

## 2002 Chevrolet Corvette

### 2002 DRIVELINE/AXLE Propeller Shaft - Corvette

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### Propeller Shaft - Corvette

## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Bearing Housing Assembly-to-Coupling Bolts (Automatic Transmission)	70 N·m	52 lb ft
Bearing Housing Assembly-to-Coupling Bolts (Manual Transmission)	90 N·m	66 lb ft
Clutch Actuator Cylinder Mounting Bolts (Manual Transmission)	12 N·m	106 lb in
Coupling-to-Propeller Shaft Bolts (Automatic Transmission)	70 N·m	52 lb ft
Coupling-to-Propeller Shaft Bolts (Manual Transmission)	90 N·m	66 lb ft
Driveline Tunnel Closeout Panel Bolts	10 N·m	89 lb in
EBTCM LH Mounting Bracket Mounting Bolts	50 N·m	37 lb ft
Flexplate Spindle Nut (Automatic Transmission)	90 N·m	66 lb ft
Flexplate-to-Flexplate Spindle Bolts (Automatic Transmission)	50 N·m	37 lb ft
Input Shaft Bearing Positioning Bolts	35 N·m	26 lb ft
Input Shaft-to-Coupling Bolts (Automatic Transmission)	70 N·m	52 lb ft
Input Shaft-to-Coupling Bolts (Manual Transmission)	90 N·m	66 lb ft
Negative Battery Cable Bolt	15 N·m	11 lb ft
Propeller Shaft Hub Clamp Bolt (Automatic Transmission)	125 N·m	93 lb ft
Rear Exhaust Hanger Mounting Bolts	50 N·m	37 lb ft
Rear Shock Absorber Lower Mounting Bolt	220 N·m	162 lb ft
Rear Suspension Crossmember Mounting Nuts	110 N·m	81 lb ft
Shift Control Closeout Boot Retaining Nuts (Manual Transmission)	12 N·m	106 lb in
Shift Control Mounting Bolts	30 N·m	22 lb ft
Transaxle Mount Bracket-to-Differential Bolts	50 N·m	37 lb ft
Transaxle Mount-to-Rear Suspension Crossmember Nuts	50 N·m	37 lb ft
Transmission Oil Cooler Rear Pipe Front Fittings-to-Junction Fittings at Engine Flywheel Housing	27 N·m	20 lb ft
Transmission Oil Cooler Rear Pipe Rear Fittings-to-Transmission Fittings	40 N·m	30 lb ft
Transmission Oil Cooler Rear Pipe Retaining Clamp Bolts	12 N·m	106 lb in
Transmission Shift Control Cable Bracket Retaining Nuts	20 N·m	15 lb ft
Transmission Shift Rod Clamp Bolt	30 N·m	22 lb ft
Transmission-to-Driveline Support Assembly Bolts/Studs	50 N·m	37 lb ft
Transmission Wiring Harness-to-LH Transmission Case Retaining Bolt	2.5 N·m	22 lb in

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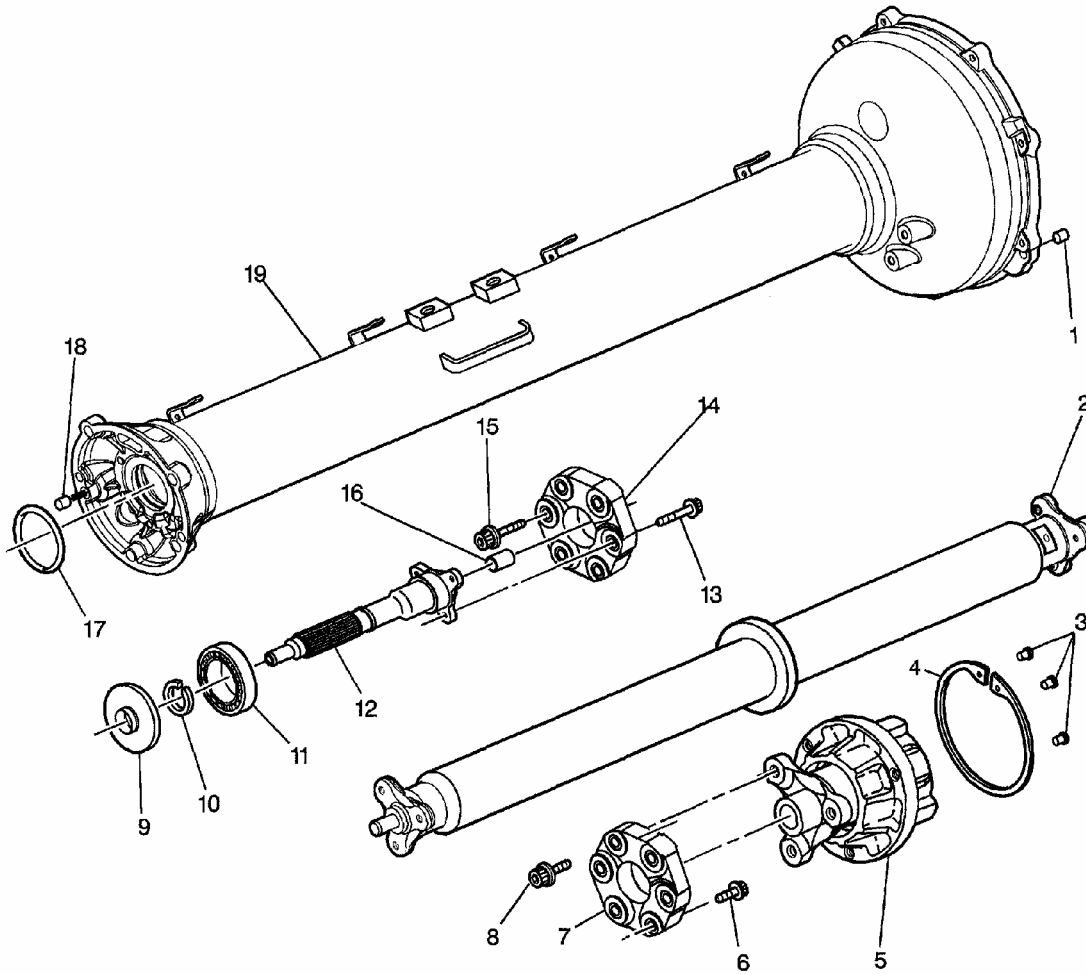
**Fig. 1: Fastener Tightening Specifications**  
Courtesy of GENERAL MOTORS CORP.

## COMPONENT LOCATOR

### DRIVELINE DISASSEMBLED VIEWS

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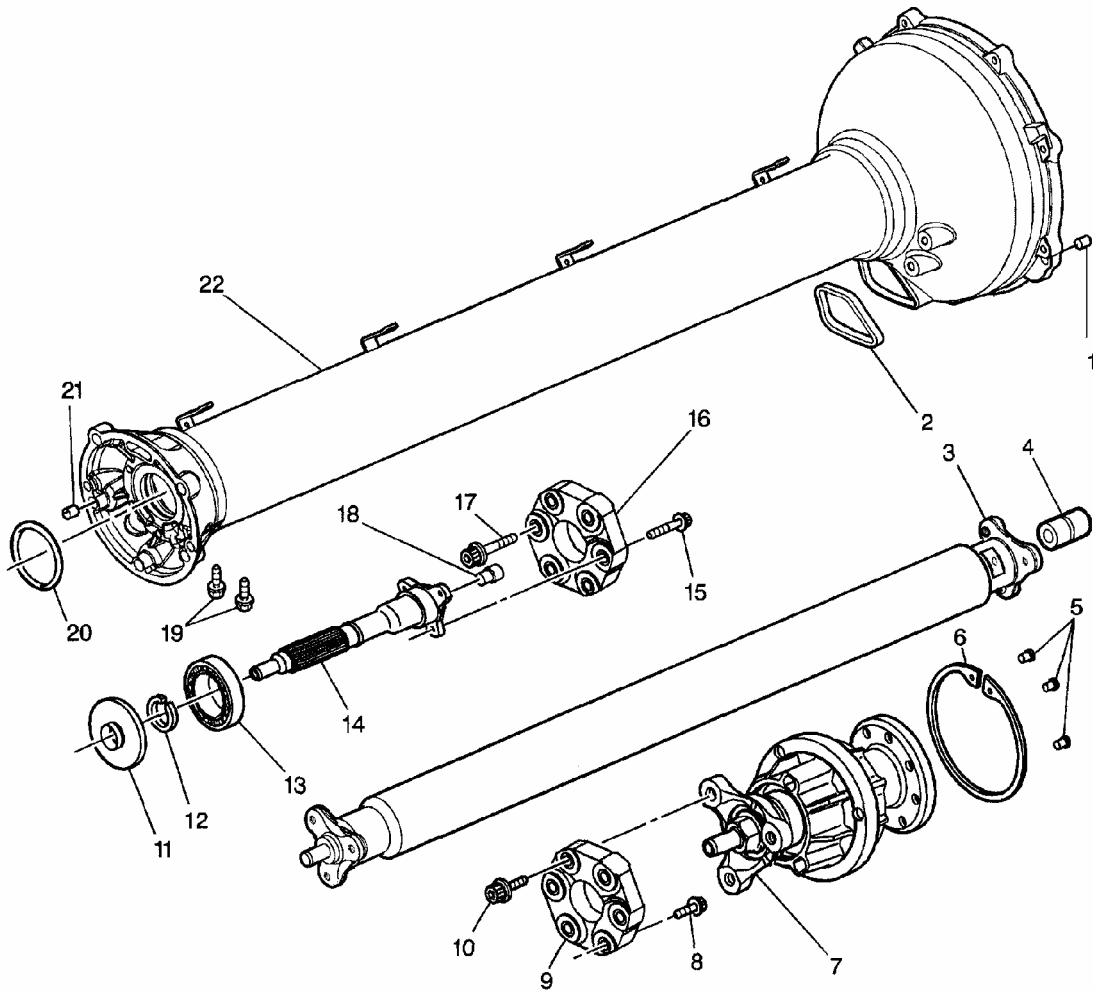
- |                              |                     |
|------------------------------|---------------------|
| (1) Dowel Pin                | (11) Bearing        |
| (2) Propeller Shaft          | (12) Input Shaft    |
| (3) Plugs                    | (13) Bolt           |
| (4) Snap Ring                | (14) Coupling       |
| (5) Bearing Housing Assembly | (15) Bolt           |
| (6) Bolt                     | (16) Bushing        |
| (7) Coupling                 | (17) O-Ring         |
| (8) Bolt                     | (18) Dowel Pin      |
| (9) Slinger Washer           | (19) Driveline Tube |
| (10) Snap Ring               |                     |

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**Fig. 2: Driveline Assembly (Manual Transmission)**  
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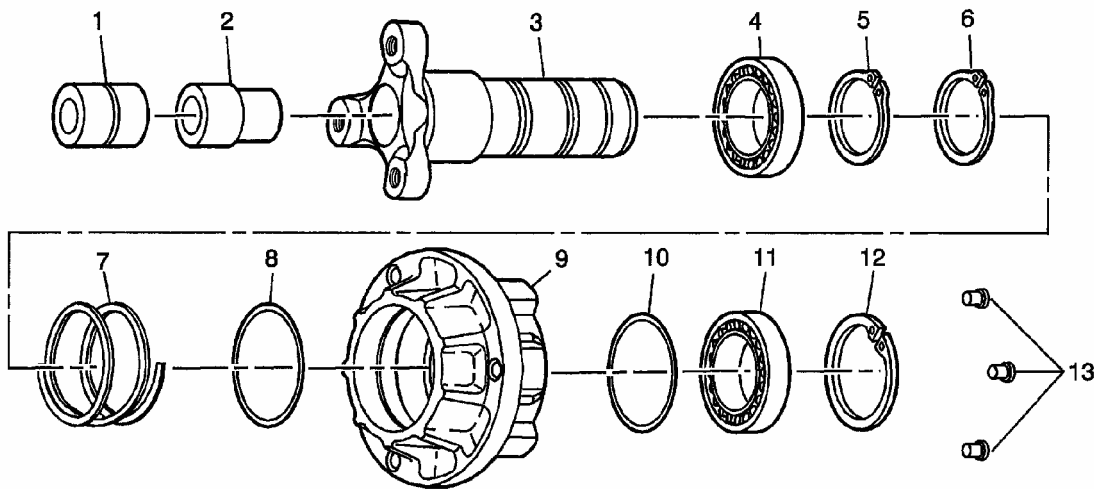
- |                              |                     |
|------------------------------|---------------------|
| (1) Dowel Pin                | (12) Snap Ring      |
| (2) Access Hole Plug         | (13) Bearing        |
| (3) Propeller Shaft          | (14) Input Shaft    |
| (4) Bushing                  | (15) Bolt           |
| (5) Plugs                    | (16) Coupling       |
| (6) Snap Ring                | (17) Bolt           |
| (7) Bearing Housing Assembly | (18) Bushing        |
| (8) Bolt                     | (19) Plug           |
| (9) Coupling                 | (20) O-Ring         |
| (10) Bolt                    | (21) Dowel Pin      |
| (11) Slinger Washer          | (22) Driveline Tube |

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**Fig. 3: Driveline Assembly (Automatic Transmission)**  
**Courtesy of GENERAL MOTORS CORP.**

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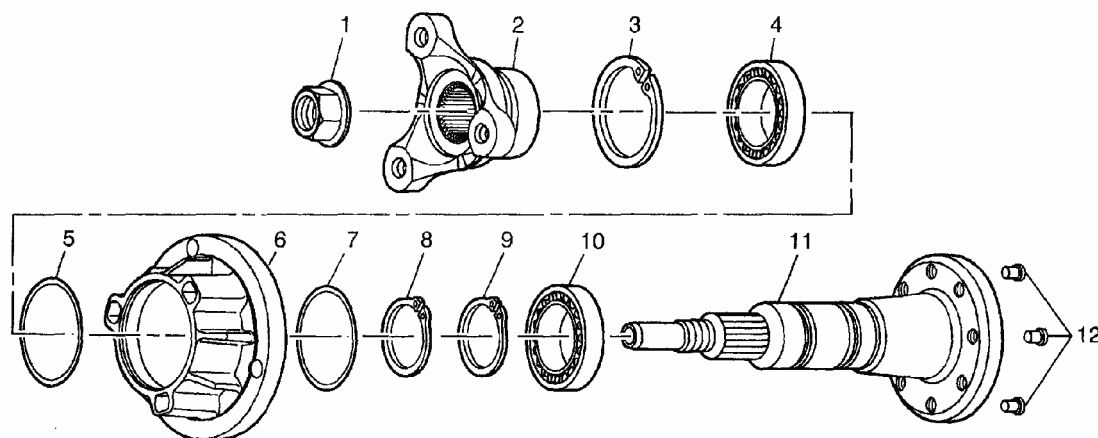
- (1) Bushing
- (2) Bushing
- (3) Hub
- (4) Bearing
- (5) Snap Ring
- (6) Snap Ring
- (7) Wave Washer

- (8) O-Ring
- (9) Bearing Housing
- (10) O-Ring
- (11) Bearing
- (12) Snap Ring
- (13) Plugs

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**Fig. 4: Rear Bearing Housing Assembly (Manual Transmission)**  
**Courtesy of GENERAL MOTORS CORP.**





- (1) Nut
- (2) Hub
- (3) Snap Ring
- (4) Bearing
- (5) O-Ring
- (6) Bearing Housing

- (7) O-Ring
- (8) Snap Ring
- (9) Snap Ring
- (10) Bearing
- (11) Flexplate Spindle
- (12) Plugs

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**Fig. 5: Rear Bearing Housing Assembly (Automatic Transmission)**  
 Courtesy of GENERAL MOTORS CORP.

## DIAGNOSTIC INFORMATION & PROCEDURES

### DRIVELINE NOISE DIAGNOSIS

1. Begin the system diagnosis by reviewing the **Driveline Disassembled Views** and **Driveline Support Assembly Description** . Reviewing the description and operation information will help you determine the correct diagnostic procedure when a malfunction exists. Reviewing the description and operation information will also help you determine if the condition described by the customer is normal operation.
2. Perform a visual and physical inspection of the following:
  - Inspect for aftermarket devices, which could affect the operation of the vehicle. Refer to **CHECKING AFTERMARKET ACCESSORIES** in Wiring Systems.
  - Inspect the easily accessible or visible system components for obvious damage or conditions, which could cause the symptom.
  - Verify the exact operating conditions under which the concern exists. Note factors such as vehicle speed, road conditions, ambient temperature, and other specifics.
  - Compare the driving characteristics or sounds, if applicable, to a known good vehicle and make sure you are not trying to correct a normal condition.
3. Test the vehicle under the same conditions that the customer reported in order to verify the system is operating properly.

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

- **VIBRATION DIAGNOSIS & CORRECTION**
- **TROUBLE SHOOTING** in Drive Axles.
- **DIAGNOSTIC STARTING POINT** in Axle Shafts.
- **Noisy in Drive**
- **Noisy When Coasting**
- **Intermittent Noise**
- **Constant Noise**
- **Noisy on Turns**

Cause	Correction
Loose propeller shaft hub clamp bolt – automatic transmission only	A loose propeller shaft hub clamp bolt may create a “rattle” type noise, mainly at idle, in the flywheel area of the transmission housing. Tighten the hub clamp bolt or replace the components as required.
Balance weight detached from the propeller shaft	A detached balance weight may create a “sliding, scraping, or ticking” type noise during acceleration or deceleration. 1. Inspect the propeller shaft and tube for a detached balance weight. 2. Replace components as required. Do not attempt to reattach the balance weight to the propeller shaft.
Propeller shaft rev limiter, snubber, contacting the driveline tube – manual transmission only A propeller shaft overspeed condition may occur when the driver selects too low a gear for the current vehicle speed.	A rev limiter, snubber, that is contacting the driveline tube may create a “moaning” type noise and/or vibration that is felt through the shift lever. Slight noise and vibration is to be considered normal during an overspeed condition but should not be present when the overspeed condition has ceased. Replace components as required.
Bearing noise within the driveline assembly	A “whirring or squealing” type noise will increase or decrease relative to the vehicle speed and may be caused by a worn bearing. A MINOR “whirring” type noise should be considered normal. Replace the bearings as required.
Broken or missing snap ring on the hub of the rear bearing housing assembly – manual transmission only	A broken or missing snap ring on the rear bearing housing may allow the propeller shaft assembly to move forward in the driveline tube. In those situations, the shoulder of the input shaft will contact the outer race of the clutch pilot bearing and create a “squealing or squeaking” type noise with the clutch pedal depressed. Repair or replace components as required.

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**Fig. 6: Driveline Noise Diagnosis (1 Of 2)**  
**Courtesy of GENERAL MOTORS CORP.**

Cause	Correction
Loose flexplate bolts or a damaged flexplate – automatic transmission: only	A flexplate that is cracked or that has loose retaining bolts may create a “clicking, clanking, or snapping” type noise in the transmission housing. Replace the components as required.
Propeller shaft “out-of-balance” condition	A propeller shaft “out-of-balance” condition may create a vibration and be caused by: <ul style="list-style-type: none"><li>• Worn rev limiter, snubber</li><li>• Bent propeller shaft</li><li>• Loose or missing parts</li></ul>

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**Fig. 7: Driveline Noise Diagnosis (2 Of 2)**  
Courtesy of GENERAL MOTORS CORP.

#### NOISY IN DRIVE

Cause	Correction
<b>Important:</b> Inspect for the proper gear oil levels prior to performing system diagnosis. Refer to <i>Lubricant Level Check</i> .	
Worn clutch disc and/or pressure plate assembly	Repair or replace as required.
Transmission noise	Repair or replace as required. Refer to Symptom List in Manual Transmission - MM6 or <i>Diagnostic System Check</i> .
Driveline assembly noise	Repair or replace as required. Refer to <i>Driveline Noise Diagnosis</i> in Propeller Shaft.
Worn axle shaft constant velocity joints	Replace the constant velocity joints as required.
Worn, loose, or damaged axle mount and/or bracket	Repair or replace the axle mount and/or bracket as required.

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**Fig. 8: Noisy In Drive (1 Of 2)**  
Courtesy of GENERAL MOTORS CORP.

Cause	Correction
Bearing noise within the differential assembly	A grinding or roar type noise will increase or decrease relative to the vehicle speed. <ol style="list-style-type: none"><li>1. Check for the proper fluid level. Fill as required.</li><li>2. If the noise continues, repair or replace the unit as required.</li></ol>
Gear set whine noise within the differential assembly	A whine type noise will increase or decrease relative to the vehicle speed, approximately 31–37 km/h (50–60 mph). Typical causes of a gear set whine type noise may include incorrect backlash and/or pinion depth adjustment or worn or scored gear set teeth. <ol style="list-style-type: none"><li>1. Check for the proper fluid level. Fill as required.</li><li>2. Repair or replace the unit as required.</li></ol>

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**Fig. 9: Noisy In Drive (2 Of 2)**  
Courtesy of GENERAL MOTORS CORP.

#### NOISY WHEN COASTING

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Cause	Correction
<b>Important:</b> Inspect for the proper gear oil levels prior to performing system diagnosis. Refer to <i>Lubricant Level Check</i> .	
Worn axle shaft constant velocity joints	Replace the constant velocity joints as required.
Worn, loose, or damaged axle mount and/or bracket	Repair or replace the axle mount and/or bracket as required.
Bearing noise within the differential assembly	A grinding or roar type noise will increase or decrease relative to the vehicle speed. 1. Check for the proper fluid level. Fill as required. 2. If the noise continues, repair or replace the unit as required.
Gear set whine noise within the differential assembly	A whine type noise will increase or decrease relative to the vehicle speed, approximately 31–37 km/h (50–60 mph). Typical causes of a gear set whine type noise may include incorrect backlash and/or pinion depth adjustment or worn or scored gear set teeth. 1. Check for the proper fluid level. Fill as required. 2. Repair or replace the unit as required.

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**Fig. 10: Noisy When Coasting**  
Courtesy of GENERAL MOTORS CORP.

#### INTERMITTENT NOISE

Cause	Correction
<b>Important:</b> Inspect for the proper gear oil levels prior to performing system diagnosis. Refer to <i>Lubricant Level Check</i> .	
Worn, loose, or damaged axle mount and/or bracket	Repair or replace the axle mount and/or bracket as required.
Incorrect gear oil	Replace with the correct gear oil and friction modifier additive. Refer to <i>Lubricant Change</i> .

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**Fig. 11: Intermittent Noise**  
Courtesy of GENERAL MOTORS CORP.

#### CONSTANT NOISE

Cause	Correction
<b>Important:</b> Inspect for the proper gear oil levels prior to performing system diagnosis. Refer to <i>Lubricant Level Check</i> .	
Low gear oil levels	Faulty oil seals or other type leaks may contribute to lower than required fluid levels. Refer to <i>Rear Axle Lubricant Leak Diagnosis</i> . Fill to the proper level with the correct gear oil and friction modifier additive. Refer to <i>Lubricant Change</i> .
Worn, loose, or damaged axle mount and/or bracket	Repair or replace the axle mount and/or bracket as required.

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**Fig. 12: Constant Noise**  
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Cause	Correction
Bearing noise within the differential assembly	A grinding or roar type noise will increase or decrease relative to the vehicle speed. 1. Check for the proper fluid level. Fill as required. 2. If the noise continues, repair or replace the unit as required.
Gear set whine noise within the differential assembly	A whine type noise will increase or decrease relative to the vehicle speed, approximately 31–37 km/h (50–60 mph). Typical causes of a gear set whine type noise may include incorrect backlash and/or pinion depth adjustment or worn or scored gear set teeth. 1. Check for the proper fluid level. Fill as required. 2. Repair or replace the unit as required.

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**Fig. 13: Constant Noise**  
Courtesy of GENERAL MOTORS CORP.

### NOISY ON TURNS

Cause	Correction
<b>Important:</b> <ul style="list-style-type: none"><li>Inspect for the proper gear oil levels prior to performing system diagnosis. Refer to <i>Lubricant Level Check</i>.</li><li>Operate the vehicle turning in tight circles in both left and right directions. A chatter type concern may indicate an incorrect type gear oil, lack of the friction modifier additive, or worn friction discs and/or plates.</li></ul>	
Worn or loose rear axle mount and/or bracket	Repair or replace as required.
Worn axle shaft constant velocity joints	Replace the constant velocity joints as required.
Worn wheel bearings	Replace the wheel bearings as required.
Incorrect gear oil	Fill to the proper level with the correct gear oil and friction modifier additive. Refer to <i>Lubricant Change</i> .
Worn clutch plates	Replace the friction discs and plates as required.

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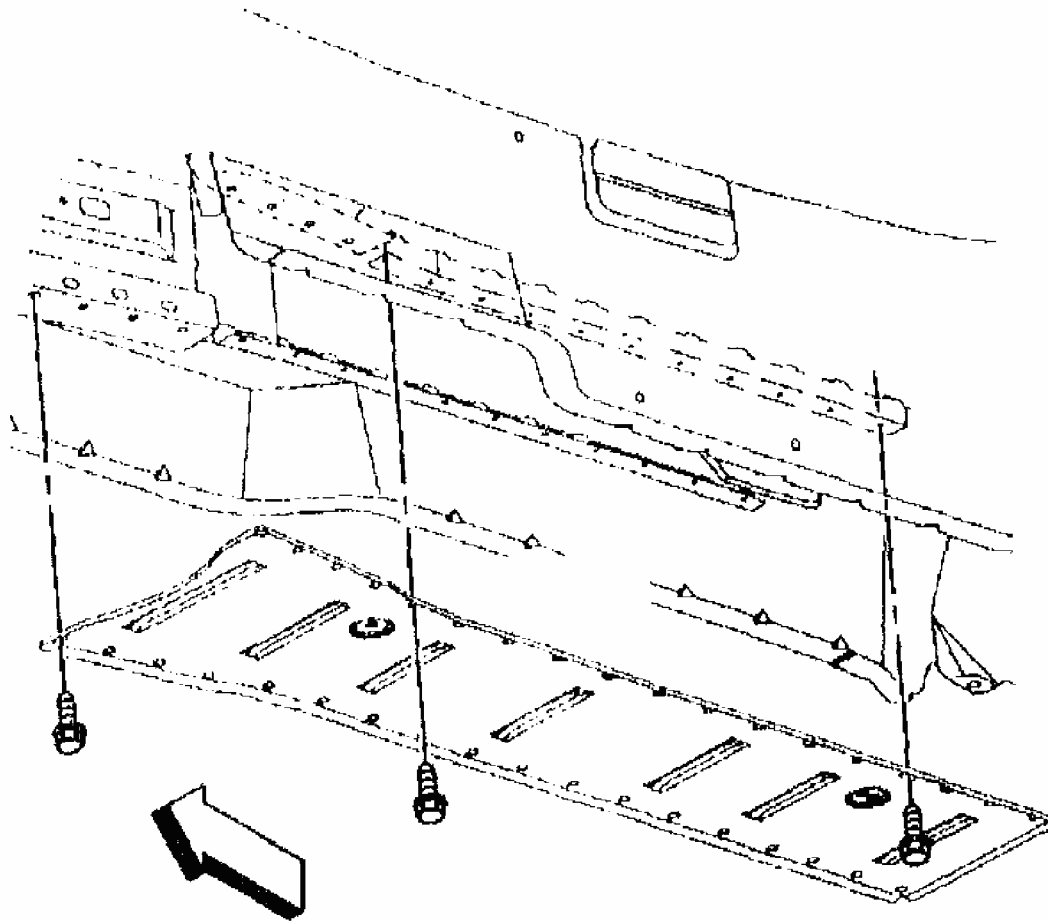
**Fig. 14: Noisy On Turns**  
Courtesy of GENERAL MOTORS CORP.

## REPAIR INSTRUCTIONS

### DRIVELINE TUNNEL CLOSEOUT PANEL REPLACEMENT

#### Removal Procedure

1. Raise and suitably support the vehicle. Refer to **LIFTING AND JACKING THE VEHICLE**.
2. Remove the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
3. Remove the driveline tunnel closeout panel bolts.
4. Remove the closeout panel.



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**Fig. 15: Removing Driveline Tunnel Closeout Panel Bolts**  
Courtesy of GENERAL MOTORS CORP.

**Installation Procedure**

1. Install the driveline tunnel closeout panel into position.
2. Install the bolt into the closeout panel locating hole (1).
3. Install the bolt into the closeout panel slotted hole (2)

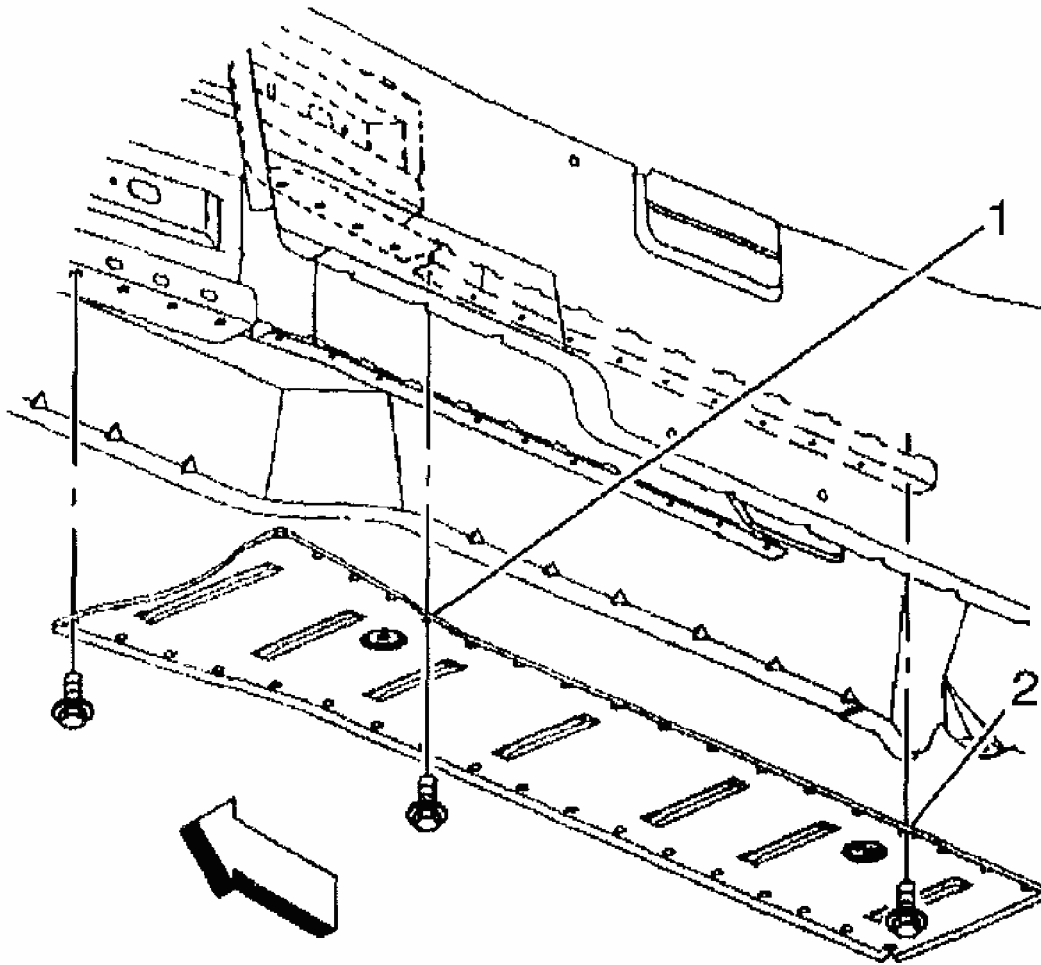
**CAUTION: Refer to FASTENER NOTICE .**

**Important:** ALL of the driveline tunnel closeout panel bolts must be installed and torqued to specifications, the closeout panel functions as a part of the vehicle body structure.

4. Install the remaining bolts.

### **Tighten**

Tighten the driveline tunnel closeout panel bolts to 10 N.m (89 lb in).



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**Fig. 16: Installing Driveline Tunnel Closeout Panel Bolts**  
Courtesy of GENERAL MOTORS CORP.

5. Install the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
6. Lower the vehicle.

## Tools Required

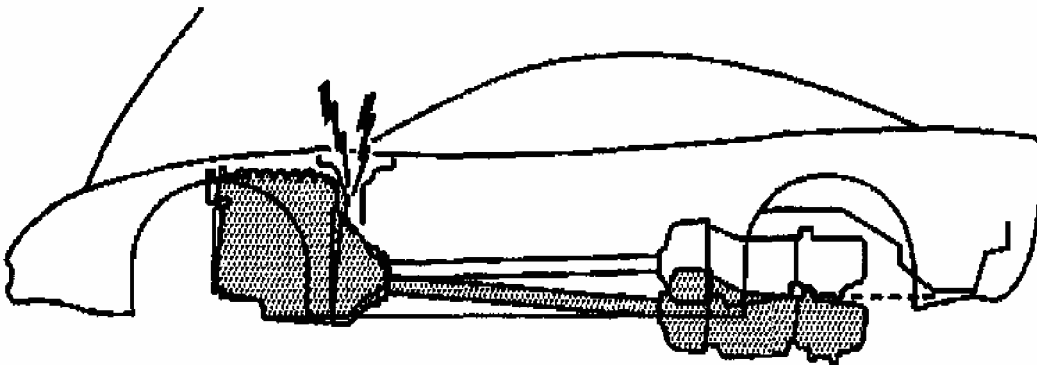
**J 42055** Transmission Support Fixture

## Removal Procedure

**CAUTION:** Failure to follow the proper removal and installation procedures may result in damage to the engine crankshaft thrust bearing.

**CAUTION:** When lowering and removing the rear of the driveline, observe the clearance between the rear of the transaxle assembly and the underbody to prevent damage.

**CAUTION:** When tilting down the rear of the driveline, observe the clearance between the rear of the engine and the composite dash panel. Do not allow the engine to rest unsupported against the composite dash panel, or vehicle damage may result.



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**Fig. 17: Identifying Engine To Composite Dash Panel Clearance**  
Courtesy of GENERAL MOTORS CORP.

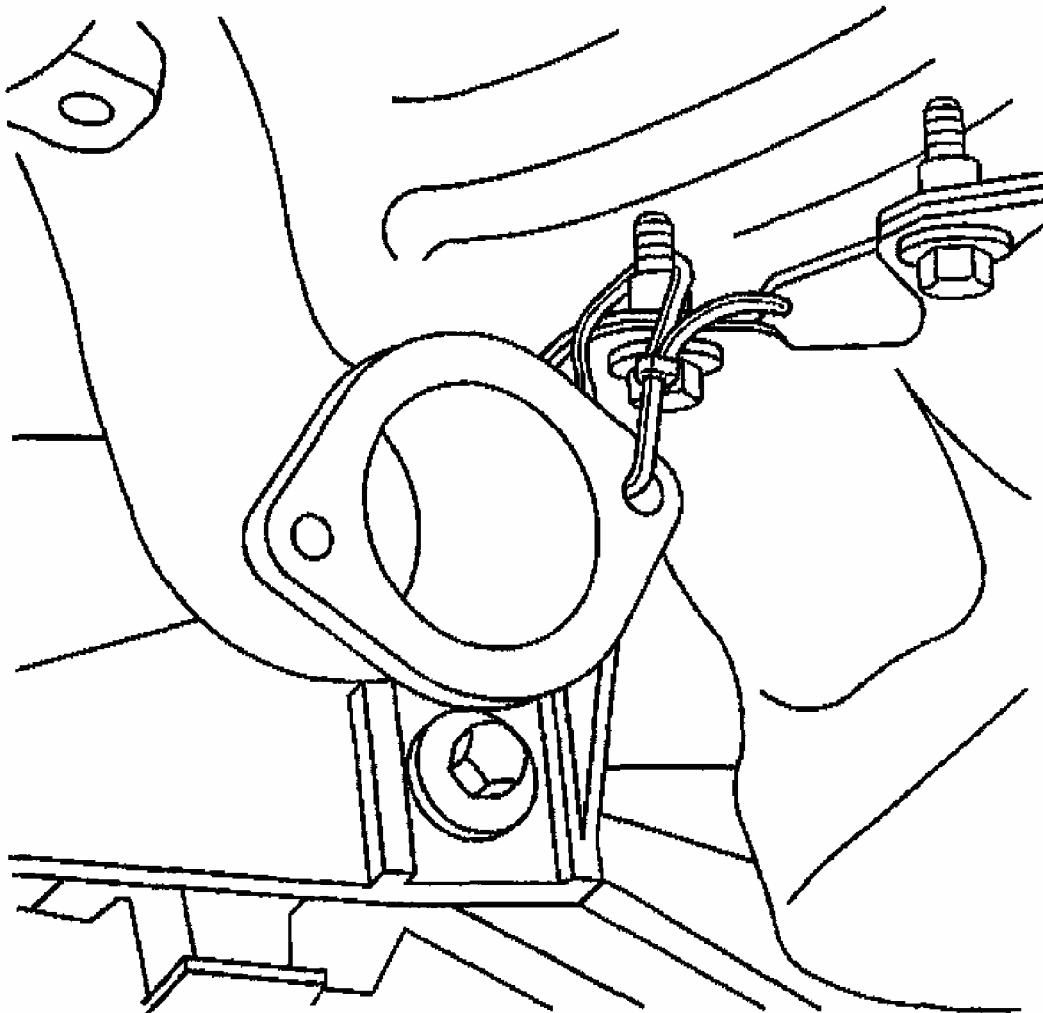
**WARNING:** Refer to **BATTERY DISCONNECT CAUTION** .

1. Disconnect the negative battery cable.
2. Raise and support the vehicle. Refer to **LIFTING AND JACKING THE VEHICLE** .
3. Remove the rear tire and wheel assemblies. Refer to **TIRE & WHEEL REMOVAL**



**& INSTALLATION** in Tires and Wheels.

4. Remove the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
5. Tie off the LH muffler assembly to the underbody to support the muffler out of the way.
6. Remove the RH muffler assembly. Refer to **MUFFLER REPLACEMENT-RIGHT** in Engine Exhaust.



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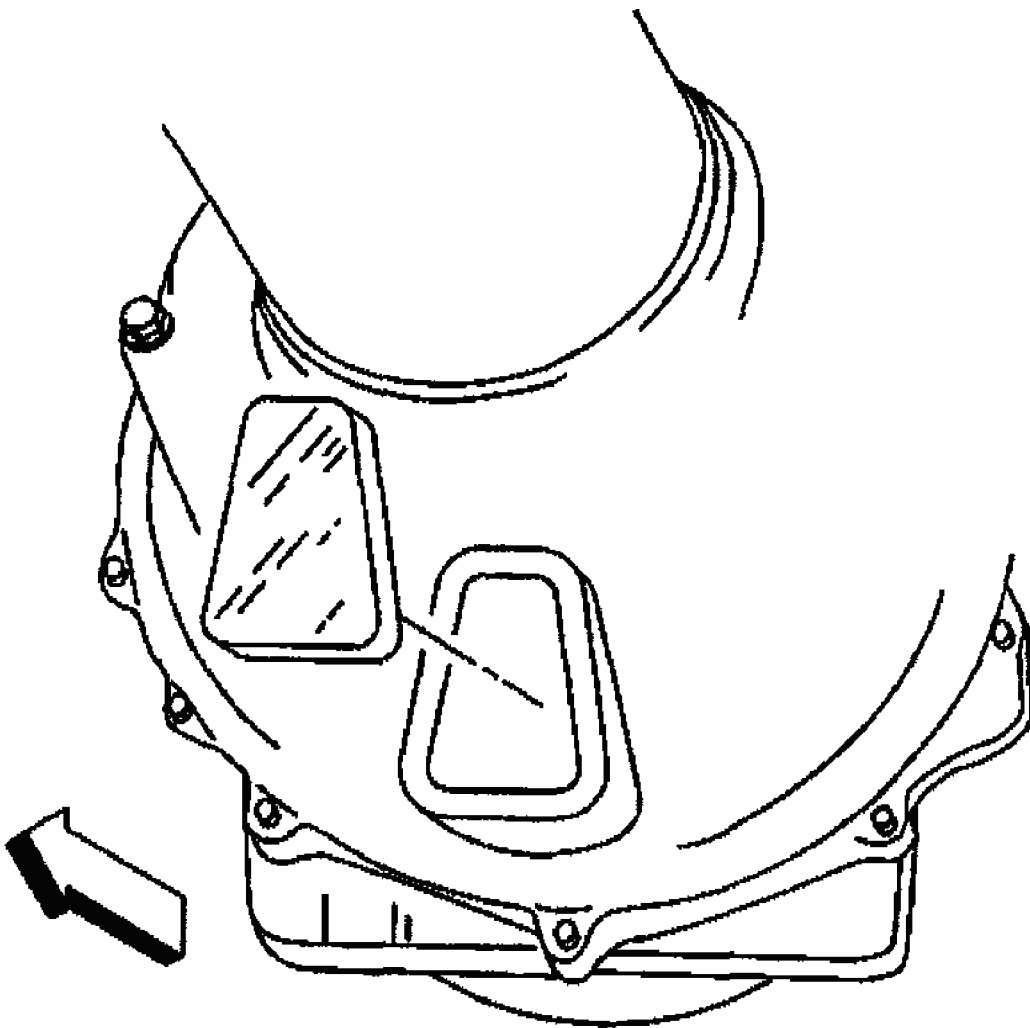
**Fig. 18: Securing LH Muffler**  
Courtesy of GENERAL MOTORS CORP.

7. Remove the driveline tunnel closeout panel. Refer to **Driveline Tunnel Closeout Panel Replacement**.

8. Using a flat bladed screwdriver, remove the rear bellhousing access plug.

**Important:** The following step must be performed to assure proper torque converter balance during installation.

9. Matchmark the transmission flexplate to the transmission torque converter through the access hole in the rear bellhousing.
10. Remove the transmission flexplate to transmission torque converter bolts. Remove starter. Refer to **STARTER MOTOR** .



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**Fig. 19: Removing Rear Bellhousing Access Plug**  
**Courtesy of GENERAL MOTORS CORP.**

11. Remove the two plug bolts from the front of driveline support assembly.

**CAUTION: Refer to FASTENER  
NOTICE .**

**Important:** The propeller input shaft front bearing positioning bolts are intended to remain torqued to specification and in place UNTIL INSTRUCTED in the installation procedure.

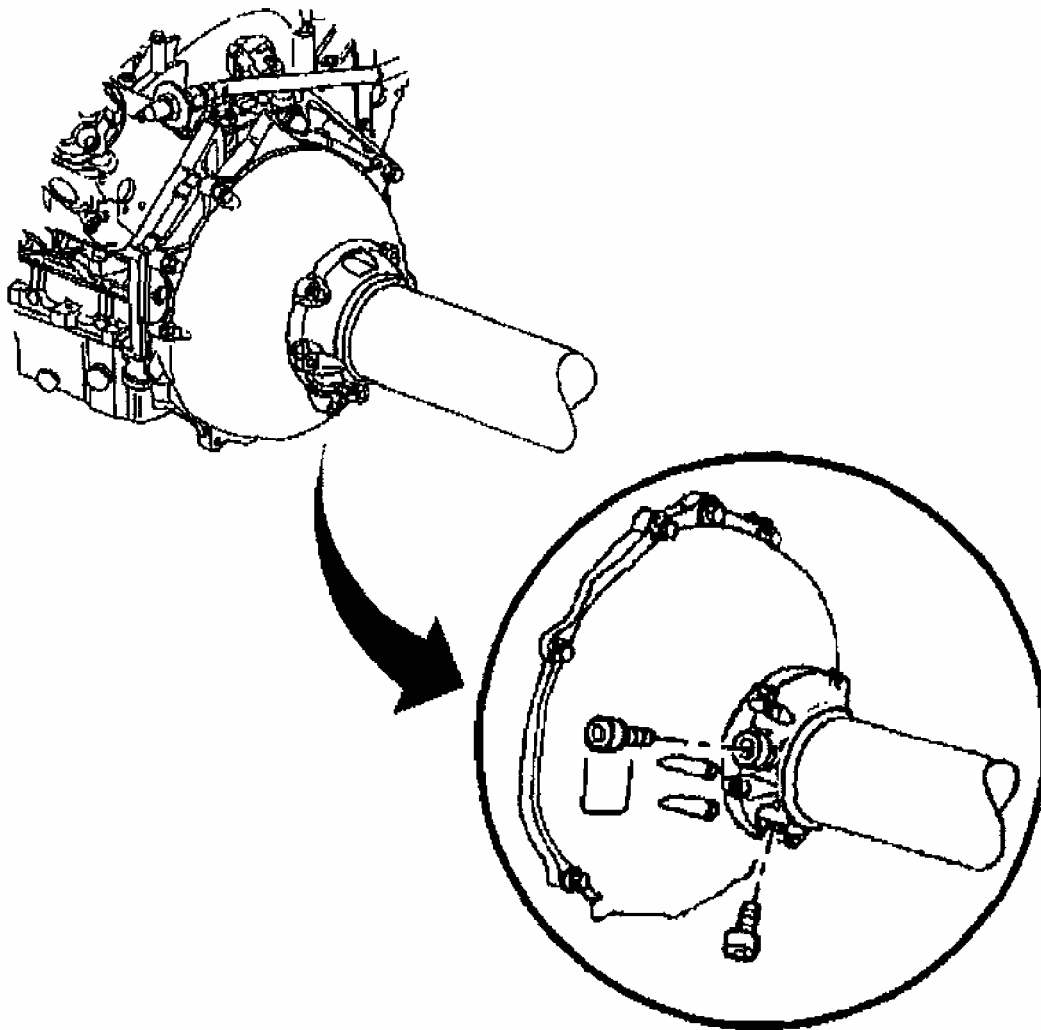
**Important:** Failure to use the minimum length fastener specified will prevent proper retention of the propeller input shaft front bearing during disassembly or installation.

12. Install two bolts, M10 - 1.5 X 55 mm, or longer, in place of the plug bolts.

(The long bolts are located to maintain the propeller input shaft front bearing in original position during removal and installation.)

**Tighten**

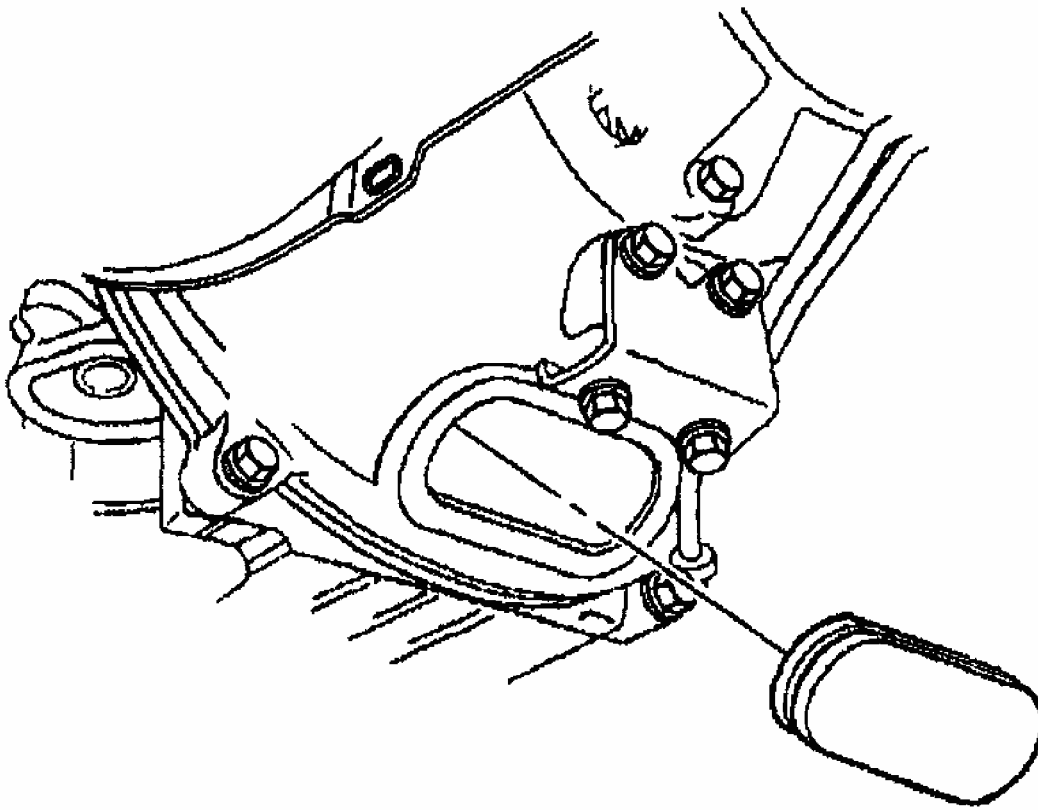
Tighten the propeller input shaft front bearing positioning bolts to 35 N.m (26 lb ft).



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**Fig. 20: Removing Plug Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

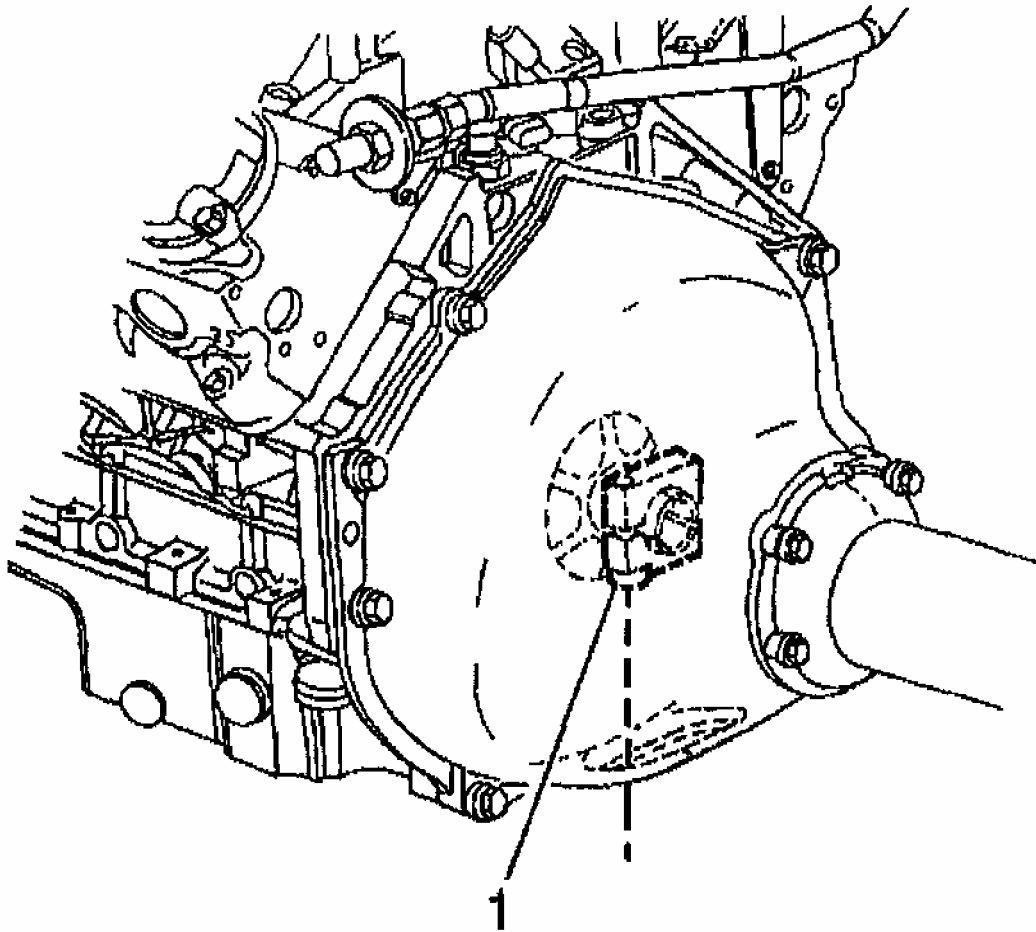
13. Using a flat bladed screwdriver, remove the engine flywheel housing access plug.



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**Fig. 21: Removing Engine Flywheel Housing Access Plug**  
**Courtesy of GENERAL MOTORS CORP.**

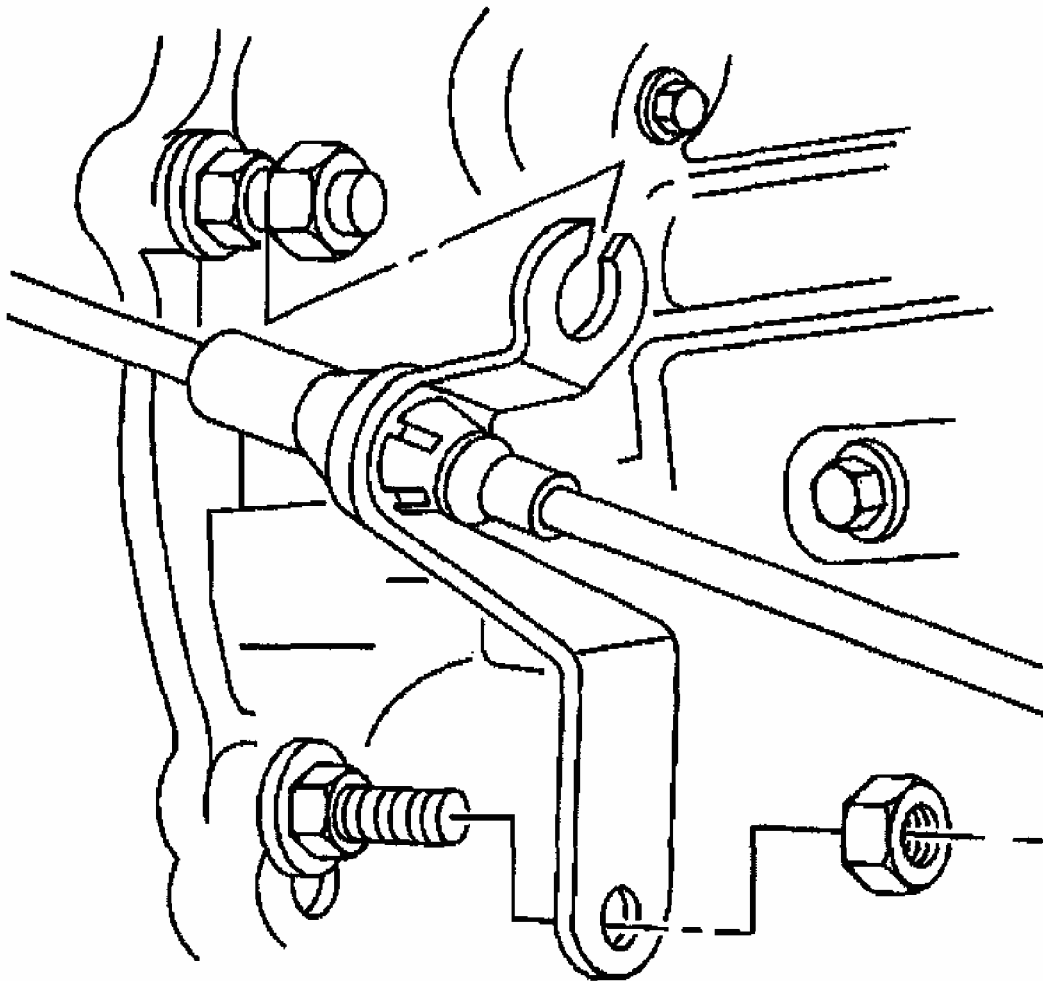
14. Loosen the propeller shaft hub clamp bolt (1). Rotate the engine at the flywheel, if necessary for alignment.



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**Fig. 22: Loosening Propeller Shaft Hub Clamp Bolt**  
**Courtesy of GENERAL MOTORS CORP.**

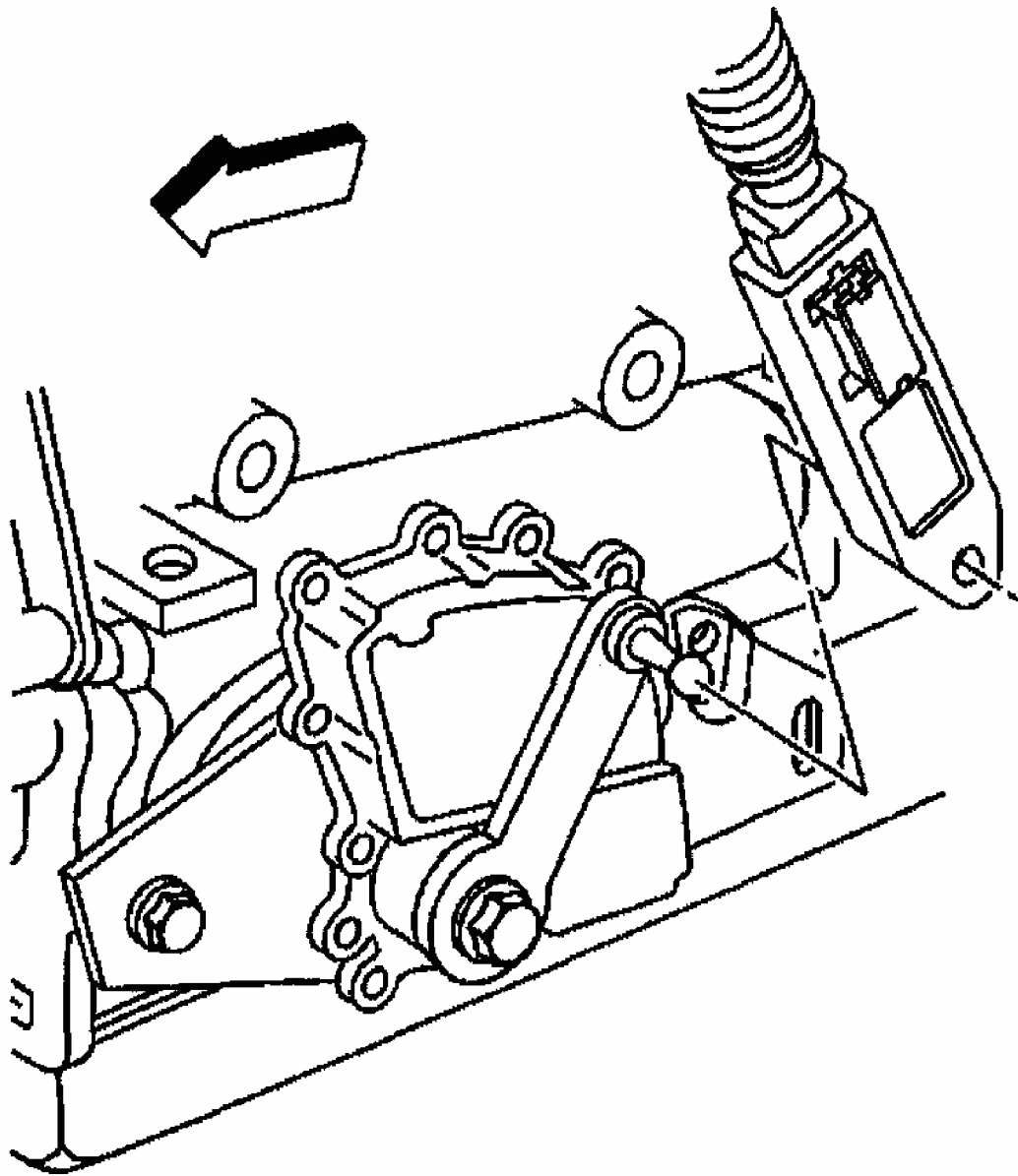
15. Remove the nuts retaining the transmission shift cable bracket to the transmission.



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**Fig. 23: Removing Transmission Shift Cable Bracket Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

16. Disconnect the transmission shift control cable from the transmission shift lever.  
Unsnap to release the cable.
17. Reposition the transmission shift cable and bracket.



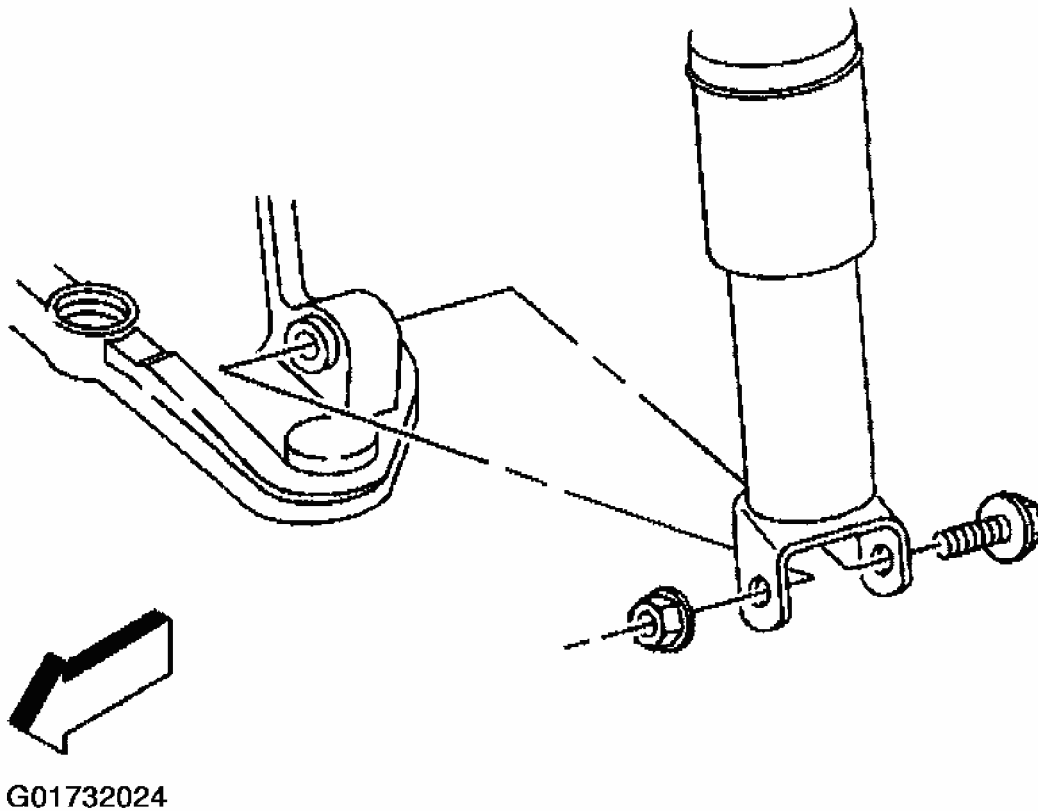
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**Fig. 24: Disconnecting Transmission Shift Cable**  
Courtesy of GENERAL MOTORS CORP.

18. Remove the rear transverse spring. Refer to **REAR TRANSVERSE SPRING** in Rear Suspension.
19. Support the lower control arm with a straight jack.
20. Disconnect the outer tie rod end from the suspension knuckle. Refer to **TIE ROD (OUTER END)** or **TIE ROD (SUSPENSION LINK)** in Rear Suspension.

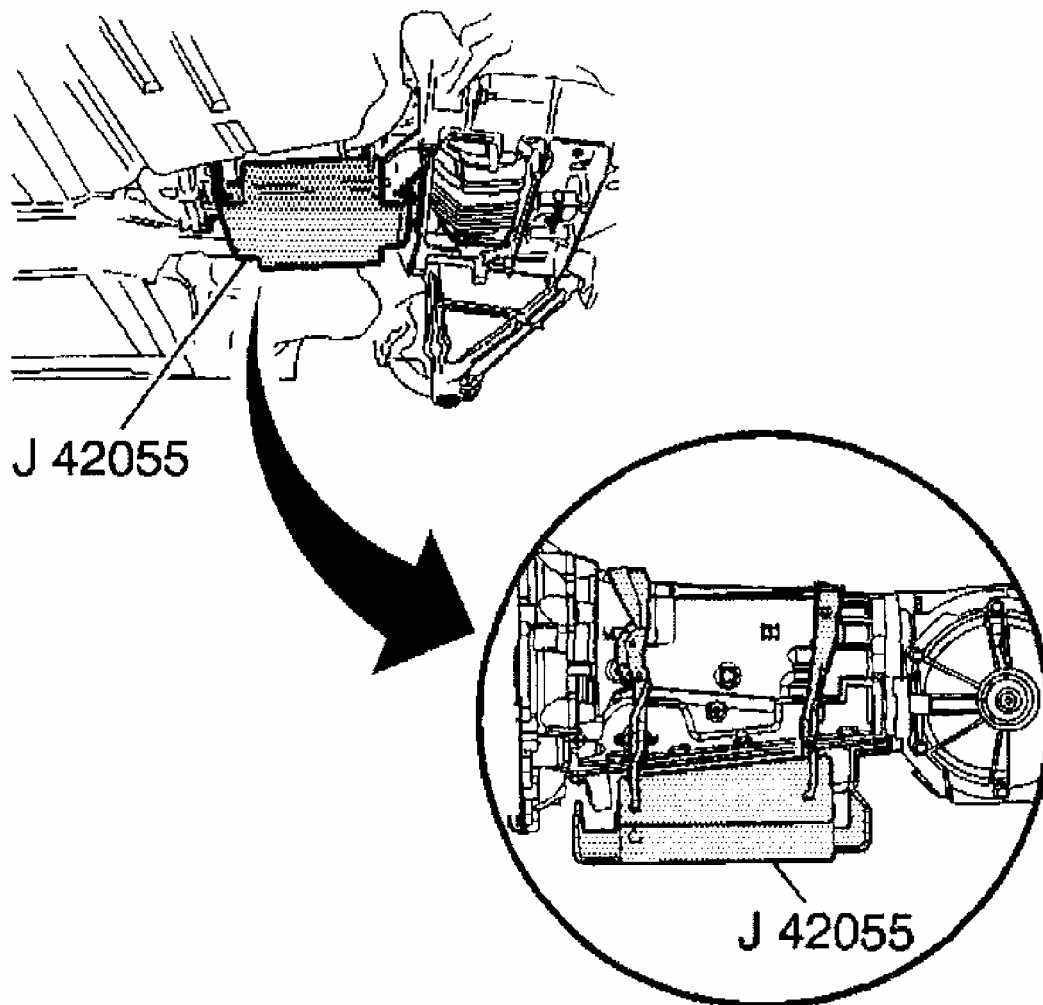


21. Remove the shock absorber lower mounting bolt.
22. Disconnect the lower ball joint from the suspension knuckle. Refer to **KNUCKLE** in Rear Suspension.
23. Remove the straight jack from the control arm.
24. Repeat steps 19 through 23 for the other side of the vehicle.



**Fig. 25: Removing Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

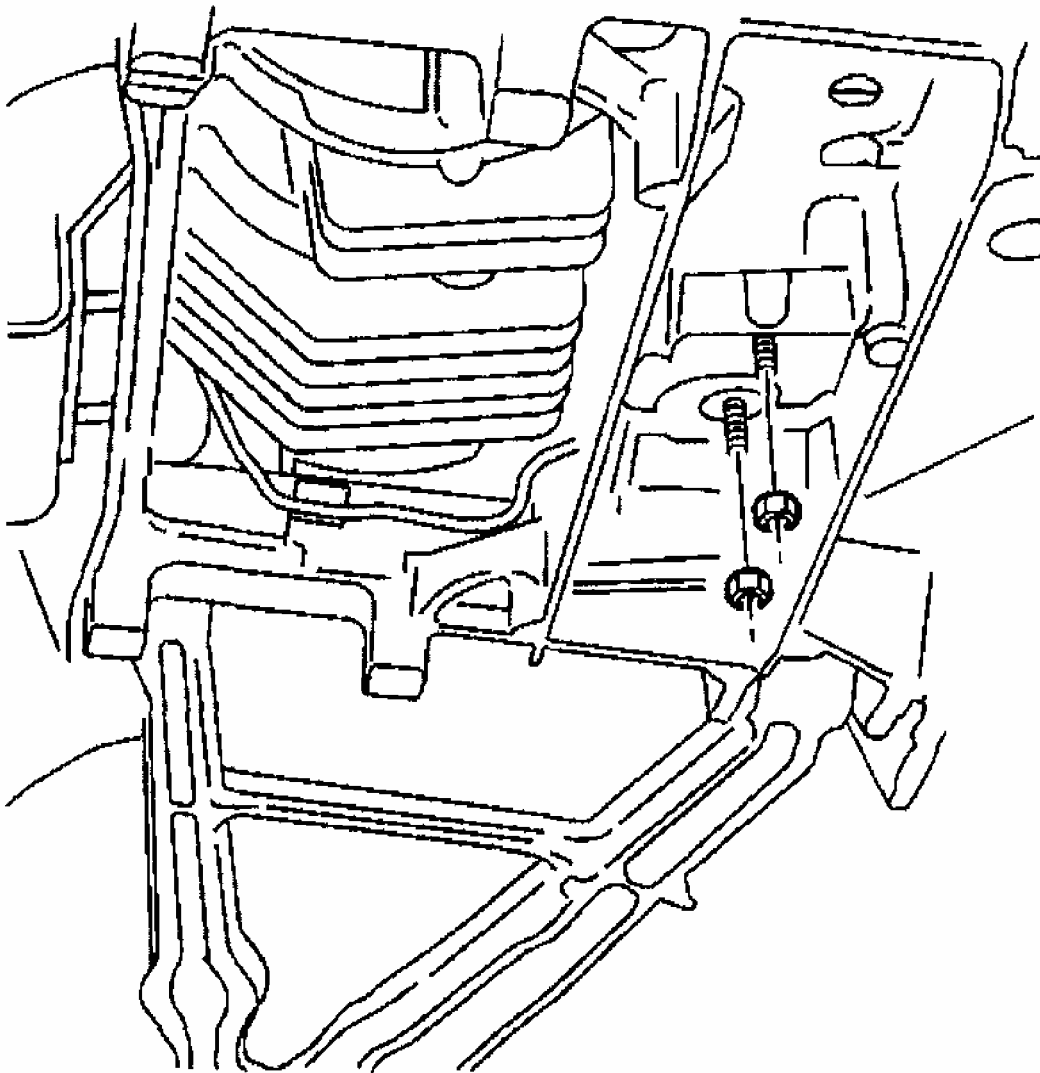
25. Assemble the **J 42055** .
26. Install the **J 42055** to a transmission jack.
27. Position and firmly secure the **J 42055** with the transmission jack to the transmission.



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**Fig. 26: Installing Transmission Support Fixture**  
Courtesy of GENERAL MOTORS CORP.

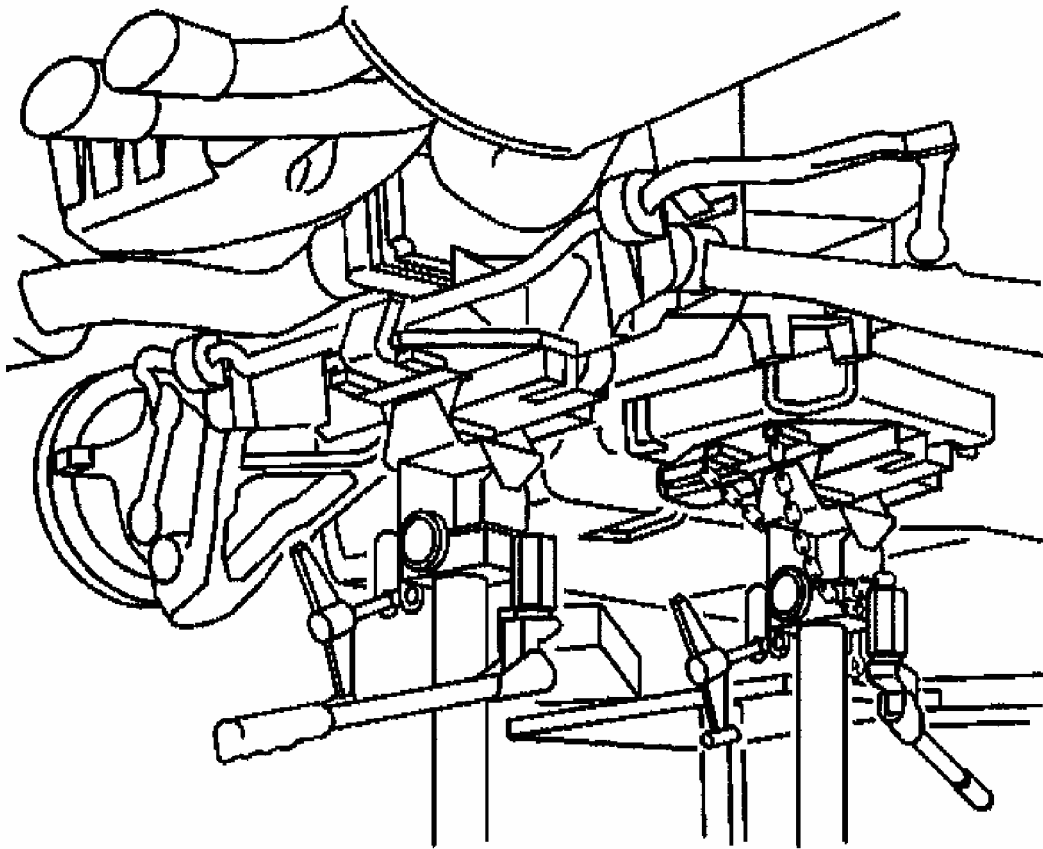
28. Disconnect the wiring harness and brake pipe clip retainers from the rear suspension crossmember.
29. Remove the transaxle mount to rear crossmember nuts.



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**Fig. 27: Removing Transaxle Mount To Rear Crossmember Nuts**  
Courtesy of GENERAL MOTORS CORP.

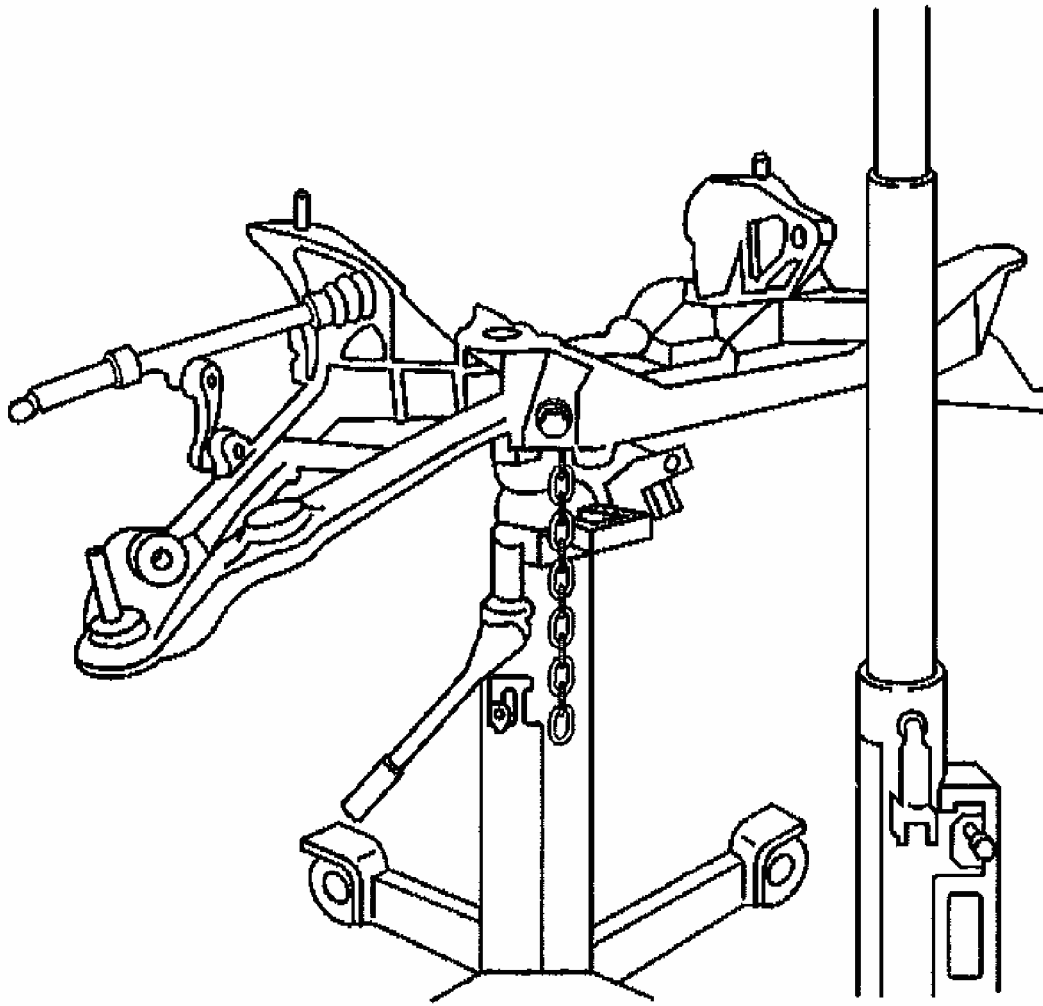
30. Position a transmission jack under the rear suspension crossmember and firmly secure the crossmember to the jack.
31. Using ONLY HAND TOOLS, remove the rear suspension crossmember retaining nuts.



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**Fig. 28: Aligning Rear Suspension Crossmember To Transmission Jack**  
**Courtesy of GENERAL MOTORS CORP.**

32. With the aid of an assistant, slowly lower the rear suspension crossmember away from the vehicle frame rails and remove the crossmember.

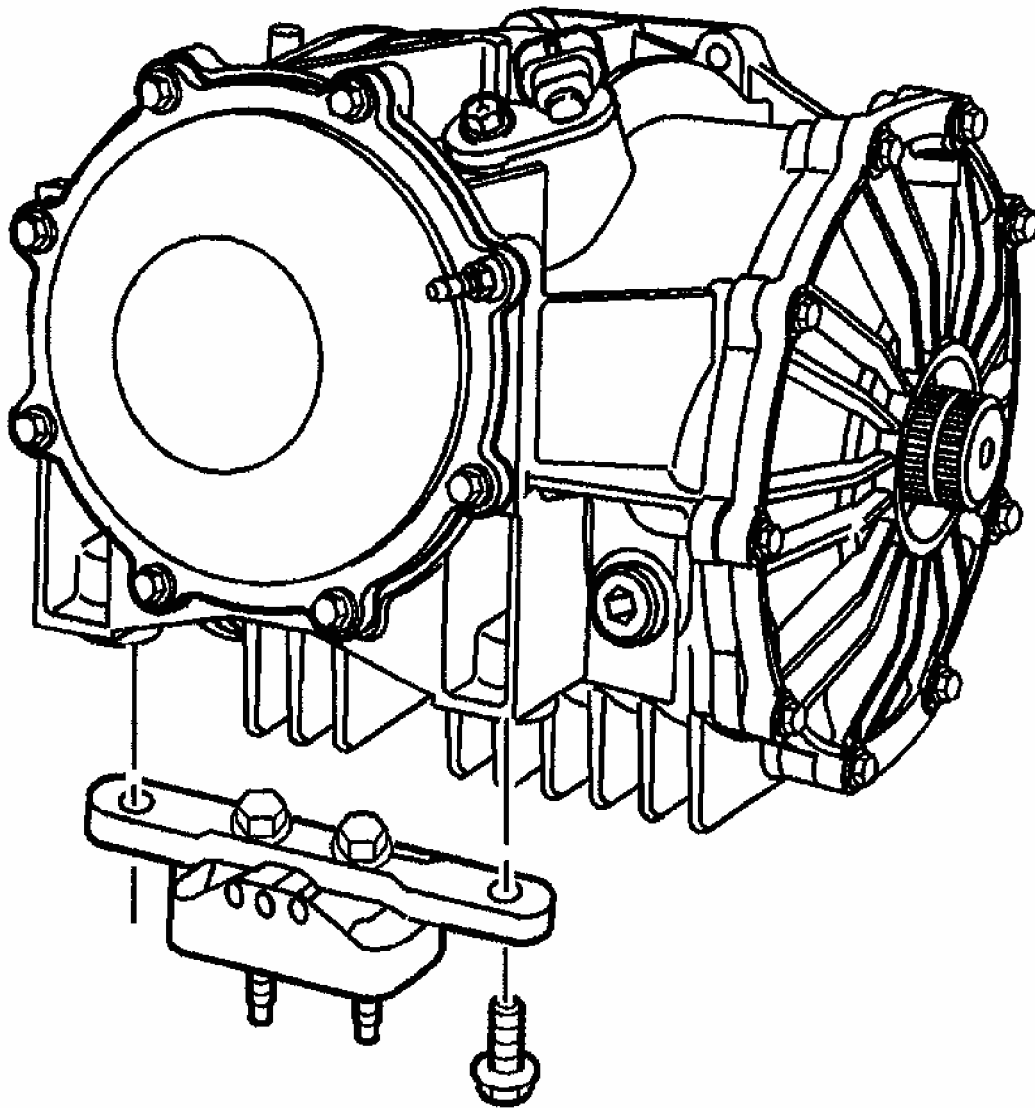


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**Fig. 29: Removing Rear Suspension Crossmember**  
Courtesy of GENERAL MOTORS CORP.

33. Remove the transaxle mount bracket to differential bolts.
34. Remove the transaxle mount with bracket.

Removing the transaxle mount will allow for greater stability on a workbench after the driveline is removed.

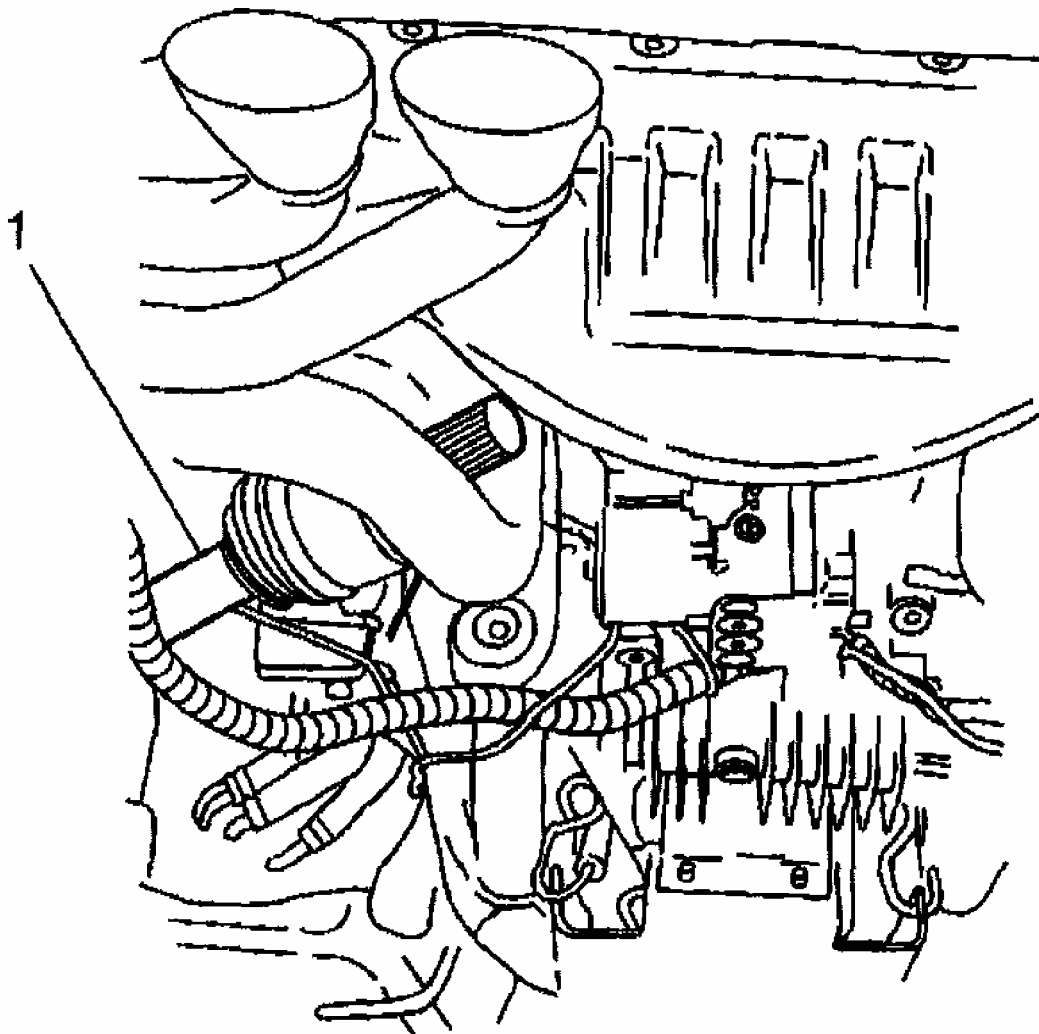


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**Fig. 30: Removing Transaxle Mount Bracket Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

35. Using a pry bar, CAREFULLY release the wheel drive shafts from the differential.
36. Tie off the wheel drive shafts to the underbody to support the shafts out of the way.

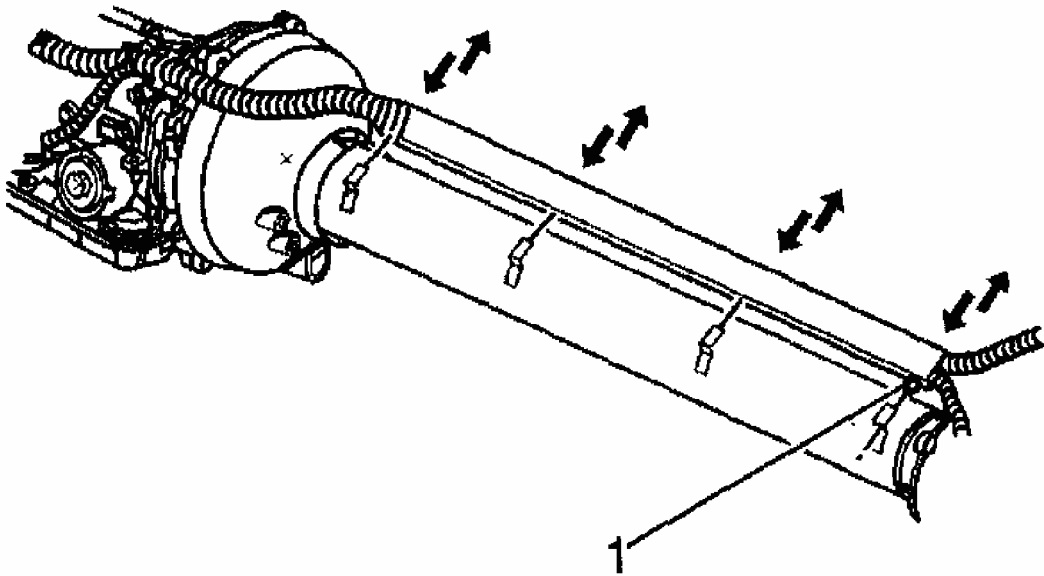
The LH muffler assembly pipe toward the rear offers a good location to help support the LH wheel drive shaft (1).



G01732030

**Fig. 31: Securing LH Wheel Drive Shaft**  
**Courtesy of GENERAL MOTORS CORP.**

37. Release the retainer (1) securing (and positioning) the wiring harness to the L-shaped brackets along the driveline support assembly, then slide the harness up out of the brackets and position out of the way.

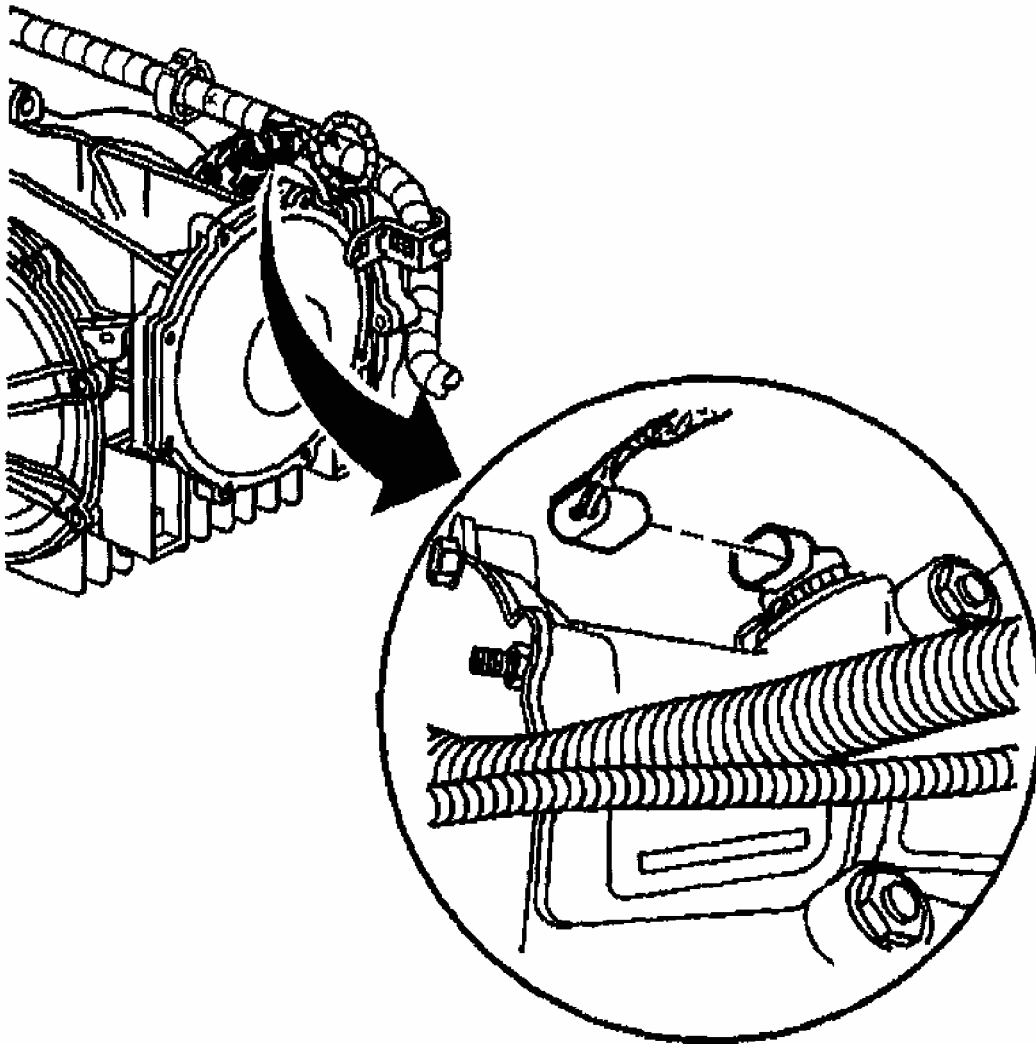


G01732031

**Fig. 32: Removing Transmission Wiring Harness Retainer**  
Courtesy of GENERAL MOTORS CORP.

38. SLOWLY lower the driveline approximately 51 mm (2 in), while simultaneously adjusting the angle of tilt, in order to access the electrical connectors.
39. Disconnect the vehicle speed sensor (VSS) electrical connector.

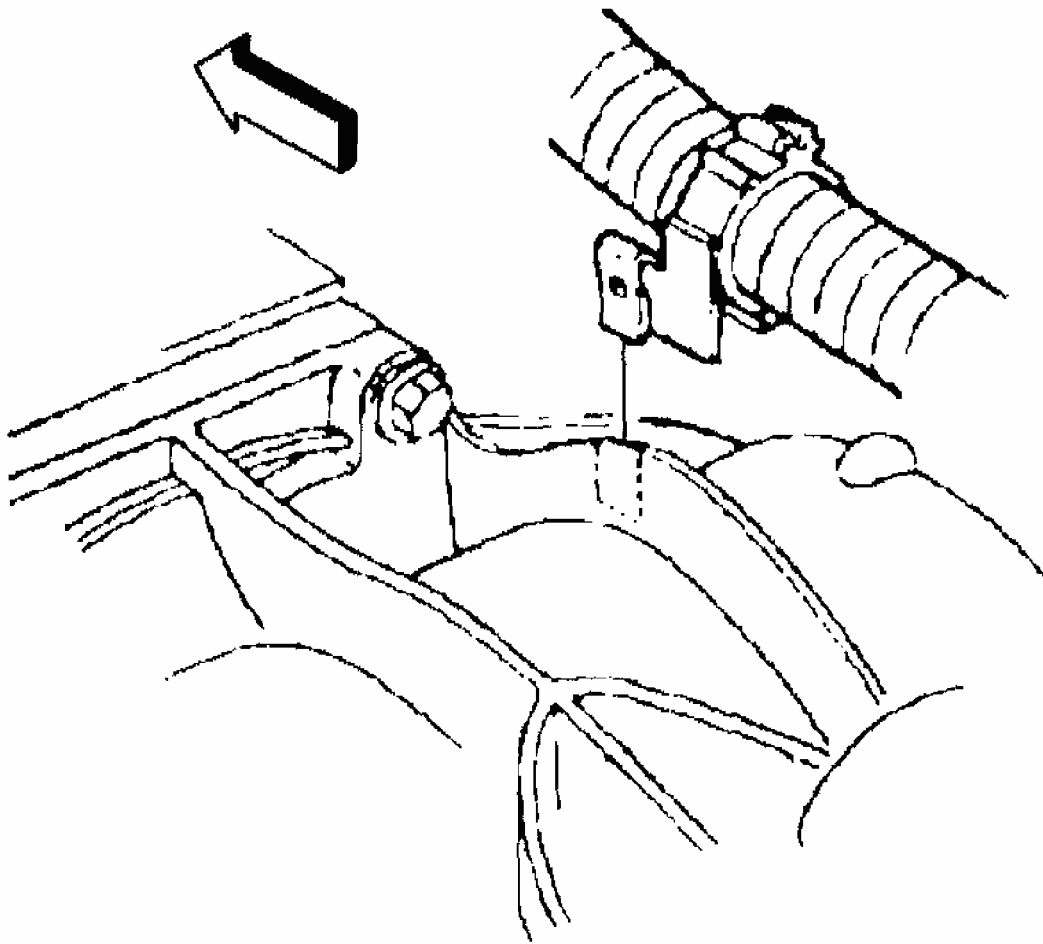




G01732032

**Fig. 33: Disconnecting VSS Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

40. Disconnect the wiring harness retainer from the stud at the differential rear cover.
41. Disconnect the wiring harness retainer clip from the top of the differential.

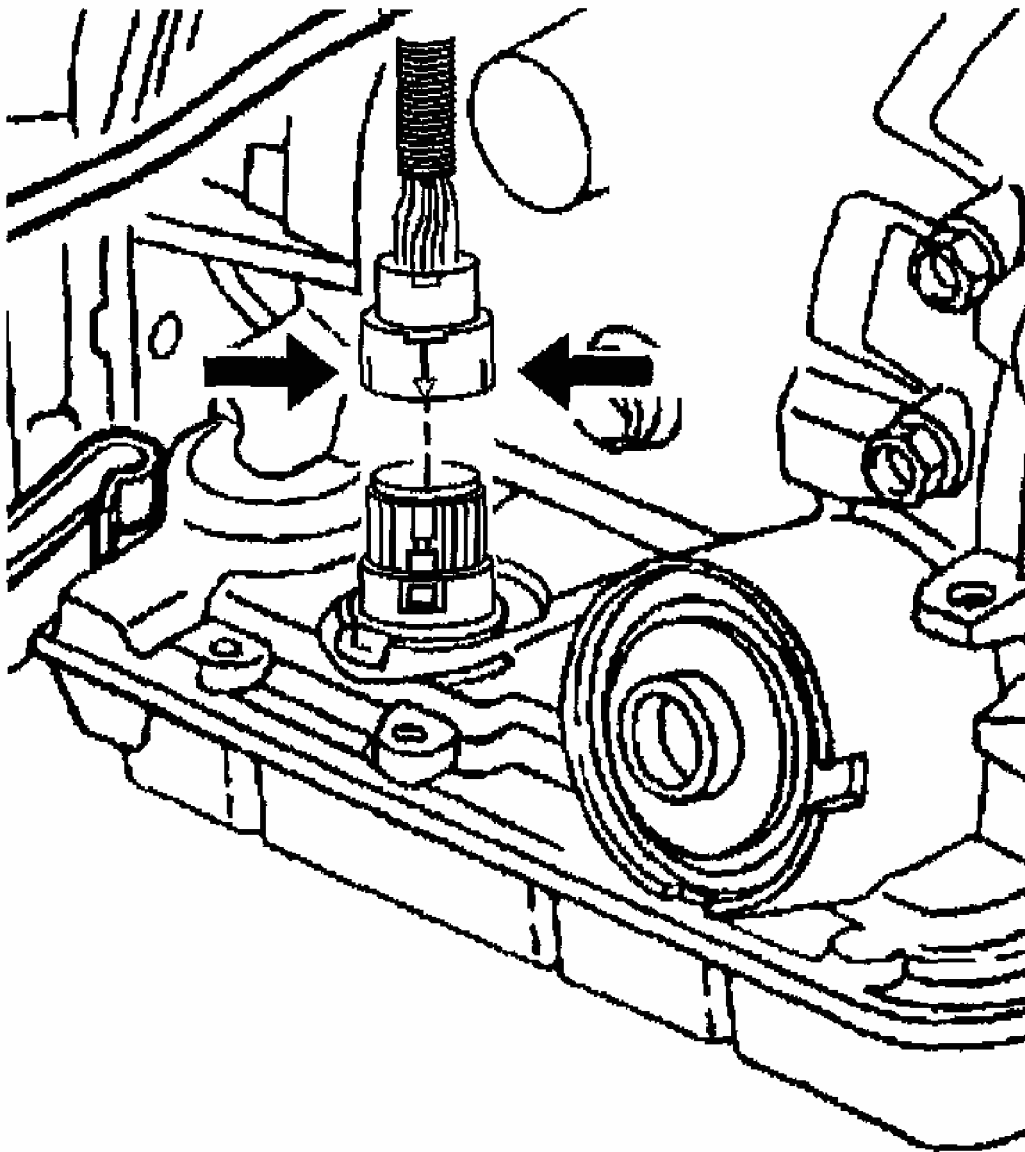


G01732033

**Fig. 34: Disconnecting Wiring Harness Retainer Clip**  
**Courtesy of GENERAL MOTORS CORP.**

42. Disconnect the transmission harness 20-way connector.

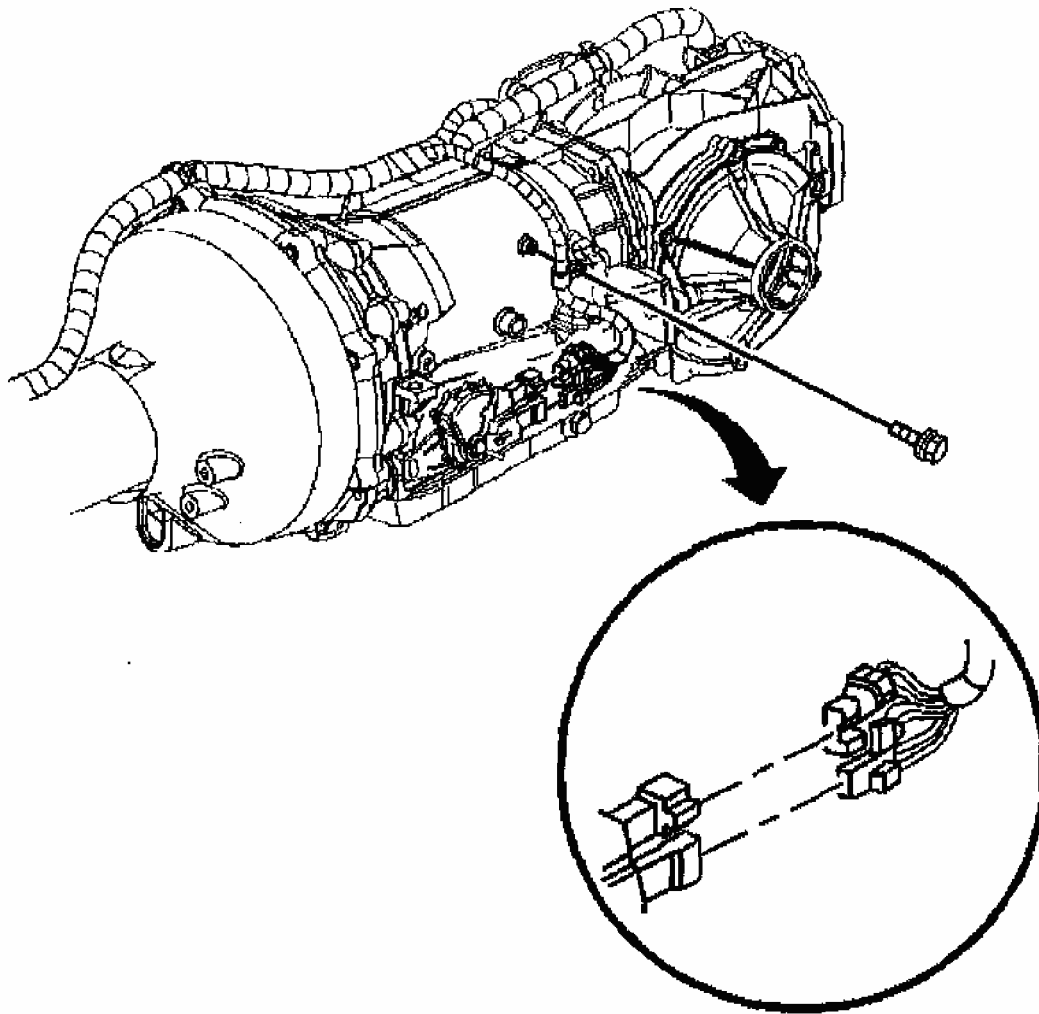
Depress both tabs on the connector and pull straight up; do not pry the connector.



G01732034

**Fig. 35: Removing Transmission Harness 20-Way Connector**  
Courtesy of GENERAL MOTORS CORP.

43. Disconnect the park/neutral position switch electrical connectors.
44. Remove the bolt retaining the transmission wiring harness to the LH side of the transmission case.



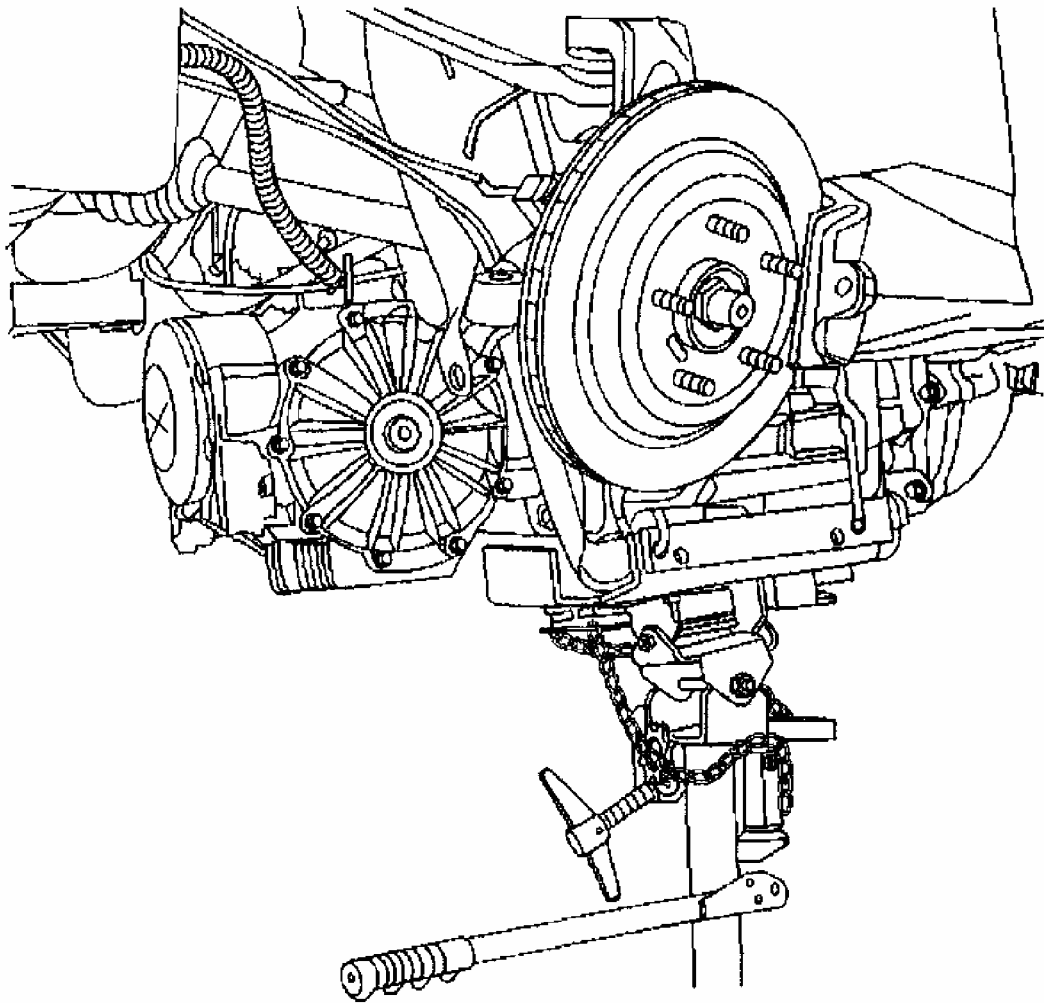
G01732035

**Fig. 36: Disconnecting Park/Neutral Position Switch Electrical Connectors**  
Courtesy of GENERAL MOTORS CORP.

45. SLOWLY lower the driveline, while simultaneously adjusting the angle of tilt, and observe the relationship between the top rear of the differential and the lowest part of the rear compartment panel floor (the center storage compartment between the frame rails), the differential should not be lowered more than approximately EVEN with the specified body point of reference.

(The engine positive crankcase ventilation (PCV) pipes which route along the rear of the engine intake manifold [LS1 only] will likely contact the dash panel.)

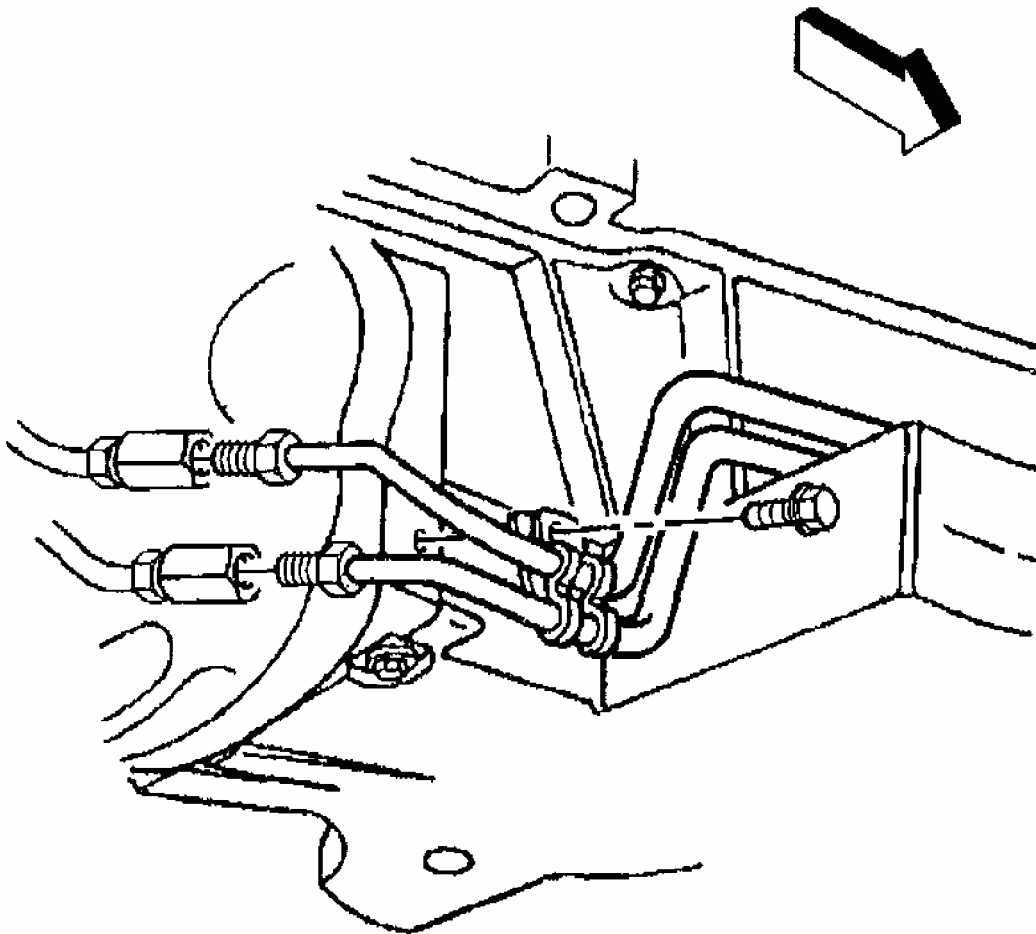
46. Release the wiring harness from the harness retainer along the top of the transmission.
47. Check to be sure that the wiring harness is free from the driveline being removed.



G01732036

**Fig. 37: Aligning Transmission Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

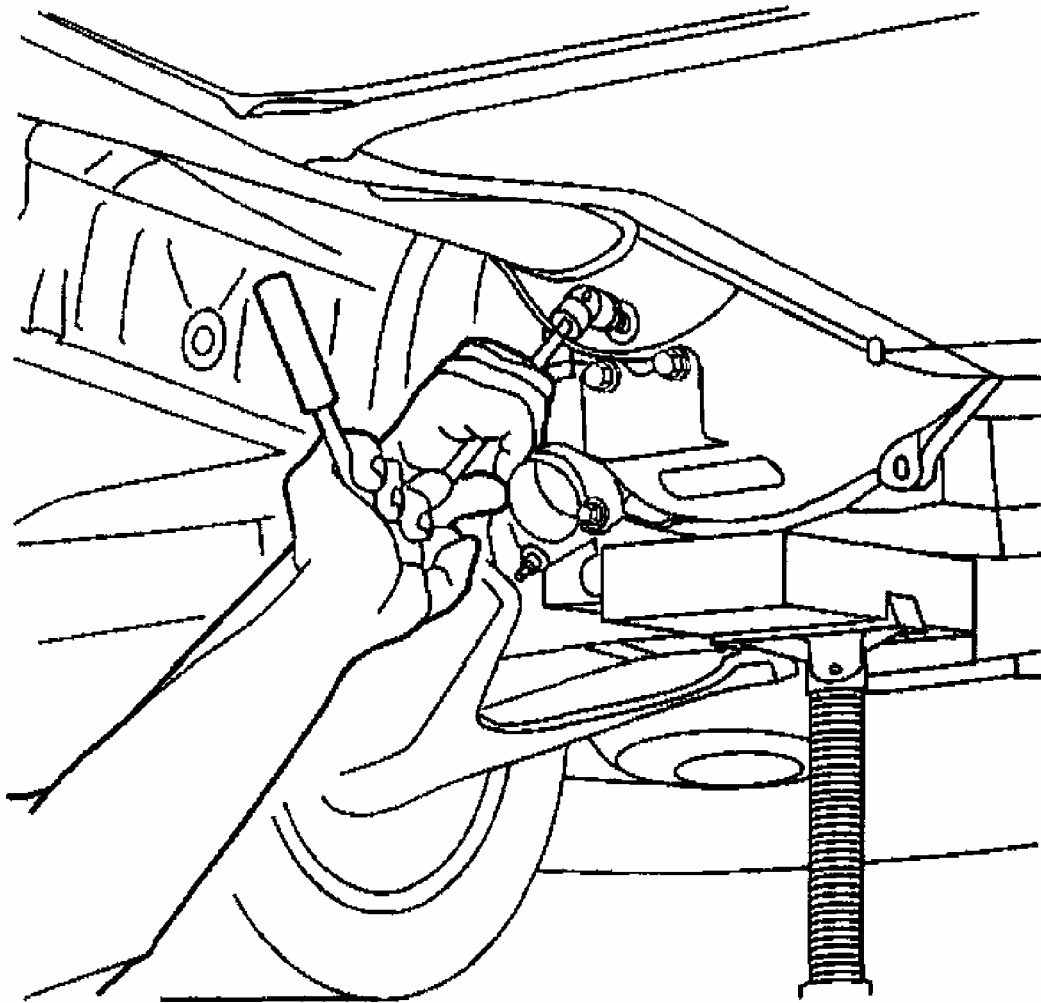
48. Disconnect the transmission oil cooler rear pipes from the junction fittings at the engine flywheel housing, then cap the pipes and plug the junction fittings to prevent contamination.



G01732037

**Fig. 38: Removing Transmission Oil Cooler Pipes Mounting Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

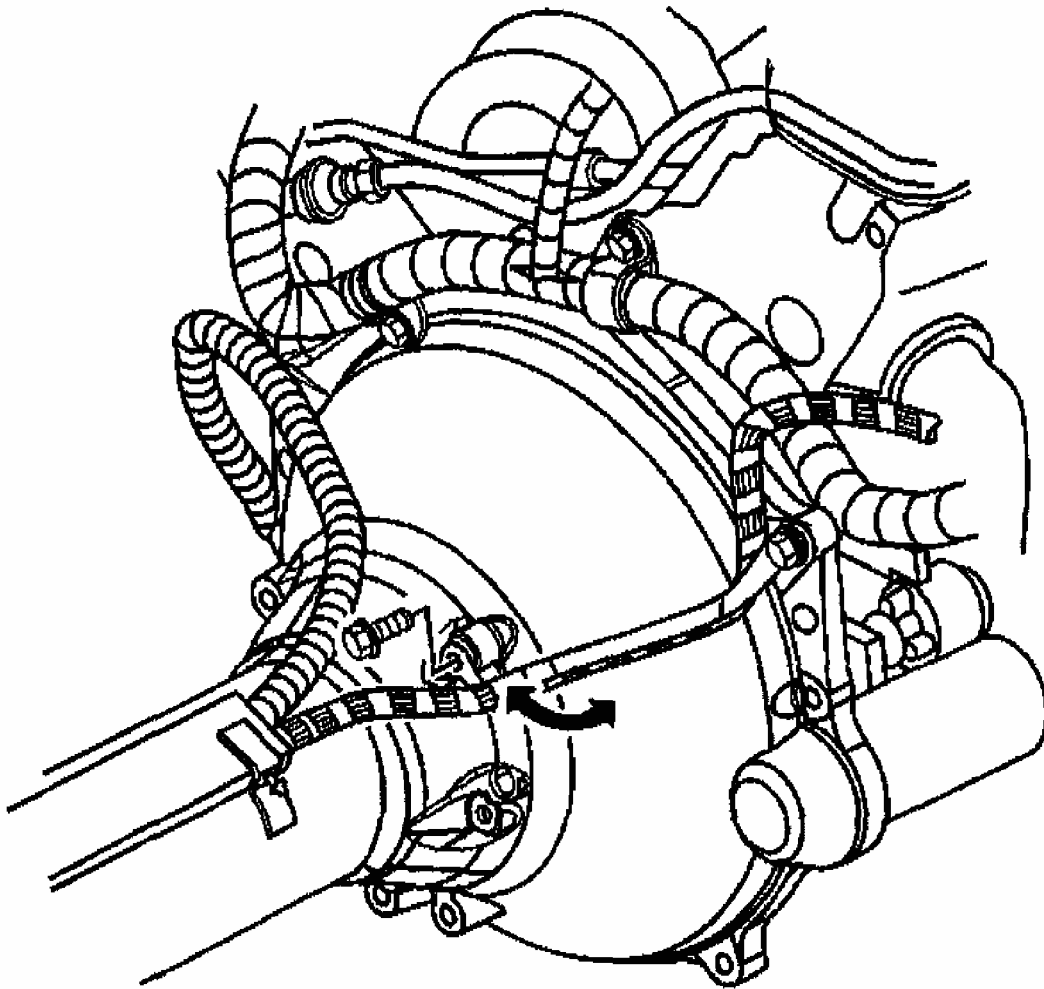
49. Using a block of wood to protect the engine oil pan, place a jack under the rear of the engine oil pan to support the engine, and prevent contact with the composite dash panel.
50. Remove the five driveline support assembly to engine flywheel housing bolts.



G01732038

**Fig. 39: Removing Driveline Support Assembly To Engine Flywheel Housing Bolts**  
Courtesy of GENERAL MOTORS CORP.

51. Carefully bend the wiring harness bracket away from the driveline and toward the driveline tunnel wall in order to make a clear removal path for the driveline.



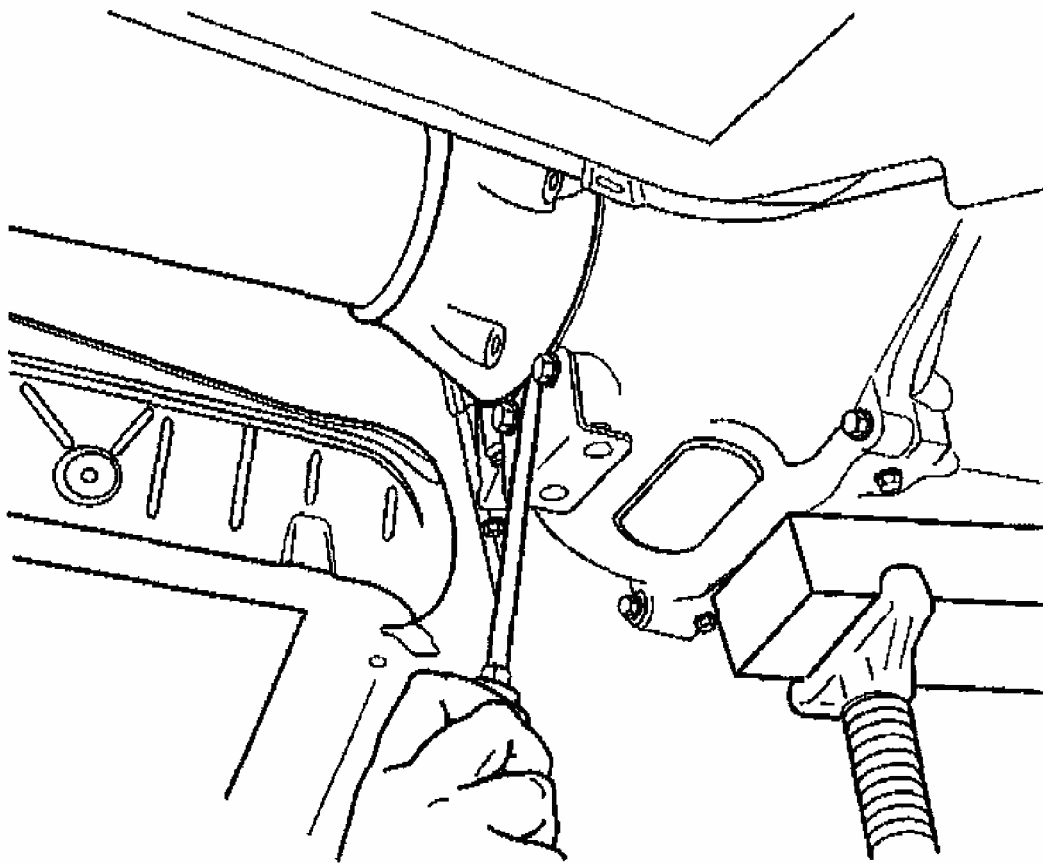
G01732039

**Fig. 40: Aligning Wiring Harness Bracket**  
Courtesy of GENERAL MOTORS CORP.

**Important:** The aid of an assistant will be necessary for the remaining steps.

52. Have an assistant insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the engine flywheel housing, then begin to pry the driveline loose from the engine.

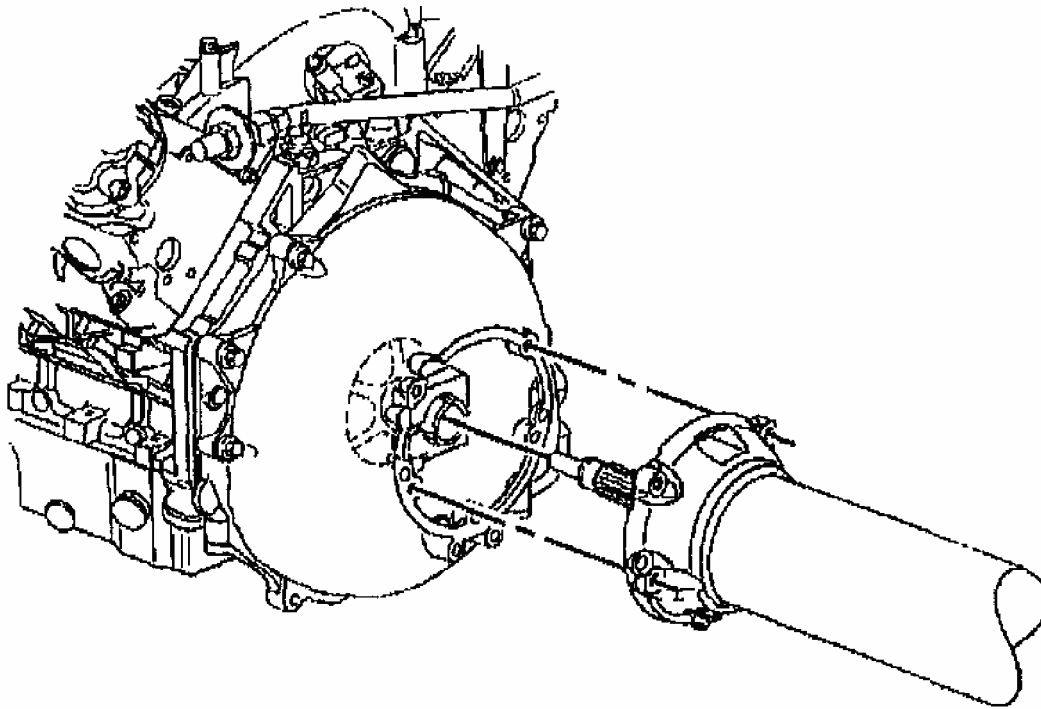




G01732040

**Fig. 41: Loosening Driveline**  
Courtesy of GENERAL MOTORS CORP.

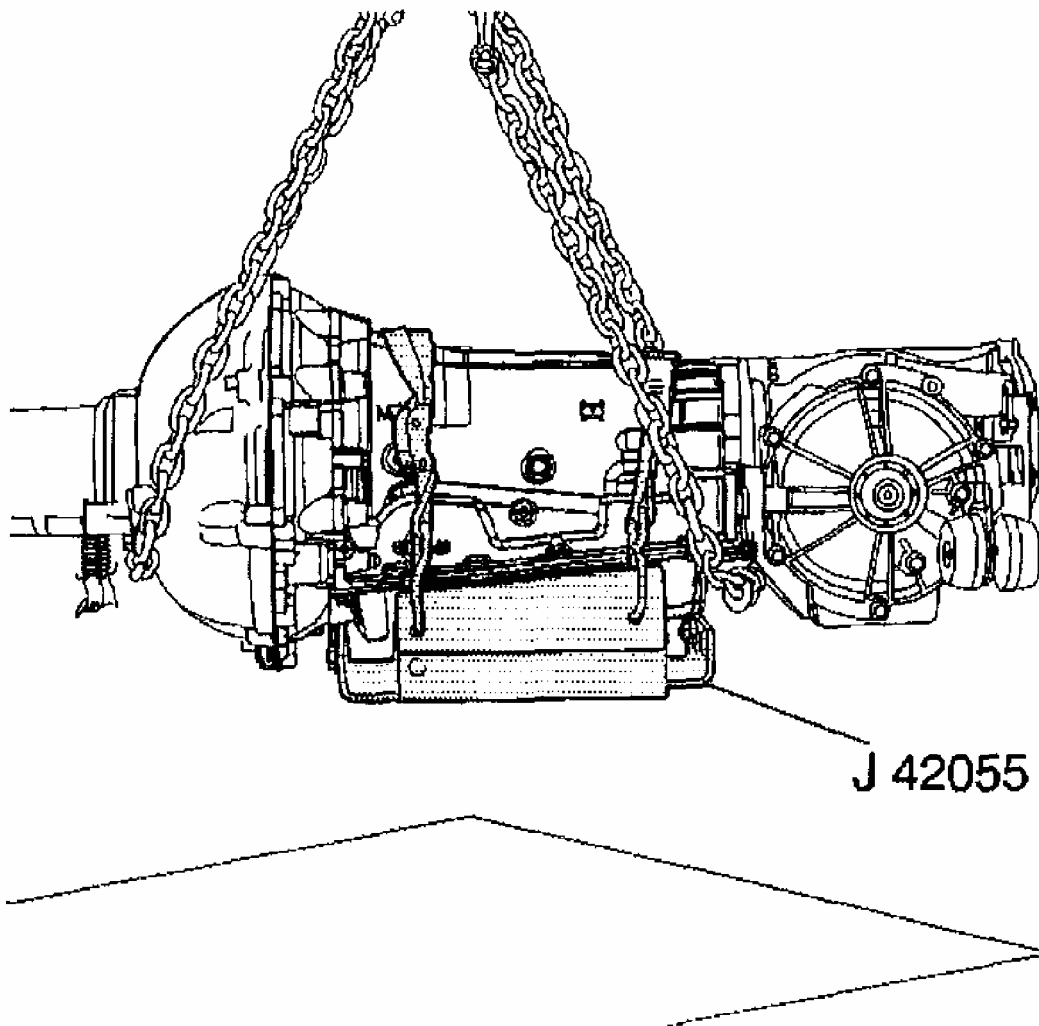
53. Have an assistant guide the front of the driveline during the removal of the driveline from the vehicle.
54. SLOWLY lower the driveline, while simultaneously adjusting the angle of tilt and pulling the driveline away from the engine UNTIL the propeller input shaft at the front of the driveline support assembly just clears the engine flywheel housing.
55. SLOWLY lower the driveline completely out of the vehicle.



G01732041

**Fig. 42: Removing Driveline**  
**Courtesy of GENERAL MOTORS CORP.**

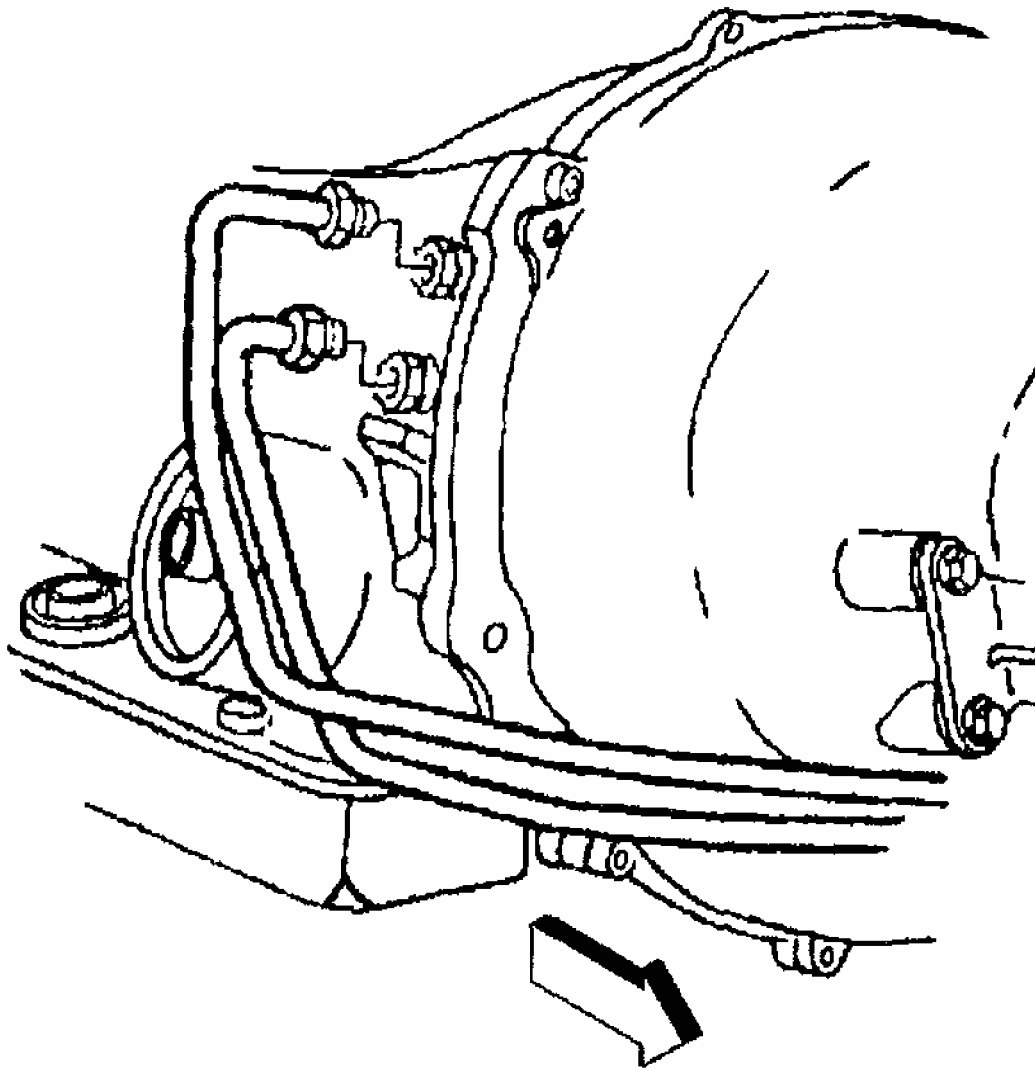
56. Position the chainfall, or equivalent, of a lift device in a way which will protect the transmission oil cooler rear pipes and the rear exhaust hangers located on the driveline support assembly.
57. Using the lift device, raise the driveline to relieve the weight from the transmission jack.
58. Disconnect the **J 42055** from the transmission jack ONLY, the **J 42055** will provide stability to the driveline components while working on a bench.
59. Position the driveline on a work bench with the lift device still attached.
60. Support the driveline support assembly and the differential for additional balance.
61. Remove the lift device from the driveline.



G01732042

**Fig. 43: Identifying Transmission Support Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

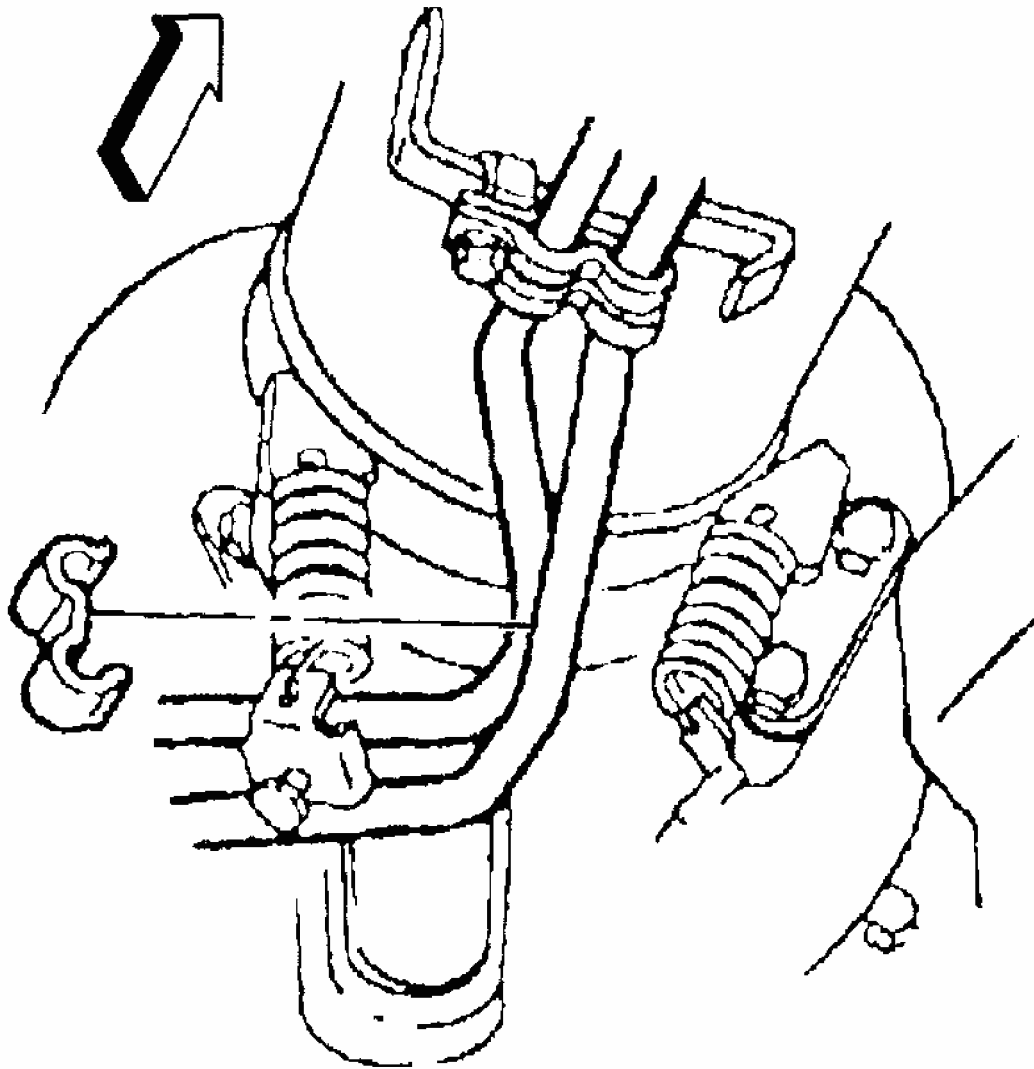
62. Disconnect the transmission oil cooler upper and lower pipe fittings from the transmission, then cap the pipes and plug the fittings to prevent contamination.



G01732043

**Fig. 44: Removing Transmission Oil Cooler Pipe Fittings**  
**Courtesy of GENERAL MOTORS CORP.**

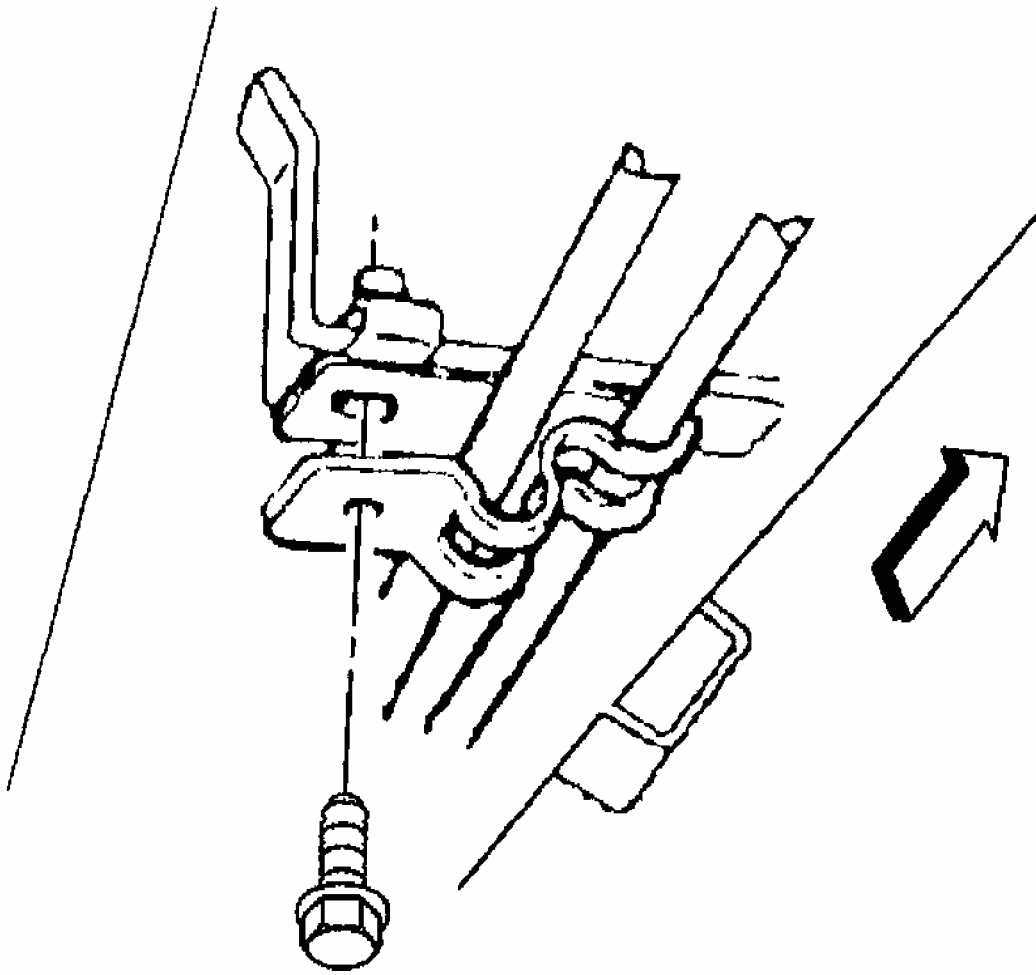
63. Remove the transmission oil cooler pipe rear clip.



G01732044

**Fig. 45: Removing Transmission Oil Cooler Pipe Rear Clip**  
Courtesy of GENERAL MOTORS CORP.

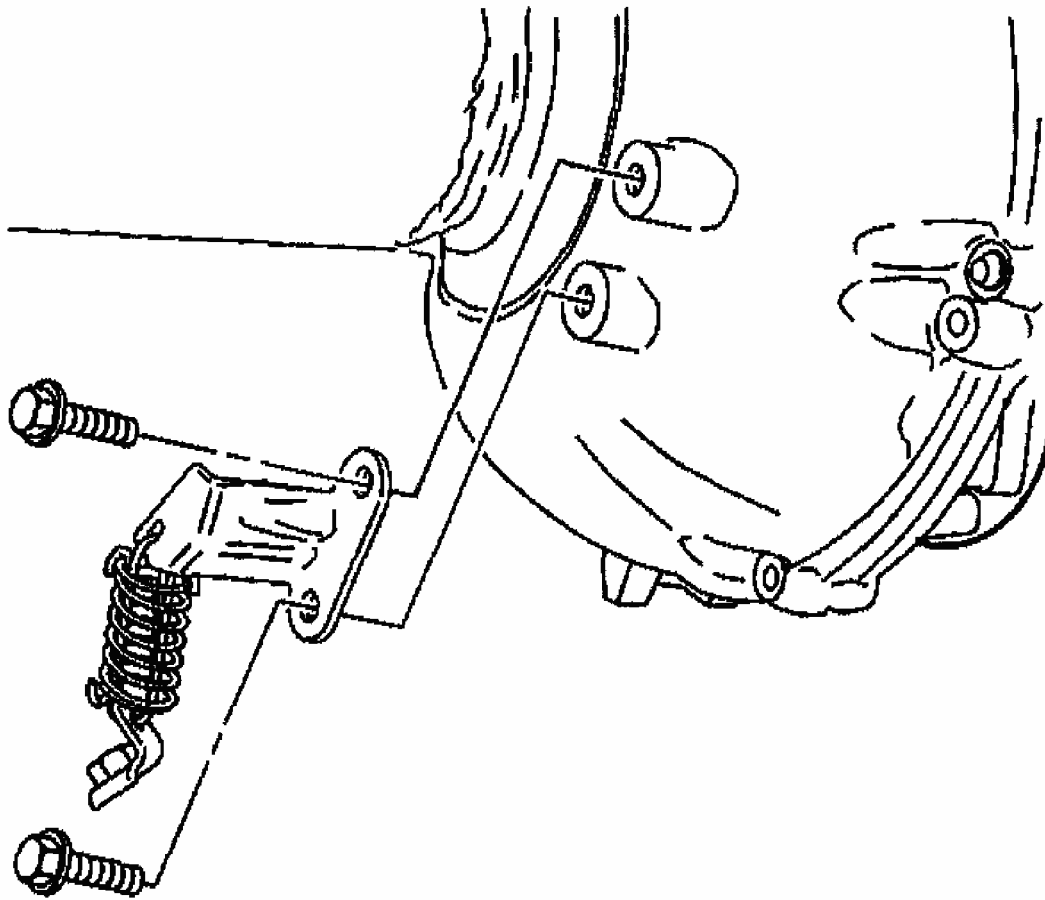
64. Remove the transmission oil cooler pipe middle clip.
65. Remove the transmission oil cooler pipe front and rear clamp bolts and clamps.
66. Remove the transmission oil cooler pipes.



G01732045

**Fig. 46: Removing Transmission Oil Cooler Pipe Clamp Bolt**  
Courtesy of GENERAL MOTORS CORP.

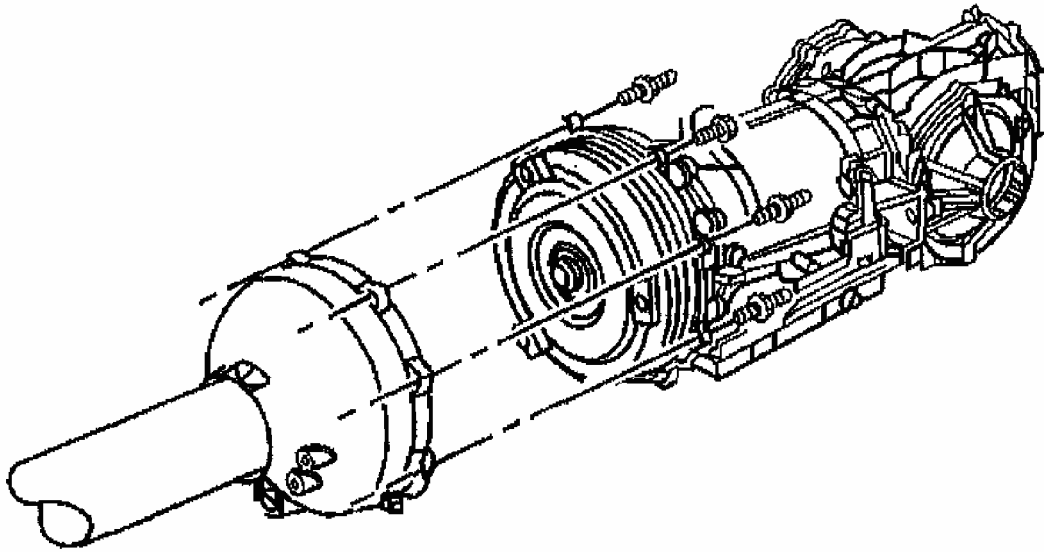
67. Remove the rear exhaust hanger mounting bolts.
68. Remove the rear exhaust hangers from the driveline support assembly.



G01732046

**Fig. 47: Removing Rear Exhaust Hanger Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

69. Remove the transmission to driveline support assembly bolts/studs.
70. Insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the transmission, then begin to pry the driveline support assembly loose from the transmission.
71. Slowly slide the driveline support assembly away from the transmission while supporting the transmission torque converter.
72. Using a strap positioned from side to side, secure the transmission torque converter to the transmission.



G01732047

**Fig. 48: Removing Transmission To Driveline Support Assembly Bolts/Studs**  
Courtesy of GENERAL MOTORS CORP.

**Installation Procedure**

**CAUTION:** Failure to follow the proper removal and installation procedures may result in damage to the engine crankshaft thrust bearing.

1. Remove the strap retaining the transmission torque converter.
2. Slowly slide the driveline support assembly to the transmission, while supporting the transmission torque converter.

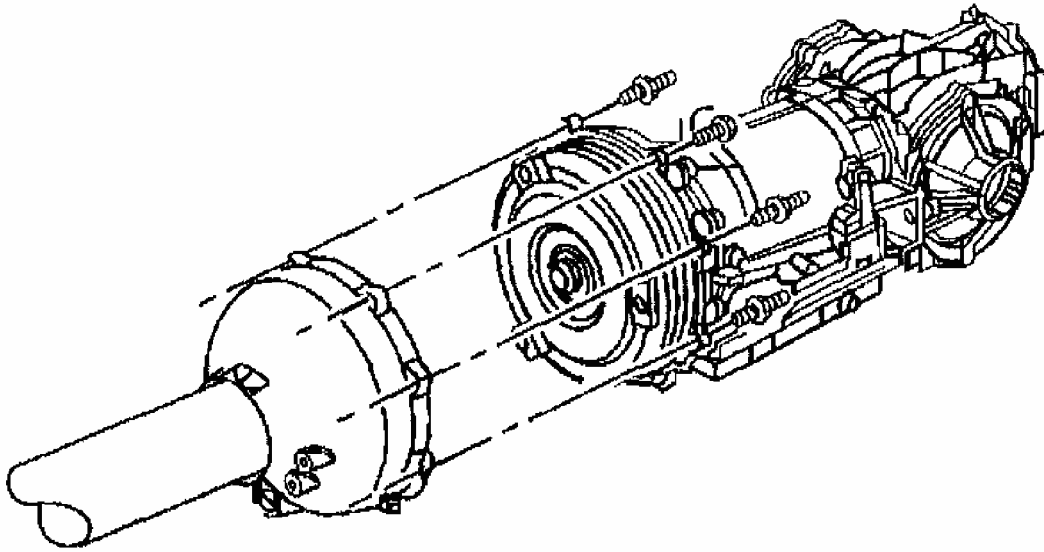
**CAUTION:** Refer to **FASTENER NOTICE** .

3. Install the transmission to driveline support assembly bolts/studs.

**Tighten**

Tighten the transmission to driveline support assembly bolts/studs to 50 N.m (37 lb ft).





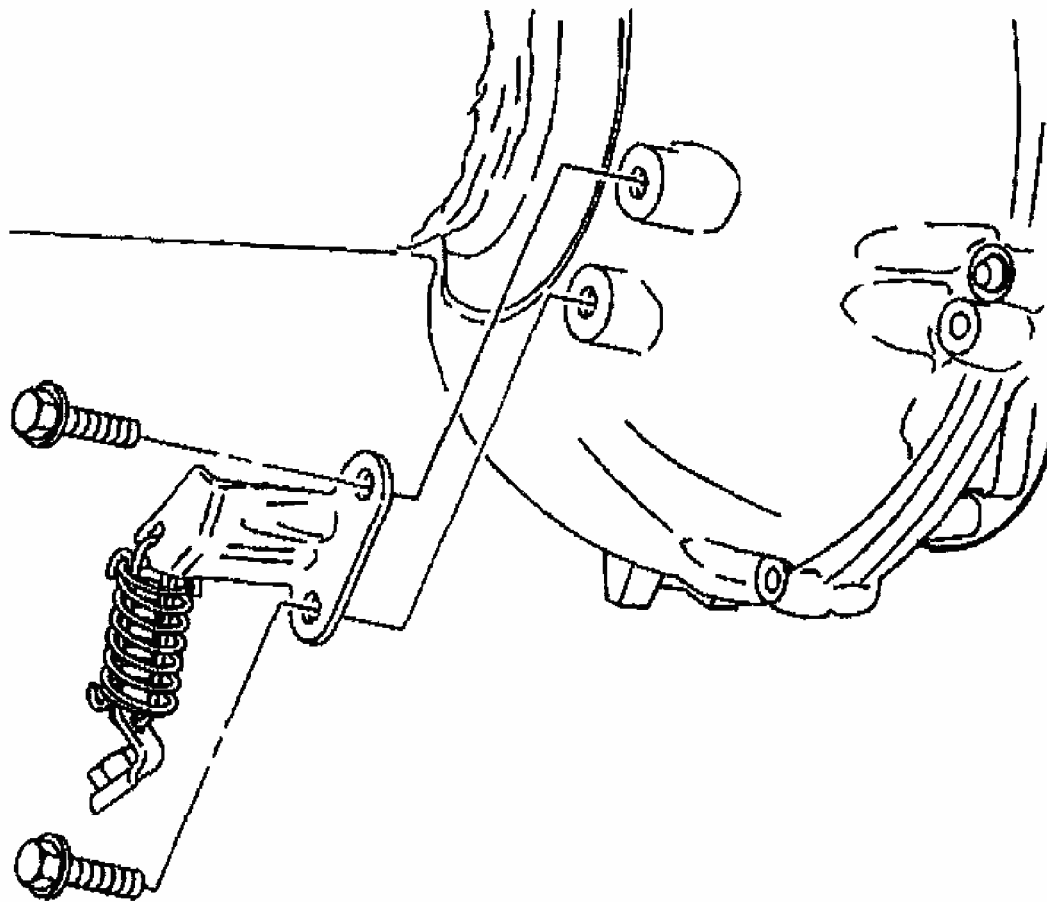
G01732048

**Fig. 49: Installing Transmission To Driveline Support Assembly Bolts/Studs**  
**Courtesy of GENERAL MOTORS CORP.**

4. Install the rear exhaust hangers to the driveline support assembly.
5. Install the rear exhaust hanger mounting bolts.

### **Tighten**

Tighten the rear exhaust hanger mounting bolts to 50 N.m (37 lb ft).



G01732049

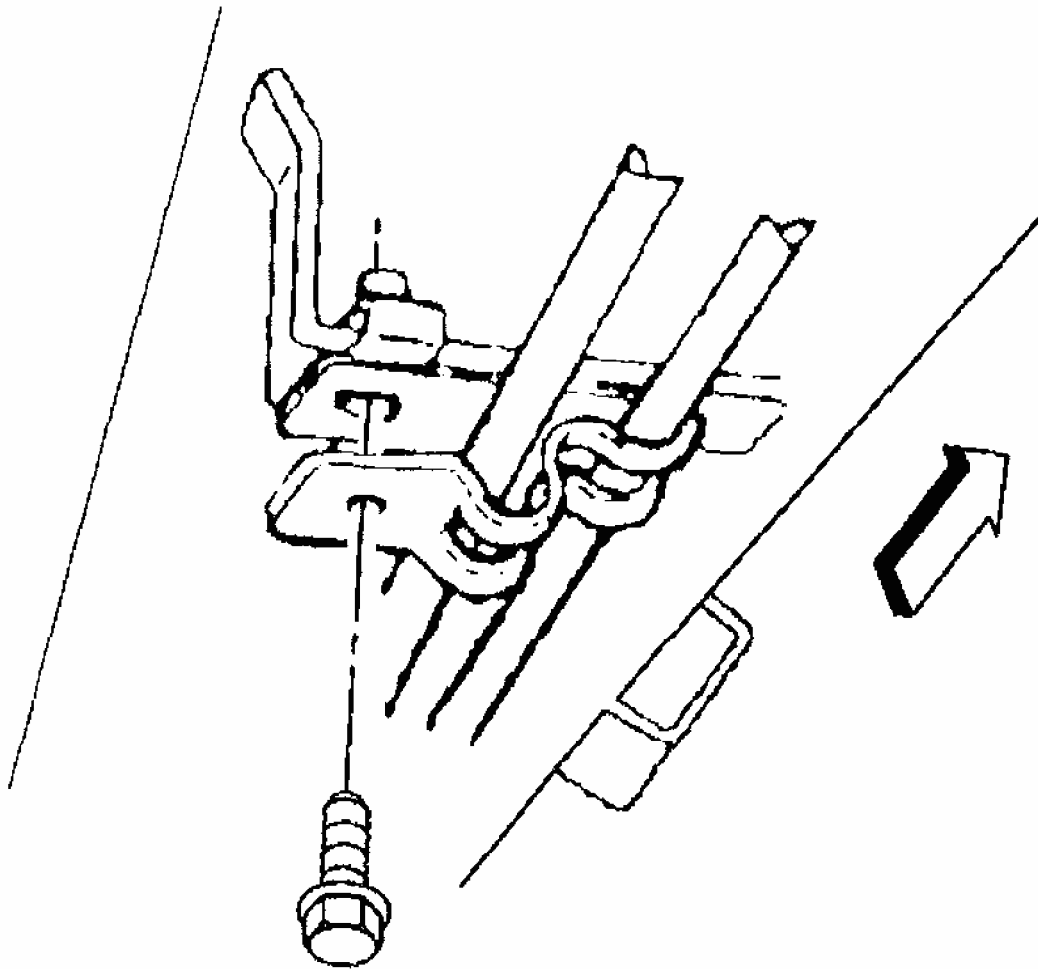
**Fig. 50: Installing Rear Exhaust Hanger Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

6. Install the transmission oil cooler pipes into position.
7. Install the transmission oil cooler pipe front and rear retaining clamps and bolts.

**Tighten**

Tighten the transmission oil cooler pipe front and rear retaining clamp bolts 12 N.m (106 lb in).

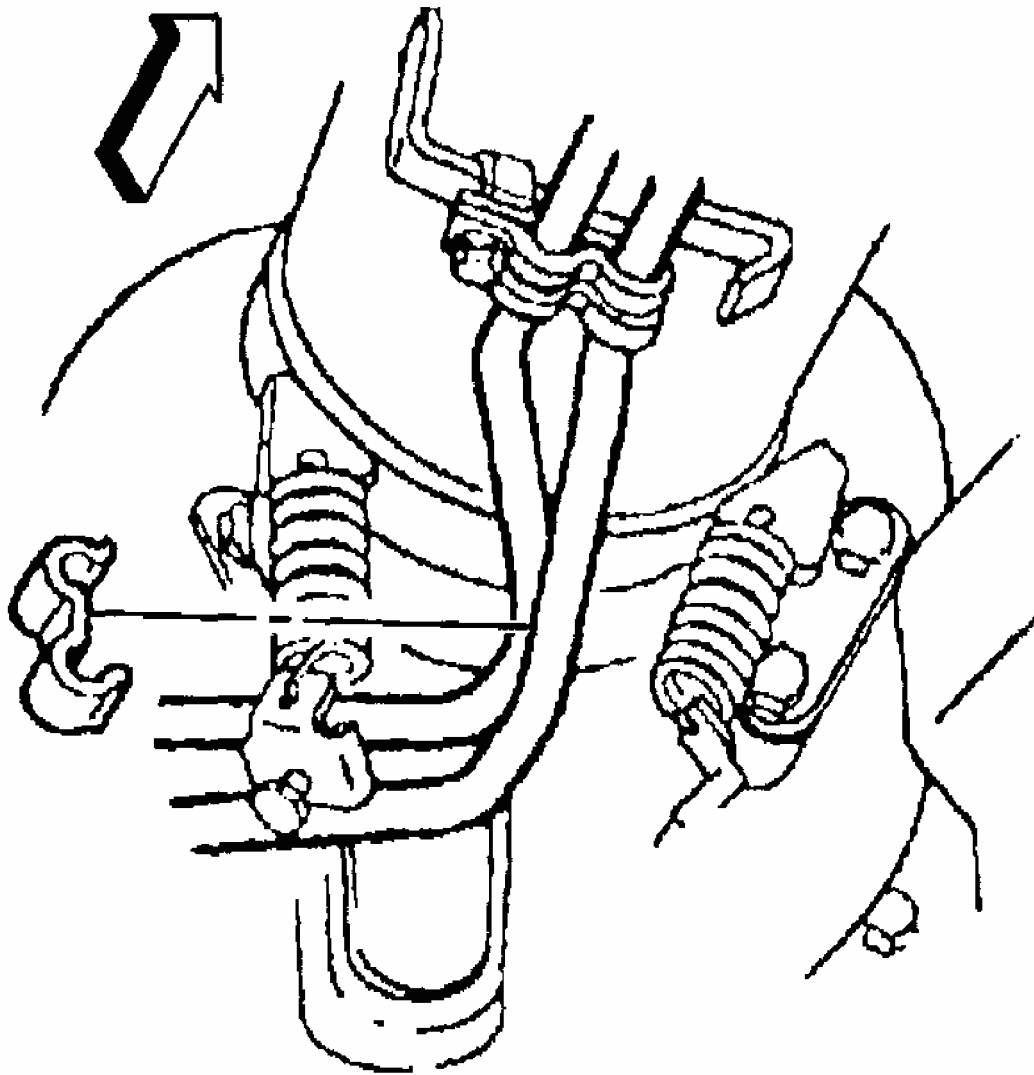
8. Install the transmission oil cooler pipe middle clip.



G01732050

**Fig. 51: Installing Transmission Oil Cooler Pipe Clamp Bolt**  
**Courtesy of GENERAL MOTORS CORP.**

9. Install the transmission oil cooler pipe rear clip.



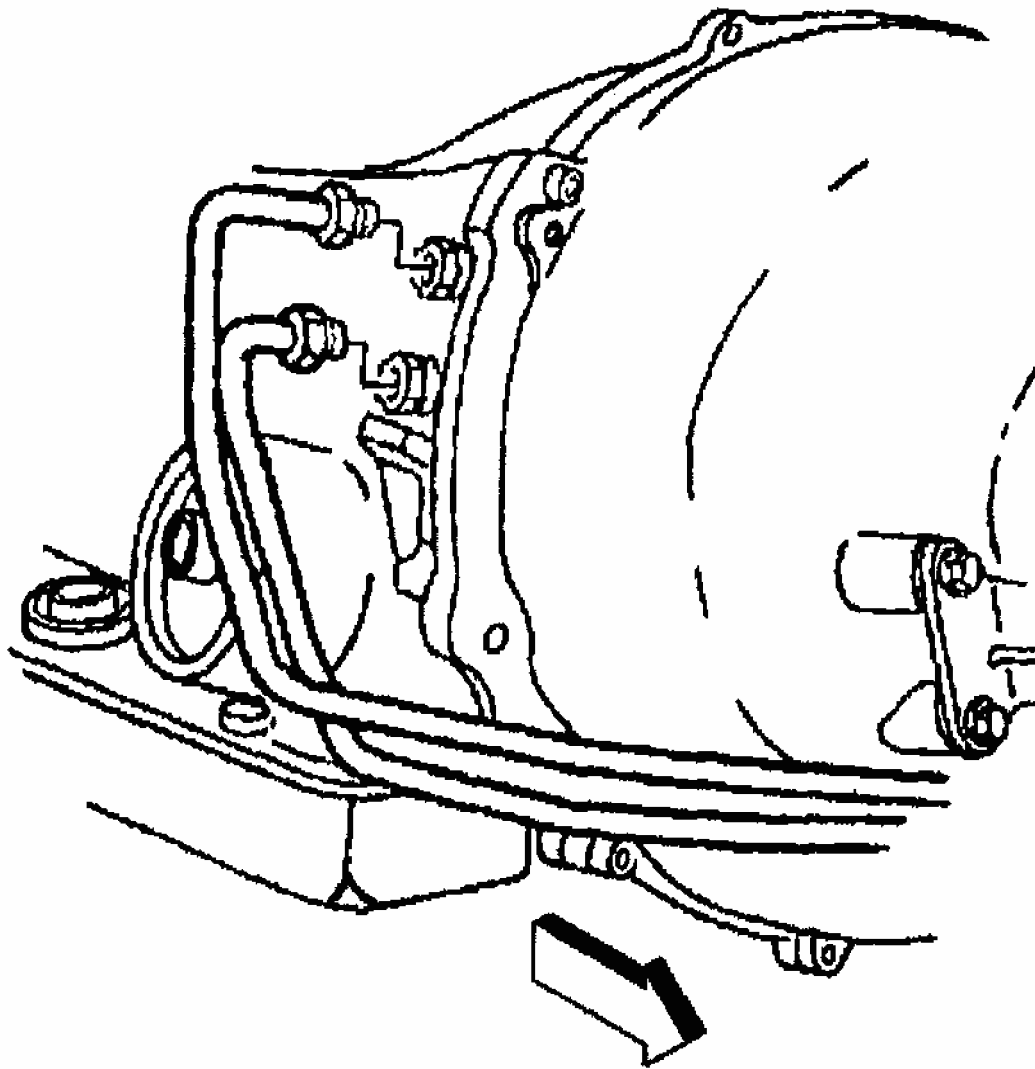
G01732051

**Fig. 52: Installing Transmission Oil Cooler Pipe Rear Clip**  
Courtesy of GENERAL MOTORS CORP.

10. Remove the caps from the transmission oil cooler pipes and remove the plugs from the fittings on the transmission.
11. ALIGN and HAND-START, then tighten ONLY by hand to seat the transmission oil cooler pipe fittings to the transmission fittings.

**Tighten**

Tighten the transmission oil cooler fittings to 40 N.m (30 lb ft).



G01732052

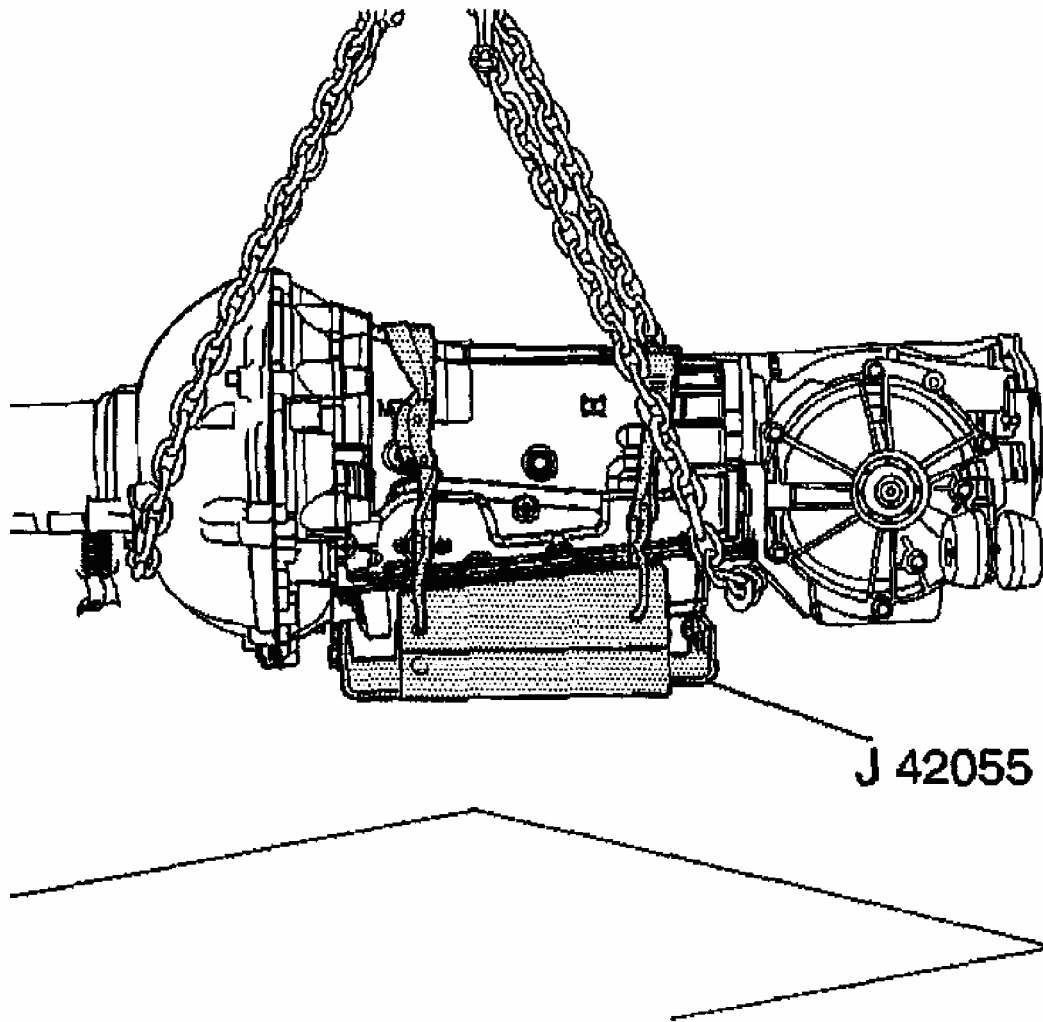
**Fig. 53: Installing Transmission Oil Cooler Fittings**  
**Courtesy of GENERAL MOTORS CORP.**

12. Position the chainfall, or equivalent lifting device, in a way which will protect the transmission oil cooler rear pipes and the rear exhaust hangers located on the driveline support assembly.

**Important:** The aid of an assistant will be necessary for the following steps until the driveline is installed into the vehicle.

13. Using the lifting device, raise the driveline off the workbench and position the driveline with the **J 42055** onto a transmission jack.

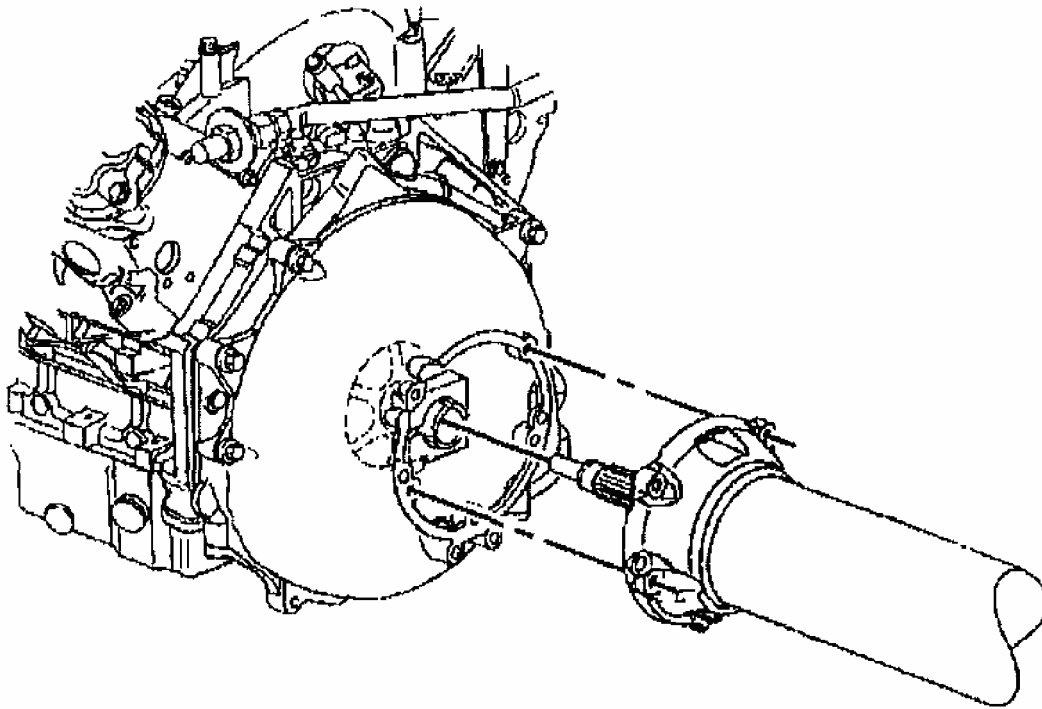
14. Connect the **J 42055** to the transmission jack.



G01732053

**Fig. 54: Identifying Transmission Support Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

15. Remove the lifting device from the driveline.
16. Position the driveline under the vehicle.
17. Begin to raise the driveline at the approximate angle used during removal.
18. Position the wiring harness along the driveline support assembly and **LOOSELY** install the harness into the harness retaining slots.
19. Have an assistant guide the front of the driveline so the propeller input shaft is just to the rear of the engine flywheel housing, then raise the driveline to the **PROPER HEIGHT** and the **PROPER ANGLE** to install to the engine.

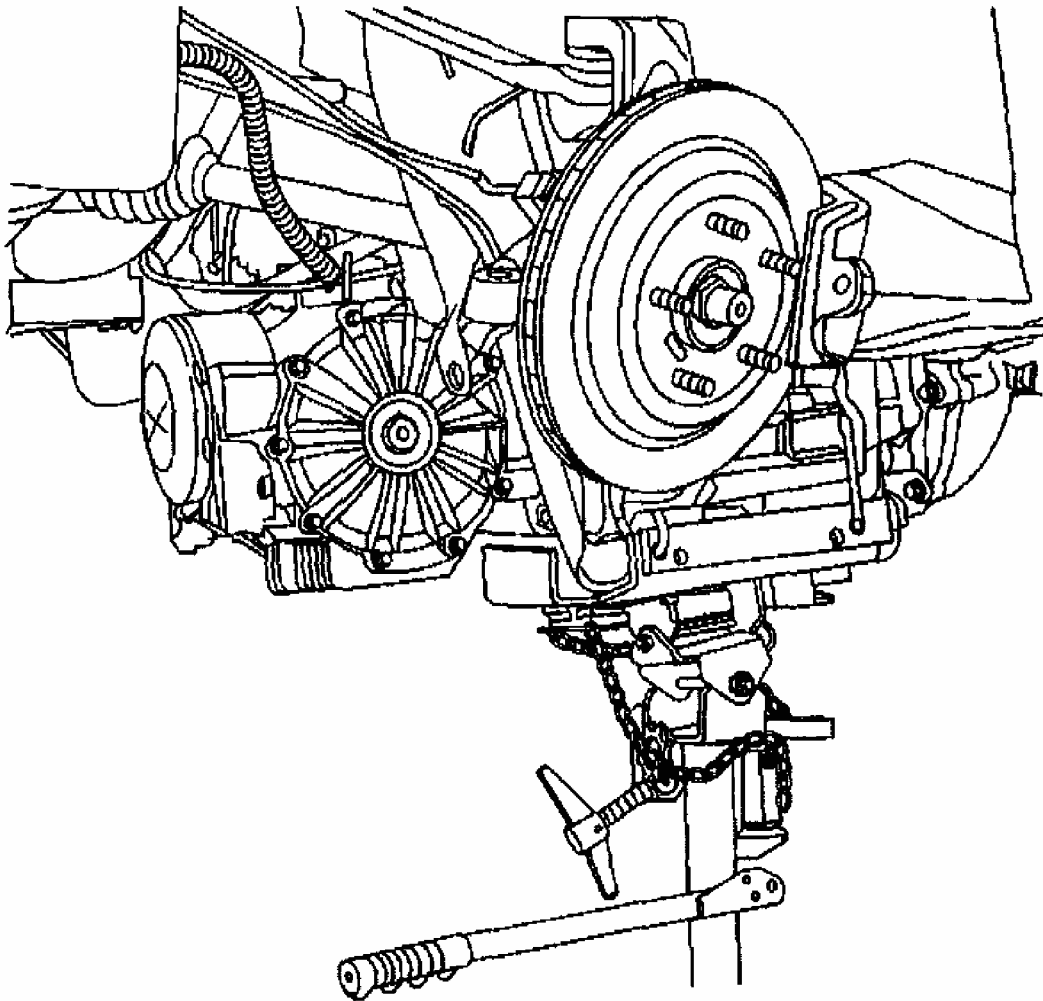


G01732054

**Fig. 55: Installing Driveline**  
Courtesy of GENERAL MOTORS CORP.

**Important:** Use care not to use too much force to install the propeller input shaft into the propeller shaft hub. The propeller input shaft front bearing positioning system is designed to withstand an insertion force not greater than 582 N (130 lb).

20. Have an assistant begin to insert the propeller input shaft into the propeller shaft hub while maintaining the proper angle of the driveline, if necessary use a screwdriver to rotate the shaft slightly to position and align the splines.
21. SLOWLY seat the driveline to the engine flywheel housing while maintaining the proper angle of the driveline.

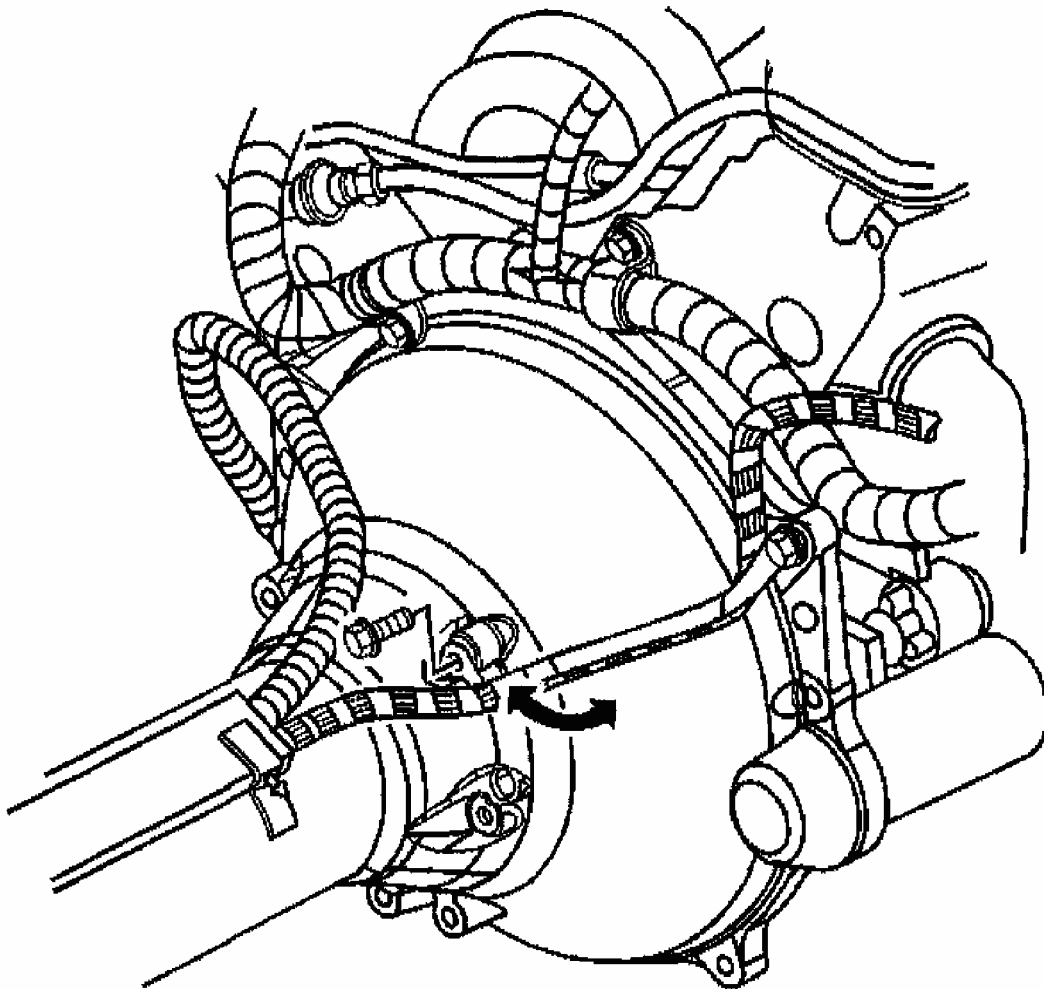


G01732055

**Fig. 56: Aligning Transmission Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

22. Reposition the wiring harness bracket to the driveline support assembly bolt hole.





G01732056

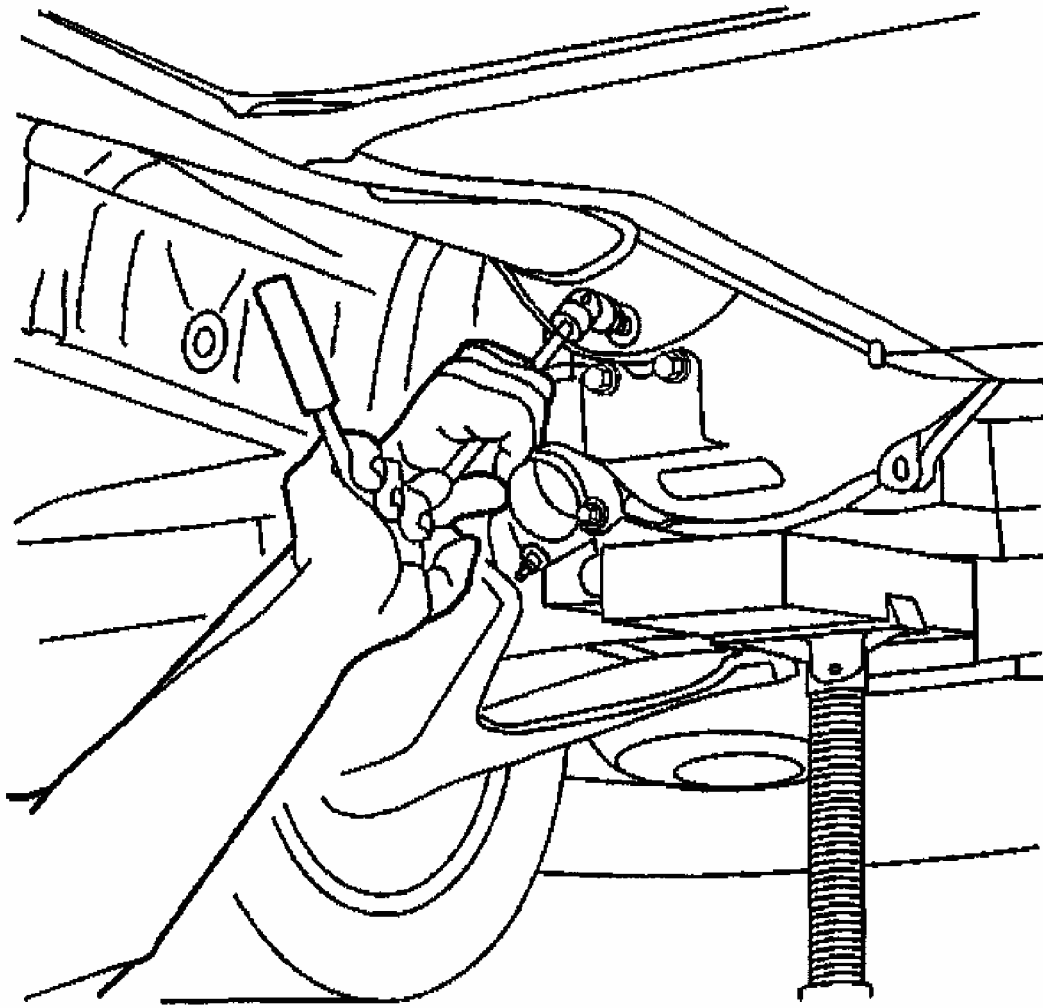
**Fig. 57: Aligning Wiring Harness Bracket**  
**Courtesy of GENERAL MOTORS CORP.**

23. Install the driveline support assembly to engine flywheel housing bolts.

**Tighten**

Tighten the driveline support assembly to engine flywheel housing bolts to 50 N.m (37 lb ft).

24. Install the wiring harness to the wiring harness retainer along the top of the transmission.
25. SLOWLY raise the driveline to approximately 51 mm (2 in) BELOW the final installed height.



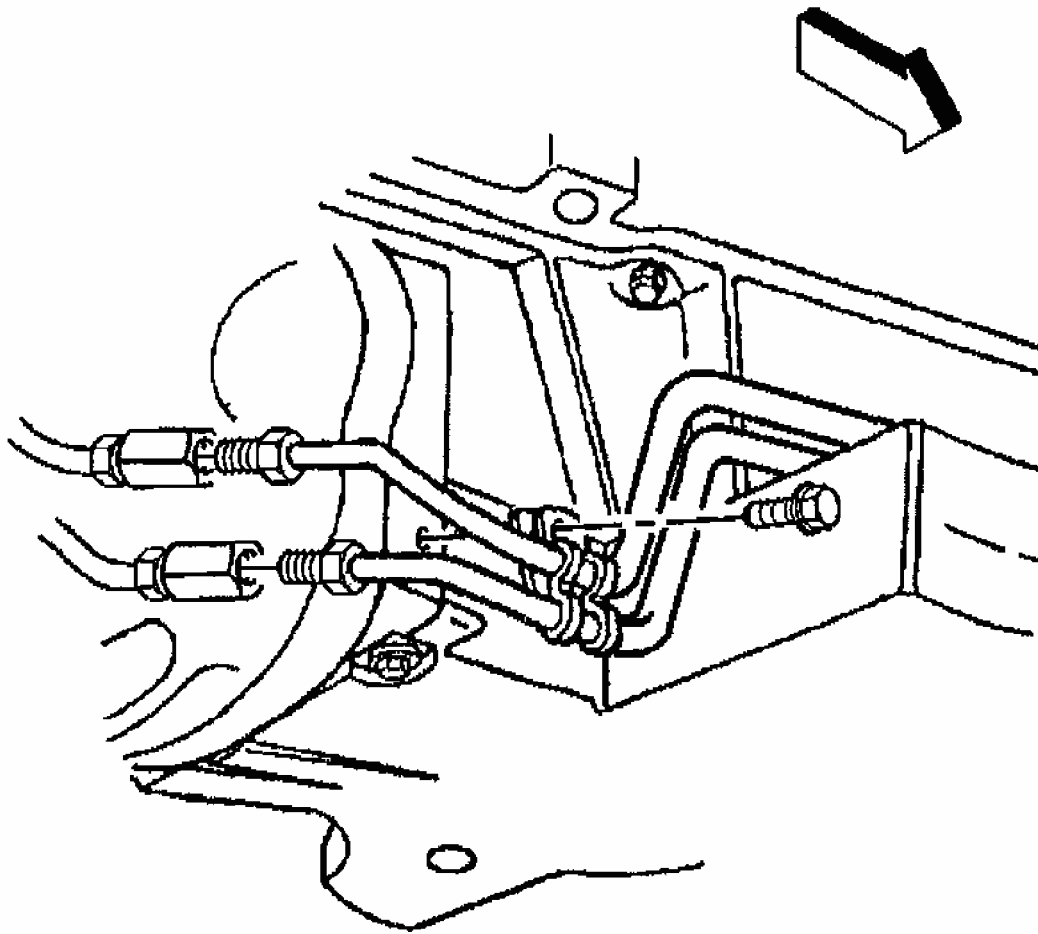
G01732057

**Fig. 58: Installing Driveline Support Assembly To Engine Flywheel Housing Bolts**  
Courtesy of GENERAL MOTORS CORP.

26. Remove the caps from the front of the transmission oil cooler pipes and remove the plugs from the junction fittings at the engine flywheel housing.
27. ALIGN and HAND-START, then tighten ONLY by hand to seat the transmission oil cooler pipes to the junction fittings at the engine flywheel housing.

### **Tighten**

Tighten the transmission oil cooler pipes to junction fittings at engine flywheel housing to 27 N.m (20 lb ft).



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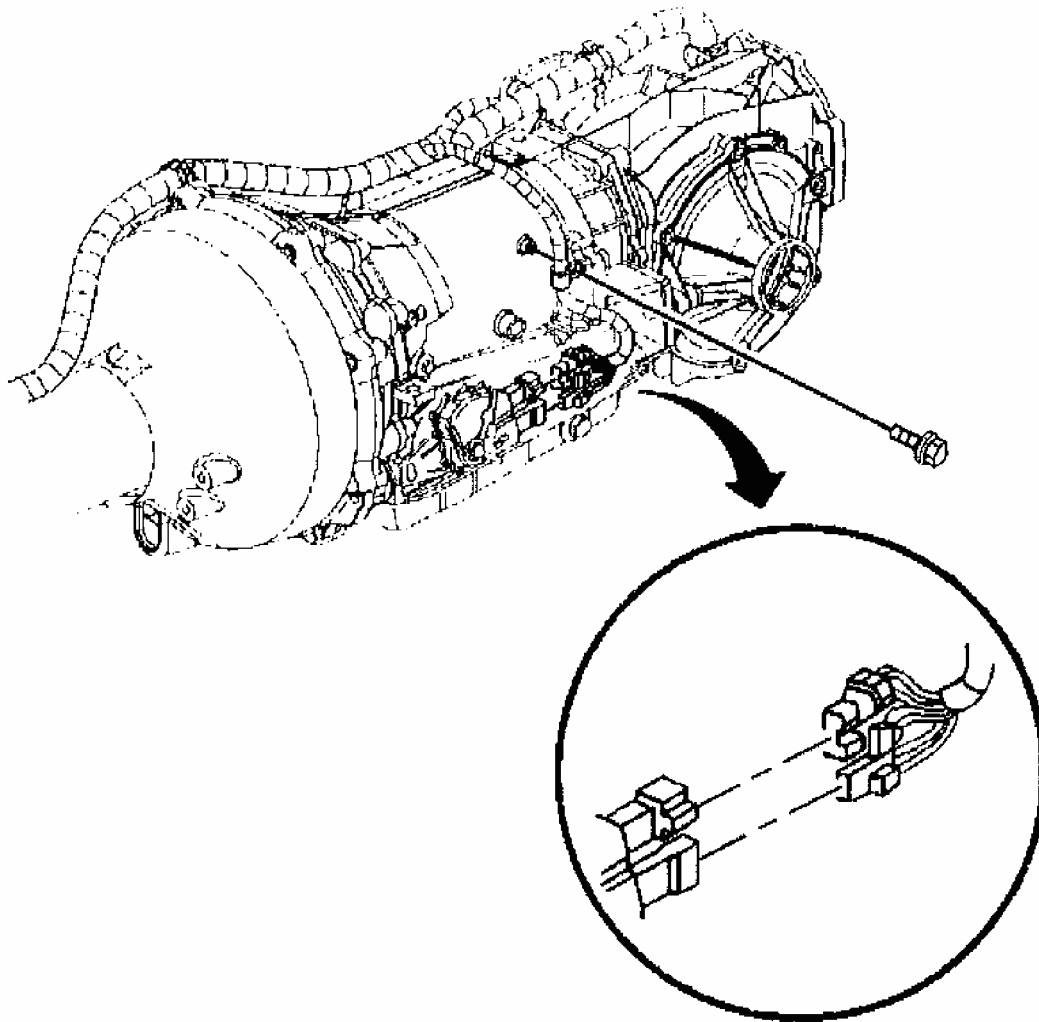
**Fig. 59: Installing Transmission Oil Cooler Pipes Retaining Bolt**  
**Courtesy of GENERAL MOTORS CORP.**

28. Install the transmission wiring harness to LH side of transmission case retaining bolt.

**Tighten**

Tighten the transmission wiring harness to LH side of transmission case retaining bolt to 2.5 N.m (22 lb in).

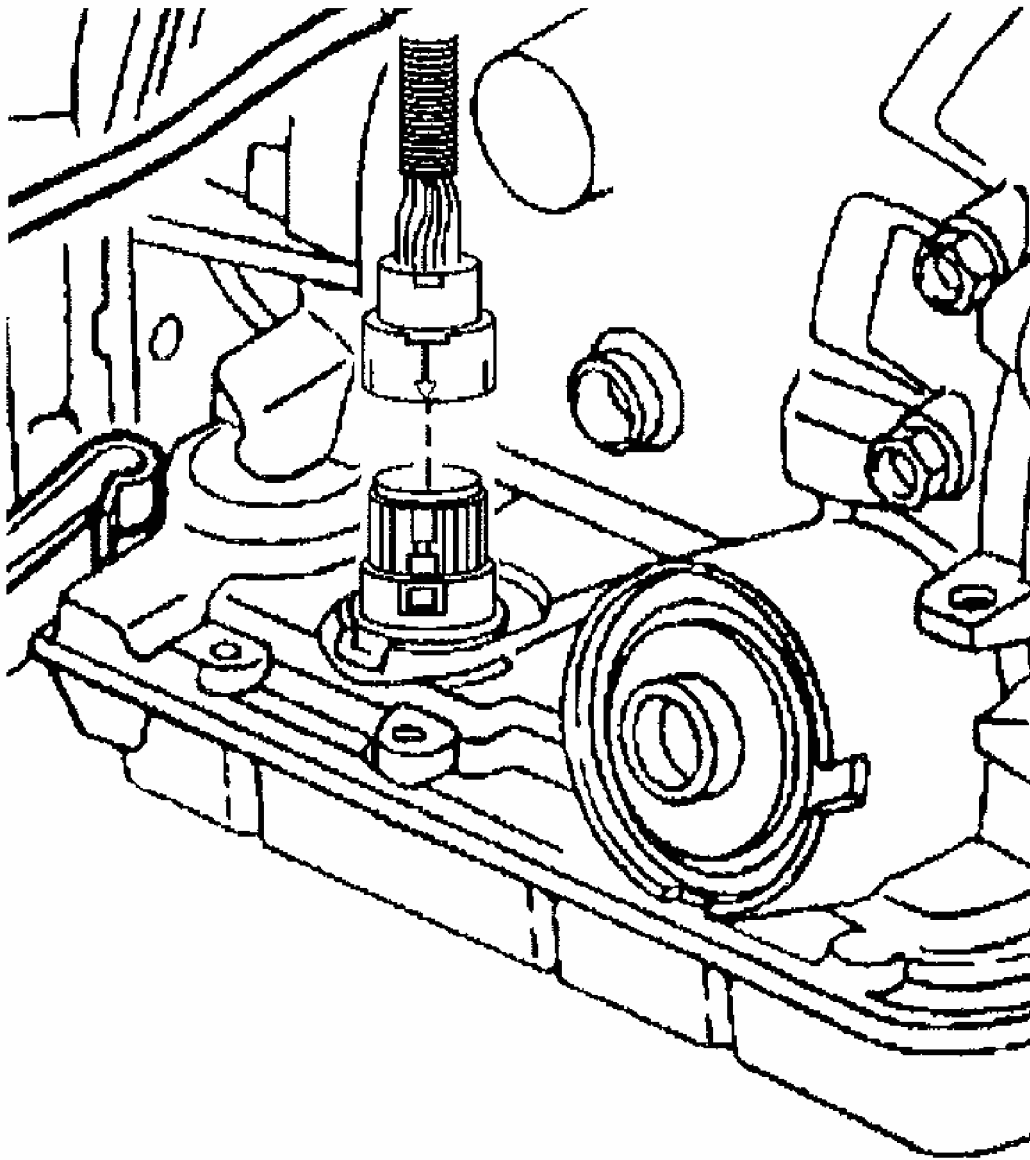
29. Connect the park/neutral position switch electrical connectors.



G01732059

**Fig. 60: Installing Transmission Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

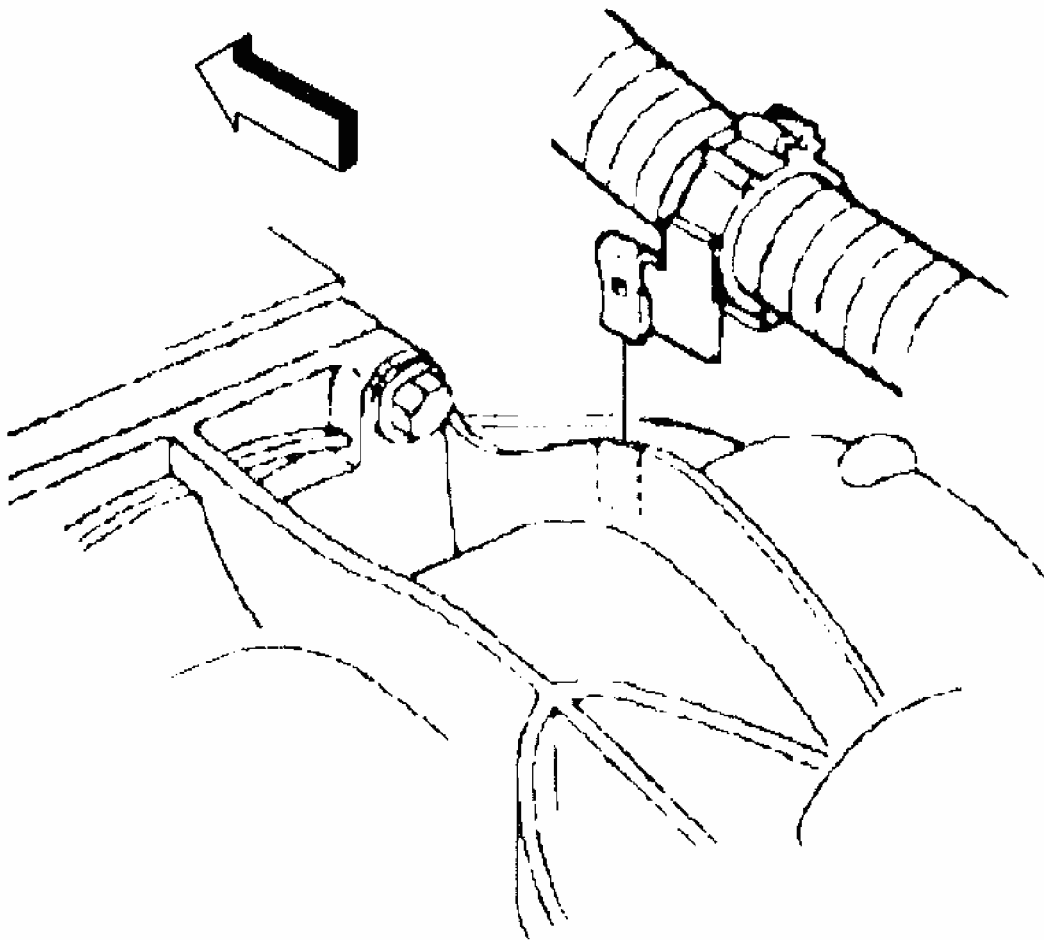
30. Connect the transmission wiring harness 20-way connector.  
Align the arrows on each half of the connector.



G01732060

**Fig. 61: Installing Transmission Wiring Harness 20-Way Connector**  
Courtesy of GENERAL MOTORS CORP.

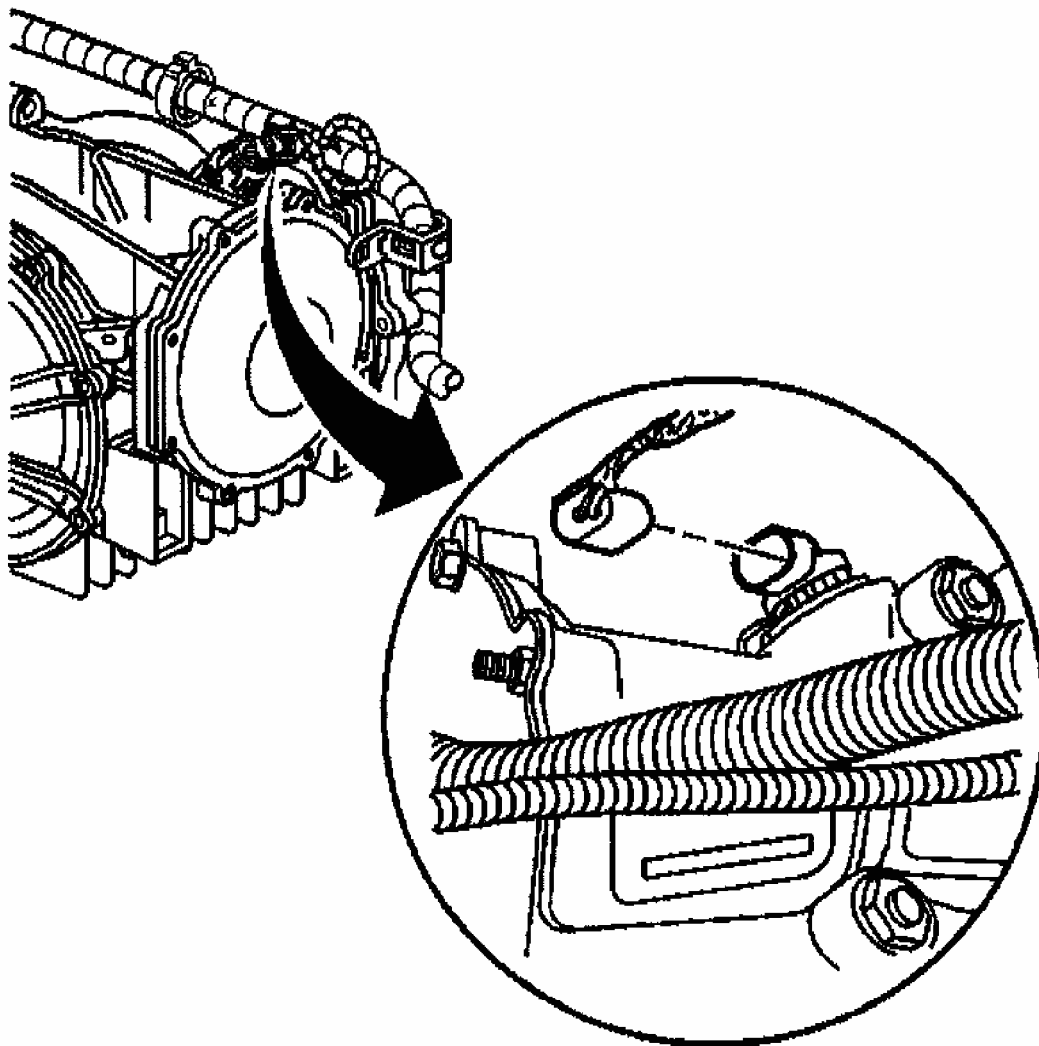
31. Connect the wiring harness clip to the top of the differential.
32. Connect the wiring harness retainer to the stud at the differential rear cover.



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**Fig. 62: Installing Transmission Wiring Harness Clip**  
**Courtesy of GENERAL MOTORS CORP.**

33. Connect the vehicle speed sensor (VSS) electrical connector.



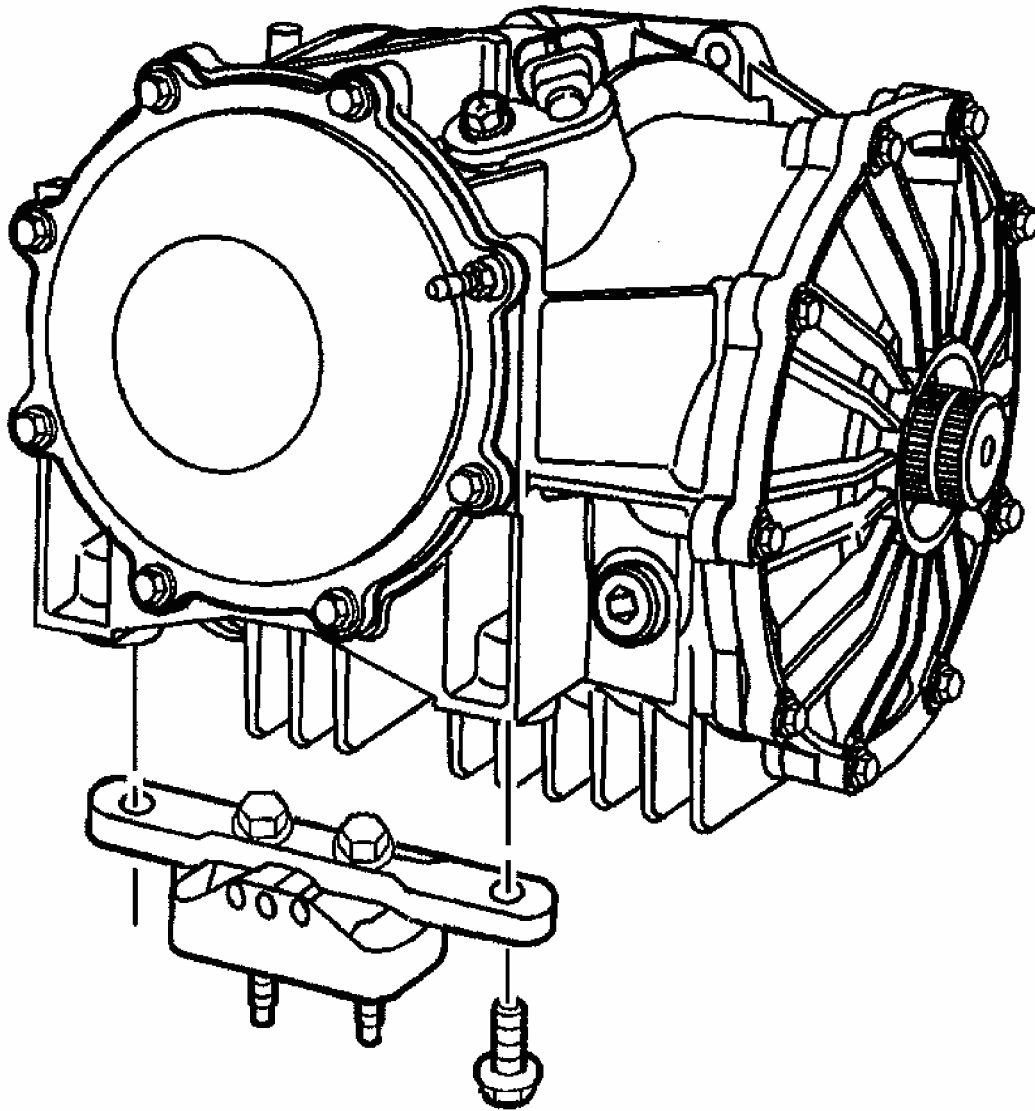
G01732062

**Fig. 63: Connecting VSS Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

34. Slowly raise the driveline to final installation height.
35. Remove the jack which supported the engine.
36. Remove the tie-off retainers from the axle shafts.
37. CAREFULLY align and seat the wheel drive shafts to the differential.
38. Install the transaxle mount and bracket to the differential.
39. Install the transaxle mount bracket to differential bolts.

**Tighten**

Tighten the transaxle mount bracket to differential bolts to 50 N.m (37 lb ft).

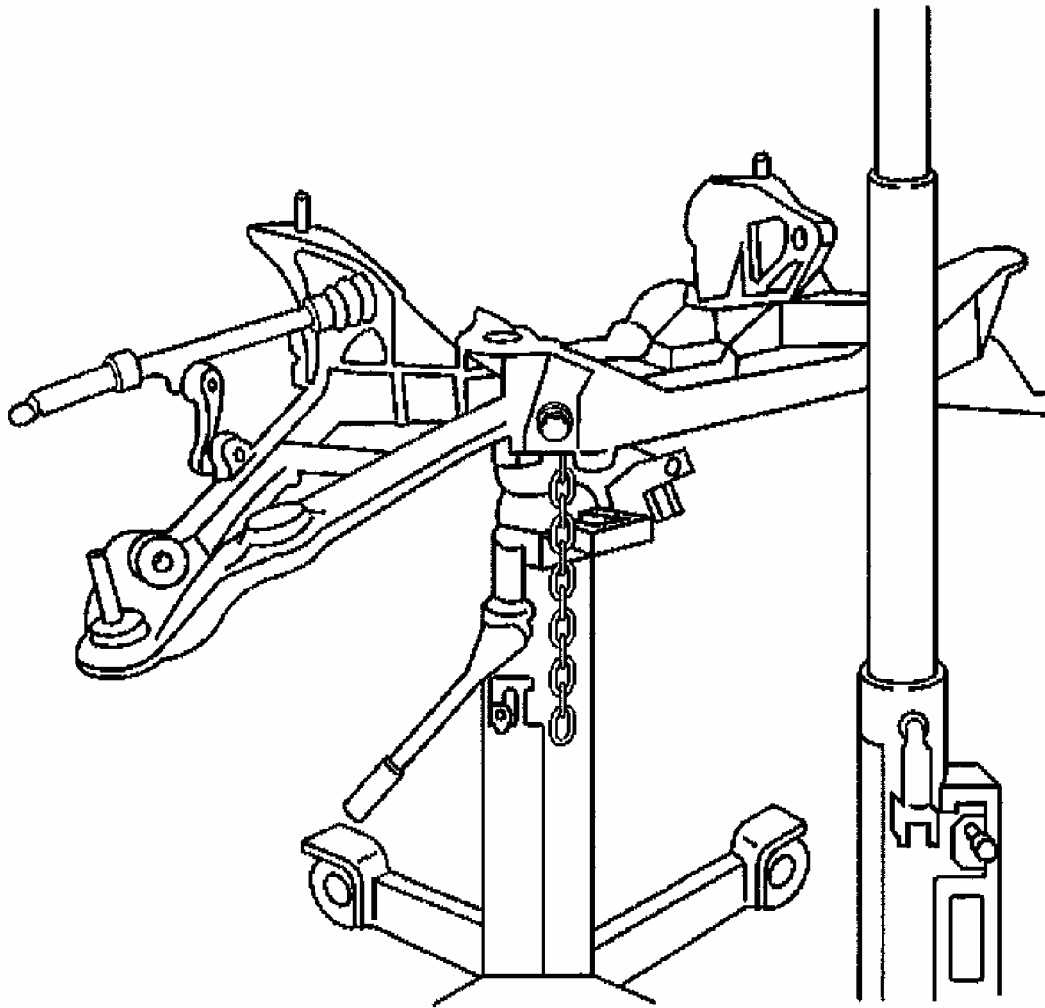


G01732063

**Fig. 64: Installing Transaxle Mount Bracket To Differential Bolts**  
Courtesy of GENERAL MOTORS CORP.

40. With the aid of an assistant, begin to raise the rear suspension crossmember (still firmly attached to a transmission jack), to the vehicle frame rails.
41. Guide the rear suspension crossmember alignment pins into the alignment holes in the vehicle frame rails, and guide the transaxle mount studs into the mounting holes in the crossmember, then raise the crossmember until it contacts the frame rails.





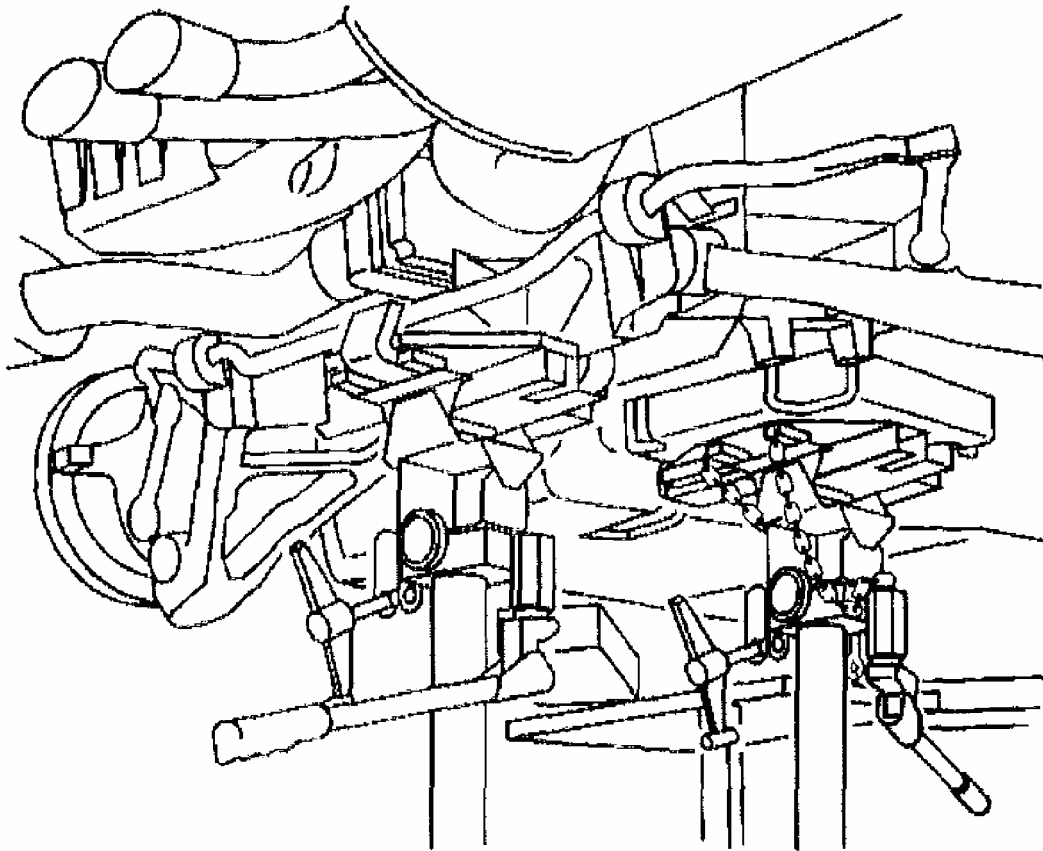
G01732064

**Fig. 65: Aligning Rear Suspension Crossmember**  
**Courtesy of GENERAL MOTORS CORP.**

42. Using ONLY HAND TOOLS, install NEW rear suspension crossmember mounting nuts.

**Tighten**

Tighten the rear suspension crossmember mounting nuts to 110 N.m (81 lb ft).



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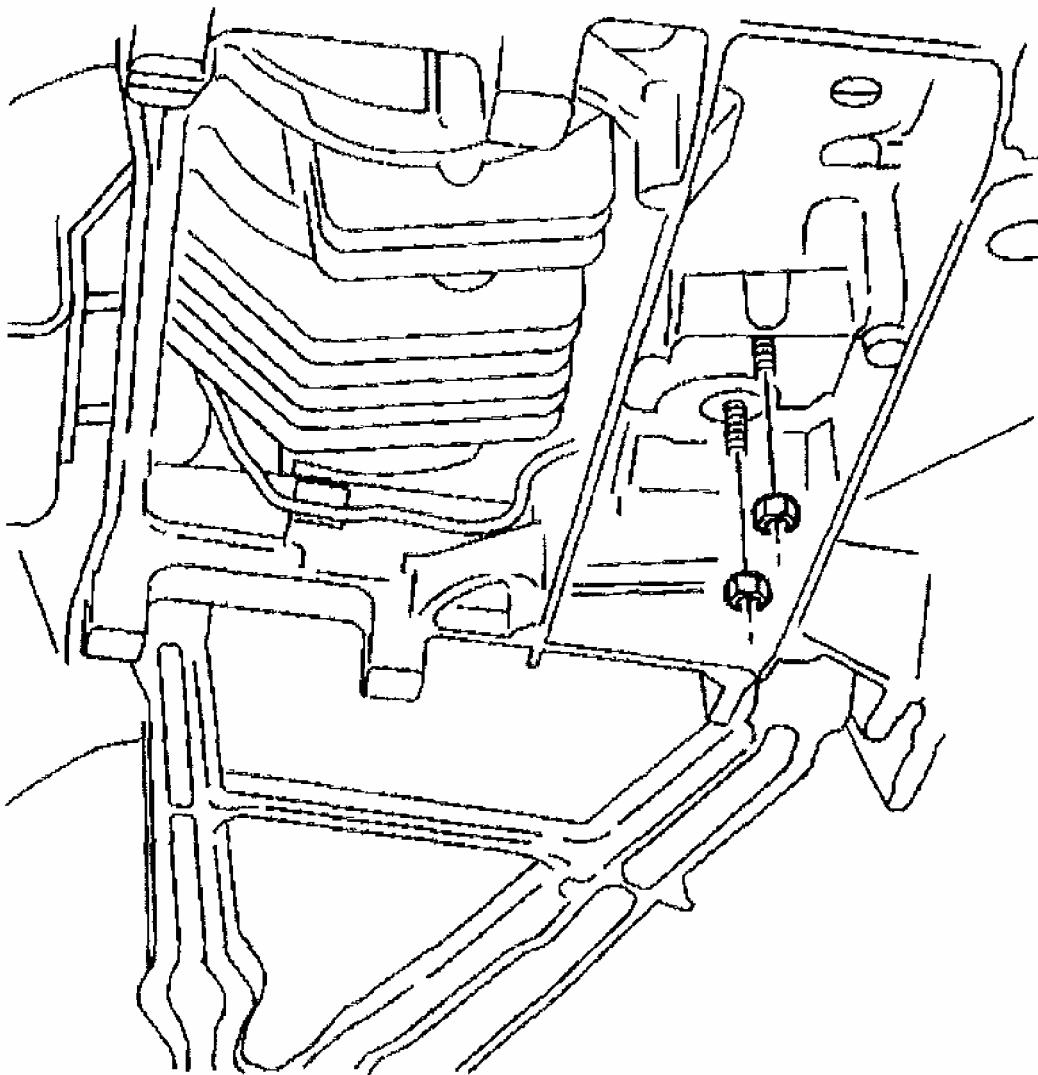
**Fig. 66: Installing Rear Suspension Crossmember**  
**Courtesy of GENERAL MOTORS CORP.**

43. Remove the transmission jack from the rear suspension crossmember.
44. Release the **J 42055** from the transmission, then remove the **J 42055** and transmission jack.
45. Install the transaxle mount to rear suspension crossmember nuts.

### **Tighten**

Tighten the transaxle mount to rear suspension crossmember nuts to 50 N.m (37 lb ft).

46. Connect the wiring harness and brake pipe clip retainers to the rear suspension crossmember.



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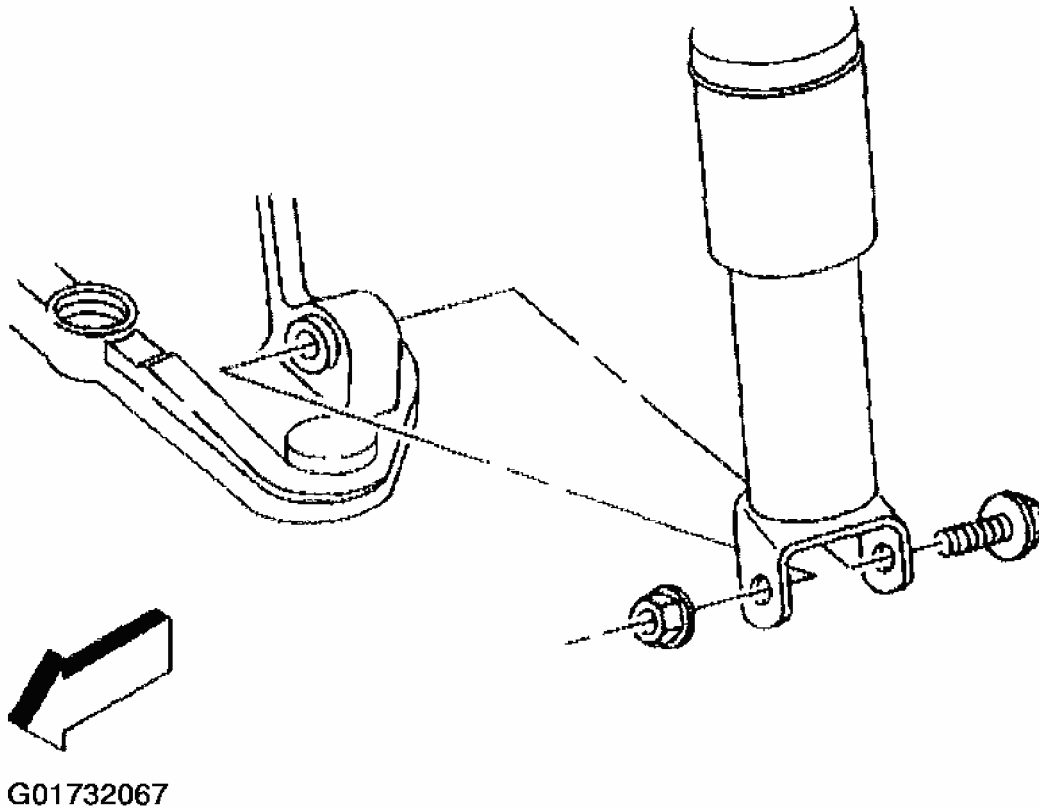
**Fig. 67: Installing Transaxle Mount To Rear Suspension Crossmember Nuts**  
Courtesy of GENERAL MOTORS CORP.

47. Support the lower control arm with a straight jack.
48. Connect the lower ball joint to the suspension knuckle. Refer to **KNUCKLE** in Rear Suspension.
49. Install the shock absorber lower mounting bolt.

### **Tighten**

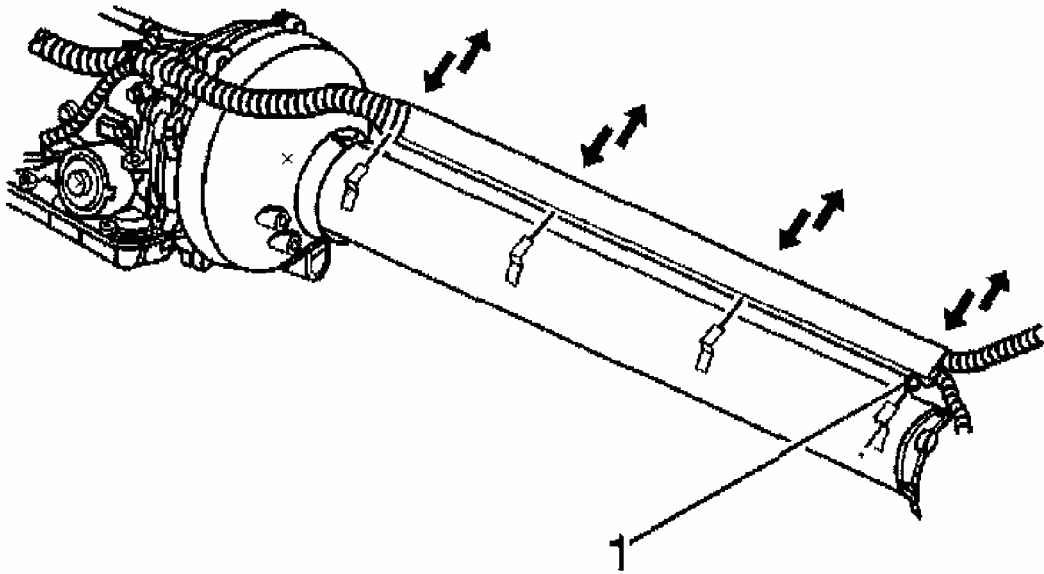
Tighten the rear shock absorber lower mounting bolt to 220 N.m (162 lb ft).

50. Connect the outer tie rod end to the suspension knuckle. Refer to **TIE ROD (OUTER END)** or **TIE ROD (SUSPENSION LINK)** in Rear Suspension.
51. Remove the straight jack from the suspension control arm.



**Fig. 68: Installing Rear Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

52. Repeat steps 47 through 51 for the other side of the vehicle.
53. Install the rear transverse spring. Refer to **REAR TRANSVERSE SPRING** in Rear Suspension.
54. Carefully position the wiring harness into the L-shaped brackets along the driveline support assembly. Align the harness retainer (locator) (1) to the hole in the forward bracket, and secure in place.

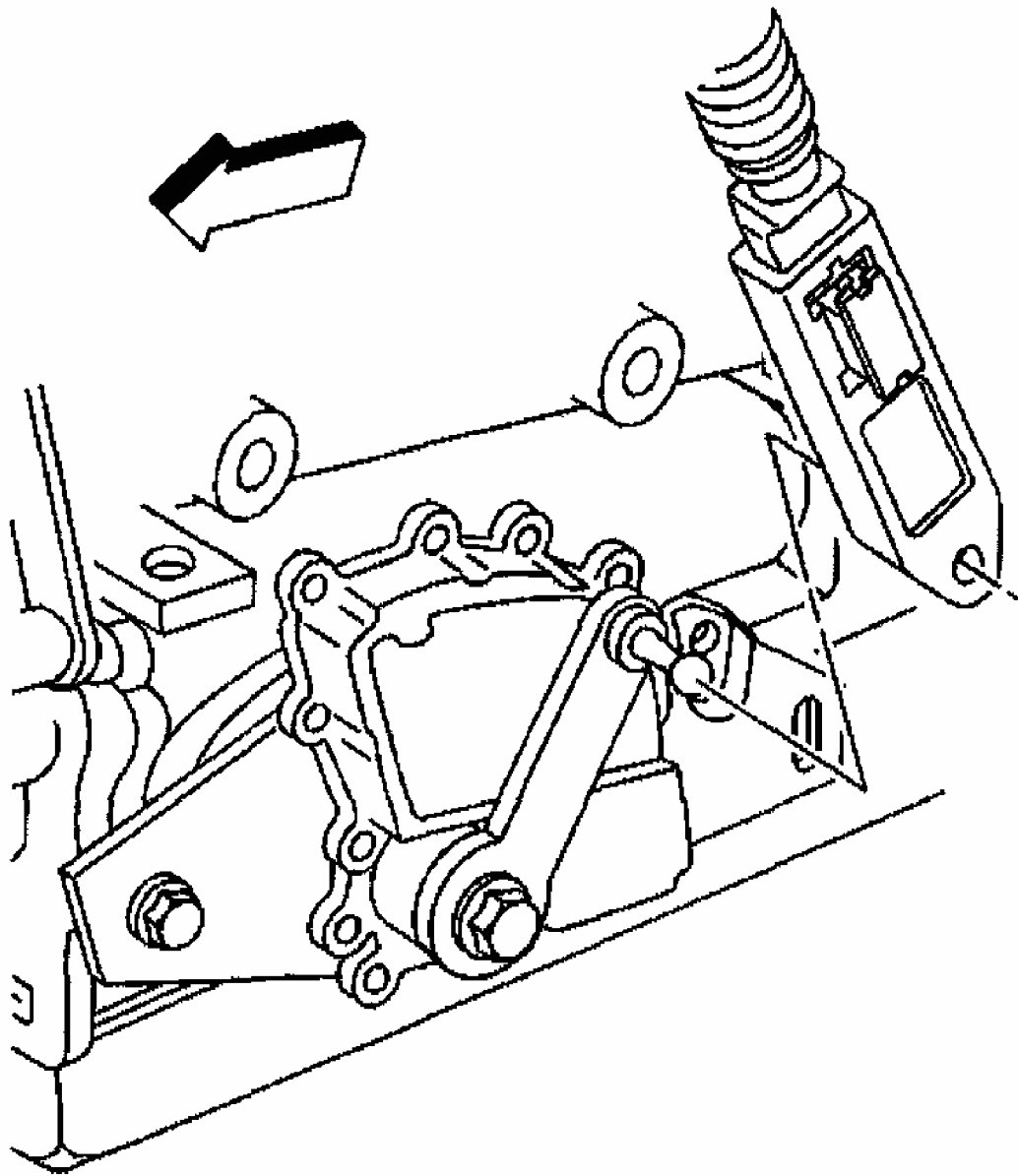


G01732068

**Fig. 69: Installing Transmission Wiring Harness Retainer**  
**Courtesy of GENERAL MOTORS CORP.**

55. Install the transmission shift cable and bracket into position.
56. Connect the transmission shift cable to the transmission shift lever.

Press to secure the cable.



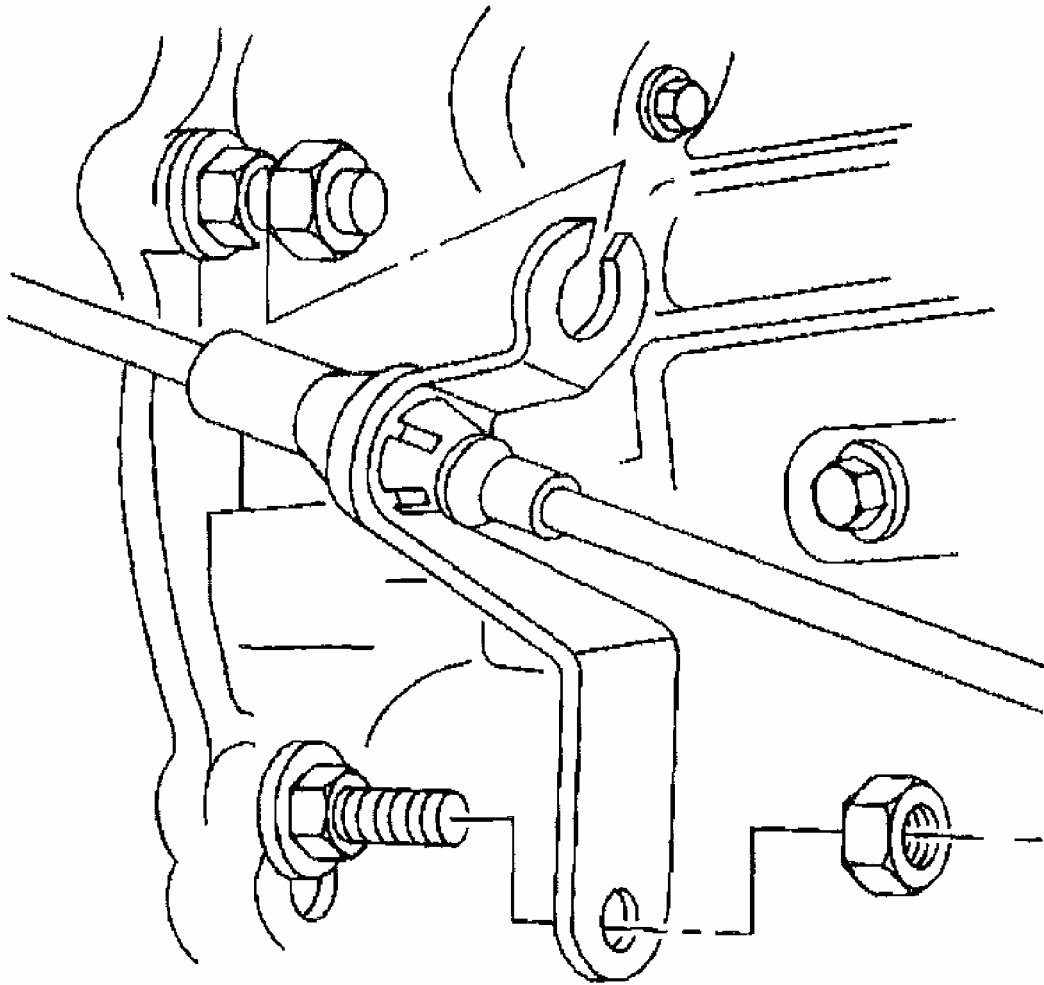
G01732069

**Fig. 70: Installing Transmission Shift Cable & Bracket**  
Courtesy of GENERAL MOTORS CORP.

57. Install the transmission shift cable bracket nuts to the transmission.

**Tighten**

Tighten the transmission shift cable bracket nuts to 20 N.m (15 lb ft).

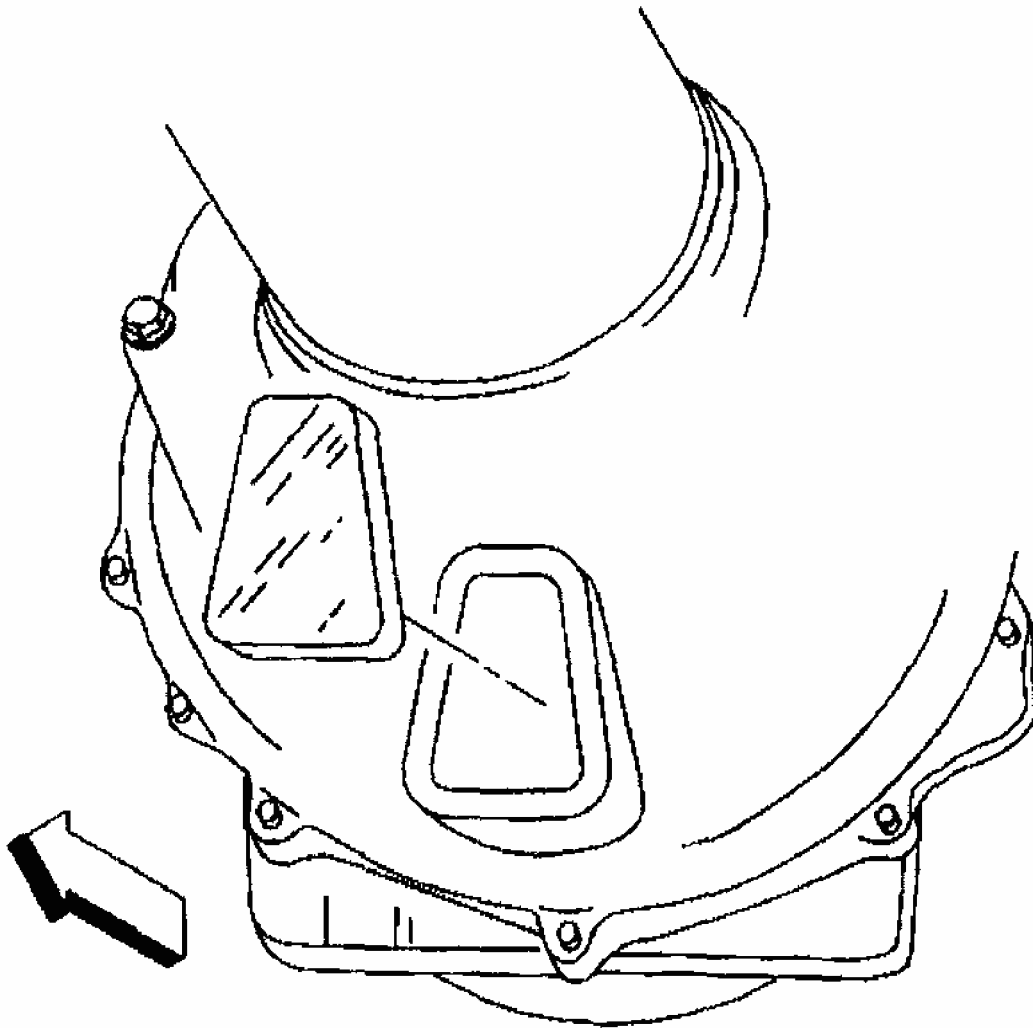


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**Fig. 71: Installing Transmission Shift Cable Bracket Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

**Important:** The following step must be performed to assure proper torque converter balance during installation.

58. Align the transmission flexplate to the transmission torque converter using the matchmark made prior to removal.
59. Install the transmission flexplate to transmission torque converter bolts. Install starter. Refer to **STARTER MOTOR** .
60. Install the rear bellhousing access plug.

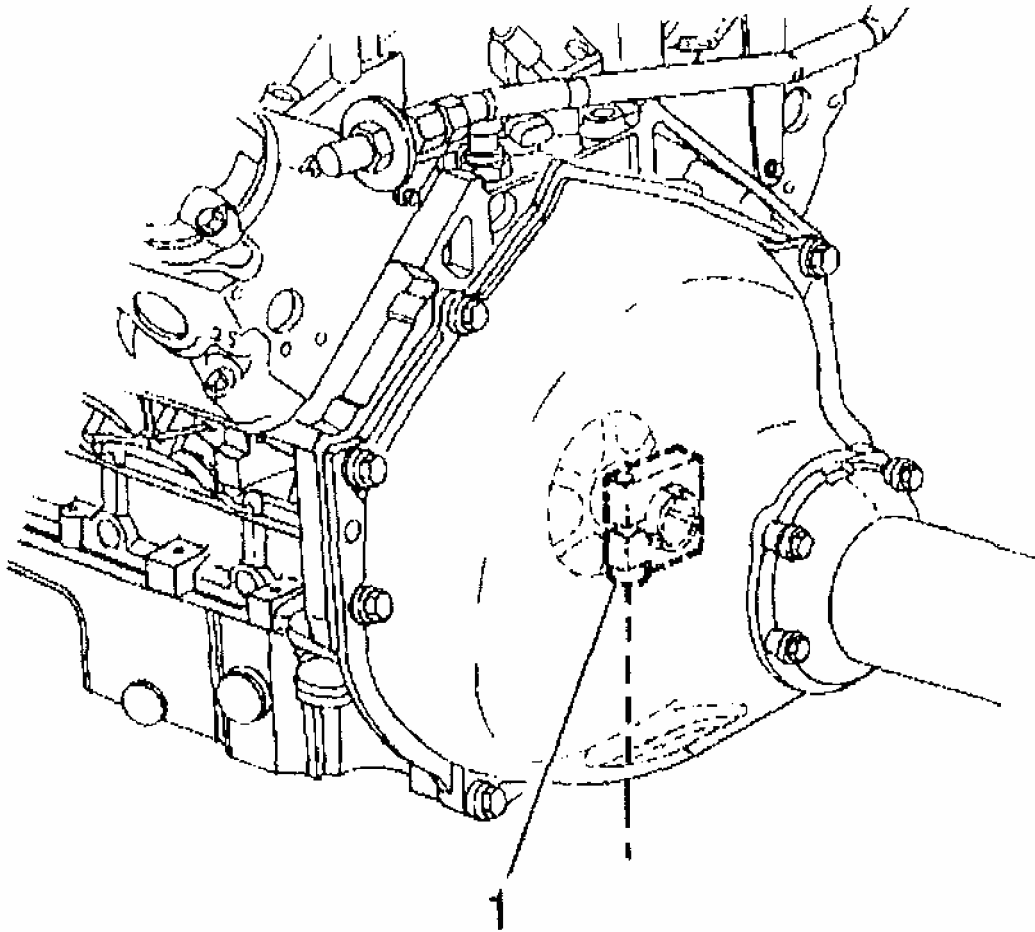


G01732071

**Fig. 72: Installing Rear Bellhousing Access Plug**  
**Courtesy of GENERAL MOTORS CORP.**

61. HAND-TIGHTEN the propeller shaft hub clamp bolt (1) until FINGER-TIGHT.





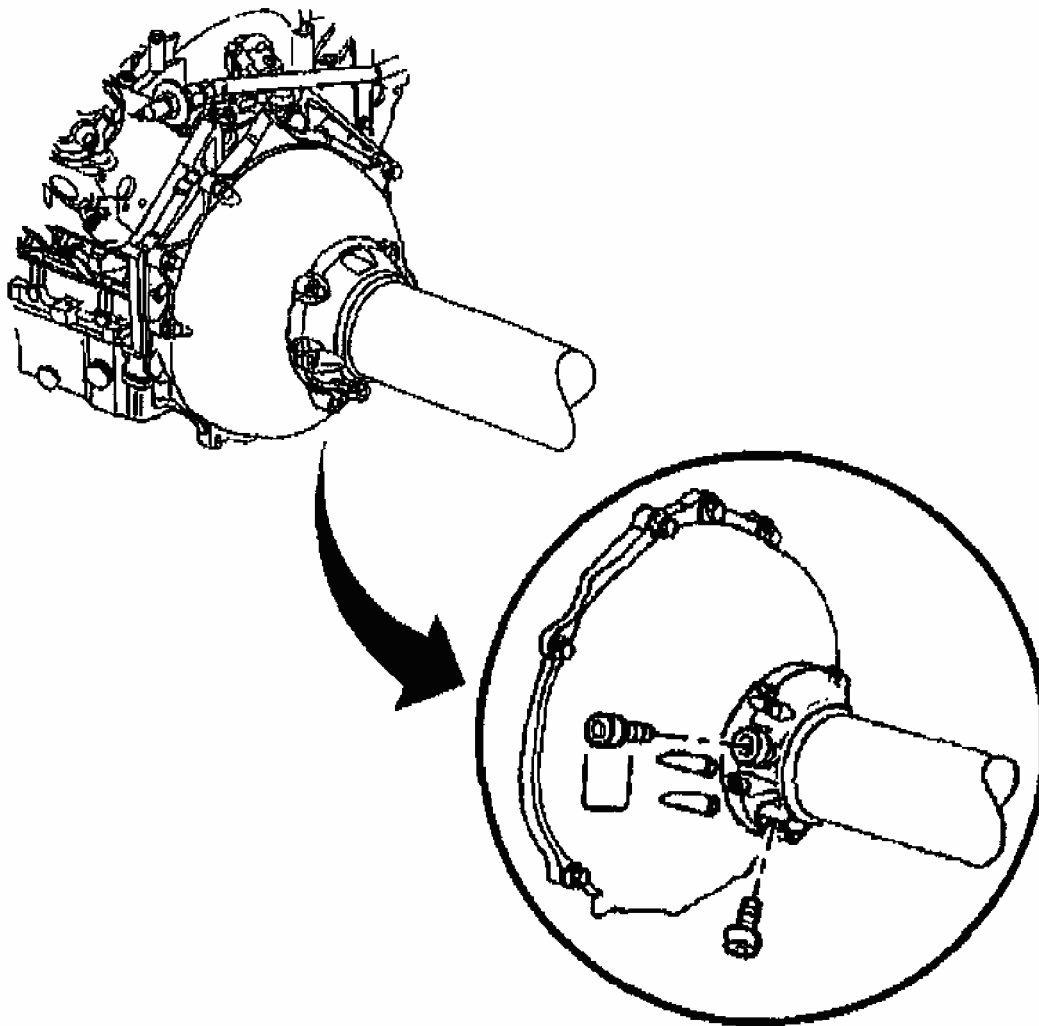
G01732072

**Fig. 73: Installing Propeller Shaft Hub Clamp Bolt**  
**Courtesy of GENERAL MOTORS CORP.**

62. Remove the propeller input shaft front bearing positioning bolts (M10 - 1.5 X 55 mm) from the driveline support assembly.
63. Install the two plug bolts to the front of the driveline support assembly.

**Tighten**

Tighten the driveline support assembly front plug bolts to 50 N.m (37 lb ft).



G01732073

**Fig. 74: Installing Plug Bolts**  
Courtesy of GENERAL MOTORS CORP.

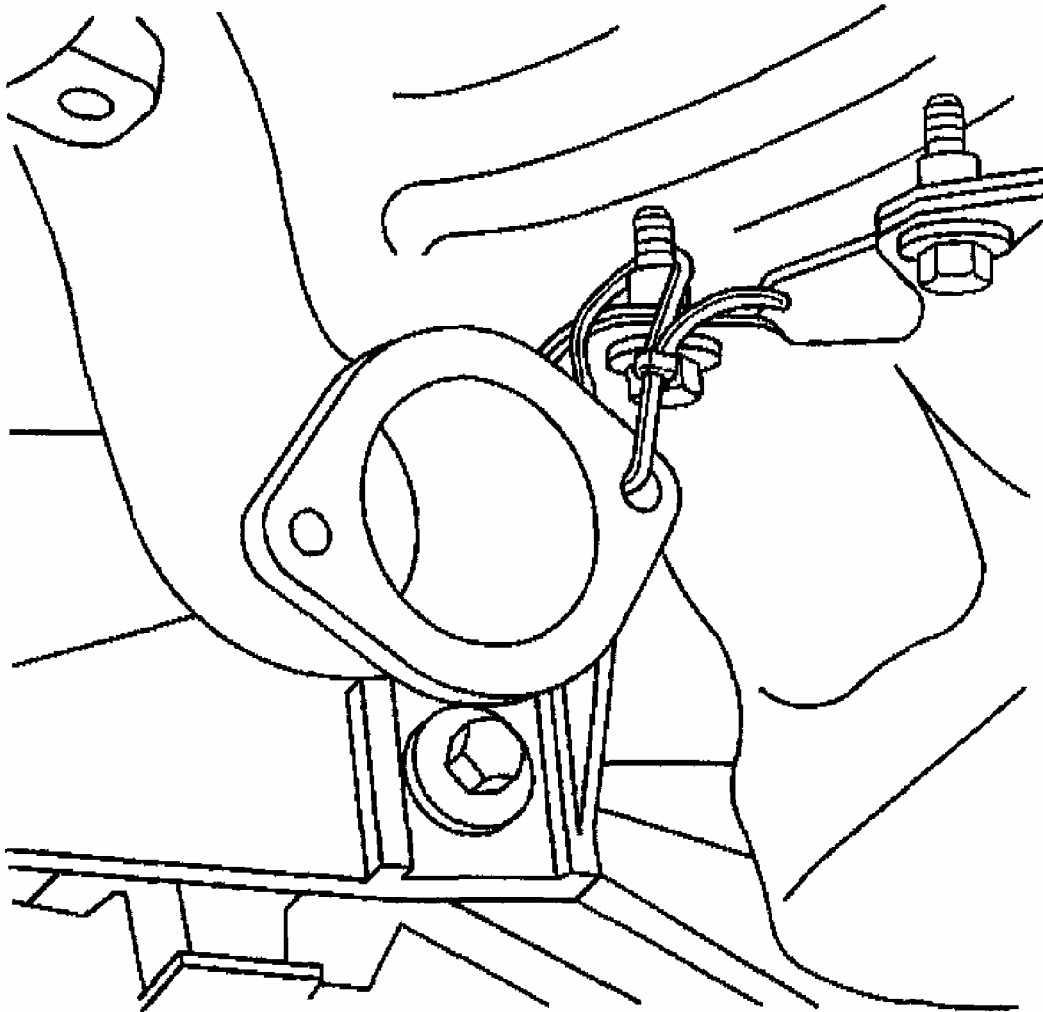
64. Install the driveline tunnel closeout panel. Refer to **Driveline Tunnel Closeout Panel Replacement**.
65. Remove the tie-off retainer from the LH muffler assembly.
66. Install the RH muffler assembly. Refer to **MUFFLER REPLACEMENT-RIGHT** in Engine Exhaust.
67. Install the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
68. Install the rear tire and wheel assemblies. Refer to **TIRE & WHEEL REMOVAL & INSTALLATION** in Tires and Wheels.

69. Lower the vehicle.
70. Connect the negative battery cable.

### **Tighten**

Tighten the negative battery cable bolt to 15 N.m (11 lb ft).

71. Program the transmitters. Refer to **TRANSMITTER PROGRAMMING** in Keyless Entry.



G01732074

**Fig. 75: Identifying LH Muffler Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

**Important:** The following steps **MUST** be performed in order to provide proper

alignment of the propeller shaft hub, the propeller input shaft and the propeller input shaft front bearing.

72. Start and run the engine at idle until normal operating temperatures are reached.

(Idle or drive for at least 10 minutes.)

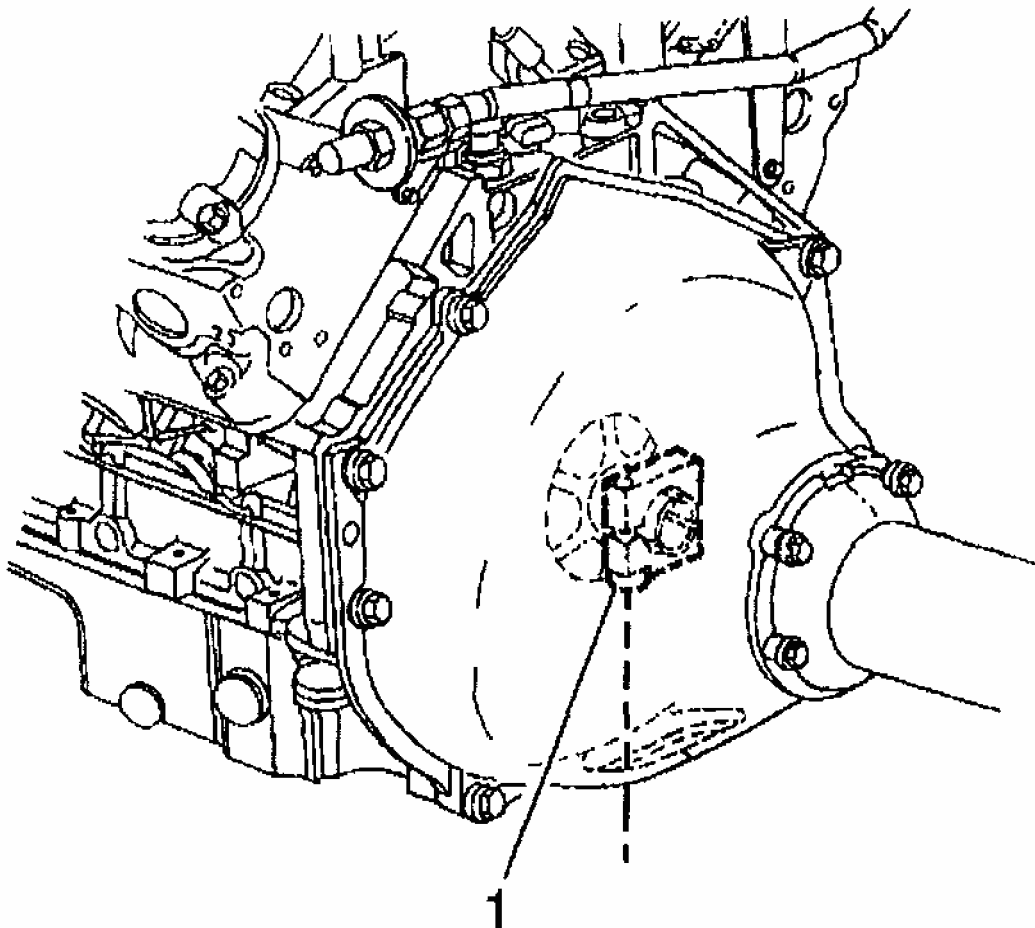
73. Turn off the engine and allow the powertrain to cool to ROOM temperature.

74. Raise the vehicle.

75. Tighten the propeller shaft hub clamp bolt (1).

### **Tighten**

Tighten the propeller shaft hub clamp bolt to 125 N.m (93 lb ft).

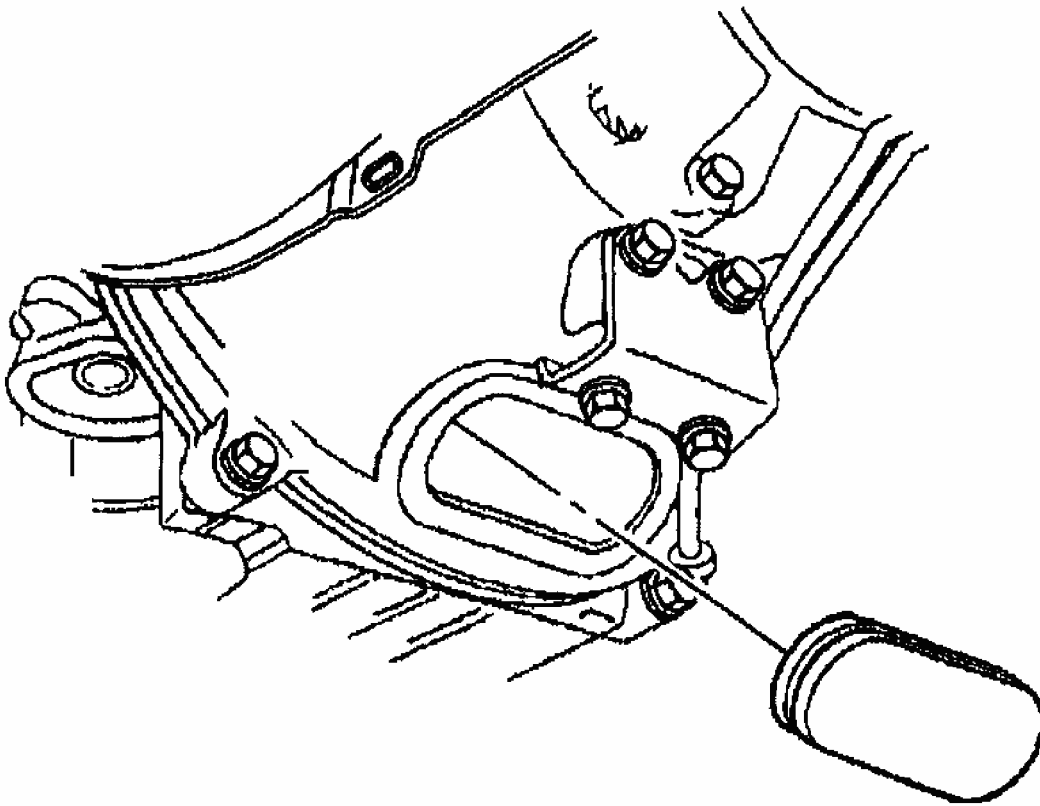


G01732075

**Fig. 76: Installing Propeller Shaft Hub Clamp Bolt**

Courtesy of GENERAL MOTORS CORP.

76. Install the engine flywheel housing access plug.
77. Flush the transmission oil cooler. Refer to **OIL COOLER FLUSHING** .
78. Lower the vehicle.



G01732076

**Fig. 77: Installing Engine Flywheel Housing Access Plug**  
Courtesy of GENERAL MOTORS CORP.

#### DRIVELINE SUPPORT ASSEMBLY REPLACEMENT (MANUAL TRANSMISSION)

##### Tools Required

- J 36221 Hydraulic Clutch Separator
- J 42055 Transmission Support Fixture

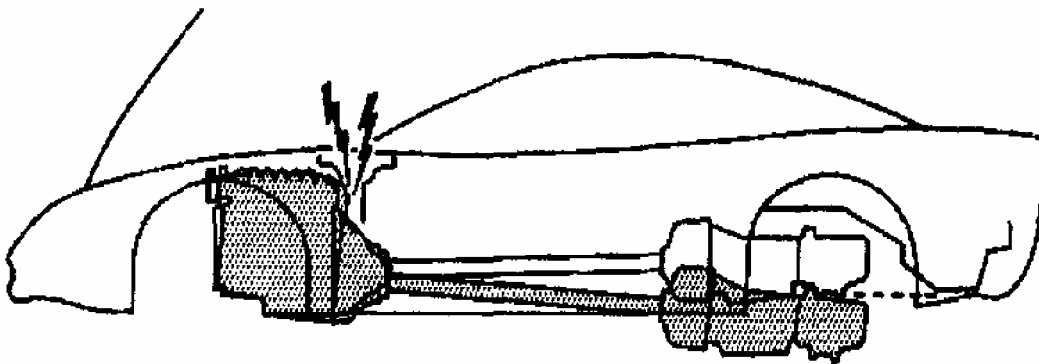
##### Removal Procedure

**WARNING:** Refer to **BATTERY DISCONNECT**

**CAUTION .**

**CAUTION:** When tilting down the rear of the driveline, observe the clearance between the rear of the engine and the composite dash panel. Do not allow the engine to rest unsupported against the composite dash panel, or vehicle damage may result.

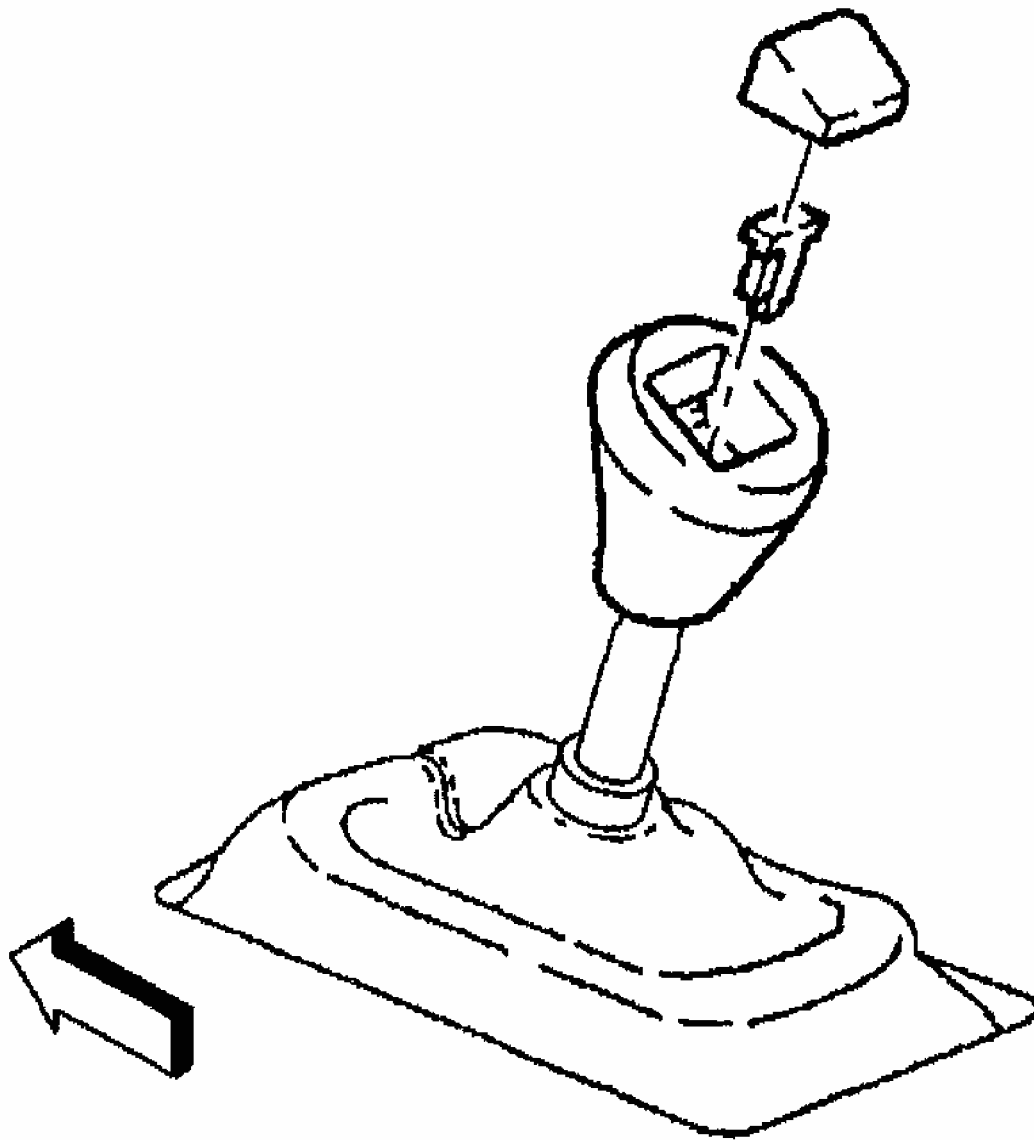
**CAUTION:** When lowering and removing the rear of the driveline, observe the clearance between the rear of the transaxle assembly and the underbody to prevent damage.



G01732077

**Fig. 78: Identifying Engine To Composite Dash Panel Clearance**  
**Courtesy of GENERAL MOTORS CORP.**

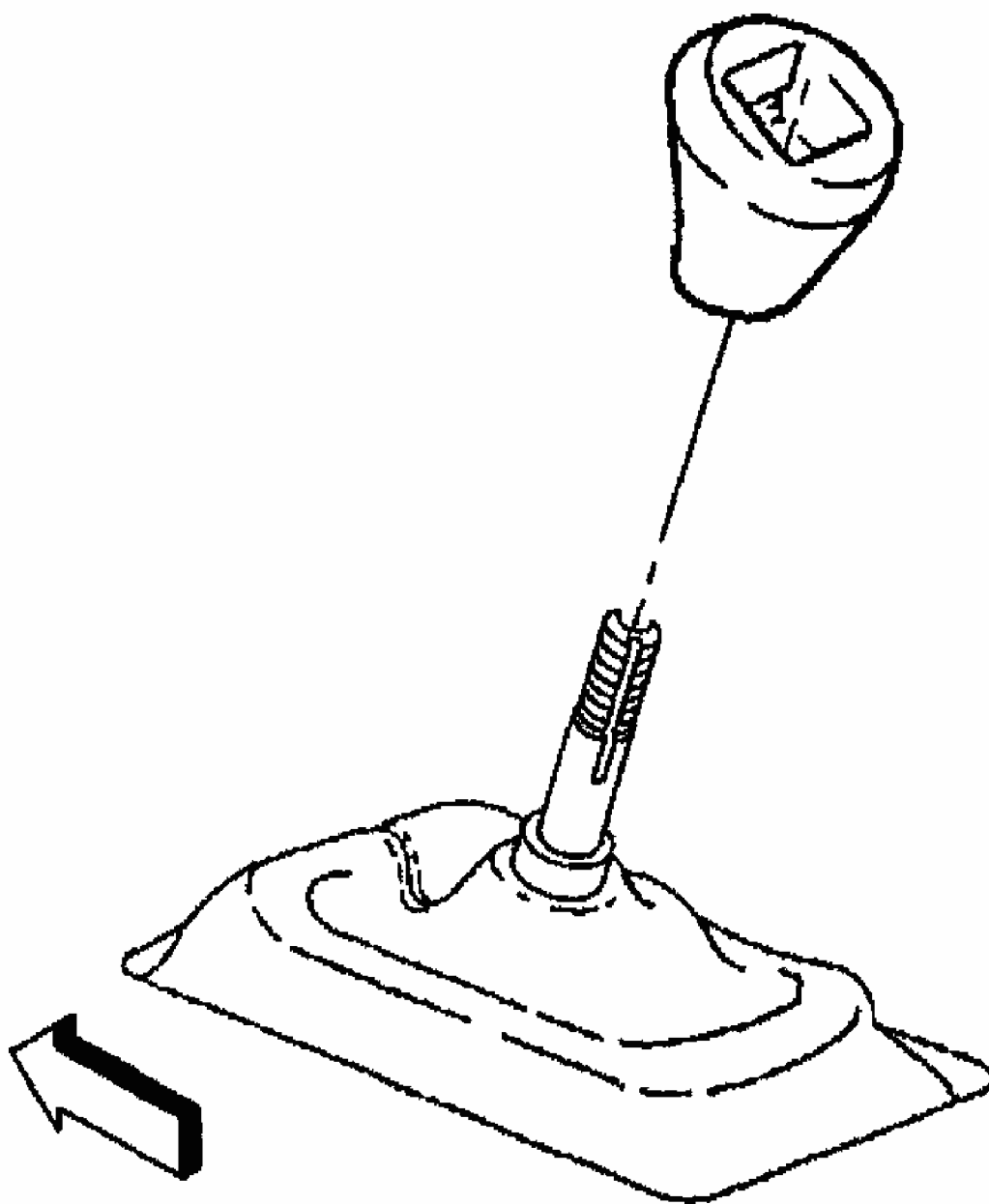
1. Disconnect the negative battery cable.
2. Remove the console. Refer to **INSTRUMENT PANEL CLUSTER** .
3. Carefully pry off the shift control knob button.
4. Pry the shift control knob retainer out of the slots and remove the retainer.



G01732078

**Fig. 79: Removing Shift Control Knob Button & Retainer**  
Courtesy of GENERAL MOTORS CORP.

5. Unscrew the shift control knob.

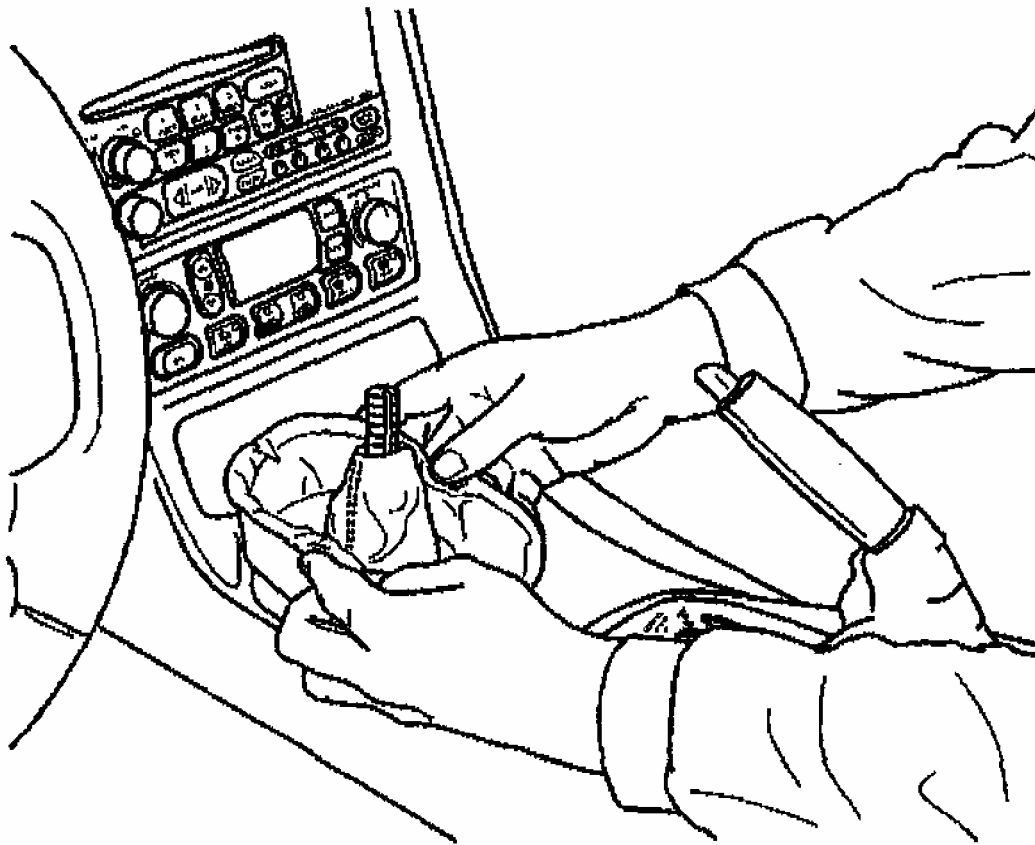


G01732079

**Fig. 80: Removing Shift Control Knob**  
Courtesy of GENERAL MOTORS CORP.

6. Grasp the sides of the shift control boot and apply light pressure in toward the shift control lever to begin to release the shift boot retaining tabs from the IP accessory trim plate.
7. Using light pressure, continue to release the remaining boot retaining tabs.

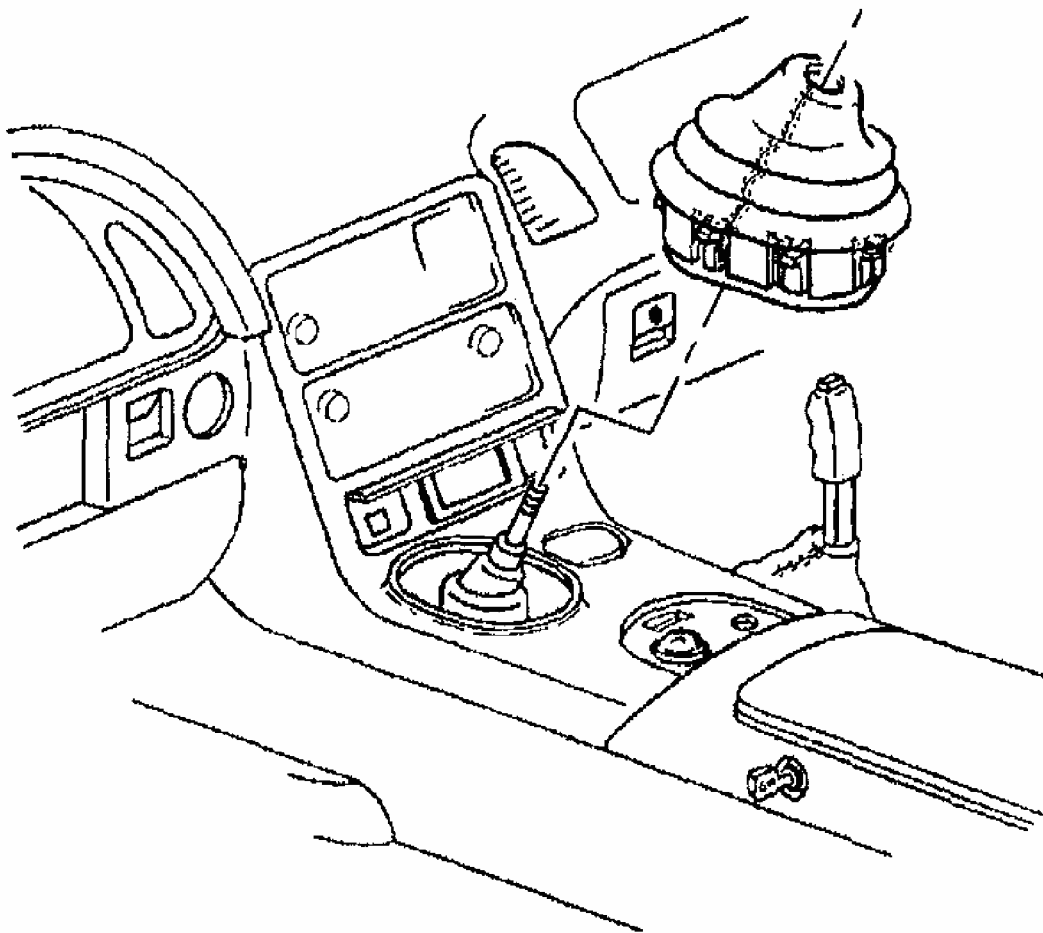




G01732080

**Fig. 81: Disconnecting Shift Boot Retaining Tabs**  
**Courtesy of GENERAL MOTORS CORP.**

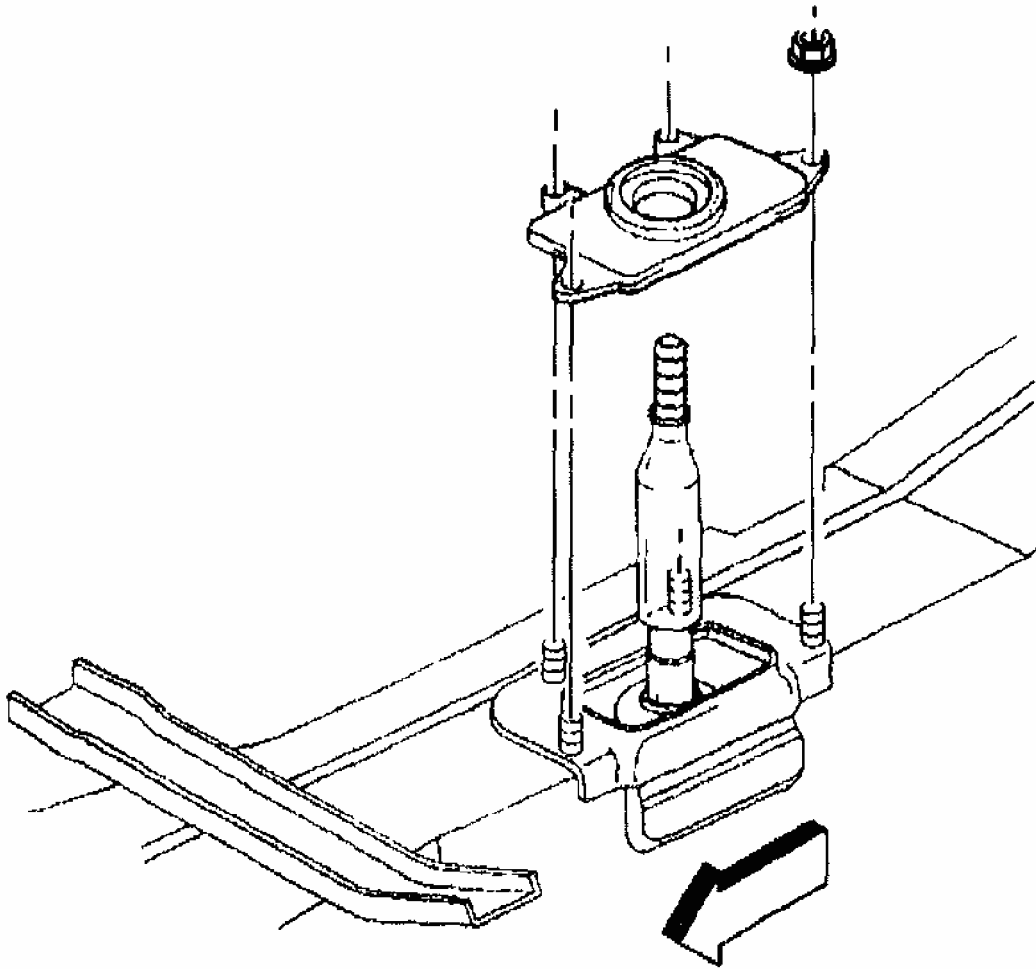
8. Lift the boot away from the trim plate and remove the boot.
9. Remove the IP accessory trim plate. Refer to **INSTRUMENT PANEL ACCESSORY TRIM PLATE & KNEE BOLSTER PANEL** .



G01732081

**Fig. 82: Removing Shift Control Boot**  
**Courtesy of GENERAL MOTORS CORP.**

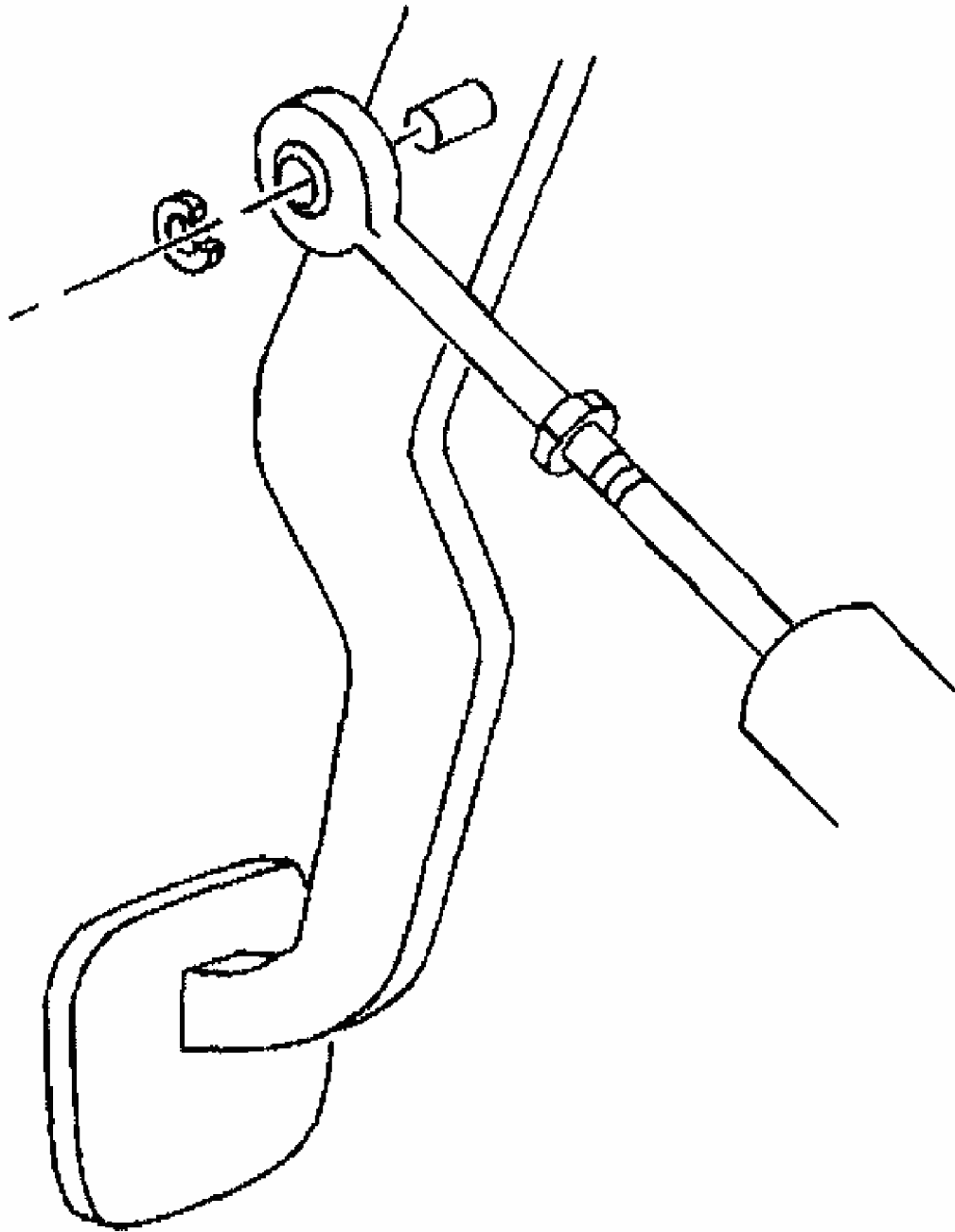
10. Remove the shift control closeout boot retaining nuts.
11. Remove the shift control closeout boot.
12. Remove the shift control assembly. Refer to **SHIFT CONTROL ASSEMBLY REPLACEMENT** .
13. Remove the left IP lower insulator panel. Refer to **CLOSEOUT/INSULATOR PANEL REPLACEMENT - LEFT** .



G01732082

**Fig. 83: Removing Shift Control Closeout Boot Retaining Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

14. Remove the clutch master cylinder pushrod retainer.
15. Disconnect the clutch master cylinder pushrod from the clutch pedal.



G01732083

**Fig. 84: Removing Clutch Master Cylinder Pushrod Retainer**  
Courtesy of GENERAL MOTORS CORP.

16. Raise and support the vehicle. Refer to **LIFTING AND JACKING THE VEHICLE** .
17. Remove the clutch actuator cylinder hose from the hose retaining clip (at the rear of the

engine).

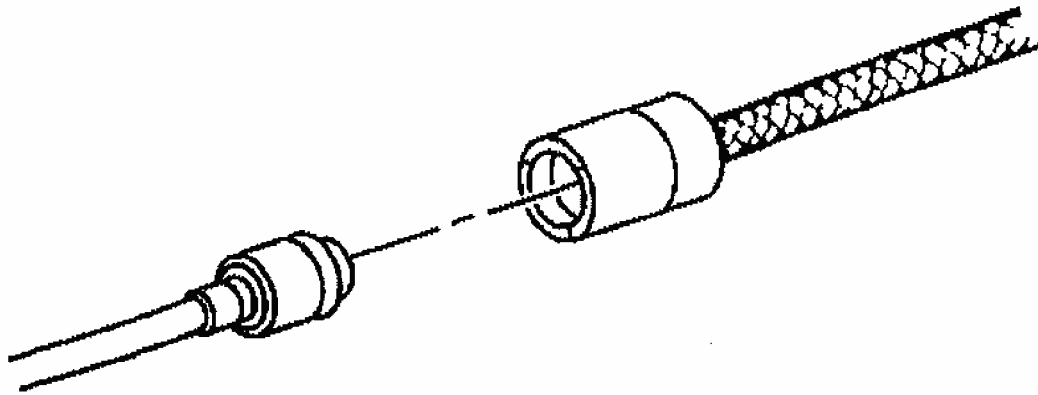


G01732084

**Fig. 85: Removing Clutch Actuator Cylinder Hose**  
Courtesy of GENERAL MOTORS CORP.

18. Using the J 36221 , depress the white circular release ring on the actuator cylinder hose and simultaneously pull lightly on the master cylinder hose to disconnect.

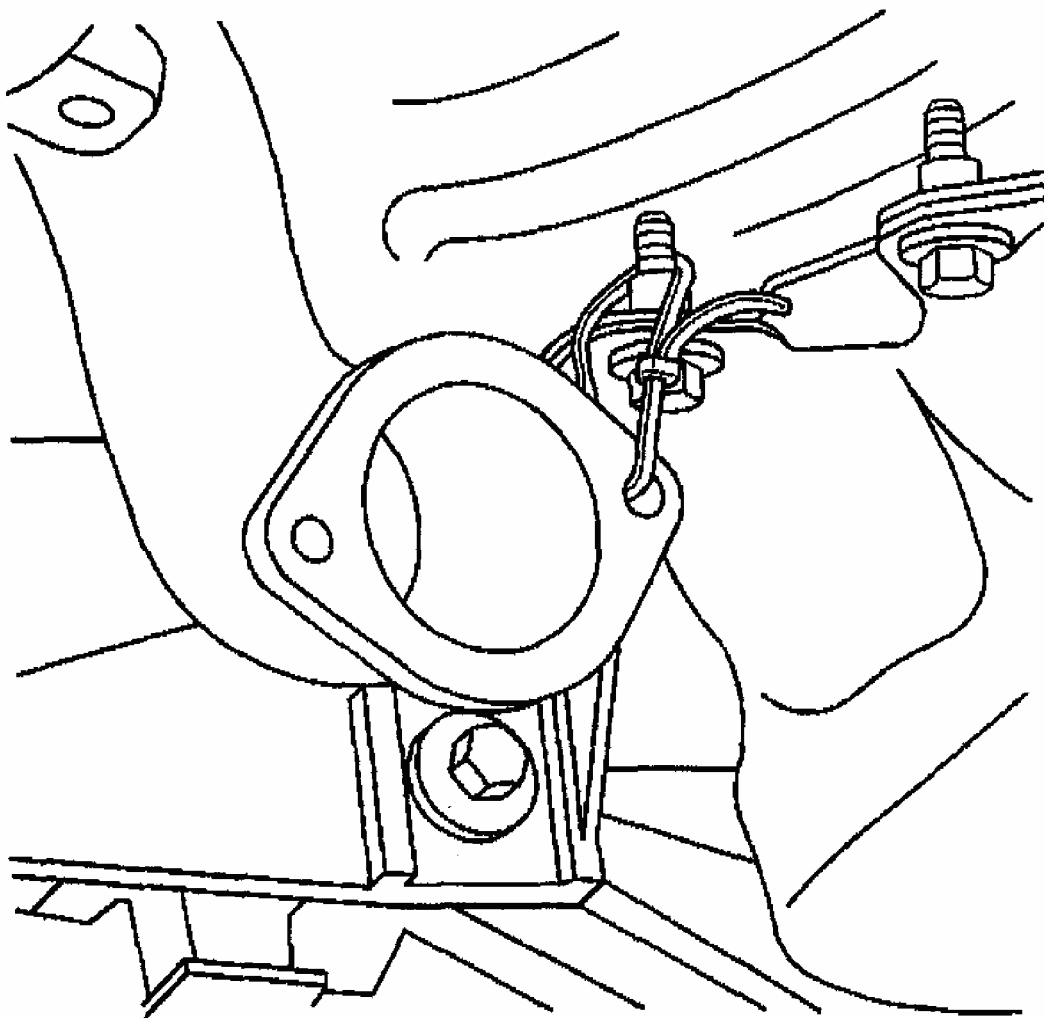
19. Protect both hose coupling ends from dirt and damage.



G01732085

**Fig. 86: Disconnecting Clutch Actuator Hose To Master Cylinder Hose Couplings**  
Courtesy of GENERAL MOTORS CORP.

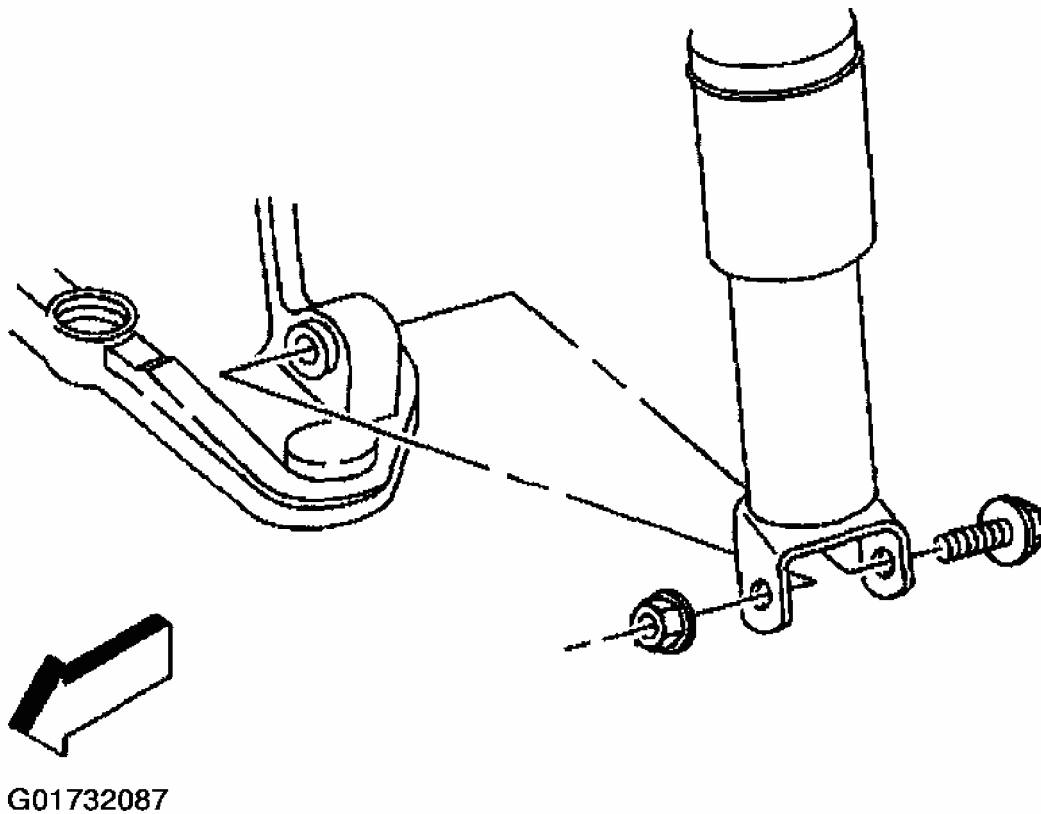
20. Remove the rear tire and wheel assemblies. Refer to **TIRE & WHEEL REMOVAL & INSTALLATION** in Tires and Wheels.
21. Remove the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
22. Tie off the muffler assemblies to the underbody to support out of the way.
23. Remove the driveline tunnel closeout panel. Refer to **Driveline Tunnel Closeout Panel Replacement** .



G01732086

**Fig. 87: Securing LH Muffler**  
**Courtesy of GENERAL MOTORS CORP.**

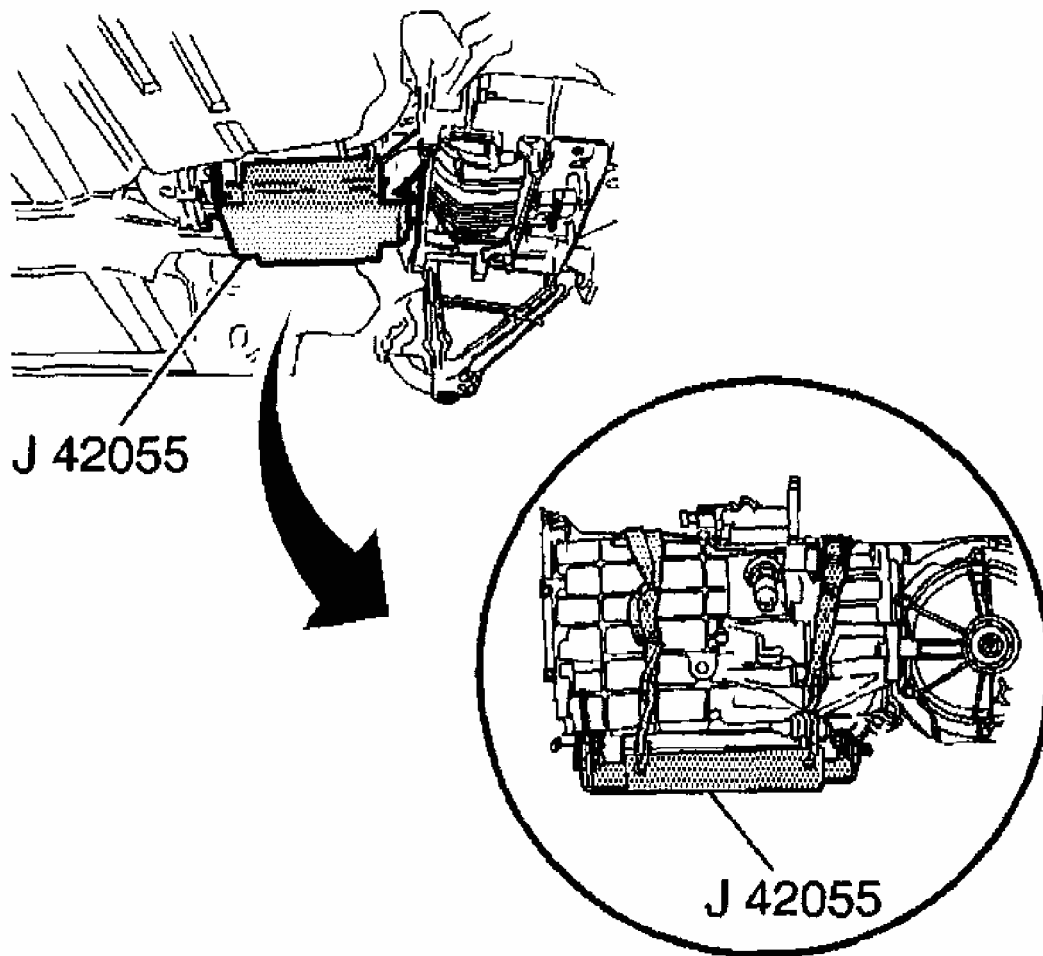
24. Remove the rear transverse spring. Refer to **REAR TRANSVERSE SPRING** in Rear Suspension.
25. Support the lower control arm with a straight jack.
26. Disconnect the outer tie rod end from the suspension knuckle. Refer to **TIE ROD (OUTER END)** or **TIE ROD (SUSPENSION LINK)** in Rear Suspension.
27. Remove the shock absorber lower mounting bolt.
28. Disconnect the lower ball joint from the suspension knuckle. Refer to **KNUCKLE** in Rear Suspension.
29. Remove the straight jack from the control arm.
30. Repeat steps 25 through 29 for the other side of the vehicle.



**Fig. 88: Removing Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

31. Assemble the **J 42055** .
32. Install the **J 42055** to a transmission jack.
33. Position and firmly secure the **J 42055** with the transmission jack to the transmission.

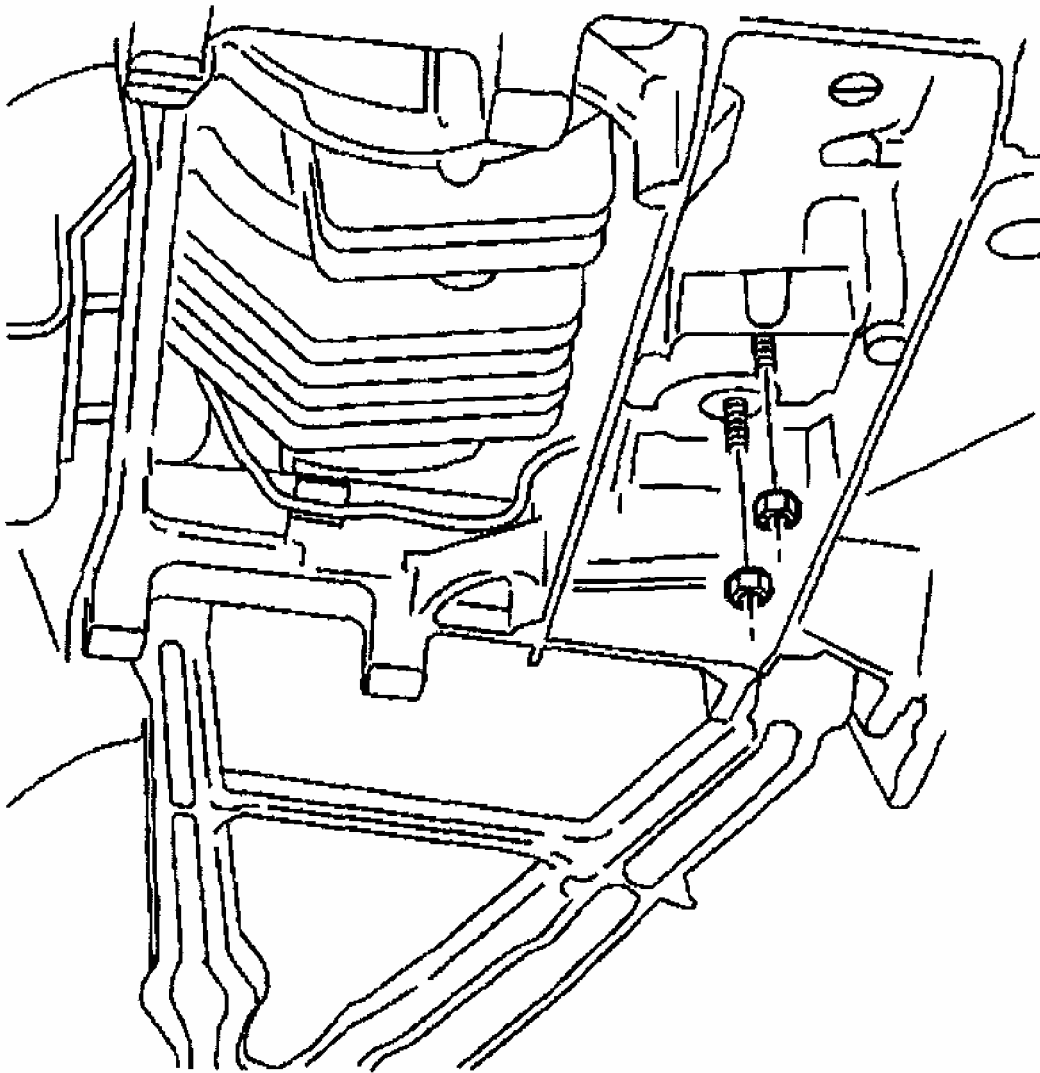




G01732088

**Fig. 89: Installing Transmission Support Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

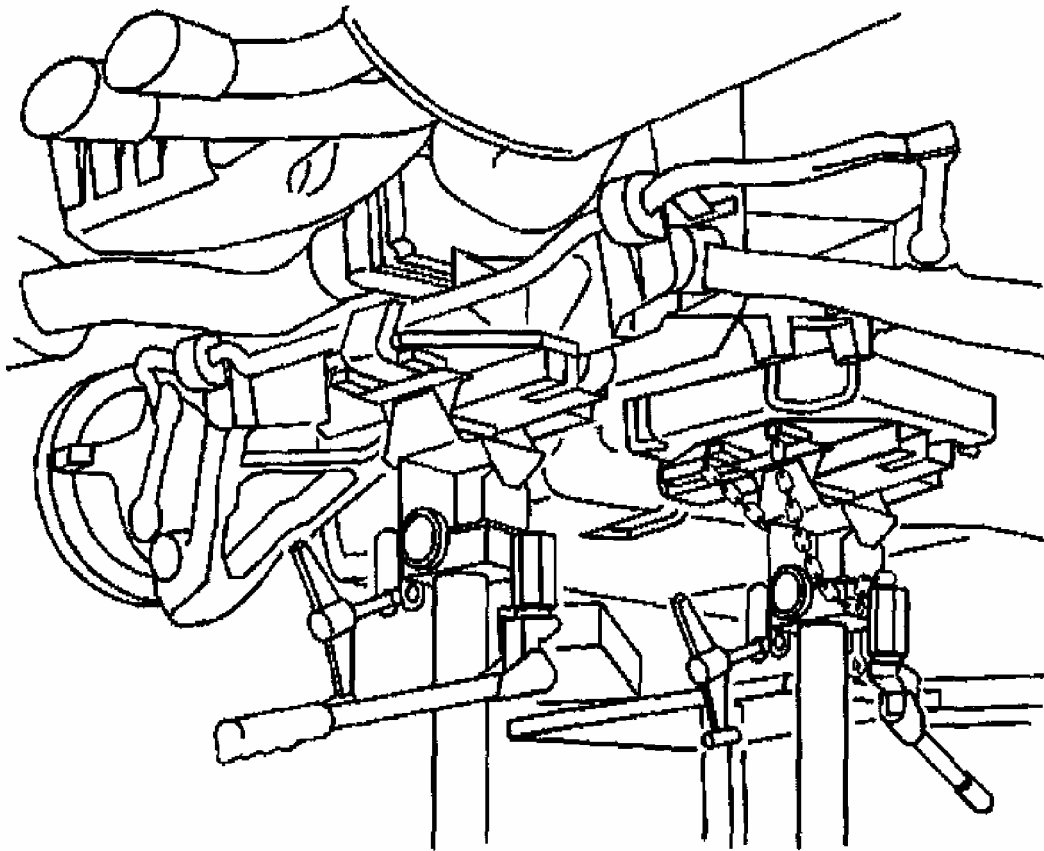
34. Disconnect the wiring harness and brake pipe clip retainers from the rear suspension crossmember.
35. Remove the transaxle mount to rear crossmember nuts.



G01732089

**Fig. 90: Removing Transaxle Mount To Rear Crossmember Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

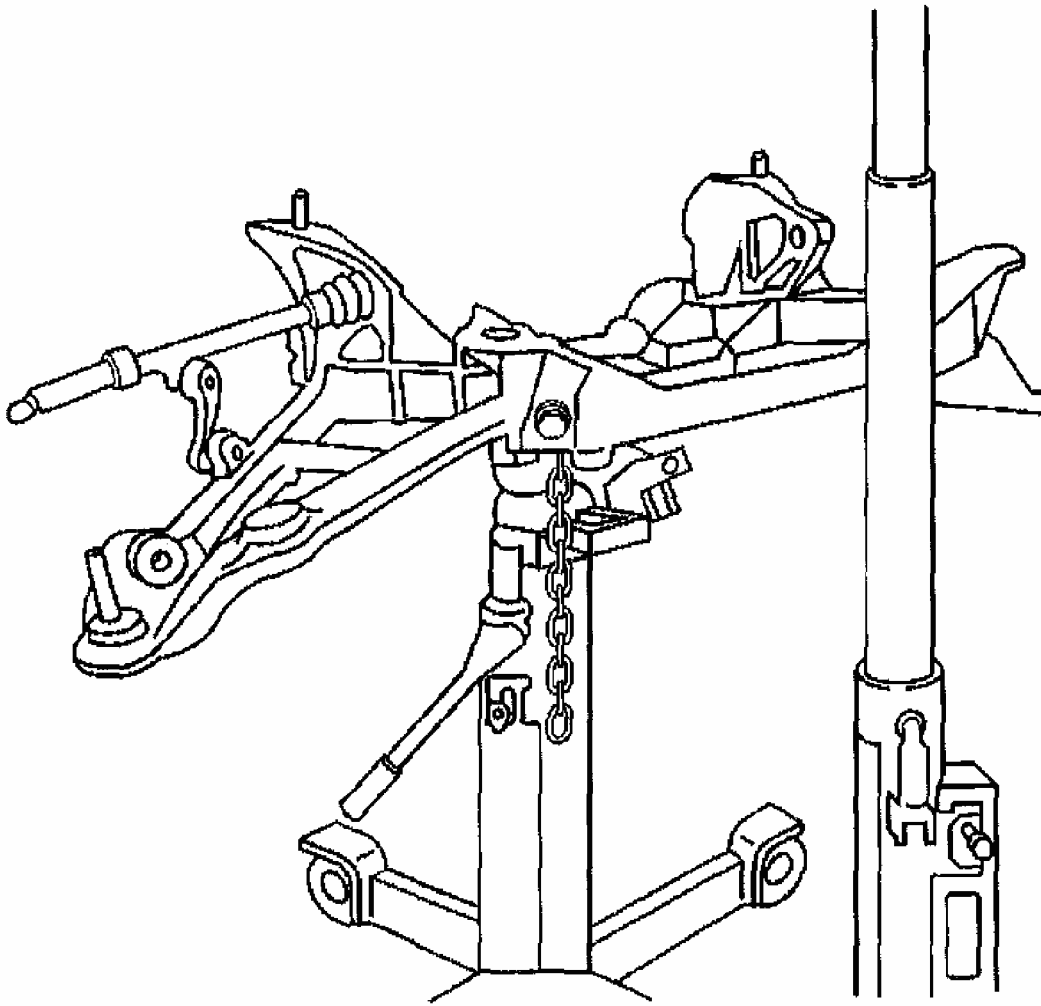
36. Position a transmission jack under the rear suspension crossmember and firmly secure the crossmember to the jack.
37. Using ONLY HAND TOOLS, remove the rear suspension crossmember retaining nuts.



G01732090

**Fig. 91: Aligning Rear Suspension Crossmember To Transmission Jack**  
**Courtesy of GENERAL MOTORS CORP.**

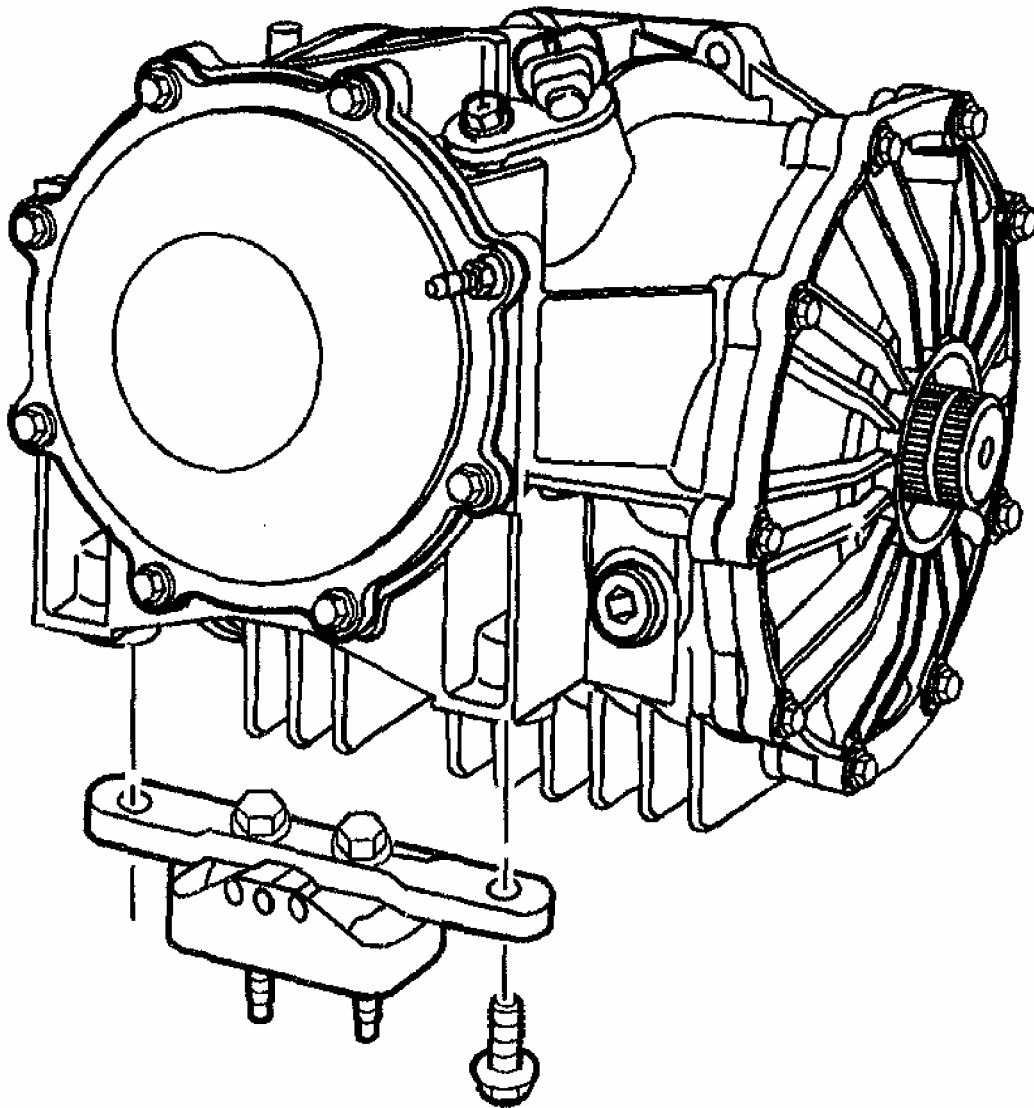
38. With the aid of an assistant, slowly lower the rear suspension crossmember away from the vehicle frame rails and remove the crossmember.



G01732091

**Fig. 92: Removing Rear Suspension Crossmember**  
Courtesy of GENERAL MOTORS CORP.

39. Remove the transaxle mount bracket to differential bolts.
40. Remove the transaxle mount with bracket. Removing the transaxle mount will allow for greater stability on a workbench after the driveline is removed.

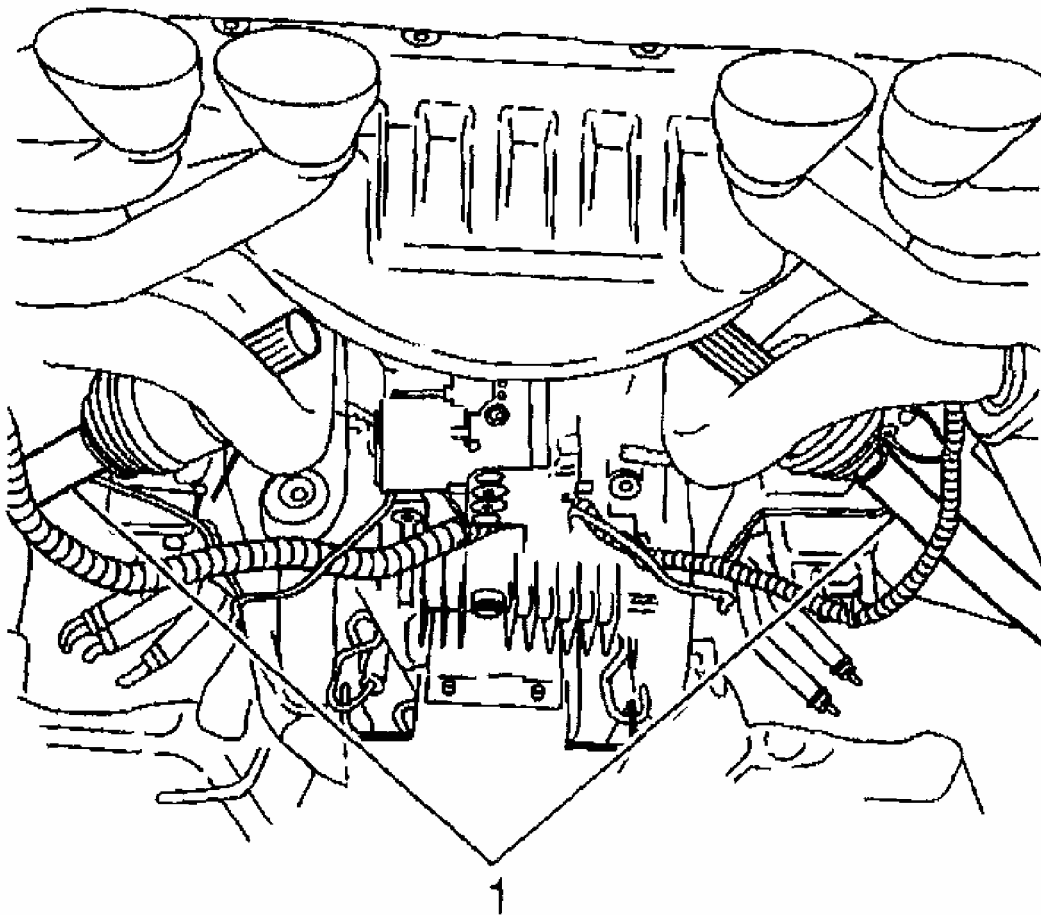


G01732092

**Fig. 93: Removing Transaxle Mount Bracket Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

41. Using a pry bar, CAREFULLY release the wheel drive shafts from the differential.
42. Tie off the wheel drive shafts (1) to the underbody to support out of the way.

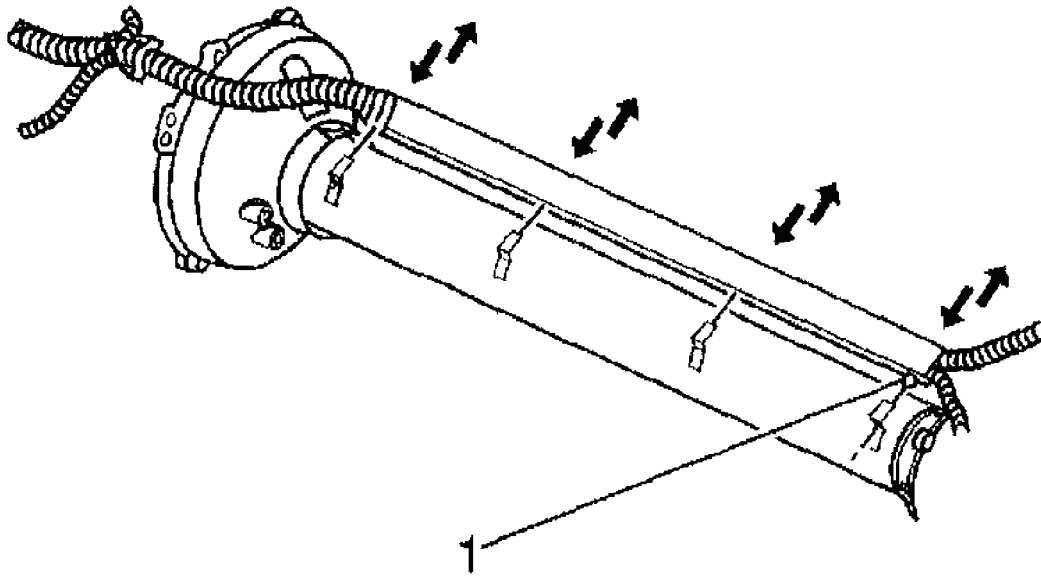
The muffler assembly pipes toward the rear offer a good location to help support the wheel drive shafts (1).



G01732093

**Fig. 94: Securing Wheel Drive Shafts**  
**Courtesy of GENERAL MOTORS CORP.**

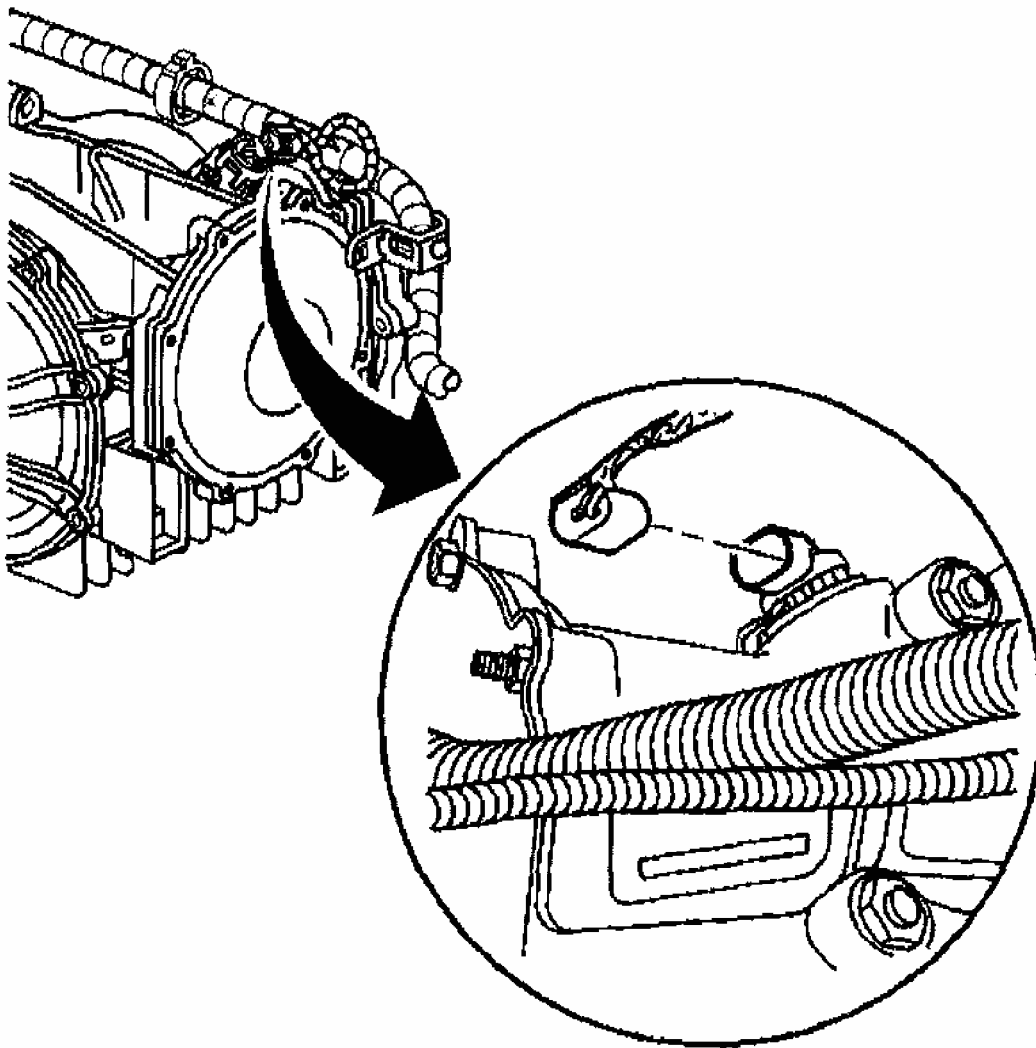
43. Release the retainer (1) securing (and positioning) the wiring harness to the L-shaped brackets along the driveline support assembly, then slide the harness up out of the brackets and position out of the way.



G01732094

**Fig. 95: Removing Transmission Wiring Harness Retainer**  
**Courtesy of GENERAL MOTORS CORP.**

44. SLOWLY lower the driveline approximately 51 mm (2 in), while simultaneously adjusting the angle of tilt, in order to access the electrical connectors.
45. Disconnect the vehicle speed sensor (VSS) electrical connector.

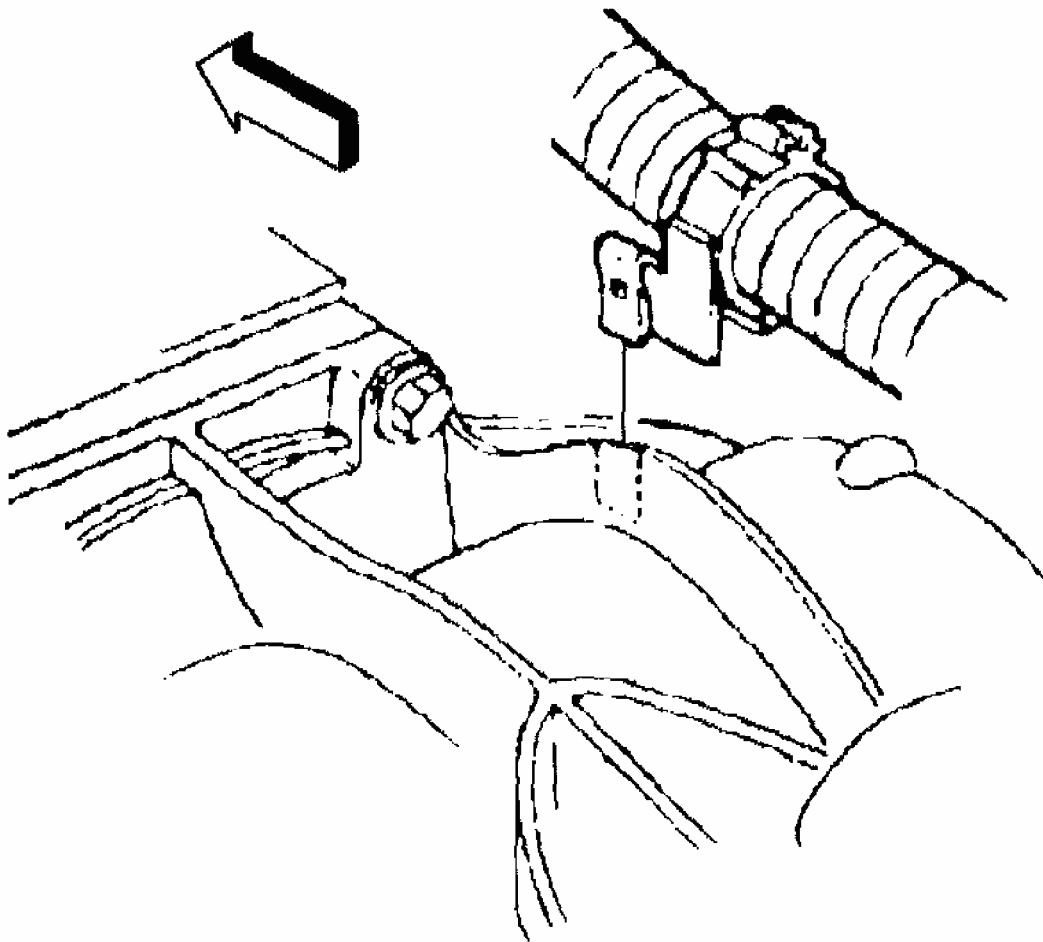


G01732095

**Fig. 96: Disconnecting VSS Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

46. Disconnect the wiring harness retainer from the stud at the differential rear cover.
47. Disconnect the wiring harness retainer clip from the top of the differential.

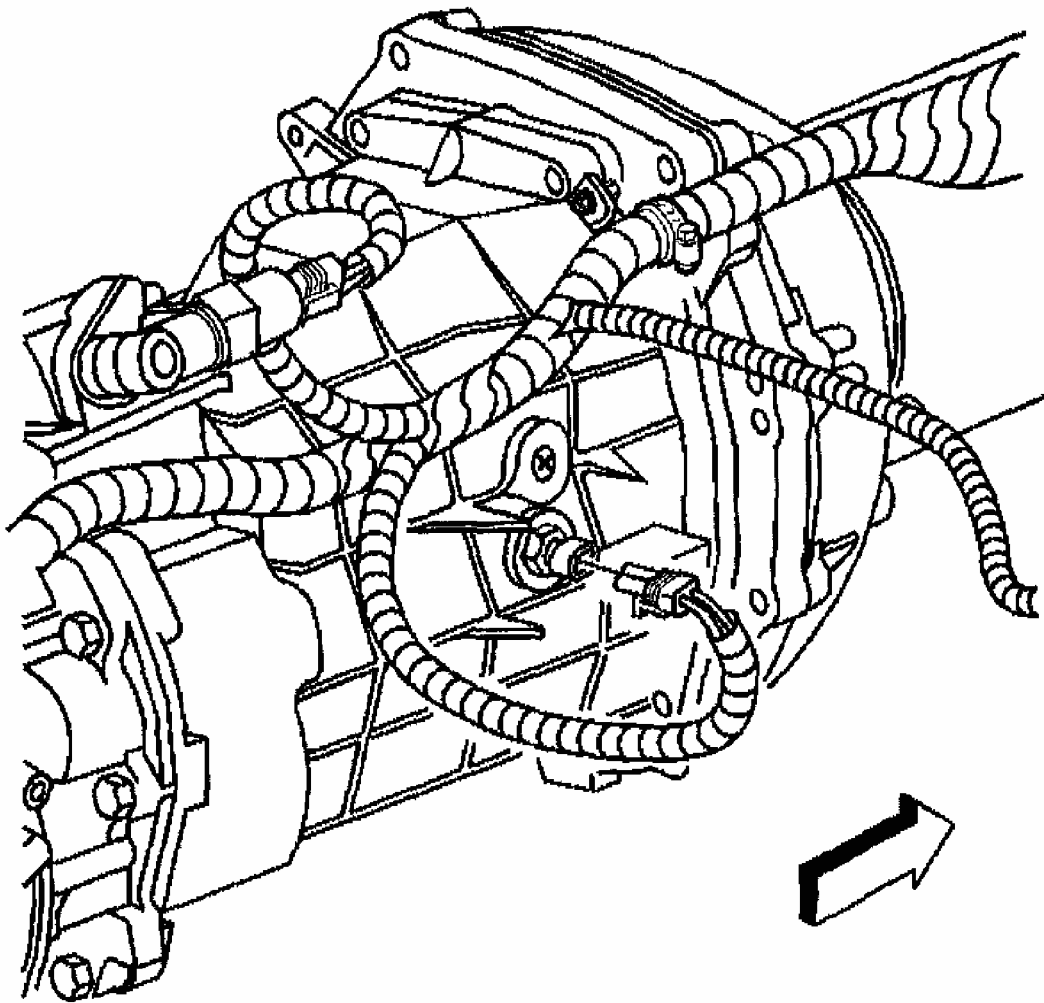




G01732096

**Fig. 97: Disconnecting Wiring Harness Retainer Clip**  
**Courtesy of GENERAL MOTORS CORP.**

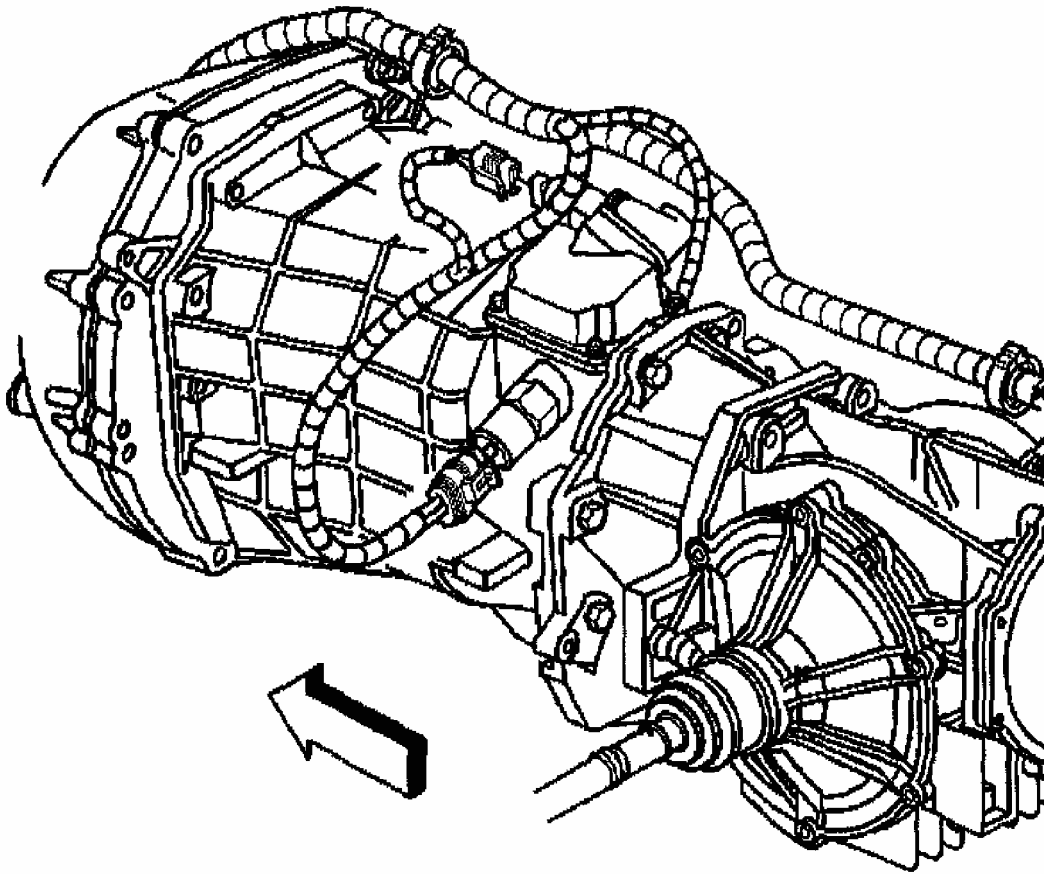
48. Disconnect the backup lamp switch electrical connector.



G01732097

**Fig. 98: Disconnecting Backup Lamp Switch Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

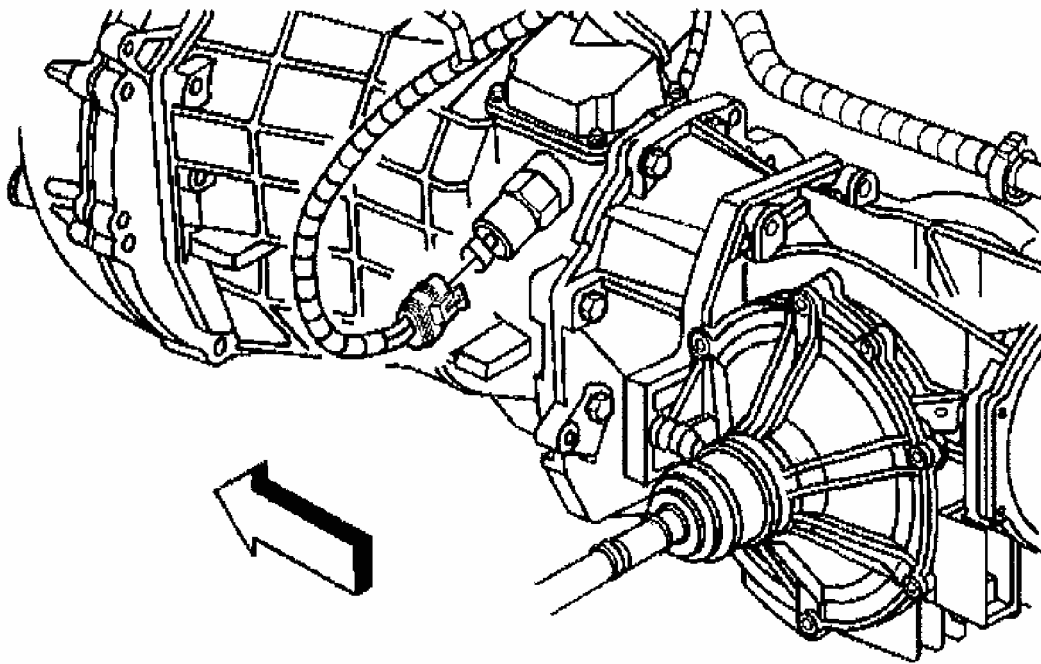
49. Disconnect the reverse lockout solenoid electrical connector.



G01732098

**Fig. 99: Disconnecting Reverse Lockout Solenoid Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

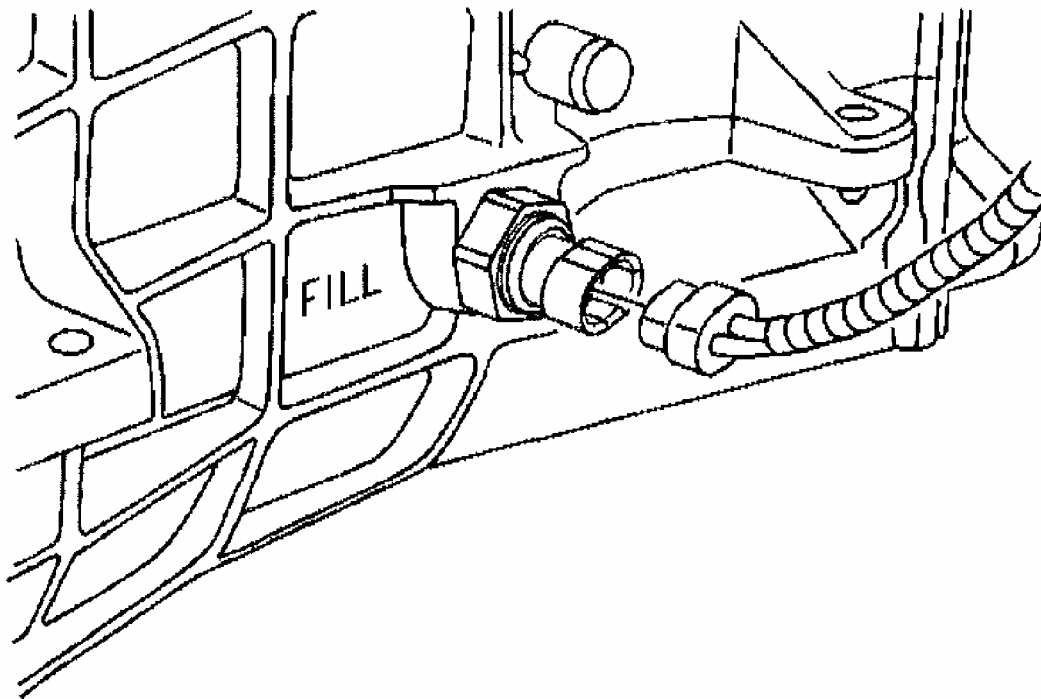
50. Disconnect the gear select (skip shift) solenoid electrical connector.



G01732099

**Fig. 100: Disconnecting Gear Select (Skip Shift) Solenoid Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

51. Disconnect the transmission fluid temperature sensor electrical connector, if equipped.

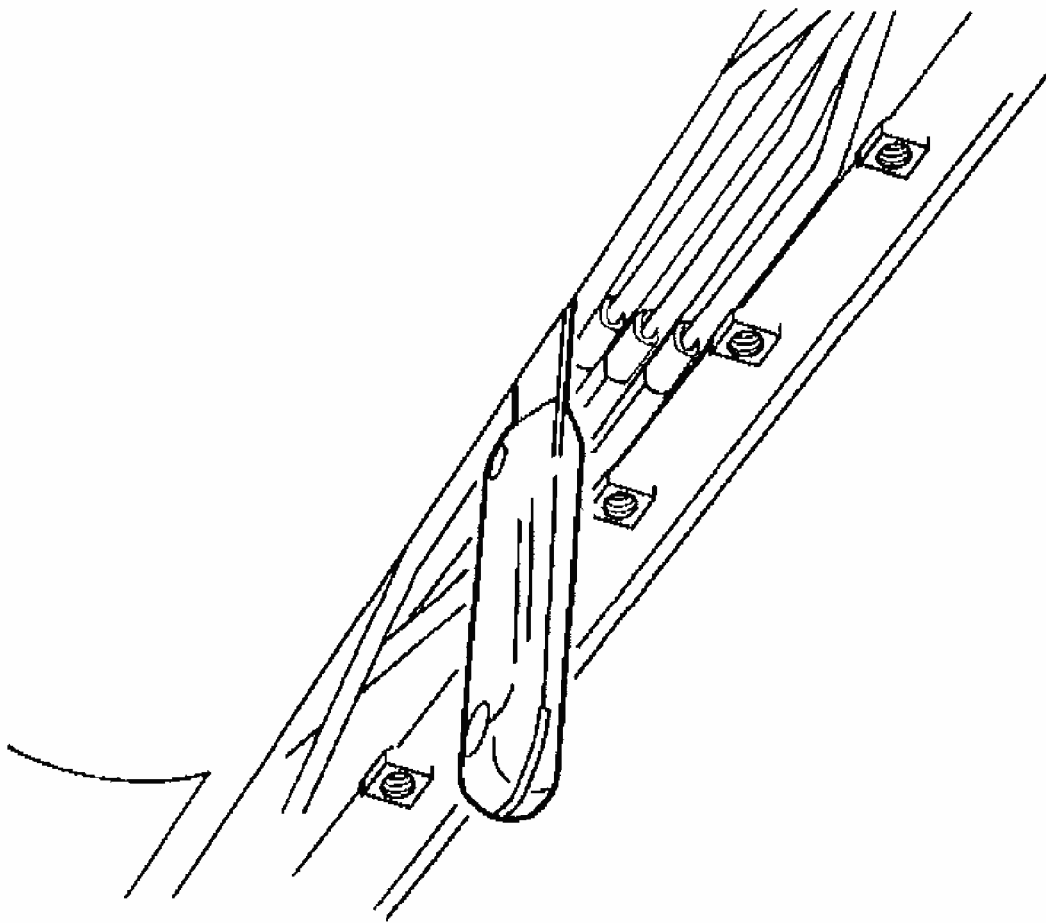


G01732100

**Fig. 101: Disconnecting Transmission Fluid Temperature Sensor Electrical Connector**

**Courtesy of GENERAL MOTORS CORP.**

52. Insert a putty knife, or similar tool, between the edge of the shifter bracket on the side of the driveline support assembly and the brake pipe retainer on the wall of the driveline tunnel.



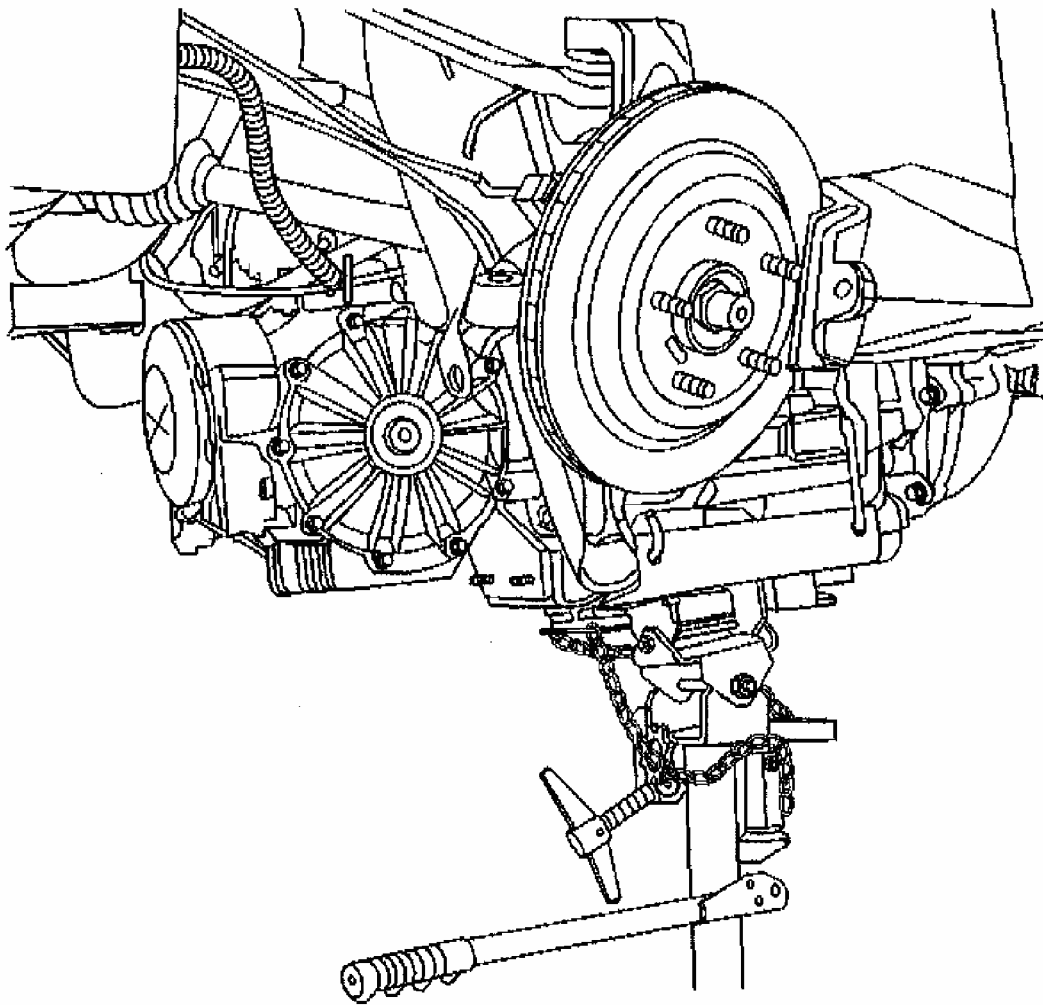
G01732101

**Fig. 102: Separating Shifter Bracket & Brake Pipe Retainer**  
**Courtesy of GENERAL MOTORS CORP.**

53. SLOWLY lower the driveline, while simultaneously adjusting the angle of tilt, and observe the relationship between the top rear of the differential and the lowest part of the rear compartment panel floor (the center storage compartment between the frame rails), the differential should not be lowered more than approximately EVEN with the specified body point of reference.

(The engine positive crankcase ventilation (PCV) pipes which route along the rear of the engine intake manifold [LS1 only] will likely contact the dash panel.)

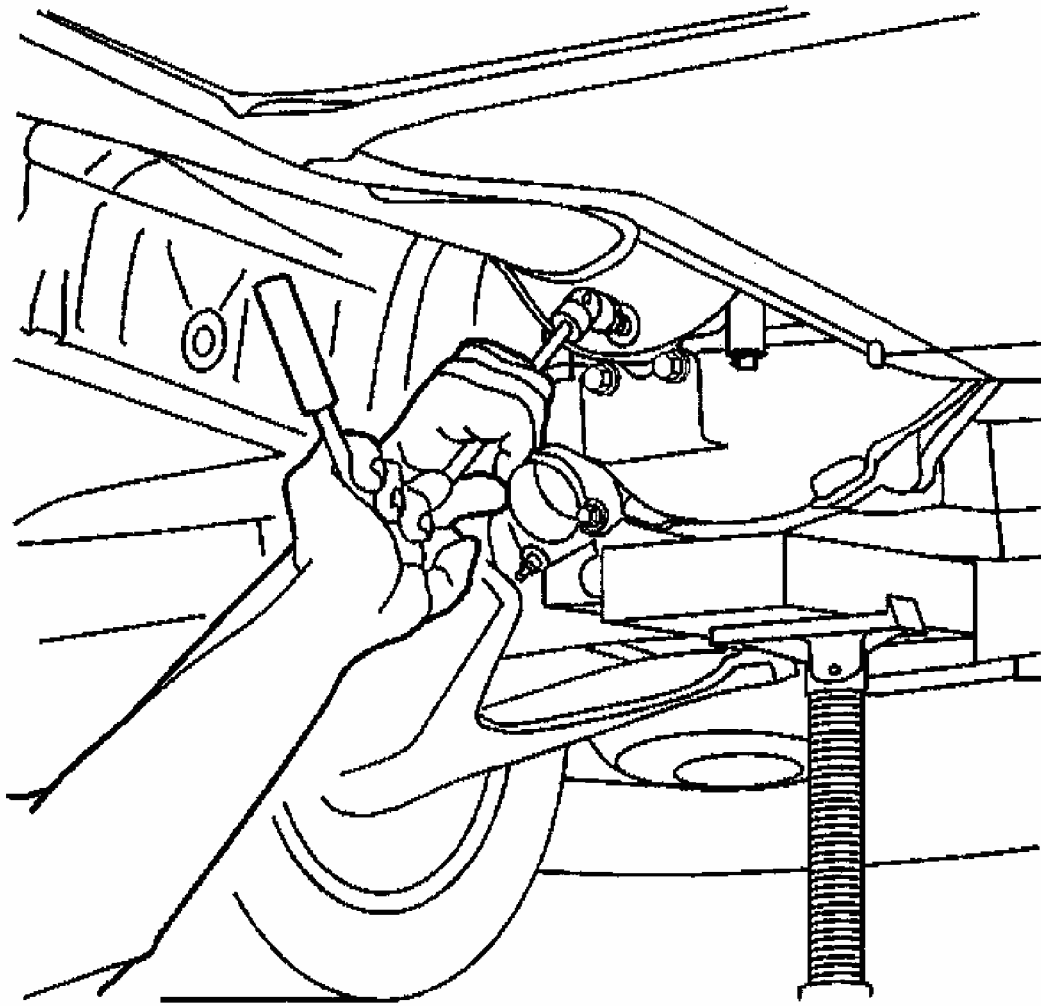
54. Release the wiring harness from the harness retainer along the top of the transmission.
55. Check to be sure that the wiring harness is free from the driveline being removed.



G01732102

**Fig. 103: Aligning Transmission Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

56. Using a block of wood to protect the engine oil pan, place a straight jack under the rear of the engine oil pan to support the engine from stressing the composite dash panel.
57. Remove the five driveline support assembly to engine flywheel housing bolts.
58. Carefully bend the wiring harness bracket away from the driveline toward the driveline tunnel wall in order to make a clear removal path for the driveline.



G01732103

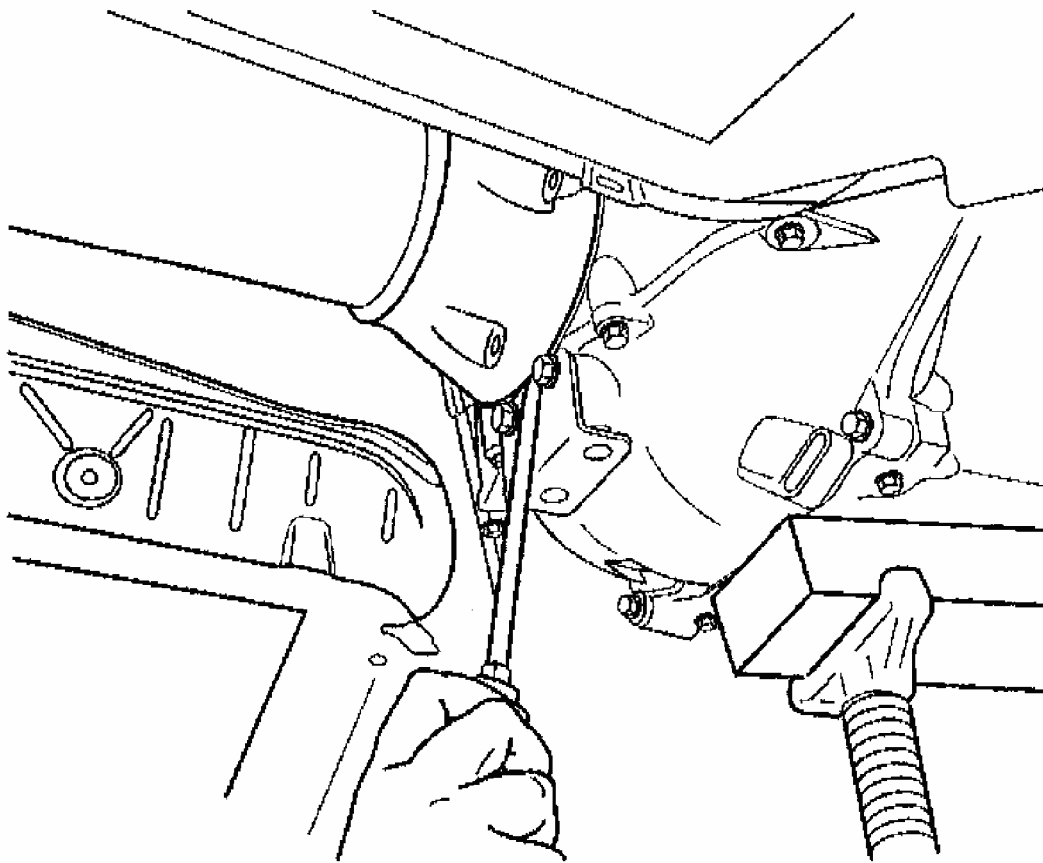
**Fig. 104: Removing Driveline Support Assembly To Engine Flywheel Housing Bolts**

**Courtesy of GENERAL MOTORS CORP.**

**Important:** The aid of an assistant will be necessary for the remaining steps.

59. Have an assistant insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the engine flywheel housing, then begin to pry the driveline loose from the engine.

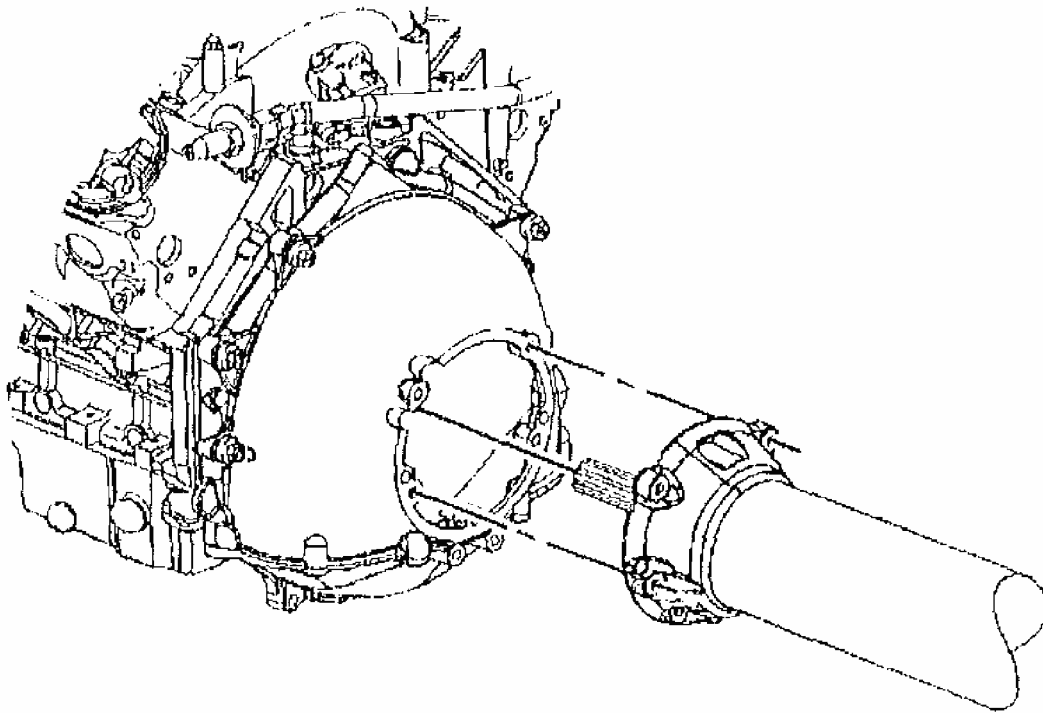




G01732104

**Fig. 105: Loosening Driveline**  
**Courtesy of GENERAL MOTORS CORP.**

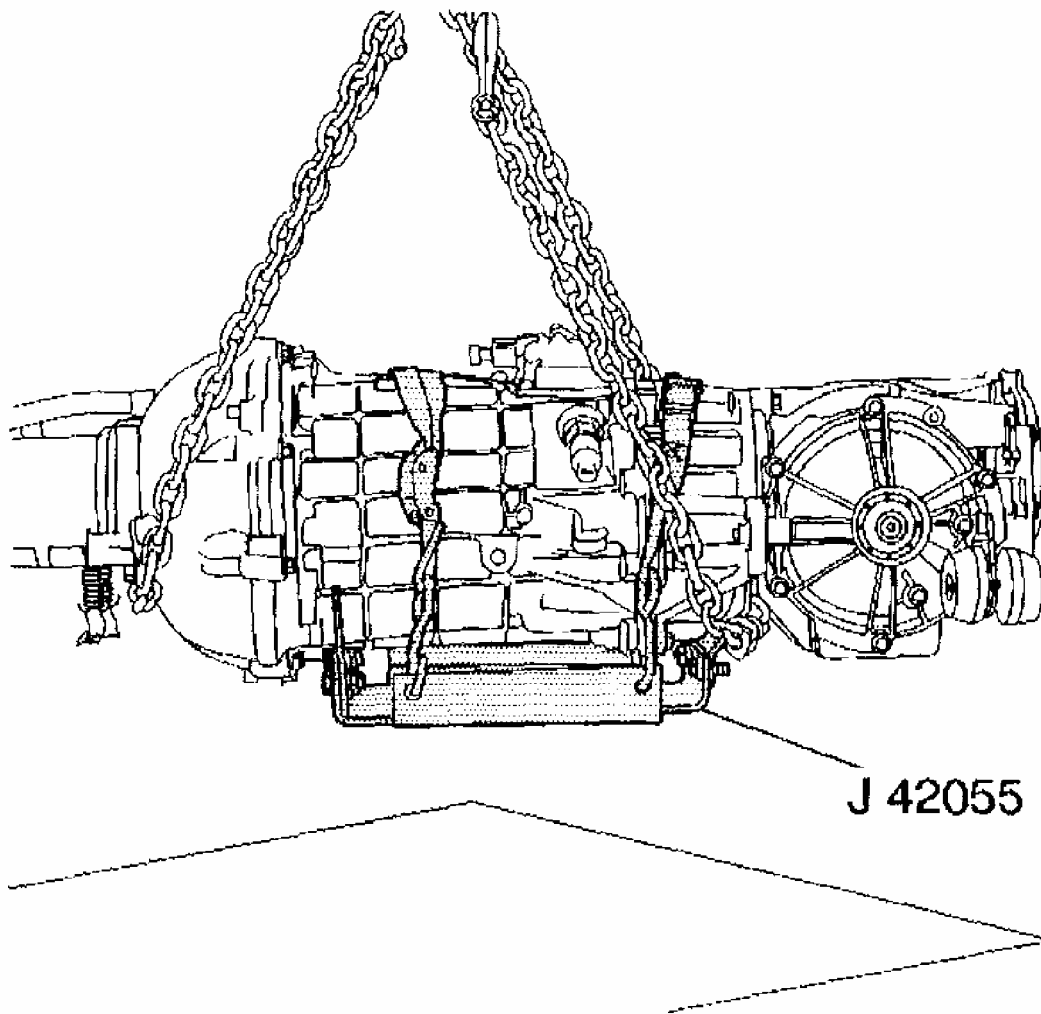
60. Have an assistant guide the front of the driveline during the removal of the driveline from the vehicle.
61. SLOWLY lower the driveline, while simultaneously adjusting the angle of tilt and pulling the driveline away from the engine UNTIL the propeller input shaft at the front of the driveline support assembly just clears the engine flywheel housing.
62. SLOWLY lower the driveline completely out of the vehicle.



G01732105

**Fig. 106: Removing Driveline**  
**Courtesy of GENERAL MOTORS CORP.**

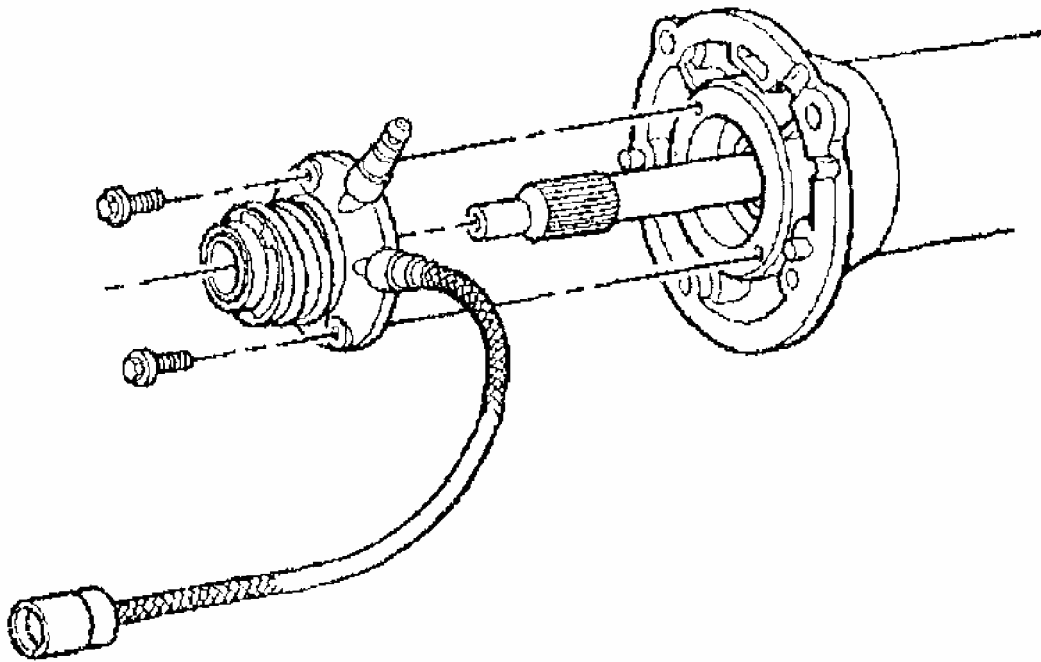
63. Position the chainfall, or equivalent lifting device, in a way which will protect the rear exhaust hangers located on the driveline support assembly.
64. Using the lifting device, raise the driveline to relieve the weight from the transmission jack.
65. Disconnect the **J 42055** from the transmission jack ONLY; the **J 42055** will provide stability to the driveline components while working on a bench.
66. Position the driveline on a workbench with the lifting device still attached.
67. Support the driveline support assembly and the differential for additional balance.
68. Remove the lifting device from the driveline.



G01732106

**Fig. 107: Identifying Transmission Support Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

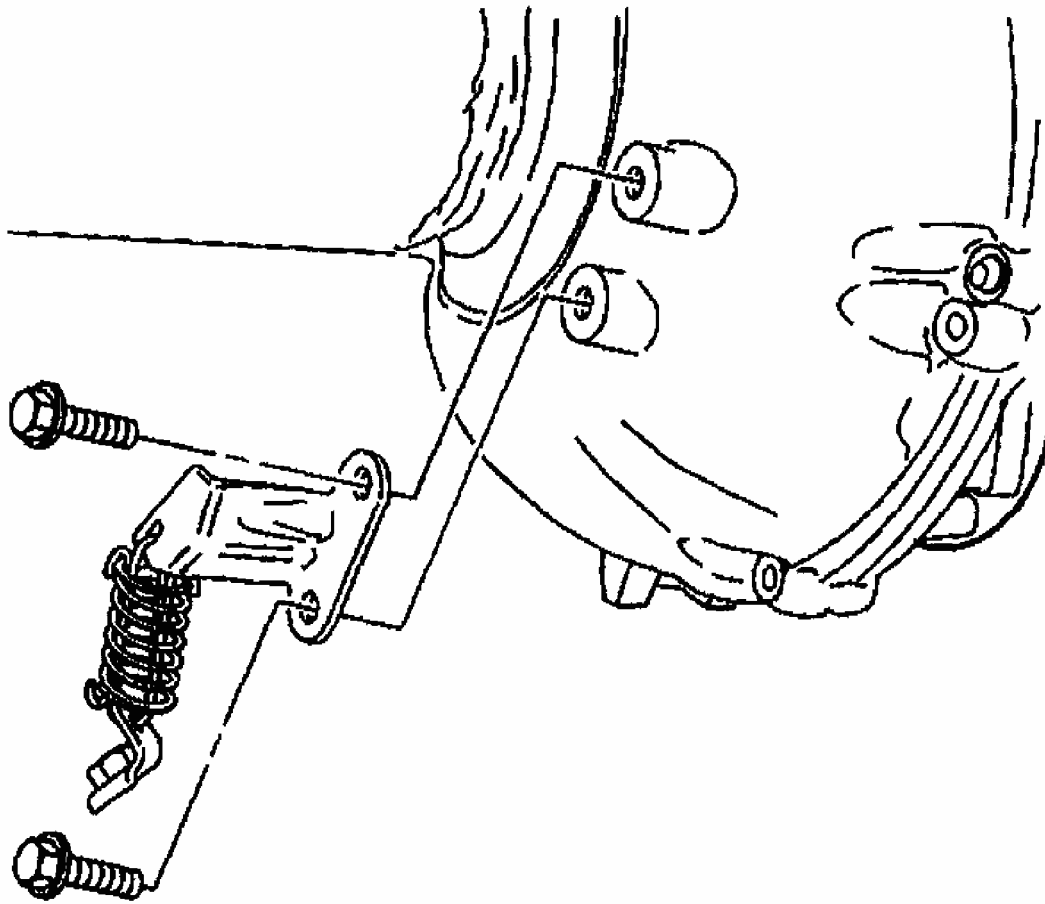
69. Remove the clutch actuator cylinder mounting bolts.
70. Remove the clutch actuator cylinder from the driveline support assembly.



G01732107

**Fig. 108: Removing Clutch Actuator Cylinder Mounting Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

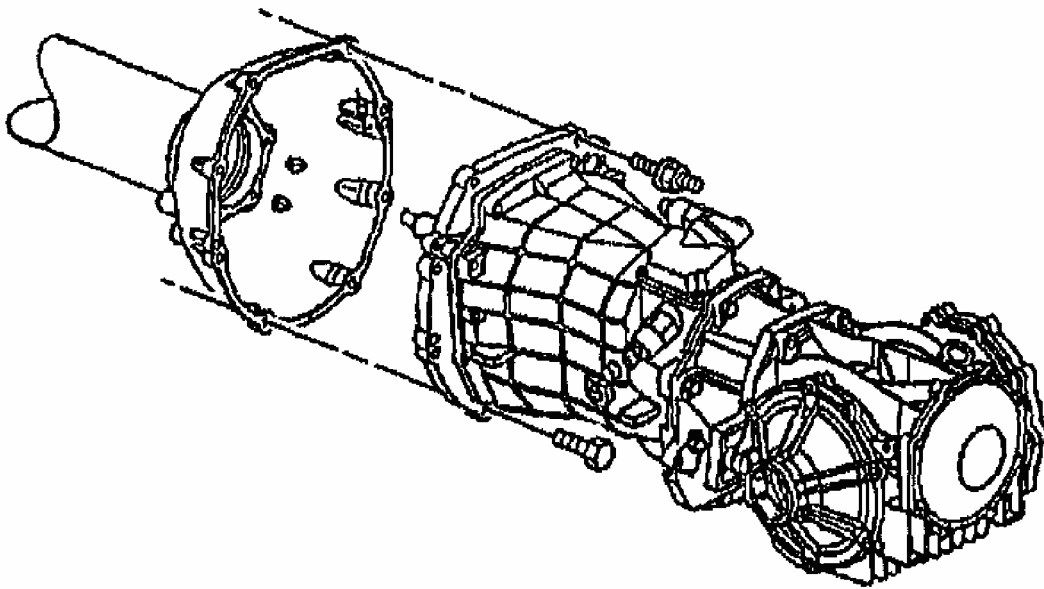
71. Remove the rear exhaust hanger mounting bolts.
72. Remove the rear exhaust hangers from the driveline support assembly.



G01732108

**Fig. 109: Removing Rear Exhaust Hanger Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

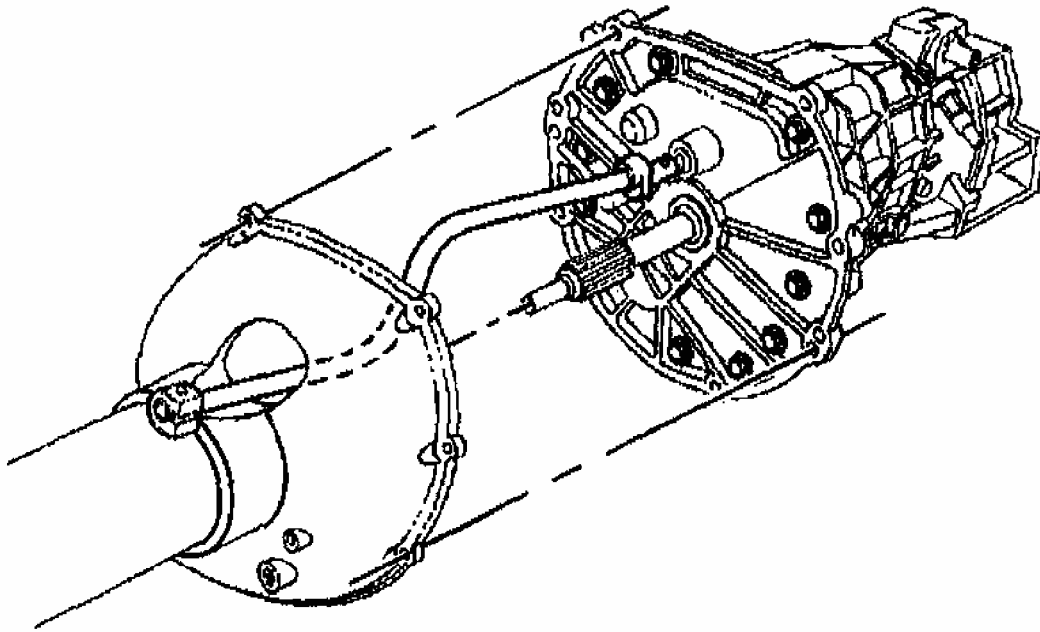
73. Remove the transmission to driveline support assembly bolts/studs.
74. Insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the transmission, then begin to pry the driveline support assembly loose from the transmission.



G01732109

**Fig. 110: Removing Transmission To Driveline Support Assembly Bolts/Studs**  
**Courtesy of GENERAL MOTORS CORP.**

75. Slowly slide the driveline support assembly away from the transmission while guiding the transmission shift rod through the opening in the driveline support assembly.



G01732110

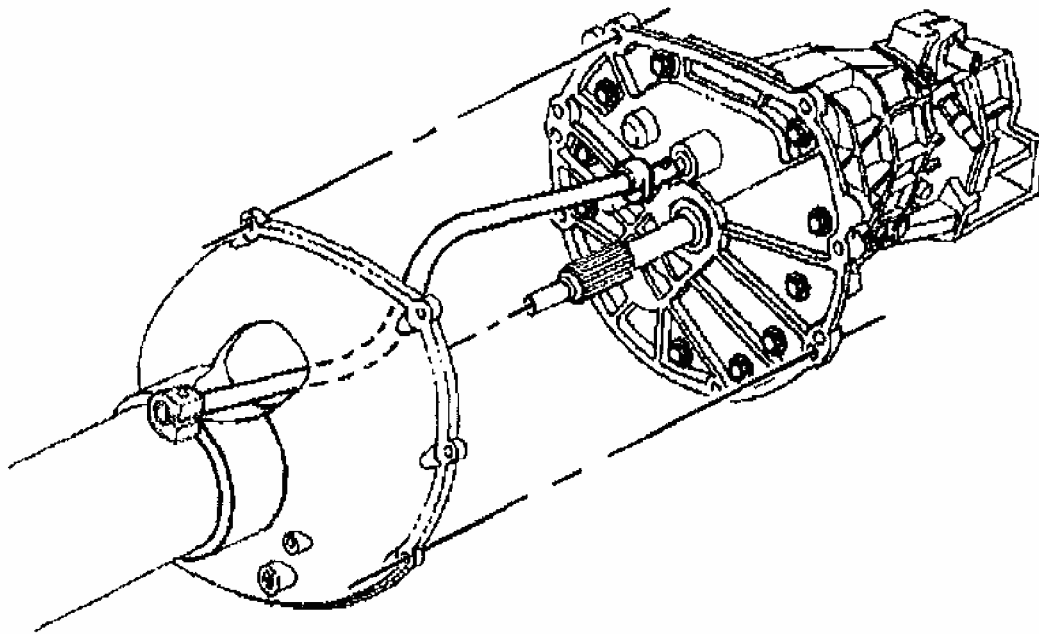
**Fig. 111: Removing Driveline Support Assembly**  
Courtesy of GENERAL MOTORS CORP.

**Installation Procedure**

**CAUTION:** When tilting down the rear of the driveline, insert a putty knife or similar tool between the shift control bracket on the driveline support assembly and the brake pipe retainer on the driveline tunnel wall to prevent damage.

**CAUTION:** Ensure that the clutch hydraulic hoses are positioned away from nearby vehicle components or vehicle damage may result.

1. Slowly slide the driveline support assembly to the transmission, while guiding the shift rod through the opening in the driveline support assembly.



G01732111

**Fig. 112: Installing Driveline Support Assembly**  
Courtesy of GENERAL MOTORS CORP.

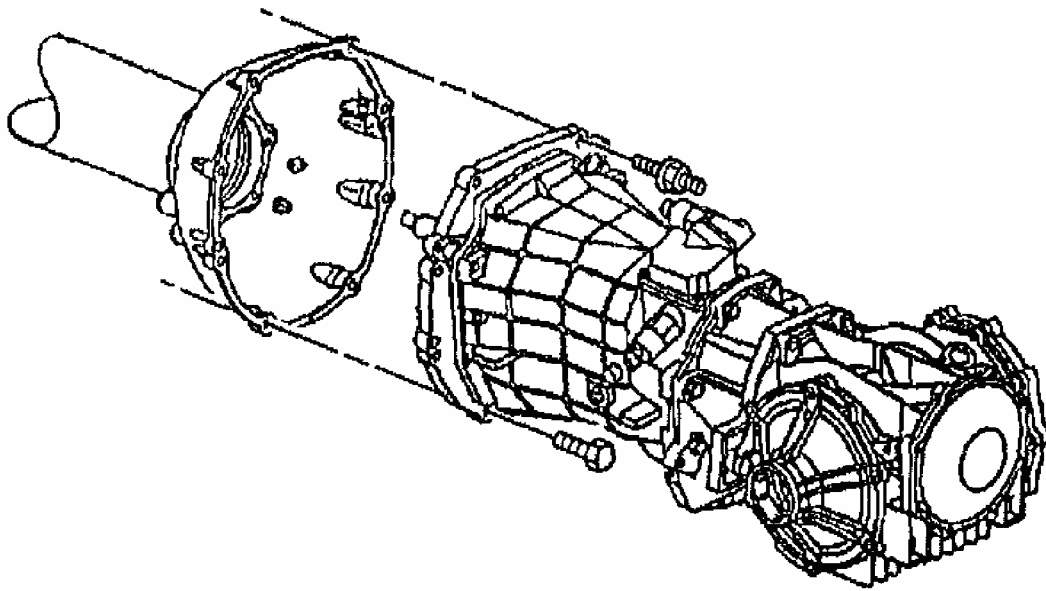
**CAUTION: Refer to FASTENER NOTICE .**

2. Install the transmission to driveline support assembly bolts/studs.

**Tighten**

Tighten the transmission to driveline support assembly bolts/studs to 50 N.m (37 lb ft).





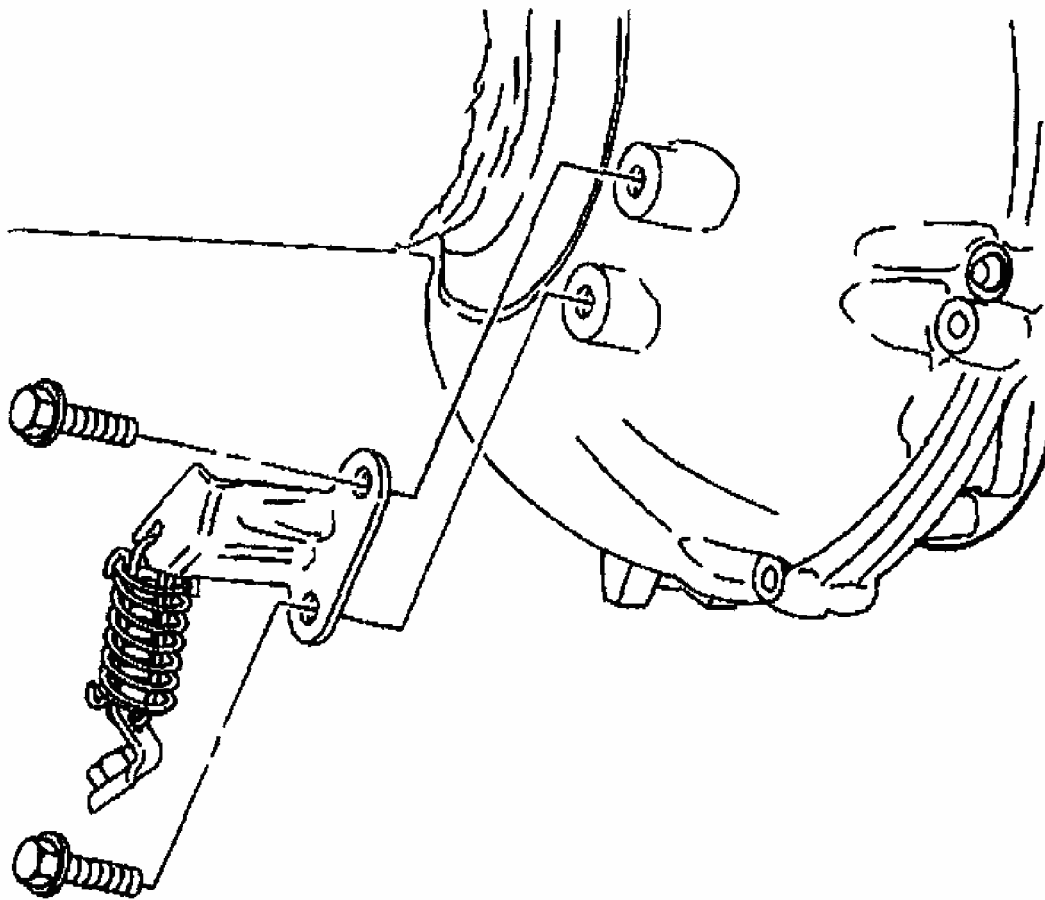
G01732112

**Fig. 113: Installing Transmission To Driveline Support Assembly Bolts/Studs**  
**Courtesy of GENERAL MOTORS CORP.**

3. Install the rear exhaust hangers to the driveline support assembly.
4. Install the rear exhaust hanger mounting bolts.

### **Tighten**

Tighten the rear exhaust hanger mounting bolts to 50 N.m (37 lb ft).



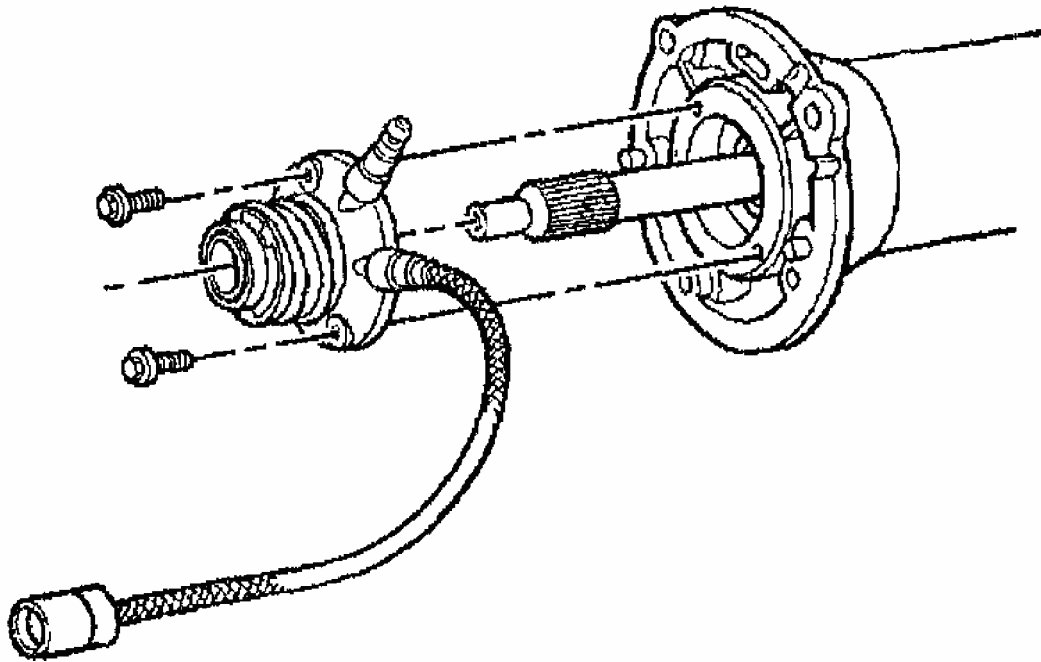
G01732113

**Fig. 114: Installing Rear Exhaust Hanger Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

5. Install the clutch actuator cylinder to the driveline support assembly.
6. Install the clutch actuator cylinder mounting bolts.

### **Tighten**

Tighten the clutch actuator cylinder mounting bolts to 12 N.m (106 lb in).



G01732114

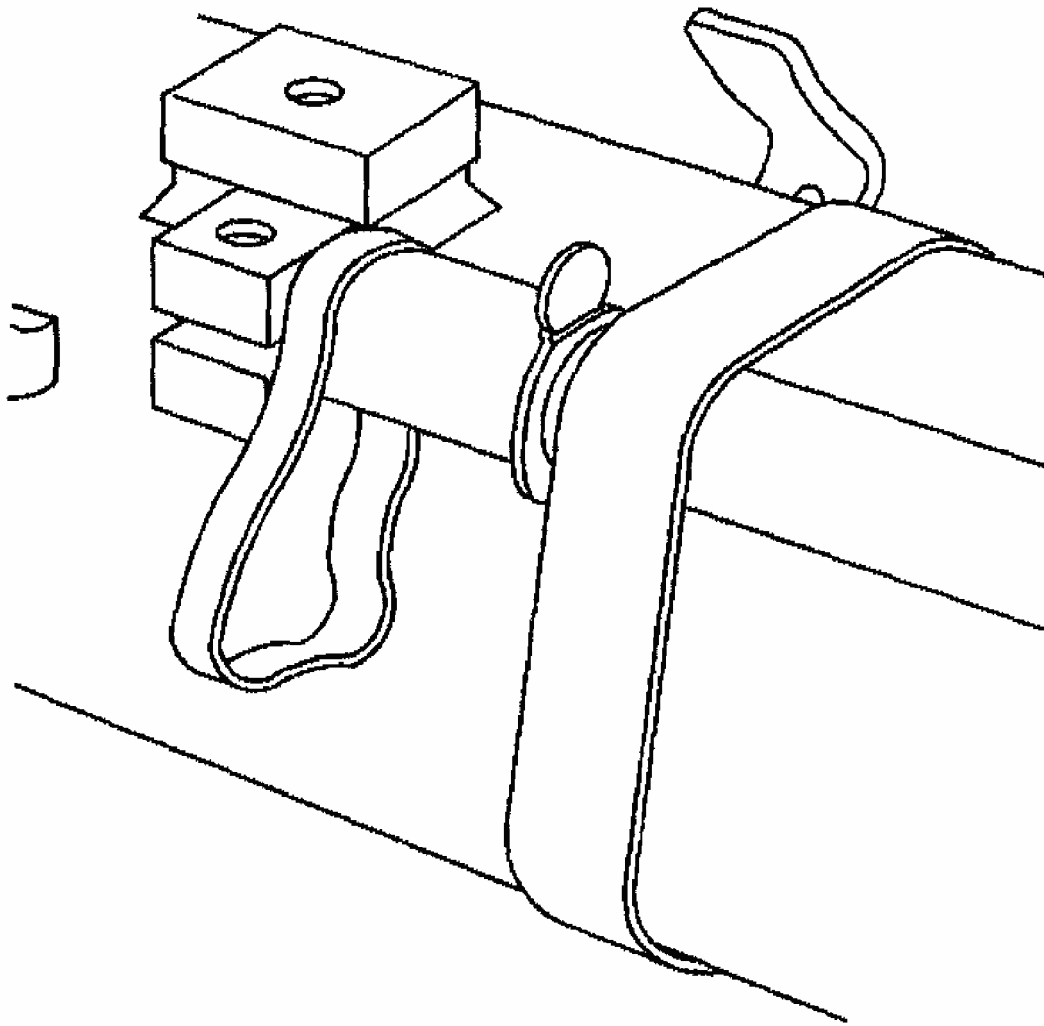
**Fig. 115: Installing Clutch Actuator Cylinder Mounting Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

7. Loosely install a rubber band onto the transmission shift rod and position just behind the shift rod clamp.

The rubber band will be used to aid in installing the shift control rod after the driveline has been installed.

8. Using a piece of masking tape, or similar tape which can be easily broken, affix the transmission shift rod to the driveline support assembly and position the rod just to the outside of the mounting boss used for the shift control.

The tape is intended to keep the shift control rod in position, and to aid in shift control rod installation.



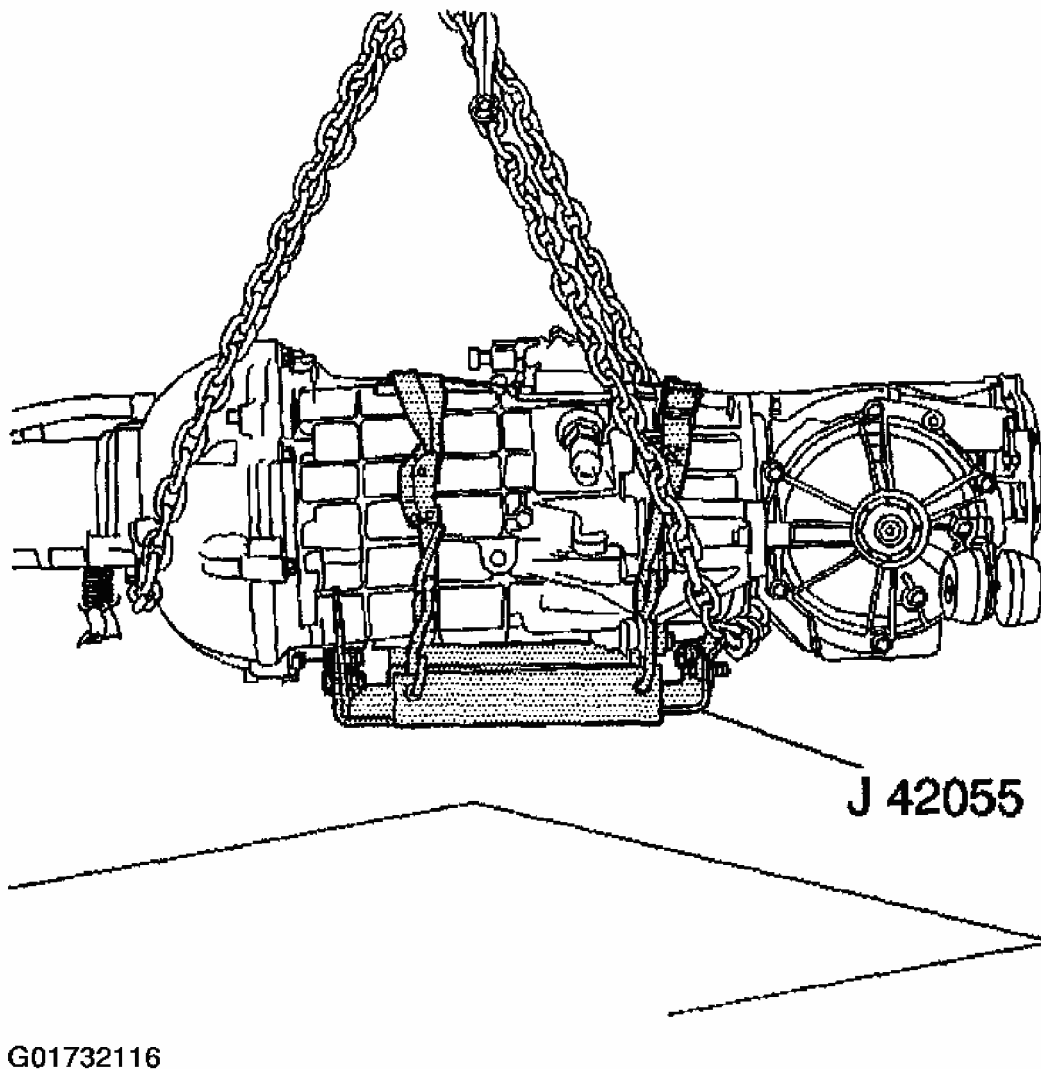
G01732115

**Fig. 116: Securing Transmission Shift Rod**  
**Courtesy of GENERAL MOTORS CORP.**

9. Position the chainfall, or equivalent lifting device, in a way which will protect the rear exhaust hangers located on the driveline support assembly.

**Important:** The aid of an assistant will be necessary for the following steps until the driveline is installed into the vehicle.

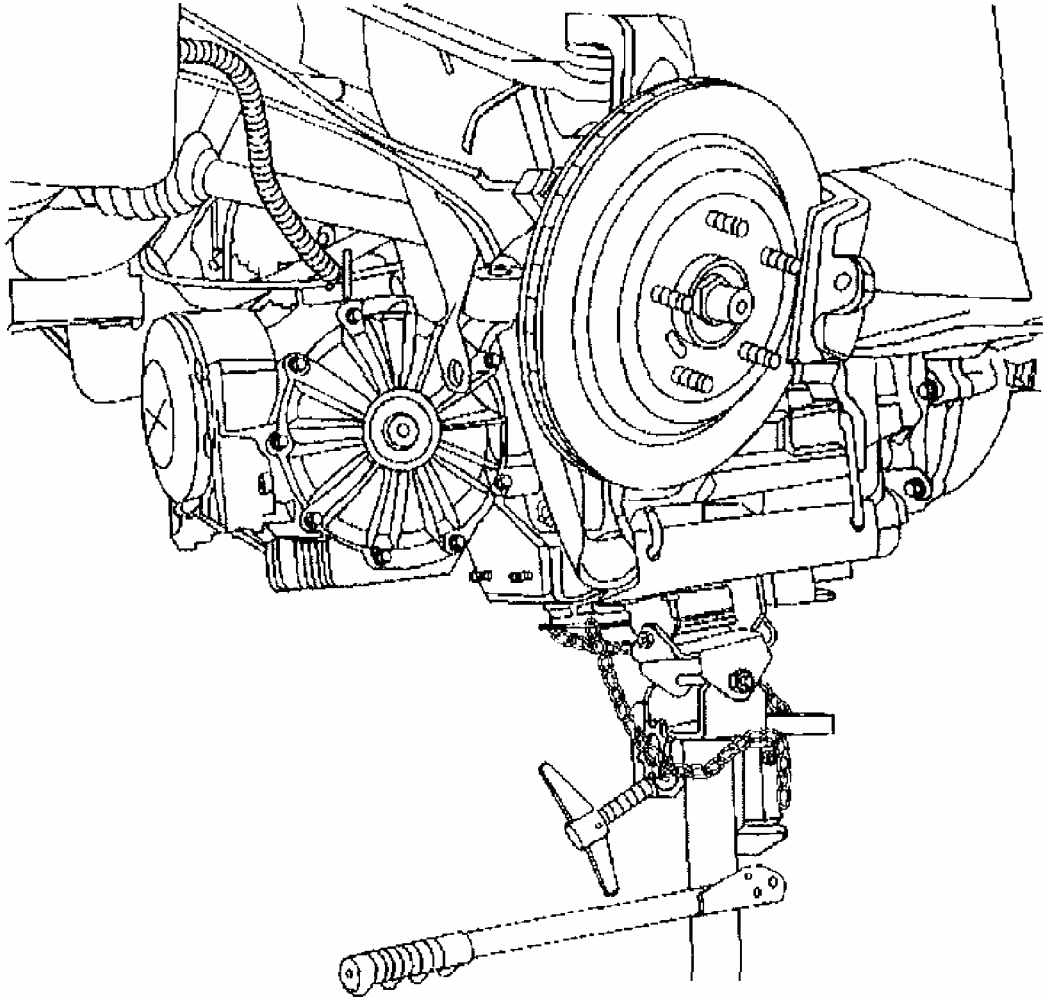
10. Using the lifting device, raise the driveline off the workbench and position the driveline with the **J 42055** onto a transmission jack.
11. Connect the **J 42055** to the transmission jack.



**Fig. 117: Identifying Transmission Support Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

12. Remove the lifting device from the driveline.
13. Position the driveline under the vehicle.
14. Begin to raise the driveline at the approximate angle used during removal.
15. Position the wiring harness along the driveline support assembly and LOOSELY install the harness into the harness retaining slots.
16. Have an assistant guide the front of the driveline so the propeller input shaft is just to the rear of the engine flywheel housing, then raise the driveline to the PROPER HEIGHT and the PROPER ANGLE to install to the engine.
17. Have an assistant begin to insert the propeller input shaft into the clutch driven plate hub while maintaining the proper angle of the driveline; if necessary, use a screwdriver

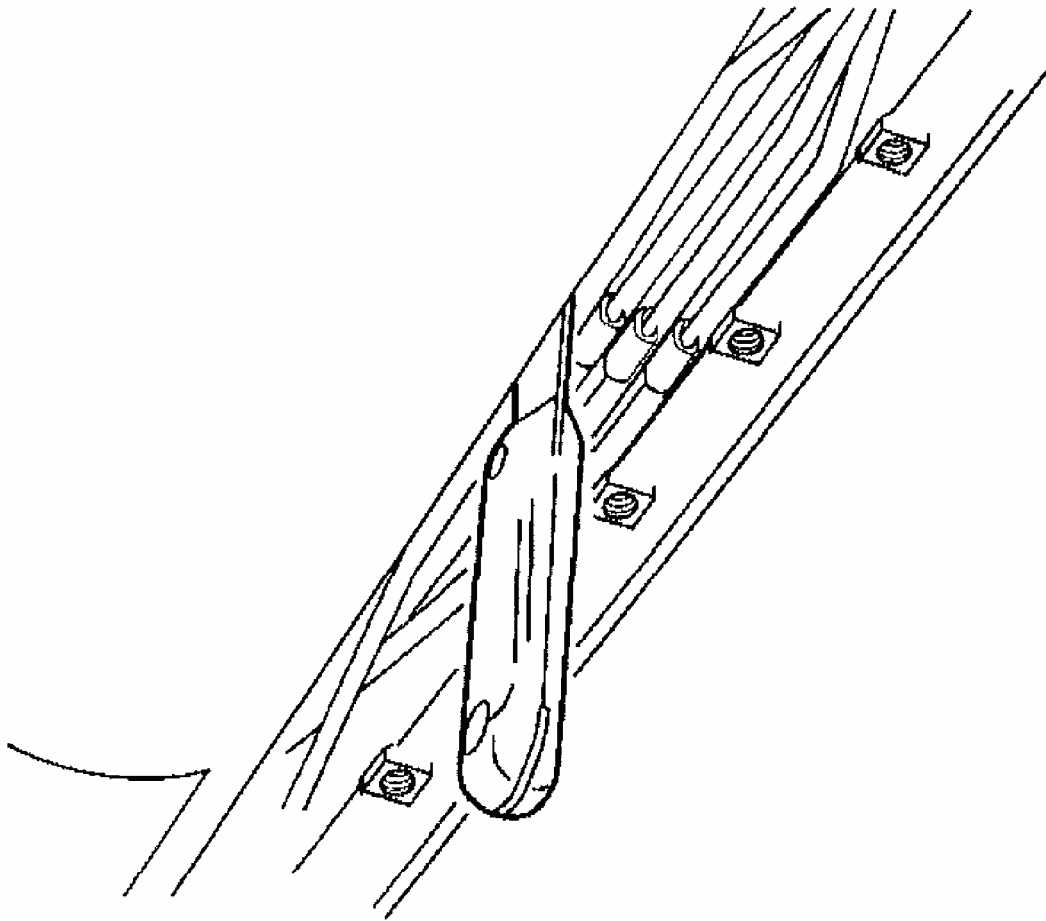
to rotate the shaft slightly to bring the splines into alignment.



G01732117

**Fig. 118: Installing Driveline**  
**Courtesy of GENERAL MOTORS CORP.**

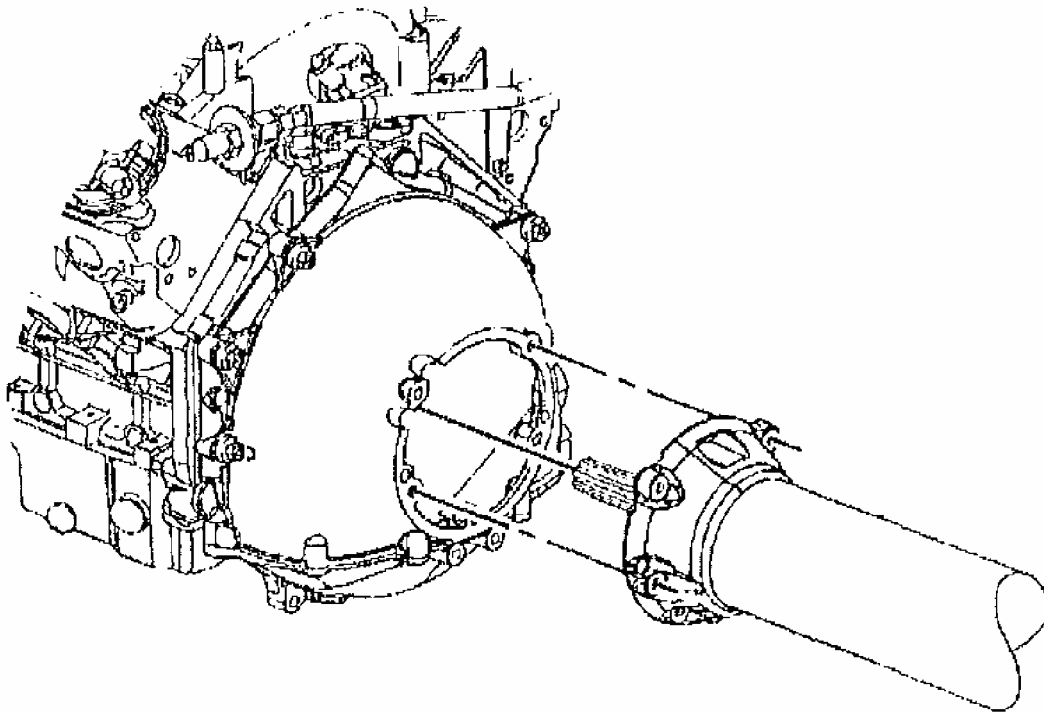
18. Insert a putty knife, or similar tool, between the edge of the shifter bracket on the side of the driveline support assembly and the brake pipe retainer on the wall of the driveline tunnel.



G01732118

**Fig. 119: Separating Shifter Bracket & Brake Pipe Retainer**  
**Courtesy of GENERAL MOTORS CORP.**

19. SLOWLY seat the driveline to the engine flywheel housing while maintaining the proper angle of the driveline.
20. Reposition the wiring harness bracket from near the driveline tunnel wall to align with the appropriate driveline support assembly bolt hole.



G01732119

**Fig. 120: Aligning Transmission Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

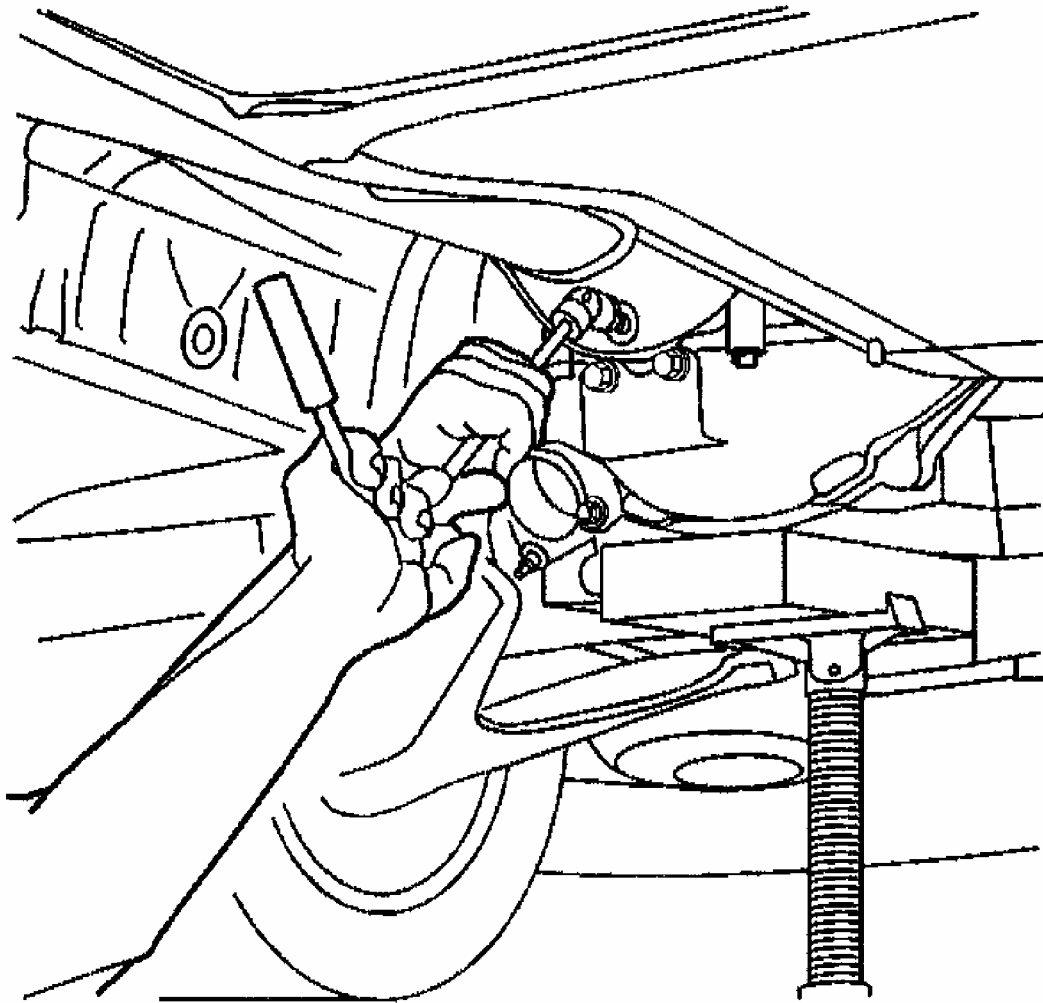
21. Install the five driveline support assembly to engine flywheel housing bolts.

**Tighten**

Tighten the driveline support assembly to engine flywheel housing bolts to 50 N.m (37 lb ft).

22. Install the wiring harness to the wiring harness retainer along the top of the transmission.
23. SLOWLY raise the driveline to approximately 51 mm (2 in) BELOW the final installed height.



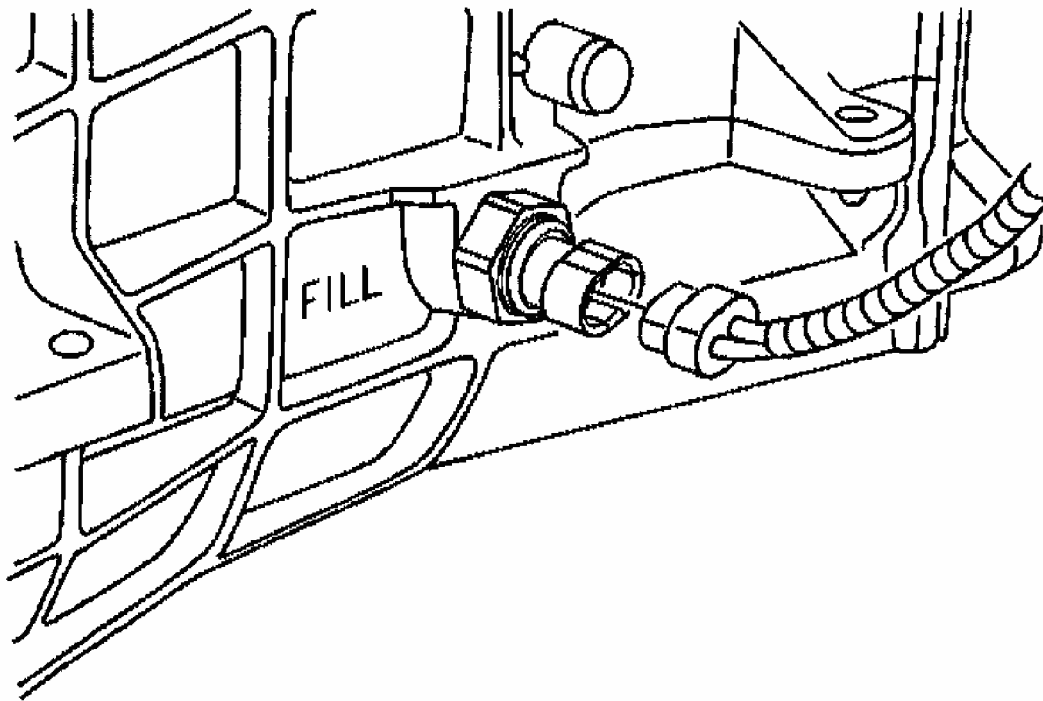


G01732120

**Fig. 121: Installing Driveline Support Assembly To Engine Flywheel Housing Bolts**

**Courtesy of GENERAL MOTORS CORP.**

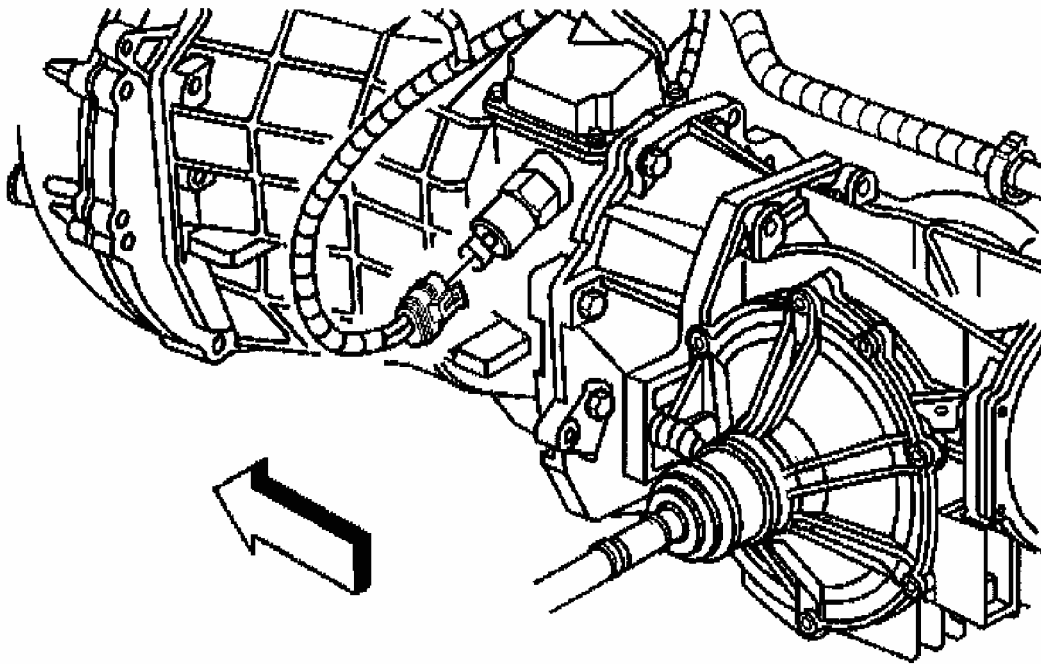
24. Connect the transmission fluid temperature sensor electrical connector, if equipped.



G01732121

**Fig. 122: Connecting Transmission Fluid Temperature Sensor Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

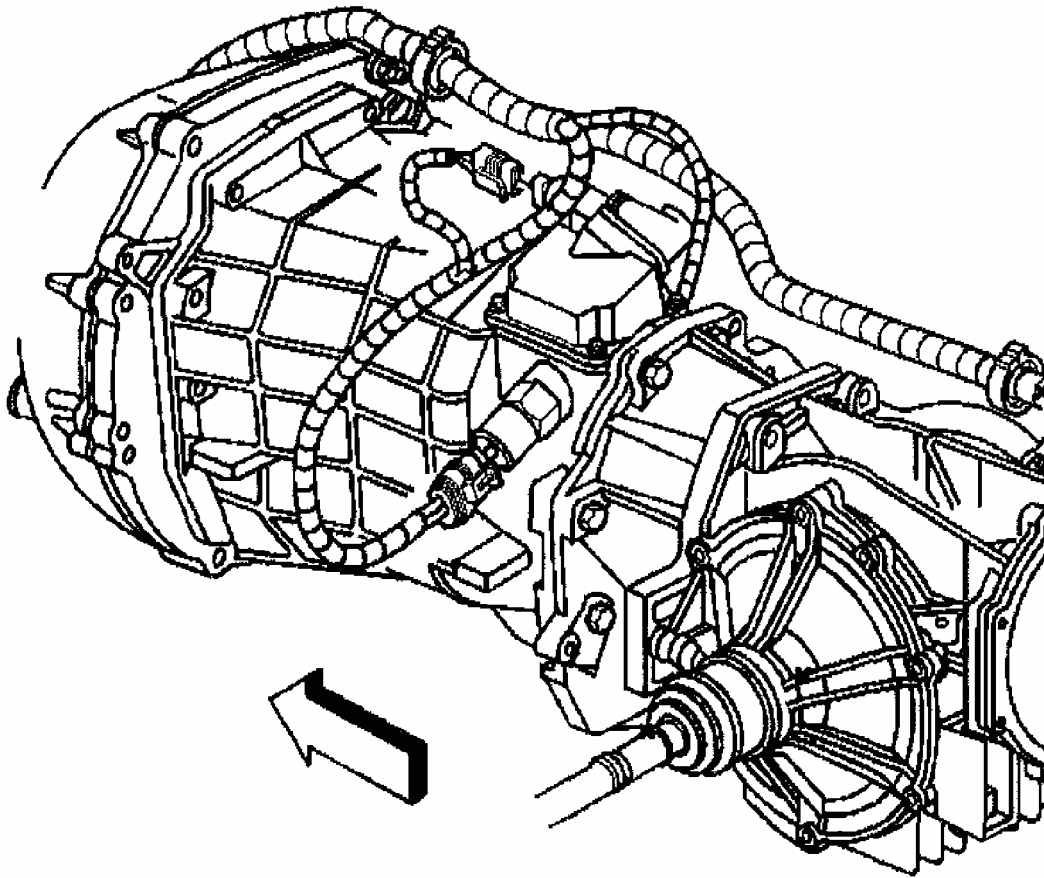
25. Connect the gear select (skip shift) solenoid electrical connector.



G01732122

**Fig. 123: Connecting Gear Select (Skip Shift) Solenoid Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

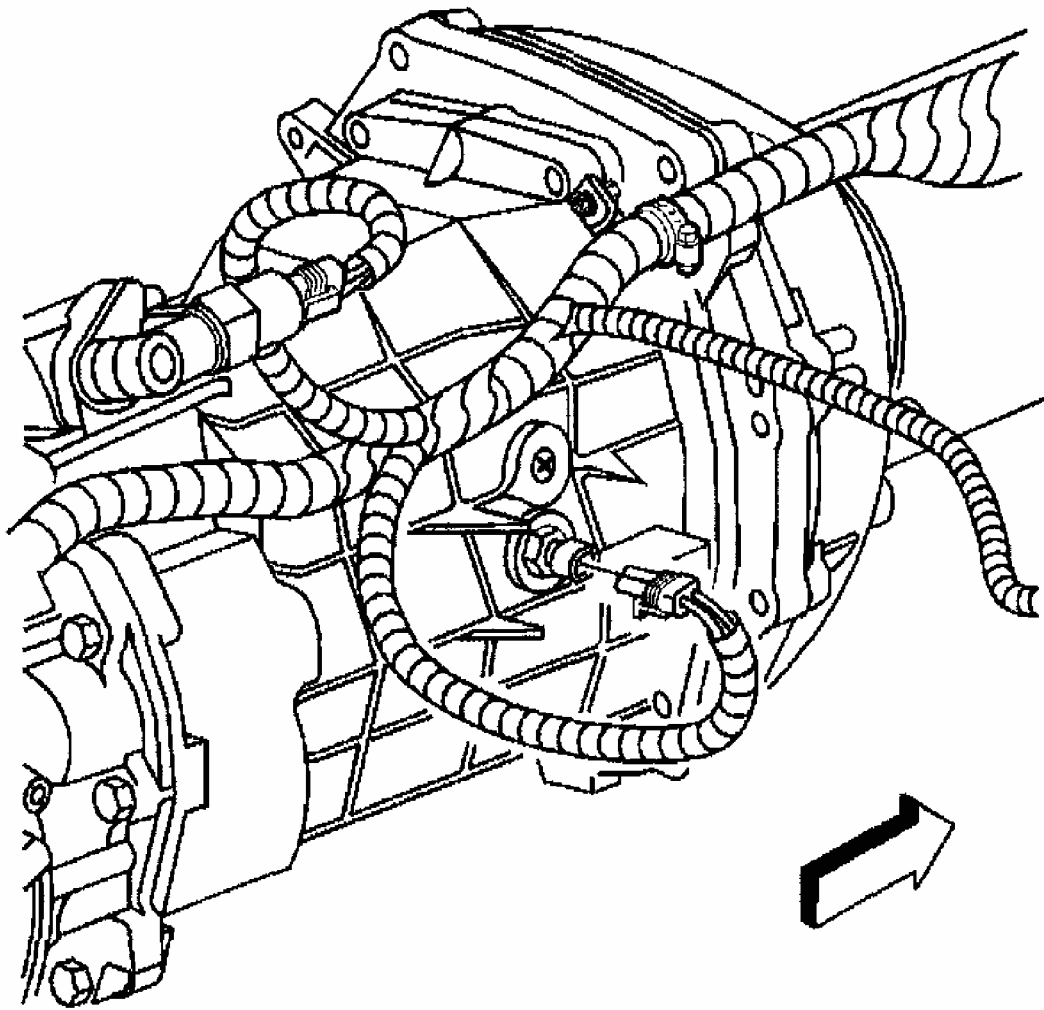
26. Connect the reverse lockout solenoid electrical connector.



G01732123

**Fig. 124: Connecting Reverse Lockout Solenoid Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

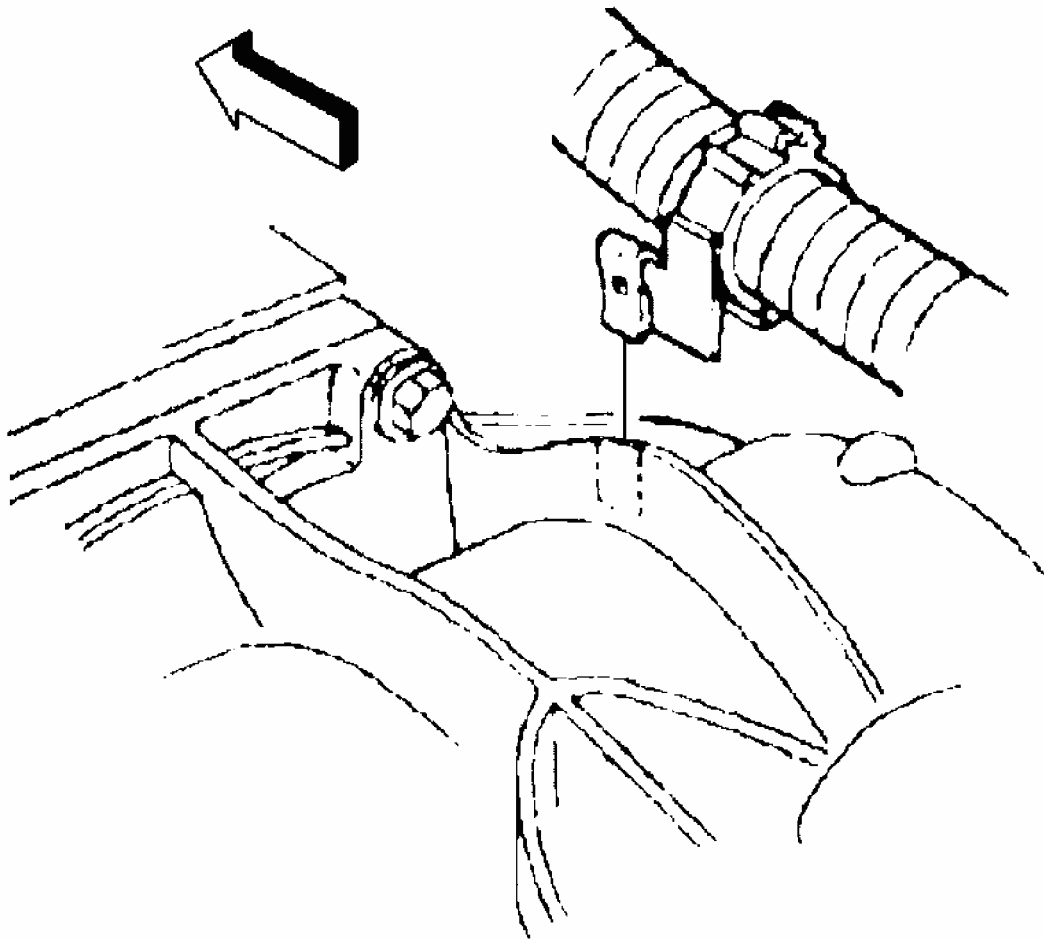
27. Connect the backup lamp switch electrical connector.



G01732124

**Fig. 125: Connecting Backup Lamp Switch Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

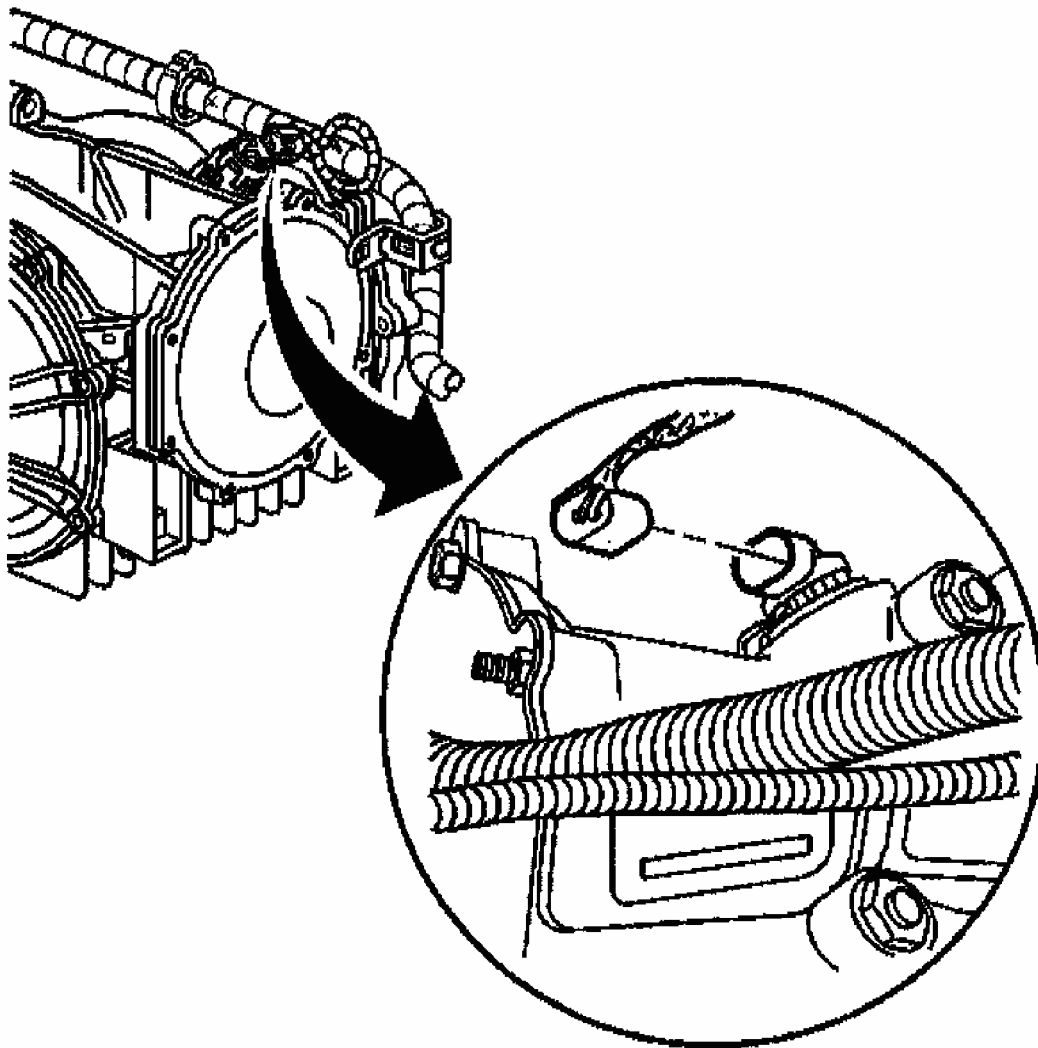
28. Connect the wiring harness clip to the top of the differential.
29. Connect the wiring harness retainer to the stud at the differential rear cover.



G01732125

**Fig. 126: Installing Transmission Wiring Harness Clip**  
**Courtesy of GENERAL MOTORS CORP.**

30. Connect the vehicle speed sensor (VSS) electrical connector.



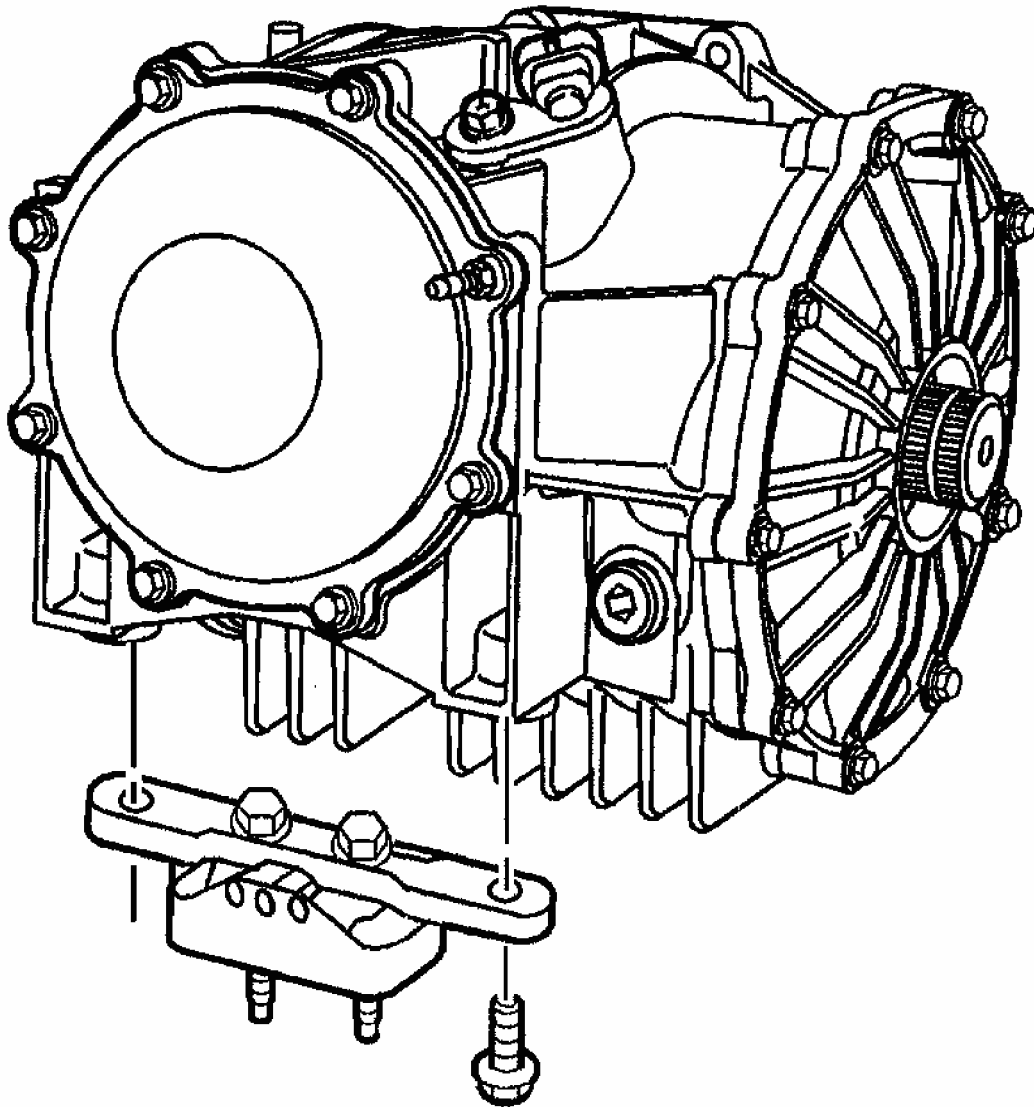
G01732126

**Fig. 127: Connecting VSS Electrical Connector**  
**Courtesy of GENERAL MOTORS CORP.**

31. Slowly raise the driveline to final installation height.
32. Remove the putty knife, if still in position.
33. Remove the jack which supported the rear of the engine.
34. Remove the tie-off retainers from the axle shafts.
35. CAREFULLY align and seat the wheel drive shafts to the differential.
36. Install the transaxle mount with bracket to the differential.
37. Install the transaxle mount bracket to differential bolts.

**Tighten**

Tighten the transaxle mount bracket to differential bolts to 50 N.m (37 lb ft).

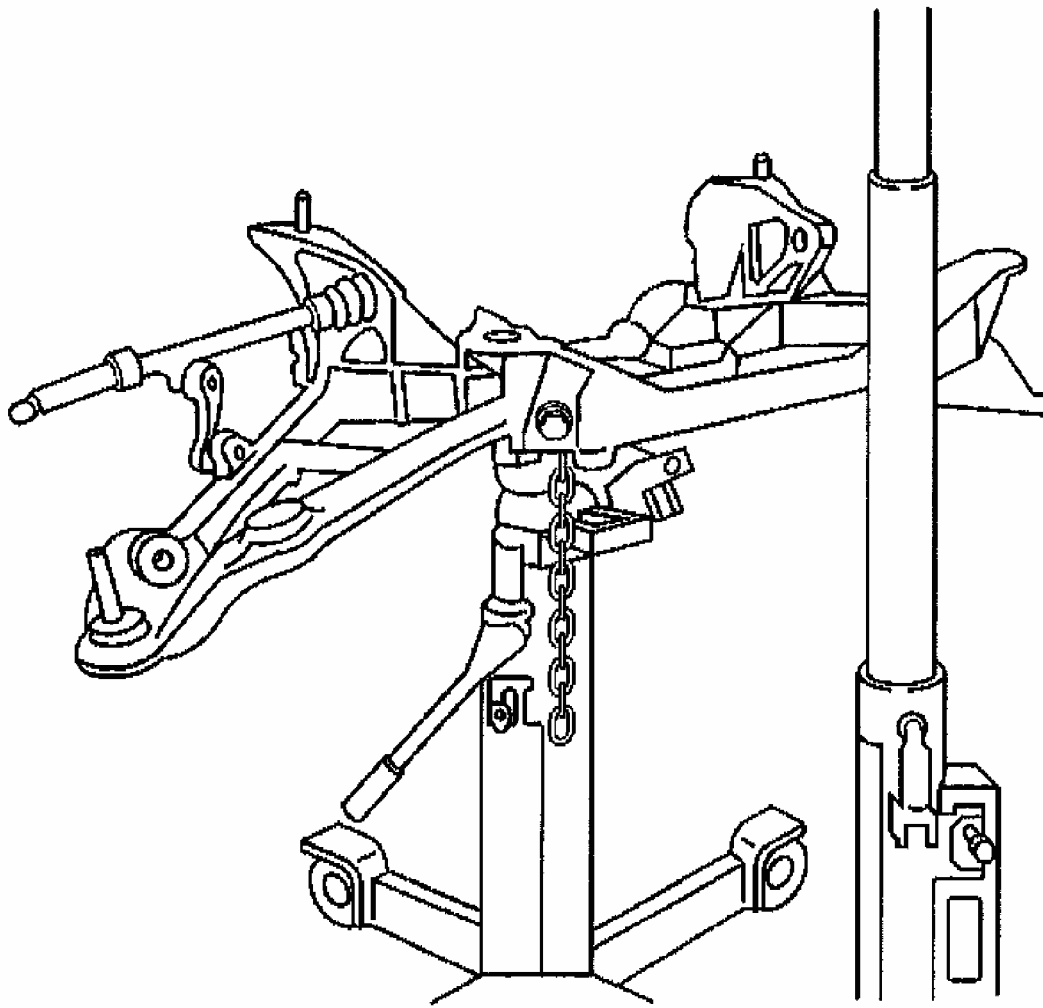


G01732127

**Fig. 128: Installing Transaxle Mount Bracket Bolts**  
Courtesy of GENERAL MOTORS CORP.

38. With the aid of an assistant, begin to raise the rear suspension crossmember (still firmly attached to a transmission jack), until it contacts the vehicle frame rails.
39. Guide the rear suspension crossmember alignment pins into the alignment holes in the vehicle frame rails, and guide the transaxle mount studs into the mounting holes in the crossmember, then raise the crossmember until it contacts the vehicle frame rails.





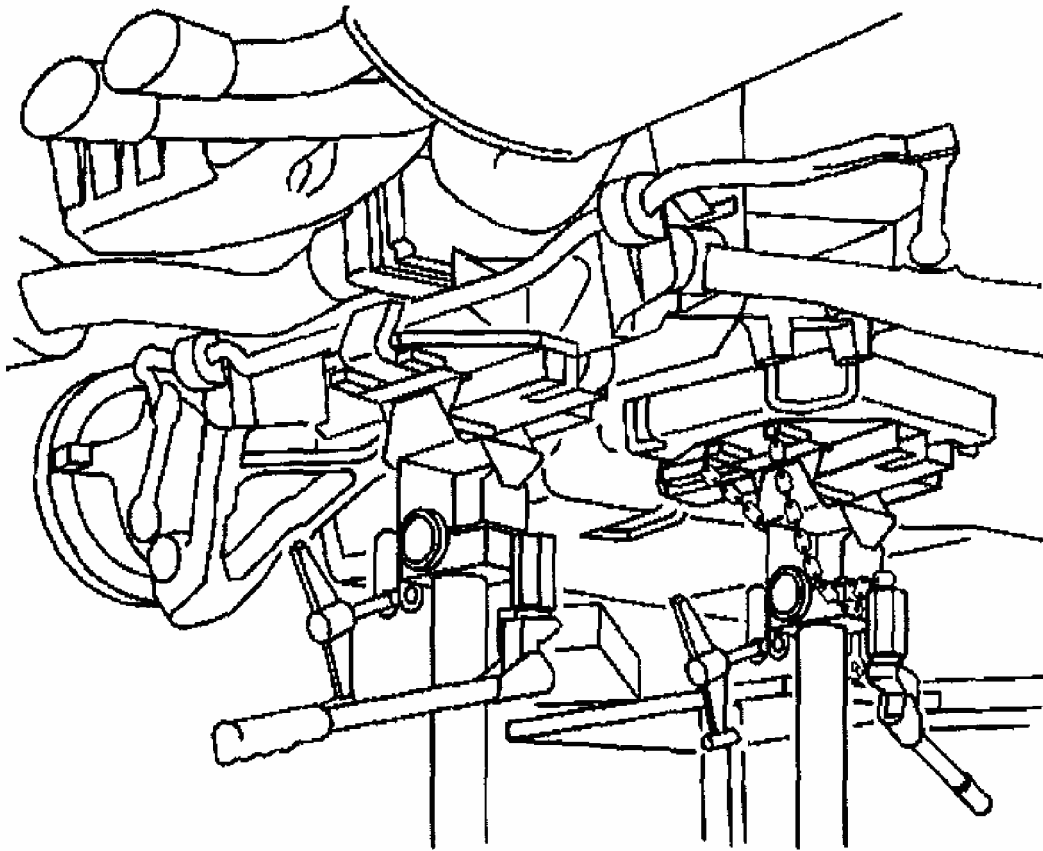
G01732128

**Fig. 129: Aligning Rear Suspension Crossmember**  
**Courtesy of GENERAL MOTORS CORP.**

40. Using ONLY HAND TOOLS, install NEW rear suspension crossmember mounting nuts.

**Tighten**

Tighten the rear suspension crossmember mounting nuts to 110 N.m (81 lb ft).



G01732129

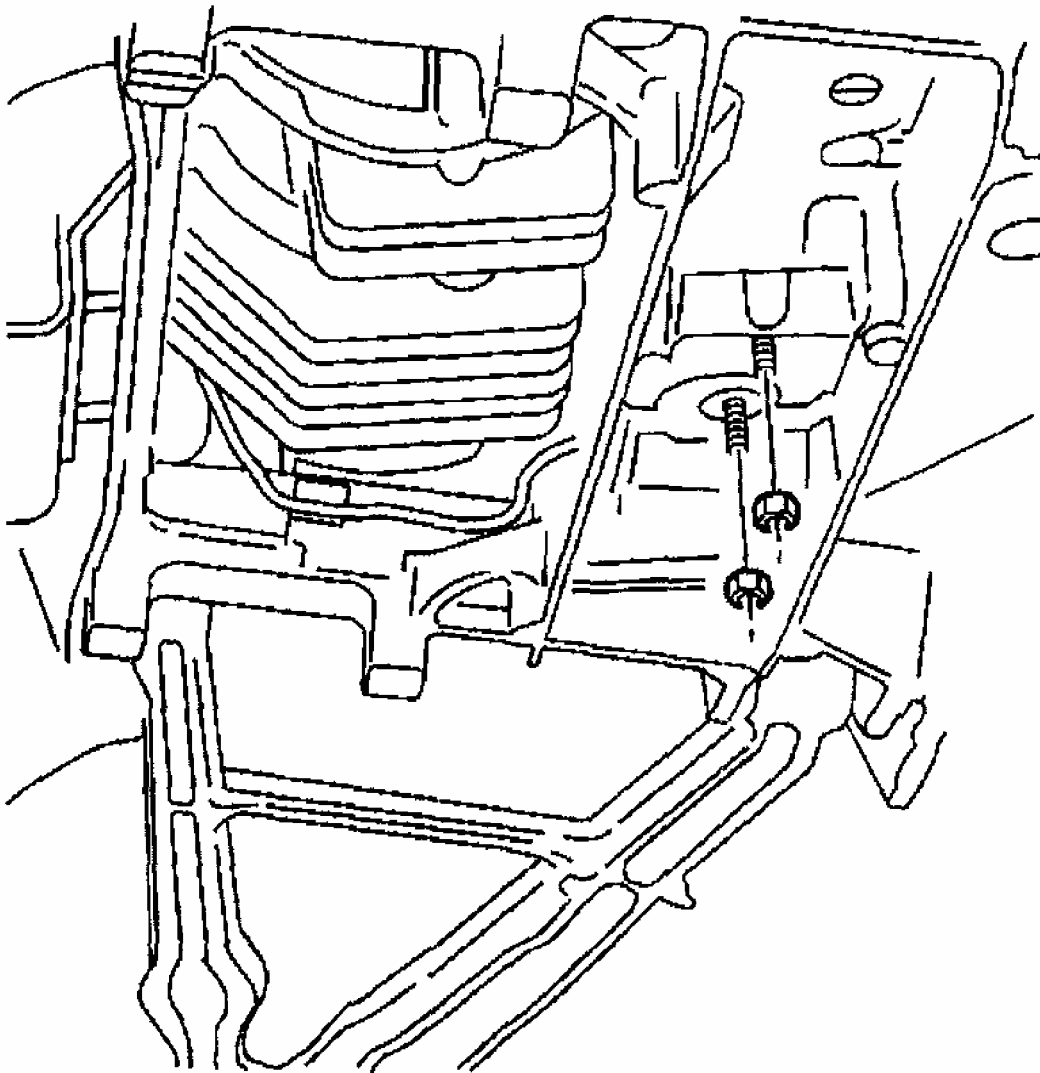
**Fig. 130: Installing Rear Suspension Crossmember**  
**Courtesy of GENERAL MOTORS CORP.**

41. Remove the transmission jack from the rear suspension crossmember.
42. Release the **J 42055** from the transmission, then remove the **J 42055** and transmission jack.
43. Install the transaxle mount to rear suspension crossmember nuts.

**Tighten**

Tighten the transaxle mount to rear suspension crossmember nuts to 50 N.m (37 lb ft).

44. Connect the wiring harness and brake pipe clip retainers to the rear suspension crossmember.



G01732130

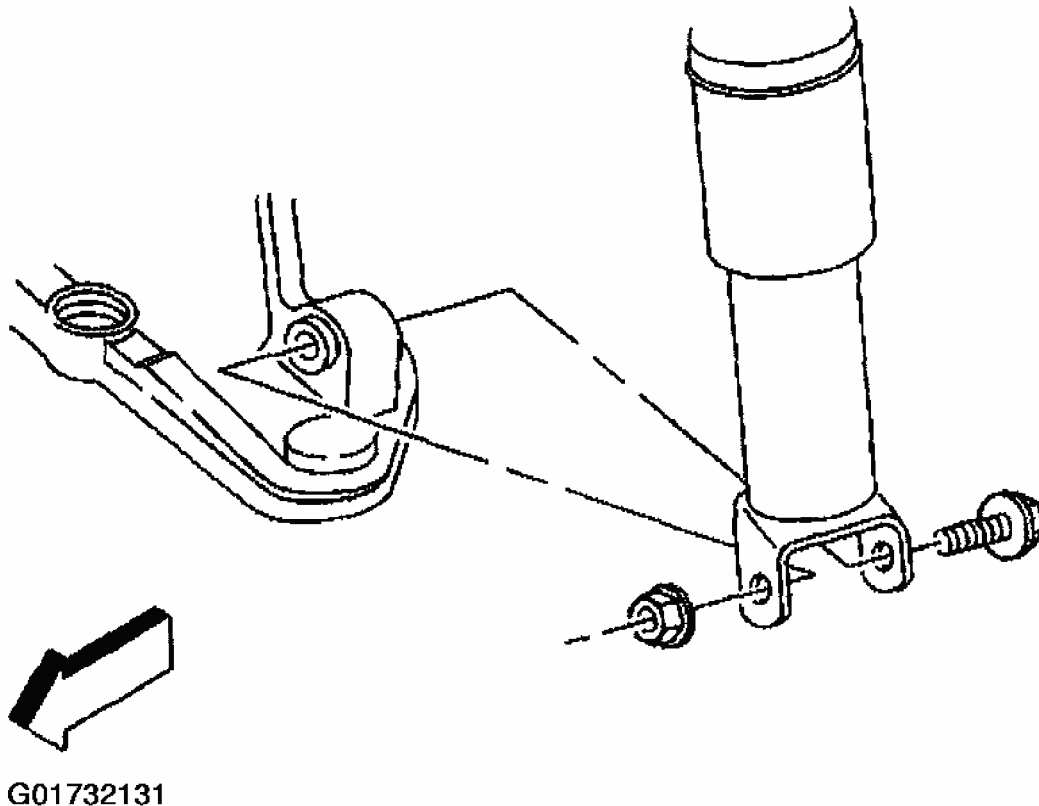
**Fig. 131: Installing Transaxle Mount To Rear Suspension Crossmember Nuts**  
Courtesy of GENERAL MOTORS CORP.

45. Support the lower control arm with a straight jack.
46. Connect the lower ball joint to the suspension knuckle. Refer to **KNUCKLE** in Rear Suspension.
47. Install the shock absorber lower mounting bolt.

### **Tighten**

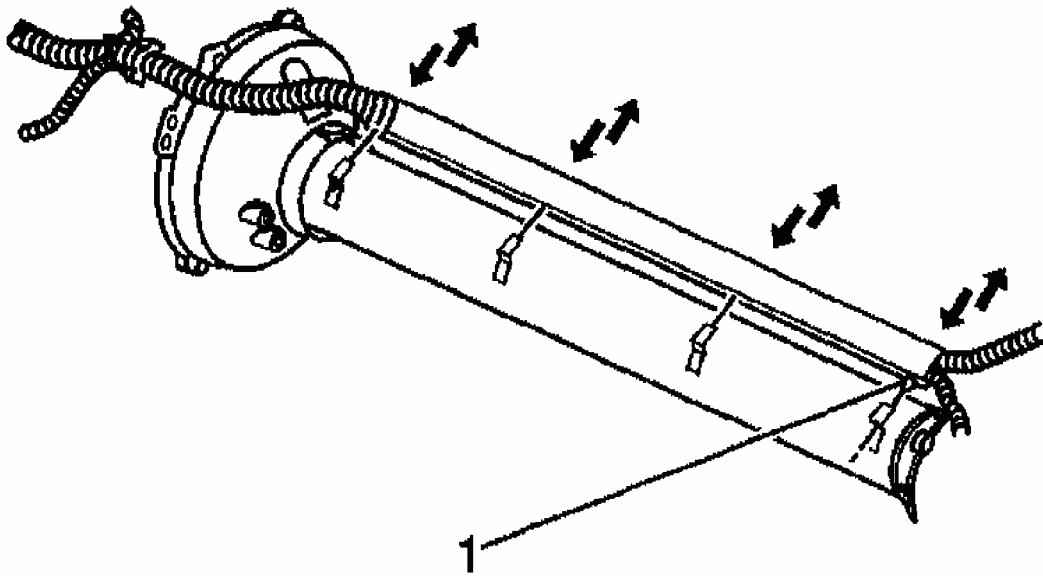
Tighten the rear shock absorber lower mounting bolt to 220 N.m (162 lb ft).

48. Connect the outer tie rod end to the suspension knuckle. Refer to **TIE ROD (OUTER END)** or **TIE ROD (SUSPENSION LINK)** in Rear Suspension.
49. Remove the straight jack from the suspension control arm.



**Fig. 132: Installing Rear Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

50. Repeat steps 45 through 49 for the other side of the vehicle.
51. Install the rear transverse spring. Refer to **REAR TRANSVERSE SPRING** in Rear Suspension.
52. Carefully pull the wiring harness down into the L-shaped brackets along the driveline support assembly, align the harness retainer (locator) (1) to the hole in the forward bracket, then secure in place.



G01732132

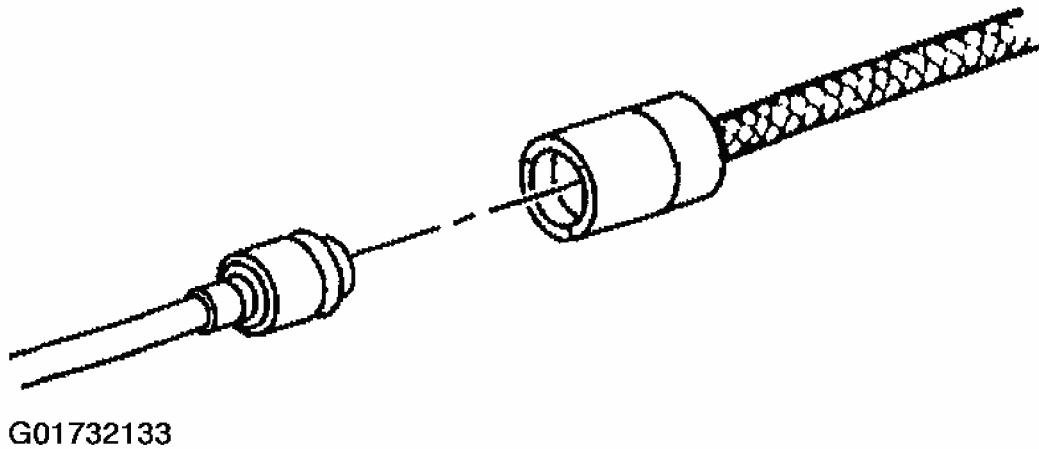
**Fig. 133: Installing Transmission Wiring Harness Retainer**  
**Courtesy of GENERAL MOTORS CORP.**

**Important:** DO NOT rely on an audible click or a visual verification of the clutch hydraulic hose quick connect fitting connection.

53. Connect the clutch actuator cylinder hose to the clutch master cylinder hose.

Push together the clutch hydraulic hose quick connect fittings, then pull back on the fittings to verify engagement.

54. Check the clutch hydraulic hoses for twists or kinks.



**Fig. 134: Connecting Clutch Actuator Cylinder Hose To Master Cylinder Couplings**

**Courtesy of GENERAL MOTORS CORP.**

55. Install the clutch actuator cylinder hose to the hose retaining clip (at the rear of the engine).
56. Install the driveline tunnel closeout panel. Refer to **Driveline Tunnel Closeout Panel Replacement** .
57. Remove the tie-off retainers from the muffler assemblies.
58. Install the catalytic converters. Refer to **CATALYTIC CONVERTER REPLACEMENT** in Engine Exhaust.
59. Install the rear tire and wheel assemblies. Refer to **TIRE & WHEEL REMOVAL & INSTALLATION** in Tires and Wheels.

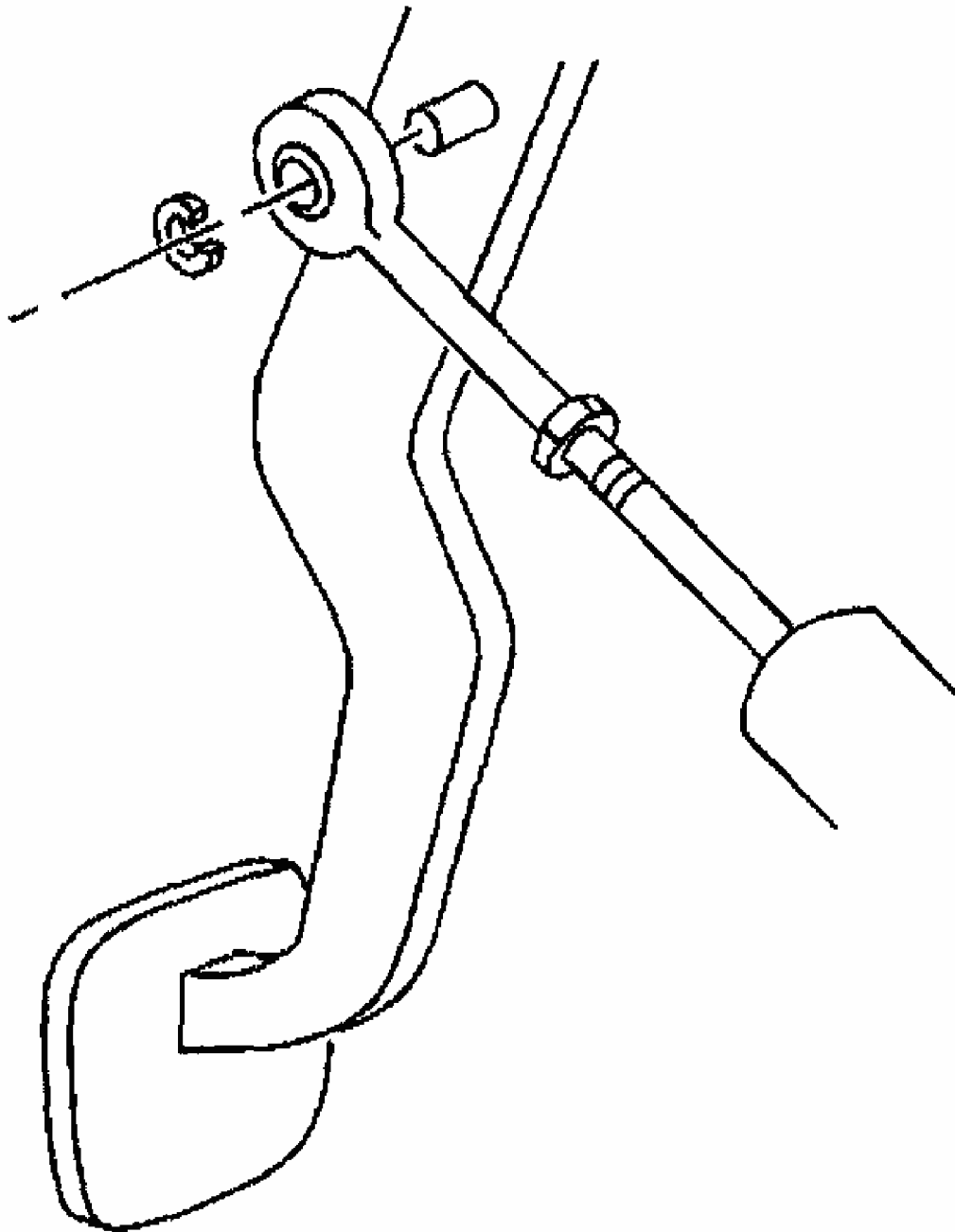


G01732134

**Fig. 135: Installing Clutch Actuator Cylinder Hose**  
**Courtesy of GENERAL MOTORS CORP.**

60. Lower the vehicle.
61. Connect the clutch master cylinder pushrod to the clutch pedal.
62. Install the clutch master cylinder pushrod retainer.

63. Install the left IP lower insulator panel. Refer to **INSTRUMENT PANEL ACCESSORY TRIM PLATE & KNEE BOLSTER PANEL** .

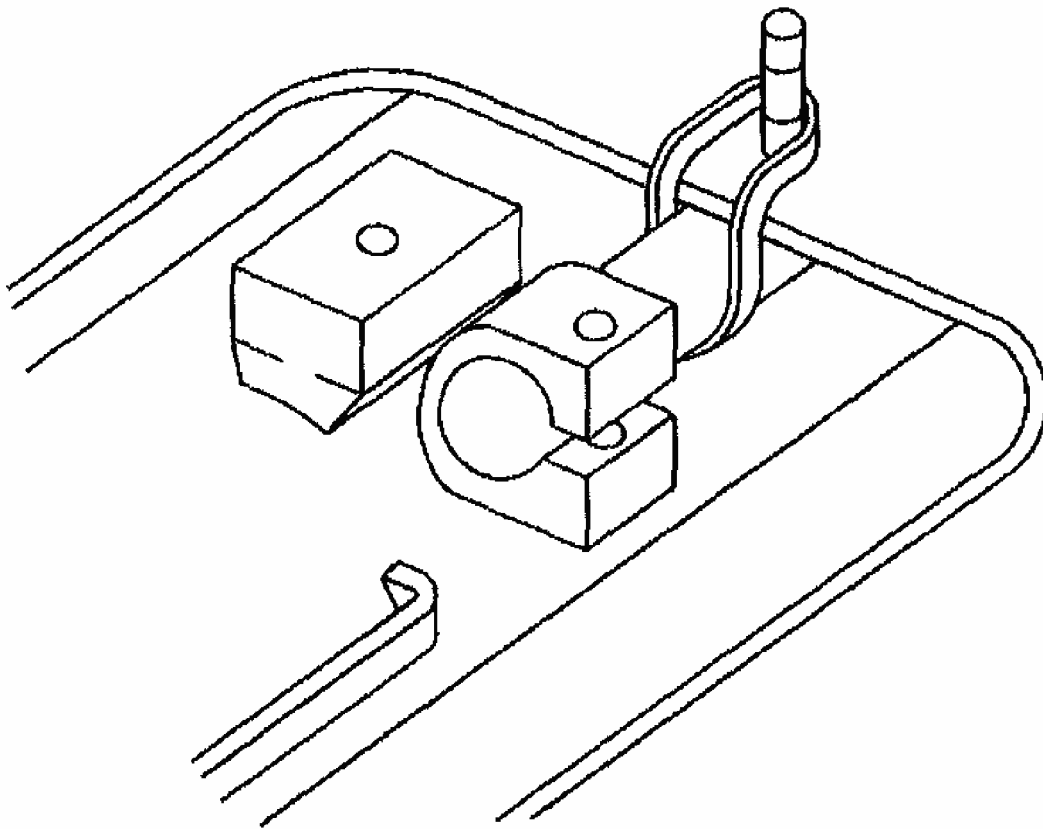


G01732135

**Fig. 136: Installing Clutch Master Cylinder Pushrod**  
Courtesy of GENERAL MOTORS CORP.



64. Grasp the transmission shift rod and pull up to break the masking tape installed earlier to maintain position during installation.
65. Stretch the rubber band, while still installed onto the transmission shift rod, over the rear stud on top of the driveline tunnel to aid in shift control installation.
66. Install the shift control assembly. Refer to **SHIFT CONTROL ASSEMBLY REPLACEMENT**.
67. Break and remove the rubber band.



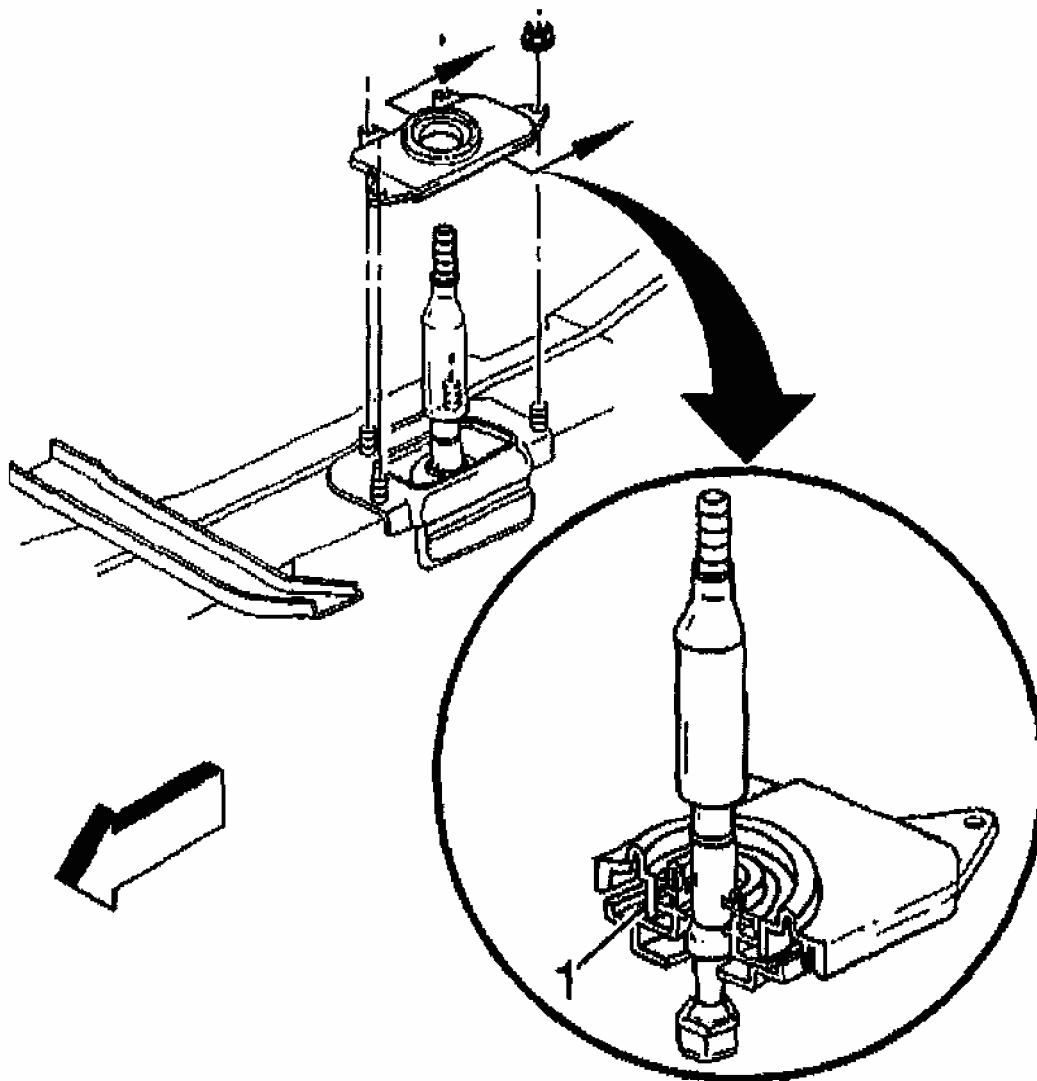
G01732136

**Fig. 137: Aligning Transmission Shift Rod**  
Courtesy of GENERAL MOTORS CORP.

68. Install the shift control closeout boot. Check that the closeout boot fully seats to the shift control lever seal and the base of the shift control assembly (1).
69. Install the shift control closeout boot retaining nuts.

### **Tighten**

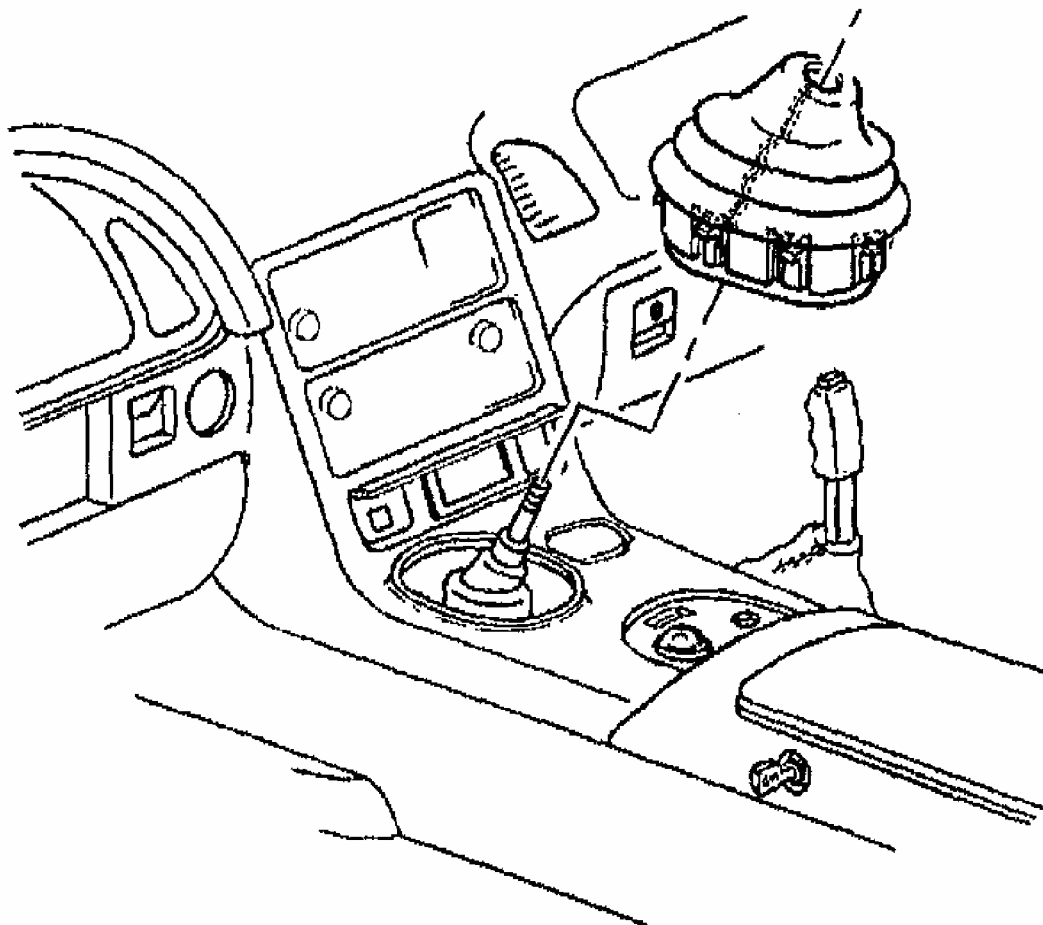
Tighten the shift control closeout boot retaining nuts to 12 N.m (106 lb in).



G01732137

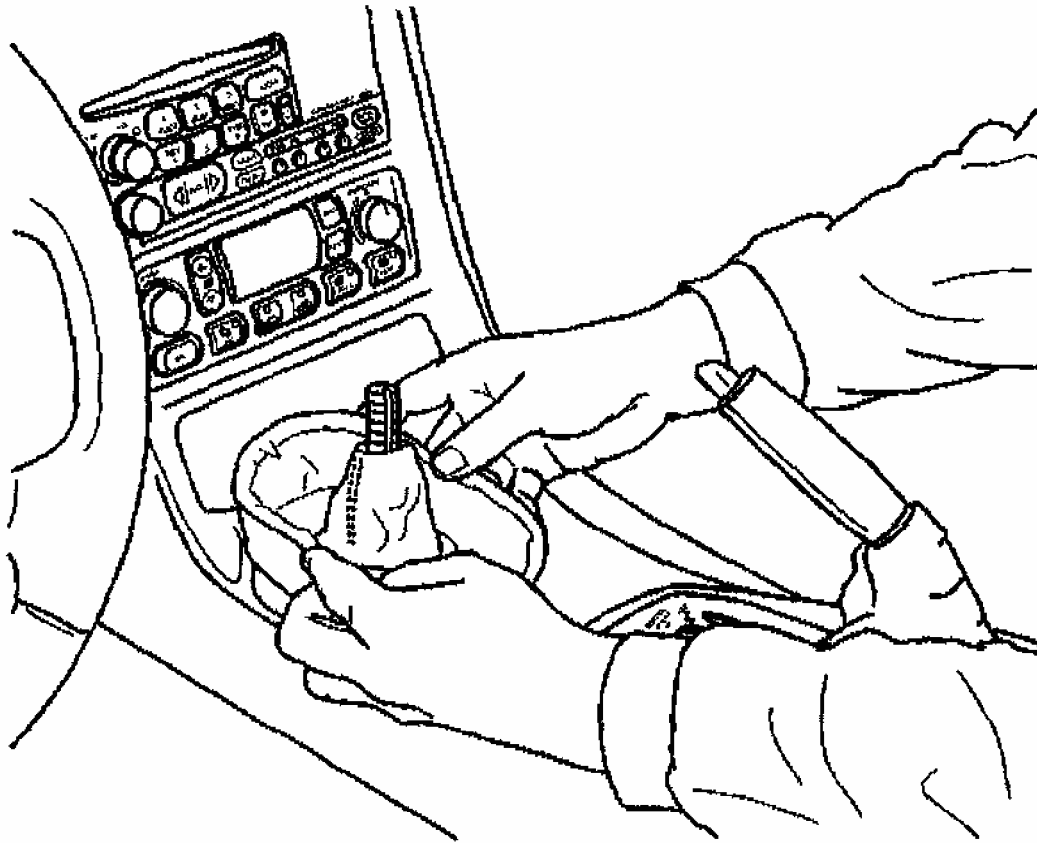
**Fig. 138: Installing Shift Control Closeout Boot Retaining Nuts**  
Courtesy of GENERAL MOTORS CORP.

70. Install the IP accessory trim plate. Refer to **INSTRUMENT PANEL ACCESSORY TRIM PLATE & KNEE BOLSTER PANEL** .
71. Install the shift control boot over the shift control lever.



**Fig. 139: Installing Shift Control Boot**  
**Courtesy of GENERAL MOTORS CORP.**

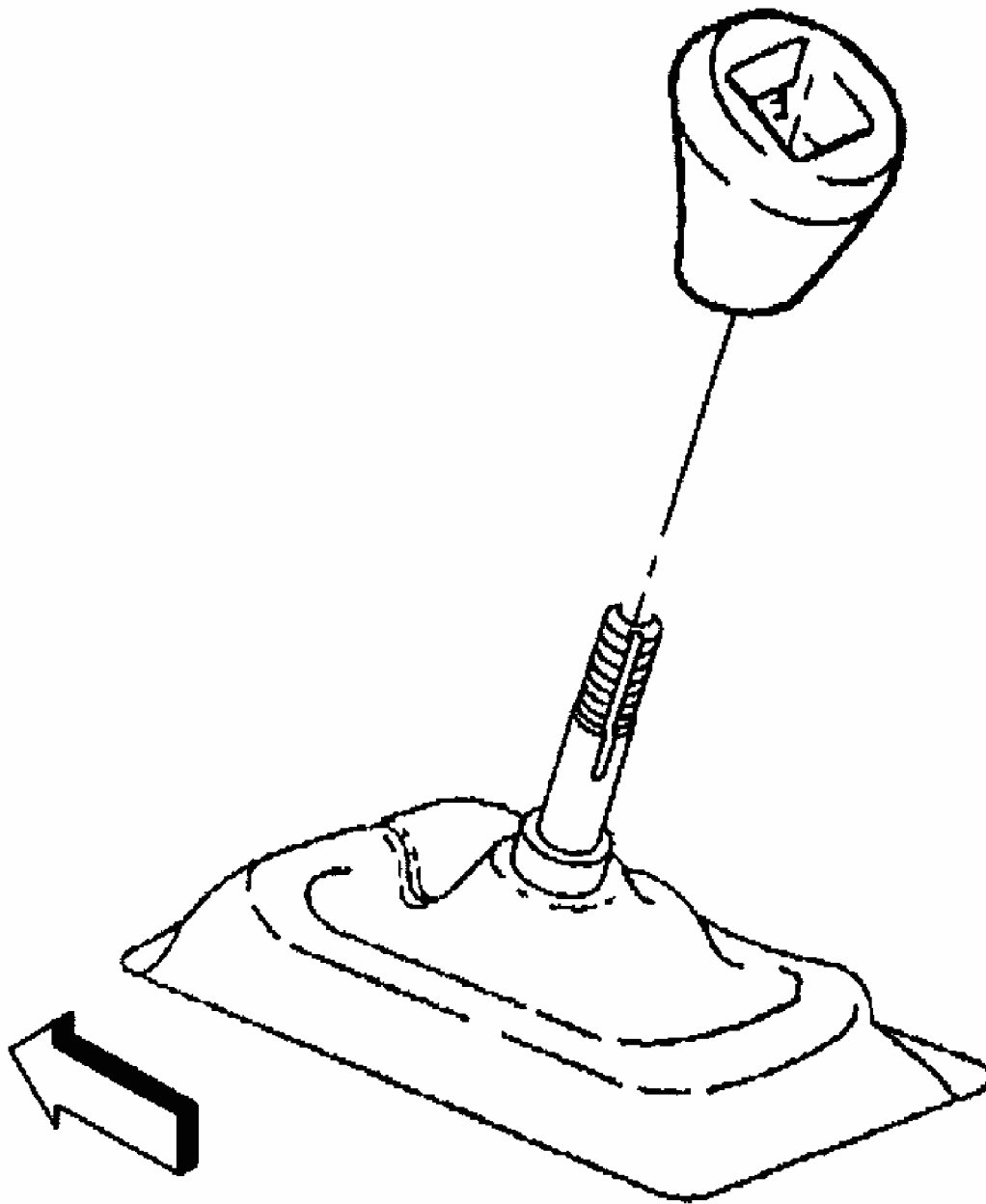
72. Align the shift control boot to the IP accessory trim plate opening, then press to lock the boot retaining tabs.
73. Adjust the shape of the boot for appearance, if necessary.



G01732139

**Fig. 140: Installing Shift Control Boot Tabs**  
**Courtesy of GENERAL MOTORS CORP.**

74. Screw the shift control knob onto the shift control lever until the knob bottoms out.



G01732140

**Fig. 141: Installing Shift Control Knob**  
**Courtesy of GENERAL MOTORS CORP.**

75. Unscrew the shift control knob just enough to align the retainer slot with the slot on the shift control lever.
76. Install the shift control knob retainer (1) into the slots and seat fully.
77. Install the shift control knob button.

78. Install the console. Refer to **CENTER CONSOLE** .

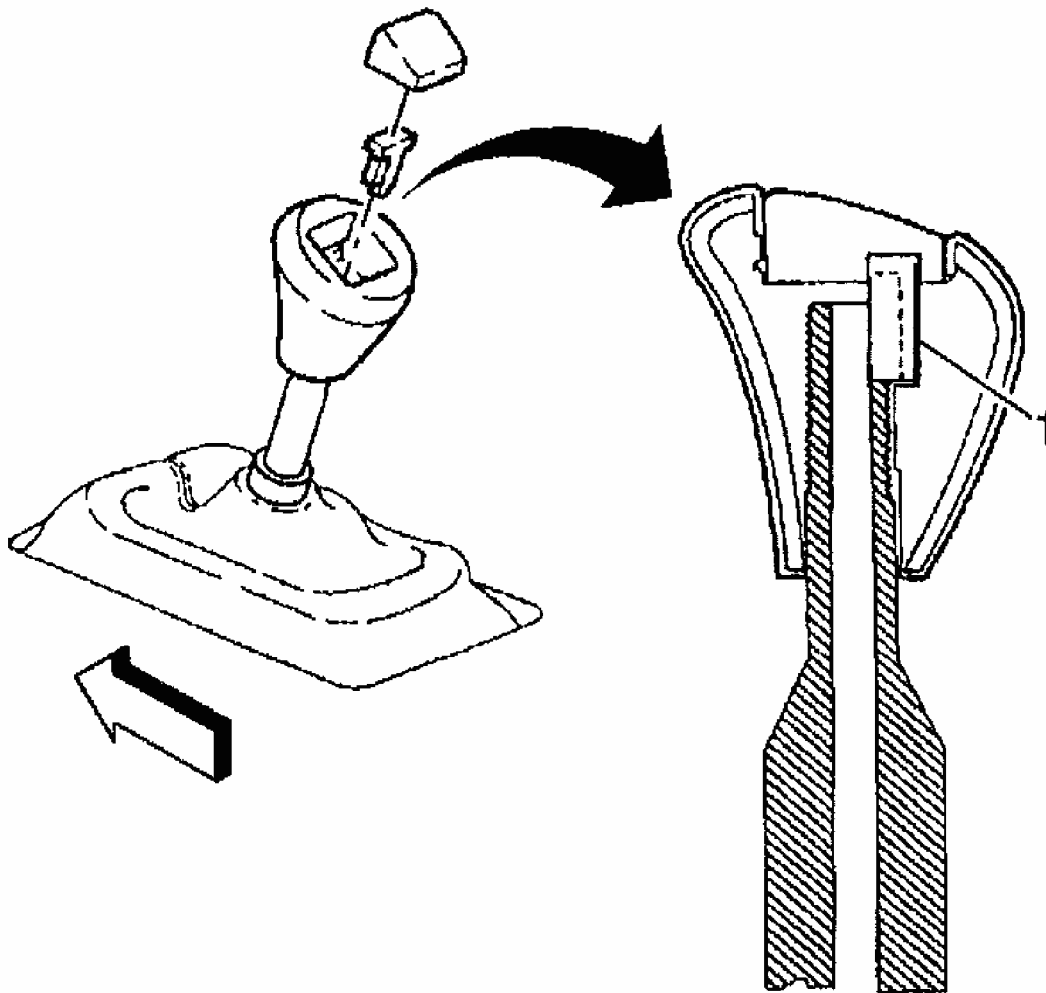
79. Connect the negative battery cable.

### **Tighten**

Tighten the negative battery cable bolt to 15 N.m (11 lb ft).

80. Program the transmitters. Refer to **TRANSMITTER PROGRAMMING** in Keyless Entry.

81. Bleed the clutch hydraulic system. Refer to **BLEEDING** in Clutch.



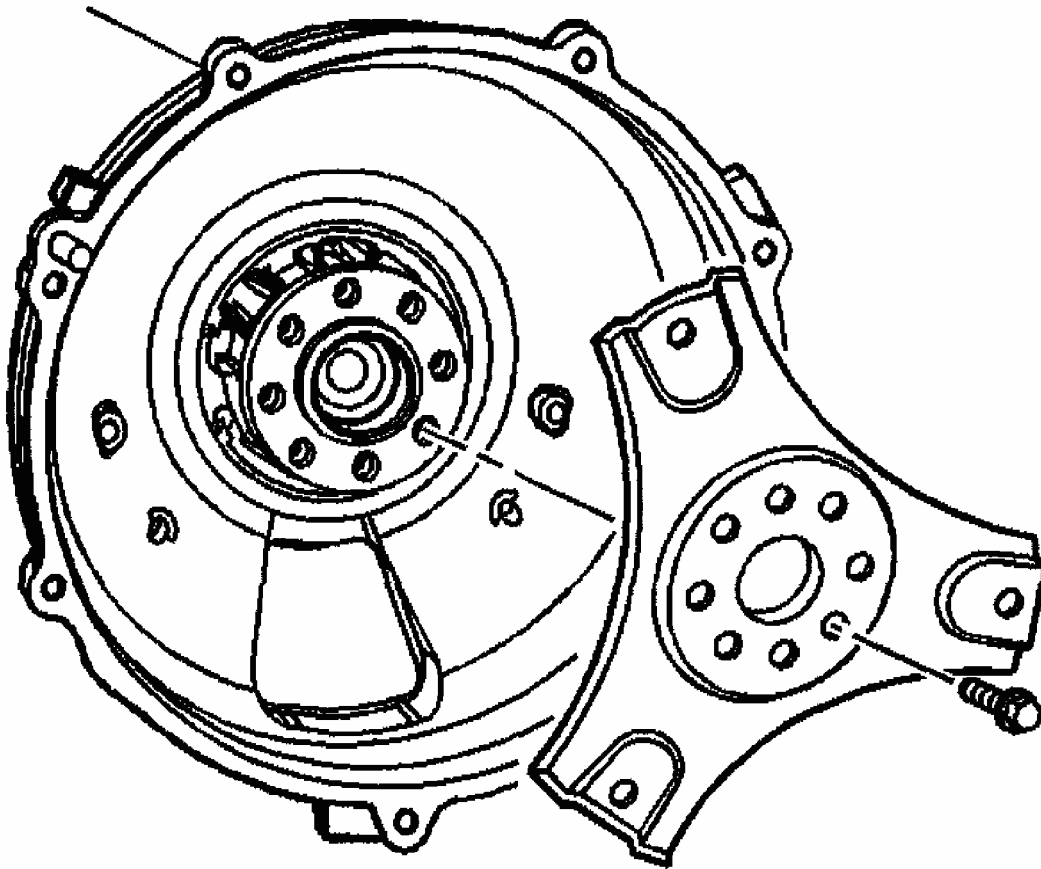
G01732141

**Fig. 142: Installing Shift Control Knob Retainer**  
Courtesy of GENERAL MOTORS CORP.

## FLEXPLATE REPLACEMENT

### Removal Procedure

1. Remove the driveline support assembly and separate it from the transmission. Refer to **Driveline Support Assembly Replacement (Automatic Transmission)** or **Driveline Support Assembly Replacement (Manual Transmission)** .
2. Remove the bolts mounting the flexplate to the flexplate spindle.
3. Remove the flexplate.



G01732142

**Fig. 143: Removing Flexplate Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

### Installation Procedure

1. Position the flexplate to the flexplate spindle so that the side of the flexplate marked **CONVERTER SIDE** will face the transmission torque converter.

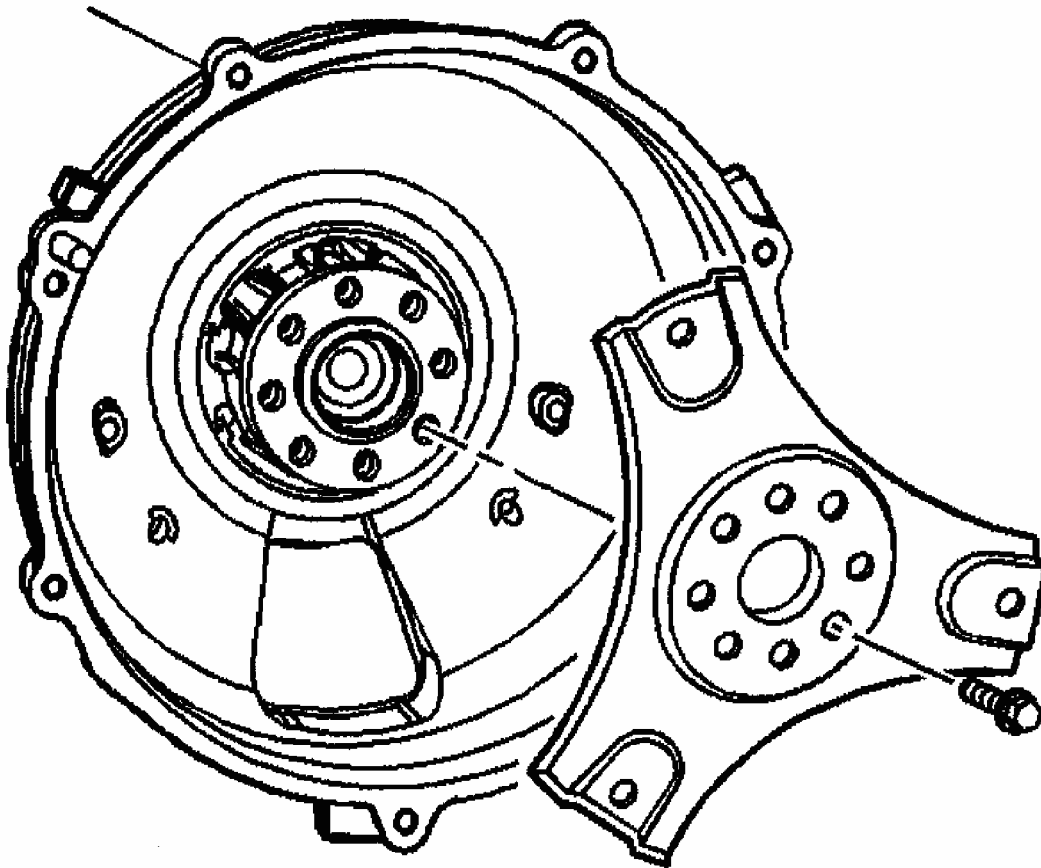
**CAUTION: Refer to FASTENER NOTICE .**

2. Install the flexplate to flexplate spindle bolts.

**Tighten**

Tighten the flexplate to flexplate spindle bolts to 50 N.m (37 lb ft).

3. Install the driveline support assembly to the transmission and the vehicle. Refer to Driveline Support Assembly Replacement (Automatic Transmission) or Driveline Support Assembly Replacement (Manual Transmission) .



G01732143

**Fig. 144: Installing Flexplate Mounting Bolts**  
**Courtesy of GENERAL MOTORS CORP.**



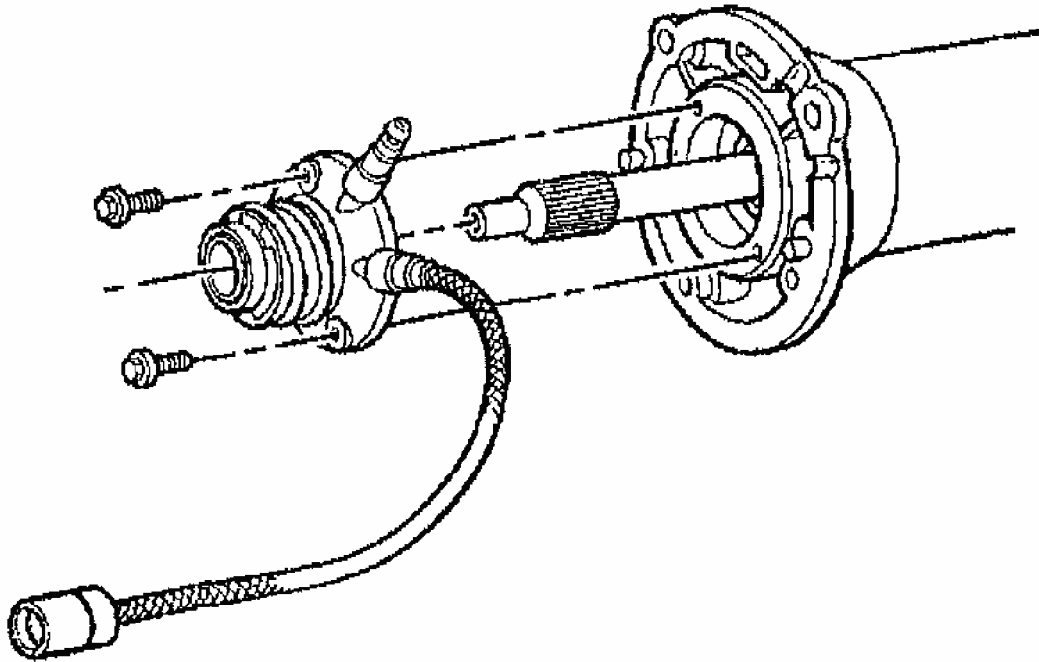
## Tools Required

- J 2619-01 Slide Hammer
- J 24420-C Harmonic Balancer Puller

### Propeller Shaft Removal

**Important:** Do not separate the input shaft, propeller shaft, couplings, or bearing housing assembly, unless required. These components are balanced as an assembly. Disassembly and improper reassembly of the components may cause vehicle driveline vibration. If the input shaft, couplings, propeller shaft, or bearing housing assembly must be separated, the components must be marked prior to disassembly. During assembly, the components must be returned to their original position and location.

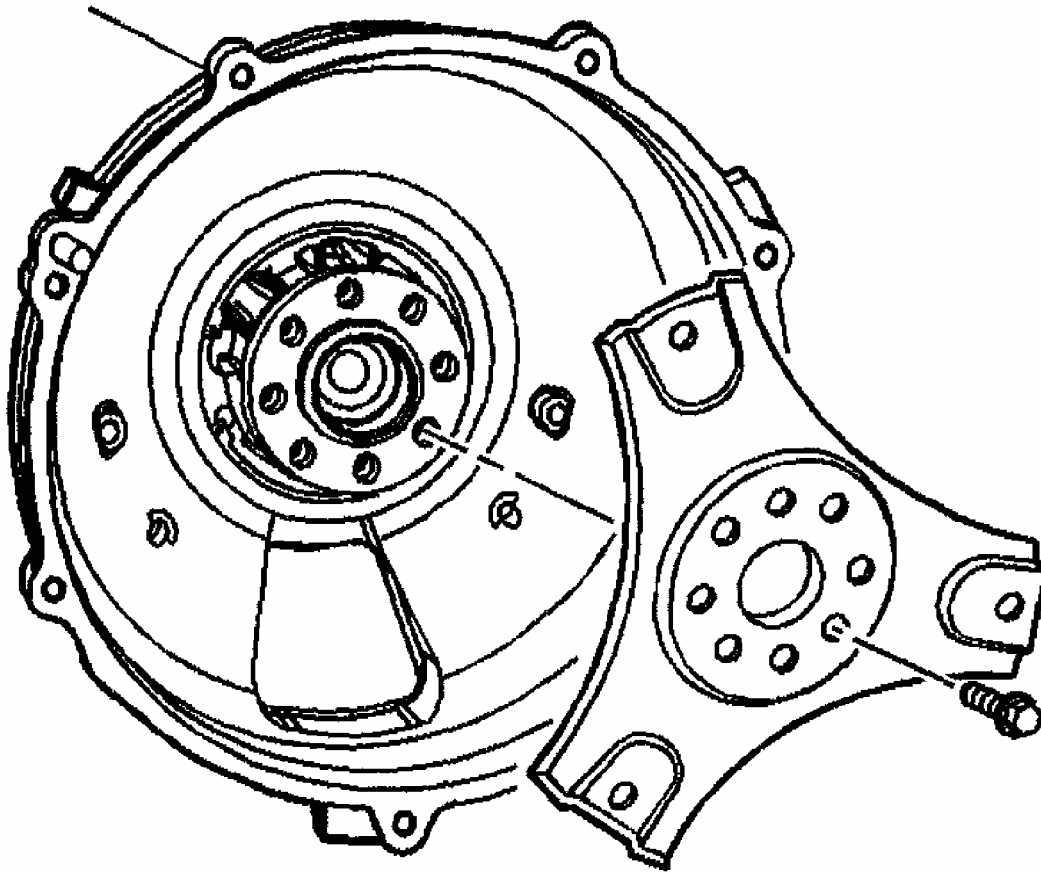
1. Remove the clutch actuator and bolts - (manual transmission).



G01732144

**Fig. 145: Removing Clutch Actuator Mounting Bolts**  
Courtesy of GENERAL MOTORS CORP.

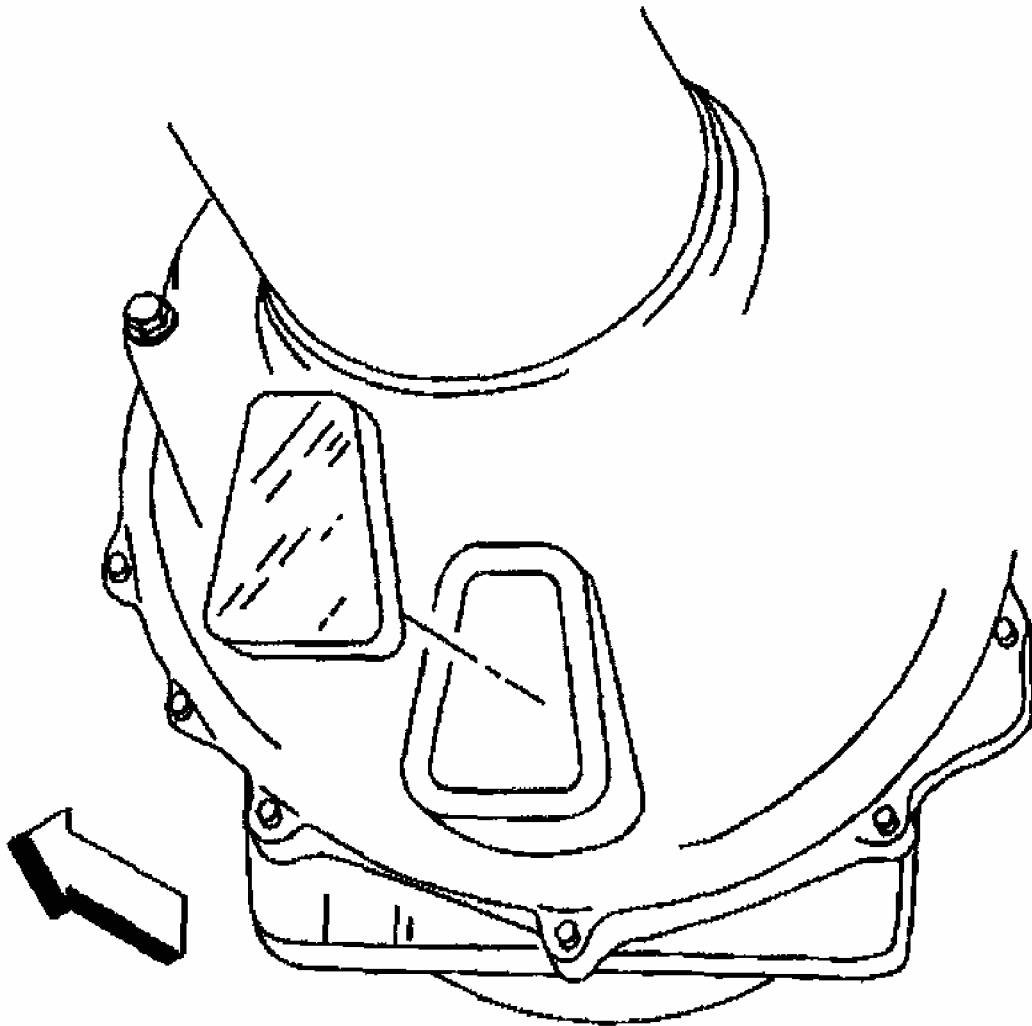
2. Remove the flex plate and bolts - (automatic transmission).



G01732145

**Fig. 146: Removing Flex Plate Mounting Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

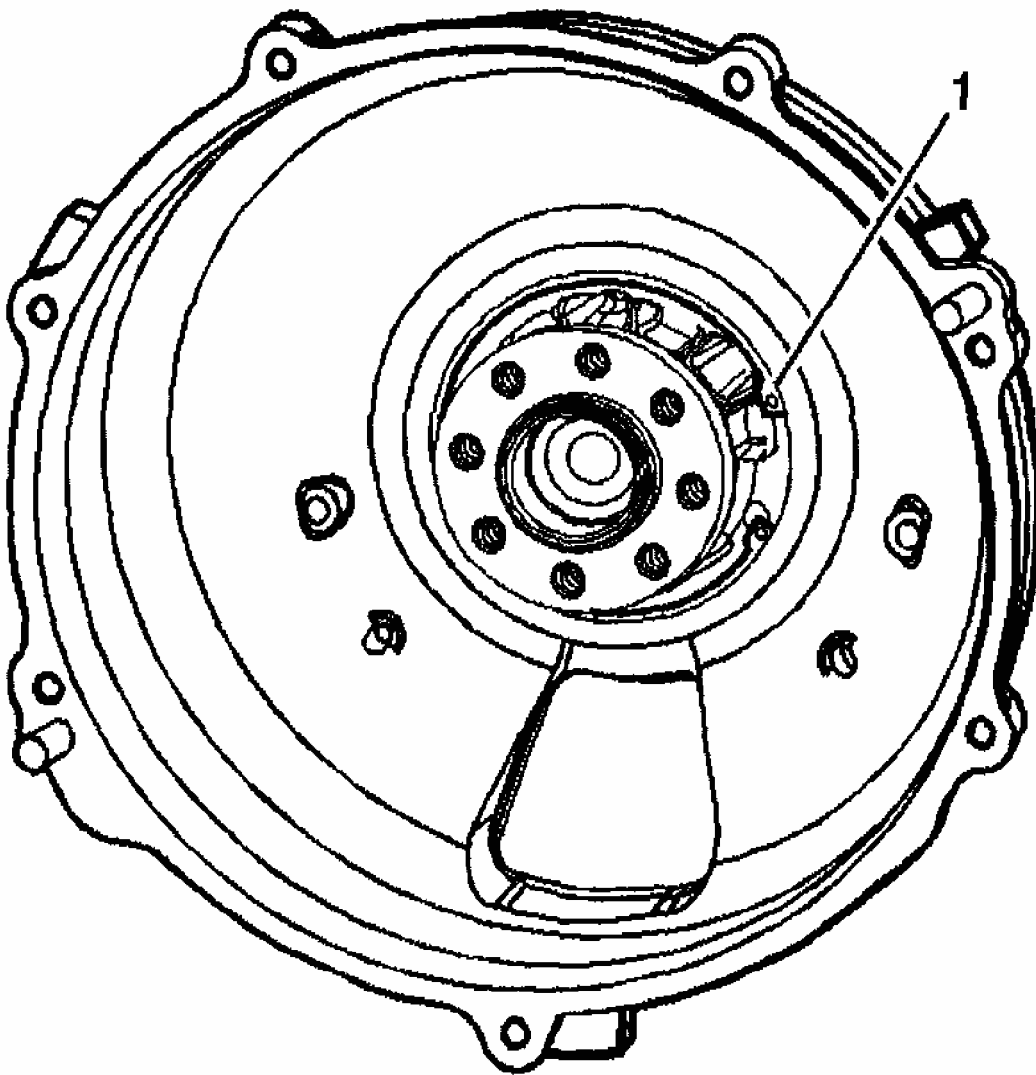
3. Remove the access hole plug, if required - (automatic transmission).



G01732146

**Fig. 147: Removing Access Hole Plug**  
**Courtesy of GENERAL MOTORS CORP.**

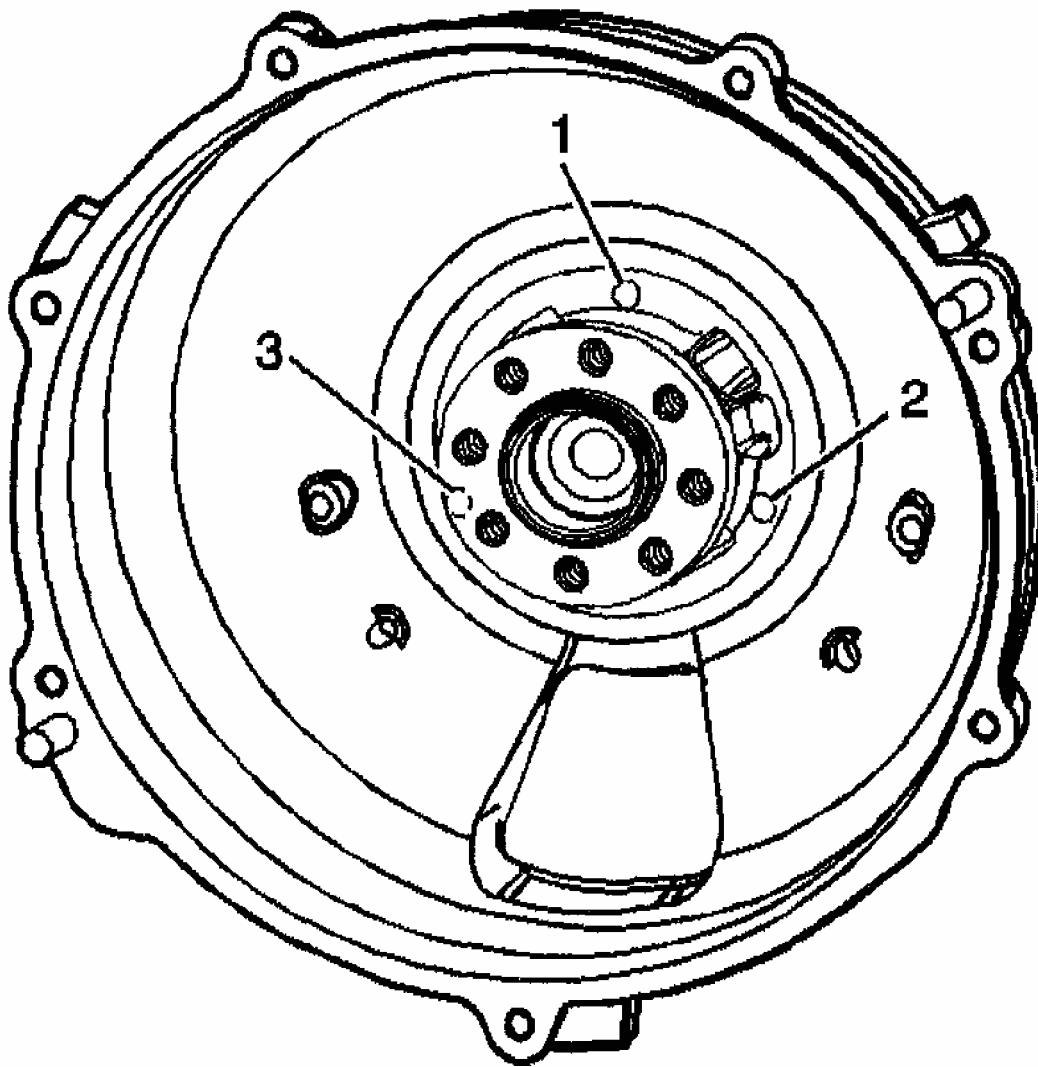
4. Remove the snap ring (1) from the driveline tube.



G01732147

**Fig. 148: Removing Driveline Tube Snap Ring**  
Courtesy of GENERAL MOTORS CORP.

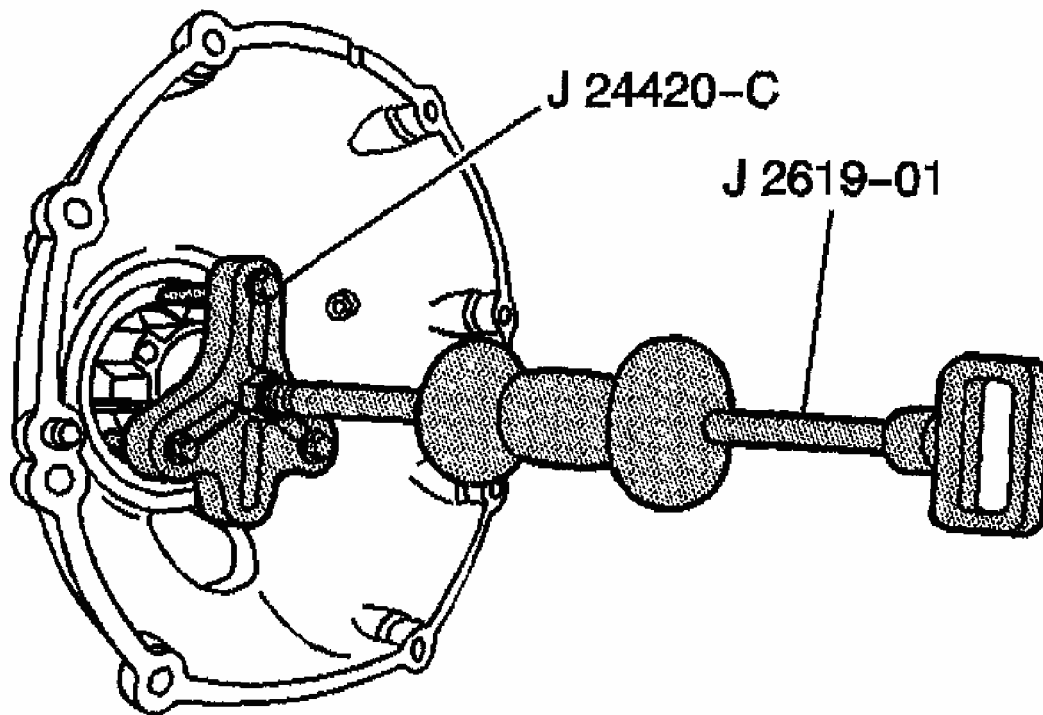
5. Remove the rear bearing housing bolt hole plugs (1-3).



G01732148

**Fig. 149: Removing Rear Bearing Housing Bolt Hole Plugs**  
Courtesy of GENERAL MOTORS CORP.

6. Install the J 24420-C and three M10-1.5 x 120 mm bolts to the rear bearing housing.
7. Install the J 2619-01 to the J 24420-C and separate the propeller shaft assembly from the driveline tube.

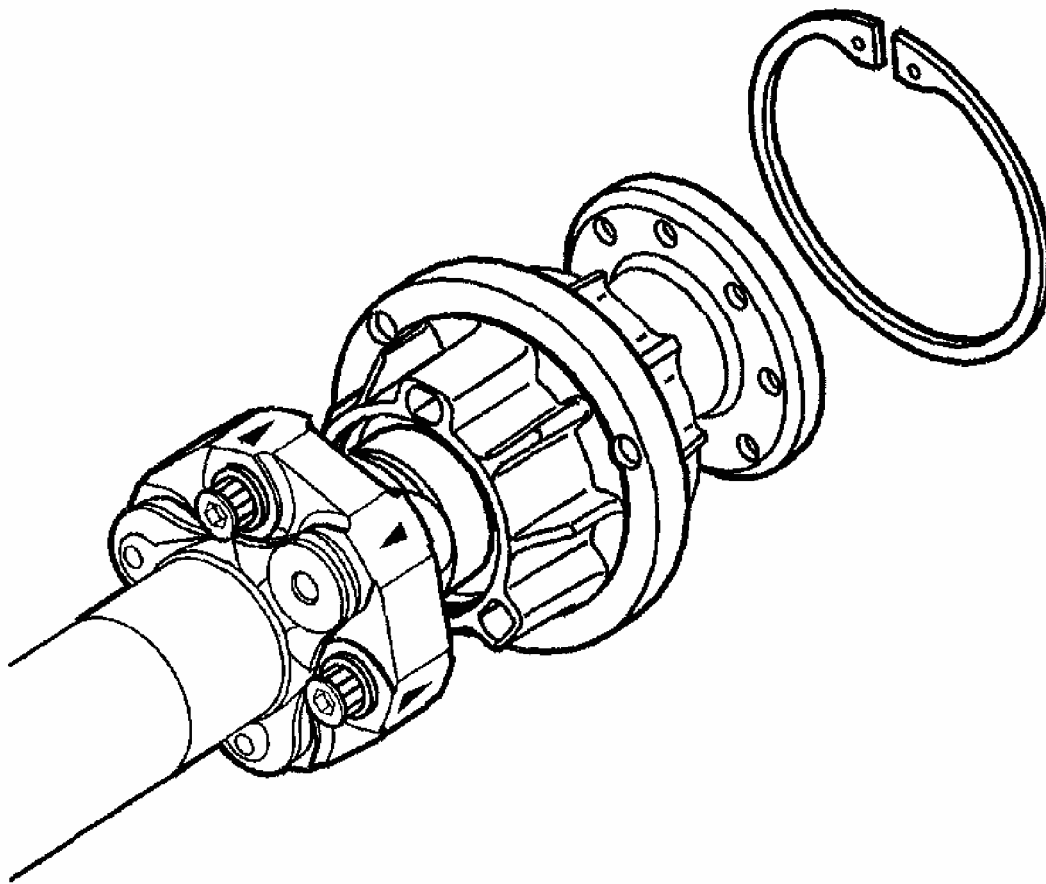


G01732149

**Fig. 150: Identifying Slide Hammer & Harmonic Balancer Puller**  
Courtesy of GENERAL MOTORS CORP.

**Important:** In order to prevent binding, the propeller shaft assembly must be withdrawn straight and evenly from the driveline tube.

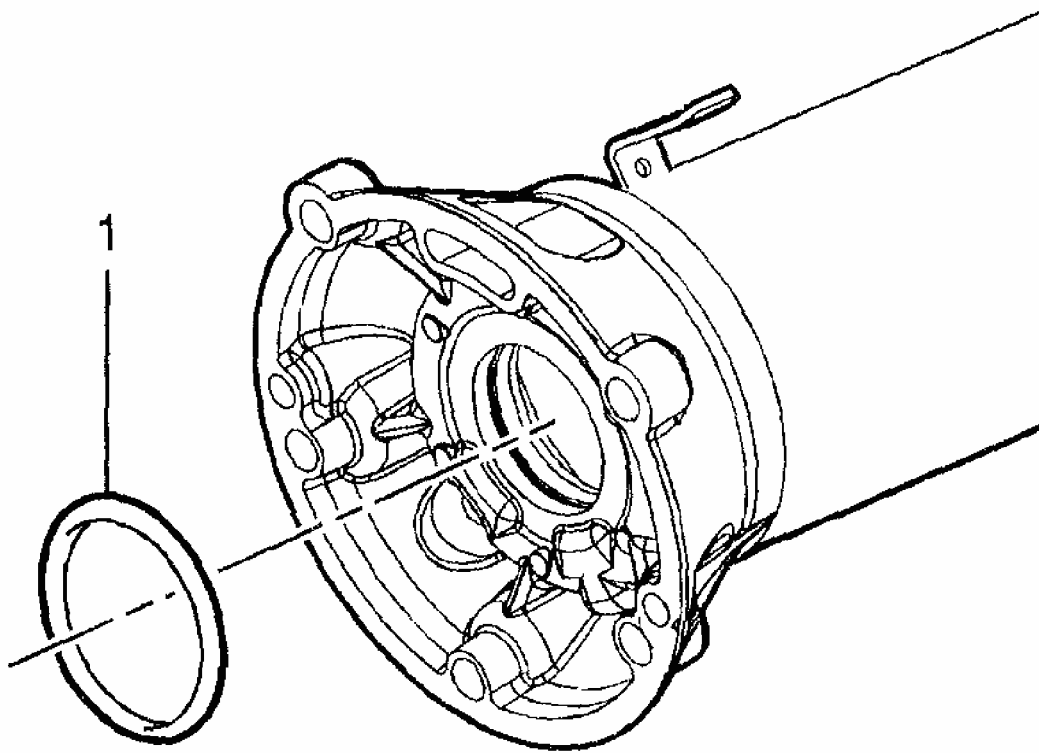
8. Remove the propeller shaft assembly from the driveline tube.



G01732150

**Fig. 151: Identifying Propeller Shaft Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

9. Remove the O-ring (1) from the front of the driveline tube.
10. Discard the O-ring.

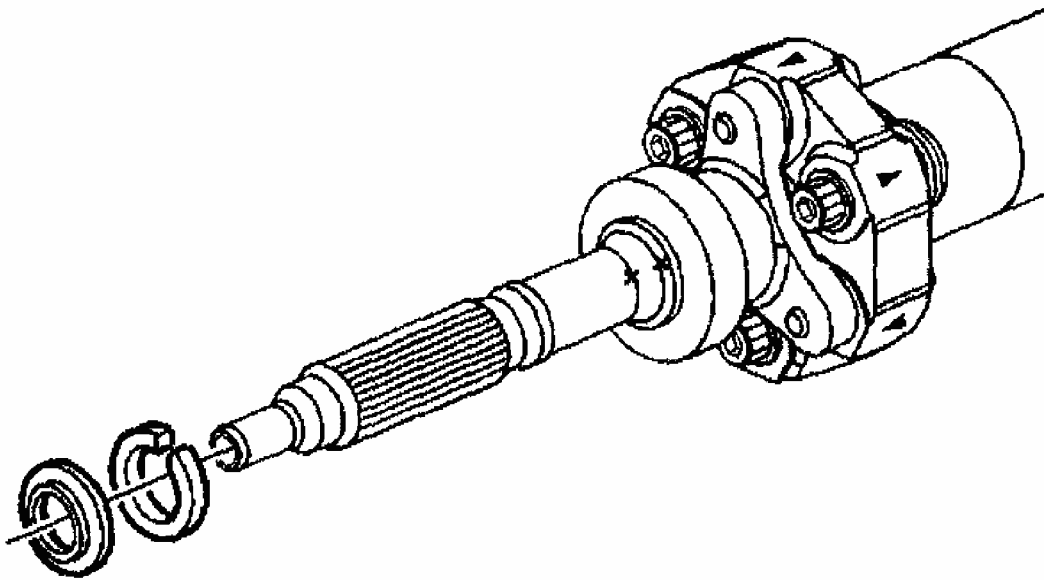


G01732151

**Fig. 152: Removing Driveline O-Ring**  
**Courtesy of GENERAL MOTORS CORP.**

11. Remove the slinger washer from the input shaft.
12. Discard the slinger washer.
13. Remove the snap ring from the input shaft.

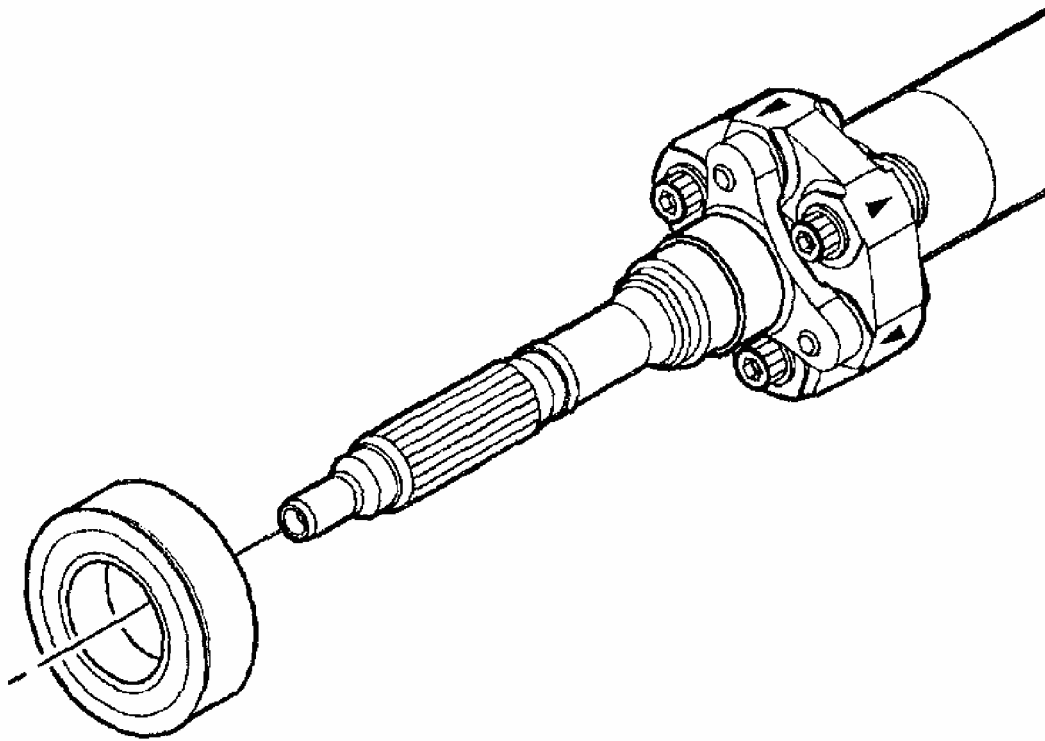




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**Fig. 153: Removing Input Shaft Slinger Washer & Snap Ring**  
Courtesy of GENERAL MOTORS CORP.

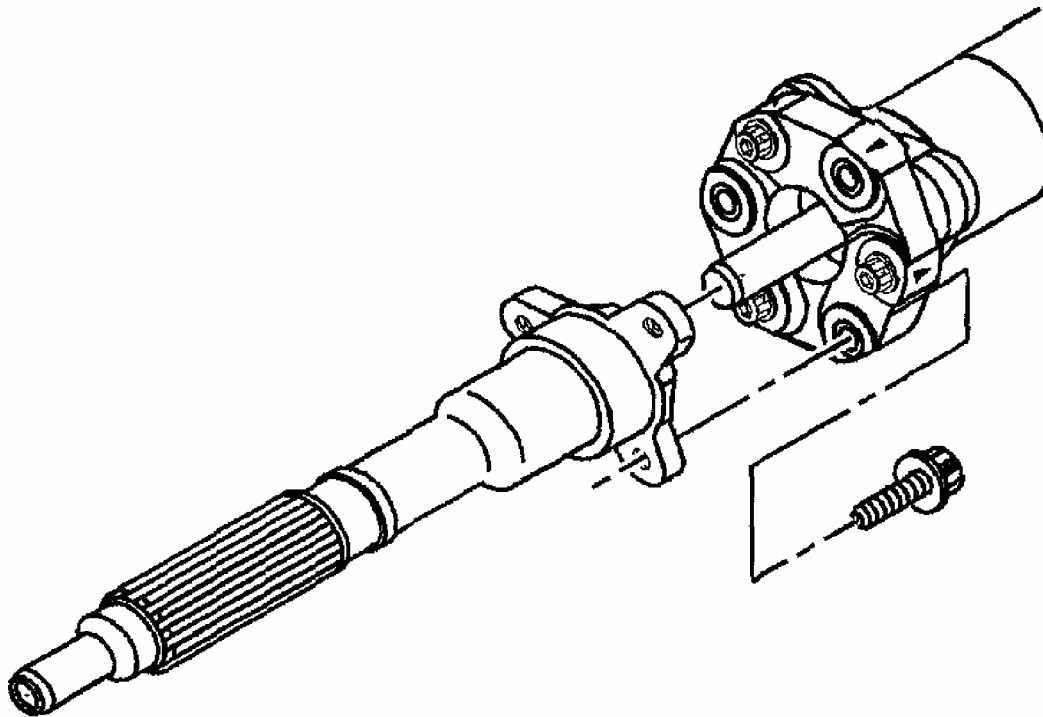
14. Remove the bearing from the input shaft.



G01732153

**Fig. 154: Removing Input Shaft Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

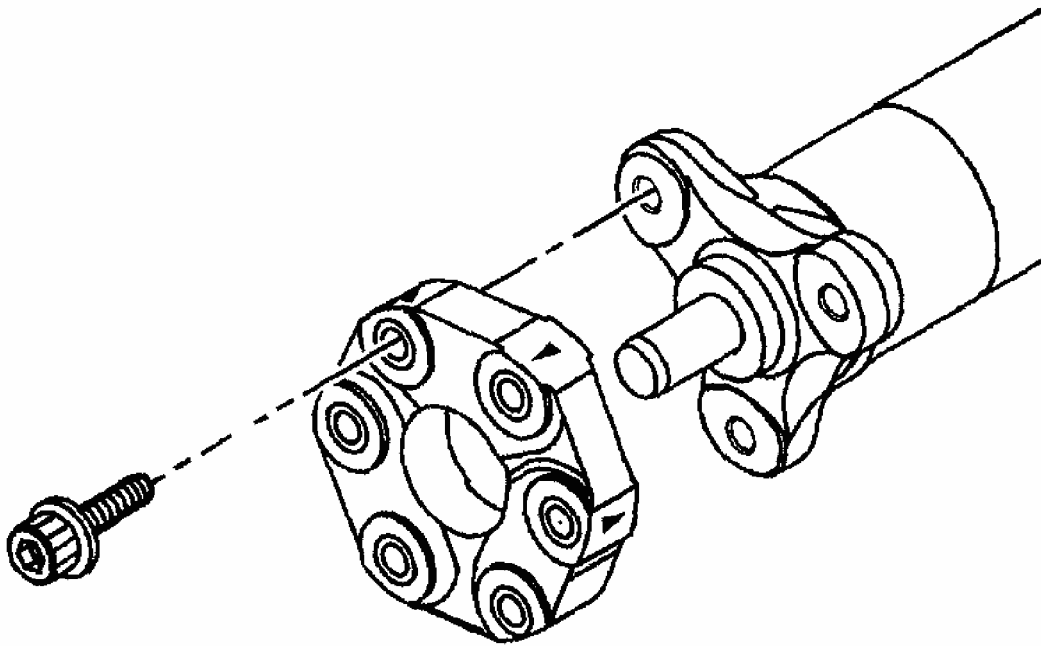
15. Remove the input shaft, bolts, and washers from the front coupling.



G01732154

**Fig. 155: Removing Input Shaft Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

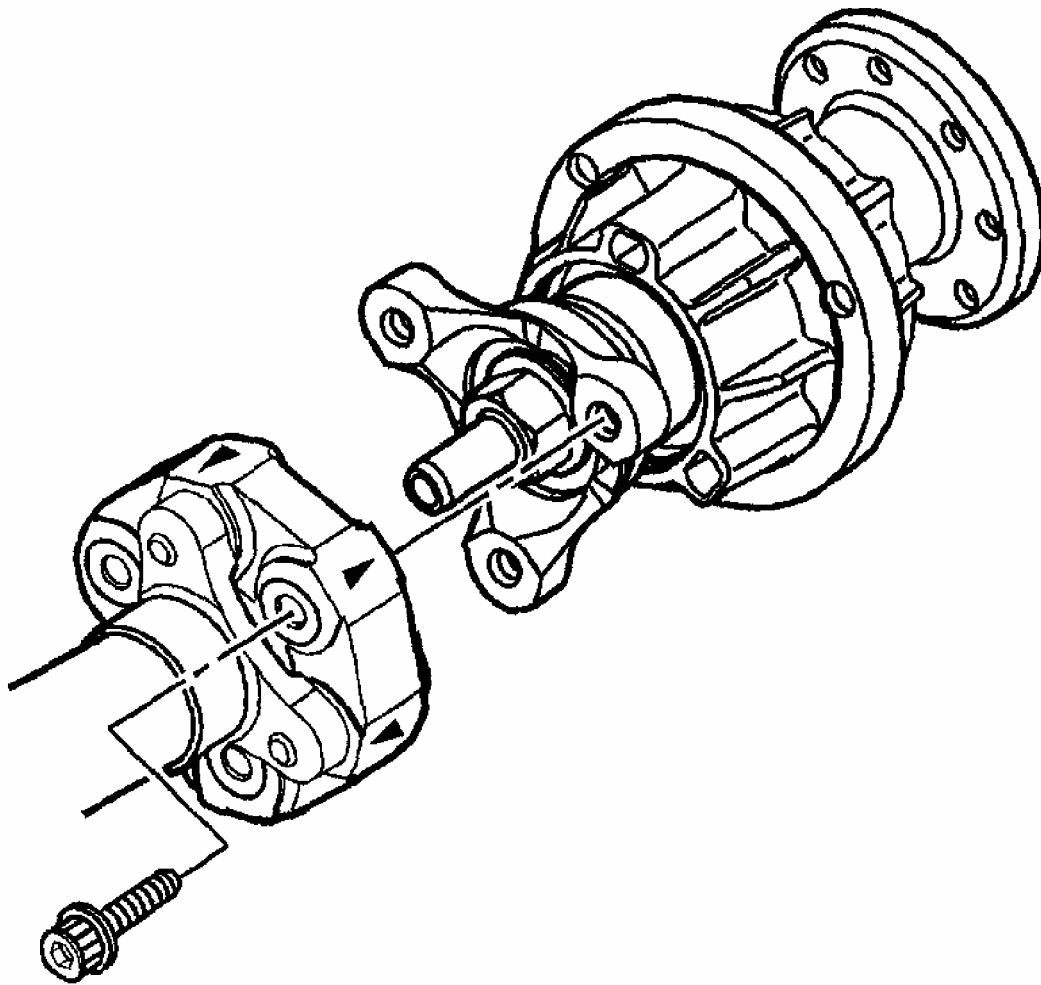
16. Remove the front coupling, bolts, and washers from the propeller shaft.



G01732155

**Fig. 156: Removing Front Coupling Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

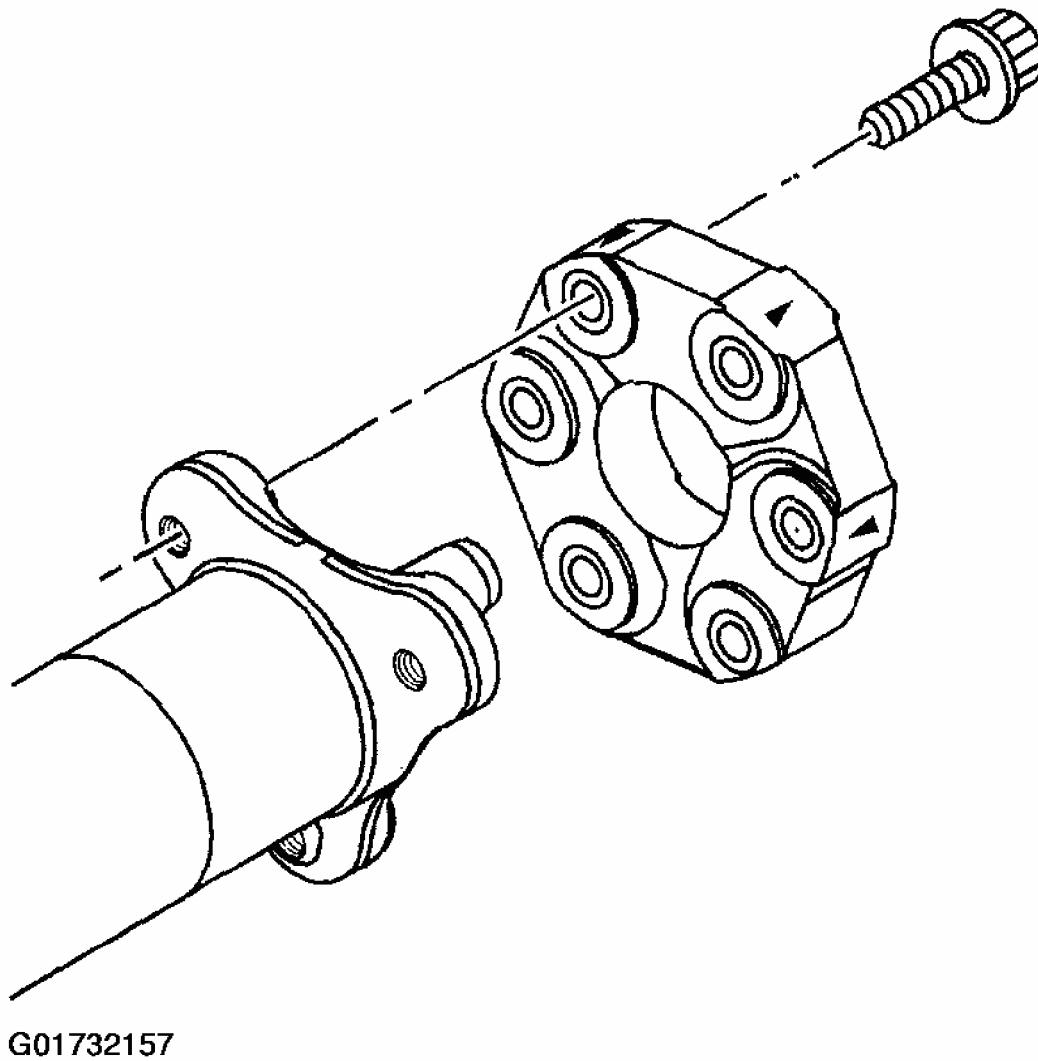
17. Remove the bearing housing assembly, bolts, and washers from the rear coupling.



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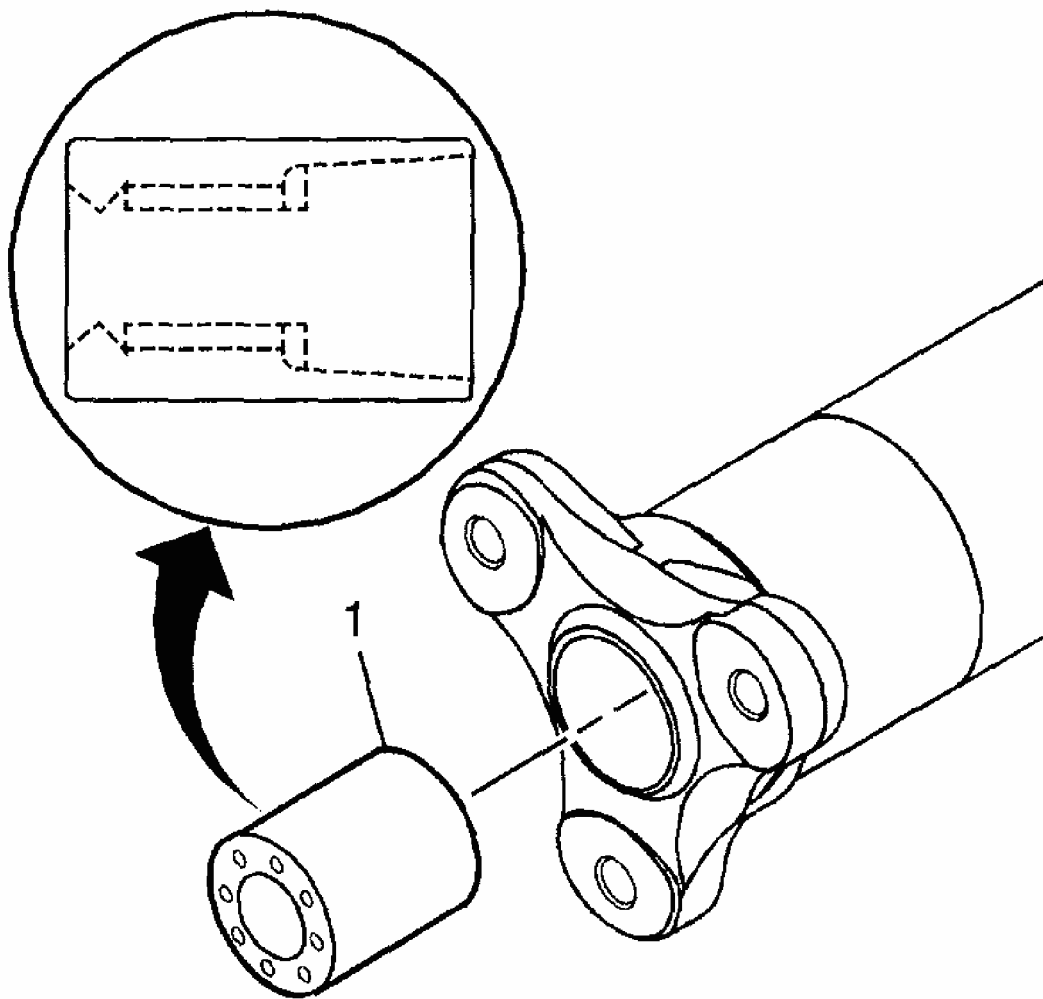
**Fig. 157: Removing Bearing Housing Assembly Retaining Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

18. Remove the rear coupling, bolts, and washers from the propeller shaft.



**Fig. 158: Removing Rear Coupling Retaining Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

19. Remove the bushing (1) from the propeller shaft, if required - (automatic transmission).

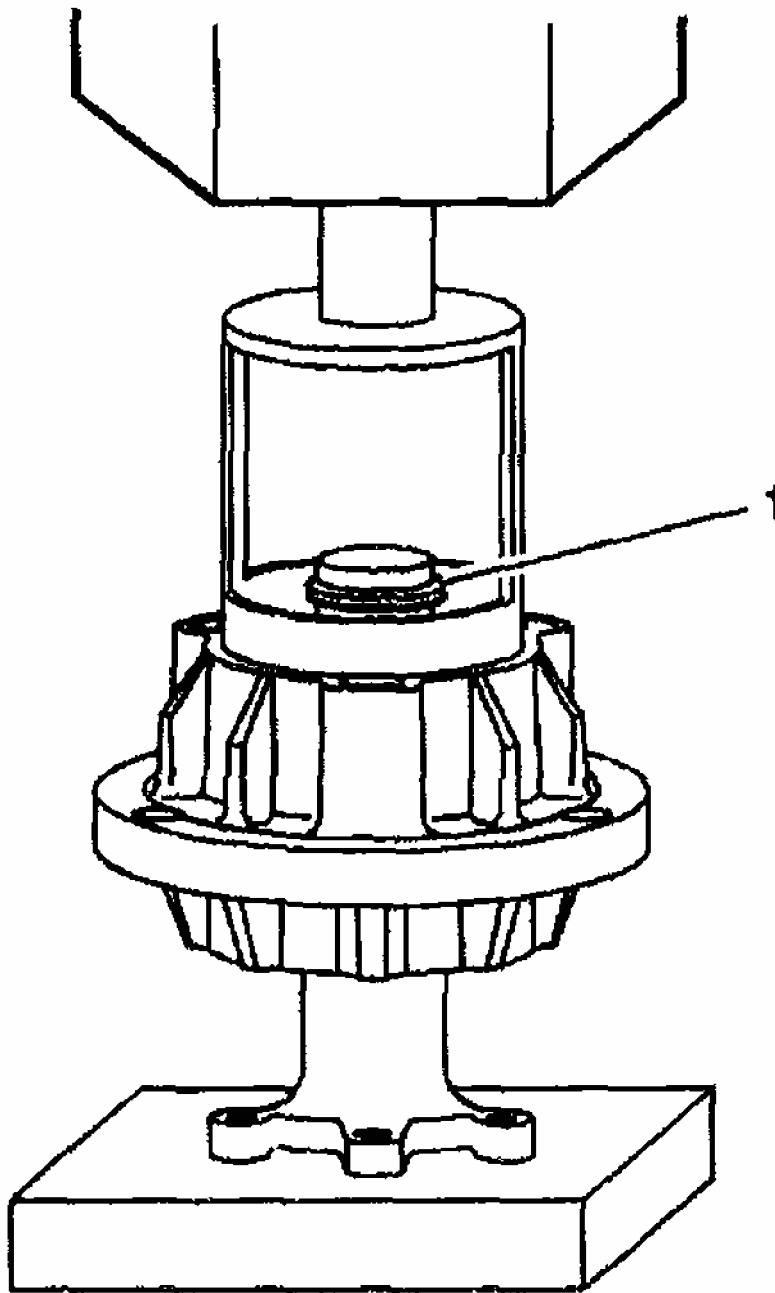


G01732158

**Fig. 159: Removing Propeller Shaft Bushing**  
**Courtesy of GENERAL MOTORS CORP.**

**Rear Bearing Housing Disassembly - Manual Transmission**

1. Position the rear bearing housing assembly into a press. Apply pressure to the housing and compress the wave washer in order to remove the snap ring (1) from the hub.

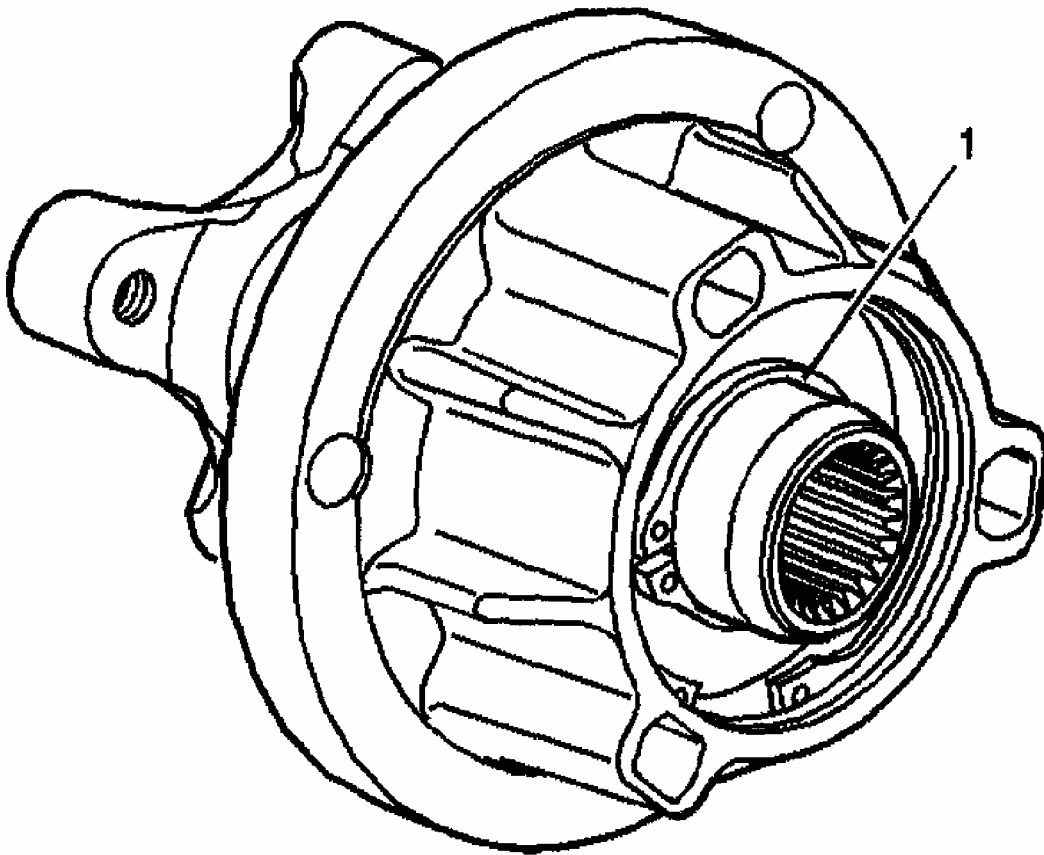


G01732159

**Fig. 160: Locating Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

2. Remove the snap ring (1) from the hub.

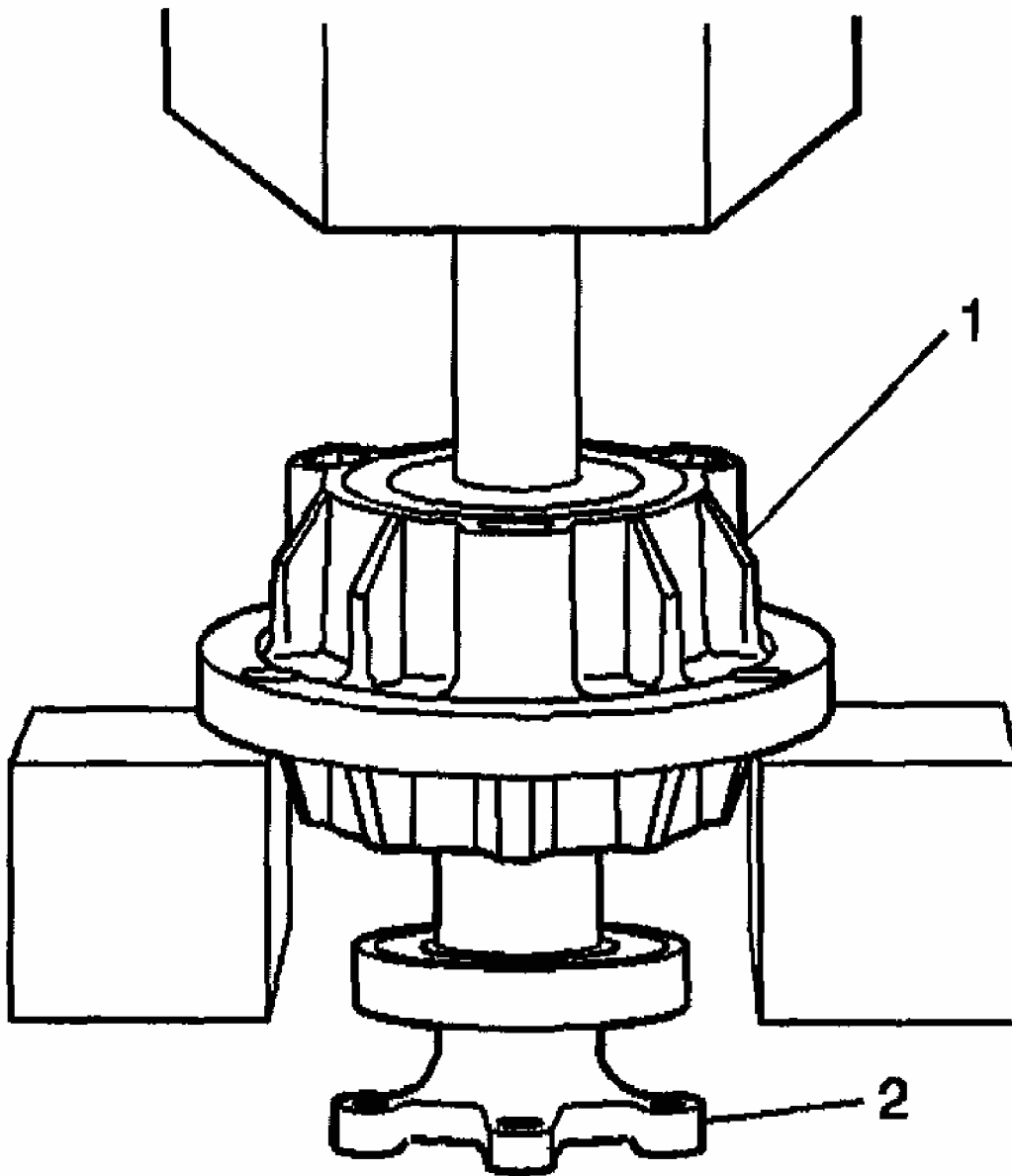




G01732160

**Fig. 161: Removing Rear Hub Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

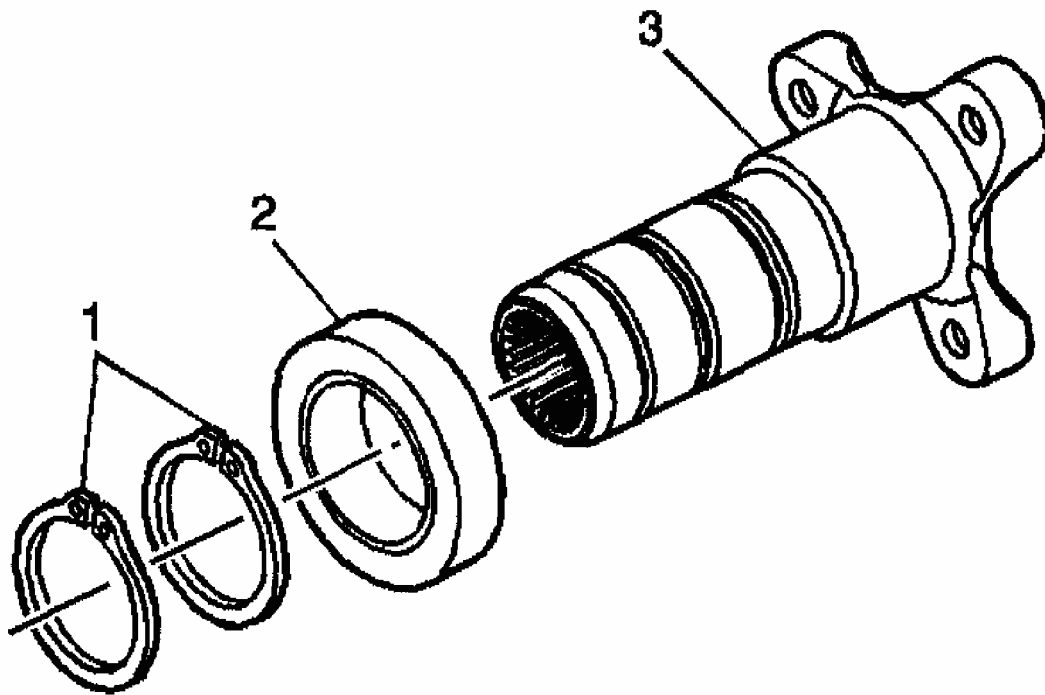
3. Position the bearing housing assembly (1) into a press in order to remove the hub and bearing assembly (2).
4. Remove the hub, with bearing (1) from the housing. The wave washer will remain in the housing.



G01732161

**Fig. 162: Aligning Rear Bearing Housing Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

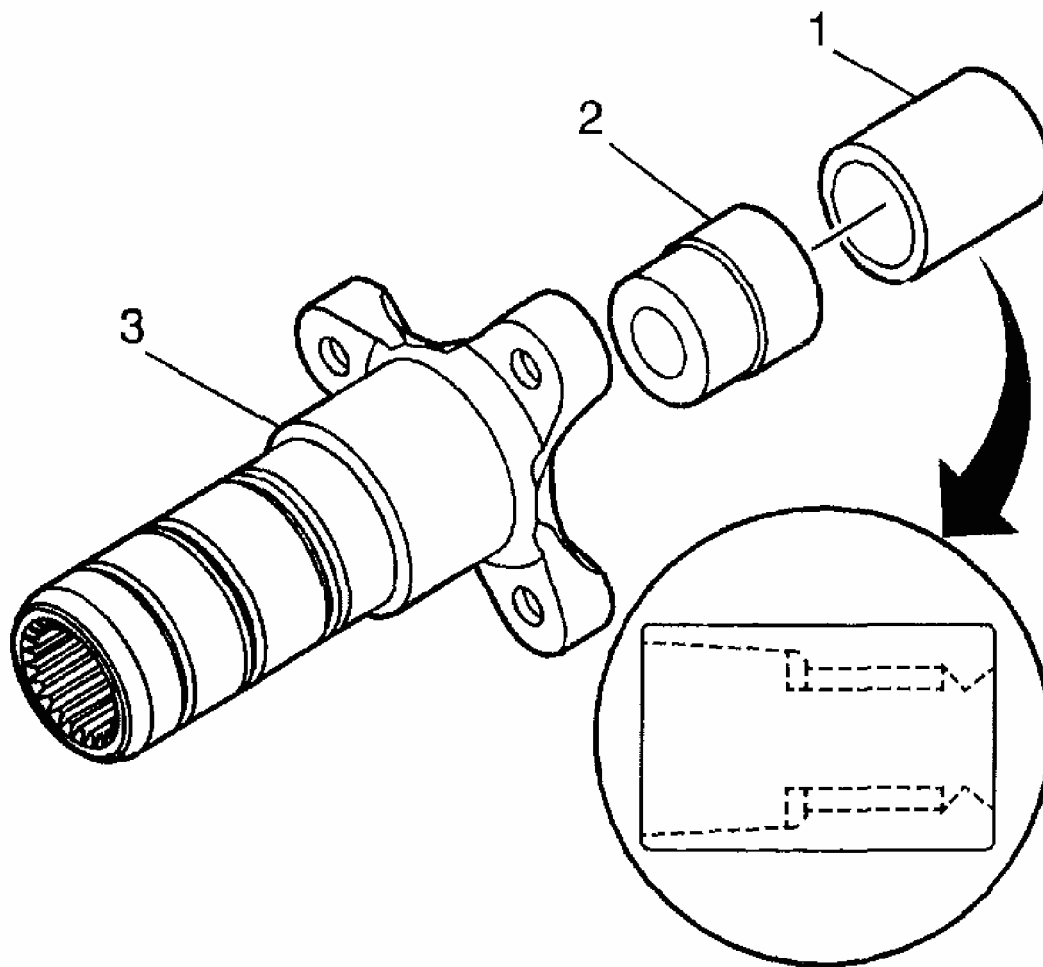
5. Remove the snap rings (1) and bearing (2) from the hub (3).



G01732162

**Fig. 163: Removing Rear Hub Snap Rings & Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

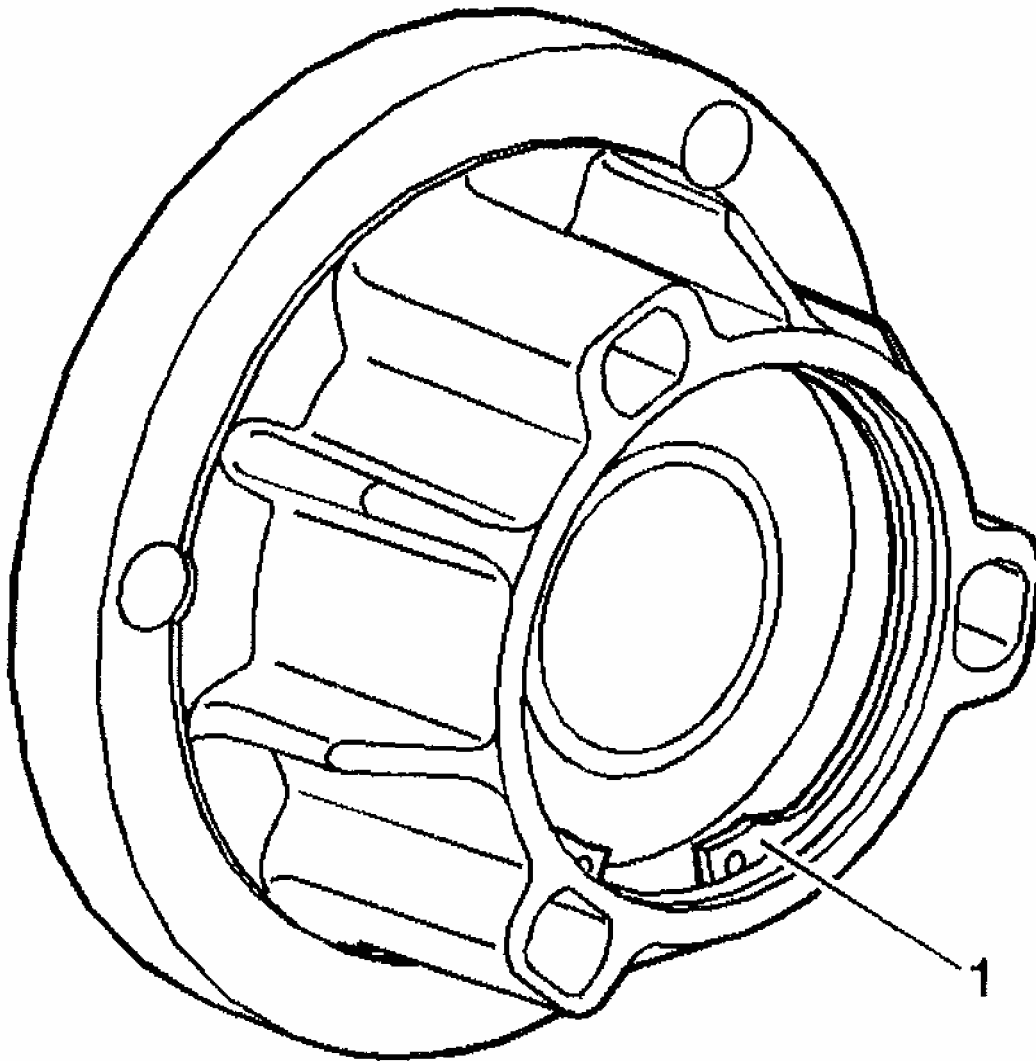
6. Remove the propeller shaft bushing (1) and transmission input shaft bushing (2) from the hub (3) - (manual transmission).



G01732163

**Fig. 164: Removing Propeller Shaft & Transmission Input Shaft Bushings**  
**Courtesy of GENERAL MOTORS CORP.**

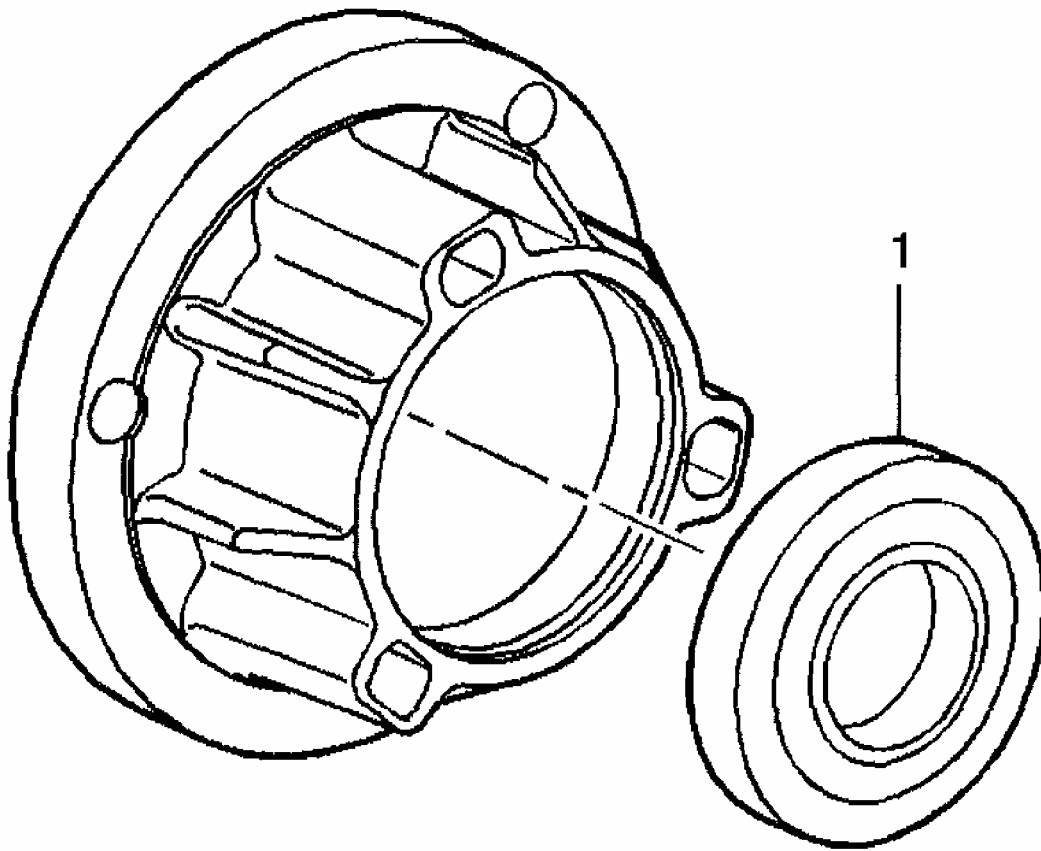
7. Remove the snap ring (1) from the rear bearing housing.



G01732164

**Fig. 165: Removing Rear Bearing Housing Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

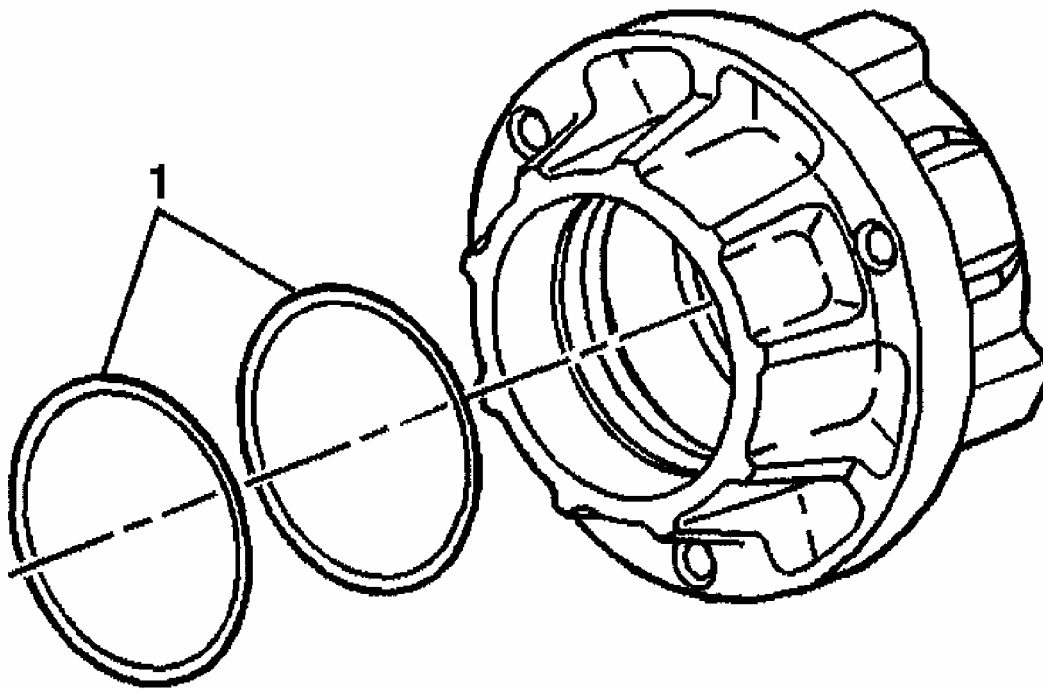
8. Position the rear bearing housing into a press and remove the bearing (1).



G01732165

**Fig. 166: Removing Rear Bearing Housing Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

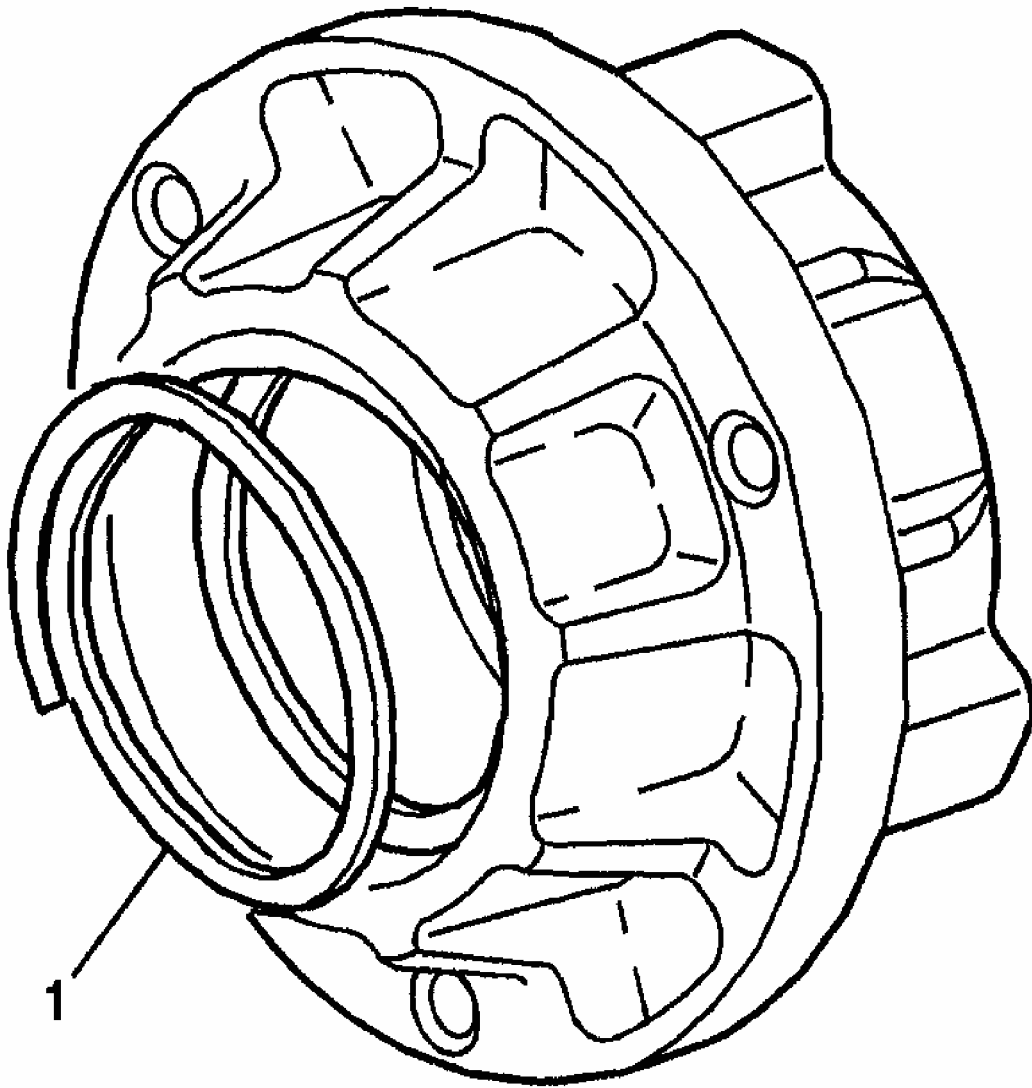
9. Remove the O-rings (1) from the rear bearing housing.
10. Discard the O-rings.



G01732166

**Fig. 167: Removing Rear Bearing Housing O-Rings**  
**Courtesy of GENERAL MOTORS CORP.**

11. Remove the wave washer (1) from the rear bearing housing.



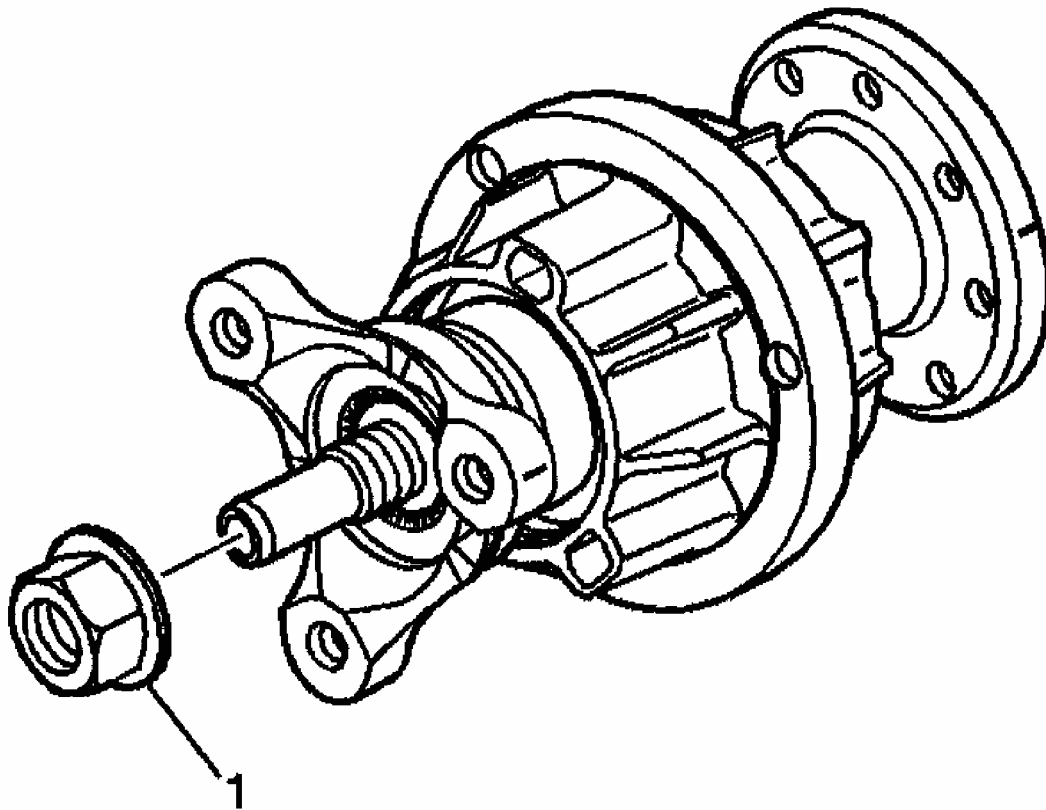
G01732167

**Fig. 168: Removing Rear Bearing Housing Wave Washer**  
**Courtesy of GENERAL MOTORS CORP.**

**Rear Bearing Housing Disassembly - Automatic Transmission**

1. Mark the assembled positions of the flange and spindle.
2. Remove the nut (1) from the flexplate spindle.

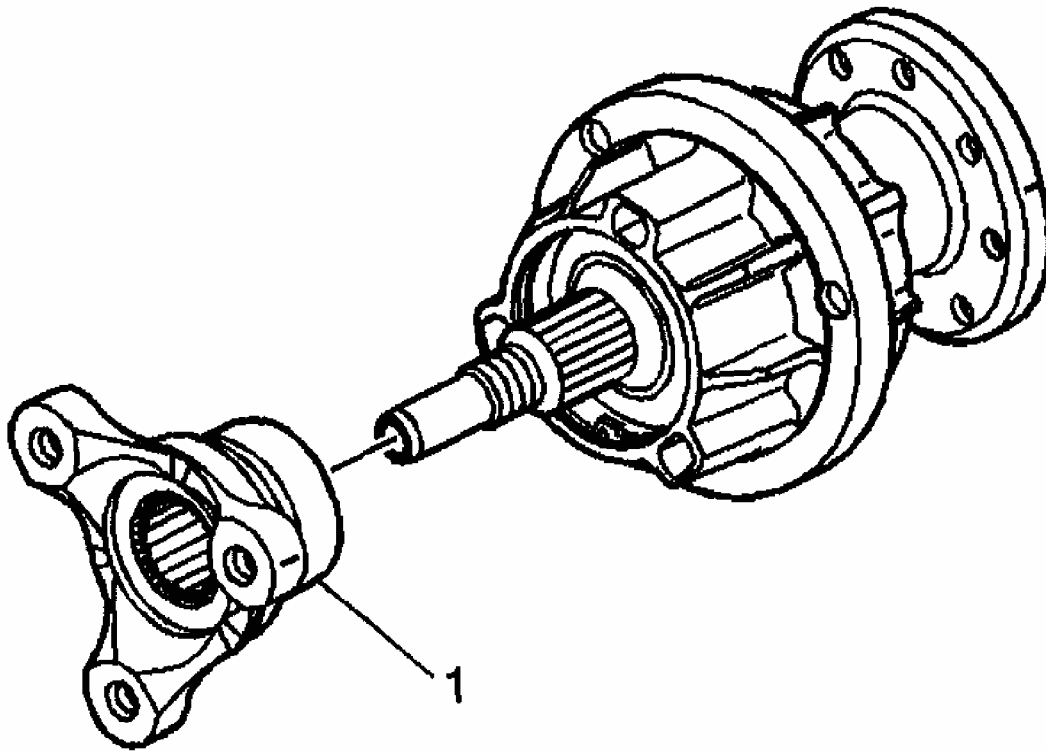




G01732168

**Fig. 169: Removing Flexplate Spindle Nut**  
**Courtesy of GENERAL MOTORS CORP.**

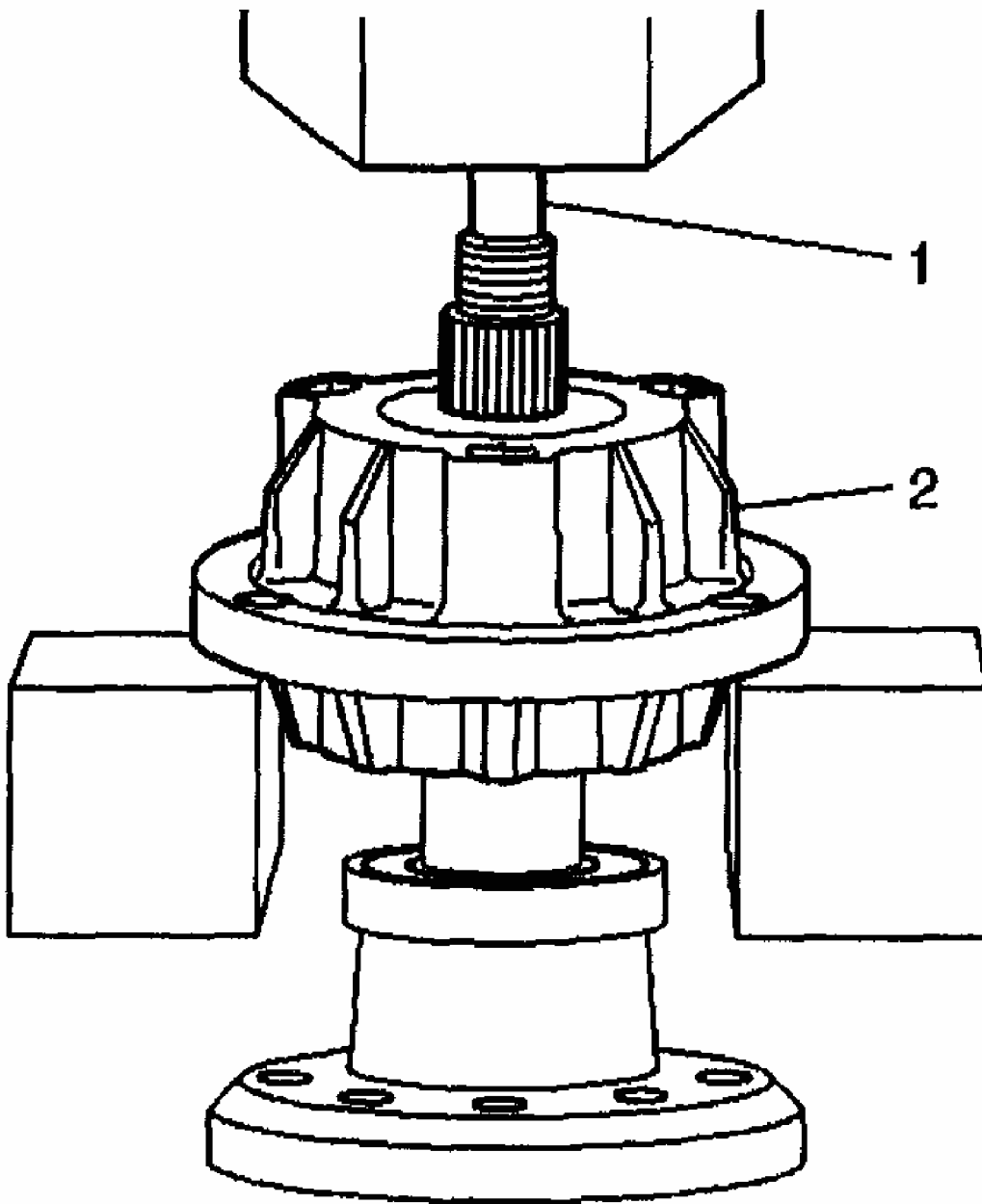
3. Remove the hub (1) from the flexplate spindle.



G01732169

**Fig. 170: Removing Rear Hub**  
Courtesy of GENERAL MOTORS CORP.

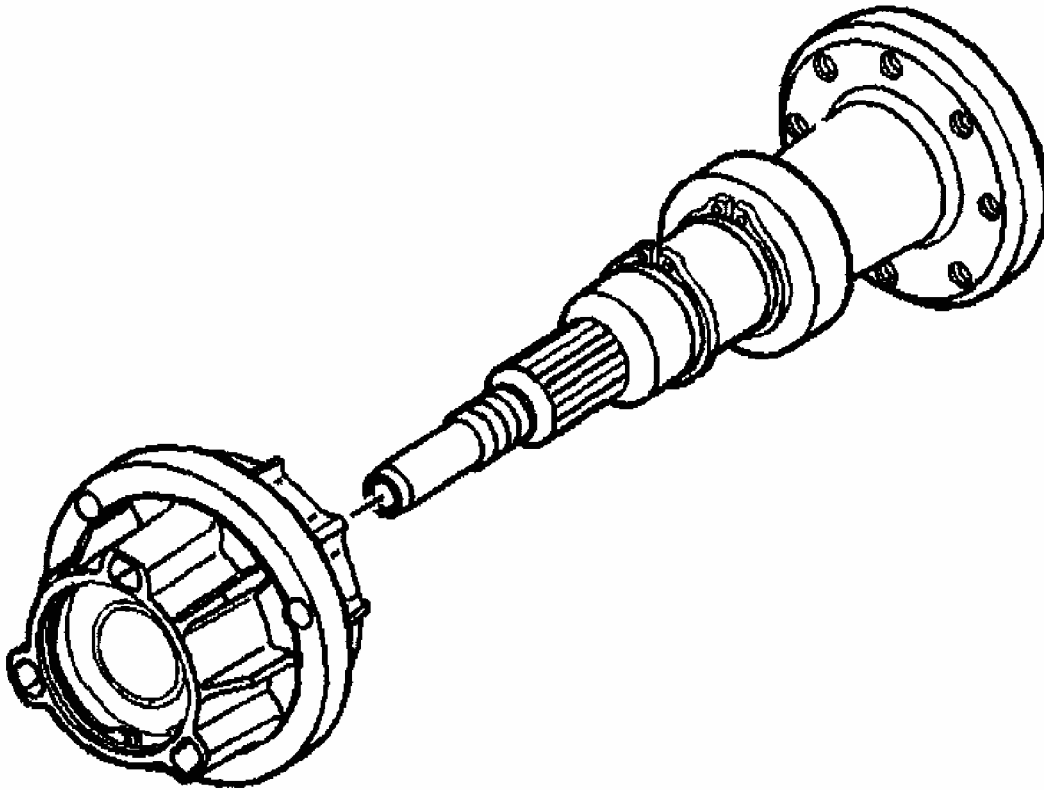
4. Position the bearing housing assembly (2) into a press in order to remove the flexplate spindle (1).



G01732170

**Fig. 171: Aligning Bearing Housing Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

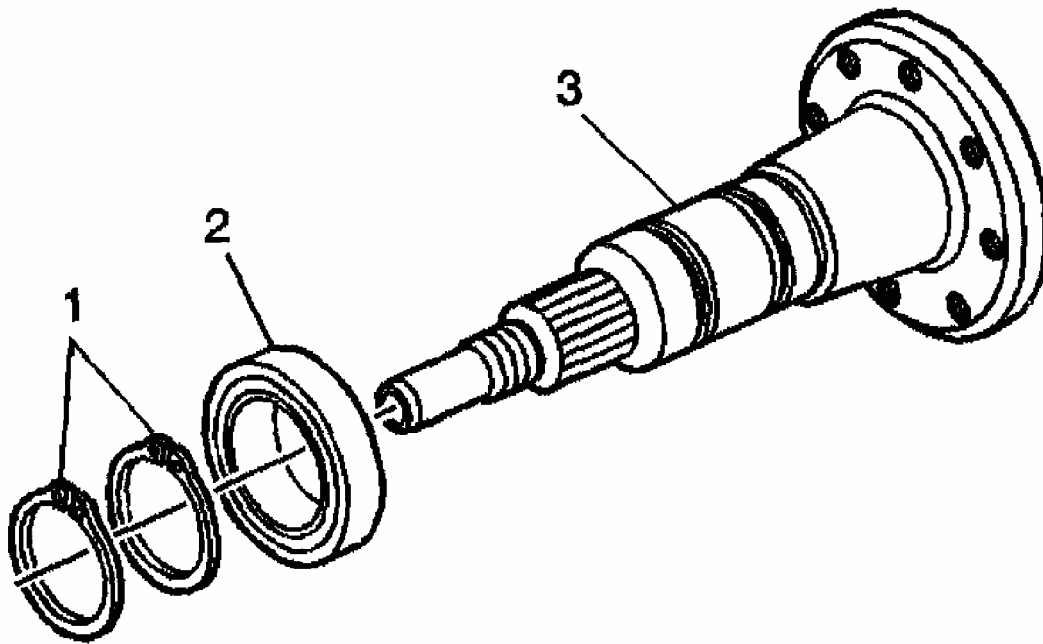
5. Remove the flexplate spindle, with bearing, from the bearing housing.



G01732171

**Fig. 172: Removing Flexplate Spindle**  
**Courtesy of GENERAL MOTORS CORP.**

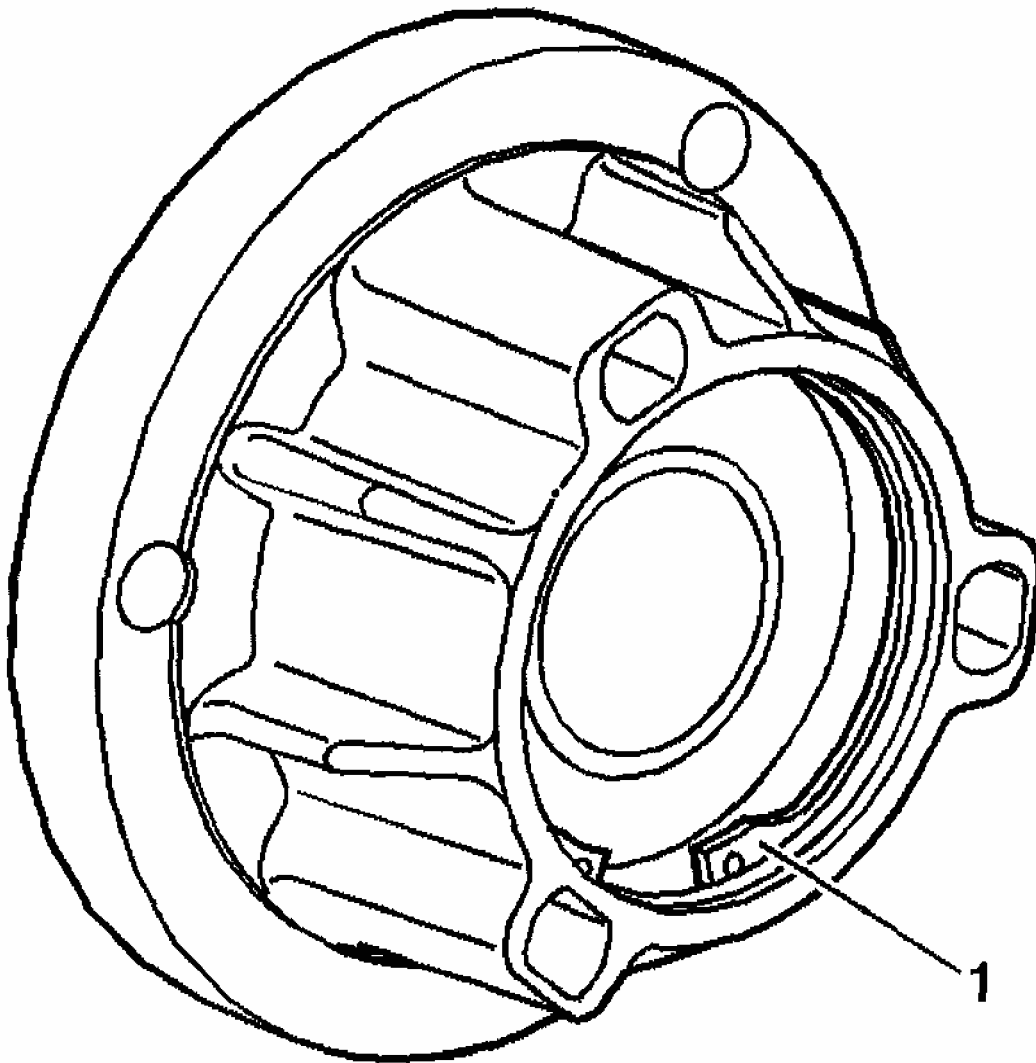
6. Remove the snap rings (1) and bearing (2) from the flexplate spindle (3).



G01732172

**Fig. 173: Removing Flexplate Snap Rings & Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

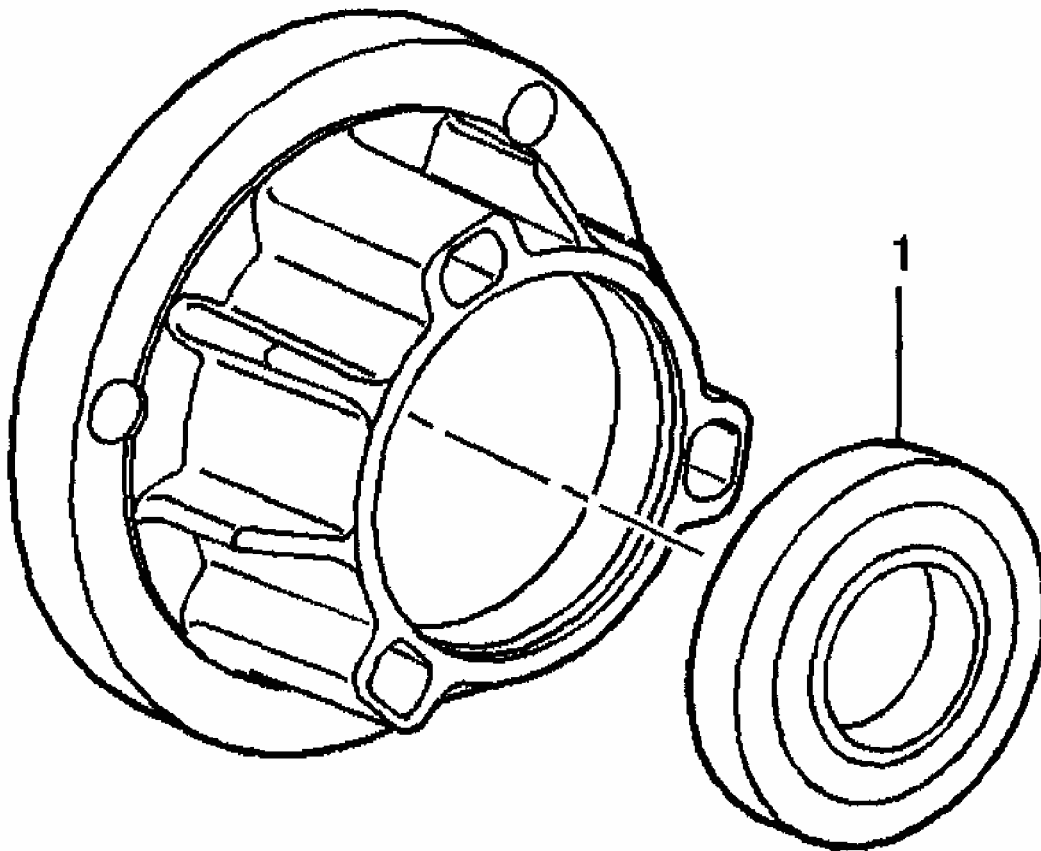
7. Remove the snap ring (1) from the rear bearing housing.



G01732173

**Fig. 174: Removing Rear Bearing Housing Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

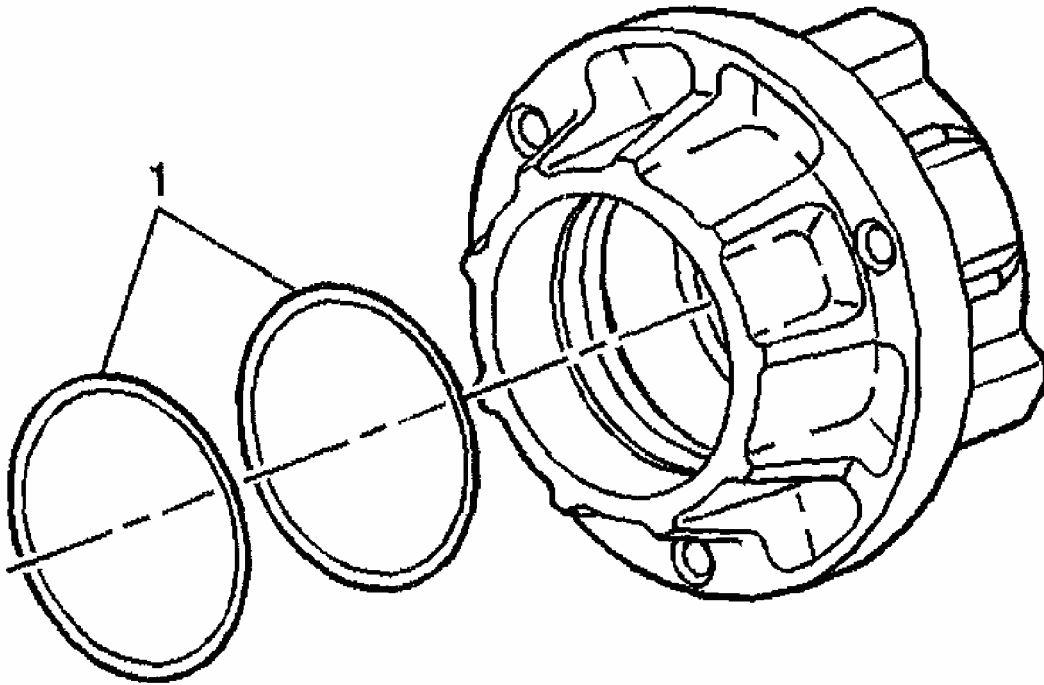
8. Position the rear bearing housing into a press and remove the bearing (1).



G01732174

**Fig. 175: Removing Rear Bearing Housing Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

9. Remove the O-rings (1) from the rear bearing housing.
10. Discard the O-rings.



G01732175

**Fig. 176: Removing Rear Bearing Housing O-Rings**  
Courtesy of GENERAL MOTORS CORP.

#### DRIVELINE SUPPORT ASSEMBLY CLEANING & INSPECTION

##### Tools Required

**J 7872** Magnetic Base Dial Indicator Set

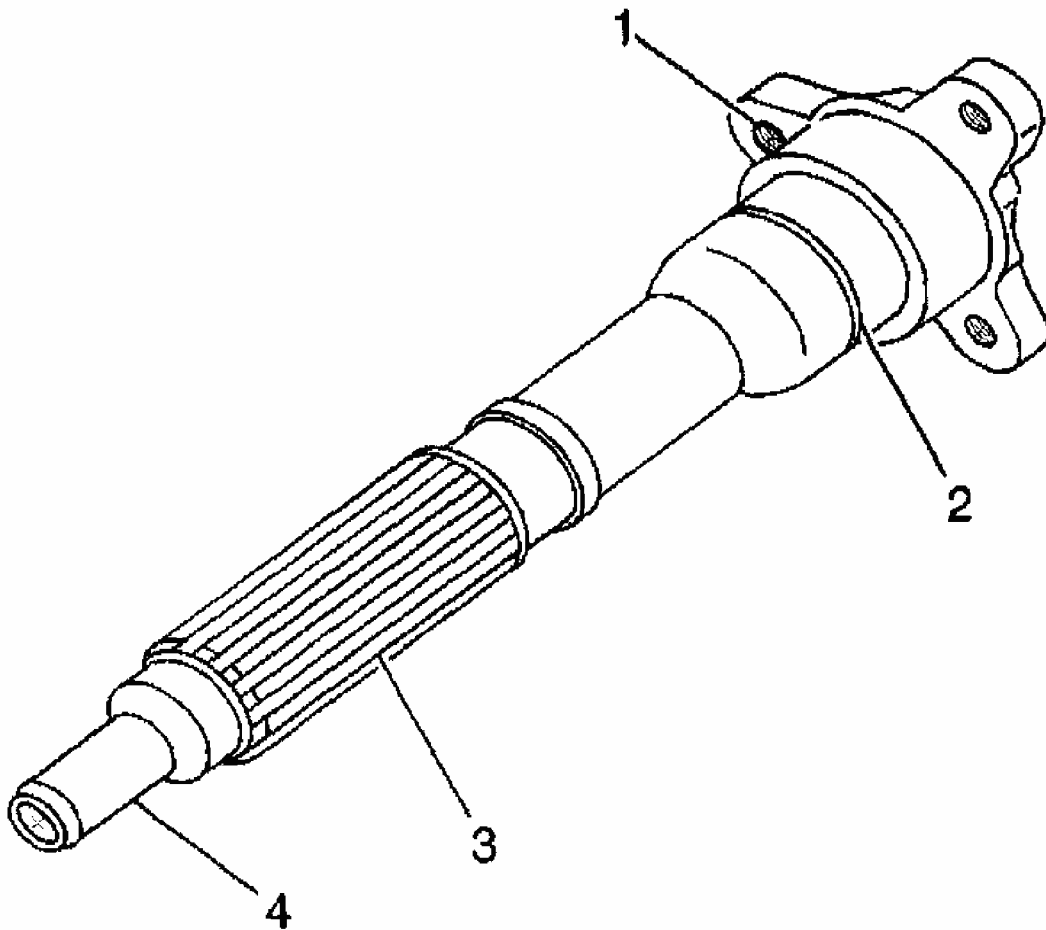
1. Clean all bolts and bolt holes of threadlocking material.
2. Clean the components in solvent.

**WARNING: Wear safety glasses in order to avoid eye damage.**

3. Dry the components with compressed air.
4. Inspect the hub for the following:
  - Damaged bolt hole threads (1)
  - Damaged snap ring grooves (2)
  - Worn splines (3)
  - Worn or scored surface (4)



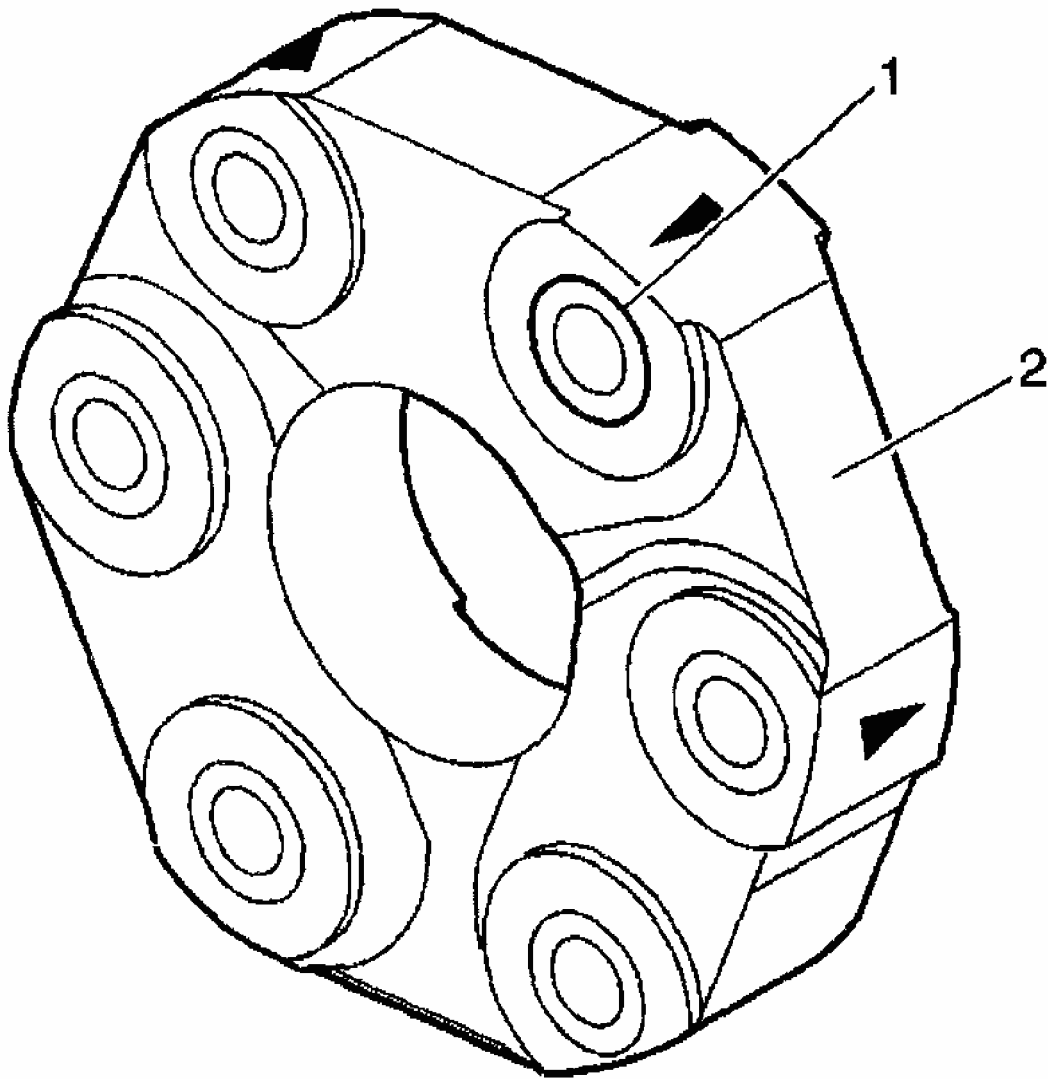
- Worn or damaged bushing



G01732176

**Fig. 177: Checking Hub**  
**Courtesy of GENERAL MOTORS CORP.**

5. Inspect the couplings for the following:
  - Loose or damaged inserts (1)
  - Worn, cracking, or deteriorated rubber (2) MINOR cracking of the rubber is normal and acceptable. If the cracks expose any frayed fabric or internal windings, replace the coupling.



G01732177

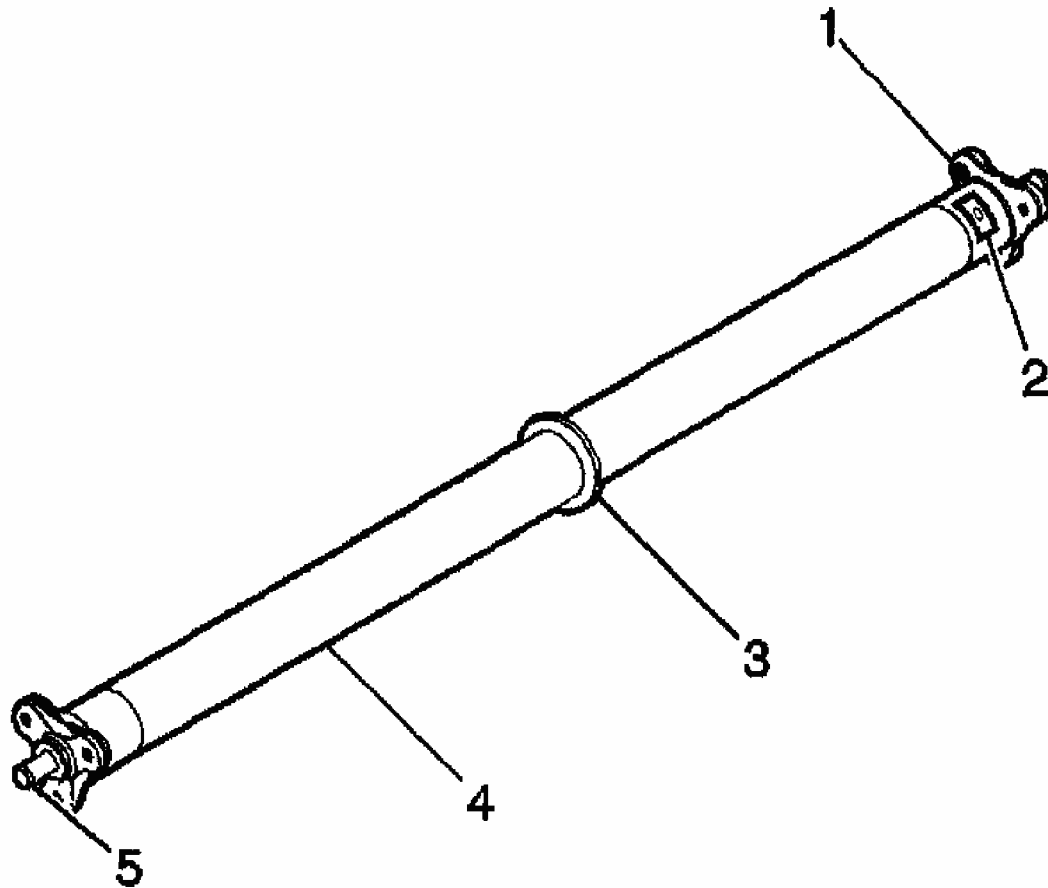
**Fig. 178: Checking Couplings**  
**Courtesy of GENERAL MOTORS CORP.**

6. Inspect the propeller shaft for the following:
- Damaged bolt hole threads (1)
  - Loose or missing balance weights (2) Balance weights may have been installed and removed during the balancing process. In those cases, a weld mark will remain on the propeller tube.

Inspect the inside of the driveline support tube for a missing balance weight.

- Loose or damaged snubber (3) - manual transmission

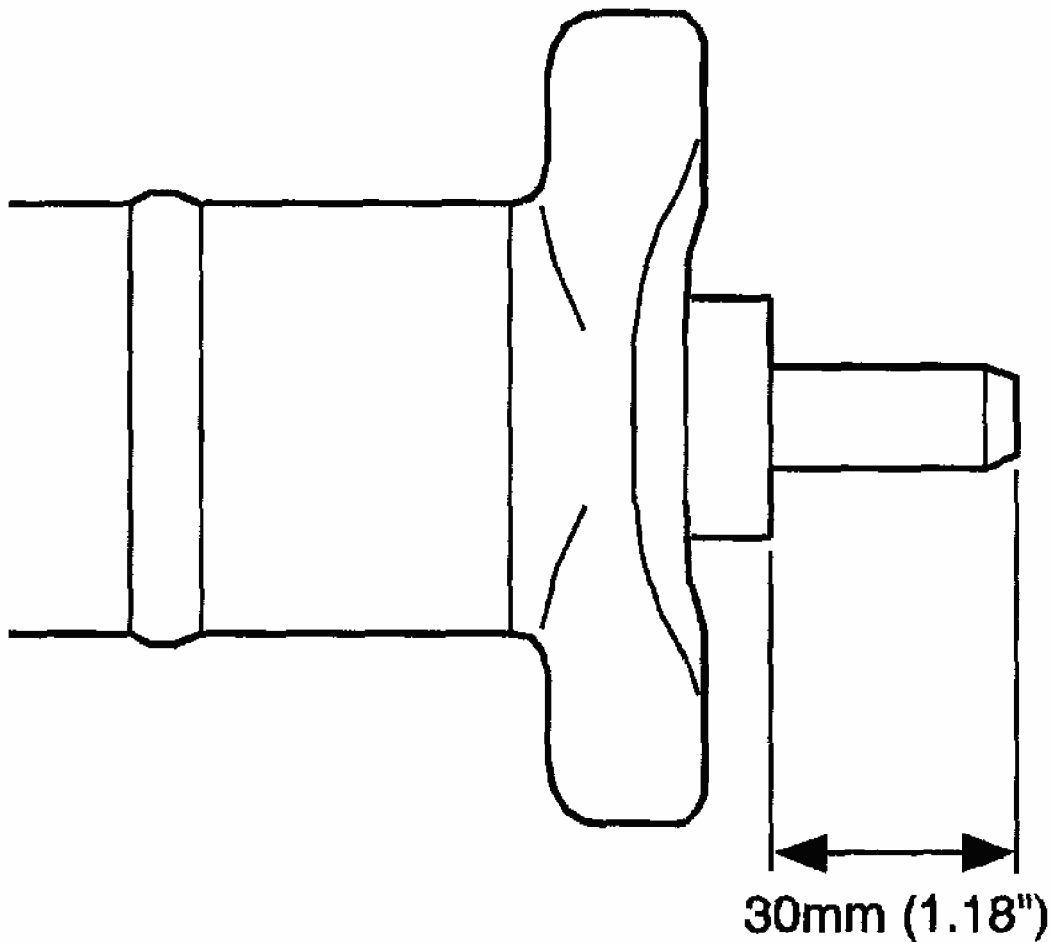
- Dented or damaged propeller shaft tube (4)
- Worn, bent, loose, or damaged pins (5)



G01732178

**Fig. 179: Checking Propeller Shaft**  
**Courtesy of GENERAL MOTORS CORP.**

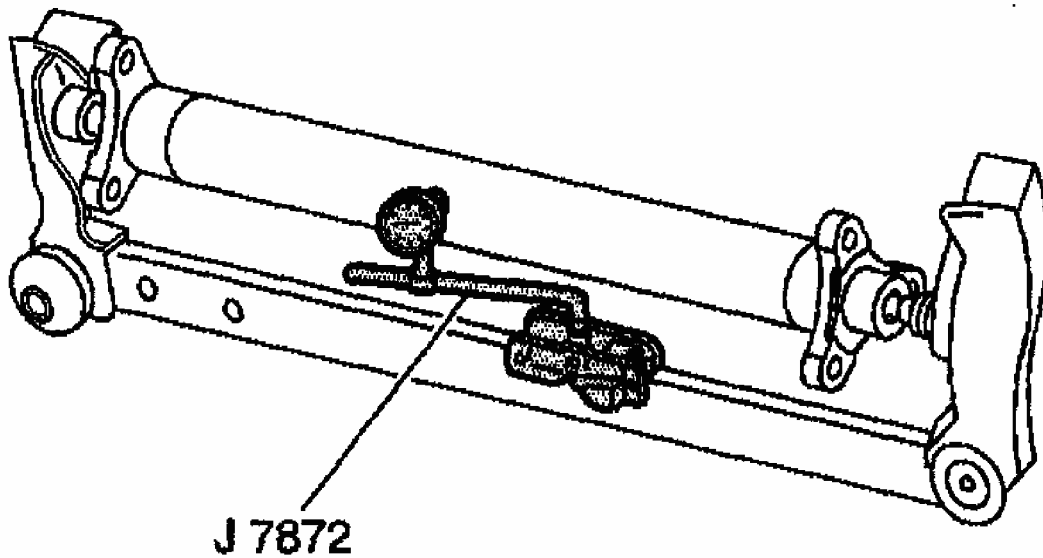
7. Inspect the propeller shaft pins for proper installation. The pin should extend beyond the flange 30 mm (1.18 in).



G01732179

**Fig. 180: Measuring Propeller Shaft Pins**  
**Courtesy of GENERAL MOTORS CORP.**

8. Measure the propeller shaft runout.
  - 8.1. Mount the propeller shaft in wooden V-blocks or between centers on a fixture.
  - 8.2. Check the runout of the propeller shaft in multiple locations, including the barrel ends, using the **J 7872**.
  - 8.3. If propeller shaft runout exceeds 0.3 mm (0.118 in), the propeller shaft is bent and should be replaced.
9. Inspect the snubber - manual transmission - for wear or a flat spot on the outer edge.
10. Check the runout of the snubber. If the runout of the outer edge of the snubber exceeds 2 mm (0.79 in), replace the propeller shaft.

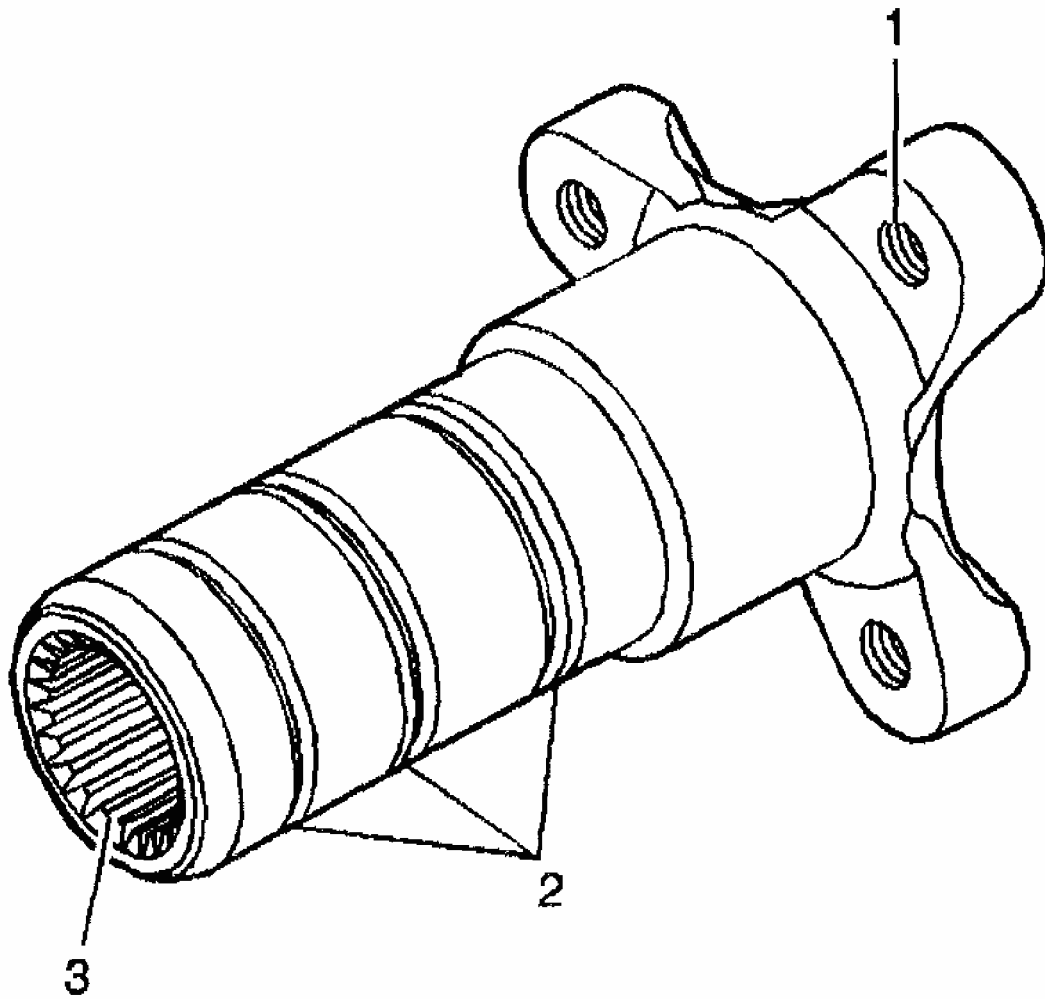


G01732180

**Fig. 181: Identifying Magnetic Base Dial Indicator Set**  
**Courtesy of GENERAL MOTORS CORP.**

11. Inspect the bearing housing hub for the following:

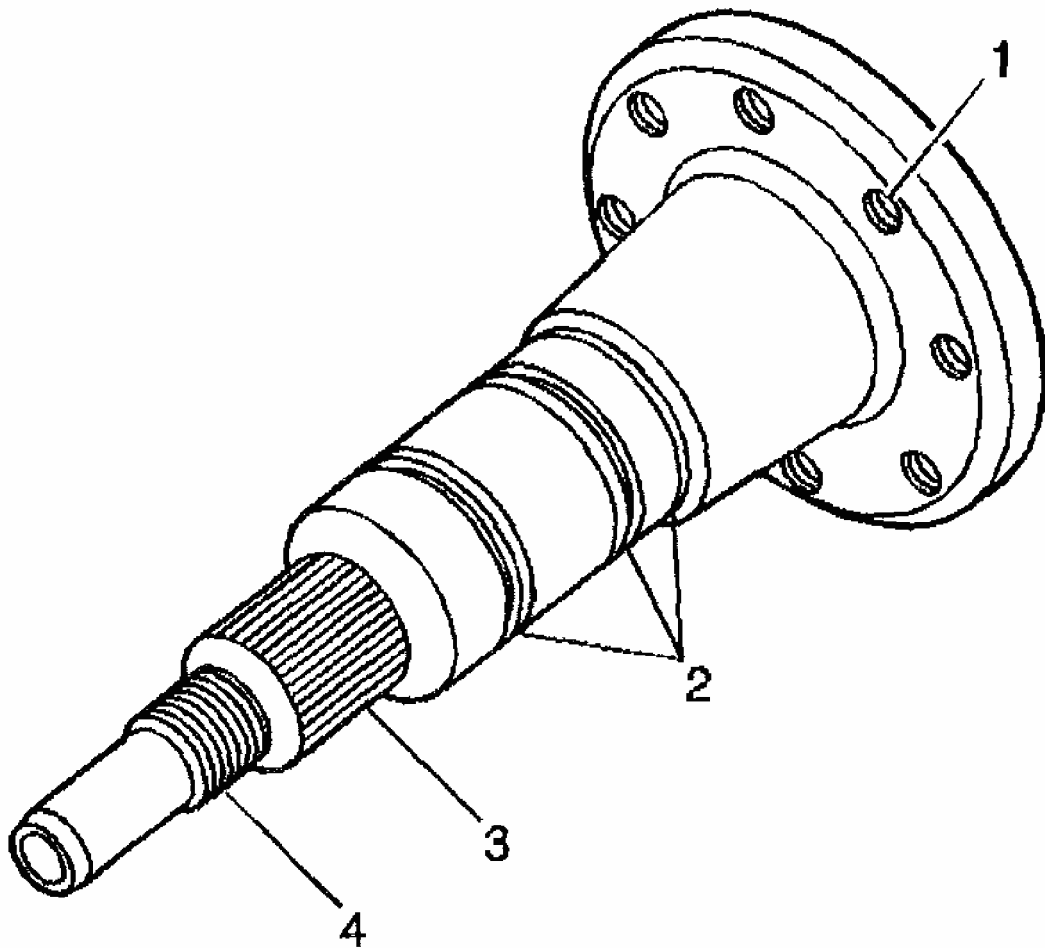
- Damaged bolt hole threads (1)
- Damaged snap ring grooves (2)
- Worn or damaged splines (3)
- Worn or damaged bushings. Bushings that have been removed from the hub will be damaged and should not be reused. Install NEW bushings during assembly.



G01732181

**Fig. 182: Checking Bearing Housing Hub**  
**Courtesy of GENERAL MOTORS CORP.**

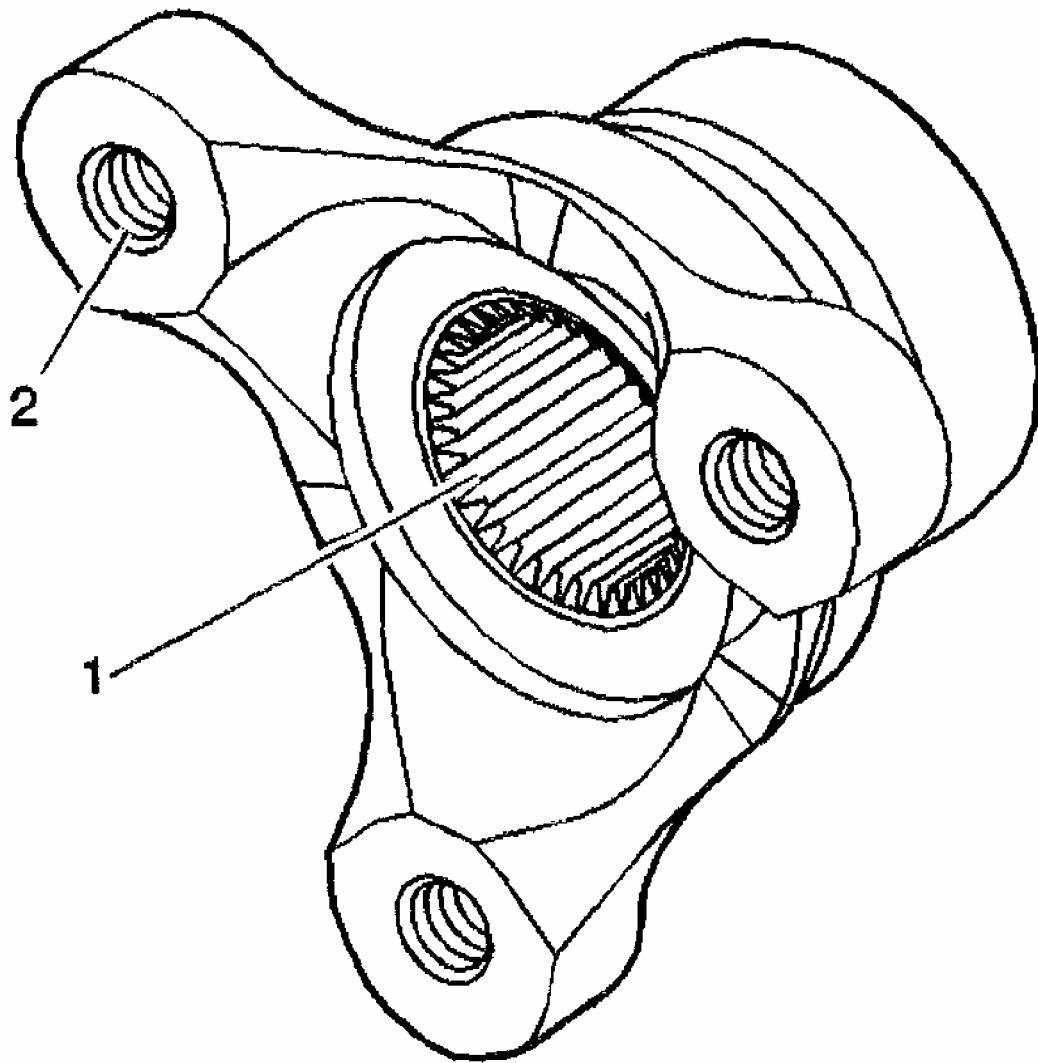
12. Inspect the flexplate spindle - automatic transmission - for the following:
- Damaged bolt hole threads (1)
  - Damaged snap ring grooves (2)
  - Worn or damaged splines (3)
  - Damaged threads (4)



G01732182

**Fig. 183: Checking Flexplate Spindle**  
**Courtesy of GENERAL MOTORS CORP.**

13. Inspect the input hub - automatic transmission - for the following:
- Worn or damaged splines (1)
  - Damaged bolt hole threads (2)

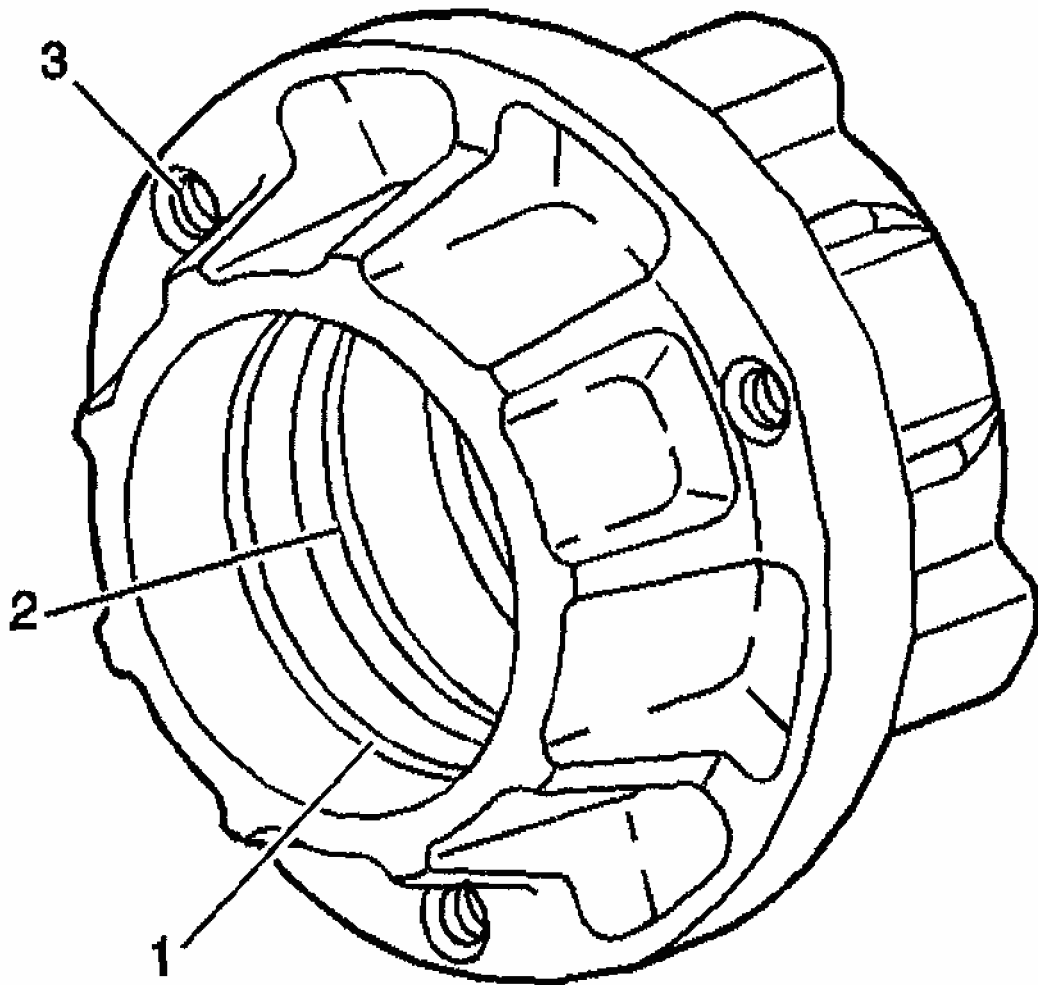


G01732183

**Fig. 184: Checking Input Hub**  
**Courtesy of GENERAL MOTORS CORP.**

14. Inspect the bearing housing for the following:
- Damaged O-ring or snap ring grooves (1-2)
  - Damaged threads (3)
  - Worn or scored bearing bores



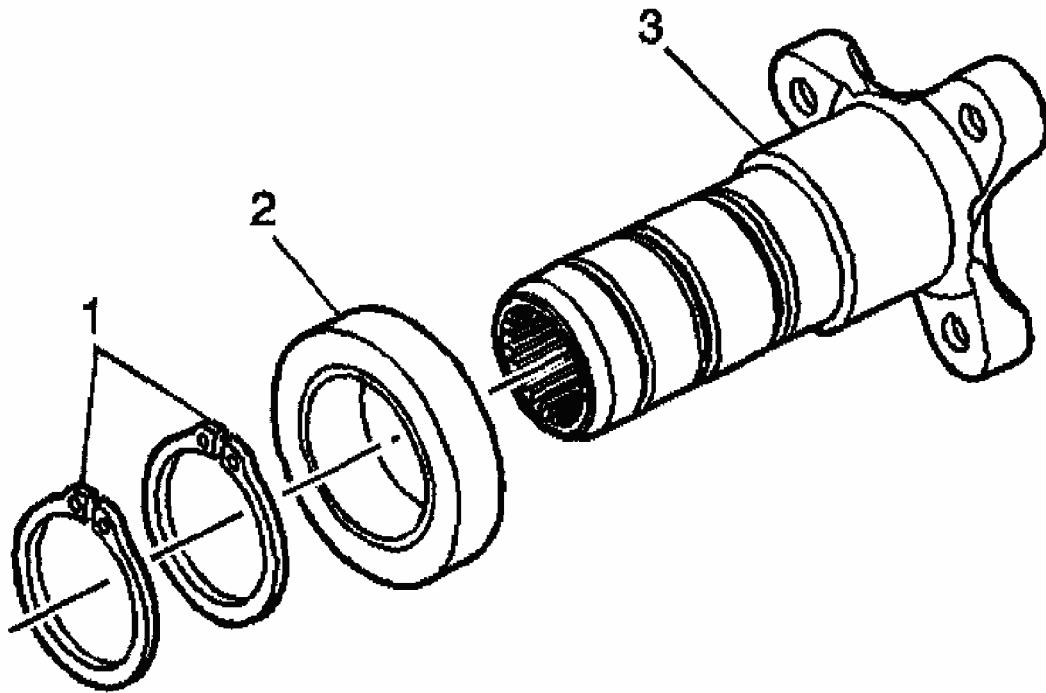


G01732184

**Fig. 185: Checking Bearing Housing**  
**Courtesy of GENERAL MOTORS CORP.**

15. Inspect the bearings for the following:
  - Damaged grease seals
  - Excessive wear or roughness of operation Bearings should rotate freely with no coarseness or rough feel
16. Inspect for bent or broken snap rings (1), replace as required.
17. Inspect the driveline tube for the following:
  - Damaged bolt hole threads
  - Damaged front O-ring groove
  - Worn or scored front bearing bore

- Missing or damaged bellhousing dowel pins
- Damage to the exterior of the tube
- Cracked welds



G01732185

**Fig. 186: Checking Bearing Housing Hub**  
Courtesy of GENERAL MOTORS CORP.

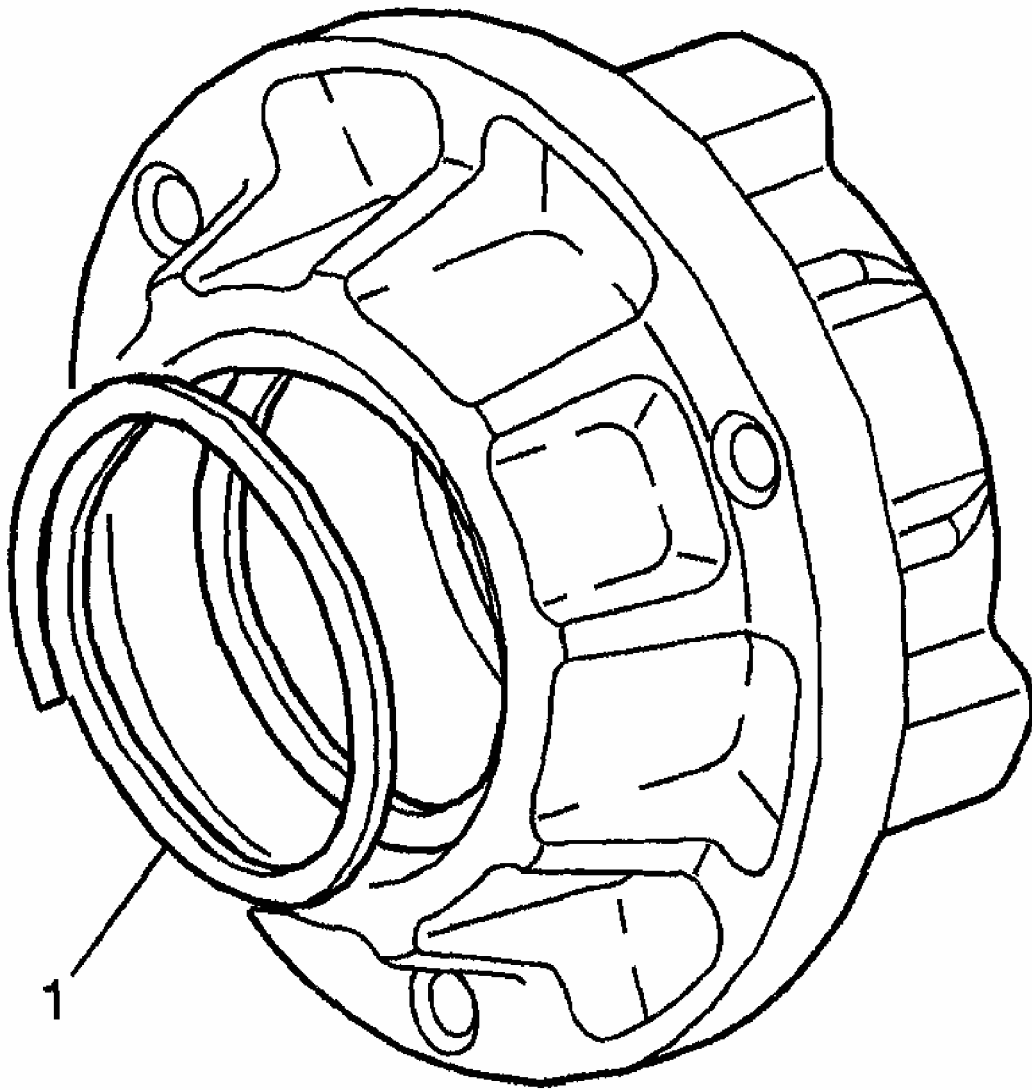
## DRIVELINE SUPPORT ASSEMBLY ASSEMBLE

### Rear Bearing Housing Assembly - Manual Transmission

**Important:** Do not separate the input shaft, propeller shaft, couplings, or bearing housing assembly, unless required. These components are balanced as an assembly. Disassembly and improper reassembly of the components may cause vehicle driveline vibration.

If the input shaft, couplings, propeller shaft, or bearing housing assembly must be separated, the components must be marked prior to disassembly. During assembly, the components must be returned to their original position and location.

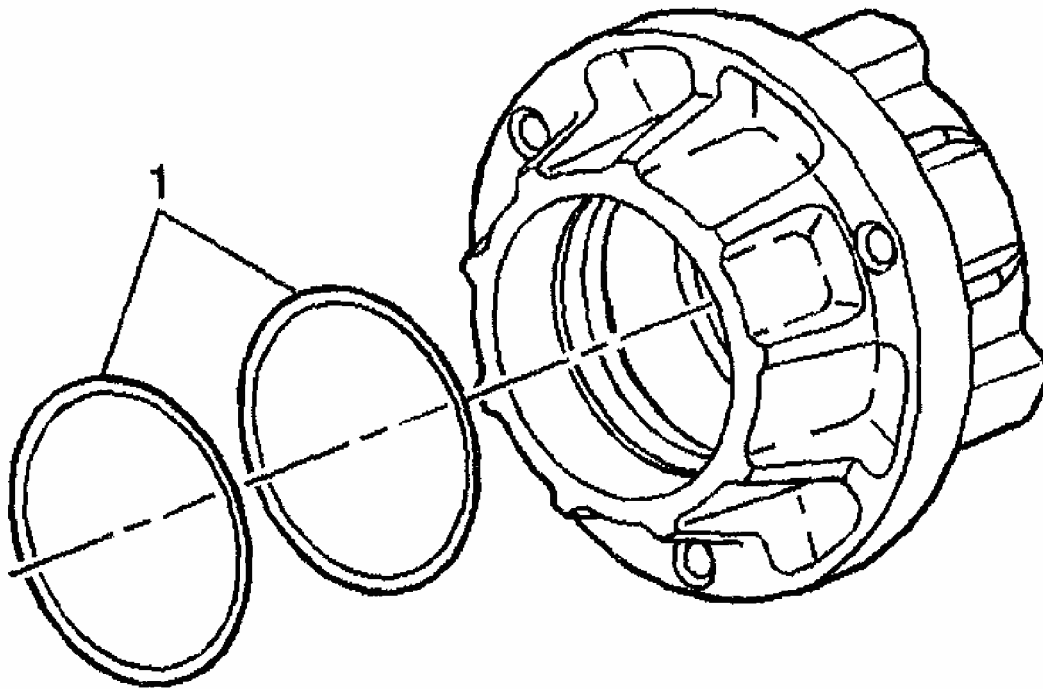
1. Install the wave washer (1) into the rear bearing housing.



G01732186

**Fig. 187: Installing Rear Bearing Housing Wave Washer**  
**Courtesy of GENERAL MOTORS CORP.**

2. Lubricate the NEW rear bearing housing O-rings (1) with clean engine oil.
3. Install the O-rings into the rear bearing housing.

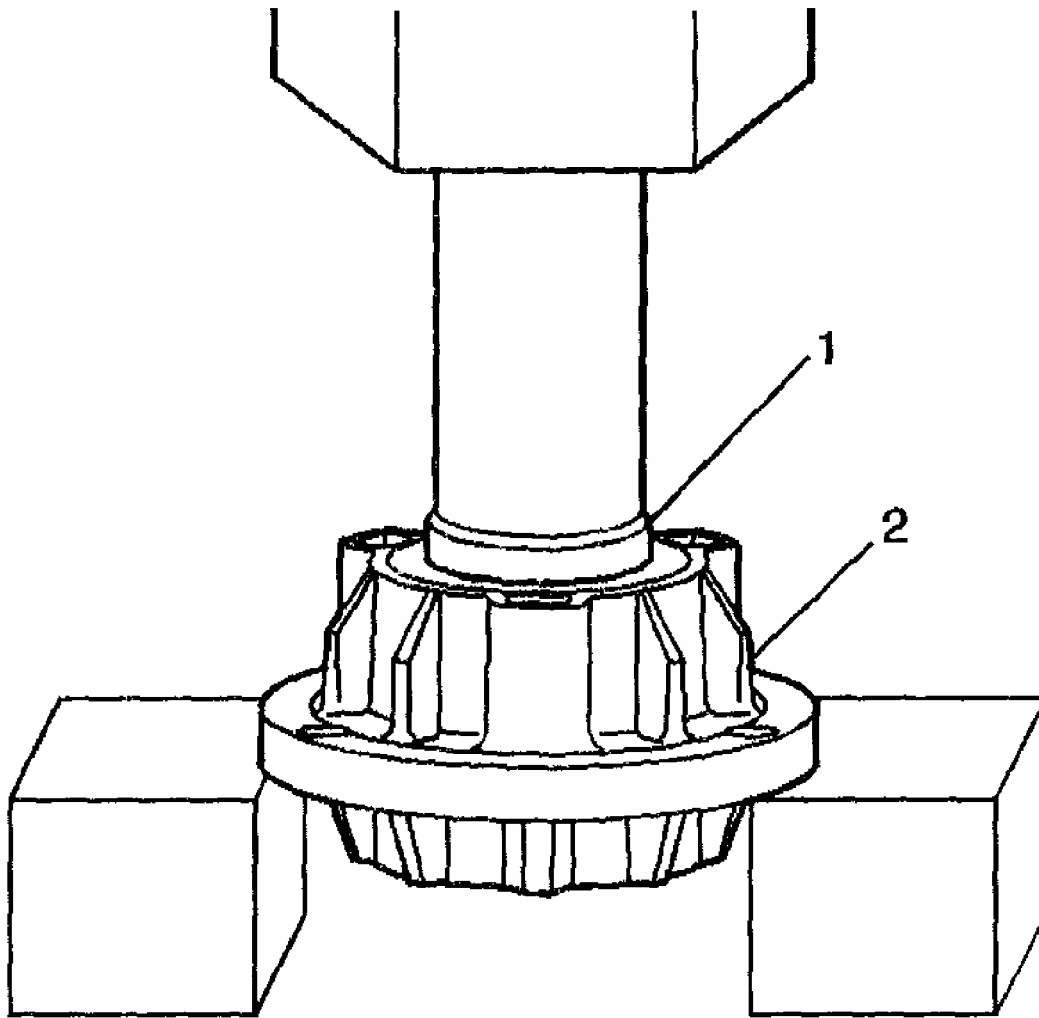


G01732187

**Fig. 188: Installing Rear Bearing Housing O-Rings**  
Courtesy of GENERAL MOTORS CORP.

**Important:** Press only on the outer race of the bearing.

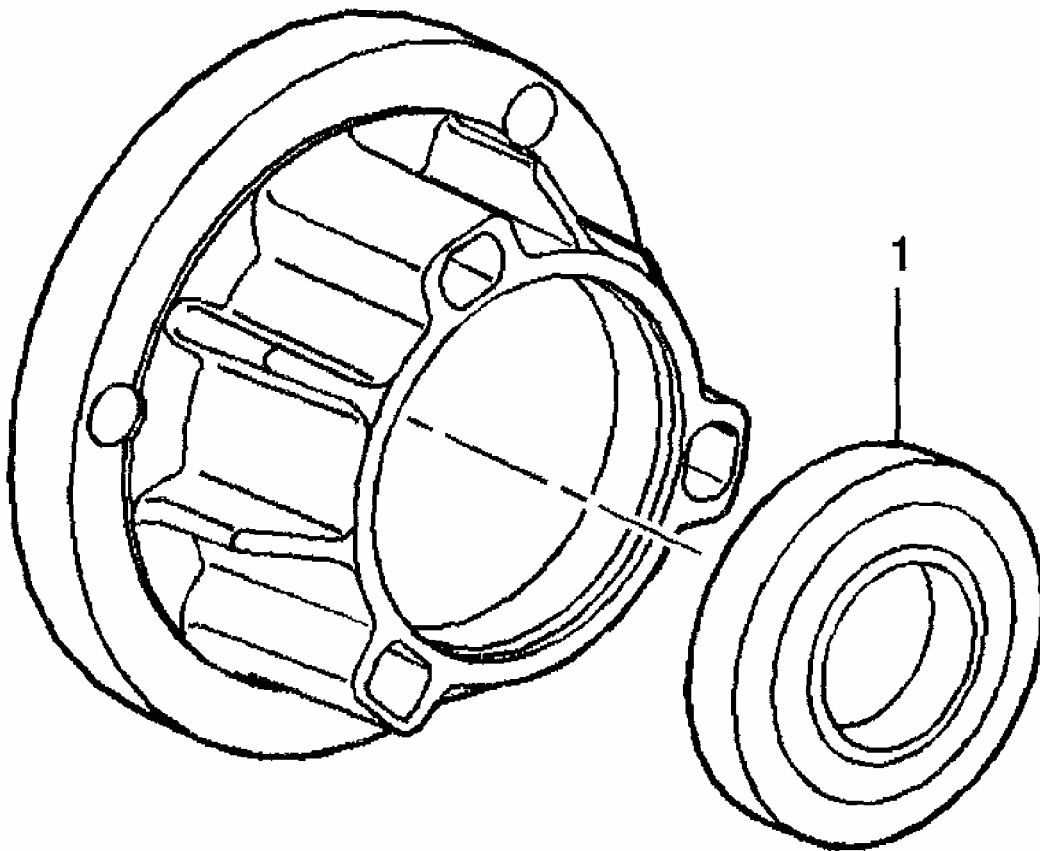
4. Position the rear bearing housing (2) into a press in order to install the bearing (1).



G01732188

**Fig. 189: Aligning Rear Bearing Housing**  
Courtesy of GENERAL MOTORS CORP.

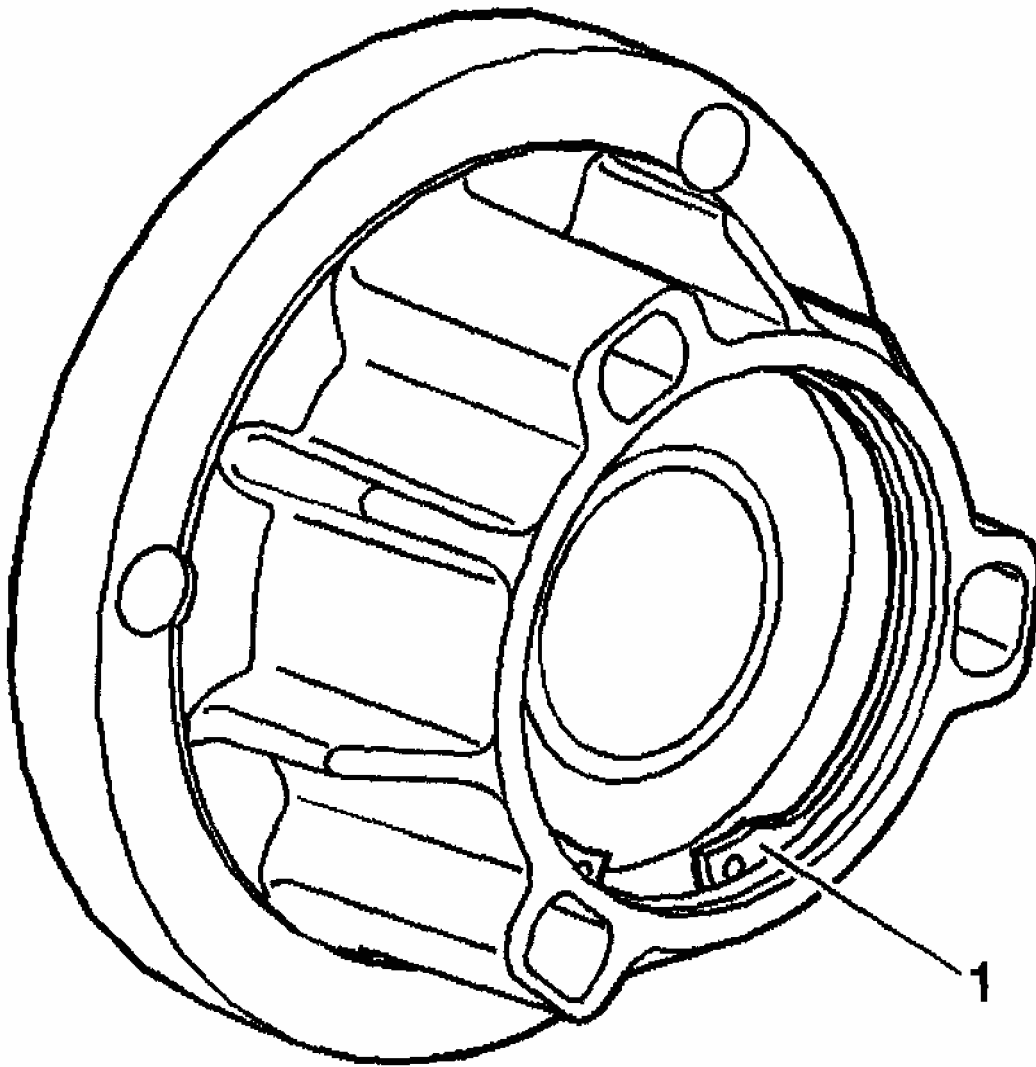
5. Install the bearing (1) into the housing.



G01732189

**Fig. 190: Installing Rear Bearing Housing Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

6. Install the snap ring (1) into the rear bearing housing.

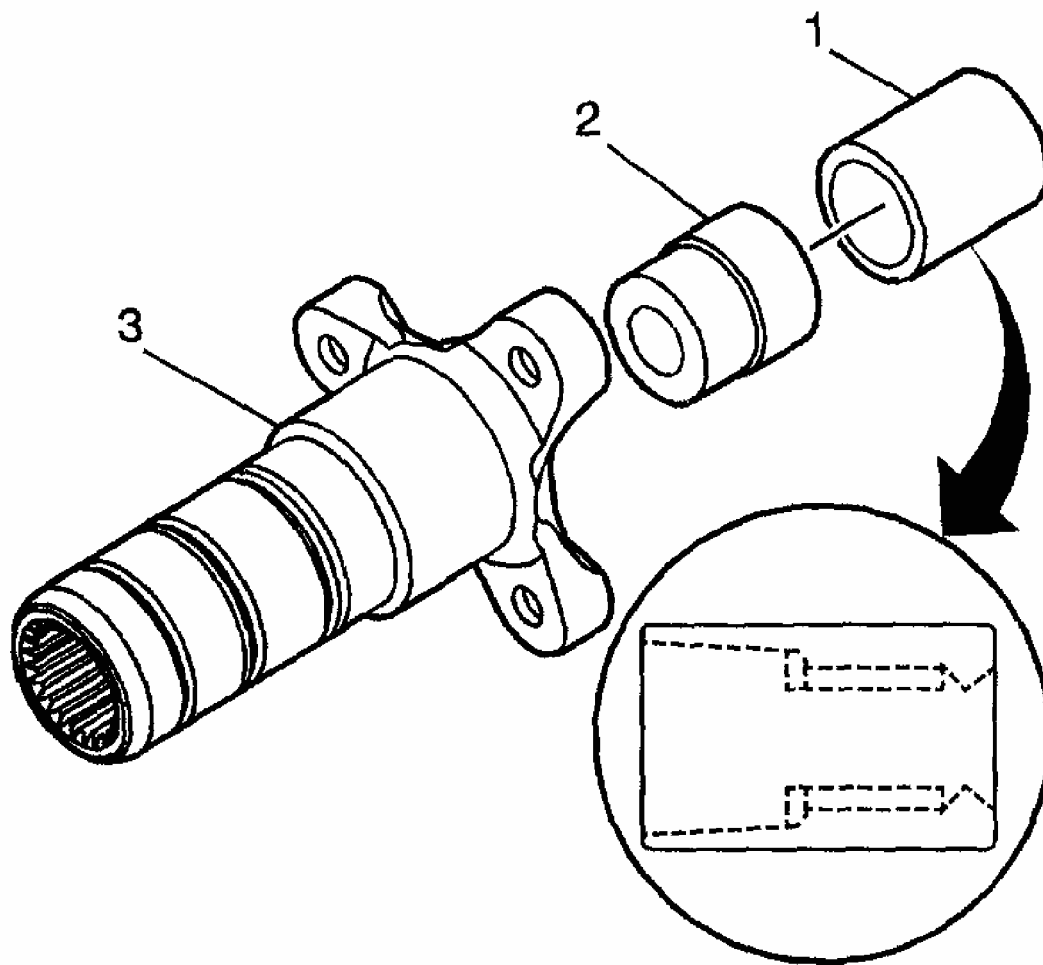


G01732190

**Fig. 191: Installing Rear Bearing Snap Ring**  
Courtesy of GENERAL MOTORS CORP.

**Important:** Install the propeller shaft bushing into hub with the smaller opening of the bushing positioned away from the hub.

7. Install the transmission input shaft bushing (2) and propeller shaft bushing (1) into the hub, if required.

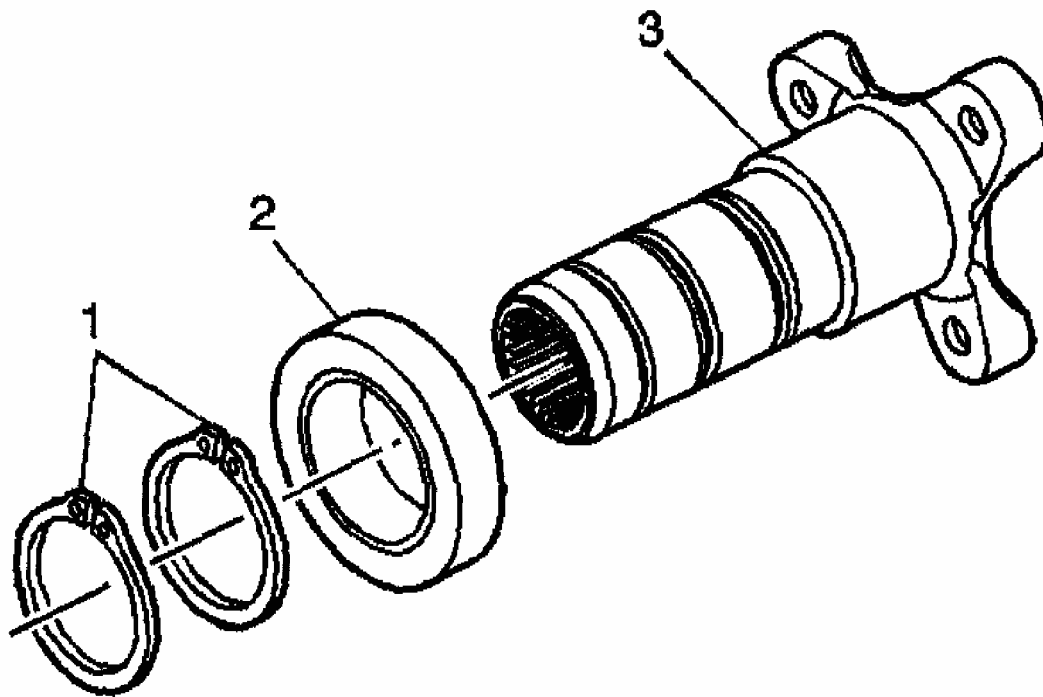


G01732191

**Fig. 192: Installing Transmission Input & Propeller Shaft Bushings**  
Courtesy of GENERAL MOTORS CORP.

8. Install the bearing (2) and snap rings (1) onto the hub (3).

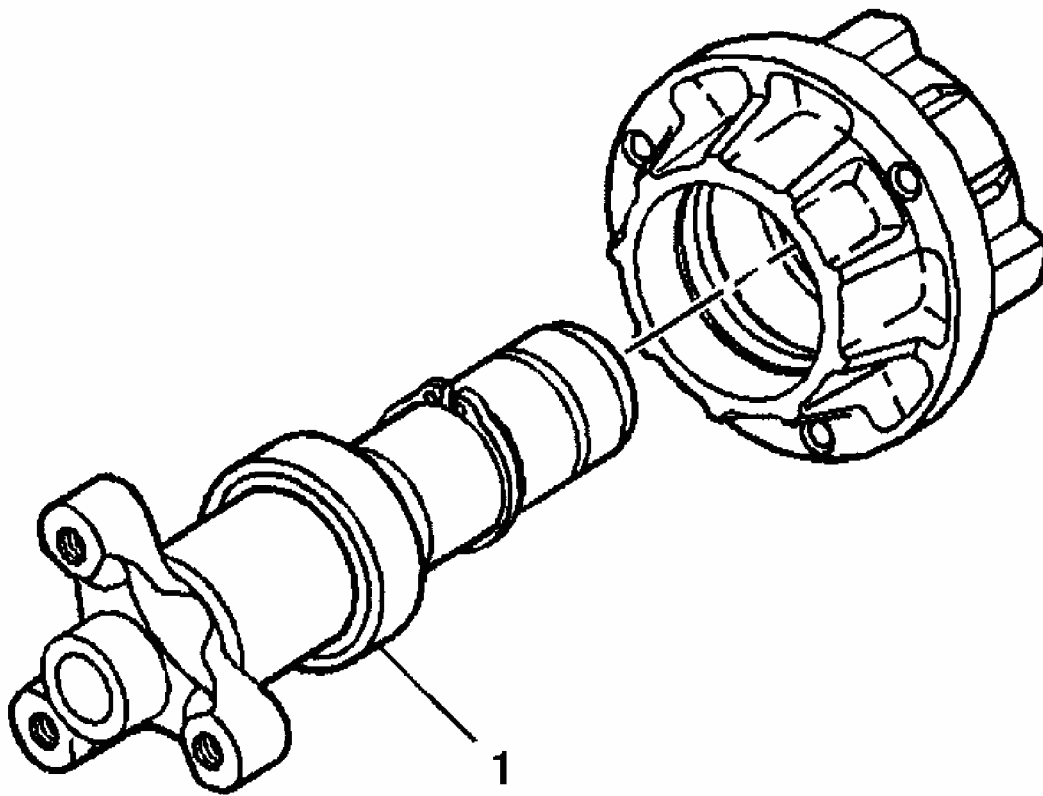




G01732192

**Fig. 193: Installing Bearing Housing Hub Bearings & Snap Rings**  
**Courtesy of GENERAL MOTORS CORP.**

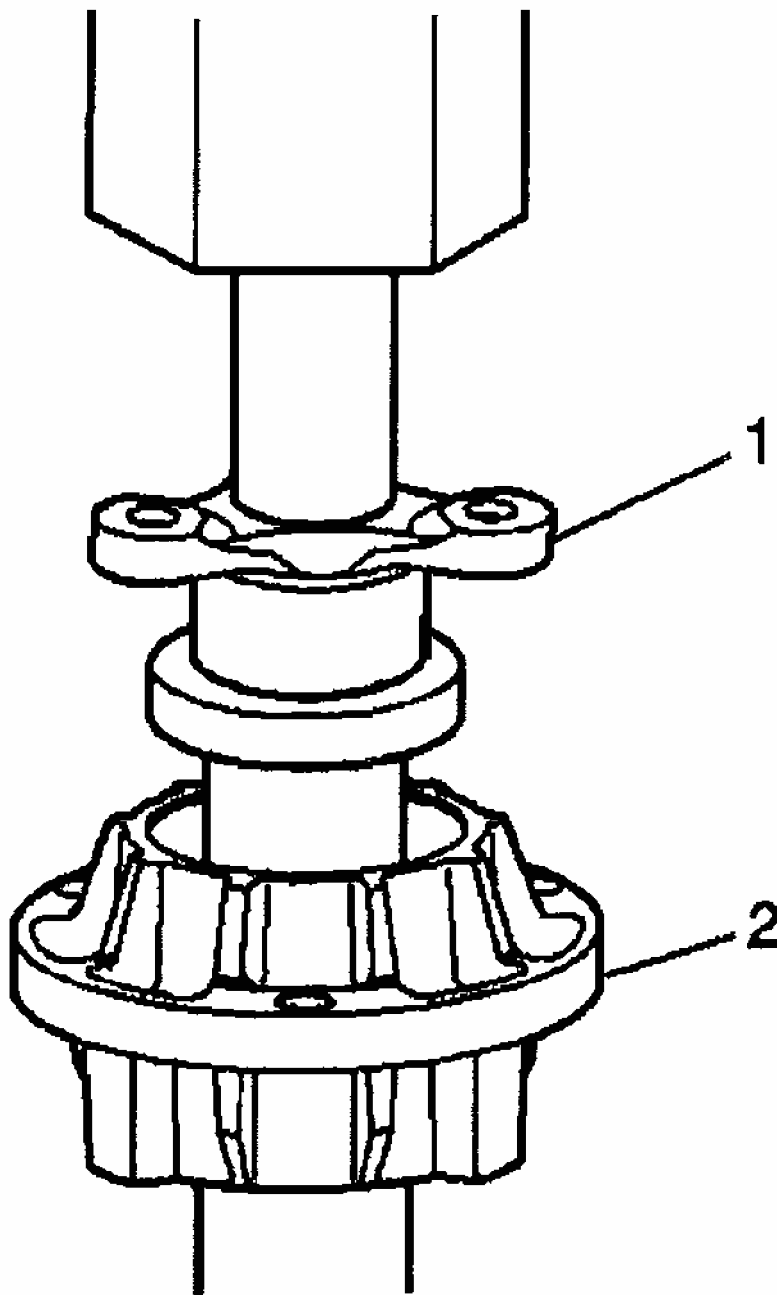
9. Install the hub (1) Into the rear bearing housing.



G01732193

**Fig. 194: Installing Bearing Housing Hub**  
**Courtesy of GENERAL MOTORS CORP.**

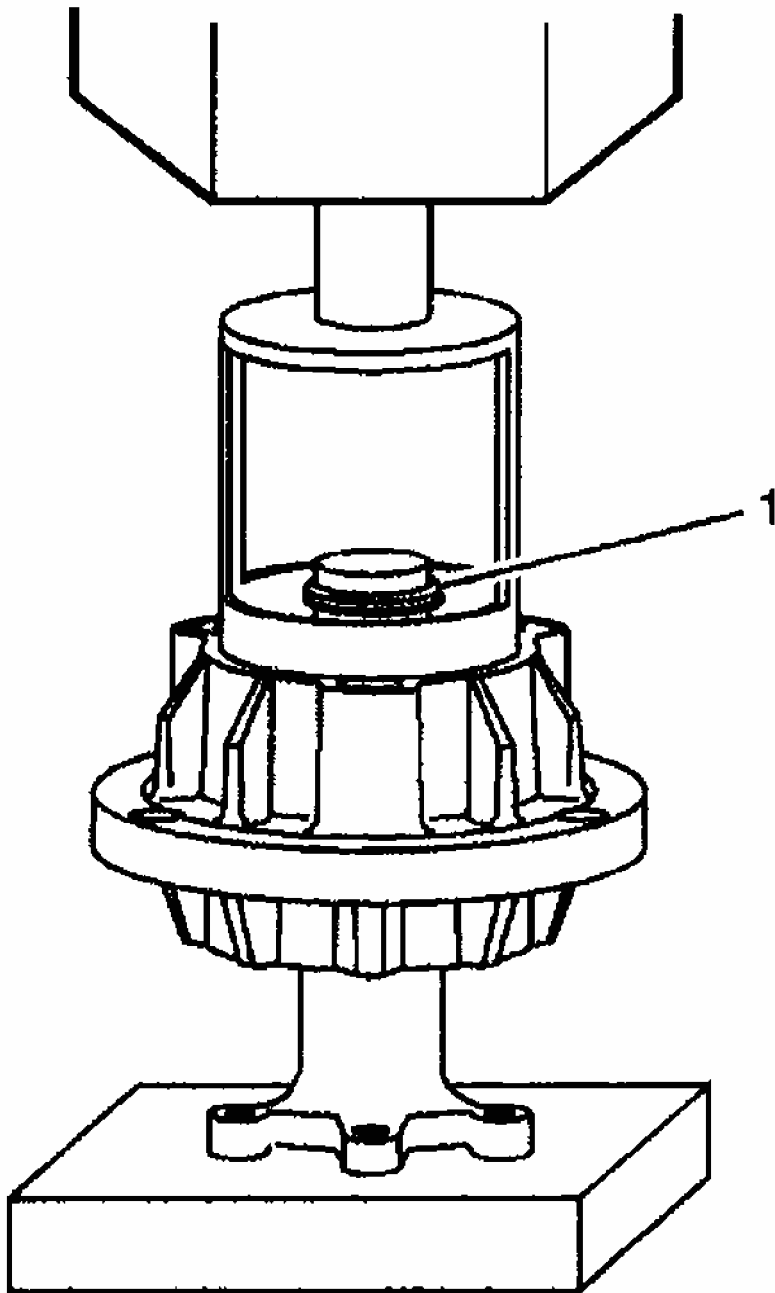
10. Press the hub - with bearing (1) into the housing (2). Support the inner race of the housing bearing when assembling the components.



G01732194

**Fig. 195: Aligning Rear Bearing Housing**  
Courtesy of GENERAL MOTORS CORP.

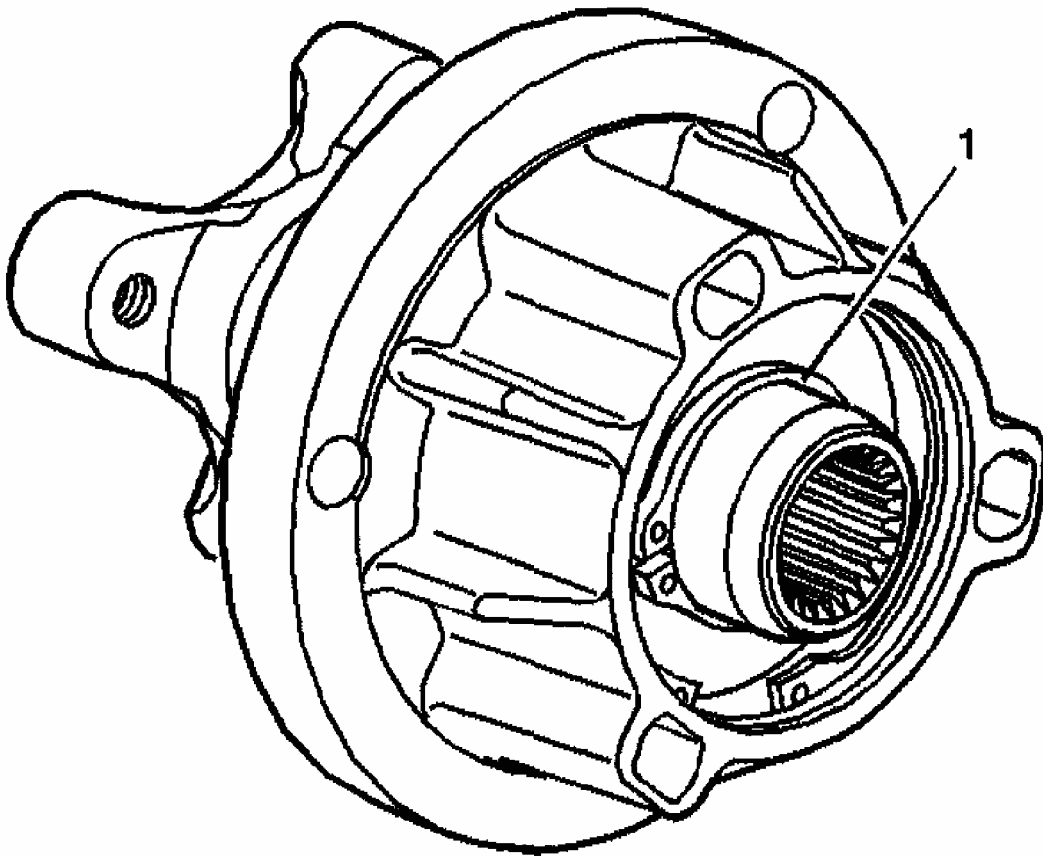
11. Position the bearing housing into a press. Apply pressure to the housing and compress the wave washer in order to install the snap ring (1).



G01732195

**Fig. 196: Locating Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

12. Install the snap ring (1) onto the hub.

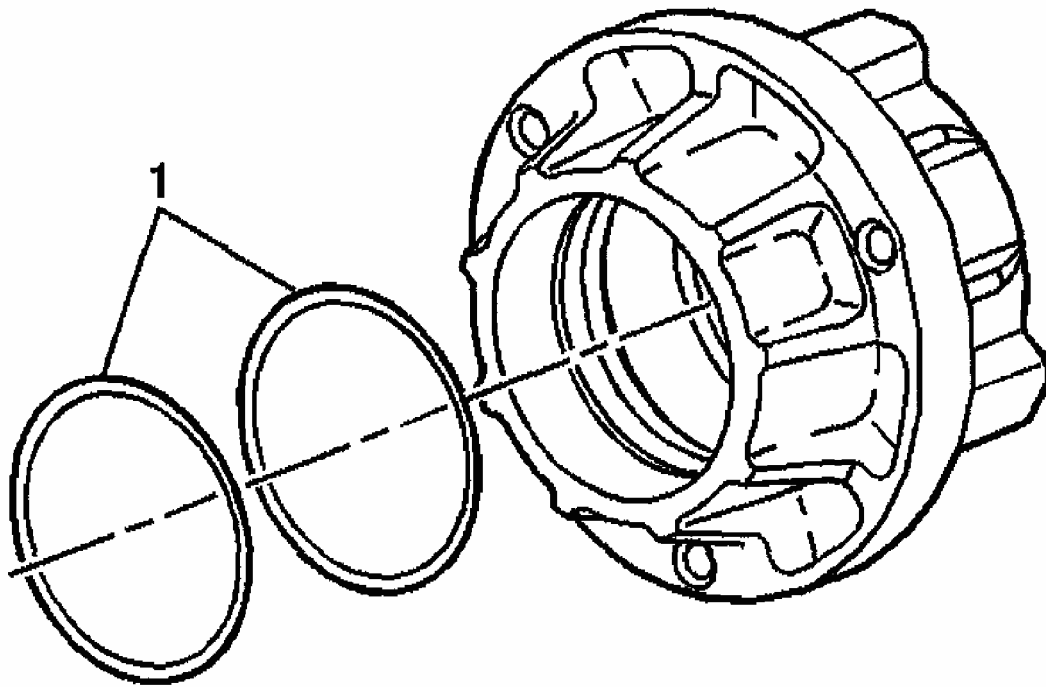


G01732196

**Fig. 197: Installing Rear Bearing Hub Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

**Rear Bearing Housing Assembly - Automatic Transmission**

1. Lubricate the NEW rear bearing housing O-rings (1) with clean engine oil.
2. Install the O-rings into the rear bearing housing.

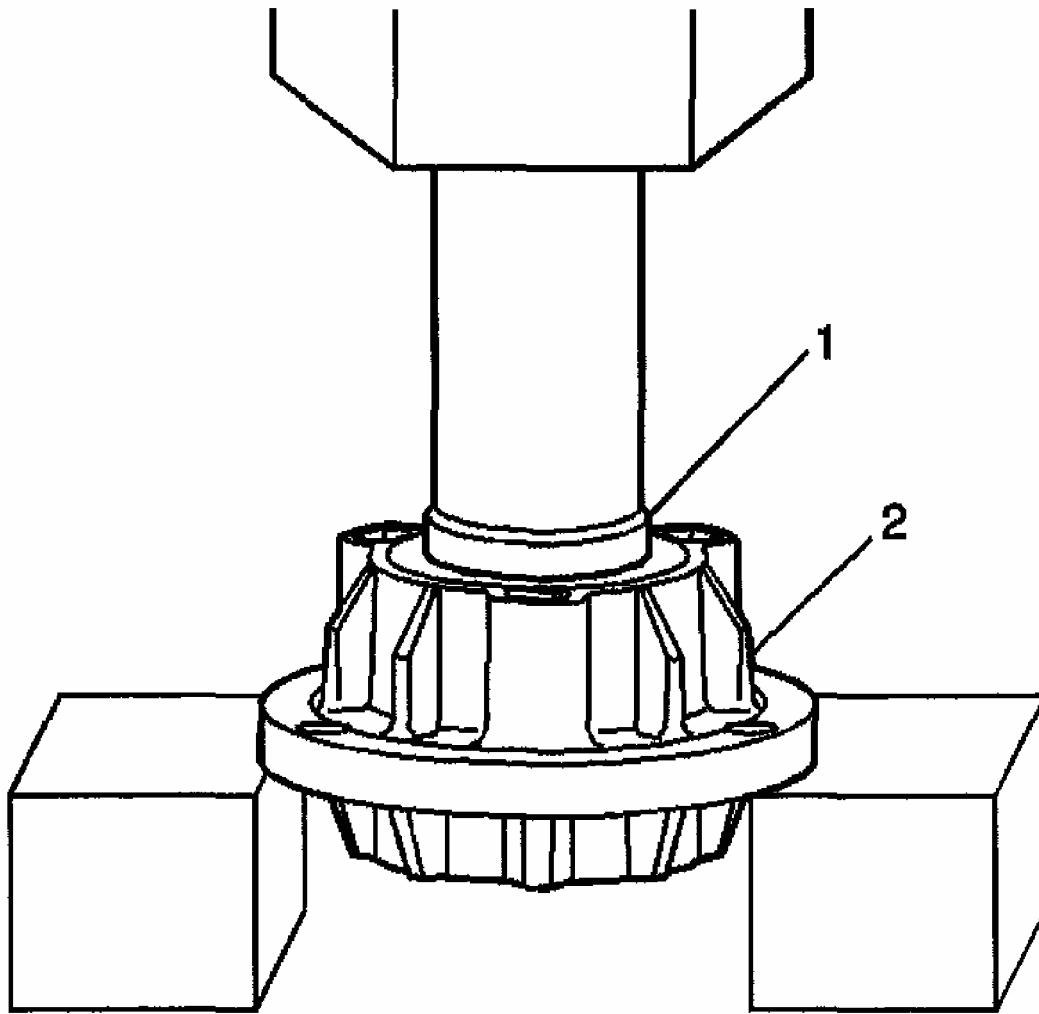


G01732197

**Fig. 198: Installing Rear Bearing Housing O-Rings**  
**Courtesy of GENERAL MOTORS CORP.**

**Important:** Press only on the outer race of the bearing.

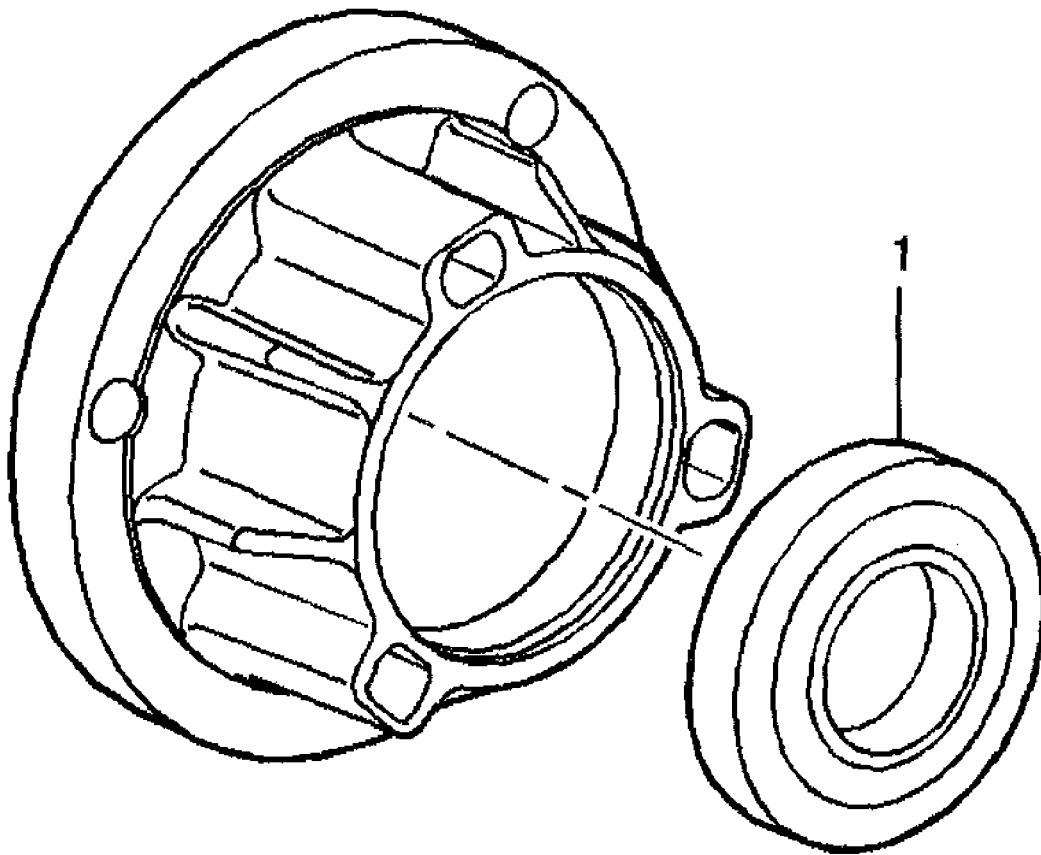
3. Position the rear bearing housing (2) into a press in order to install the bearing (1).



G01732198

**Fig. 199: Aligning Rear Bearing Housing**  
**Courtesy of GENERAL MOTORS CORP.**

4. Install the bearing (1) into the housing.

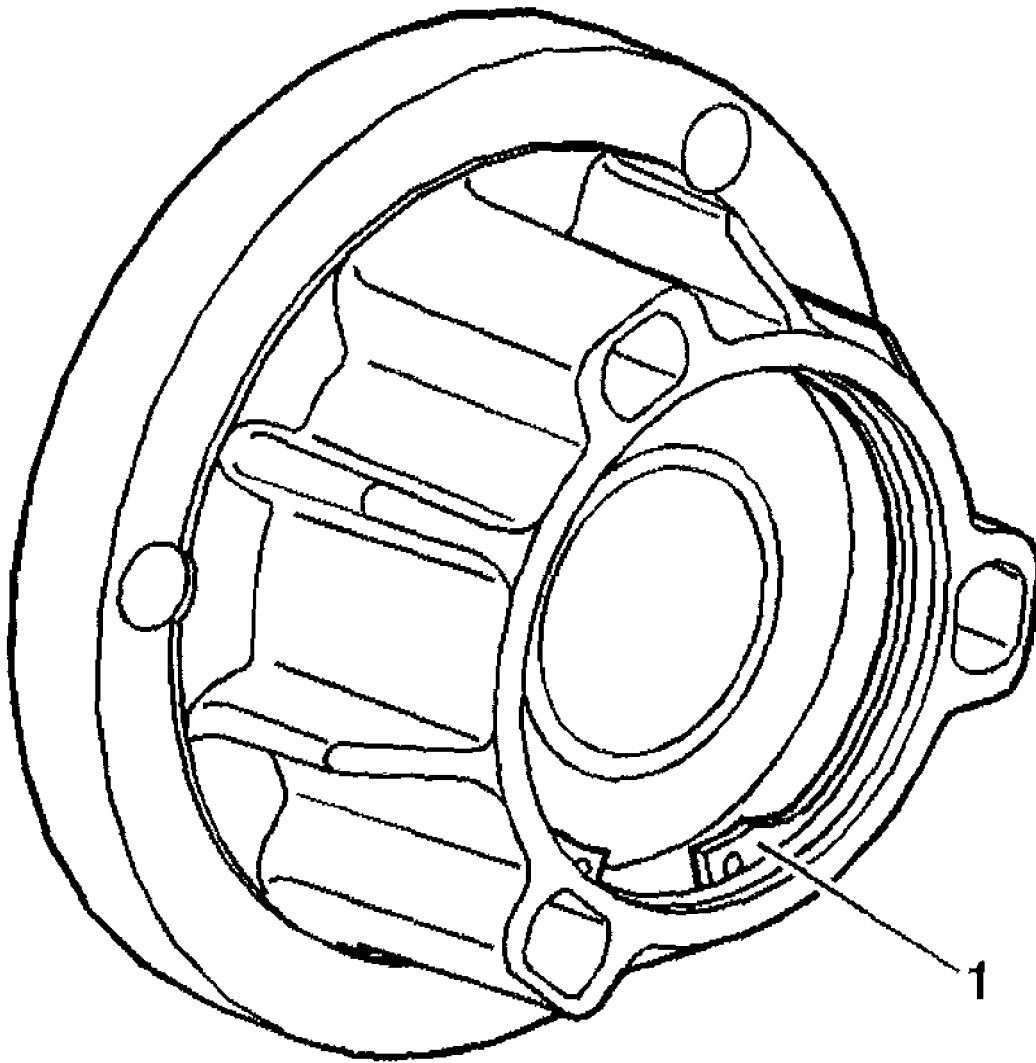


G01732199

**Fig. 200: Installing Rear Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

5. Install the snap ring (1) into the rear bearing housing.

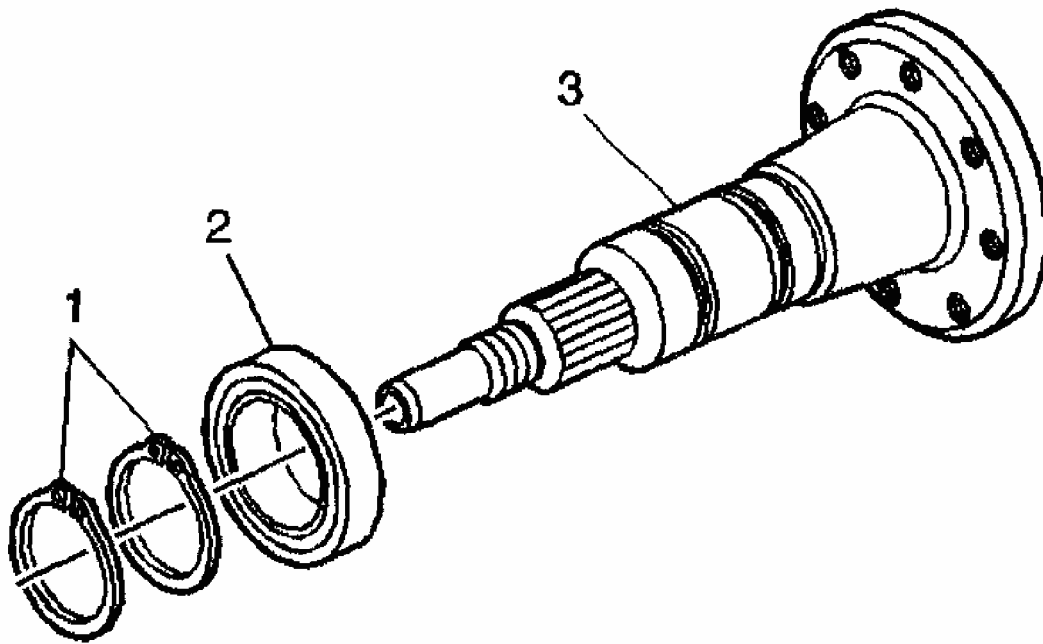




G01732200

**Fig. 201: Installing Rear Bearing Housing Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

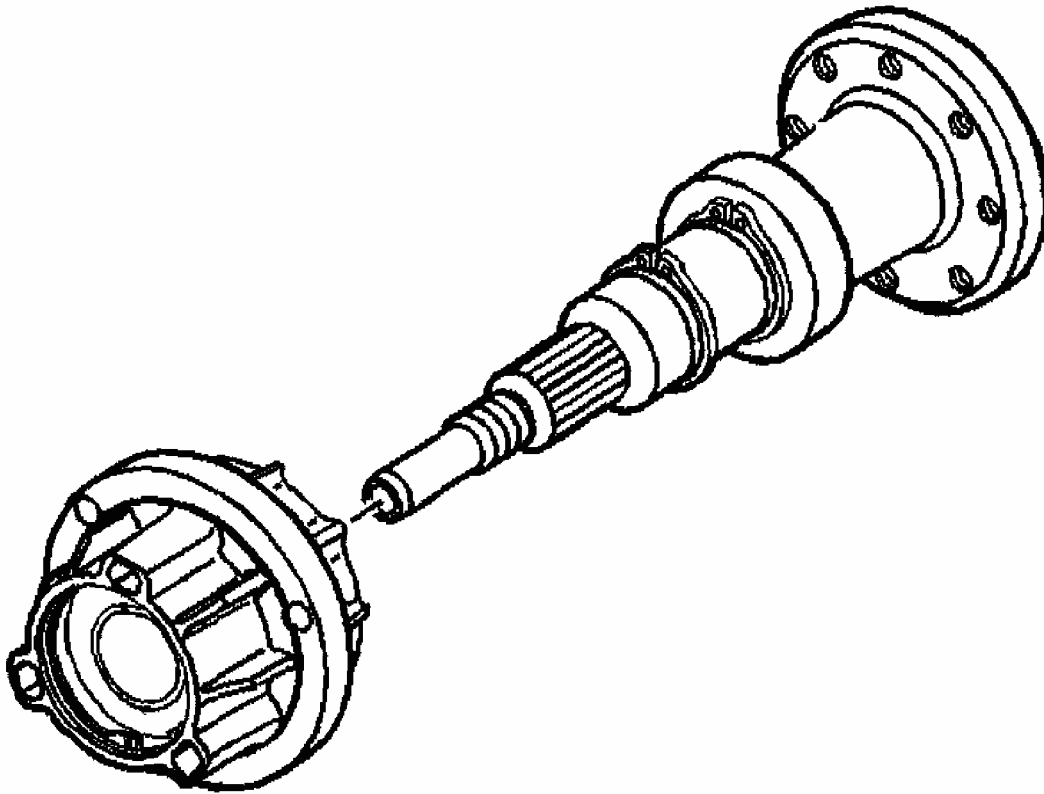
6. Install the bearing (2) and snap rings (1) onto the flexplate spindle (3).



G01732201

**Fig. 202: Installing Flexplate Spindle Bearing & Snap Rings**  
**Courtesy of GENERAL MOTORS CORP.**

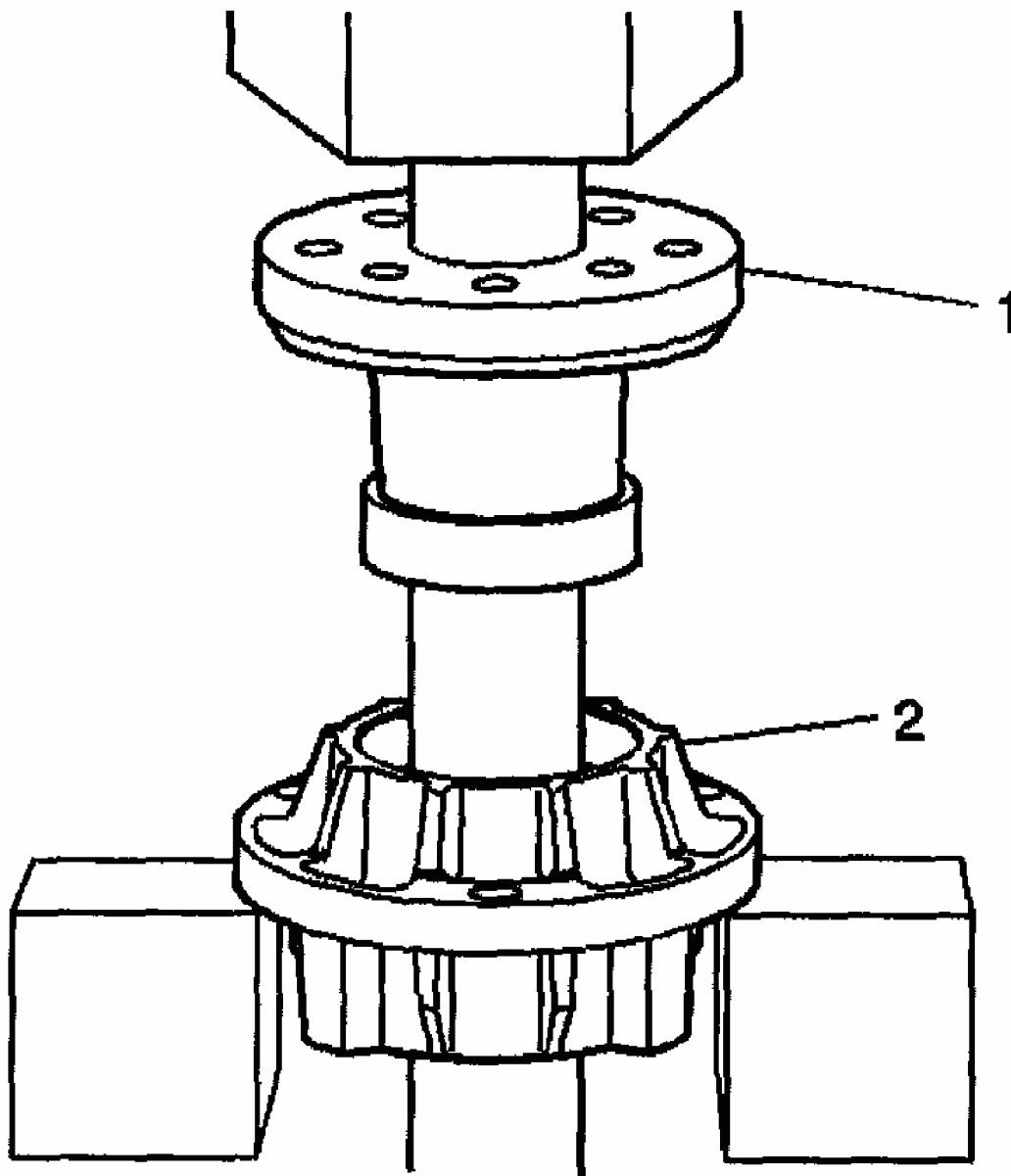
7. Install the flexplate spindle, with bearing, into the rear bearing housing.



G01732202

**Fig. 203: Installing Flexplate Spindle**  
**Courtesy of GENERAL MOTORS CORP.**

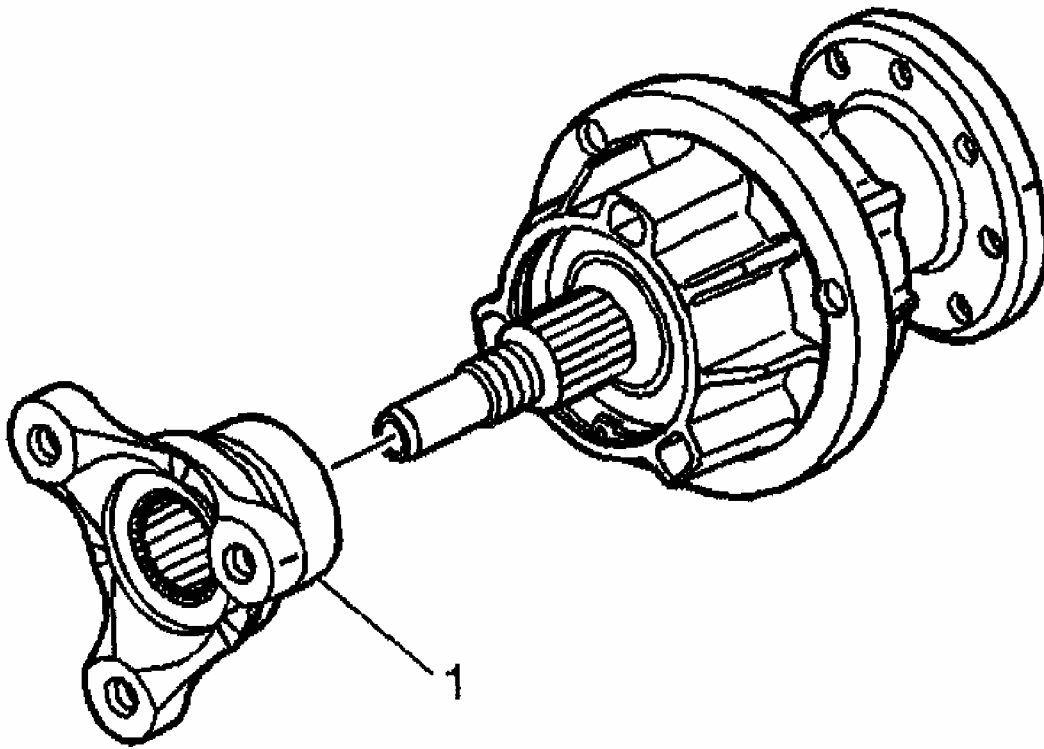
8. Press the flexplate spindle, with bearing, (1) into the housing (2). Support the inner race of the housing bearing when assembling the components.



G01732203

**Fig. 204: Aligning Flexplate Spindle**  
Courtesy of GENERAL MOTORS CORP.

9. Install the hub (1) onto the flexplate spindle. Align the marks on the flexplate spindle and hub for proper assembly.
10. Apply threadlock GM P/N United States 12345382, GM P/N Canada 10953489, or equivalent to the threads of the spindle.



G01732204

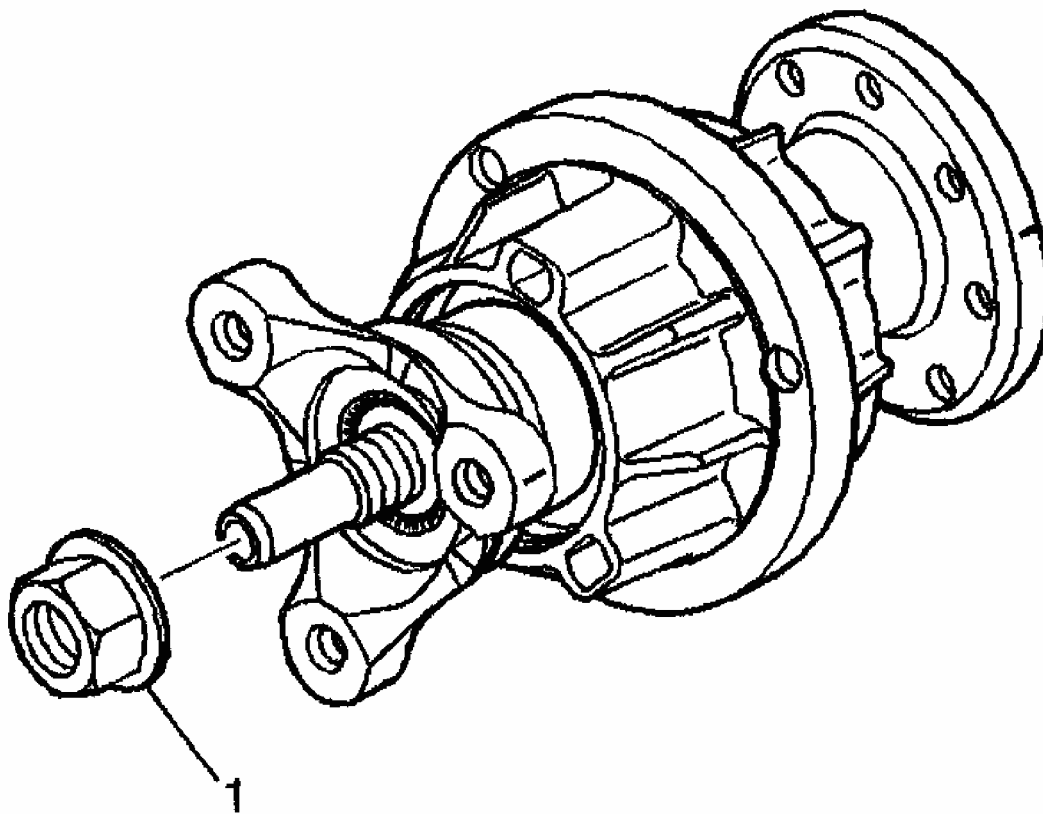
**Fig. 205: Installing Rear Bearing Hub**  
Courtesy of GENERAL MOTORS CORP.

**CAUTION: Refer to FASTENER NOTICE .**

11. Install the nut (1) to the flexplate spindle.

**Tighten**

Tighten the spindle nut to 90 N.m (66 lb ft).



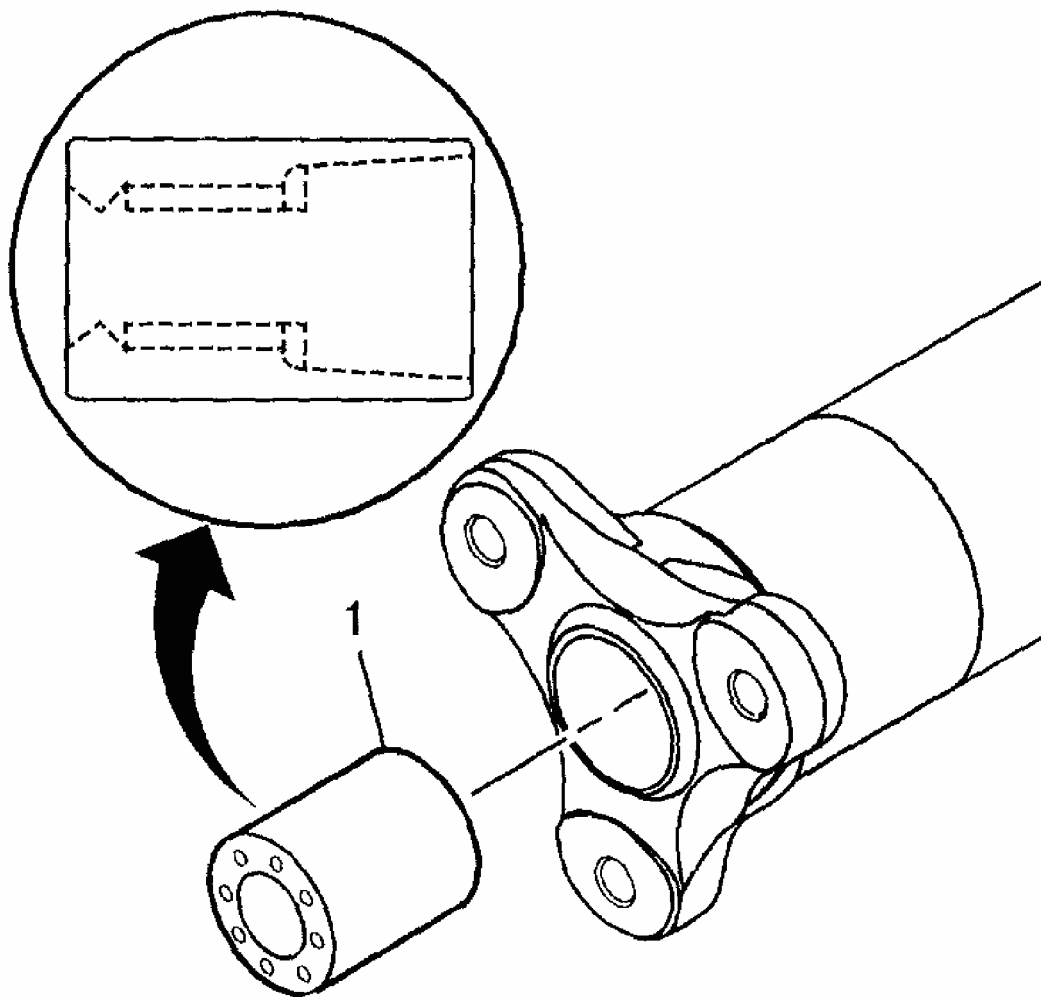
G01732205

**Fig. 206: Installing Flexplate Spindle Nut**  
**Courtesy of GENERAL MOTORS CORP.**

#### Propeller Shaft Installation

**Important:** Install the propeller shaft bushing into hub with the smaller opening of the bushing positioned away from the flange.

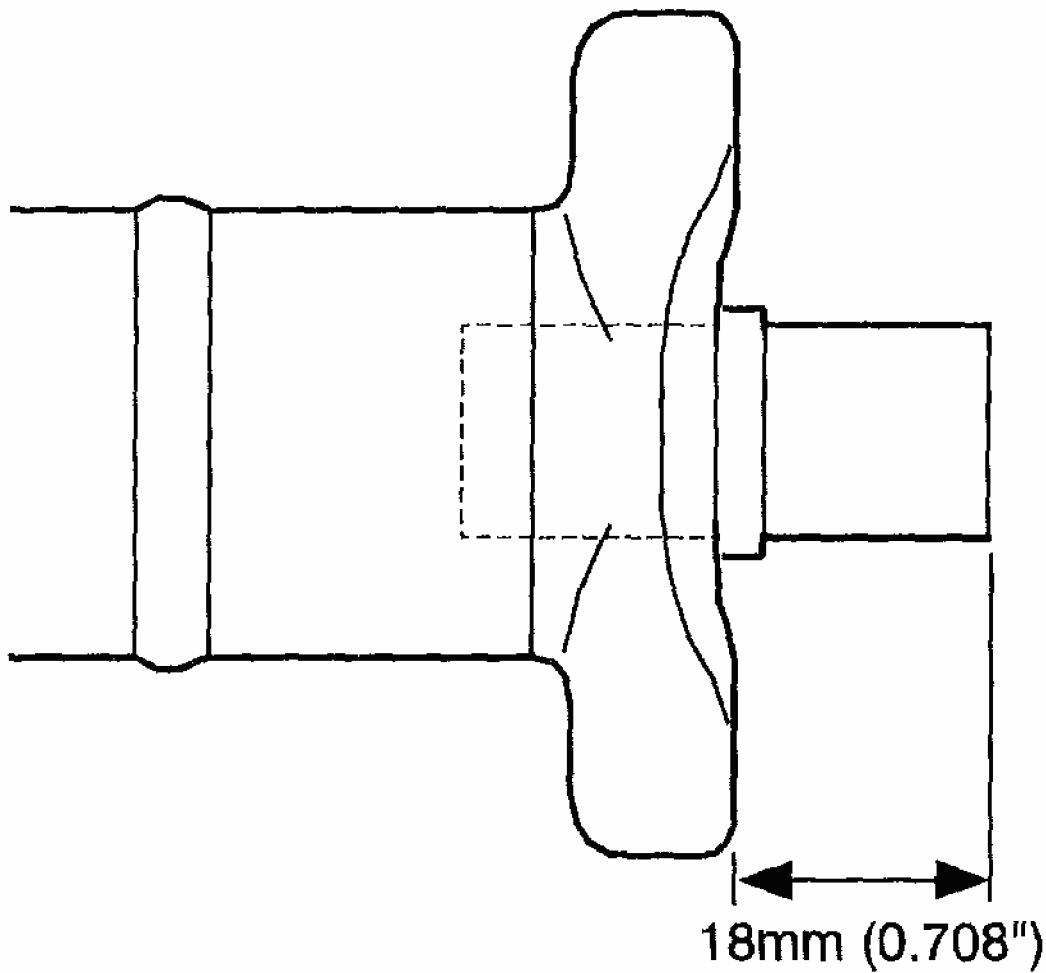
1. Install a NEW bushing (1) into the automatic transmission propeller shaft, if required.



G01732206

**Fig. 207: Installing Propeller Shaft Bushing**  
**Courtesy of GENERAL MOTORS CORP.**

2. Inspect the bushing for proper installation. A properly installed bushing will protrude 18 mm (0.708 in) from the face of the hub.



G01732207

**Fig. 208: Measuring Propeller Shaft Bushing**  
Courtesy of GENERAL MOTORS CORP.

3. Apply threadlock GM P/N United States 12345382, GM P/N Canada 10953489, or equivalent to the threads of the coupling bolts.

**CAUTION: Refer to FASTENER NOTICE .**

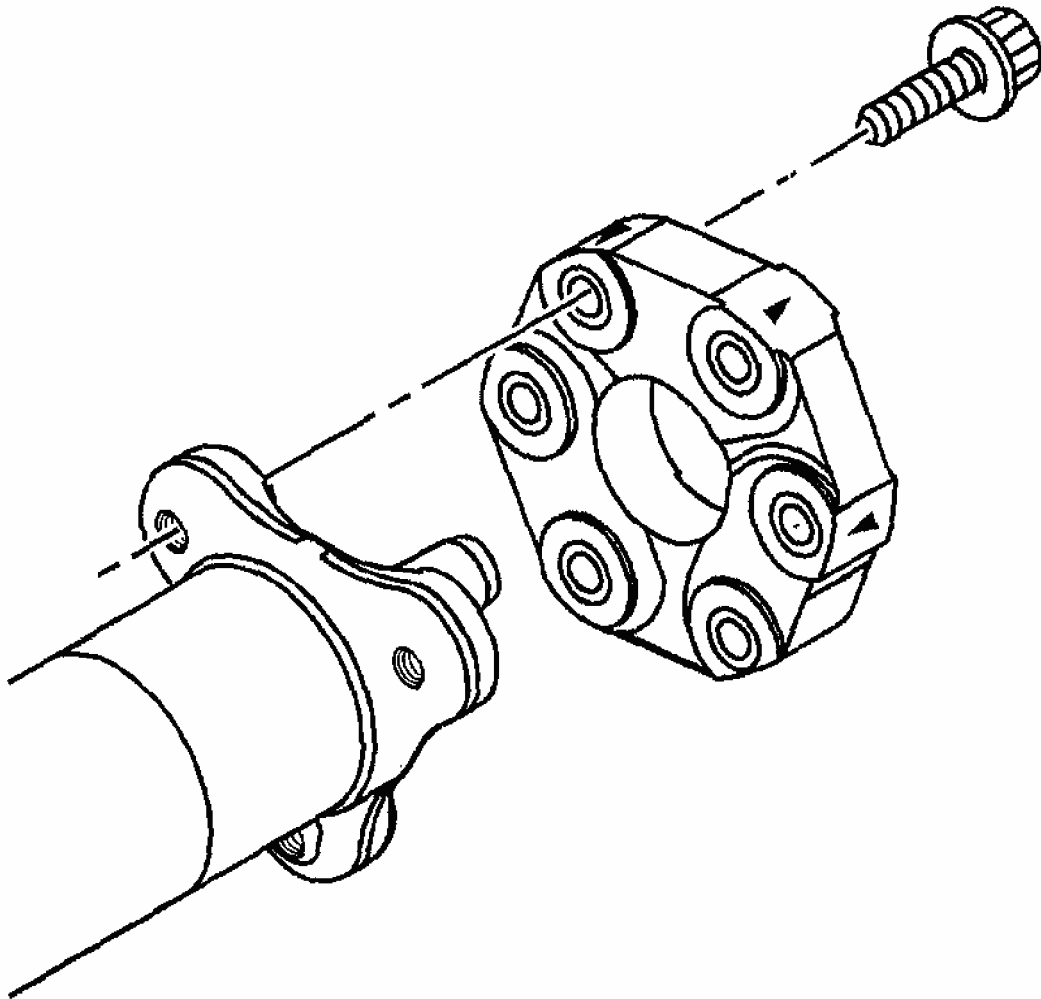
**Important:** If the coupling orientation mark has been lost during the cleaning or disassembly process, the coupling **MUST** be installed with the directional arrow pointed toward the flange to which it mounts.

4. Install the rear coupling, bolts, and washers to the propeller shaft.



## Tighten

- Tighten the coupling bolts - Automatic Transmission to 70 N.m (52 lb ft).
- Tighten the coupling bolts - Manual Transmission to 90 N.m (66 lb ft).



G01732208

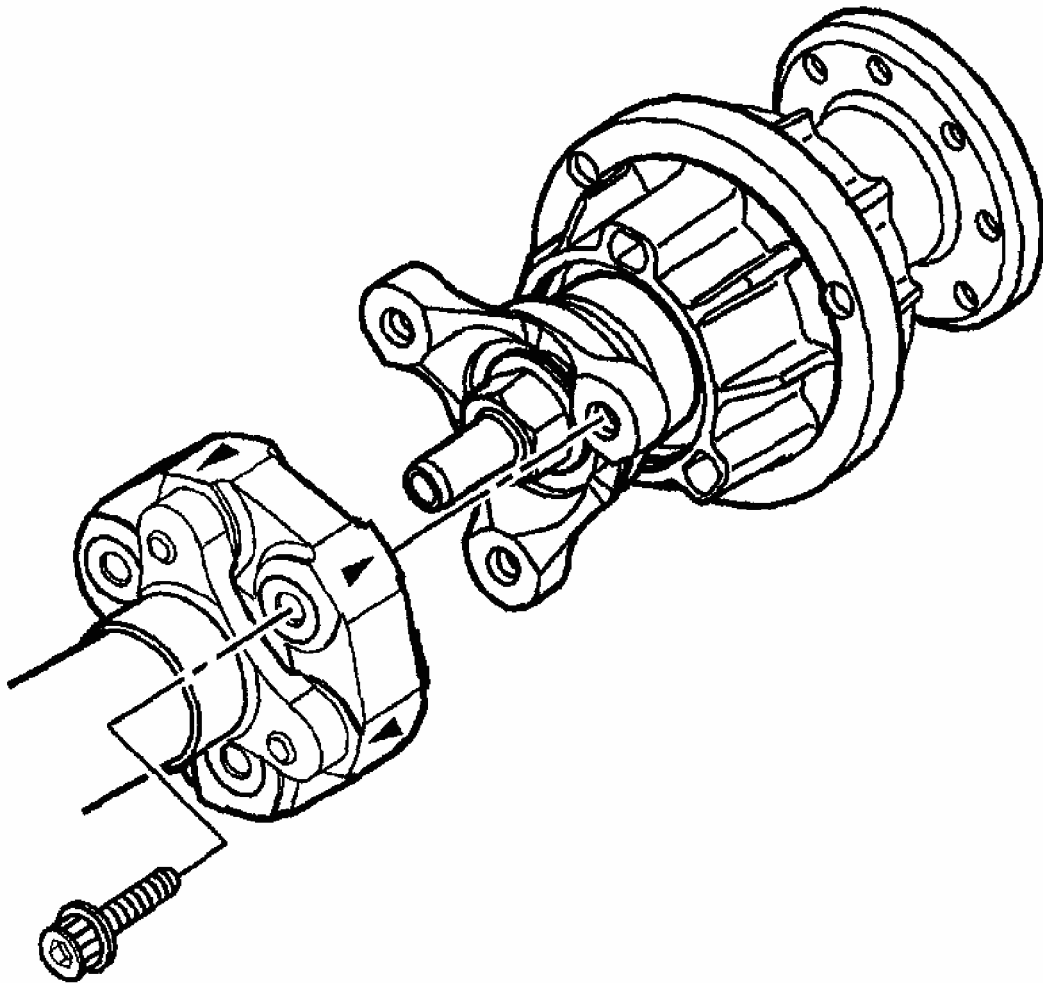
**Fig. 209: Installing Rear Coupling To Propeller Shaft Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

**Important:** If the coupling orientation mark has been lost during the cleaning or disassembly process, the coupling **MUST** be installed with the directional arrow pointed toward the flange to which it mounts.

5. Install the rear bearing housing assembly, bolts, and washers to the rear coupling.

### Tighten

- Tighten the coupling bolts - Automatic Transmission to 70 N.m (52 lb ft).
- Tighten the coupling bolts - Manual Transmission to 90 N.m (66 lb ft).



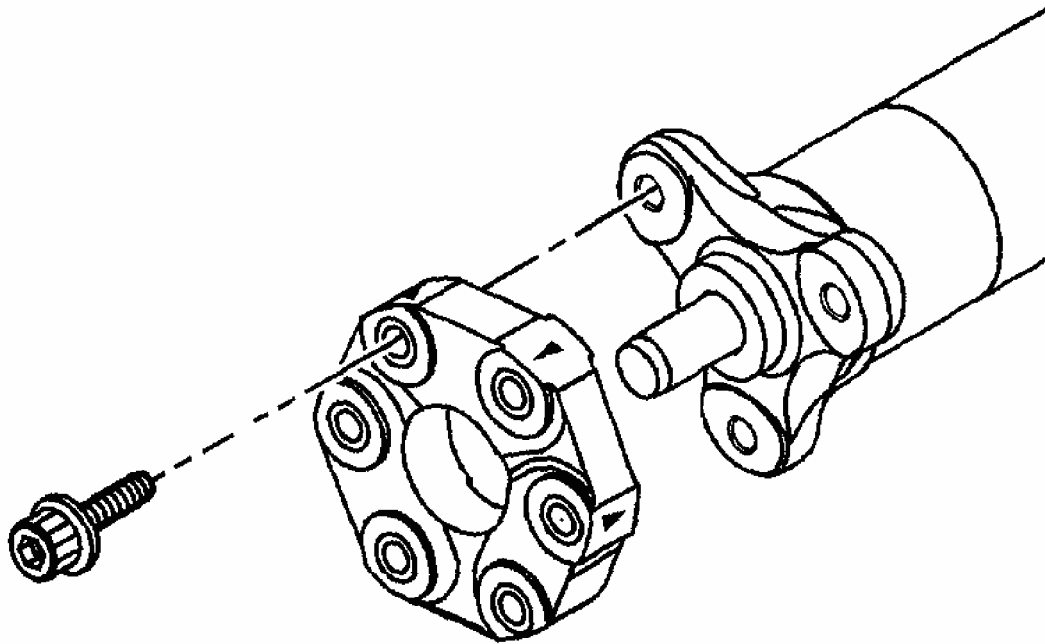
G01732209

**Fig. 210: Installing Rear Coupling To Rear Bearing Housing Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

6. Install the front coupling, bolts, and washers to the propeller shaft.

### Tighten

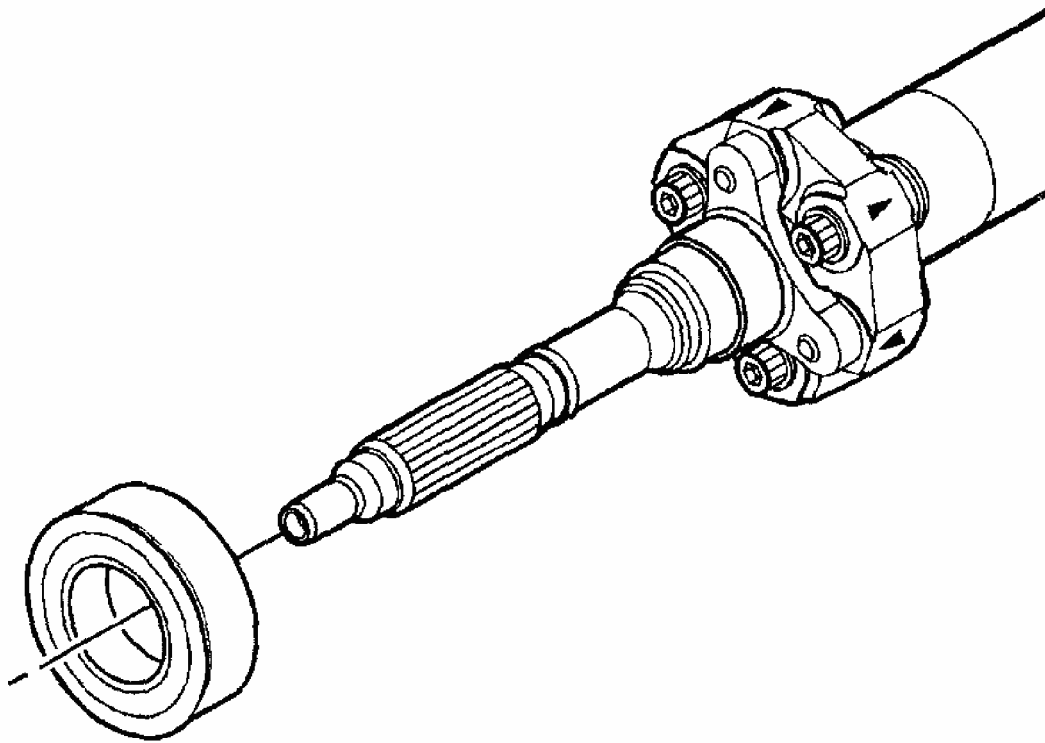
- Tighten the coupling bolts - Automatic Transmission to 70 N.m (52 lb ft).
- Tighten the coupling bolts - Manual Transmission to 90 N.m (66 lb ft).



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**Fig. 211: Installing Front Coupling To Propeller Shaft Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

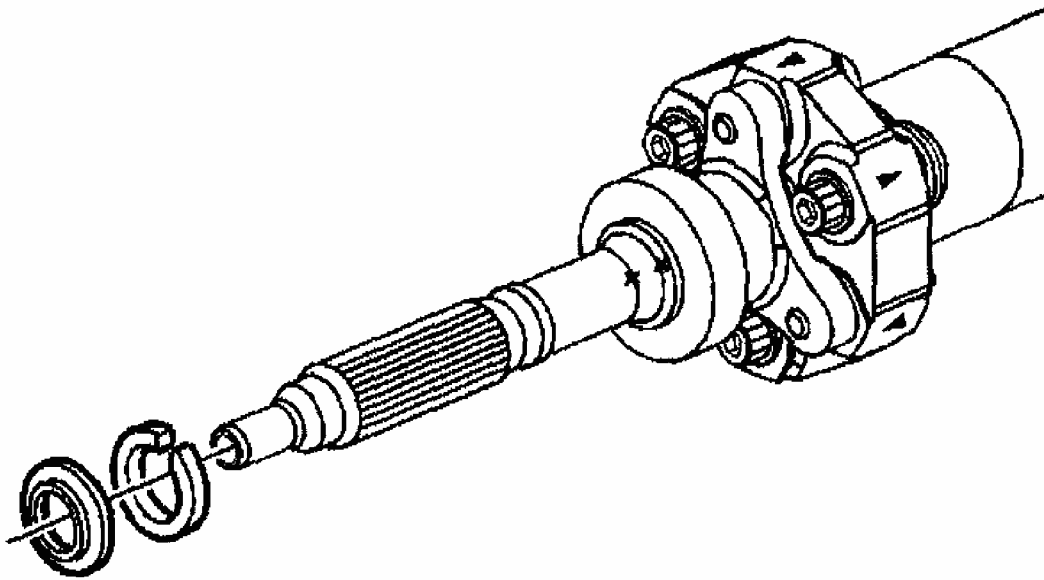
7. Install the bearing onto the input shaft. Install the bearing until completely seated against the flange of the input shaft.



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**Fig. 212: Installing Input Shaft Bearing**  
**Courtesy of GENERAL MOTORS CORP.**

8. Install the snap ring into the groove of the input shaft.
9. Install a NEW slinger washer onto the input shaft. A properly installed slinger washer will have a gap of 1.5-2.5 mm (0.050-0.098 in) between the washer and the bearing face.



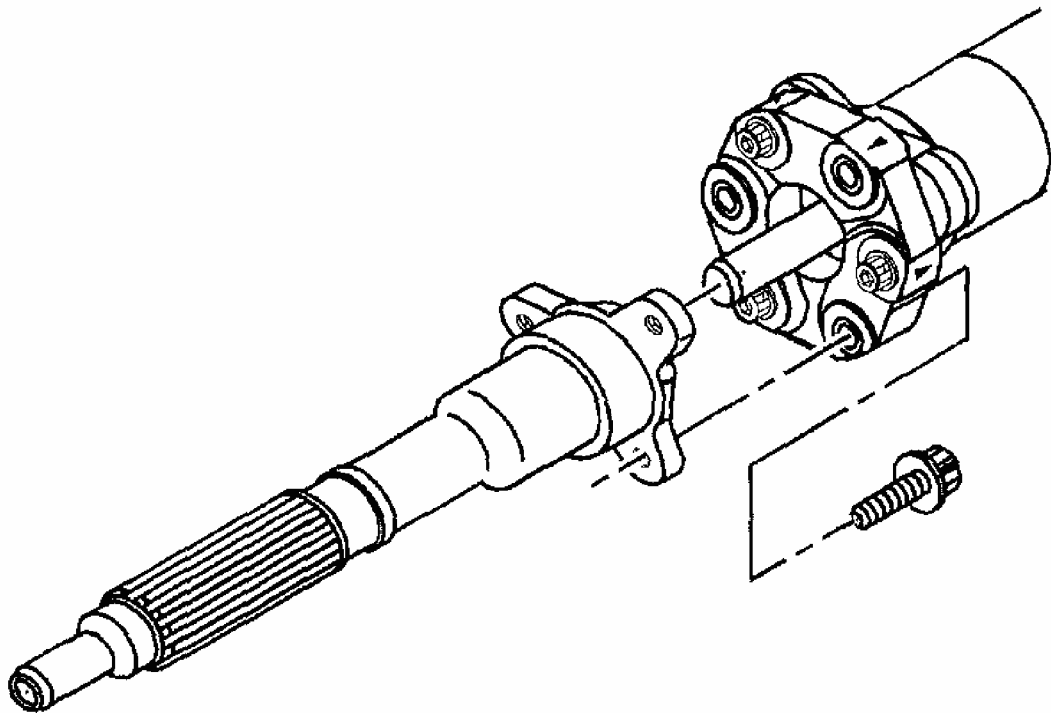
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**Fig. 213: Installing Input Shaft Snap Ring & Slinger Washer**  
**Courtesy of GENERAL MOTORS CORP.**

10. Install the input shaft, bolts, and washers to the coupling.

**Tighten**

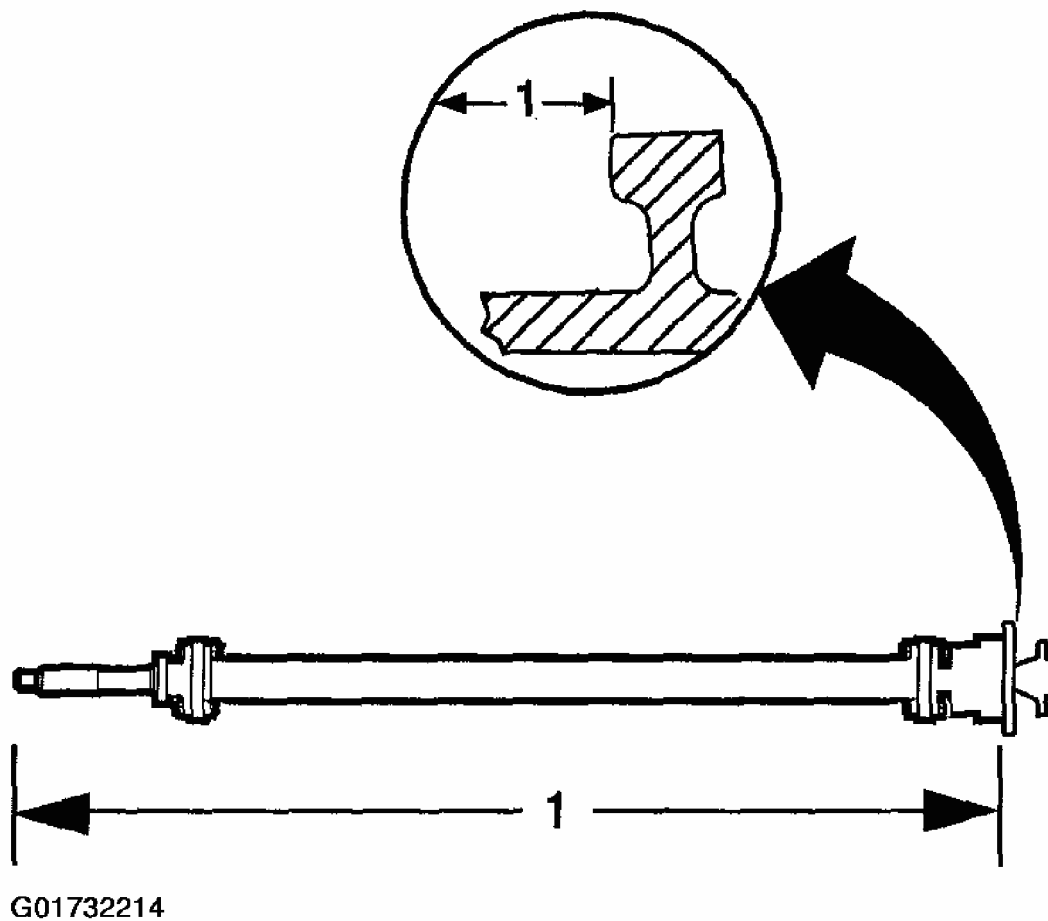
- Tighten the coupling bolts - Automatic Transmission to 70 N.m (52 lb ft).
- Tighten the coupling bolts - Manual Transmission to 90 N.m (66 lb ft).



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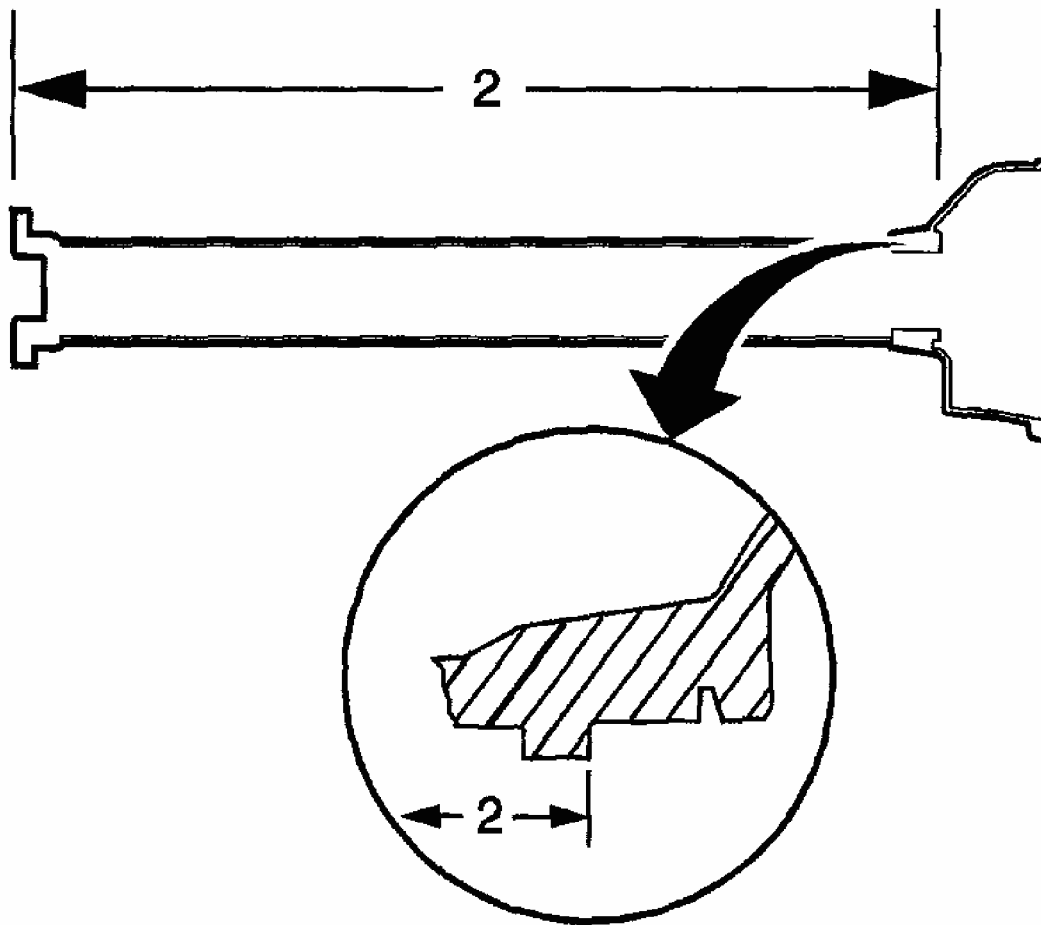
**Fig. 214: Installing Input Shaft Coupling Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

11. Measure the distance (1) from the end of the input shaft to the flange on the bearing housing (automatic transmission). Record the amount as distance 1.



**Fig. 215: Measuring Input Shaft**  
Courtesy of GENERAL MOTORS CORP.

12. Measure the distance (2) from the driveline tube front bellhousing flange to the bearing housing flange (automatic transmission). Record this as distance 2.
13. Subtract the distance 2 from distance 1.
14. Record the computation as distance 3.

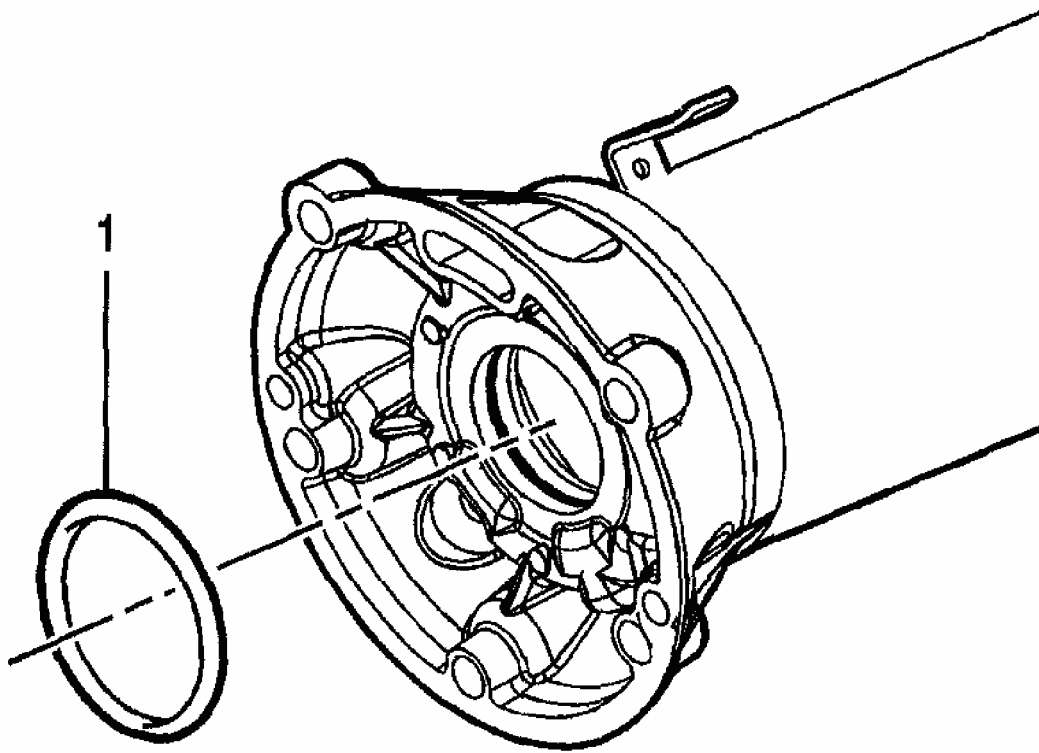


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**Fig. 216: Measuring Driveline Tube To Bearing Housing Clearance**  
**Courtesy of GENERAL MOTORS CORP.**

15. Lubricate the NEW driveline tube O-ring (1) with clean engine oil.
16. Install the O-ring into the front of the driveline tube.



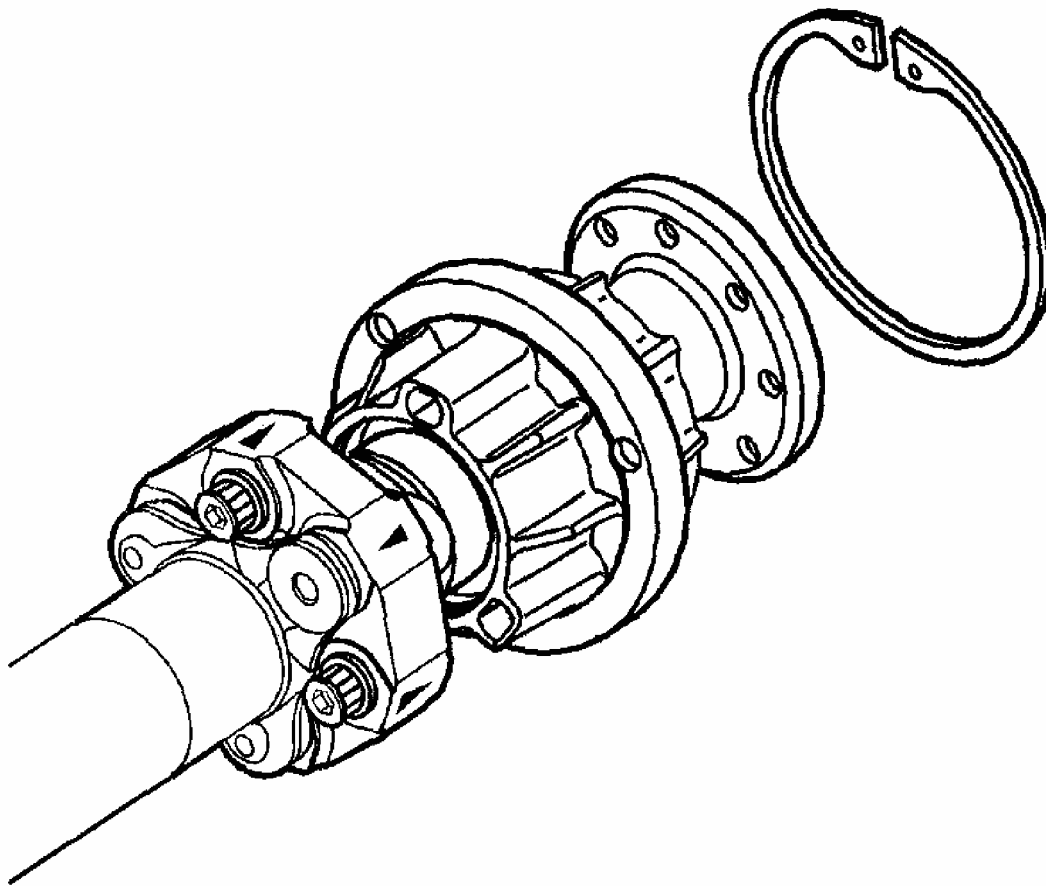


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**Fig. 217: Installing Driveline Tube O-Ring**  
**Courtesy of GENERAL MOTORS CORP.**

17. Install the propeller shaft assembly into the driveline tube.

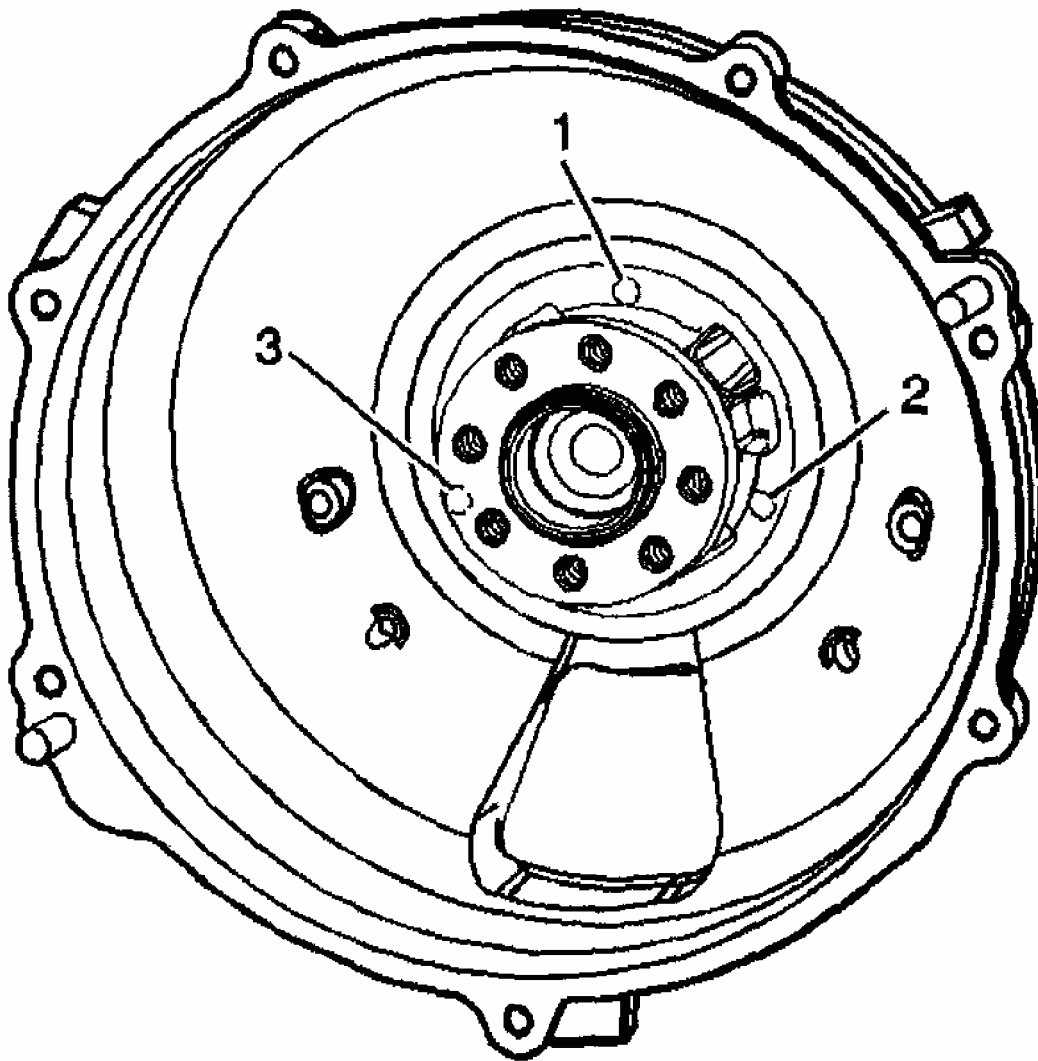
During installation, lift the front of the input shaft to avoid damage to the slinger washer. Using a punch, tap evenly on the flat flange area of the rear bearing housing and install the assembly completely into the tube.



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**Fig. 218: Installing Propeller Shaft Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

18. Install the rear bearing housing bolt hole plugs (1-3).



G01732218

**Fig. 219: Installing Rear Bearing Housing Bolt Hole Plugs**  
Courtesy of GENERAL MOTORS CORP.

19. Install the snap ring (1) into the driveline tube. The beveled edge of the snap ring faces the rear of the driveline tube assembly and will seat completely into the groove of the housing.

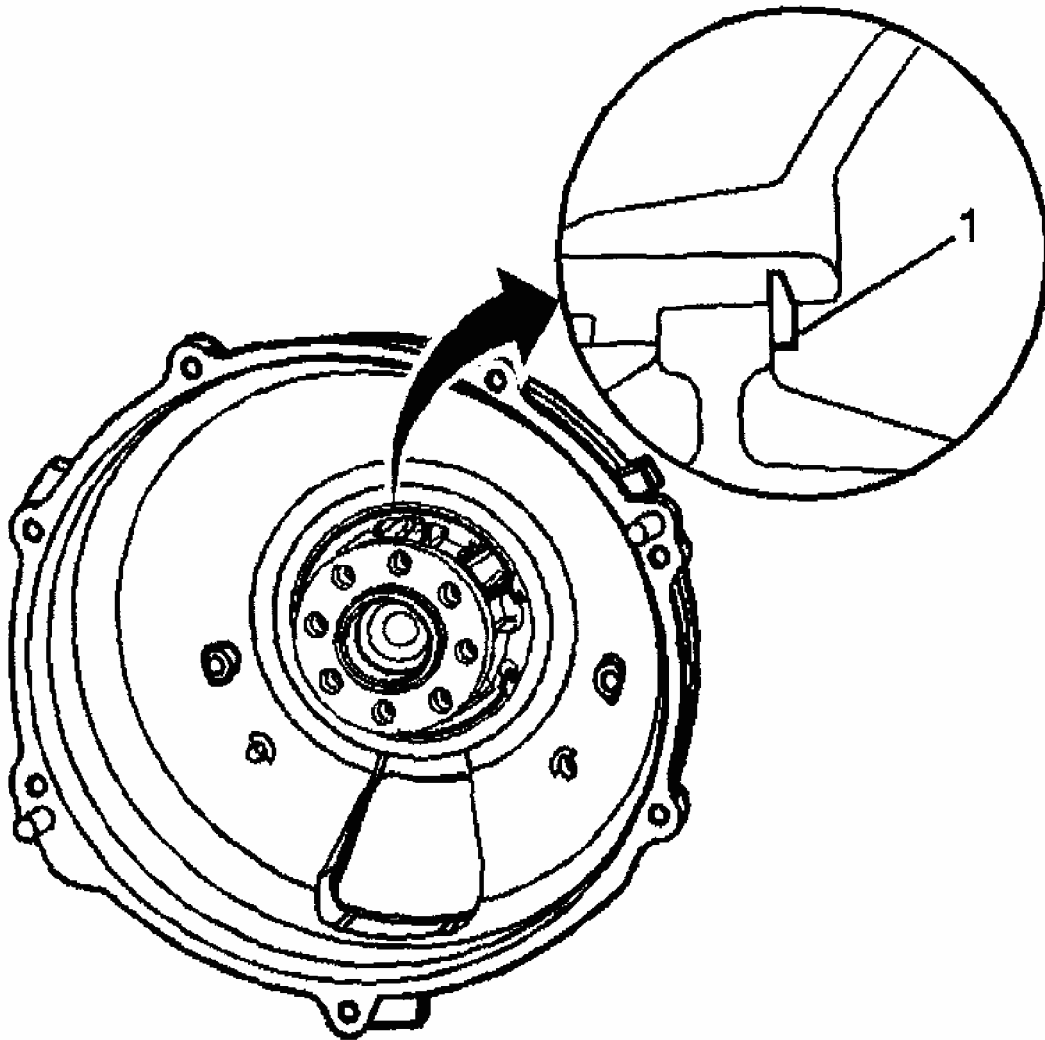
**Important:** The propeller shaft assembly must be checked for proper installation into the driveline tube (automatic transmission). When the propeller shaft assembly is installed into the driveline tube, the couplings may compress and not properly position the input shaft.

20. Measure the distance from the end of the input shaft to the driveline tube front bell

housing flange (automatic transmission).

The actual distance must be equal to or within 2 mm (0.079 in) of the recorded dimension 3.

**20.1.** If the actual distance is not within specifications, use a heat gun and heat the outside of the driveline support tube at the front bearing location.



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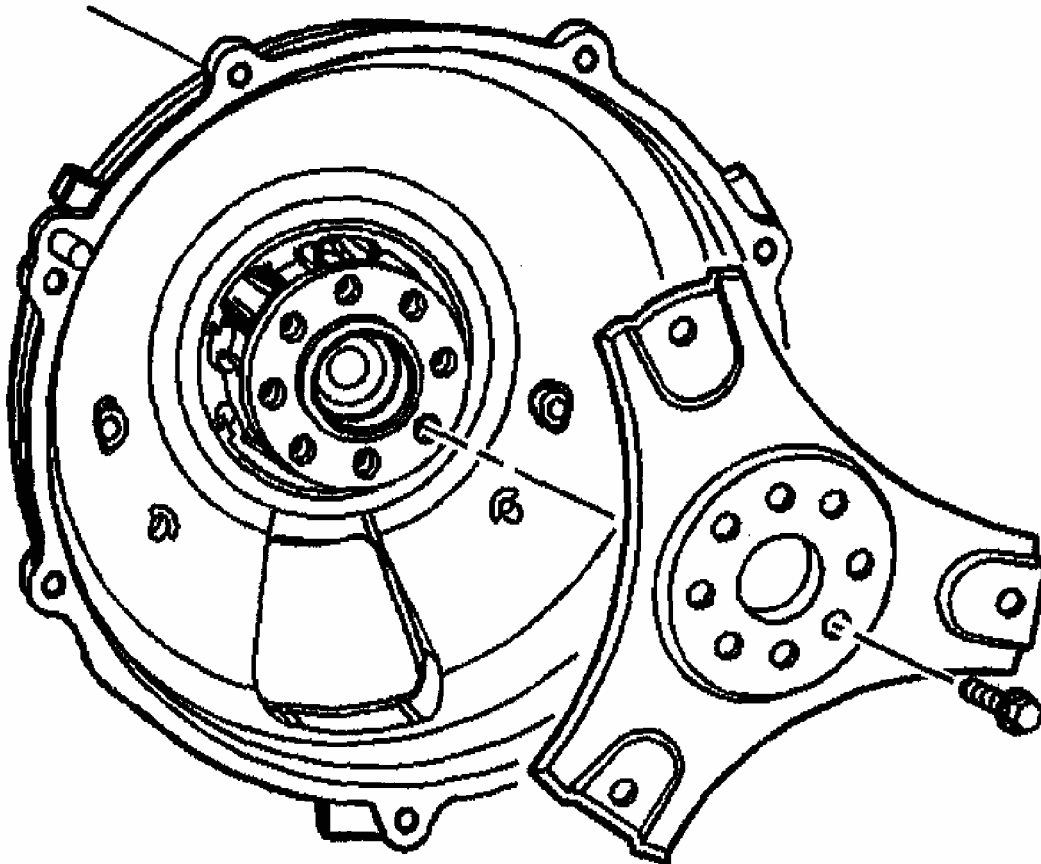
**Fig. 220: Identifying Driveline Snap Ring**  
**Courtesy of GENERAL MOTORS CORP.**

**20.2.** Tap on the rear of the propeller shaft assembly or pull on the input shaft until the shaft has reached the proper position.

21. Install the flex plate and bolts - (automatic transmission).

**Tighten**

Tighten the flex plate bolts to 50 N.m (37 lb ft).



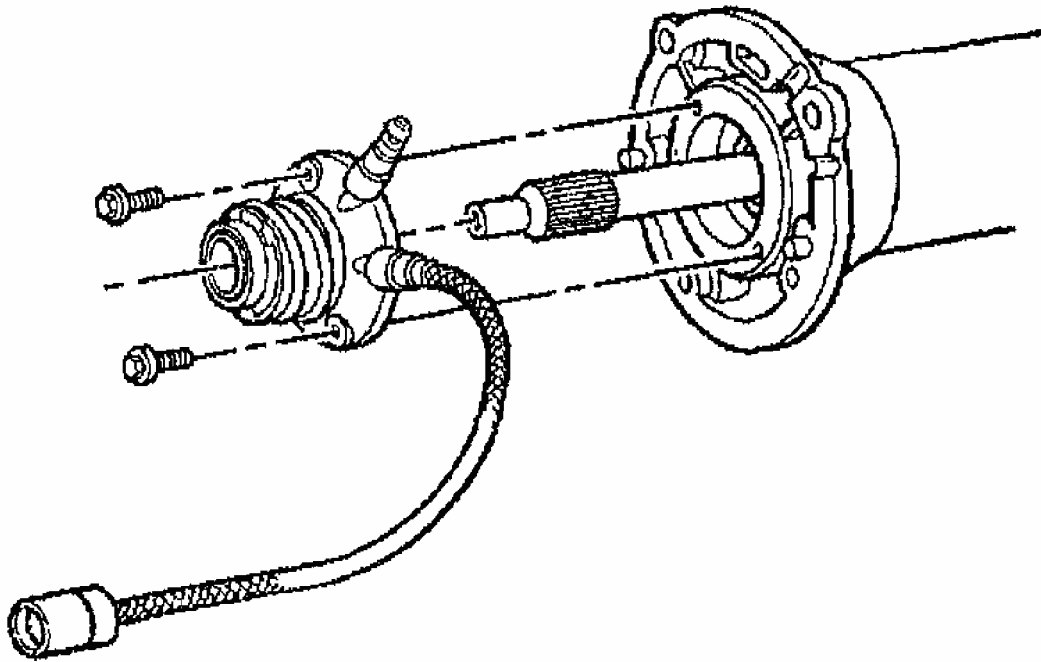
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**Fig. 221: Installing Flex Plate Retaining Bolts**  
**Courtesy of GENERAL MOTORS CORP.**

22. Install the clutch actuator and bolts - (manual transmission).

**Tighten**

Tighten the clutch actuator bolts to 12 N.m (106 lb in).



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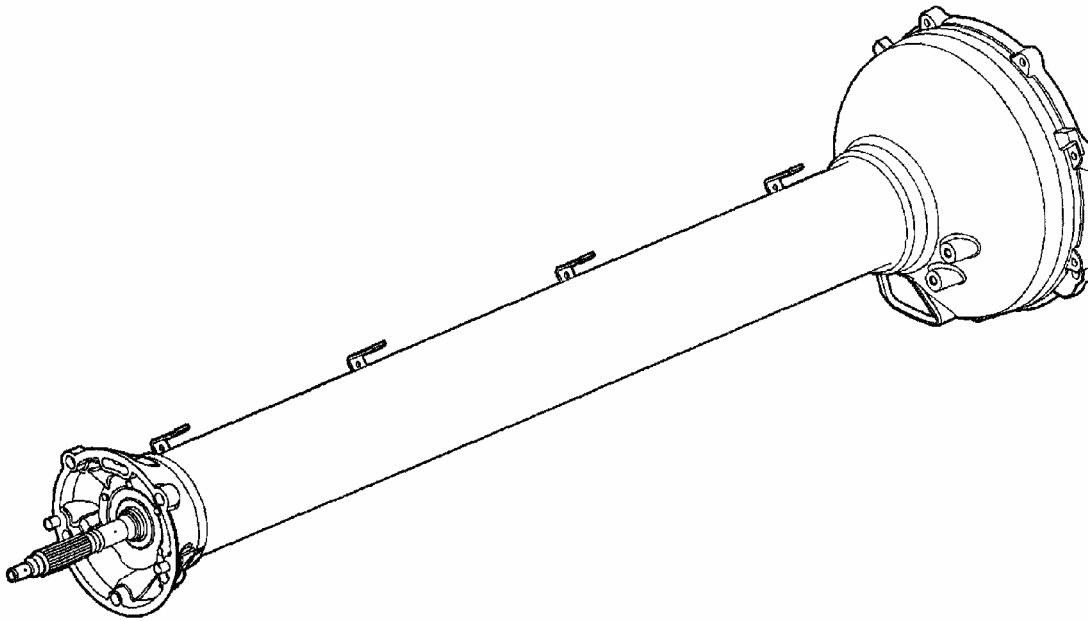
**Fig. 222: Installing Clutch Actuator Bolts**  
Courtesy of GENERAL MOTORS CORP.

## DESCRIPTION & OPERATION

### DRIVELINE SUPPORT ASSEMBLY DESCRIPTION

## 2002 Chevrolet Corvette

### 2002 DRIVELINE/AXLE Propeller Shaft - Corvette

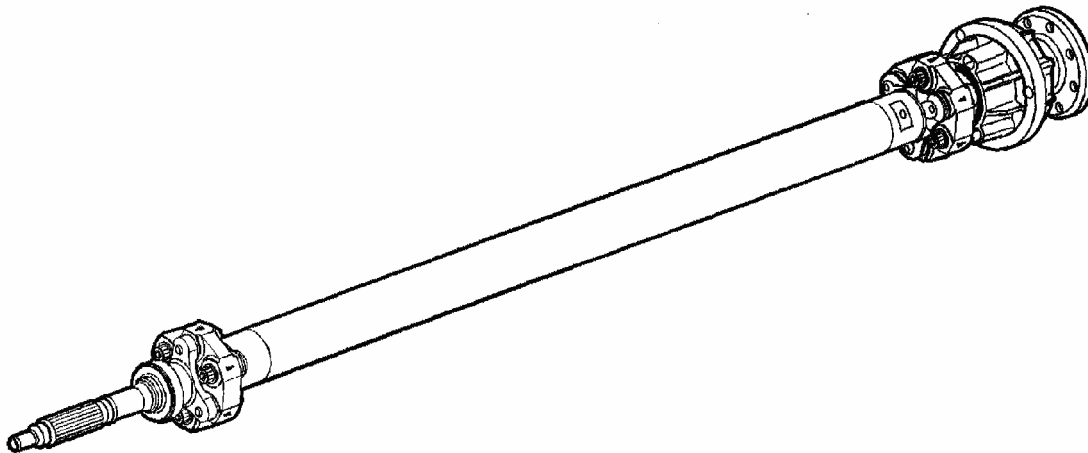


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**Fig. 223: Driveline Assembly**  
Courtesy of GENERAL MOTORS CORP.

Automatic Transmission application shown.

The driveline support assembly consists of a driveline support tube, with rear bell housing, and an internal propeller shaft assembly. The front of the driveline assembly mounts to the engine bellhousing. In manual transmission applications, the clutch actuator is retained to the front of the tube and the shifter linkage is mounted to brackets at the top center area. The driveline support assembly is specific for each vehicle as equipped, either automatic or manual transmission applications.



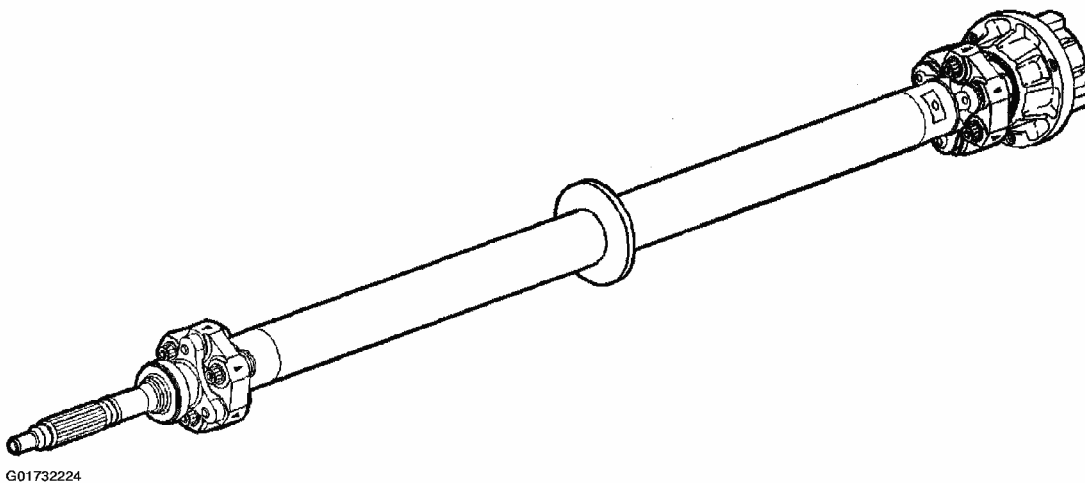
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**Fig. 224: Propeller Shaft Assembly (Automatic Transmission)**

**Courtesy of GENERAL MOTORS CORP.**

The automatic transmission propeller shaft assembly consists of a splined front input shaft, front coupling, propeller shaft, rear coupling, M10 bolts, and a bearing and housing assembly. The input shaft, propeller shaft, couplings and bearing and housing assembly are balanced as an assembly. The front of the propeller shaft assembly is supported, at the input shaft, by a ball type bearing. An O-ring, located in the front of the driveline support tube, prevents the front bearing outer race from spinning.

The rear of the propeller shaft assembly is supported by a bearing and housing assembly. The bearing and housing assembly consists of a housing, internally splined input hub, externally splined flexplate spindle, O-rings, snap rings, and two ball type bearings. The propeller shaft assembly is retained in the driveline tube by an internal snap ring. The torque converter flex plate is retained to the flexplate spindle by bolts and is mated to the torque converter.



**Fig. 225: Propeller Shaft Assembly (Manual Transmission)**  
**Courtesy of GENERAL MOTORS CORP.**

The manual transmission propeller shaft assembly consists of a splined front input shaft, front coupling, propeller shaft, rear coupling, M12 bolts, and a bearing and housing assembly. The input shaft, propeller shaft, couplings and bearing and housing assembly are balanced as an assembly.

The front of the propeller shaft assembly is supported, at the input shaft, by a ball type bearing. An O-ring, located in the front of the driveline support tube, prevents the front bearing outer race from spinning. The rear bearing of the propeller shaft assembly is supported by a bearing and housing assembly.

The bearing and housing assembly consists of a housing, internally splined hub, pilot bushings, O-rings, snap rings, a wave washer, and two ball type bearings. The bearing



## 2002 Chevrolet Corvette


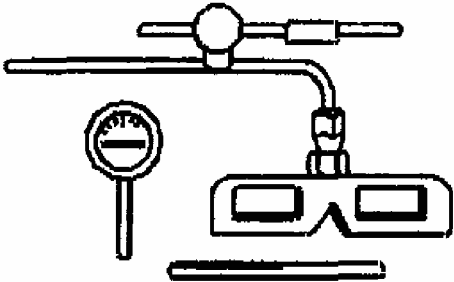
### 2002 DRIVELINE/AXLE Propeller Shaft - Corvette

housing hub internal splines couple to the manual transmission splined input shaft. The propeller shaft assembly is retained in the driveline tube by an internal snap ring. The propeller shaft tube has an overspeed limiter, snubber, that prevents permanent propeller shaft damage as a result of a downshift above recommended speeds.

**Important:** Disassembly and improper reassembly of the propeller shaft components may result in driveline vibration. The propeller shaft and components should be kept free of any foreign material which could upset balance and also produce driveline vibration.

**CAUTION:** When servicing the engine, transaxle, or driveline support assembly, the proper installation procedure must be followed. Automatic transmission applications have a specific installation procedure and sequence of installation steps. Failure to follow proper procedures may cause damage to other vehicle driveline components.

## SPECIAL TOOLS & EQUIPMENT

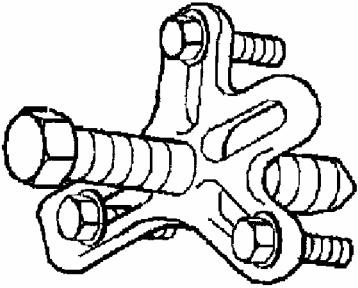
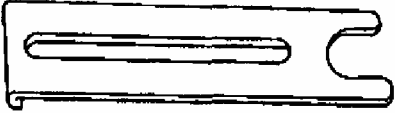
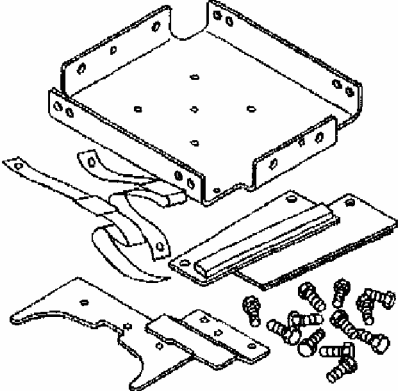
Illustration	Tool Number/ Description
	J 2619-01 Slide Hammer
	J 7872 Magnetic Base Dial Indicator Set

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**Fig. 226: Special Tools & Equipment (1 Of 2)**  
Courtesy of GENERAL MOTORS CORP.

## 2002 Chevrolet Corvette

2002 DRIVELINE/AXLE Propeller Shaft - Corvette

Illustration	Tool Number/ Description
	J 24420-C Harmonic Balancer Puller
	J 36221 Hydraulic Clutch Separator
	J 42055 Transmission Support Fixture

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**Fig. 227: Special Tools & Equipment (2 Of 2)**  
**Courtesy of GENERAL MOTORS CORP.**