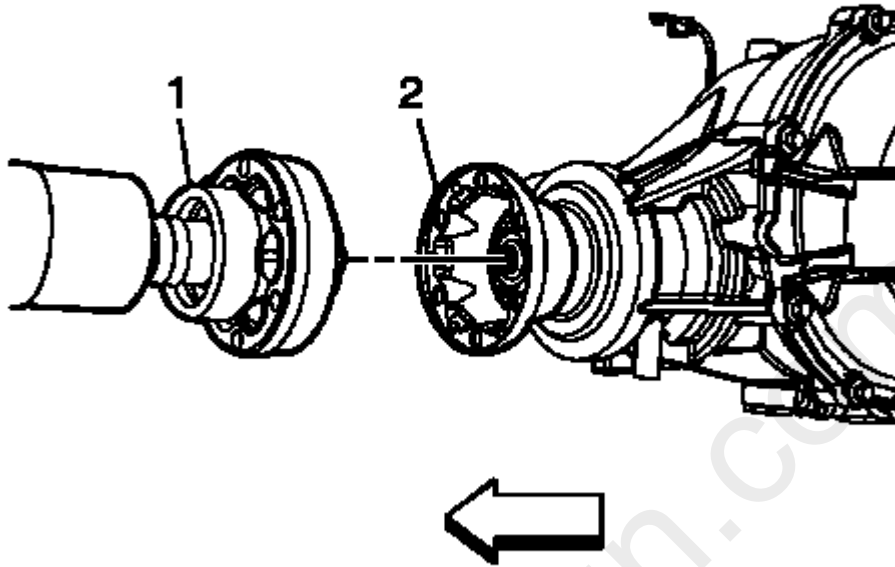


Fig. 14: Removing/Installing Propeller Shaft At Rear Differential
Courtesy of GENERAL MOTORS COMPANY

6. Position the propeller shaft (1) in the rear differential flange (2).

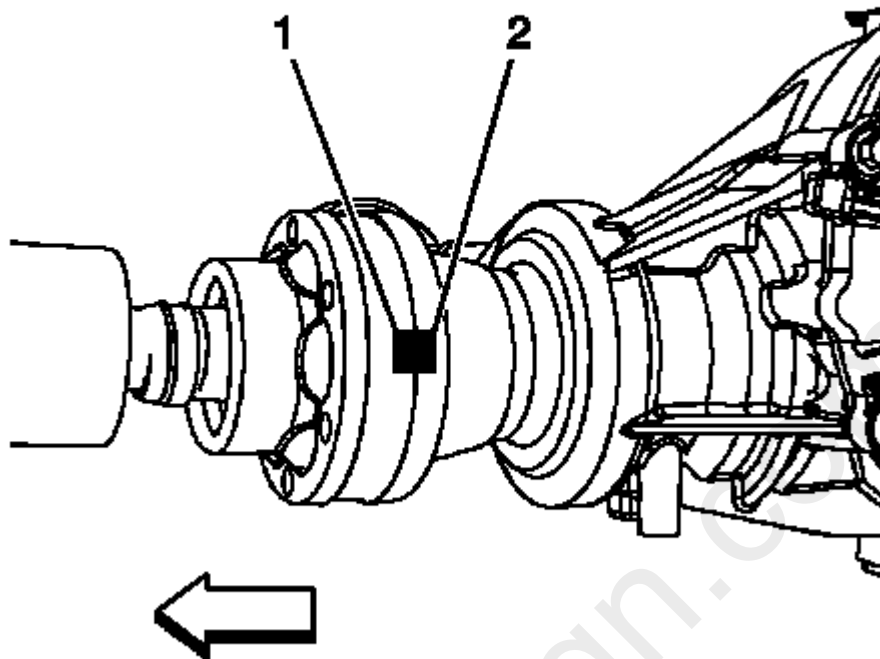


Fig. 15: Aligning Marks Of Propeller Shaft To Rear Differential Flange
Courtesy of GENERAL MOTORS COMPANY

7. Align the reference marks on the propeller shaft (1) and the differential drive flange (2).

NOTE: If reusing the propeller shaft bolts, to ensure proper adhesion and fastener retention, the threads must be free of debris prior to the application of threadlocker. Use the appropriate cleaner, thoroughly clean the threads and allow to dry.

8. Apply threadlocker to the threads of the bolts. Refer to Adhesives, Fluids, Lubricants, and Sealers.

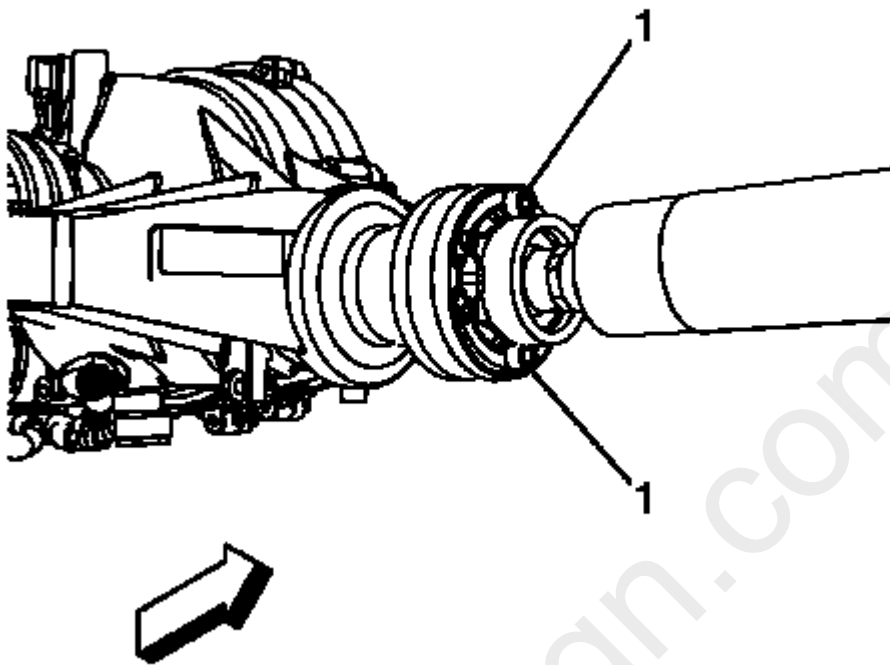


Fig. 16: Identifying Propeller Shaft Bolt & Washers
Courtesy of GENERAL MOTORS COMPANY

9. Install 3 of the bolt and washers (1) to hold the propeller shaft in place.

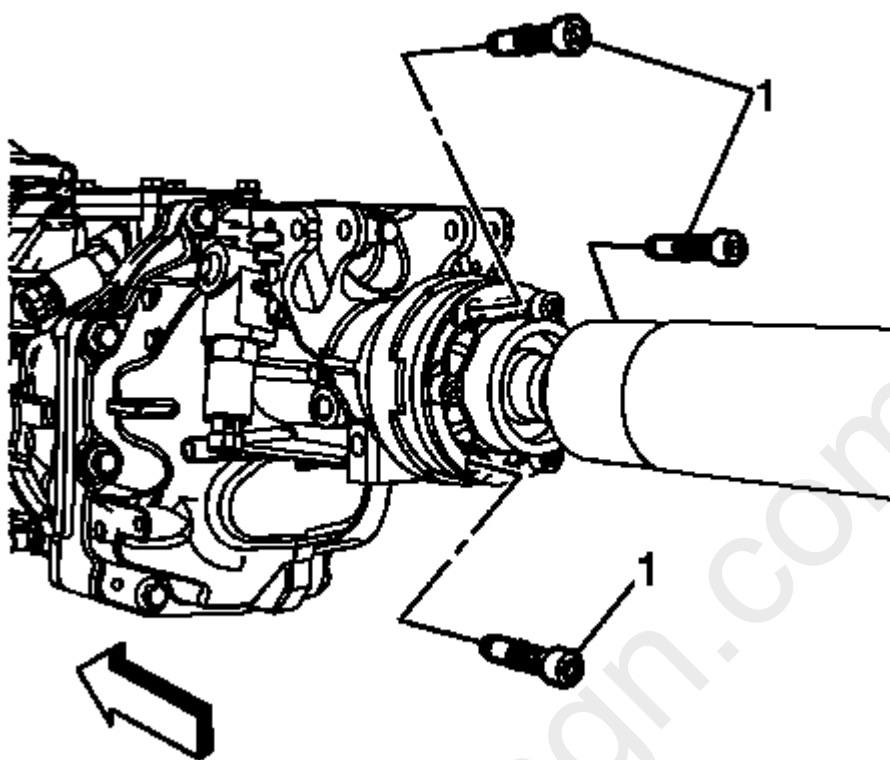


Fig. 17: Identifying Propeller Shaft To Transmission Flange Bolts
Courtesy of GENERAL MOTORS COMPANY

10. Install the remaining bolts (1) for the propeller shaft to transmission flange.

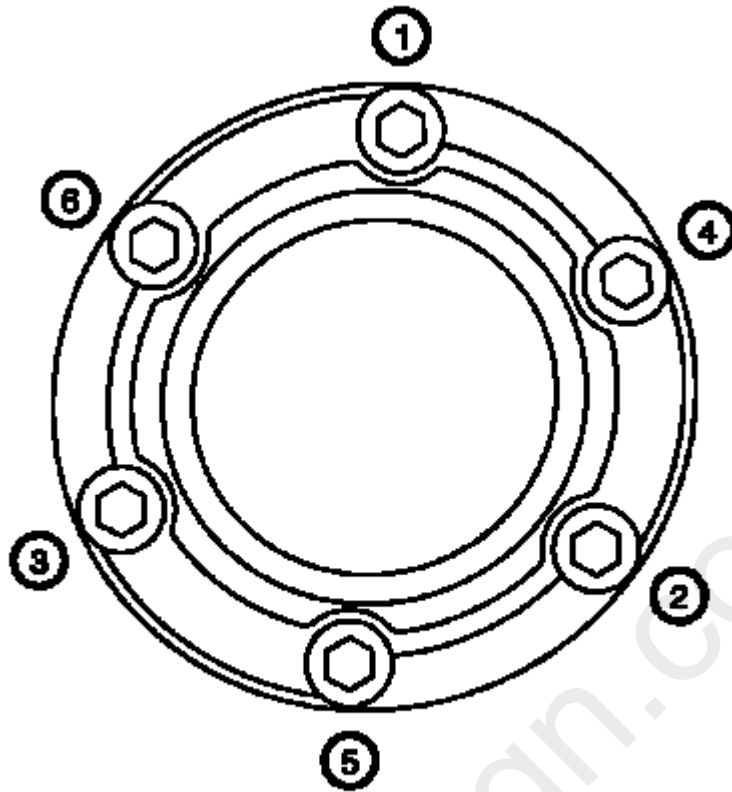


Fig. 18: Installing Propeller Shaft CV Joint-To-Differential Flange Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

11. Tighten the bolts in sequence to 65 N.m (48 lb ft).

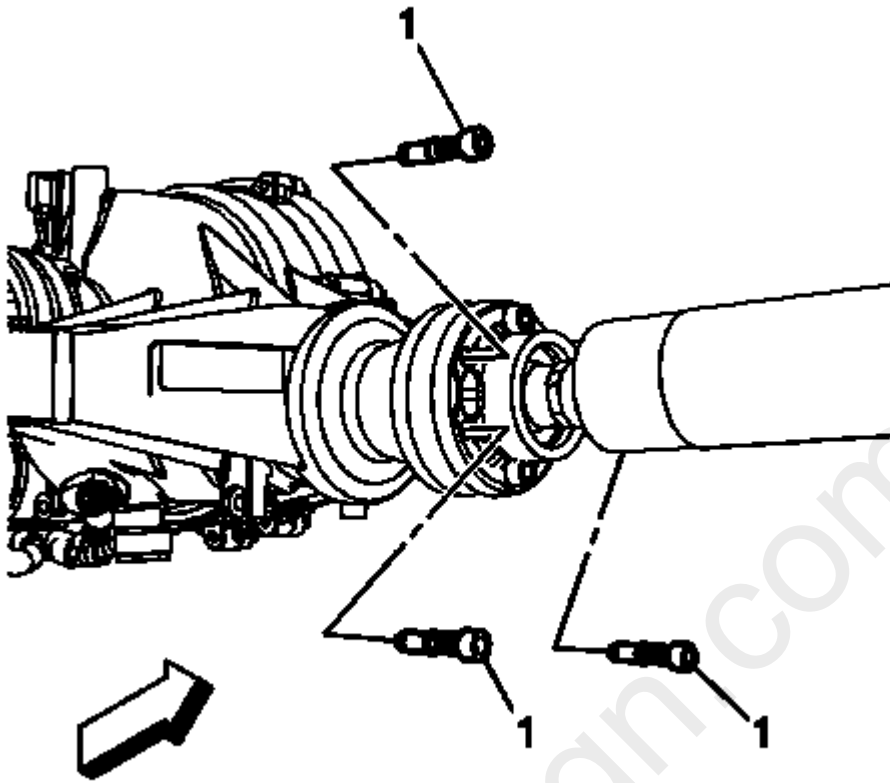


Fig. 19: Identifying Propeller Shaft To Transmission Flange Bolts
Courtesy of GENERAL MOTORS COMPANY

12. Install the remaining 3 propeller shaft bolts (1) to rear differential flange.

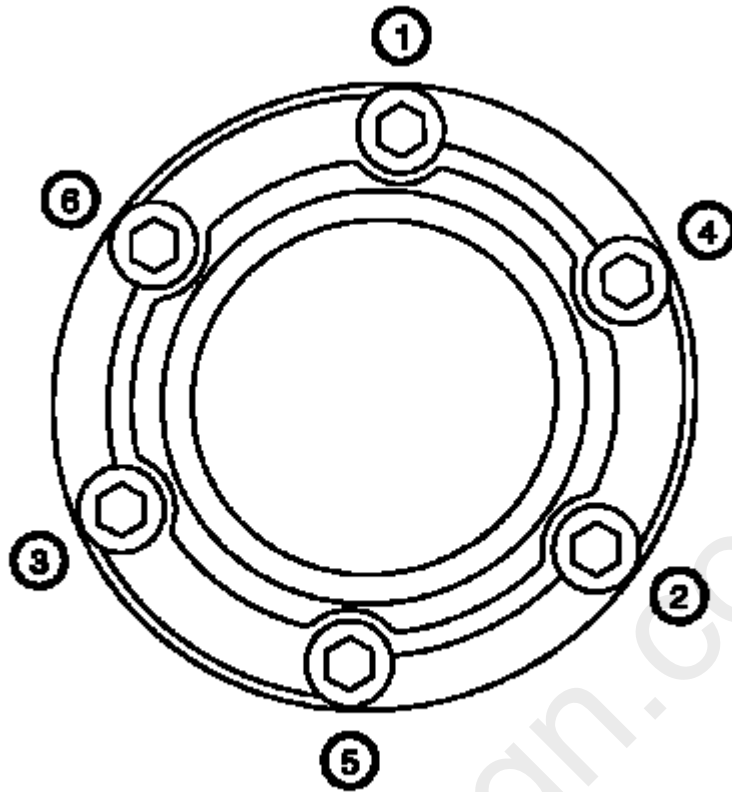


Fig. 20: Installing Propeller Shaft CV Joint-To-Differential Flange Bolts
Courtesy of GENERAL MOTORS COMPANY

13. Tighten the bolts in sequence to 65 N.m (48 lb ft).

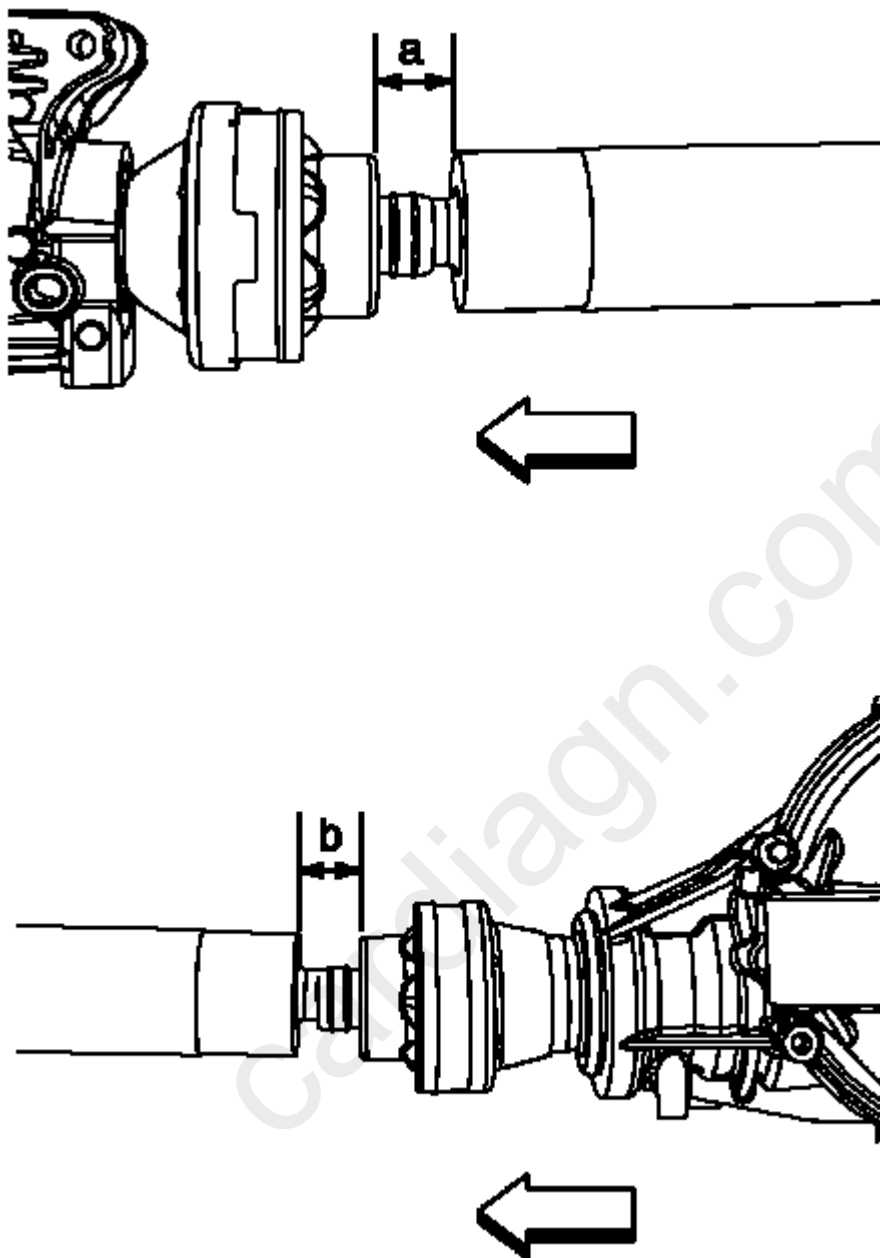


Fig. 21: Adjusting Center Bearing
Courtesy of GENERAL MOTORS COMPANY

NOTE: The propeller shaft must be centered between the front and rear CV joints to ensure optimal propeller shaft CV joint travel.

14. Adjust the center bearing so the measured distance of the propeller shaft and the constant velocity joint at (a) and at (b) is 34.5 mm (1.60 inch).

15. Tighten the center bearing bolts to 50 N.m (37 lb ft).
16. Install the floor pan mid tunnel insulator.
17. Install the exhaust system. Refer to Exhaust System Replacement (LSA-Coupe) , Exhaust System Replacement (LSA-Wagon) .
18. Lower the vehicle.

REAR PROPELLER SHAFT REPLACEMENT (RPO LFX OR LFW WITH MXO)

NOTE: The following service information is for those vehicles equipped with automatic transmission and are rear wheel drive (RWD).

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the rear mufflers. Refer to Exhaust System Replacement (Single Exhaust) , Exhaust System Replacement (LFX/LFW-Coupe) , Exhaust System Replacement (LFX/LFW-Wagon) .
3. Remove the floor pan mid tunnel insulator.

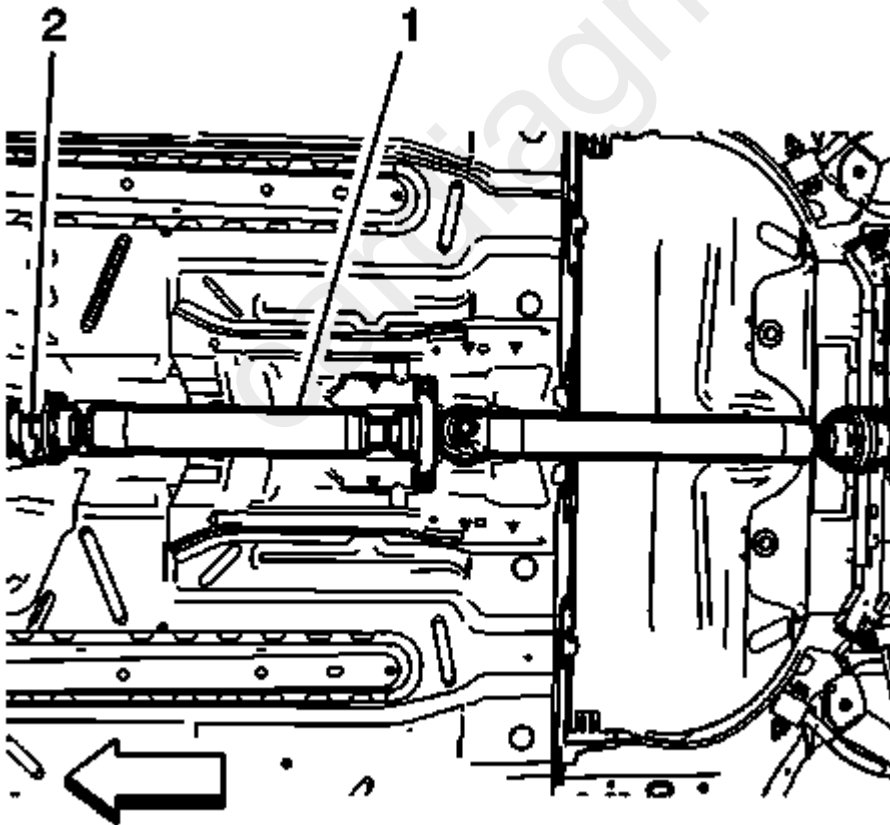


Fig. 22: Propeller Shaft & Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

4. Mark the relationship of the propeller shaft (1) to the transmission flange (2).

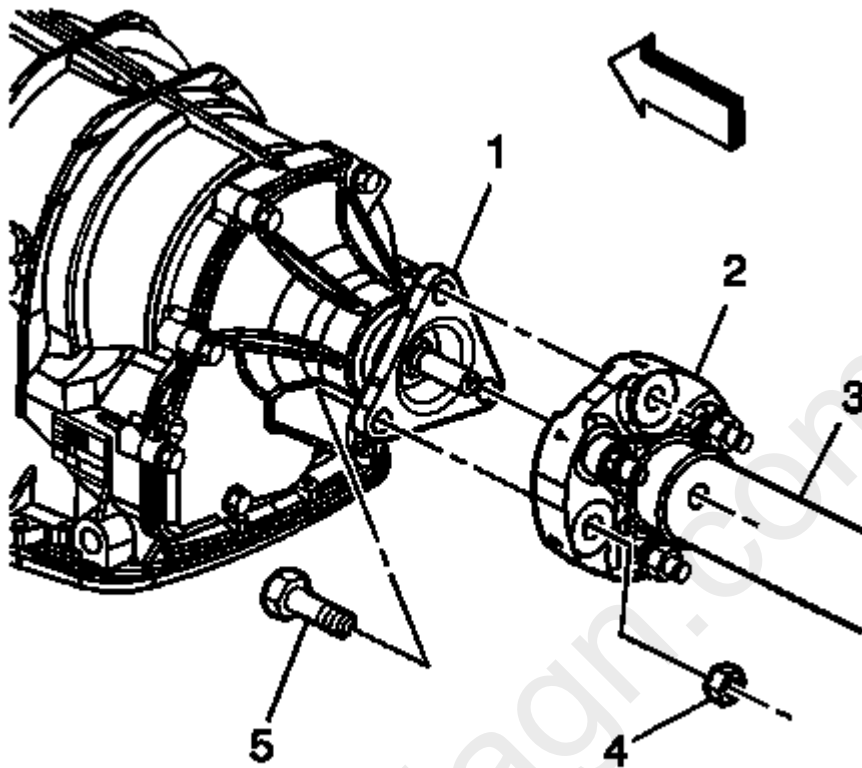


Fig. 23: Propeller Shaft & Transmission Flange Components
Courtesy of GENERAL MOTORS COMPANY

NOTE: In steps 4 and 5, remove only the propeller shaft coupler-to-transmission flange bolts and the propeller shaft to rear differential flange. **DO NOT** remove the coupler from the propeller shaft nuts and bolts. If the bolts, nuts, and or washers are found to be damaged or excessively worn, **DO NOT** use. Discard and replace with **NEW**.

5. Remove the transmission flange bolts (5), nuts (4) from the drive flange (1) and propeller shaft coupler (2).

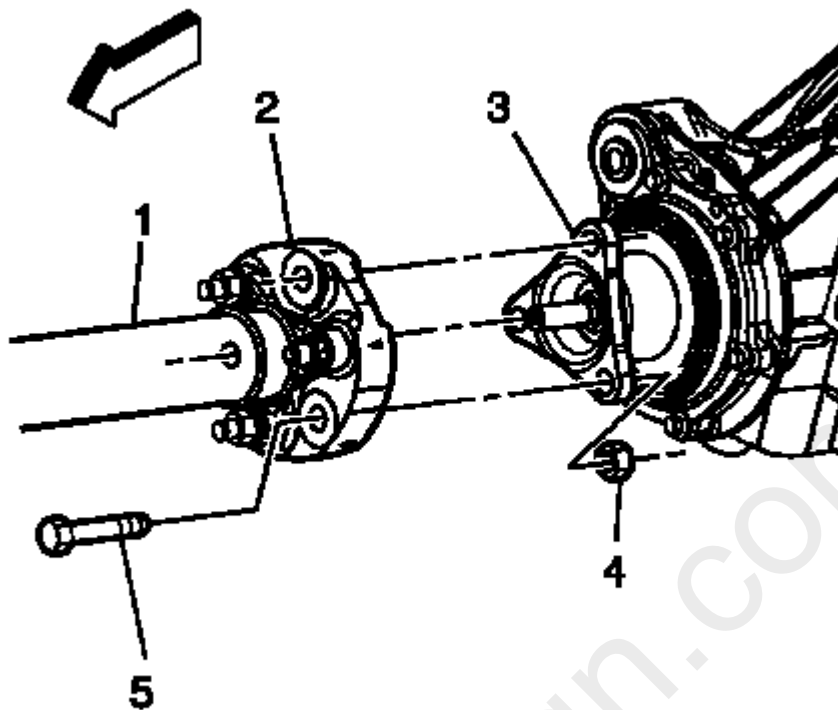


Fig. 24: Propeller Shaft & Transmission Flange Components
Courtesy of GENERAL MOTORS COMPANY

6. Remove the differential flange bolts (5), nuts (4) from the propeller shaft coupler (2) and the differential drive flange (3).
7. Using a jack stand, support the propeller shaft at the center support bearing.

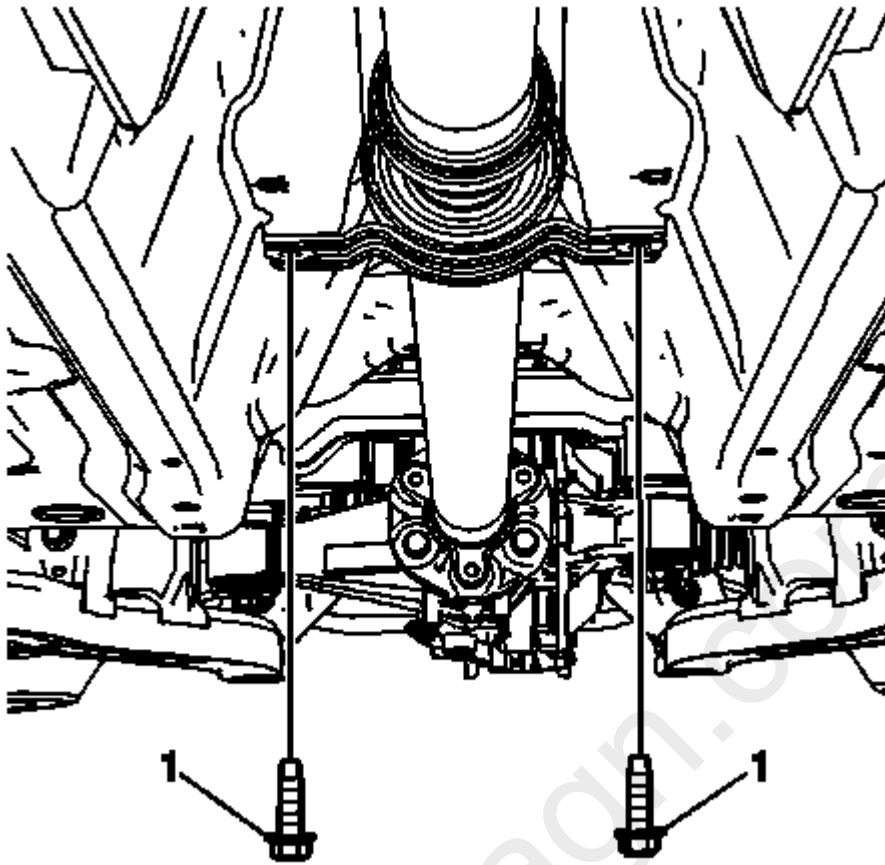


Fig. 25: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

WARNING: Some vehicles are equipped with shims between the center support bearing and the mounting bracket for the center support bearing for the proper driveshaft angle. DO NOT discard these shims. If the shims are present, they must be reused.

8. Remove the center support bearing bolts (1).

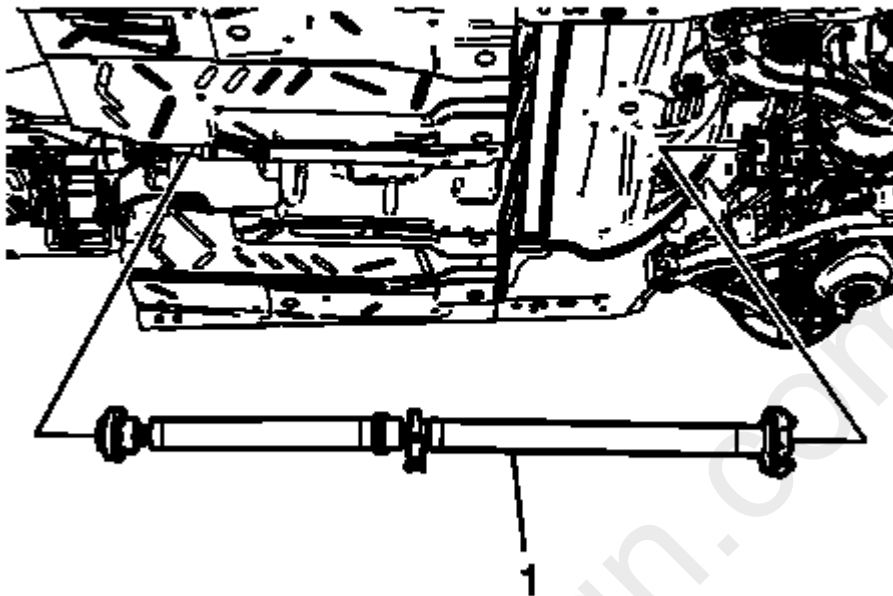


Fig. 26: Identifying Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the propeller shaft couplers and or the center support bearing are found to be damaged or have excessive wear, replace the propeller shaft as an assembly.

9. Remove the propeller shaft (1) from the vehicle.

Installation Procedure

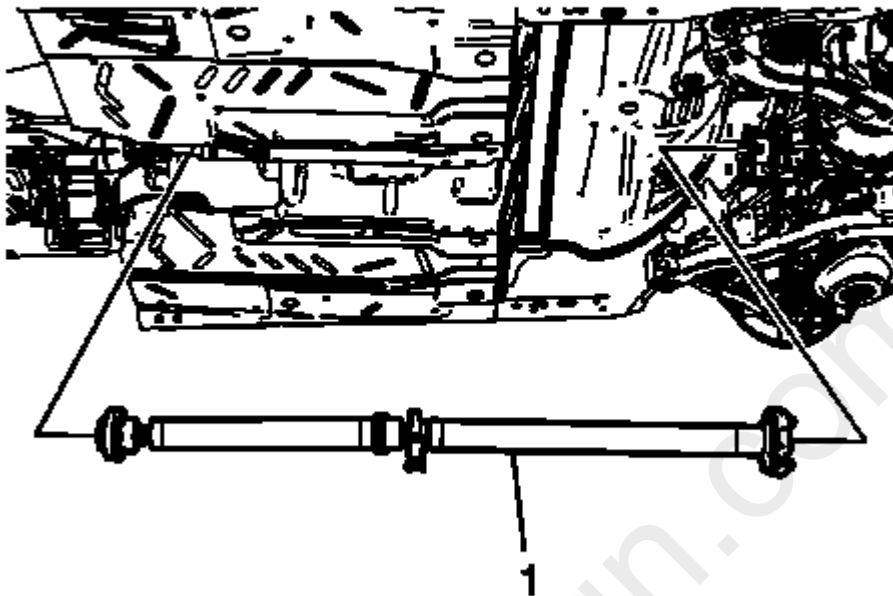


Fig. 27: Identifying Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

1. Apply a small amount of lubricant to the pilot shaft on the rear differential drive flange and the transmission drive flange. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.

NOTE: When installing the propeller shaft, install the propeller shaft to the transmission drive flange and the rear differential flange prior to install the center support bearing.

2. With the aide of an assistant, install the propeller shaft assembly (1).

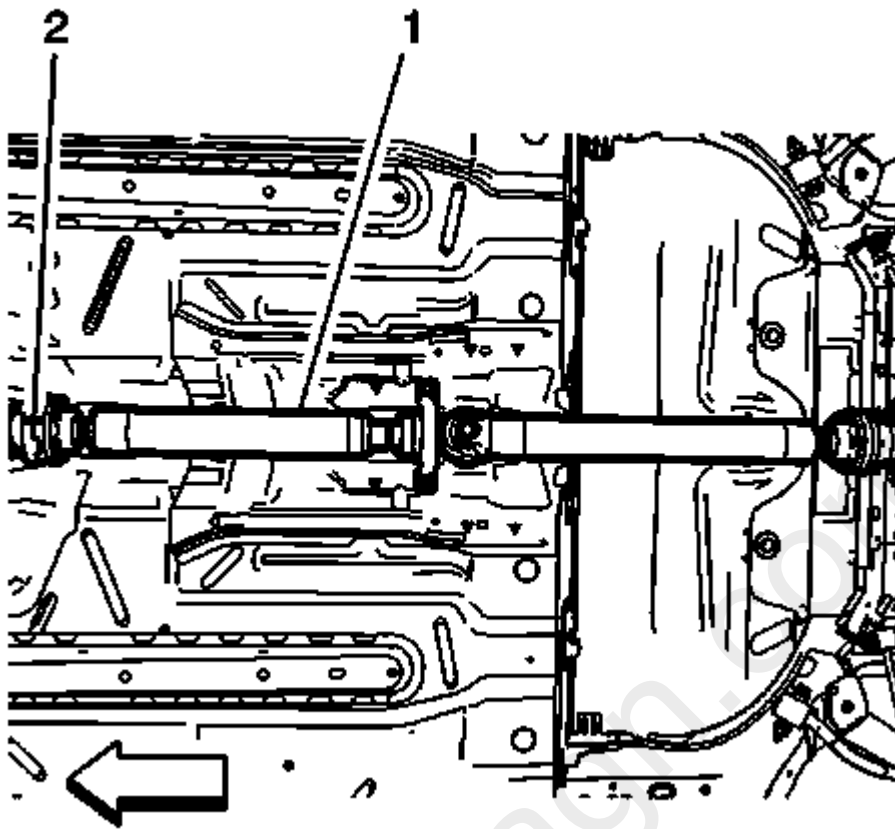


Fig. 28: Propeller Shaft & Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

3. Align the reference marks on the propeller shaft (1) and the transmission flange (2).

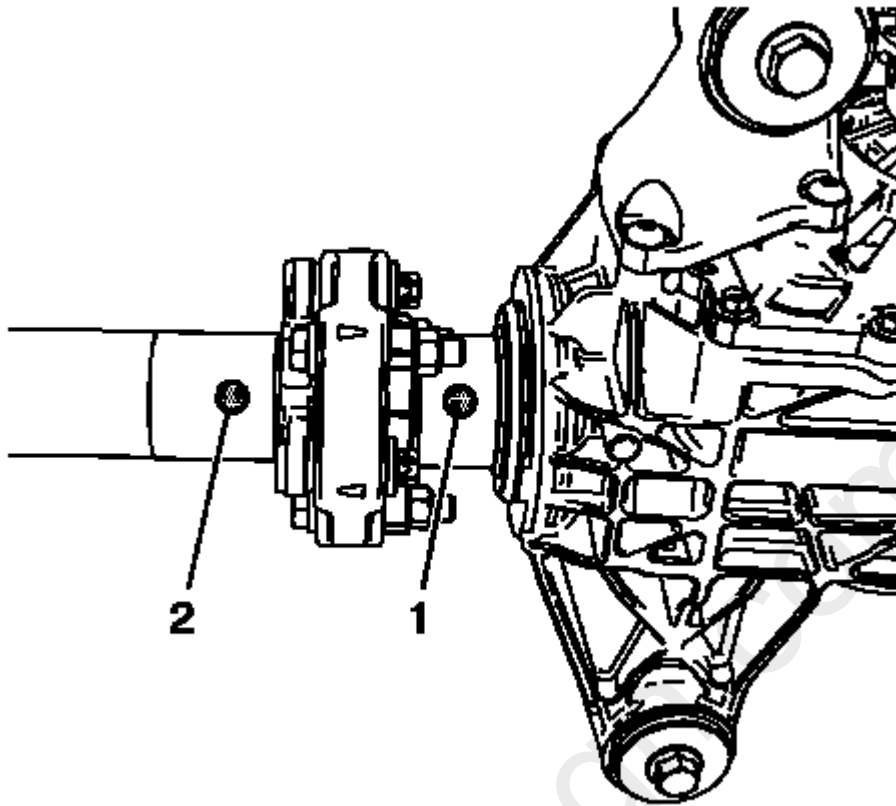


Fig. 29: Identifying Orange & Yellow Dots On Propeller shaft
Courtesy of GENERAL MOTORS COMPANY

NOTE: Align the yellow and orange paint dots on the propeller shaft and the drive flange. Failure to do so could cause a drive line vibration and possible damage to the propeller shaft.

4. Align the yellow dot (2) on the propeller shaft with the orange dot (1) on the differential drive flange.

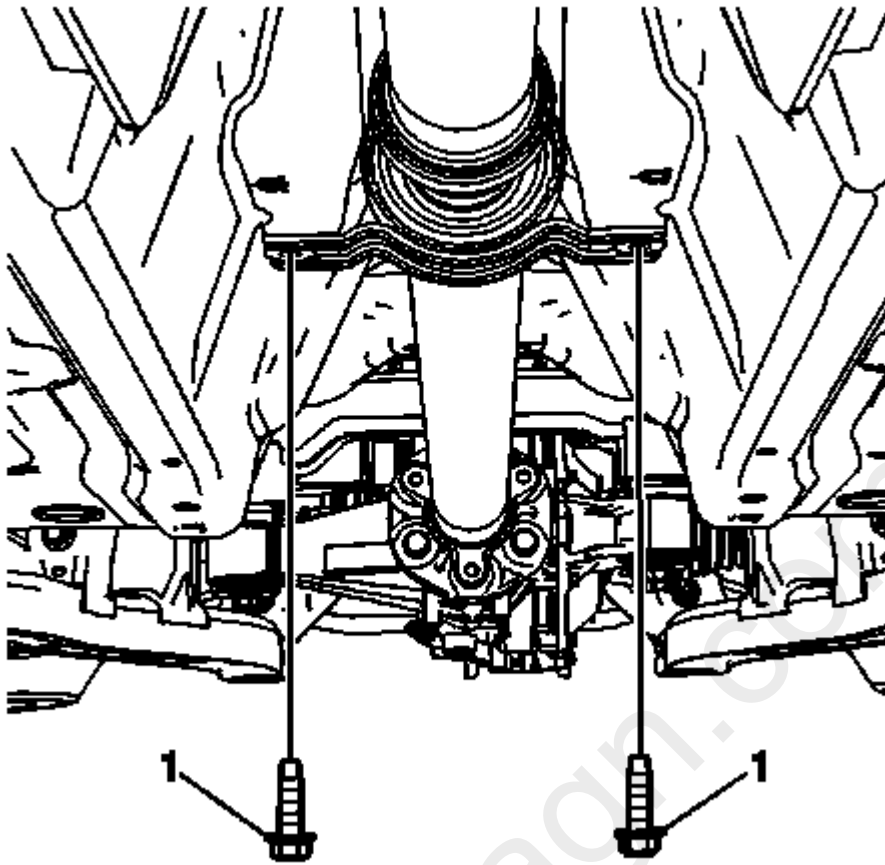


Fig. 30: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: If the vehicle has shims between the center support bearing and the mounting bracket, mark the location of the shims to ensure the proper re-installation of the shims to retain the proper driveshaft angle. **DO NOT** discard the shims. If there shims are present, they must be reused.

5. Install the center support bearing and the shim, if equipped.

CAUTION: Refer to Fastener Caution .

6. Install the center support bearing bolts (1) and tighten to 50 N.m (37 lb ft).

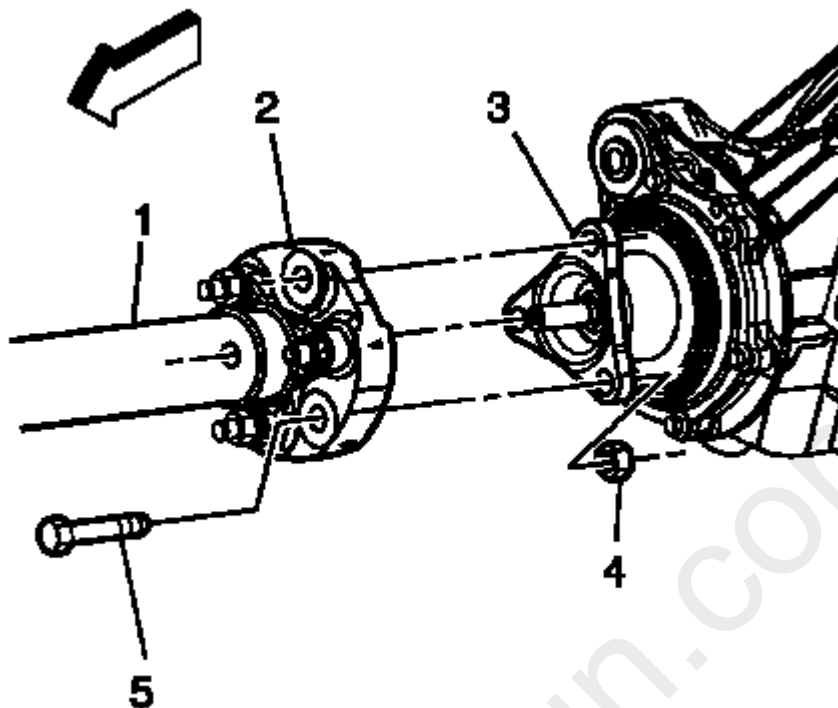


Fig. 31: Propeller Shaft & Transmission Flange Components
Courtesy of GENERAL MOTORS COMPANY

NOTE: Using an approved cleaner, thoroughly clean the threads and allow to dry. Apply threadlocker to the propeller shaft to flange bolt. Ensure that there are no gaps in the threadlocker along the length of the filled area of the bolt. Allow the threadlocker to cure approximately 10 minutes before installation.

7. Install the propeller shaft bolts (5).
8. Install the propeller shaft coupler-to-differential flange nuts (4) and tighten to 85 N.m (63 lb ft).

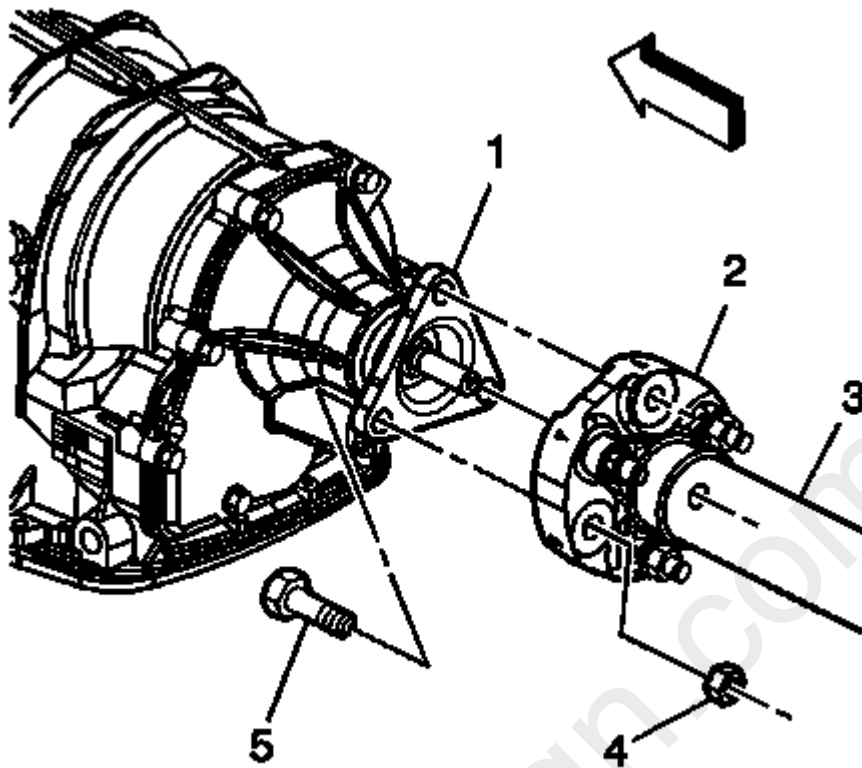


Fig. 32: Propeller Shaft & Transmission Flange Components
 Courtesy of GENERAL MOTORS COMPANY

NOTE: If reusing the propeller shaft-to-flange nuts and bolts, refer to step 6 for the proper application of the threadlocker.

9. Install the bolts (5) and the nuts (4) and tighten to 85 N.m (63 lb ft).
10. Install the floor pan mid tunnel insulator.
11. Install the rear mufflers. Refer to Exhaust System Replacement (Single Exhaust) , Exhaust System Replacement (LFX/LFW-Coupe) , Exhaust System Replacement (LFX/LFW-Wagon) .
12. Lower the vehicle.

REAR PROPELLER SHAFT REPLACEMENT (RPO LFX OR LFW WITH MX7 OR MN6)

CAUTION: The propeller shaft must be supported during removal and/or installation so that the CV joint does not articulate more than 8 degrees. Allowing the propeller shaft to articulate greater than 8 degrees could cause damage to the CV boot. Damage to boot could lead to contamination or loss of lubrication which could lead to CV joint damage.

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the rear muffler. Refer to Exhaust System Replacement (Single Exhaust) , Exhaust System Replacement (LFX/LFW-Coupe) , Exhaust System Replacement (LFX/LFW-Wagon) .
3. Remove the floor pan mid tunnel insulator.

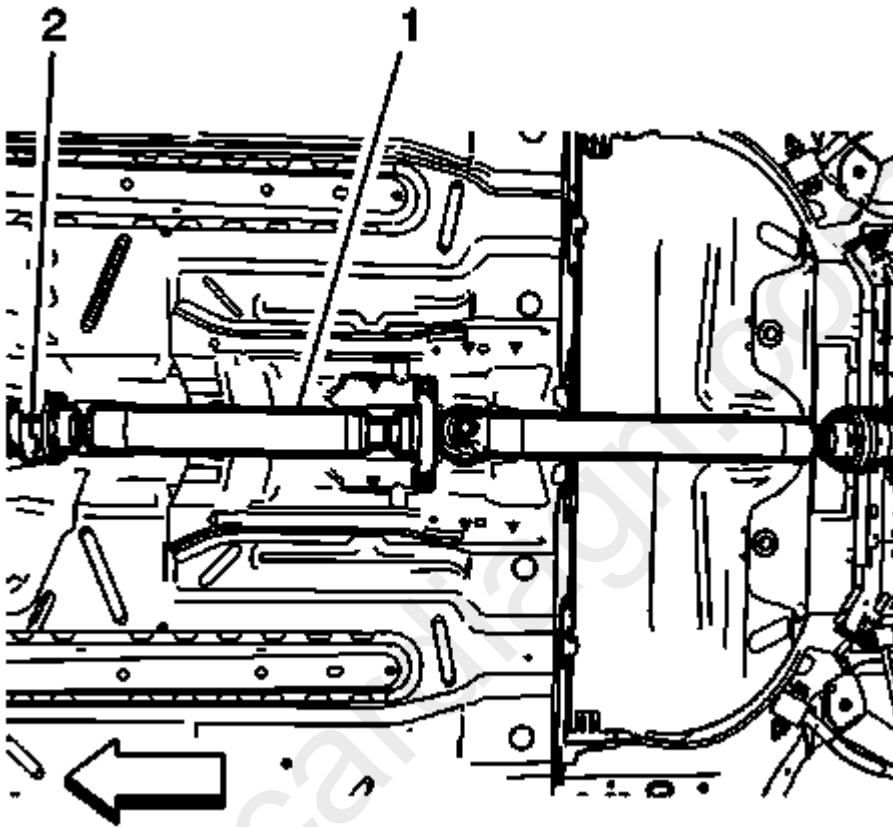


Fig. 33: Propeller Shaft & Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

4. Mark the relationship of the propeller shaft (1) to the transmission flange (2).
5. Using a suitable jack stand, support the propeller shaft at the center support bearing.

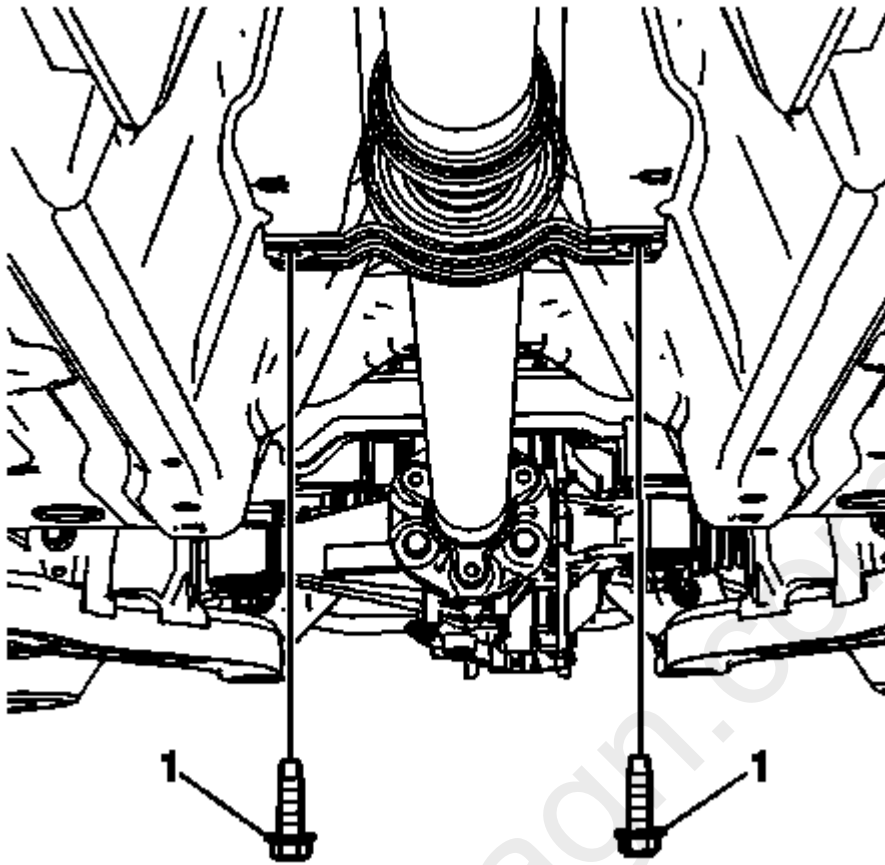


Fig. 34: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Some vehicles are equipped with shims or rubber insulators between the center support bearing and the mounting bracket for the center support bearing for the proper driveshaft angle. DO NOT discard these shims or rubber insulators. If the shims or rubber insulators are present, they must be reused.

6. Remove the mounting bolts (1) for the center support bearing.

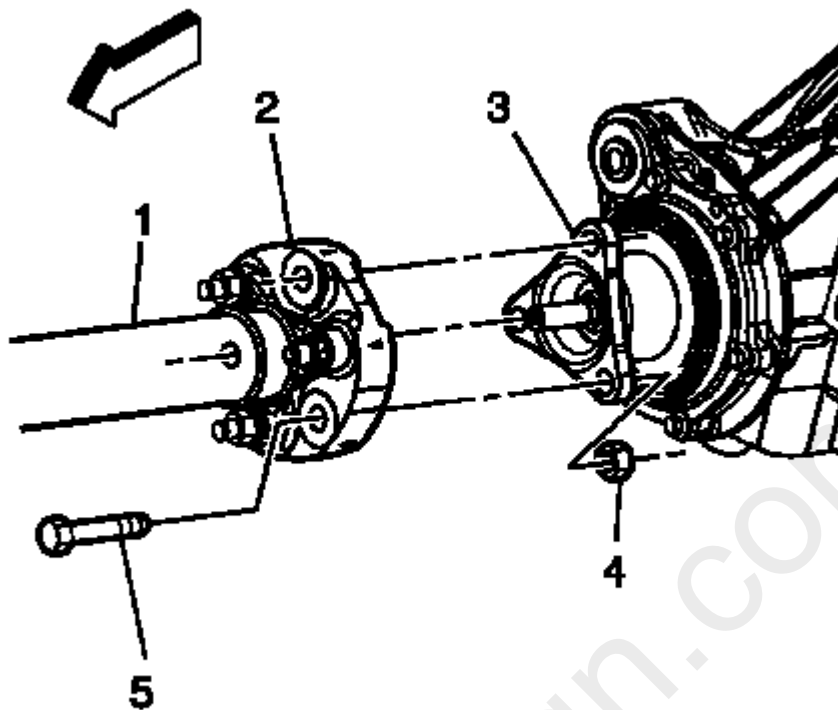


Fig. 35: Propeller Shaft & Transmission Flange Components
Courtesy of GENERAL MOTORS COMPANY

NOTE: Remove only the propeller shaft coupler-to-differential flange bolts. DO NOT remove the coupler from the propeller shaft.

7. Remove the propeller shaft nuts (4), bolts (5) from the propeller shaft (1).

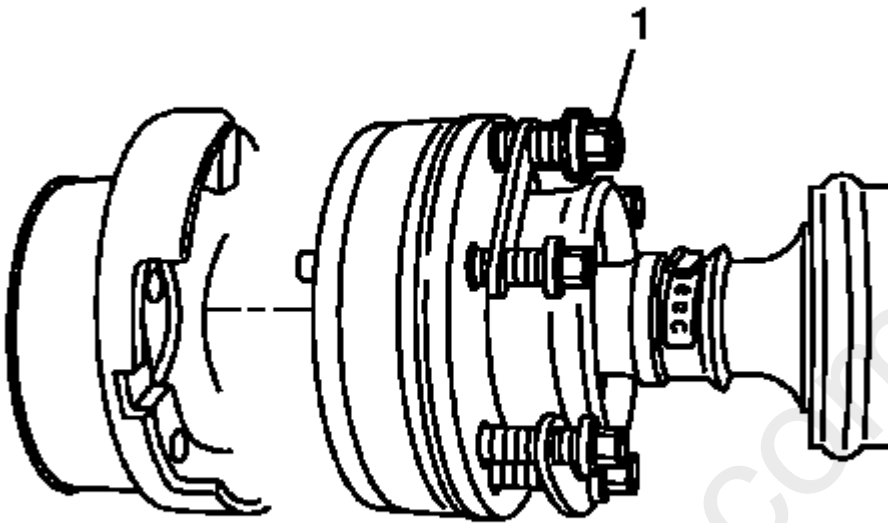


Fig. 36: CV Joint Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: If the bolts and washers are found to be damaged or are excessively worn, **DO NOT** reuse the bolts and washers. Replace with new.

8. Remove the bolts (1) from the CV joint on the propeller shaft to the transmission/transfer case flange.
9. Using a flat-bladed screw driver, remove the propeller shaft from the transmission/transfer case flange.
10. Remove the jack stand from the center support bearing.
11. Remove the propeller shaft from the rear differential flange.

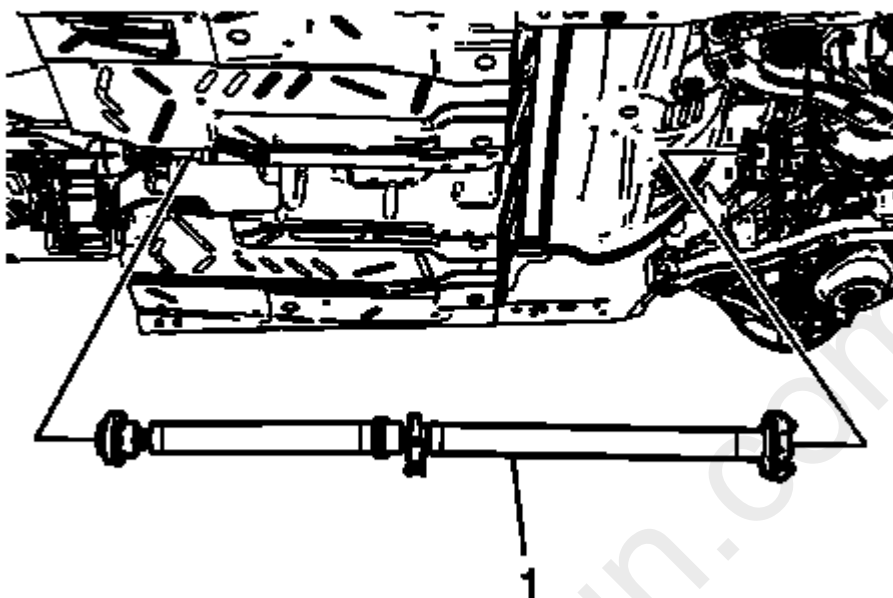


Fig. 37: Identifying Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

12. Remove the propeller shaft (1) from the vehicle.

Installation Procedure

1. Apply a small amount of lubricant to the rear propeller shaft center bushing and rear differential flange pilot shaft. Refer to **Adhesives, Fluids, Lubricants, and Sealers**

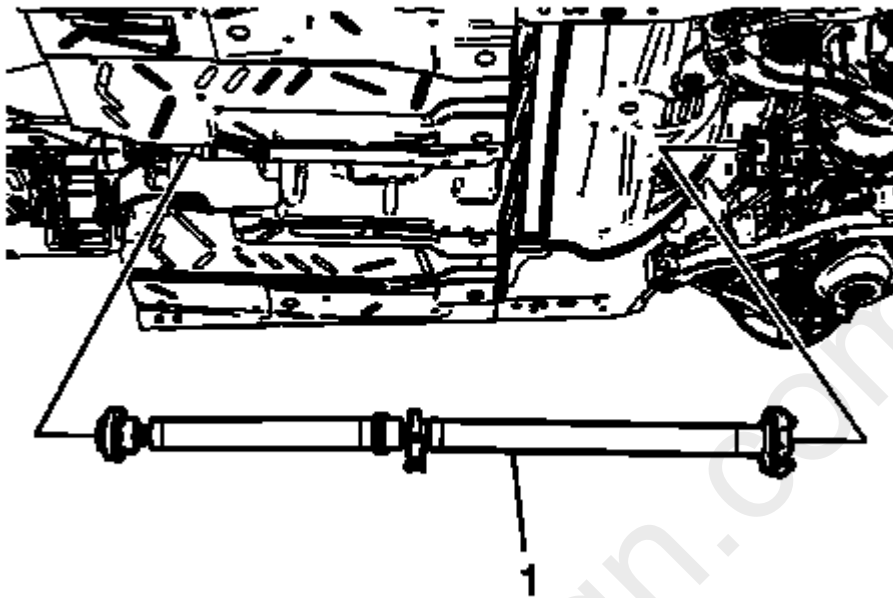


Fig. 38: Identifying Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

NOTE: When installing the propeller shaft, install the propeller shaft to the transmission drive flange and the rear differential flange prior to install the center support bearing.

2. With the aid of an assistant, position the propeller shaft (1) in the vehicle.

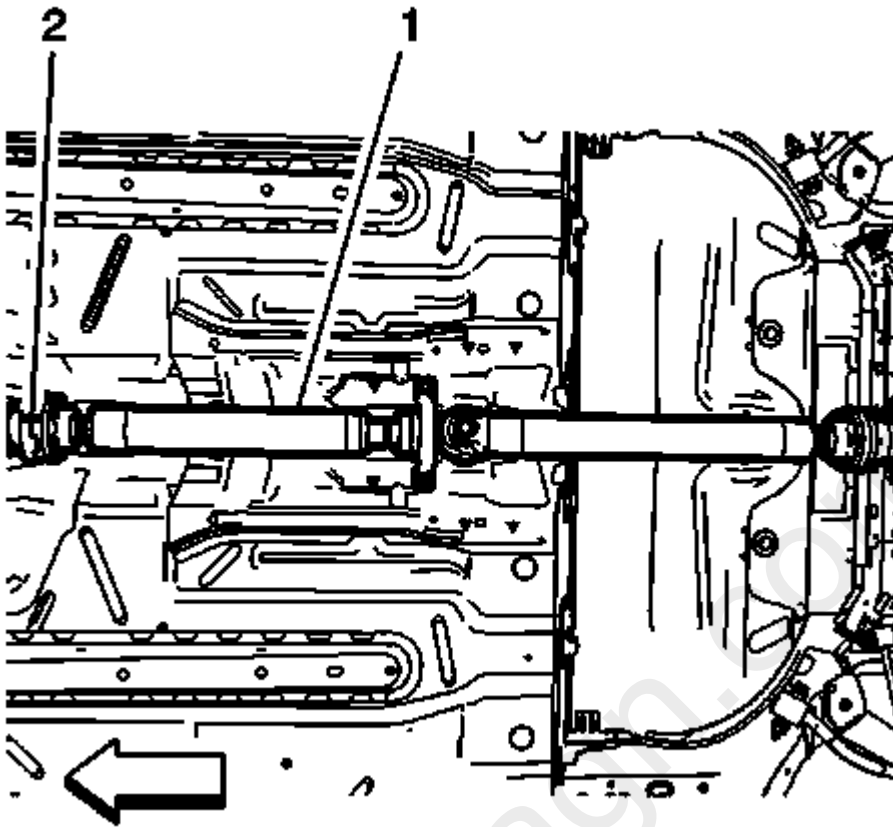


Fig. 39: Propeller Shaft & Transmission Flange
Courtesy of GENERAL MOTORS COMPANY

3. Align the reference marks on the propeller shaft (1) and the transmission flange (2).

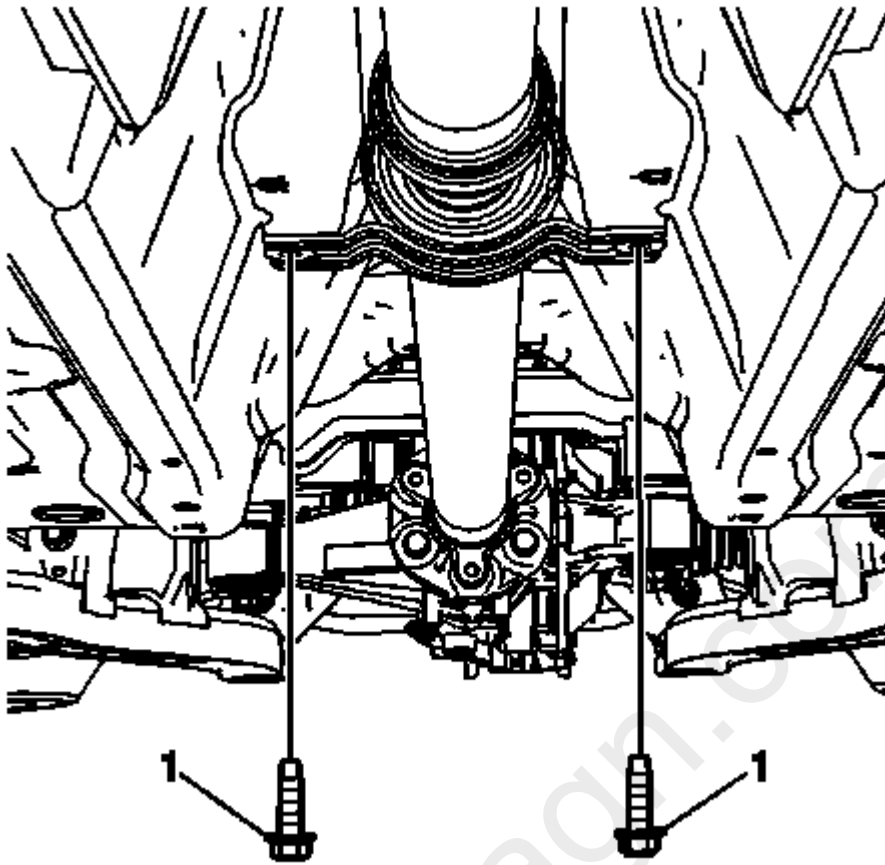


Fig. 40: Identifying Center Support Bearing Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: If the vehicle has shims between the center support bearing and the mounting bracket, mark the location of the shims to ensure the proper re-installation of the shims to retain the proper driveshaft angle. **DO NOT** discard the shims. If there shims are present, they must be reused.

4. Install the propeller shaft center support bearing and the shims or the rubber insulators, if equipped.

NOTE:

- If reusing the support bearing bracket bolts, ensure the proper adhesive and fastener retention, the threads must be free of debris prior to the application of the threadlocker.
- Ensure that there are no gaps in the threadlocker along the length of the filled area of the bolt. Allow the threadlocker to cure approximately 10 minutes before installing the bolt.

5. Apply threadlocker to the mounting bolts. Refer to Adhesives, Fluids, Lubricants, and Sealers.

CAUTION: Refer to Fastener Caution .

6. Install the mounting bolts (1) for the center support bearing and tighten the support bearing bolts to:
 - 50 (37 lb ft) for those vehicle equipped with the metal shims
 - 35 (26 lb ft) for those vehicles equipped with the rubber insulators

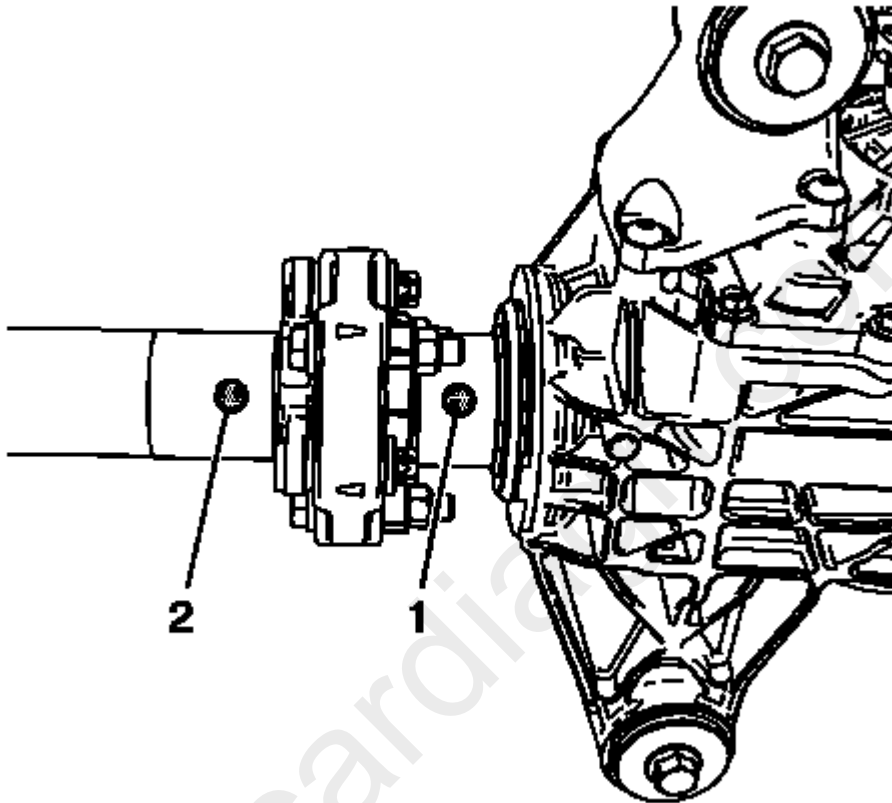


Fig. 41: Identifying Orange & Yellow Dots On Propeller shaft
Courtesy of GENERAL MOTORS COMPANY

NOTE: Align the yellow and orange dots on the propeller shaft and the drive flange. Failure to do so could cause a drive line vibration and possible damage to the propeller shaft.

7. Align the orange paint mark (1) on the rear differential with the one yellow paint mark (2) on the propeller shaft.

NOTE: If reusing the propeller shaft-to-flange nuts and bolts, to ensure proper adhesion and fastener retention, the threads must be free of debris prior to the application of threadlocker.

8. Using denatured alcohol, thoroughly clean the threads and allow to dry.
9. Apply threadlocker to the propeller shaft to the flange bolt. Ensure that there are no gaps in the threadlocker along the length of the filled area of the bolt. Allow the threadlocker to cure approximately 10 minutes before installation. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.

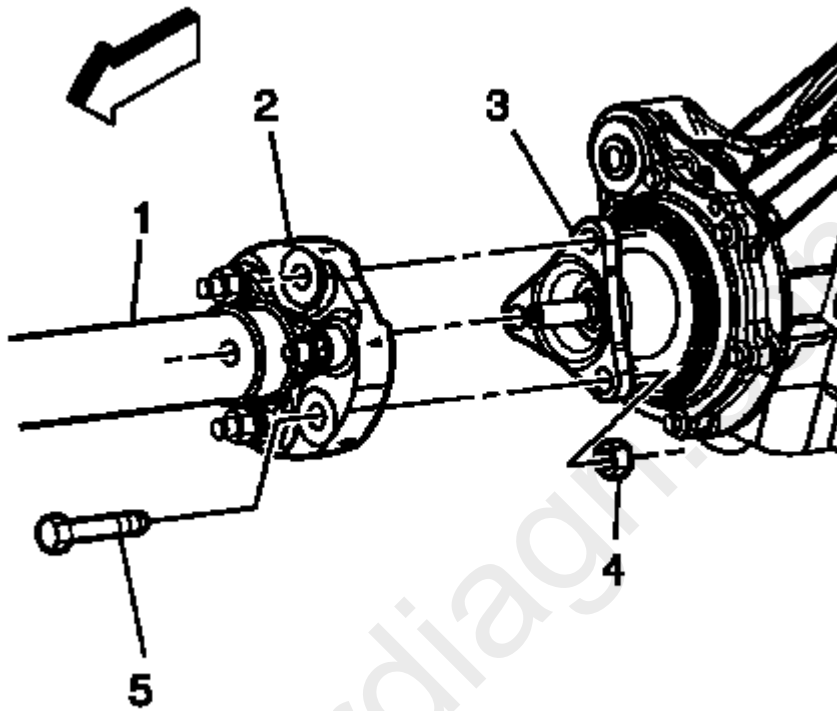


Fig. 42: Propeller Shaft & Transmission Flange Components
Courtesy of GENERAL MOTORS COMPANY

10. Install the rear propeller shaft (1) coupler (2) on the differential flange (3).
11. Install the bolt (5).
12. Install the propeller shaft coupler-to-differential flange nuts (4) and tighten to 85 (63 lb ft).

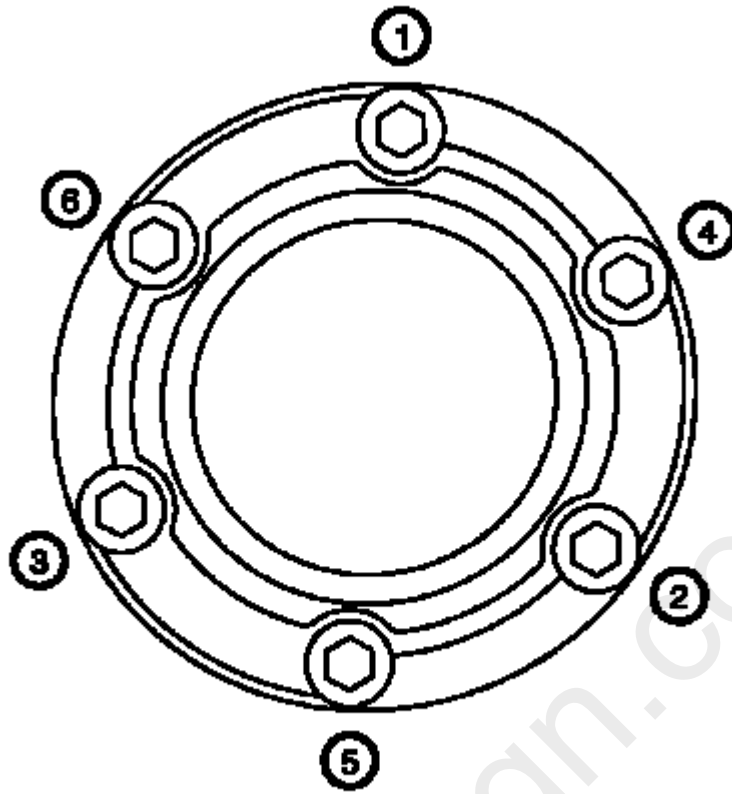


Fig. 43: Installing Propeller Shaft CV Joint-To-Differential Flange Bolts
Courtesy of GENERAL MOTORS COMPANY

13. Install the propeller shaft CV joint to transfer case flange bolts and tighten in sequence (1-6) to 40 (29 lb ft).
14. Install the floor pan mid tunnel insulator.
15. Install the exhaust system. Refer to Exhaust System Replacement (Single Exhaust) , Exhaust System Replacement (LFX/LFW-Coupe) , Exhaust System Replacement (LFX/LFW-Wagon) .
16. Lower the vehicle.

FRONT PROPELLER SHAFT COUPLING REPLACEMENT

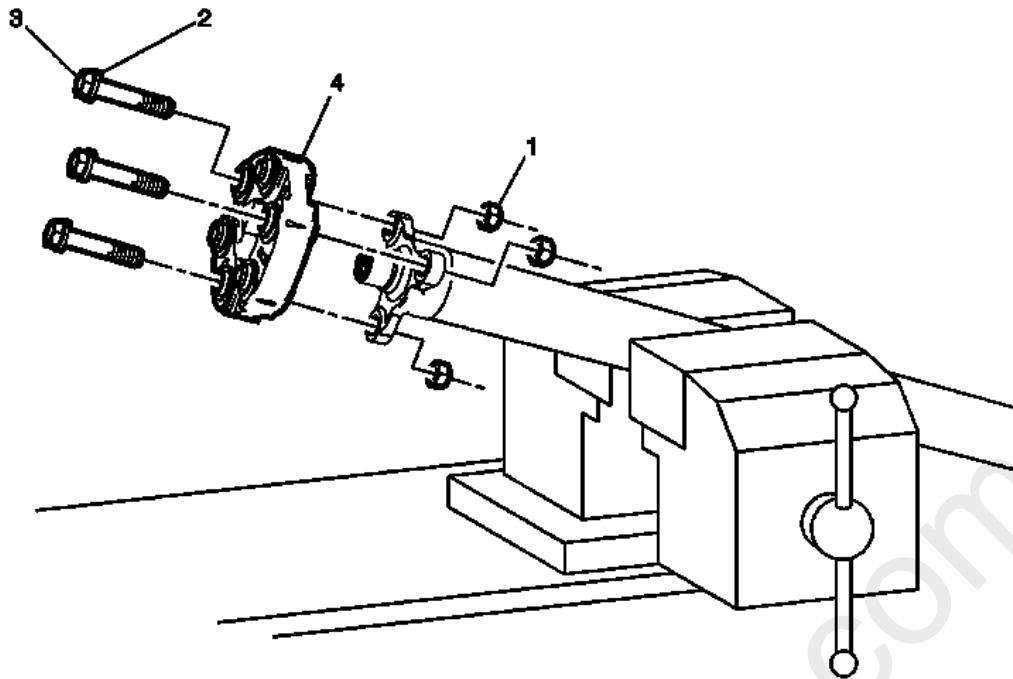


Fig. 44: Front Propeller Shaft Coupling Components
 Courtesy of GENERAL MOTORS COMPANY

Front Propeller Shaft Coupling Replacement

Callout	Component Name
Preliminary Procedure	
1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> 2. Remove the front propeller shaft. Refer to <u>Front Propeller Shaft Replacement</u>	
1	Front Propeller Shaft Nut (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 85 (63 lb ft)
2	Front Propeller Shaft Washers (Qty: 3)
3	Front Propeller Shaft Bolt (Qty: 3)
4	Front Propeller Shaft Coupling

REAR PROPELLER SHAFT COUPLING REPLACEMENT

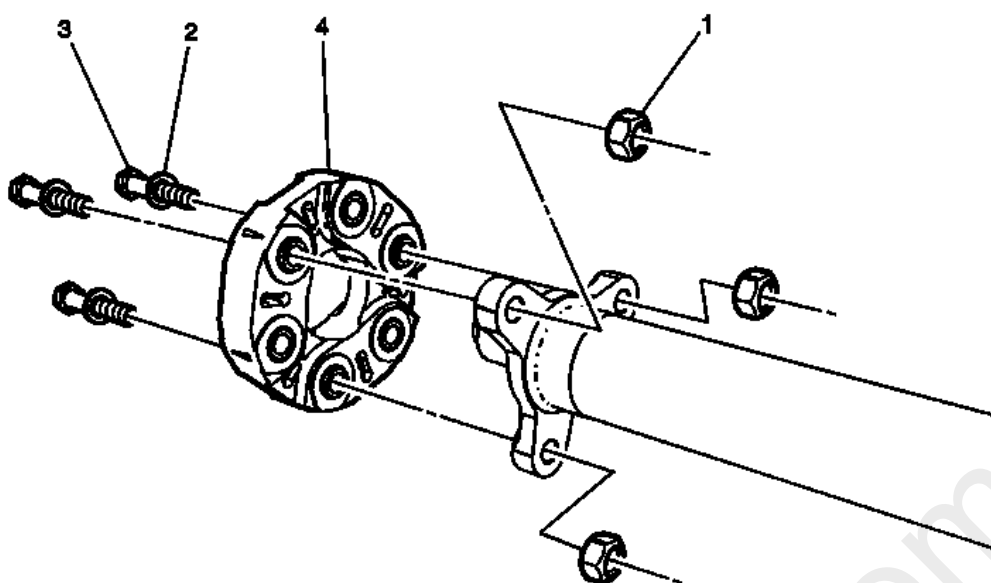


Fig. 45: Rear Propeller Shaft Coupling Components

Courtesy of GENERAL MOTORS COMPANY

Rear Propeller Shaft Coupling Replacement

Callout	Component Name
Preliminary Procedure 1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> 2. Remove the rear propeller shaft. Refer to <u>Rear Propeller Shaft Replacement (RPO LSA)</u>, <u>Rear Propeller Shaft Replacement (RPO LFX or LFW with MXO)</u>, <u>Rear Propeller Shaft Replacement (RPO LFX or LFW with MX7 or MN6)</u>	
1	Rear Propeller Shaft Nut (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 85 (63 lb ft)
2	Rear Propeller Shaft Washers (Qty: 3)
3	Rear Propeller Shaft Bolt (Qty: 3)
4	Rear Propeller Shaft Coupling

DESCRIPTION AND OPERATION

PROPELLER SHAFT DESCRIPTION AND OPERATION

The propeller shaft is a tube with joints at both ends which do not require periodic maintenance, that transmit power from the transfer case or transmission output shaft to the differential.

Two-Piece Propeller Shaft Description

There are 2 universal joints used on the two-piece propeller shaft. A center bearing assembly is used to support the propeller shaft connection point, and help isolate the vehicle from vibration.

Propeller Shaft Phasing Description

The propeller shaft is designed and built with the yoke lugs, ears, in line with each other. This produces the smoothest running shaft possible. A propeller shaft designed with built in yoke lugs in line is known as in-phase. An out of phase propeller shaft often causes vibration. The propeller shaft generates vibration from speeding up and slowing down each time the universal joint goes around. The vibration is the same as a person snapping a rope and watching the wave reaction flow to the end. An in phase propeller shaft is similar to 2 persons snapping a rope at the same time and watching the waves meet and cancel each other out. A total cancellation of vibration produces a smooth flow of power in the driveline.

Universal Joint Description (RWD Only)

The universal joint is connected to the propeller shaft. The universal consist of 4 caps with needle bearings and grease seals mounted on the trunnions of a cross or spider. These bearings and caps are greased at the factory and no periodic maintenance is required. There are 2 universal joints used in a two-piece propeller shaft. The bearings and caps are pressed into the yokes and staked in place. Universal joints are designed to handle the effects of various loads and rear axle windup conditions during acceleration and braking. The universal joint operates efficiently and safely within the designed angle variations. When the design angles are exceeded, the operational life of the joint decreases.

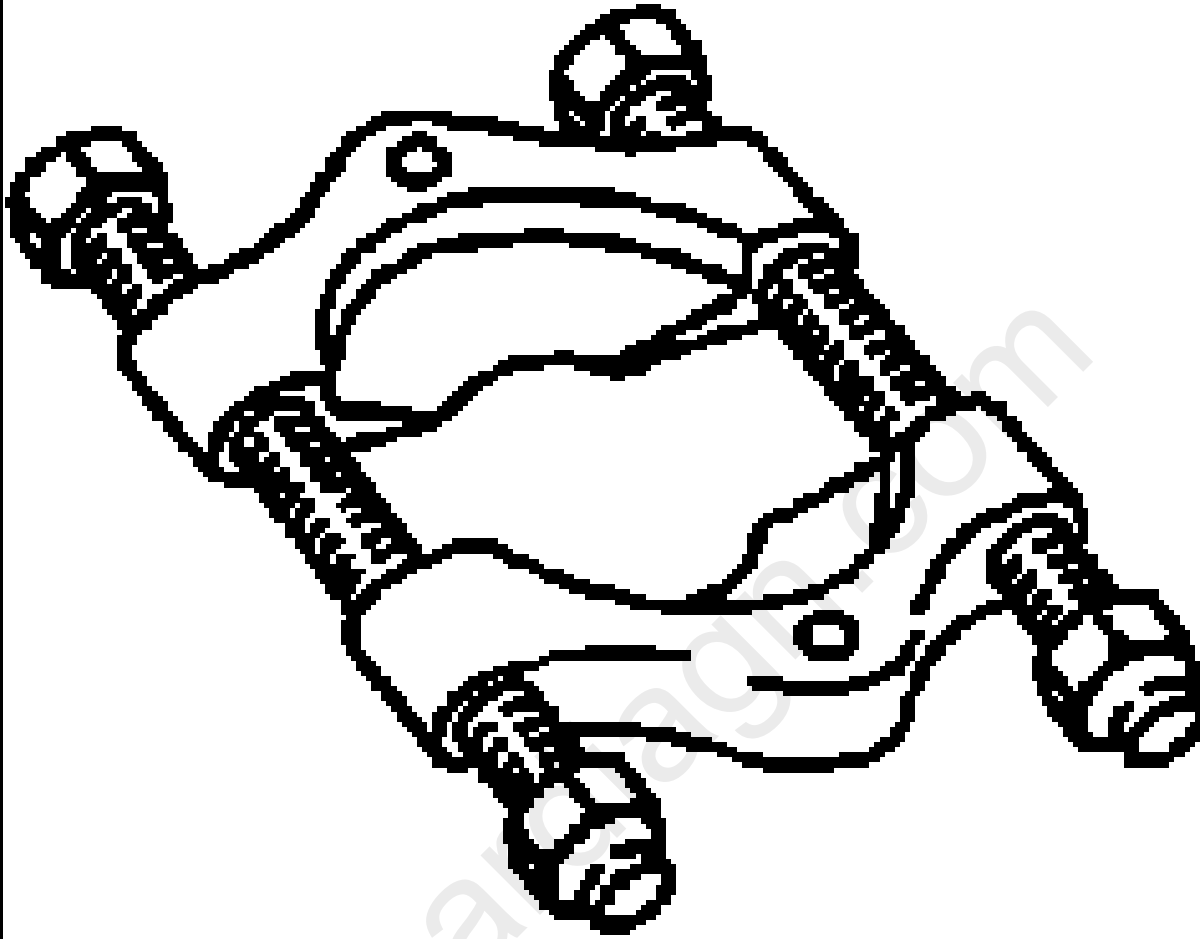
Center Bearing Description

Center bearings support the driveline when using 2 or more propeller shafts. The center bearing is a ball bearing mounted in a rubber cushion that attaches to a frame crossmember. The manufacturer prelubricates and seals the bearing. The cushion allows vertical motion at the driveline and helps isolate the vehicle from vibration.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Descrip



J 22912-01
Rear Pinion and /
Bearing Remov

J 25863
Pinion Cone and
Bearing Install

