

2017 DRIVELINE/AXLE

Propeller Shaft - CT6

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Front Axle Propeller Shaft Bolt @ Front Differential Carrier Assembly	58 N.m (43 lb ft)
Front Axle Propeller Shaft Bolt @ Transfer Case	58 N.m (43 lb ft)
Front Axle Propeller Shaft Heat Shield Bolt	9 N.m (80 lb in)
Front Propeller Shaft Bolt	90 N.m (66 lb ft)
Propeller Shaft Bearing Support Bolt	58 N.m (43 lb ft)
Rear Propeller Shaft Bolt	90 N.m (66 lb ft)

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Propeller Shaft Coupler to Drive Flange	Lubricant	1052949	-
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](#)

PROPELLER SHAFT DIAGNOSIS

Review the propeller shaft system function. Refer to [Propeller Shaft Description and Operation](#)

Inspect for loose or missing propeller shaft-to-flange bolts. Tighten or replace as necessary. Refer to [Front Axle Propeller Shaft Replacement \(LGX, LGW\)](#) and [Propeller Shaft Replacement](#)

Inspect for loose center bracket bolts and damaged rubber bushings. Tighten or replace as necessary. Refer to [Propeller Shaft Replacement](#)

The propeller shaft and the joints are not serviceable.

The joint seals should be inspected for the following:

- Tears
- Cracks
- Contamination of the lubricating grease

Carefully pinch the seal and feel for the presence of grit

- Loose or missing seal clamps
- Leakage of lubricating grease from the seals

The joints should be inspected for the following conditions:

- Binding or impeded motion during axial movement of the front and rear joints
- Binding or impeded motion during lateral movement of the rear joint
- Loose or missing crimped-on end caps
- Leakage of lubricating grease from the end caps

The propeller shaft must be replaced if any of the above conditions exist. This will ensure that the propeller shaft continues to operate as intended and does not damage the other driveline components.

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 Fastener Specifications .
Bolts loose at propeller shaft flange and coupling.	Tighten the bolts to specifications. Refer to Fastener Specifications .

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.	

Checks	Action
A loose pinion yoke or companion flange	Tighten the bolts and the pinion nut to specified torque. Refer to Fastener Specifications .
Loose rubber coupling	Tighten the bolts to specified torque. Refer to Fastener Specifications .
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

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. Refer to Propeller Shaft Replacement and Front Axle Propeller Shaft Replacement (LGX, LGW) .
The side gear hub counterbore in the differential is worn oversize.	Replace the differential case and/or the side gears. Refer to Front Differential Carrier Assembly Replacement .

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

Checks	Action
DEFINITION: When driving the vehicle at various speeds a squeaking sound occurs.	
The universal joint has lost lubricant.	Replace the rear propeller shaft. Refer to Propeller Shaft Replacement .

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 Diagnostic Starting Point - Vehicle .
The universal joint is worn or damaged.	Replace the driveshaft complete. Refer to Propeller Shaft Replacement .
Rubber coupling bolts loose.	Tighten the bolts to specifications. Refer to Fastener Specifications .

REPAIR INSTRUCTIONS

PROPELLER SHAFT REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Exhaust Muffler Remove - [Exhaust Muffler Replacement \(LTG without HP9\)](#) [Exhaust Muffler Replacement \(LGW, LGX\)](#) [Exhaust Muffler Replacement \(LTG with HP9\)](#)

3. Mark (1) the relationship of the propeller shaft flange (2) and the output flange (3) of the transmission.

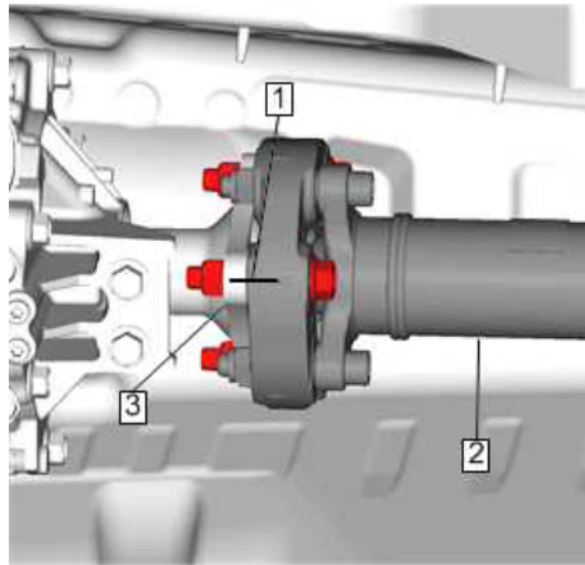


Fig. 1: Propeller Shaft Flange And Transmission Output Flange

Courtesy of GENERAL MOTORS COMPANY

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

4. Mark (1) the relationship of the propeller shaft flange (2) and the rear axle pinion flange (3).

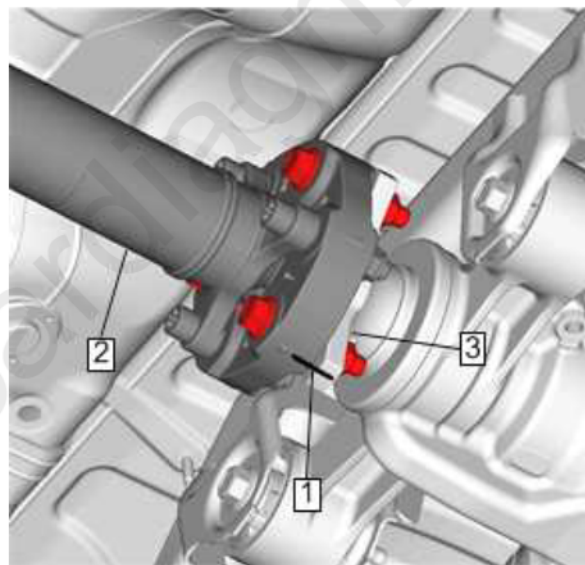


Fig. 2: Propeller Shaft Flange And Rear Axle Pinion Flange

Courtesy of GENERAL MOTORS COMPANY

5. Intermediate Body Exhaust Heat Shield» Remove - **Intermediate Body Exhaust Heat Shield Replacement (LGW, LGX, LTG)**
6. Support the propeller shaft with a suitable hydraulic jack stand.
7. Remove the propeller shaft front bolts (1) and nuts (2). [3x]

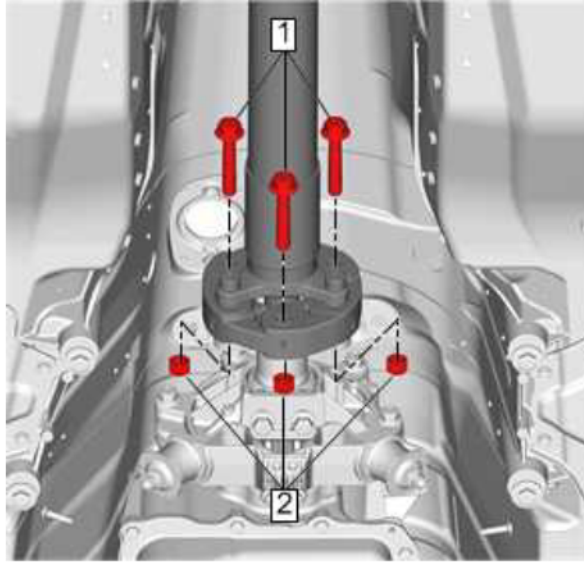


Fig. 3: Propeller Shaft Front Bolts And Nuts

Courtesy of GENERAL MOTORS COMPANY

8. Remove the propeller shaft rear bolts (1) and the nuts (2). [3x]

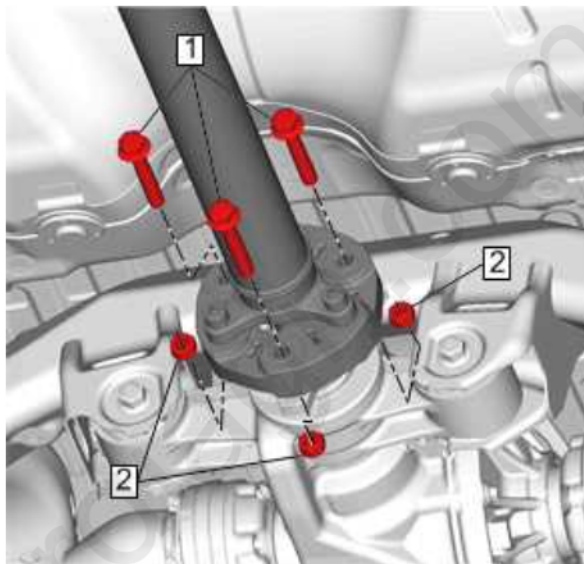


Fig. 4: Rear Propeller Shaft Nuts And Bolts

Courtesy of GENERAL MOTORS COMPANY

9. Propeller Shaft Bearing Support Bolt (1)» Remove [2x]

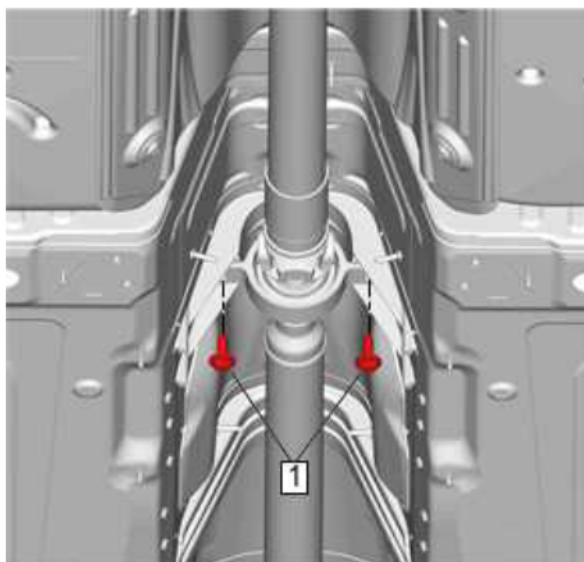


Fig. 5: Propeller Shaft Bearing Support Bolt

Courtesy of GENERAL MOTORS COMPANY

10. If the propeller shaft does not easily separate from the differential or transmission, use a rubber mallet to gently tap the locations (1) on the rubber coupling shown above to separate.

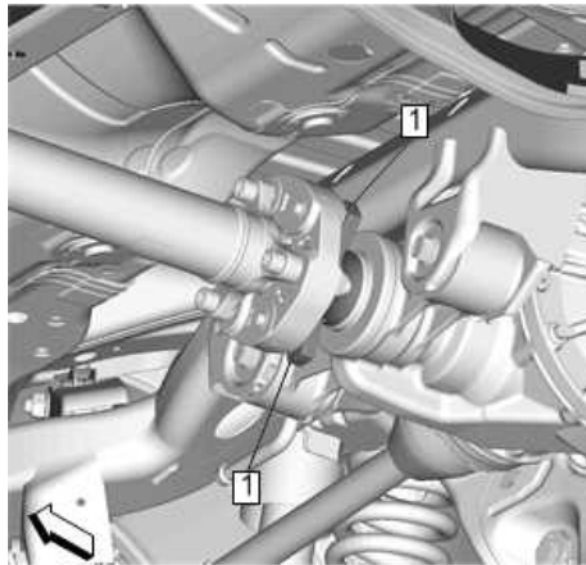


Fig. 6: Lubricant Or WD-40(R) To Area Shown
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Care should be taken not to use sharp or pry tools when separating the propeller shaft coupler from the drive flange. Damage to the coupler could result and replacement of the entire propeller shaft would be required.

NOTE: It may be necessary to apply a small amount of penetrating lubricant or WD-40® to the area shown (1) to aid in separation of the propeller shaft coupling.

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

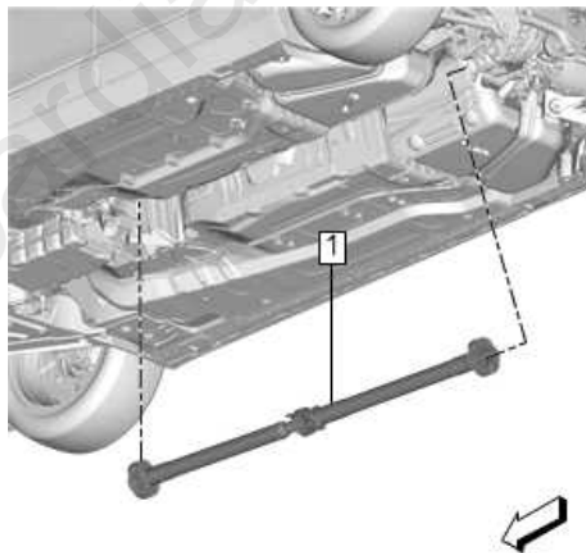


Fig. 7: Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Thoroughly clean and apply threadlocker to the threads of the propeller shaft bolts. Refer to [Adhesives, Fluids, Lubricants and Sealers](#)

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 an appropriate cleaner to thoroughly clean the threads and allow to dry. Apply threadlocker to

the propeller shaft to flange bolts. Ensure that there are no gaps in the threadlocker along the length of the filled area of the bolts. Allow the threadlocker to cure approximately 10 minutes before installation.

2. Position the propeller shaft (1) in the vehicle.

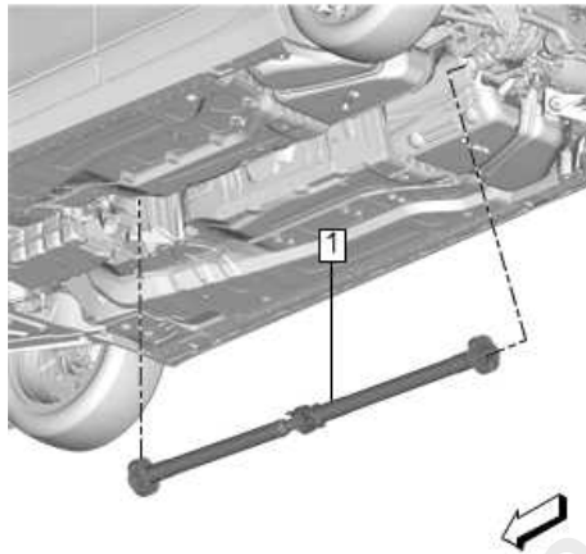


Fig. 8: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

3. Propeller Shaft Bearing Support Bolt» Install and tighten 58 N.m (43 lb ft)

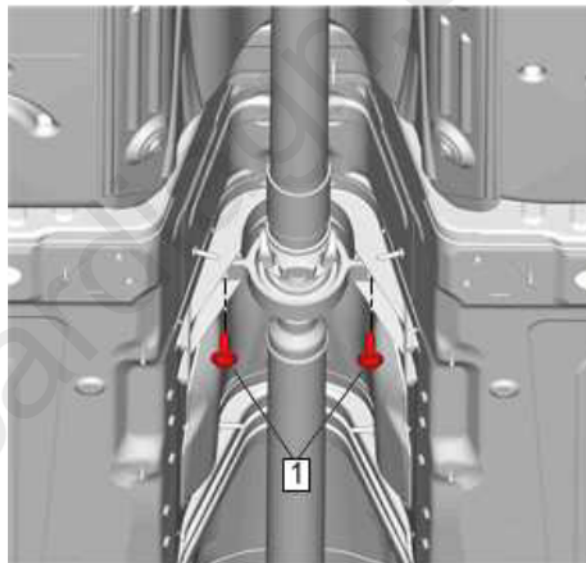


Fig. 9: Propeller Shaft Bearing Support Bolt

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

4. Align the reference mark (1) between the propeller shaft flange and the rear axle pinion flange.

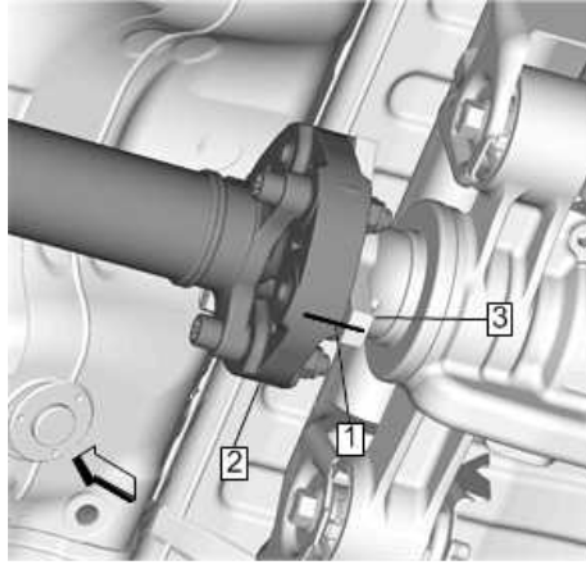


Fig. 10: Propeller Shaft Flange And Rear Axle Pinion Flange
 Courtesy of GENERAL MOTORS COMPANY

5. Install the rear propeller shaft bolts (1) and nuts (2), [3x] and tighten to 90 N.m (66 lb ft).

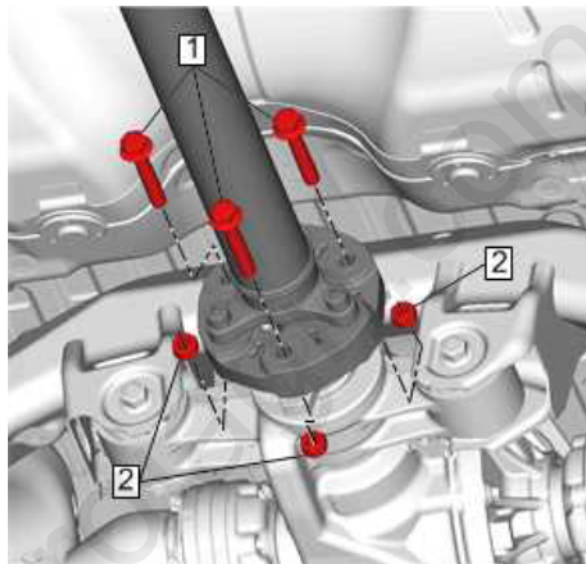


Fig. 11: Rear Propeller Shaft Nuts And Bolts
 Courtesy of GENERAL MOTORS COMPANY

6. Align the reference mark (1) between the propeller shaft flange and the output flange of the transmission.

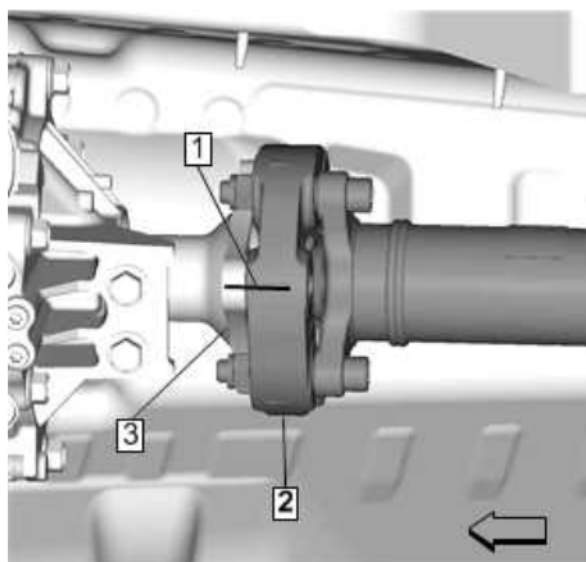


Fig. 12: Propeller Shaft Flange And Transmission Output Flange
 Courtesy of GENERAL MOTORS COMPANY

7. Install the front propeller shaft bolts (1) and nuts (2), [3x] and tighten to 90 N.m (66 lb ft).

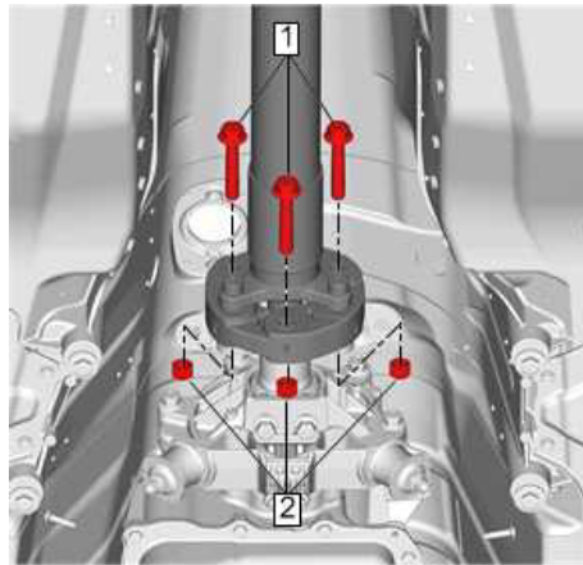


Fig. 13: Propeller Shaft Front Bolts And Nuts
Courtesy of GENERAL MOTORS COMPANY

8. Intermediate Body Exhaust Heat Shield» Install - **Intermediate Body Exhaust Heat Shield Replacement (LGW, LGX, LTG)**
9. Exhaust Muffler» Install - **Exhaust Muffler Replacement (LTG without HP9) Exhaust Muffler Replacement (LGW, LGX) Exhaust Muffler Replacement (LTG with HP9)**
10. Remove the support and lower the vehicle. Refer to **Lifting and Jacking the Vehicle**

FRONT AXLE PROPELLER SHAFT HEAT SHIELD REPLACEMENT (LGX, LGW)

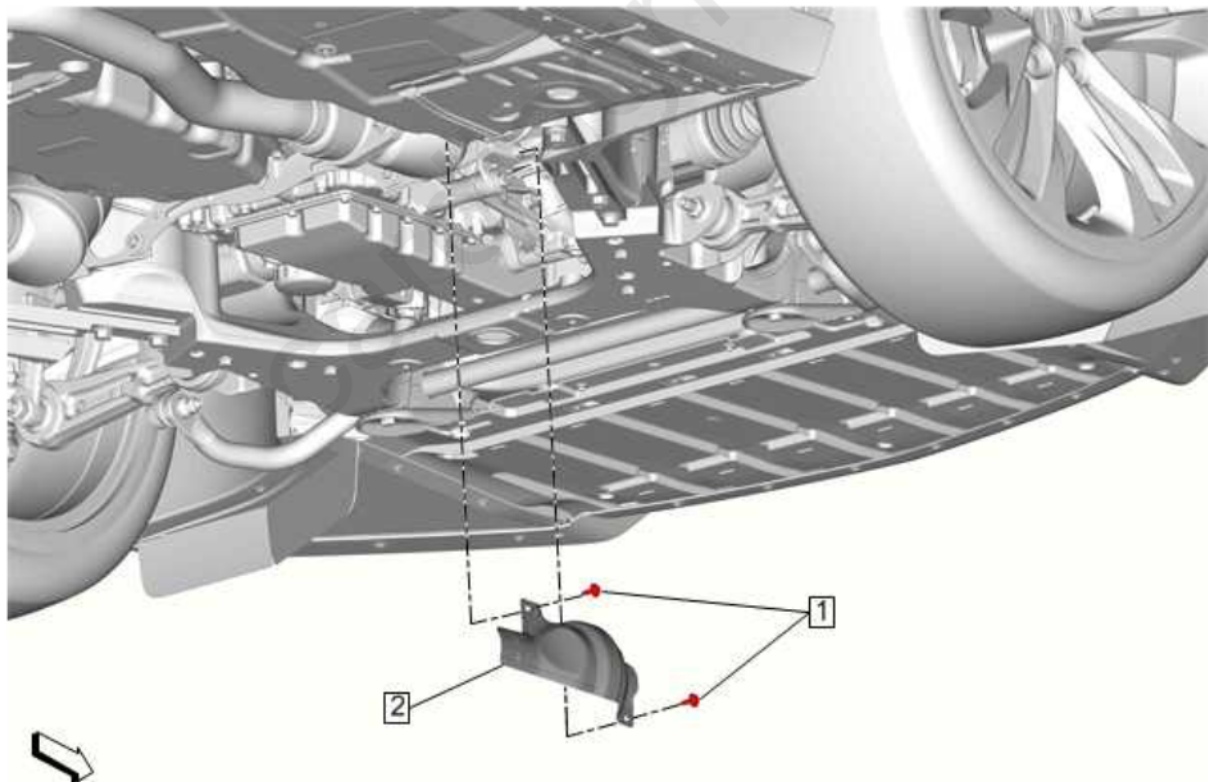


Fig. 14: Front Axle Propeller Shaft Heat Shield (LGX, LGW)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Drivetrain and Front Suspension Cradle Plate» Remove - Drivetrain and Front Suspension Cradle Plate Replacement	
1	Front Axle Propeller Shaft Heat Shield Bolt [2x] CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Front Axle Propeller Shaft Heat Shield

FRONT AXLE PROPELLER SHAFT REPLACEMENT (LGX, LGW)

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Drivetrain and Front Suspension Cradle Plate» Remove - [Drivetrain and Front Suspension Cradle Plate Replacement](#)
3. Front Axle Propeller Shaft Heat Shield» Remove - [Front Axle Propeller Shaft Heat Shield Replacement \(LGX, LGW\)](#)
4. Transmission Support Crossmember» Remove - [Transmission Support Crossmember Replacement \(LTG\)](#)
5. Using a suitable marker or paint pen, mark the relationship of the front propeller shaft to the transfer case and the front differential carrier assembly.
6. Front Axle Propeller Shaft Bolt (1) @ Front Differential Carrier Assembly» Remove [4x]

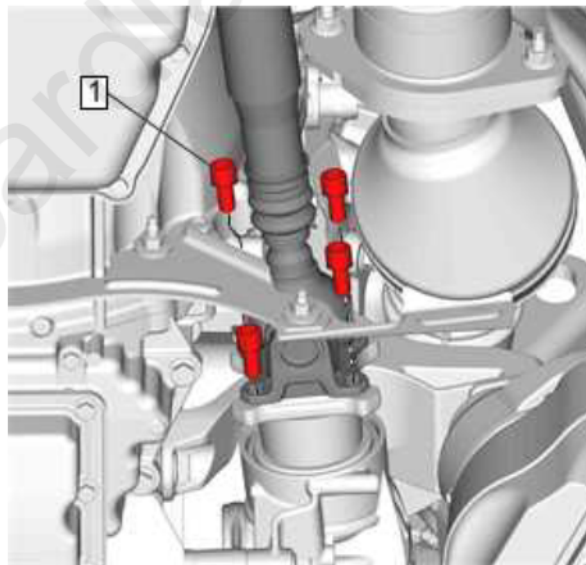


Fig. 15: Front Axle Propeller Shaft Bolt
 Courtesy of GENERAL MOTORS COMPANY

7. Front Axle Propeller Shaft Bolt (1) @ Transfer Case» Remove [4x]

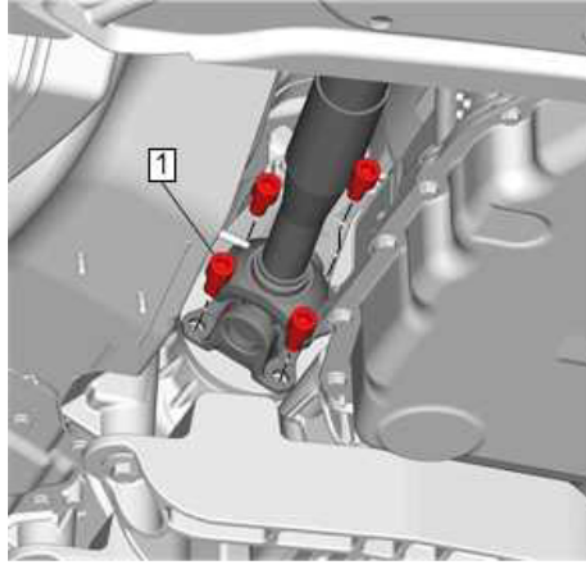


Fig. 16: Front Axle Propeller Shaft Bolt
Courtesy of GENERAL MOTORS COMPANY

8. Front Axle Propeller Shaft (1)» Remove

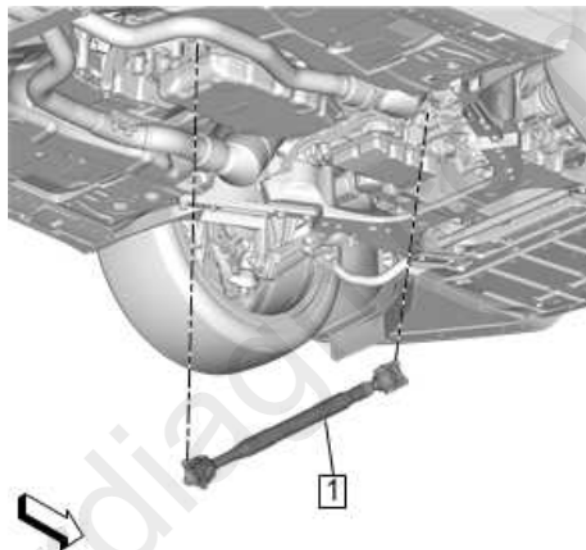


Fig. 17: Front Axle Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Front Axle Propeller Shaft (1)» Install

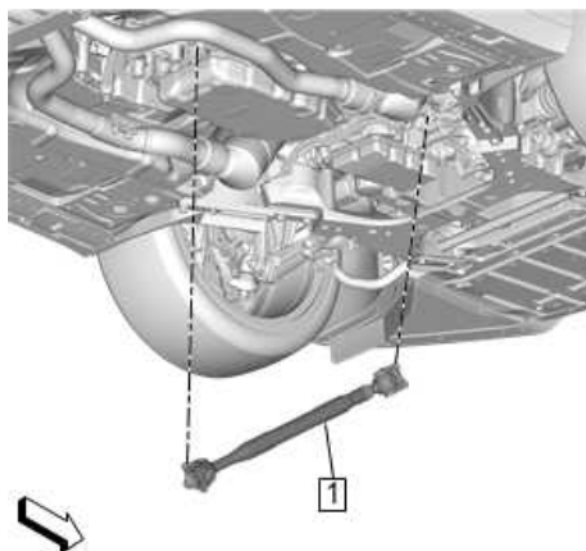


Fig. 18: Front Axle Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

2. Align the reference marks on the front propeller shaft to the transfer case and the front differential carrier assembly.
3. Thoroughly clean and apply threadlocker to the threads of the propeller shaft bolts. Refer to [Adhesives, Fluids, Lubricants and Sealers](#)

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

4. Front Axle Propeller Shaft Bolt (1) @ Transfer Case» Install and tighten [4x] 58 N.m (43 lb ft)

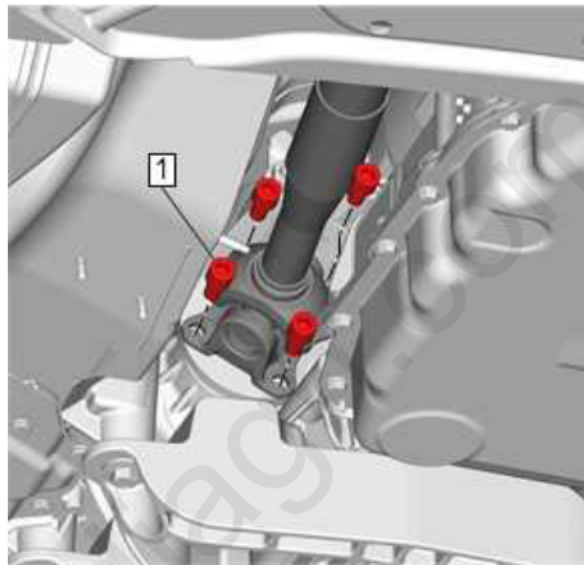


Fig. 19: Front Axle Propeller Shaft Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to [Fastener Caution](#) .

5. Front Axle Propeller Shaft Bolt (1) @ Front Differential Carrier Assembly» Install and tighten [4x] 58 N.m (43 lb ft)

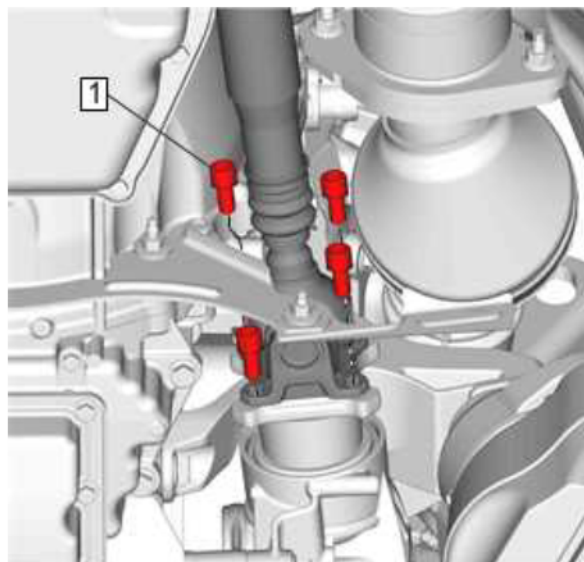


Fig. 20: Front Axle Propeller Shaft Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Transmission Support CrossmemberA» Install - [Transmission Support Crossmember Replacement \(LTG\)](#)
7. Front Axle Propeller Shaft Heat ShieldA» Install - [Front Axle Propeller Shaft Heat Shield Replacement \(LGX, LGW\)](#)
8. Drivetrain and Front Suspension Cradle PlateA» Install - [Drivetrain and Front Suspension Cradle Plate Replacement](#)
9. Remove the support and lower the vehicle. Refer to [Lifting and Jacking the Vehicle](#)

DESCRIPTION AND OPERATION

PROPELLER SHAFT DESCRIPTION AND OPERATION

The propeller shaft is a tube with rubber couplers at each end which do not require periodic maintenance. This transmits power from the transfer case or transmission output shaft to the differential.

Two-Piece Propeller Shaft Description

There is 1 universal joint used in this two-piece propeller shaft design and connects the two pieces together. 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

The universal joint connects the two-piece 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. 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 a 2 or more piece propeller shaft. 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.
