

## 2003 Isuzu Ascender

2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

### 2003 TRANSMISSION

Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Drain Plug	27 N-m	20 lb ft
Extension Housing to Rear Case Half Bolts	22 N-m	16 lb ft
Fill Plug	27 N-m	20 lb ft
Front Case Half to Rear Case Half Bolts	22 N-m	16 lb ft
Oil Pump Cover Bolts	11 N-m	9 lb ft
Transfer Case Motor/Encoder Bolts	16 N-m	12 lb ft
Vehicle Speed Sensors	17 N-m	13 lb ft

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**Fig. 1: Fastener Tightening Specifications**

### SEALERS, ADHESIVES, AND LUBRICANTS

Application	Type of Material	GM Part Number	
		United States	Canada
Drain Plug	Pipe Sealant	12346004	10953480
Fill Plug	Pipe Sealant	12346004	10953480
Rear Case Half to Front Case Half	RTV Sealant	12345739	10953541
Rear Extension to Rear Case Half	RTV Sealant	12345739	10953541
Vehicle Speed Sensor O-rings	Transfer Case Fluid	12378508	10953626
Vent	Retaining Compound	12377901	10953504

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**Fig. 2: Sealers, Adhesives & Lubricants**

### CAPACITIES - APPROXIMATE FLUID

Application	Specification	
	Metric	English
Auto Trac II GM P/N 12378508 (Canadian P/N 10953626)	1.8 liters	2 quarts

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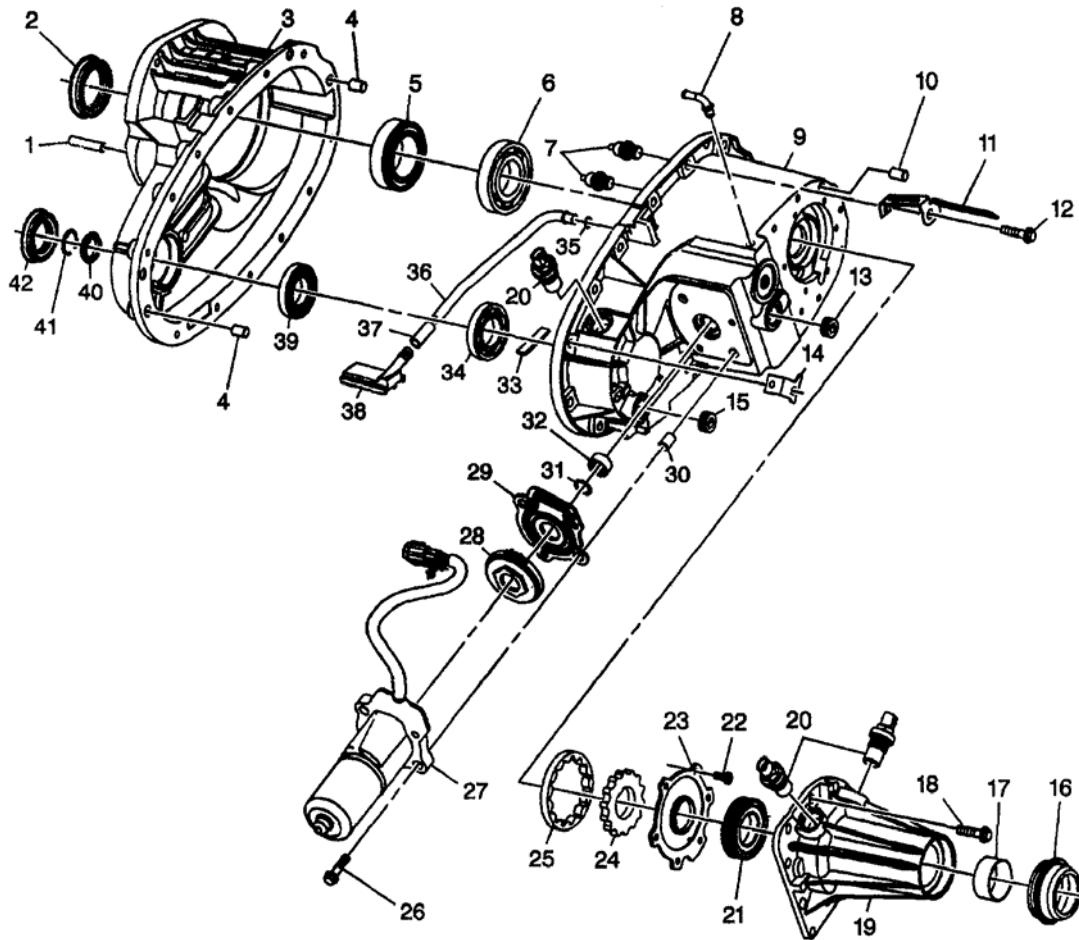
**Fig. 3: Capacities - Approximate Fluid**

## VISUAL IDENTIFICATION

### TRANSFER CASE DISASSEMBLED VIEW

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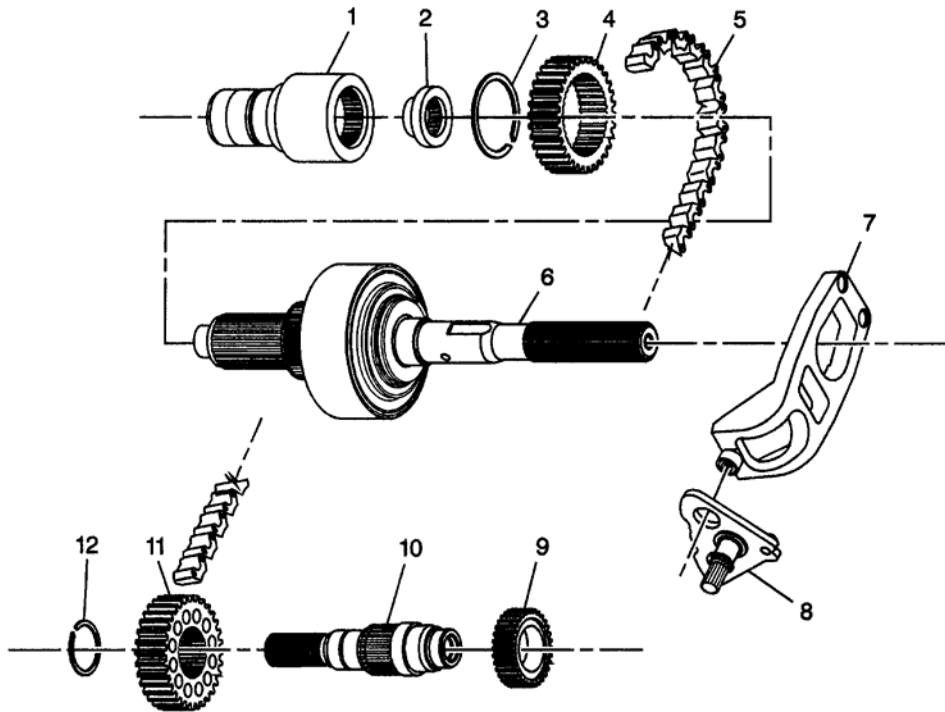


- |                                        |                                          |
|----------------------------------------|------------------------------------------|
| (1) Adapter Stud                       | (22) Oil Pump Cover Bolt                 |
| (2) Input Shaft Seal                   | (23) Oil Pump Cover                      |
| (3) Front Case Half                    | (24) Oil Pump Drive Gear                 |
| (4) Location Pin                       | (25) Oil Pump Driven Gear                |
| (5) Front Input Bearing                | (26) Encoder Motor Bolt                  |
| (6) Rear Output Rear Bearing           | (27) Encoder Motor                       |
| (7) Control Lever Studs                | (28) Encoder Sensor                      |
| (8) Vent Pipe                          | (29) Insulator                           |
| (9) Rear Case Half                     | (30) Location Pin                        |
| (10) Location Pin                      | (31) Actuator Lever Shaft Retaining Ring |
| (11) Wiring Harness Bracket            | (32) Actuator Lever Shaft Bearing        |
| (12) Case Half Bolt                    | (33) Chip Collector Magnet               |
| (13) Oil Fill Plug                     | (34) Front Output Shaft Rear Bearing     |
| (14) Bracket                           | (35) Oil Pump Suction Pipe Seal O-Ring   |
| (15) Oil Drain Plug                    | (36) Oil Pump Suction Pipe               |
| (16) Rear Output Shaft Seal            | (37) Oil Pump Suction Hose               |
| (17) Rear Extension Bushing            | (38) Oil Pump Screen                     |
| (18) Rear Extension Bolt               | (39) Front Output Shaft Front Bearing    |
| (19) Rear Extension                    | (40) Front Output Shaft Dust Seal        |
| (20) Vehicle Speed Sensors             | (41) Front Output Shaft Ring             |
| (21) Output Shaft Speed Reluctor Wheel | (42) Front Output Shaft Seal             |

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**Fig. 4: Case Components Disassembled View**



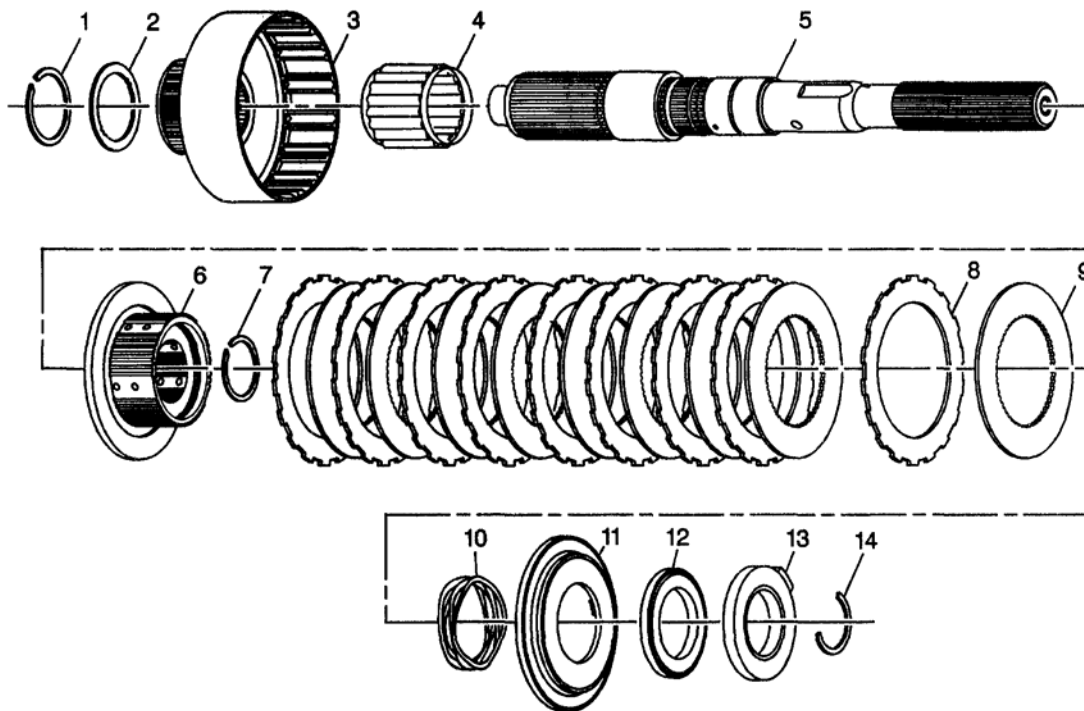
- |                                   |                                             |
|-----------------------------------|---------------------------------------------|
| (1) Input Shaft Gear              | (7) Clutch Lever                            |
| (2) Input Gear Thrust Bearing     | (8) Control Actuator Lever Shaft            |
| (3) Drive Sprocket Retaining Ring | (9) Front Output Shaft Speed Reluctor Wheel |
| (4) Drive Sprocket                | (10) Front Output Shaft                     |
| (5) Drive Chain                   | (11) Driven Sprocket                        |
| (6) Rear Output Shaft             | (12) Driven Sprocket Retaining Ring         |

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**Fig. 5: Internal Components Disassembled View**

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- (1) Clutch Retaining Ring
- (2) Rear Output Shaft Thrust Washer
- (3) Clutch Housing
- (4) Clutch Housing Bearing
- (5) Rear Output Shaft
- (6) Clutch Hub
- (7) Clutch Retaining Ring
- (8) Clutch Pressure Plate - Outer

- (9) Clutch Pressure Plate - Inner
- (10) Clutch Spring
- (11) Clutch Pressure Plate - Apply
- (12) Clutch Pressure Plate Bearing
- (13) Clutch Inner Plate
- (14) Clutch Pressure Plate Bearing Hub Retaining Ring

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**Fig. 6: Rear Output Shaft Assembly Disassembled View**

## REPAIR INSTRUCTIONS

### TRANSFER CASE DISASSEMBLE

#### Tools Required

- J 3289-20 Holding Fixture
- J 23907 Slide Hammer with Bearing Adapter
- J 26941 Bushing/Bearing Remover - 3-4 inch
- J 36513 Gear and Bearing Separate or Plate
- J 44707 T Bar Push Puller
- J 44737 Shift Rail Bearing Remover
- J 44759 Adapter 3/8 NC to 5/8 NF

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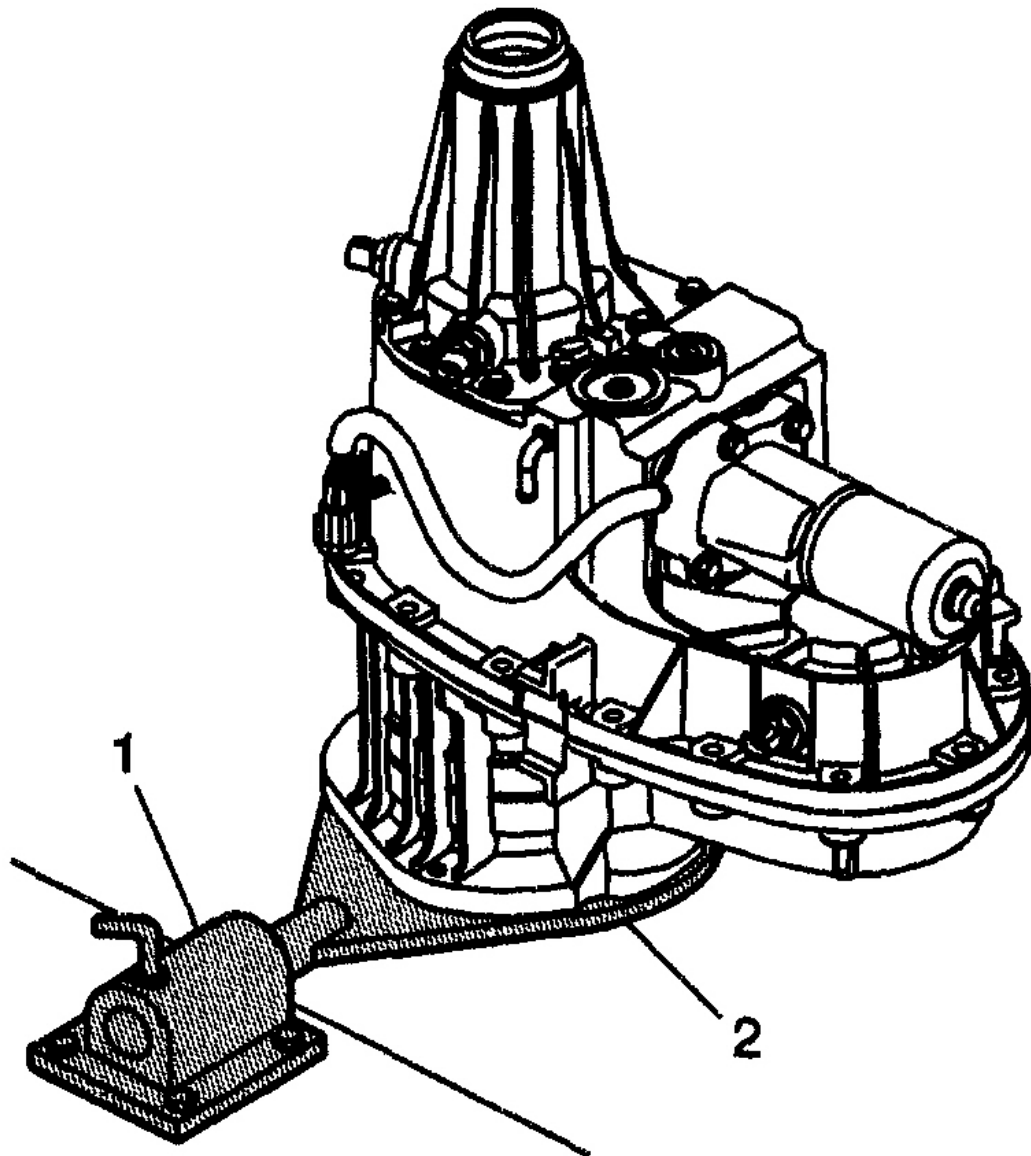
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- J 45358 Case Spreader
- J 45380 Transfer Case Rear Bushing Remover and Installer
- J 45759 Assembly Fixture

1. If available, using the adapter studs, attach the J 45759 (2) to the transfer case.
2. Mount the J 3289-20 (1) to a sturdy work bench.
3. Install the J 45759 (2) into the J 3289-20 (1) and secure with the pivot pin.

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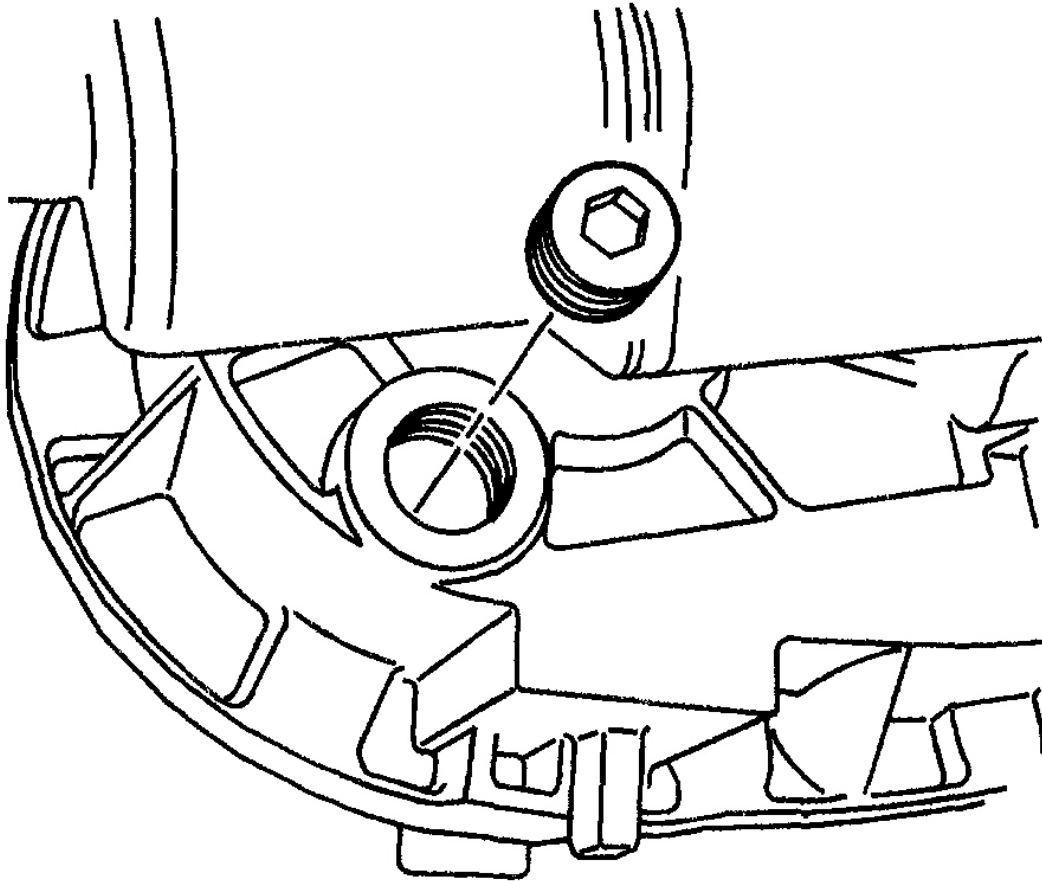
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**Fig. 7: Installing J 45759 & J 3289-20**

4. Remove the drain plug.
5. Tip the transfer case to remove any remaining transfer case fluid.



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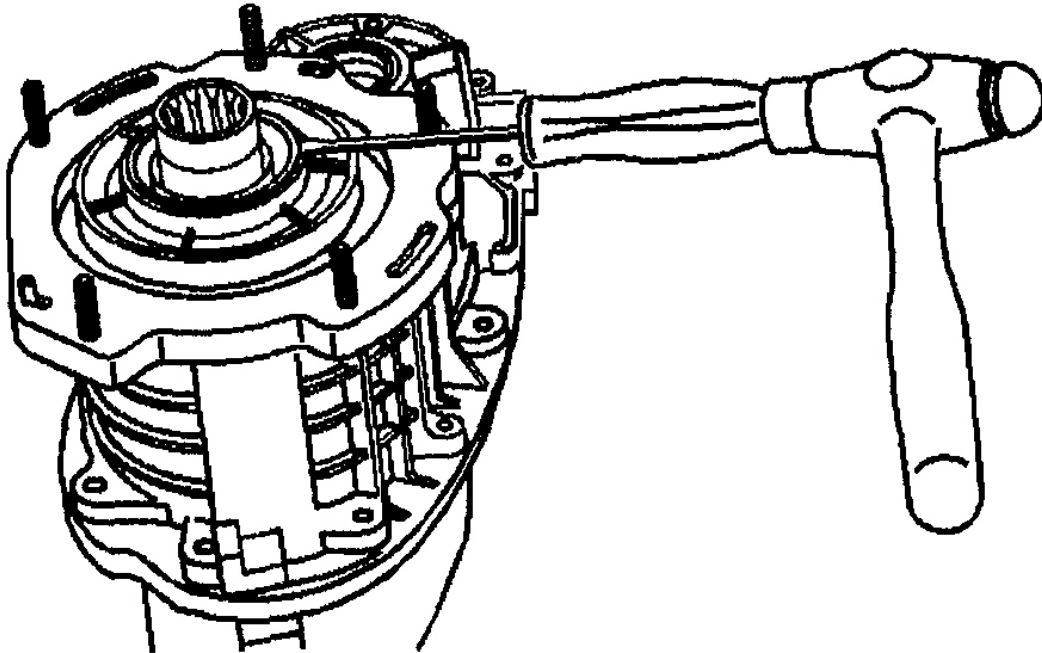
**Fig. 8: Removing Drain Plug**

**NOTE:** Refer to **TRANSFER CASE SEAL REMOVAL NOTICE** in **Cautions and Notices**.

6. Using a fine flat-bladed screwdriver and a mallet, loosen the front input shaft seal.

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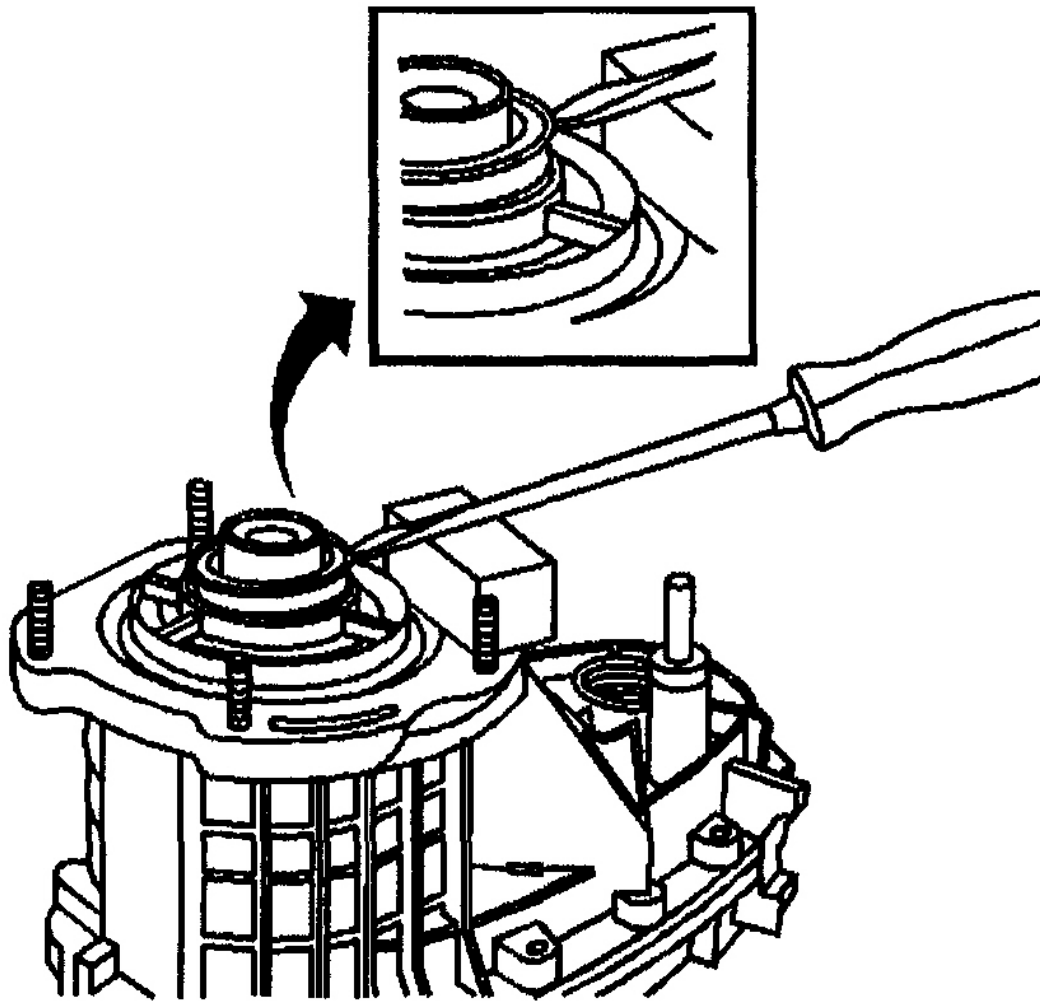


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**Fig. 9: Loosening Front Input Shaft Seal**

7. Using a small block of wood and a large flat-bladed screwdriver, remove the front input shaft seal from the transfer case.

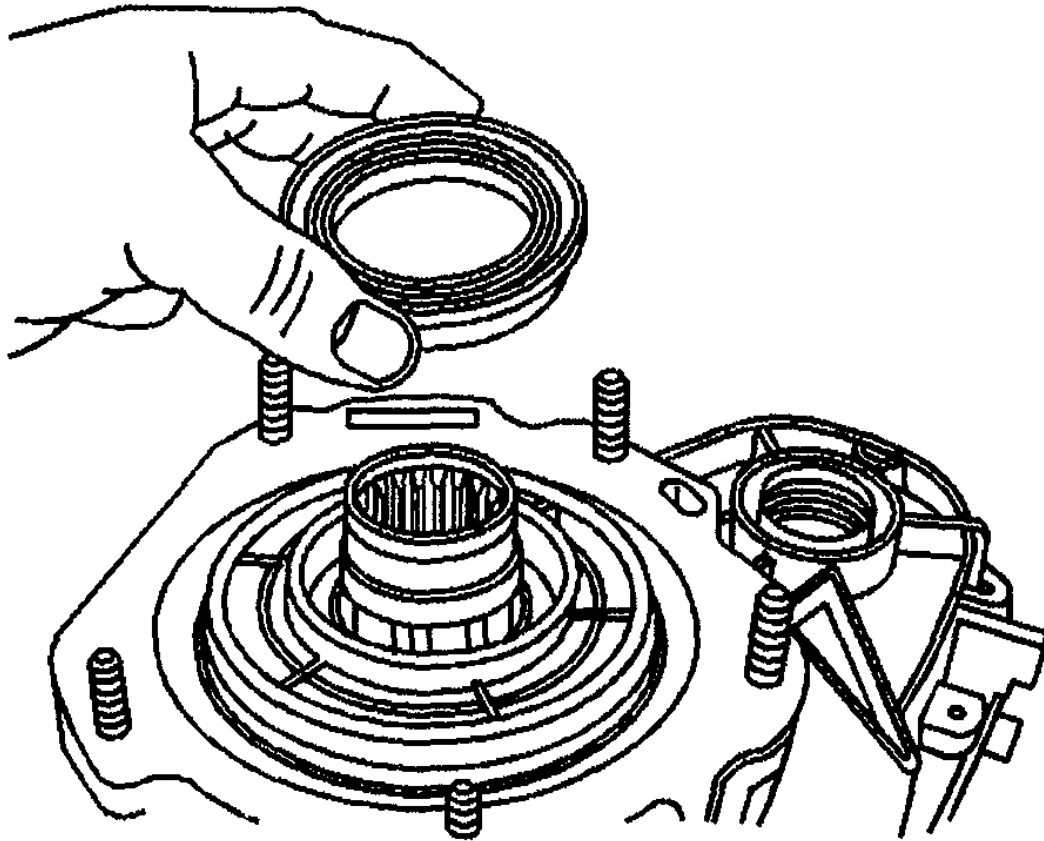




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**Fig. 10: Removing Front Input Shaft Seal From Transfer Case**

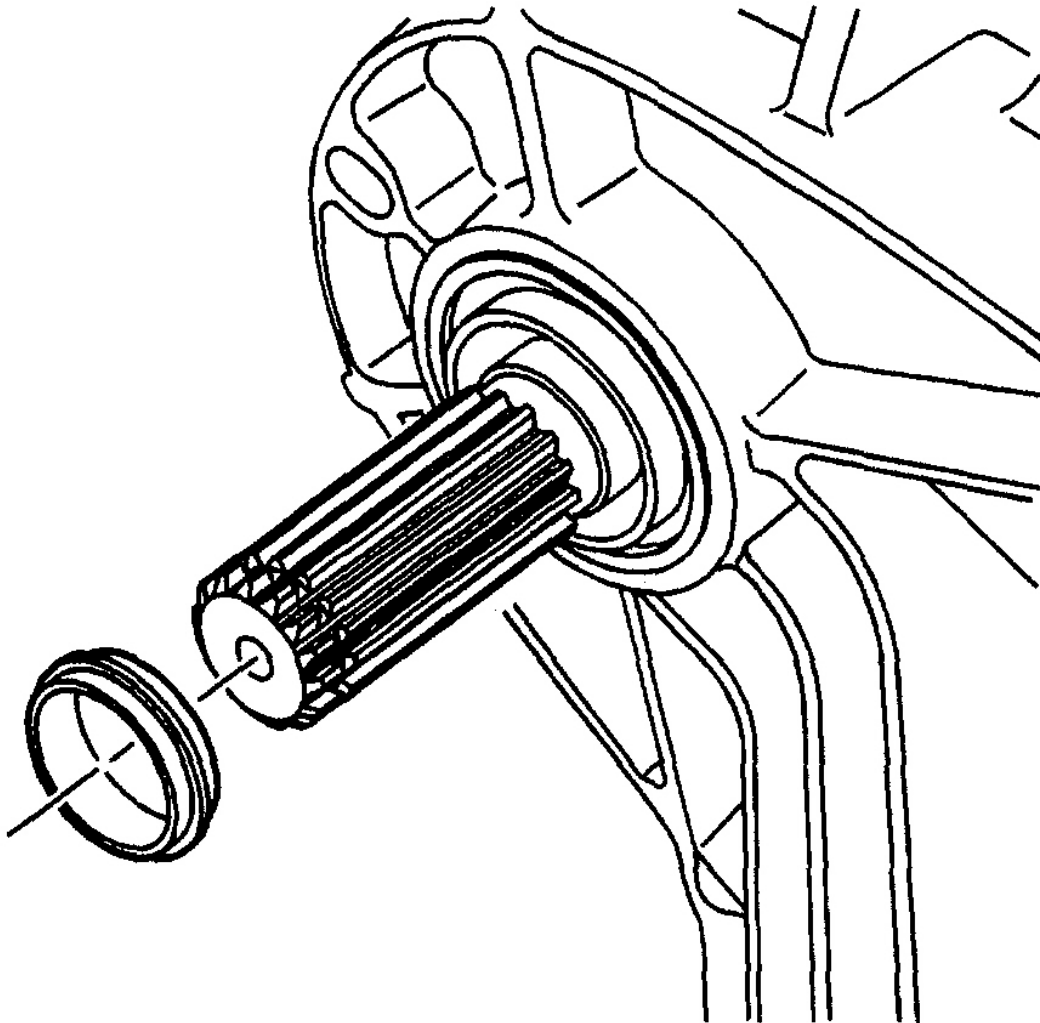
8. Remove the front input shaft seal.



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**Fig. 11: Removing Front Input Shaft Seal**

9. Remove the dust seal from the front output shaft. The front output shaft oil seal does not require removal at this time.



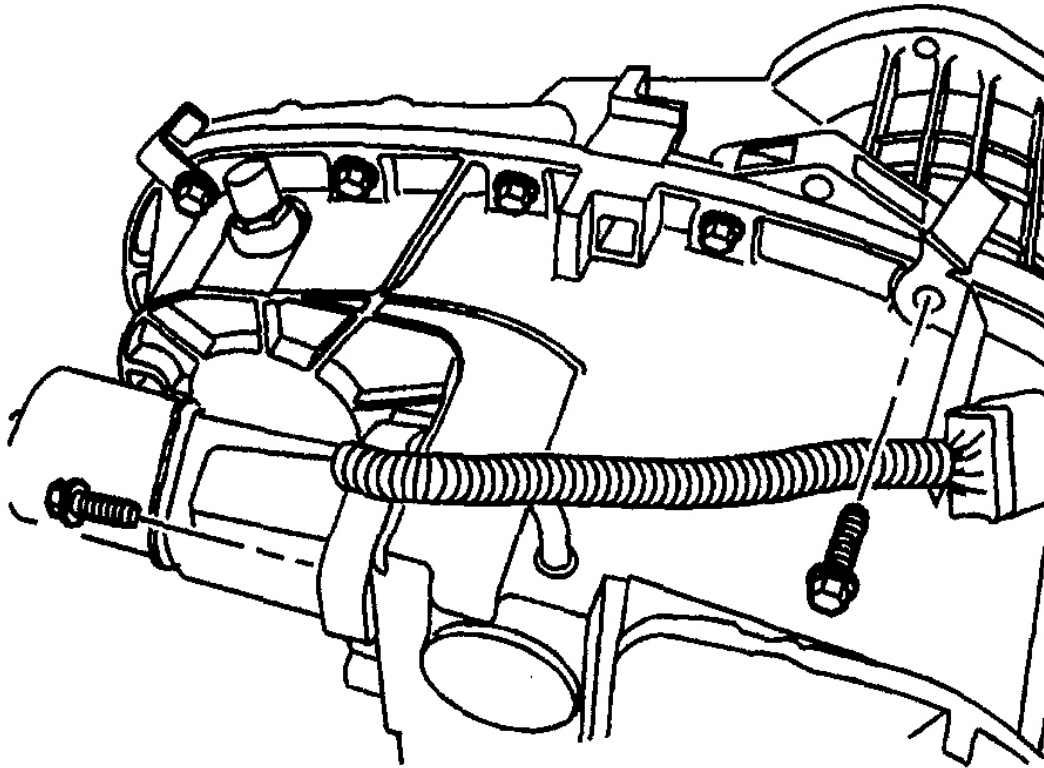
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**Fig. 12: Removing Dust Seal From Front Output Shaft**

10. Remove the transfer case bolt that is retaining the wiring harness bracket.
11. Mark the location of the wiring harness bracket bolt.
12. Remove the encoder/motor mounting bolts.

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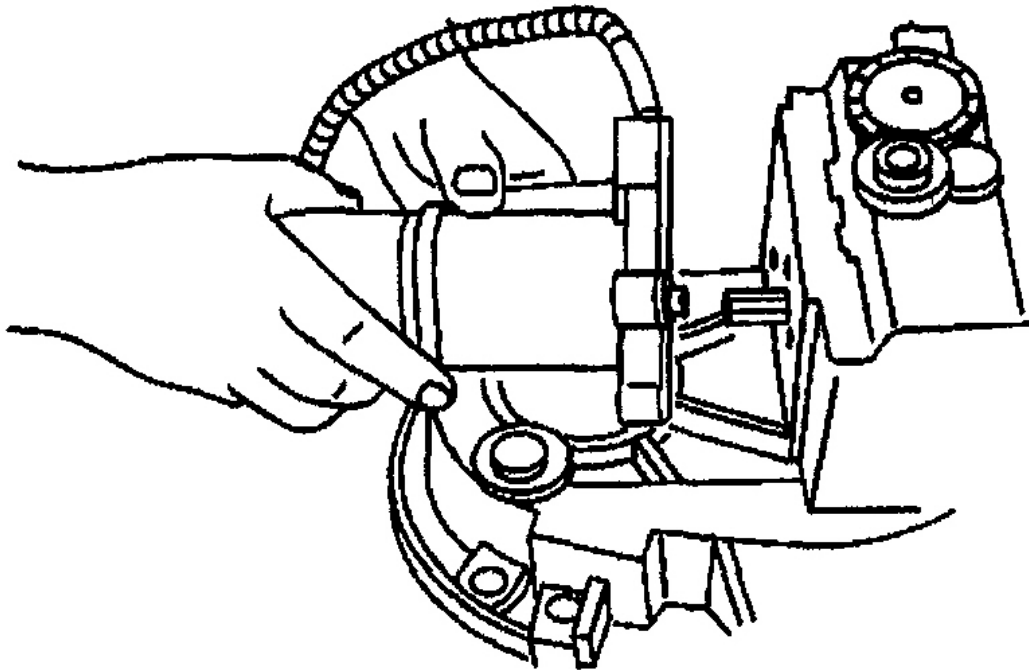
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**Fig. 13: Removing Encoder/Motor Mounting Bolts**

13. Remove the encode/motor assembly.

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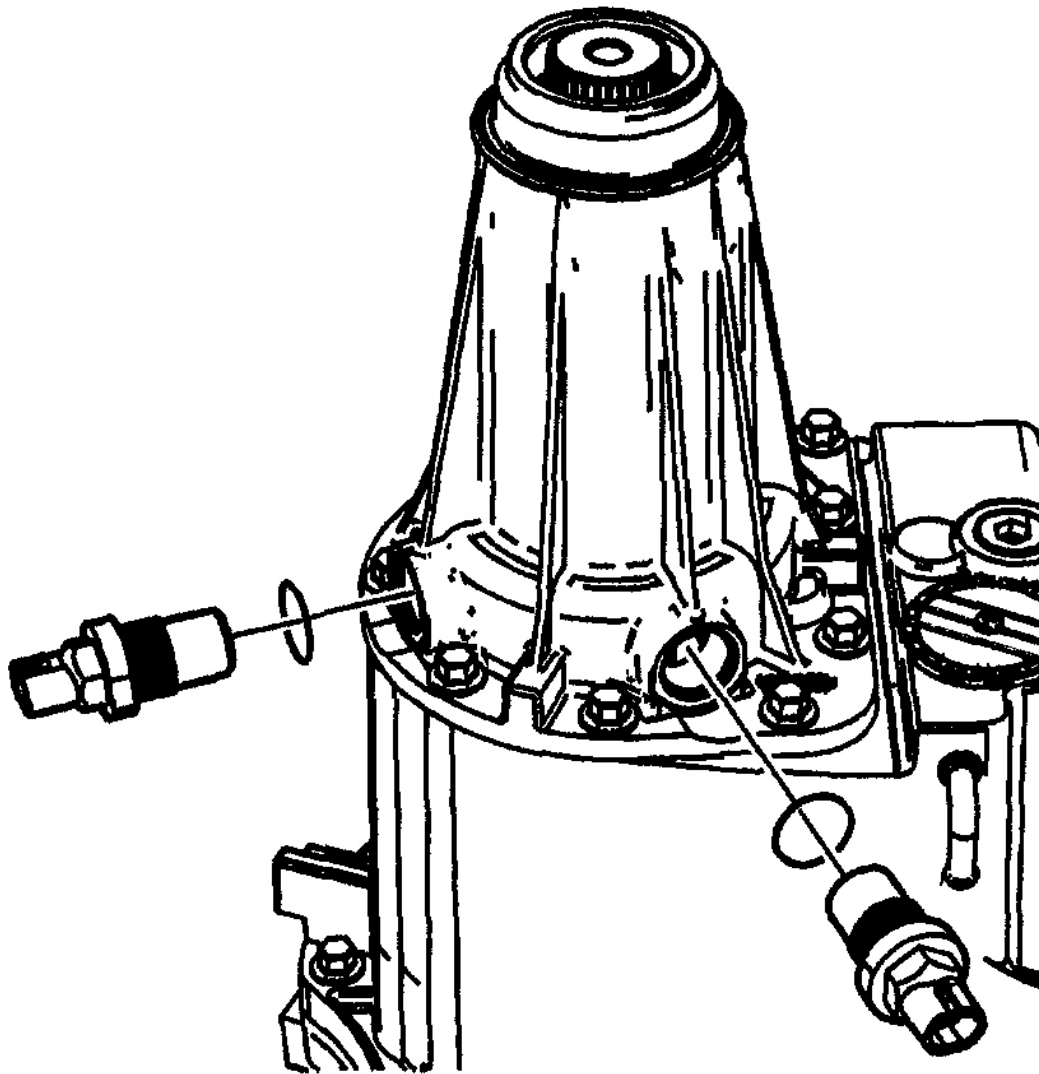
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**Fig. 14: Removing Encoder/Motor Assembly**

14. Remove both vehicle speed sensors (VSS) and O-ring seals from the rear extension.

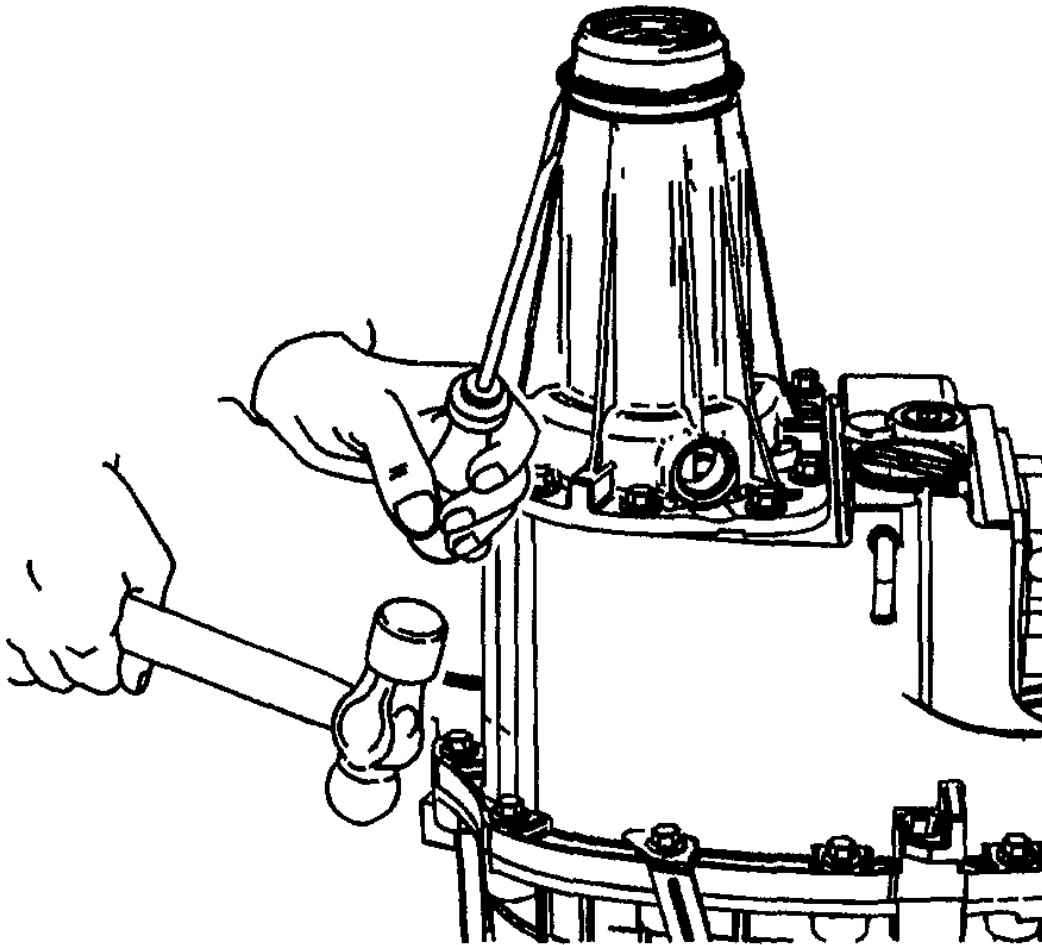


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**Fig. 15: Removing Vehicle Speed Sensors & O-Ring Seals From Rear Extension**

**NOTE:** Refer to TRANSFER CASE SEAL REMOVAL NOTICE in Cautions and Notices.

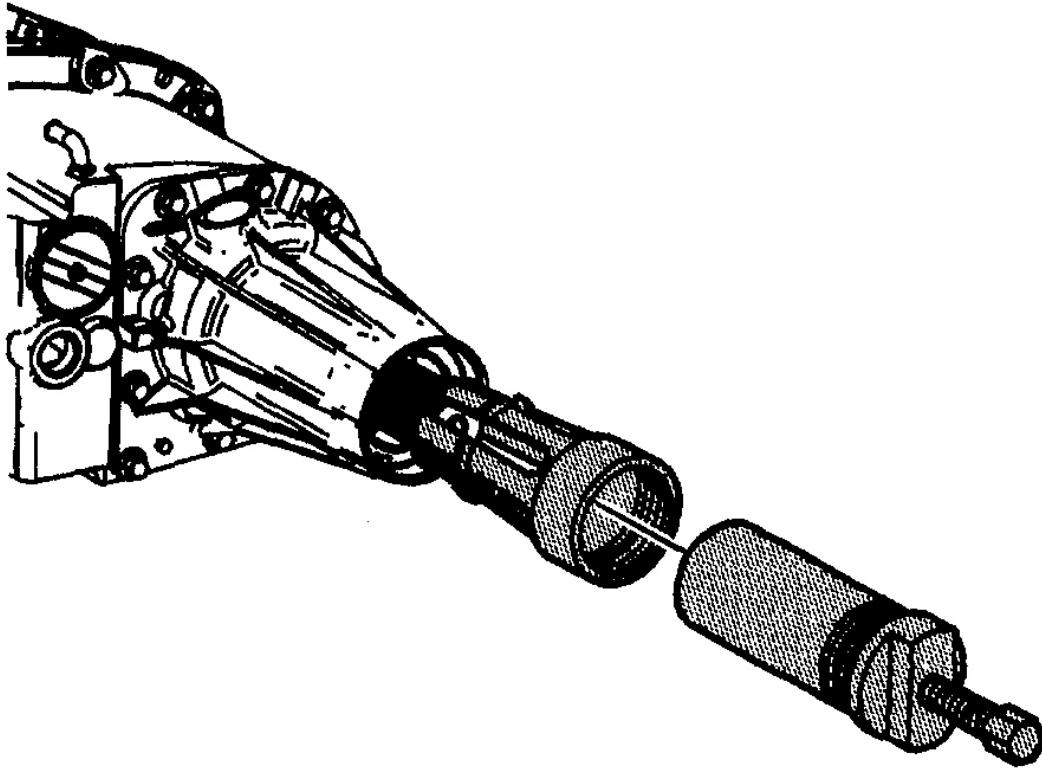
15. Remove the rear output shaft seal.



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**Fig. 16: Removing Rear Output Shaft Seal**

16. Inspect the rear output shaft bushing for scoring or wear.
17. Remove the rear output shaft bushing using the J 45380.
  - Install the finger section of the J 45380 in front of the bushing.
  - Install the tube and forcing screw assembly to the finger section. Ensure the forcing screw is backed out.
  - Using a wrench on the forcing screw, remove the rear output shaft bushing.



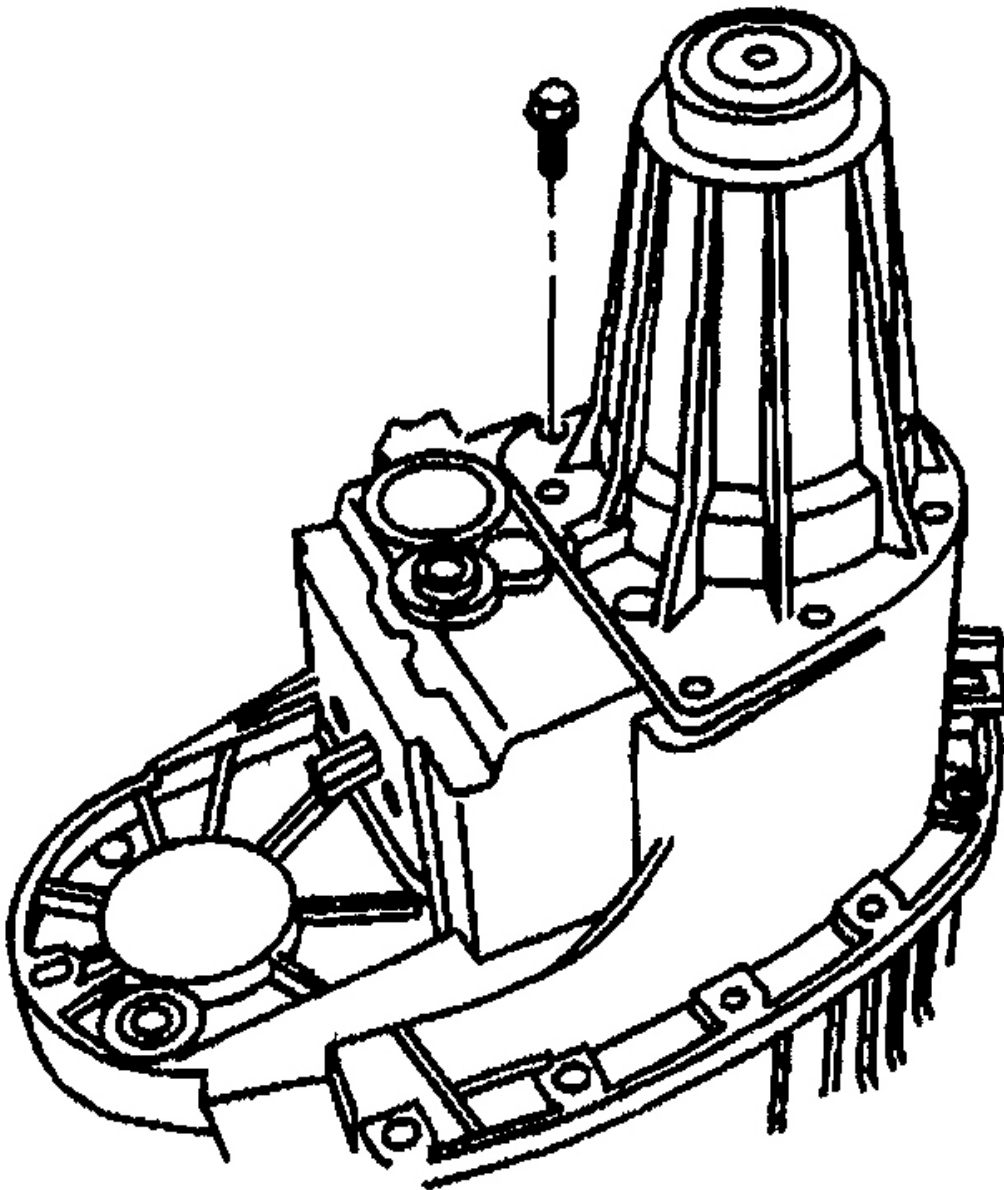
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**Fig. 17: Removing Rear Output Shaft Bushing**

**IMPORTANT:** Remove the rear extension and case half bolts at the same time for easier rear case disassembly.

18. Remove the rear extension mounting bolts.





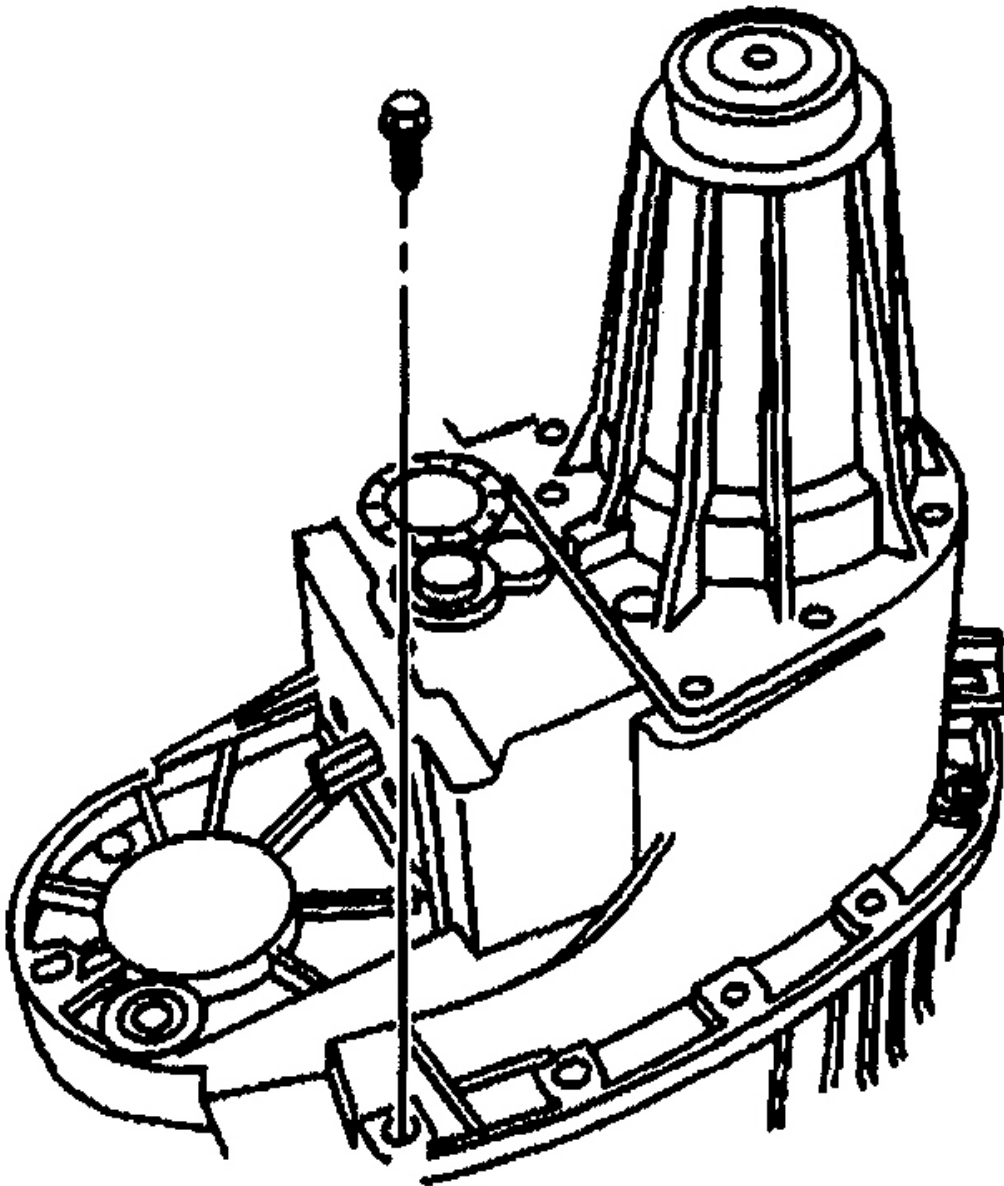
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**Fig. 18: Removing Rear Extension Mounting Bolts**

19. Remove the case half bolts.

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**Fig. 19: Removing Case Half Bolts**

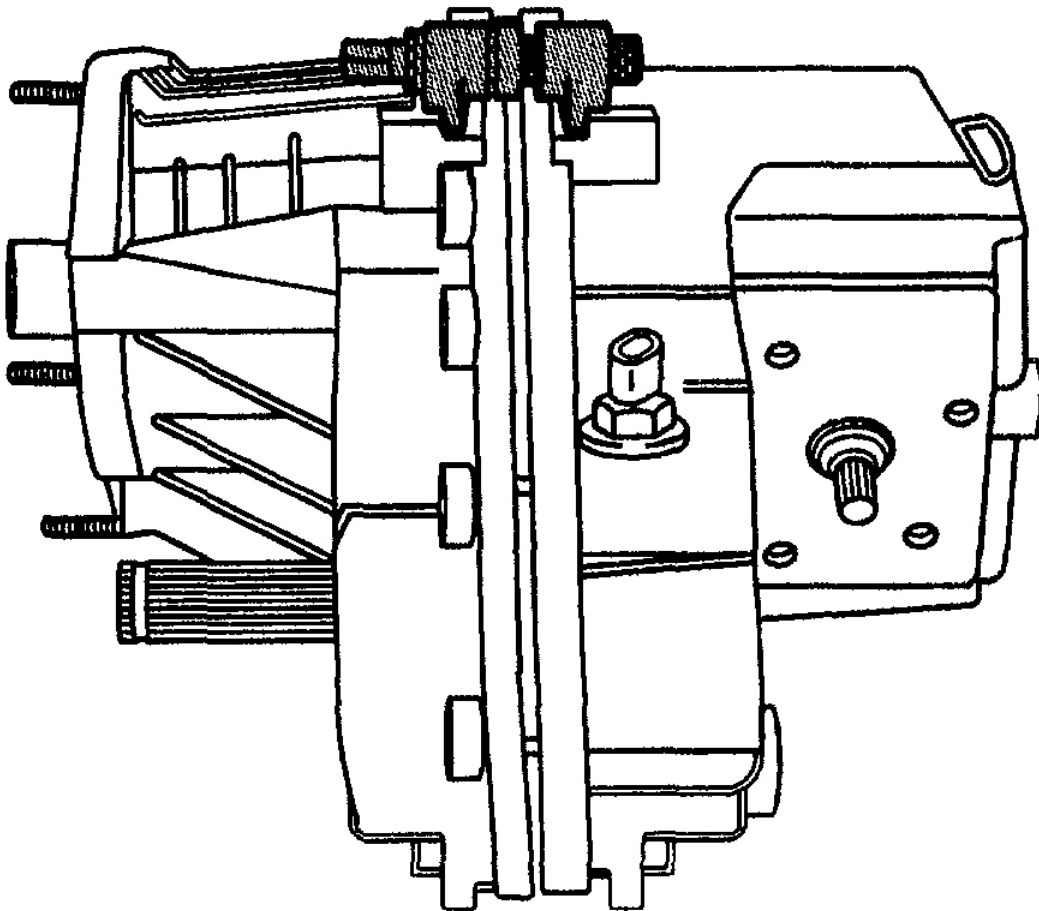
**NOTE:** Refer to **MACHINED SURFACE DAMAGE NOTICE** in Cautions and Notices.

20. Install the J 45358 between the tabs on one side of the case.

**IMPORTANT:**

- Ensure that all of the case half bolts have been removed.
- **DO NOT** use screwdrivers or pry bars to separate the transfer case halves. The special tool must be used to separate the transfer case halves properly.

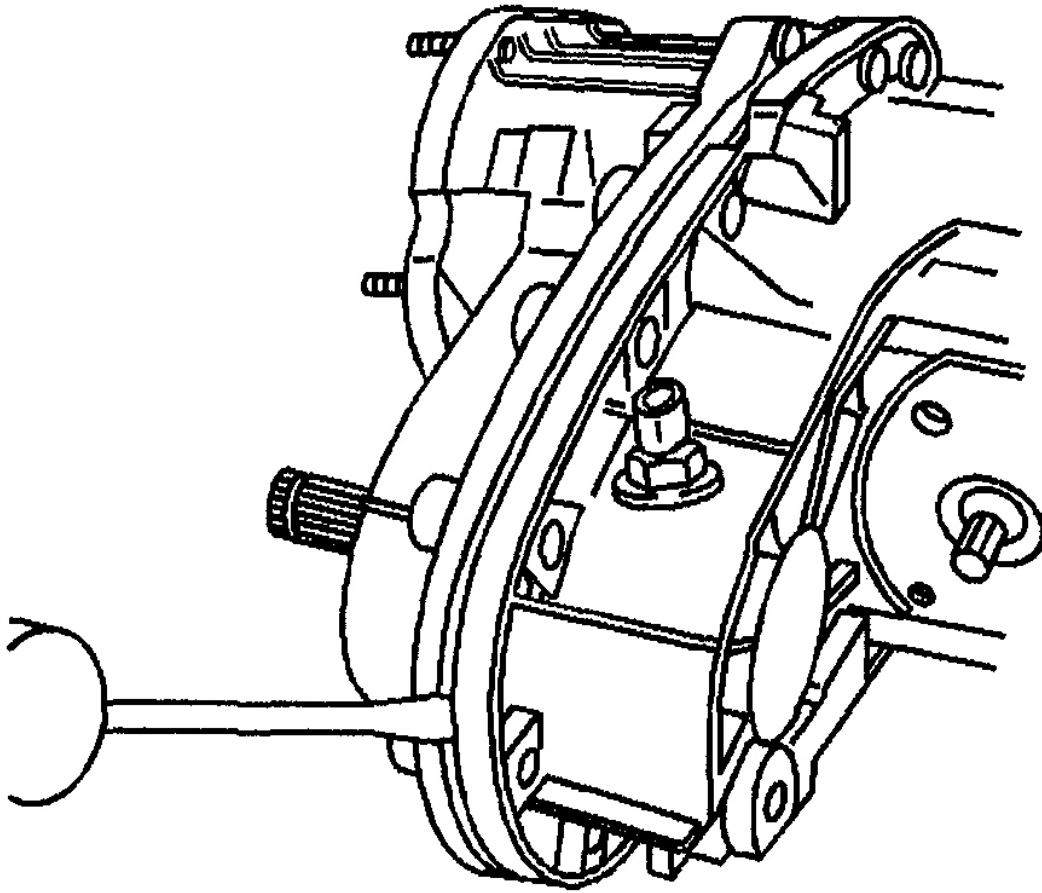
21. Using the J 45358, shear the sealer securing the front and rear case half together.
22. Move the J 45358 to the tabs on the other side of the case and shear the sealer.



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**Fig. 20: Installing J 45358 Between Tabs On Side Of Case**

23. Use a suitable prying tool at one side of the case half.



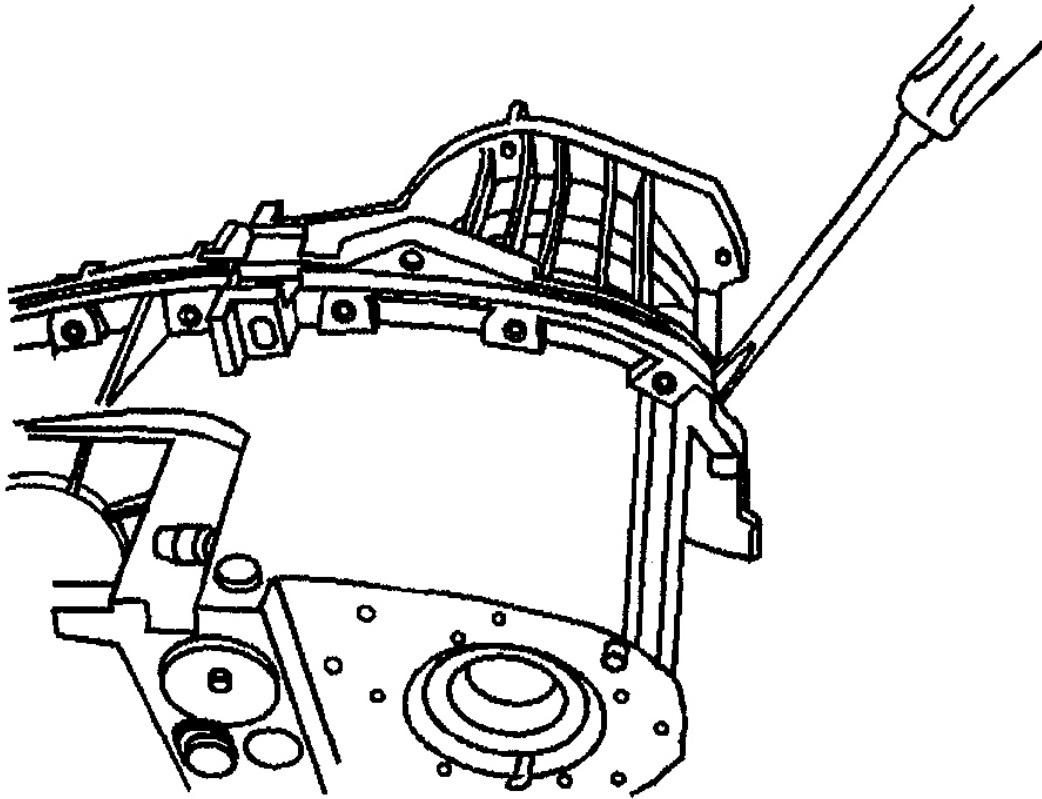
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**Fig. 21: Inserting Prying Tool At One Side Of Case Half**

24. Use a suitable prying tool at the other side of the cased halves.
25. Working both tools, separate the front input shaft from the front output shaft bearing, and the input shaft from the output shaft.

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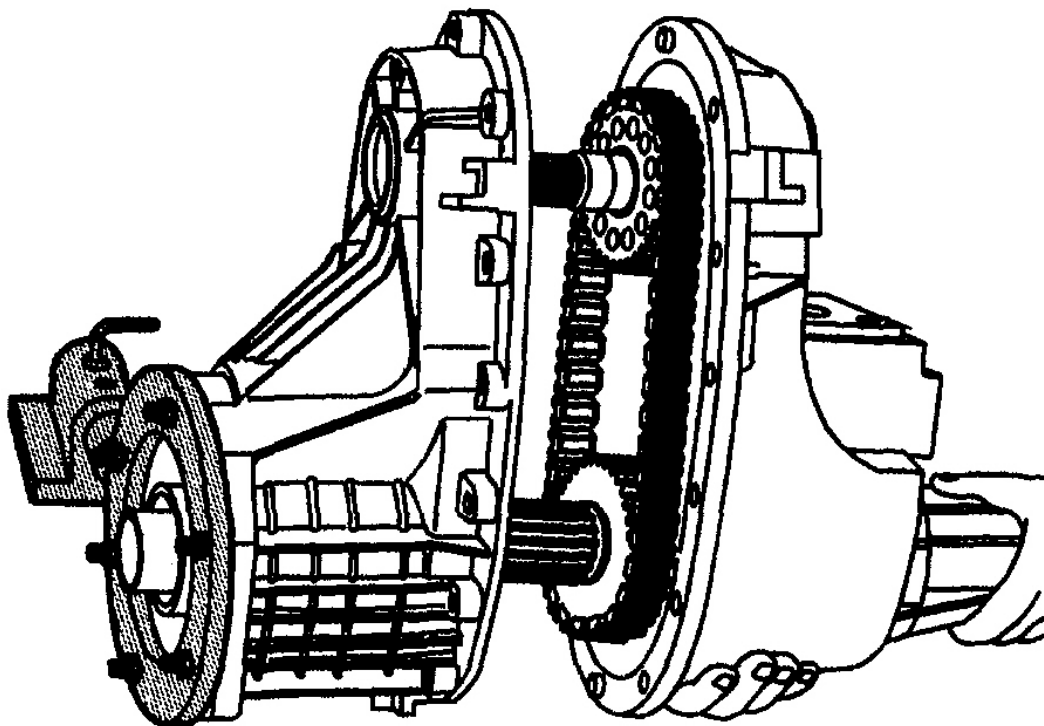
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**Fig. 22: Inserting Prying Tool At Other Side Of Case Half**

26. Remove the front case half from the rear case half. Only the input gear assembly will remain with the front case half.

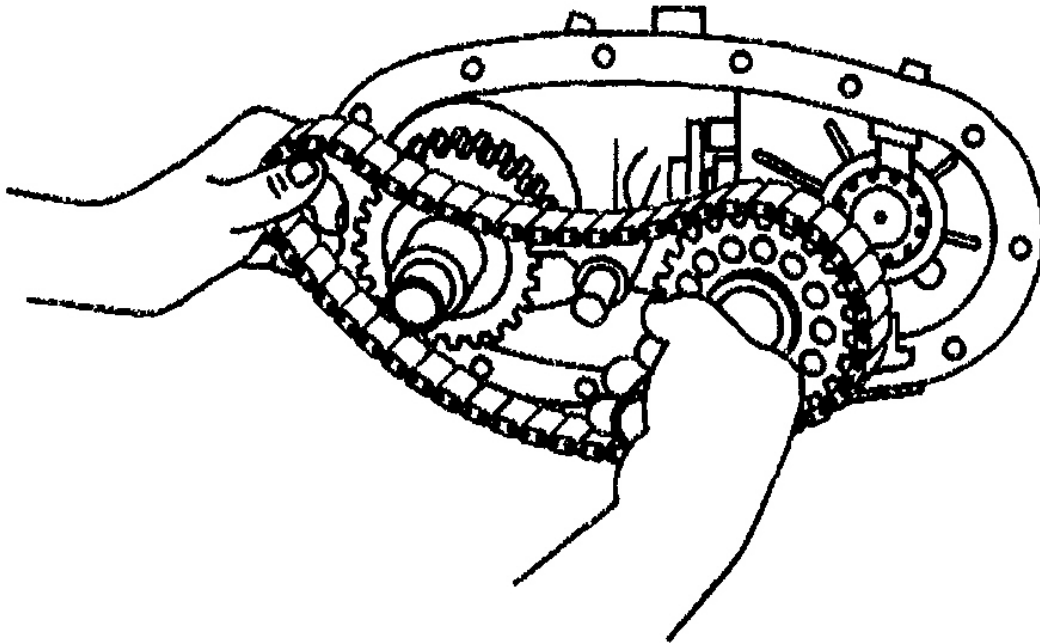


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**Fig. 23: Removing Front Case Half From Rear Case Half**

**IMPORTANT:** If using the drive chain and sprockets again, mark the position of the drive chain to the sprockets in order for the proper wear pattern alignment.

27. Remove the front output shaft from the front output shaft rear bearing.
28. Remove the drive chain assembly from the drive gear on the output shaft, and the driven gear on the front output shaft.



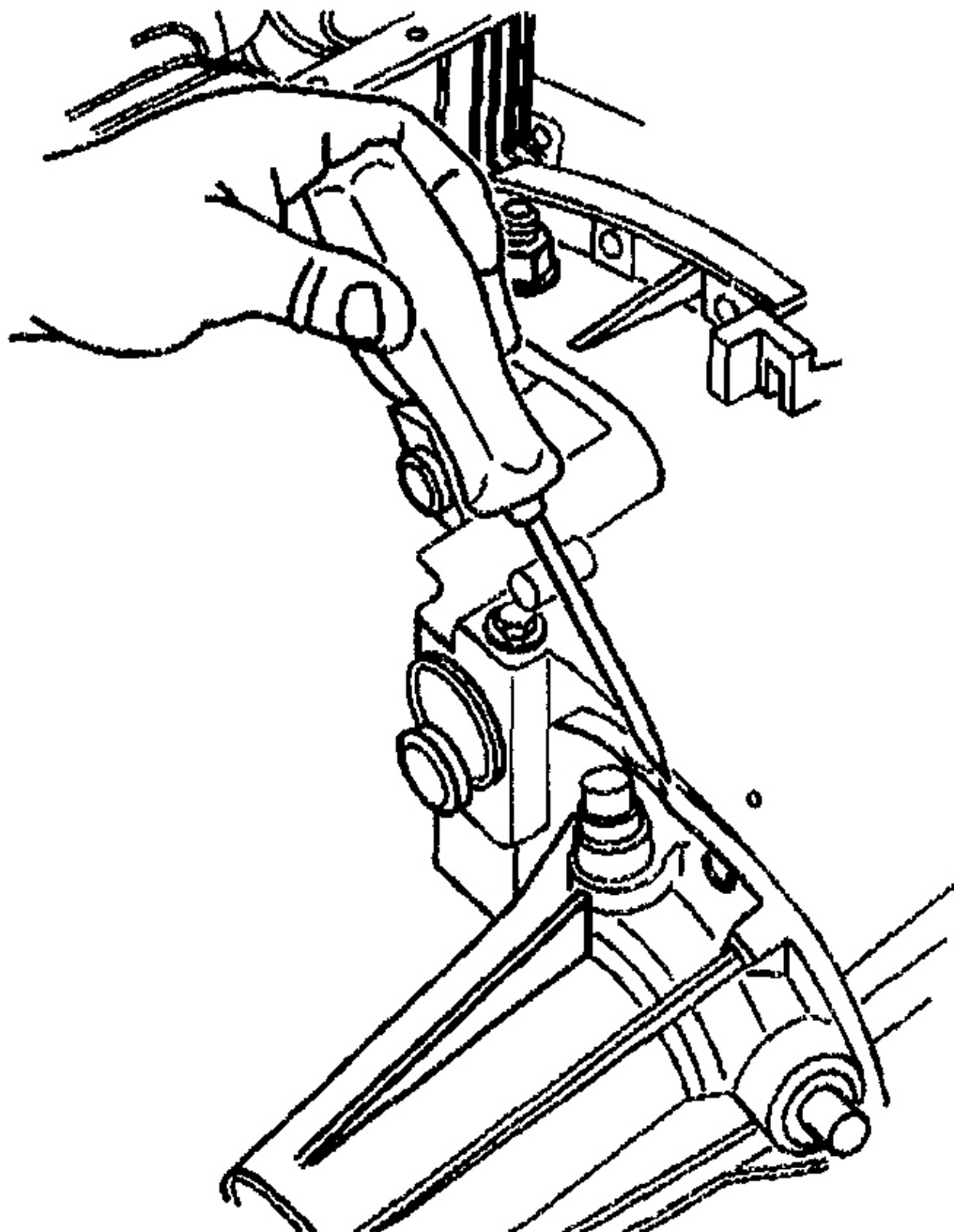
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**Fig. 24: Removing Drive Chain Assembly From Drive Gear**

29. Insert a screw driver in the slot of the rear extension.

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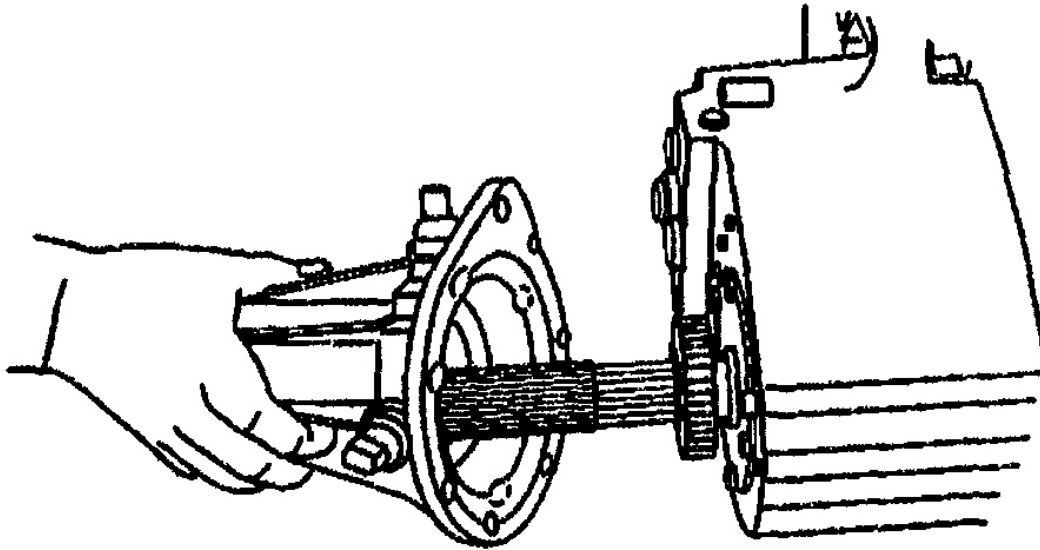
**Fig. 25: Inserting Screw Driver In Rear Extension Slot**



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30. Remove the rear extension from the rear case half.



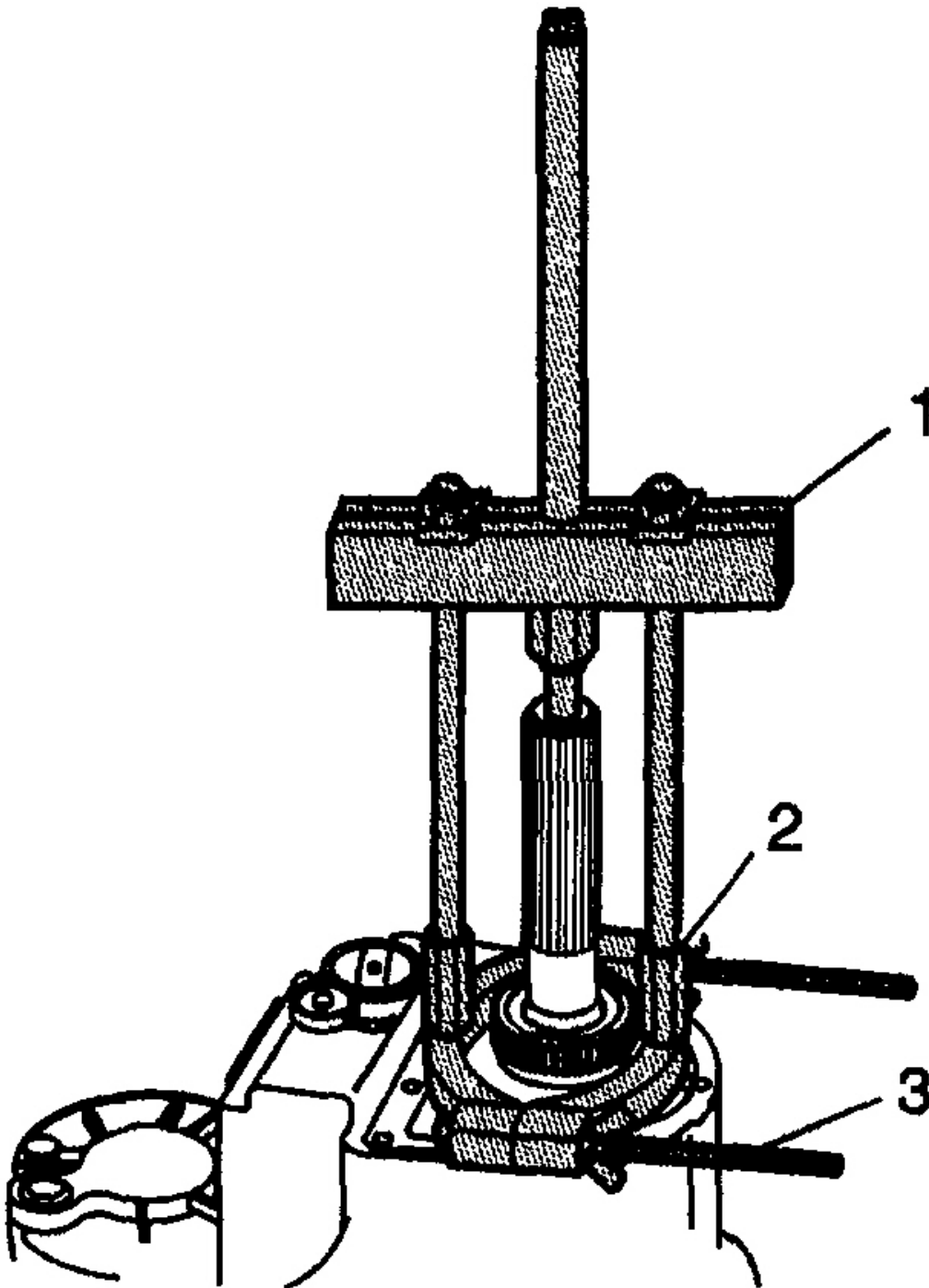
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**Fig. 26: Removing Rear Extension From Rear Case Half**

31. Using the J 44707 (1), the J 44759 (2), and the J 36513 (3), remove the speed sensor reluctor wheel from the rear output shaft.
32. Discard the speed sensor reluctor wheel after removal.

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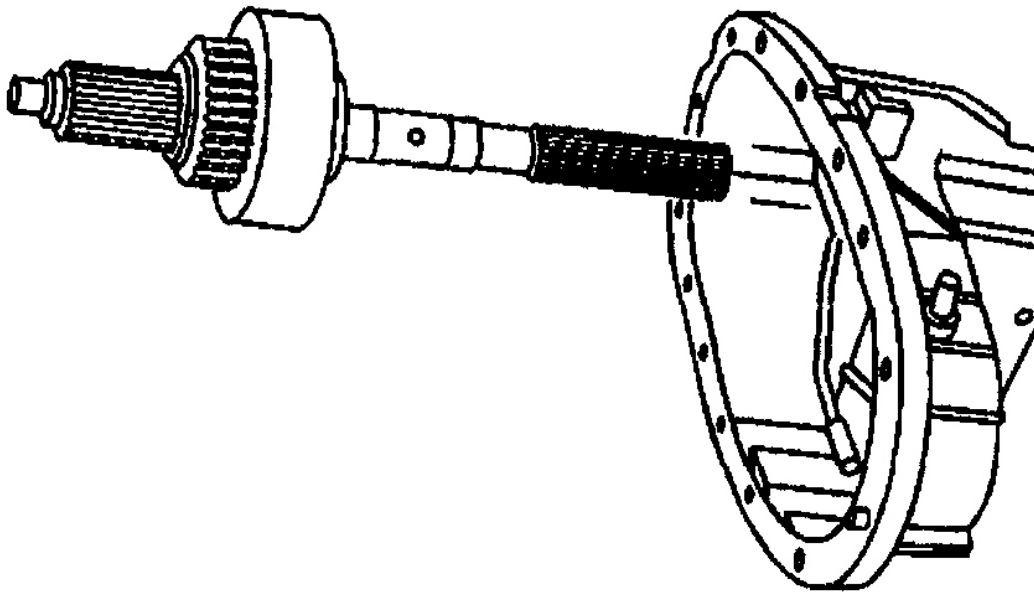
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**Fig. 27: Removing Speed Sensor Reluctor Wheel From Rear Output Shaft**

33. Remove the rear output shaft assembly.



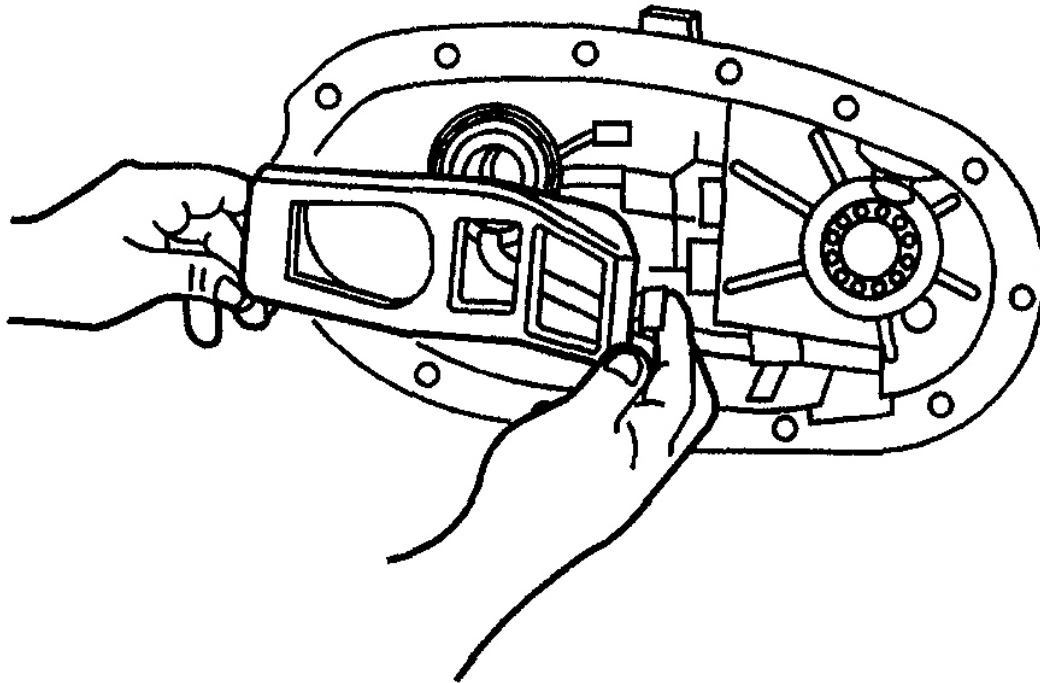
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**Fig. 28: Removing Rear Output Shaft Assembly**

34. Remove the clutch lever from the rear case half.

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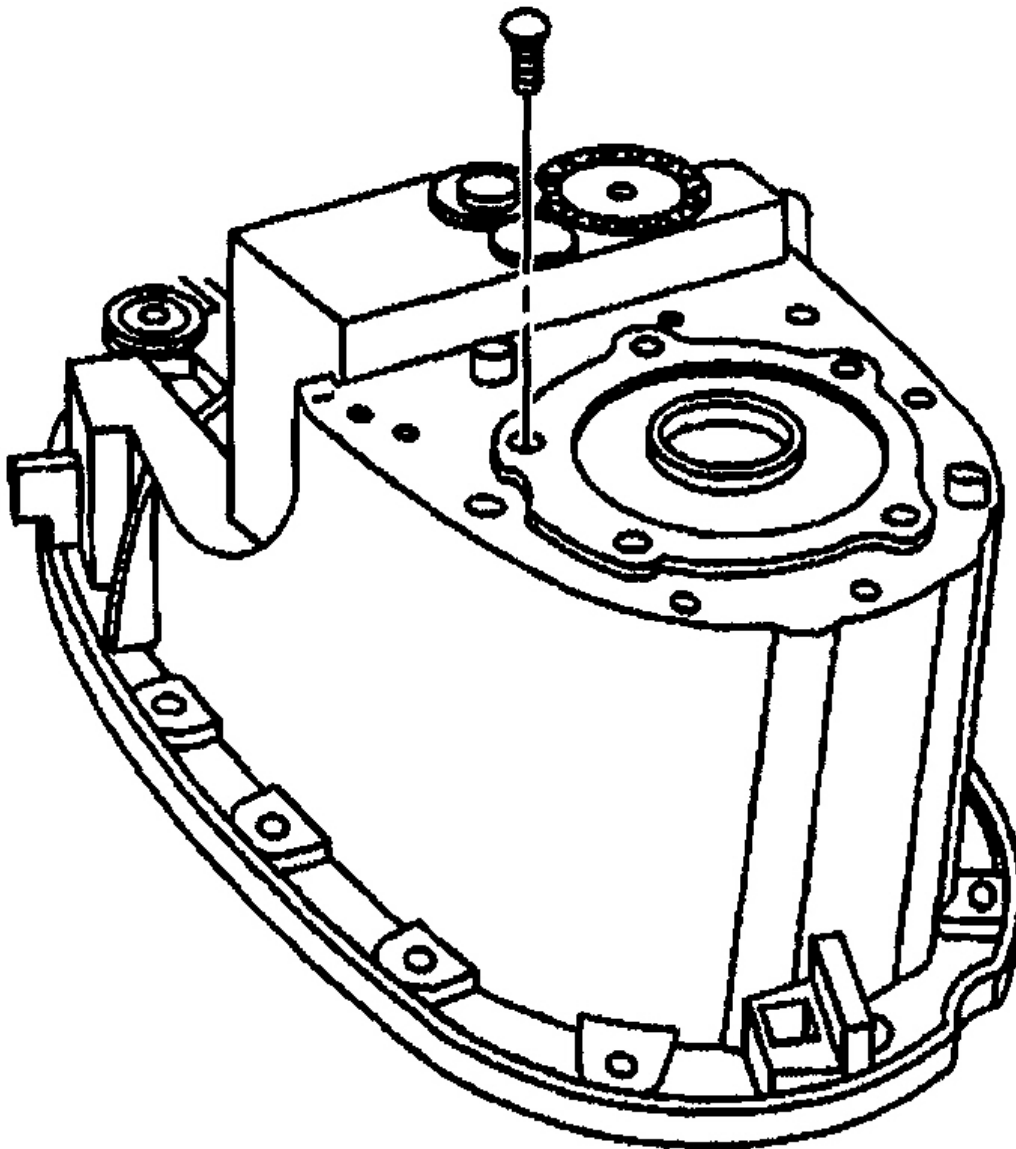
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**Fig. 29: Removing Clutch Lever From Rear Case Half**

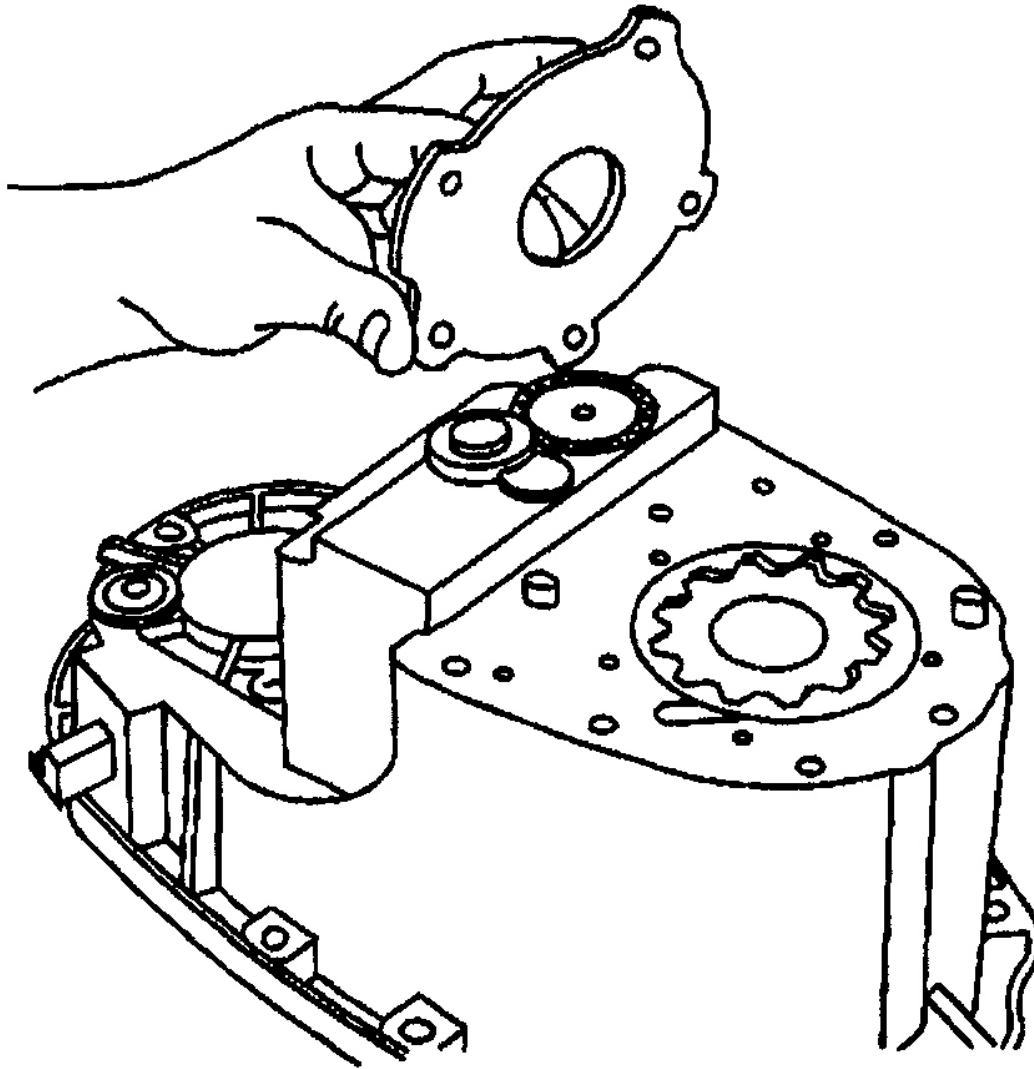
35. Remove the oil pump cover mounting bolts.



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**Fig. 30: Removing Oil Pump Cover Mounting Bolts**

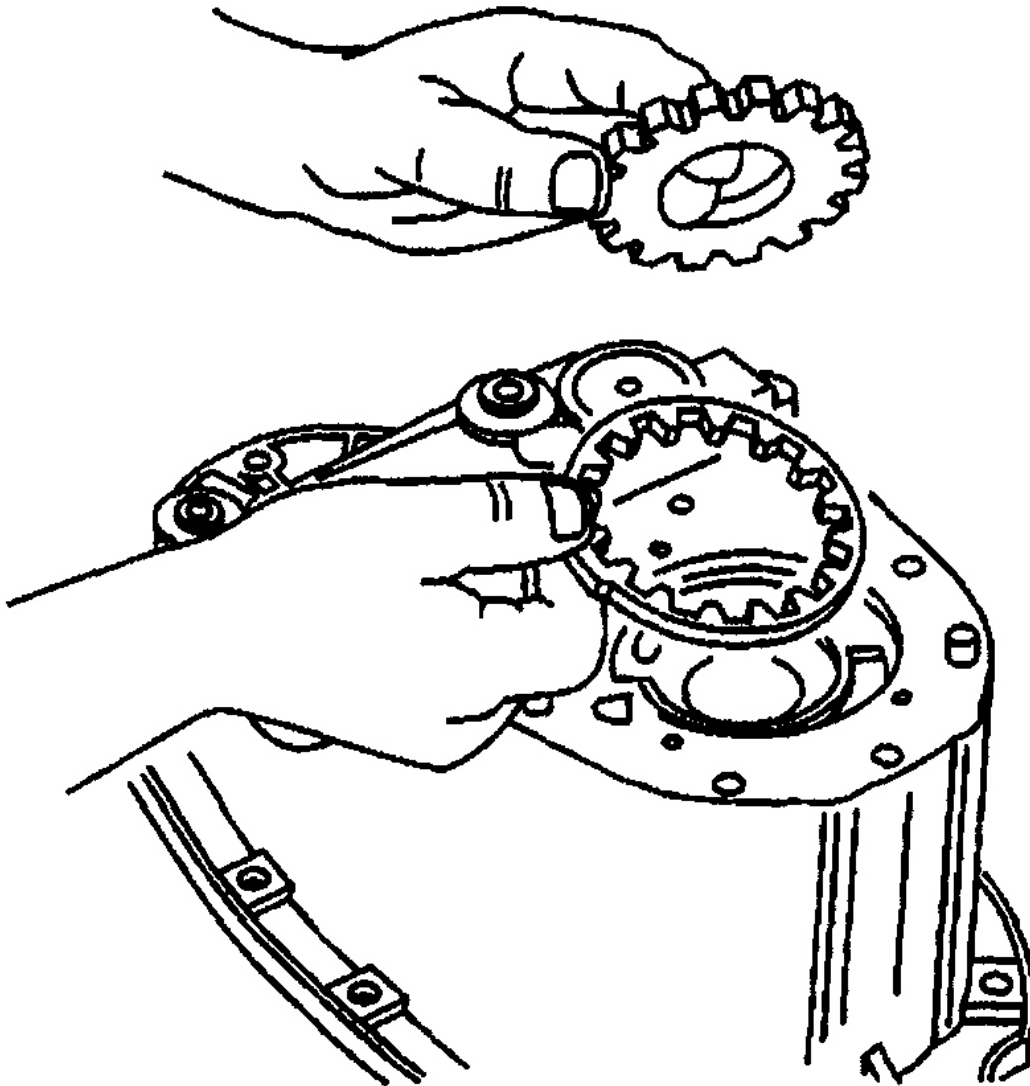
36. Remove the oil pump cover.



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**Fig. 31: Removing Oil Pump Cover**

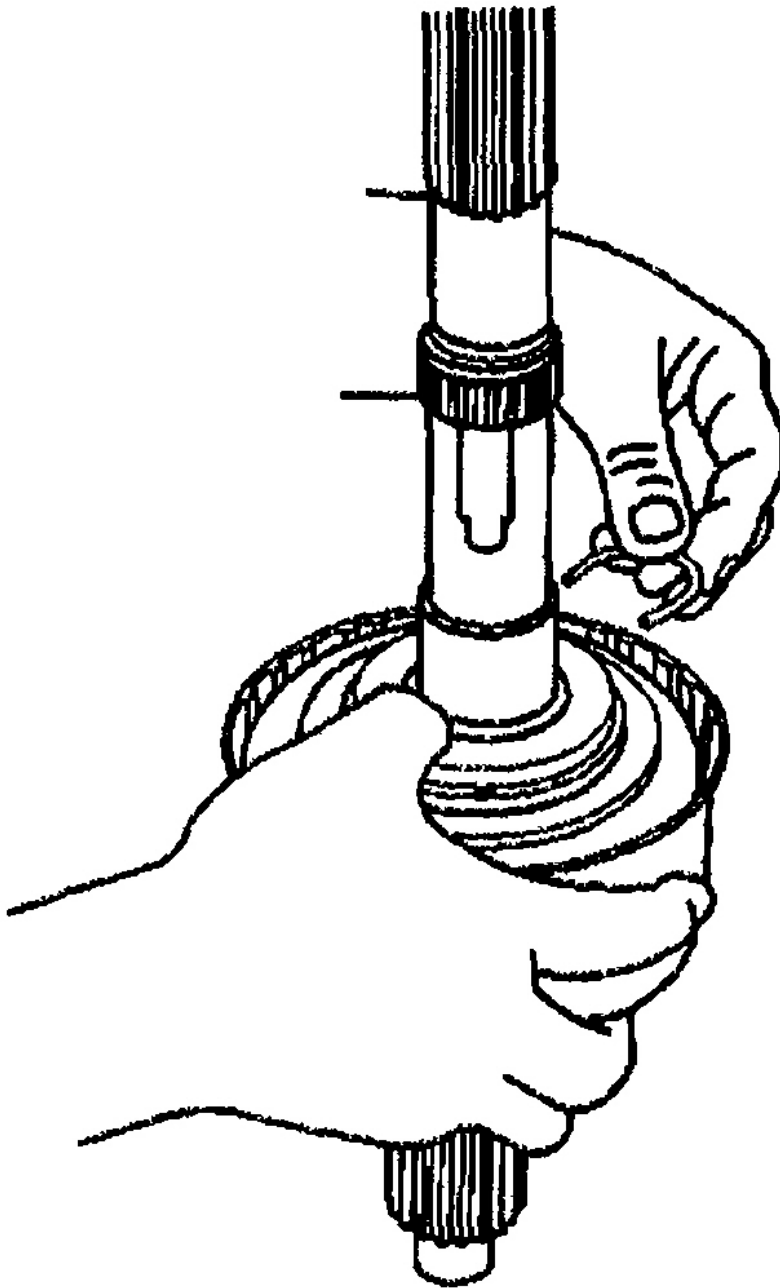
37. Remove the oil pump drive gear, the inner rotor.
38. Remove the oil pump driven gear, the outer rotor.



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**Fig. 32: Removing Oil Pump Drive Gear (Inner Rotor) & Driven Gear (Outer Rotor)**

39. While pushing down on the clutch apply plate, remove the clutch pressure plate bearing retaining ring.

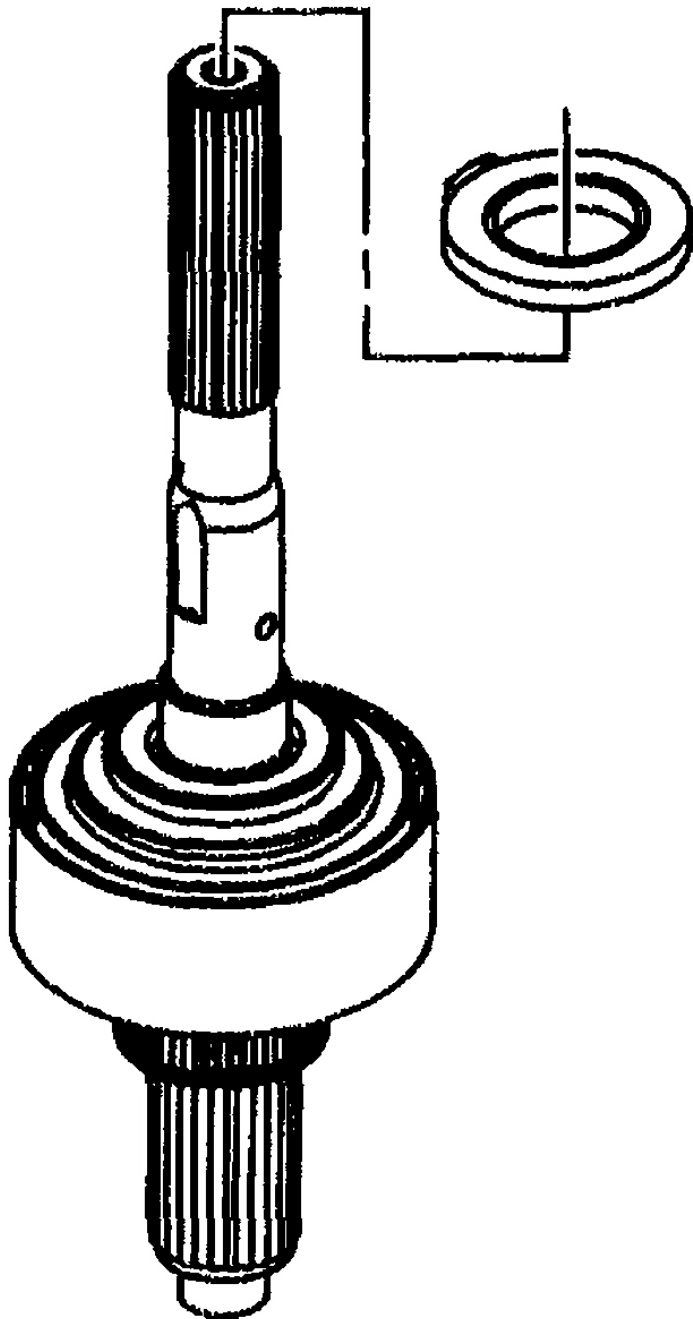


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**Fig. 33: Removing Clutch Pressure Plate Bearing Retaining Ring**

40. Remove the clutch inner plate.

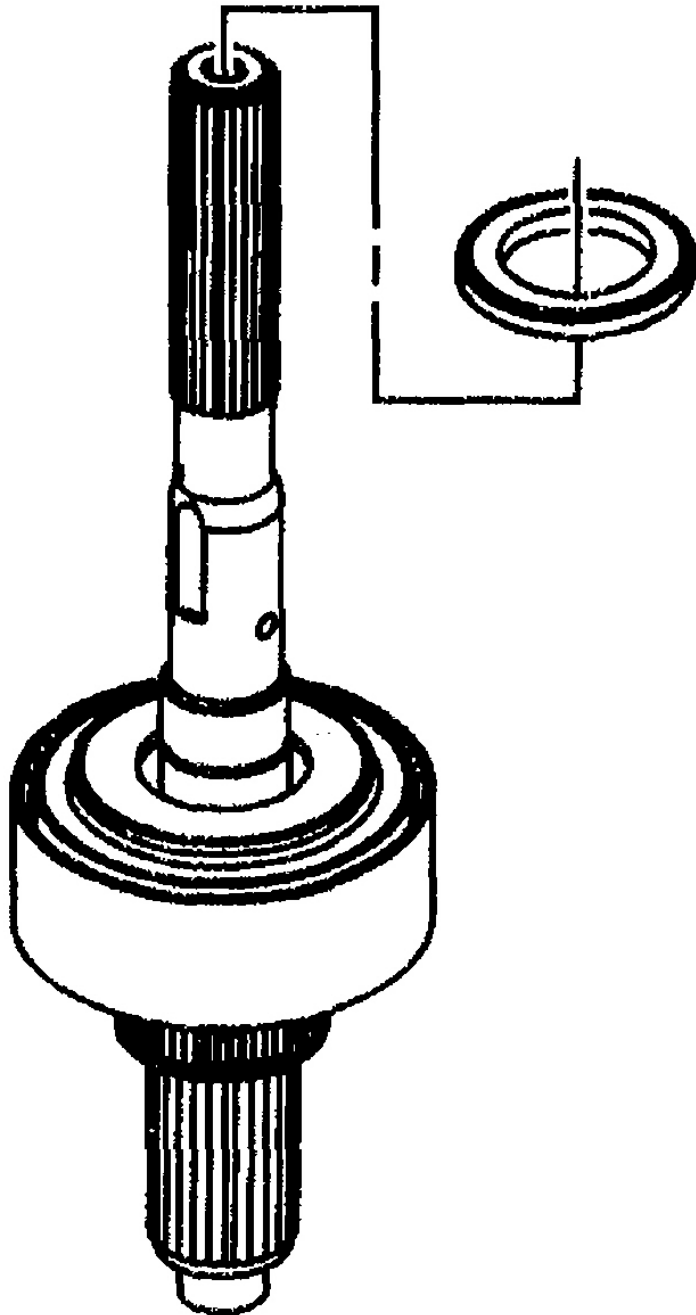




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**Fig. 34: Removing Clutch Inner Plate**

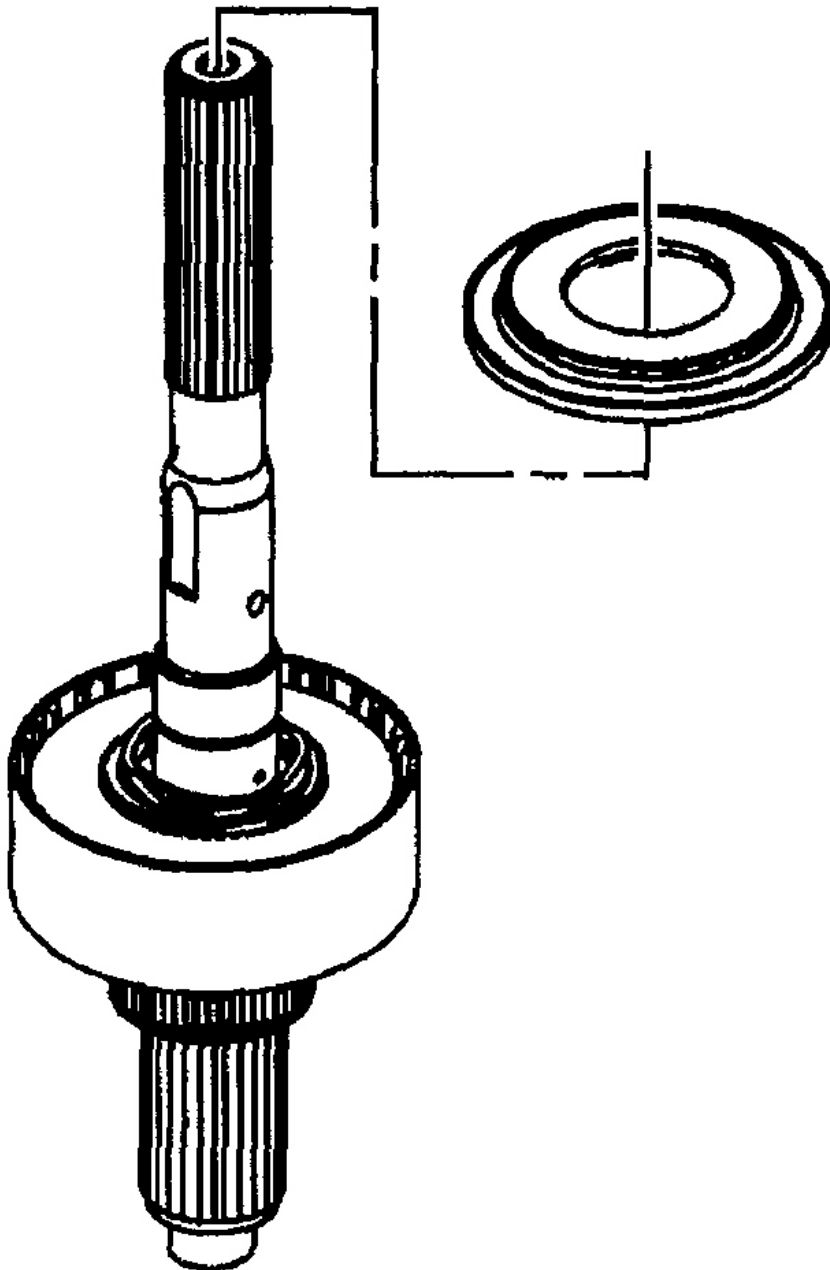
41. Remove the clutch pressure plate bearing.



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**Fig. 35: Removing Clutch Pressure Plate Bearing**

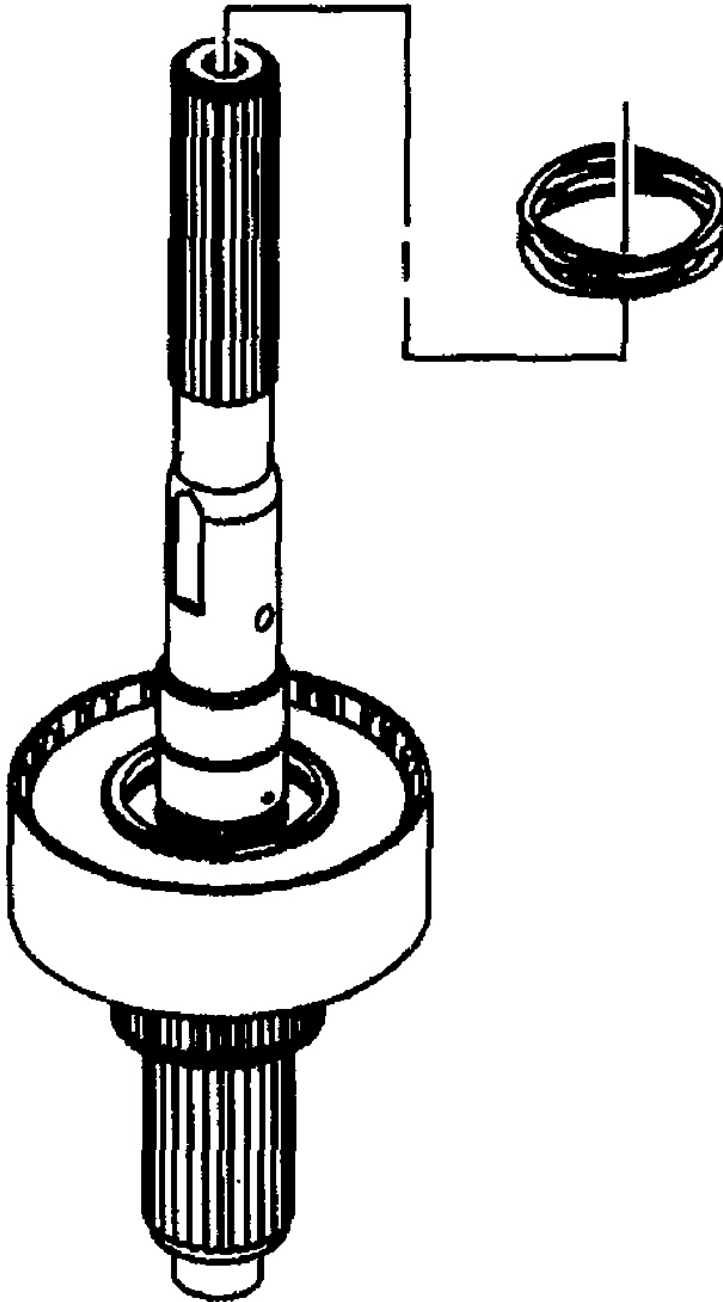
42. Remove the clutch apply plate.



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**Fig. 36: Removing Clutch Apply Plate**

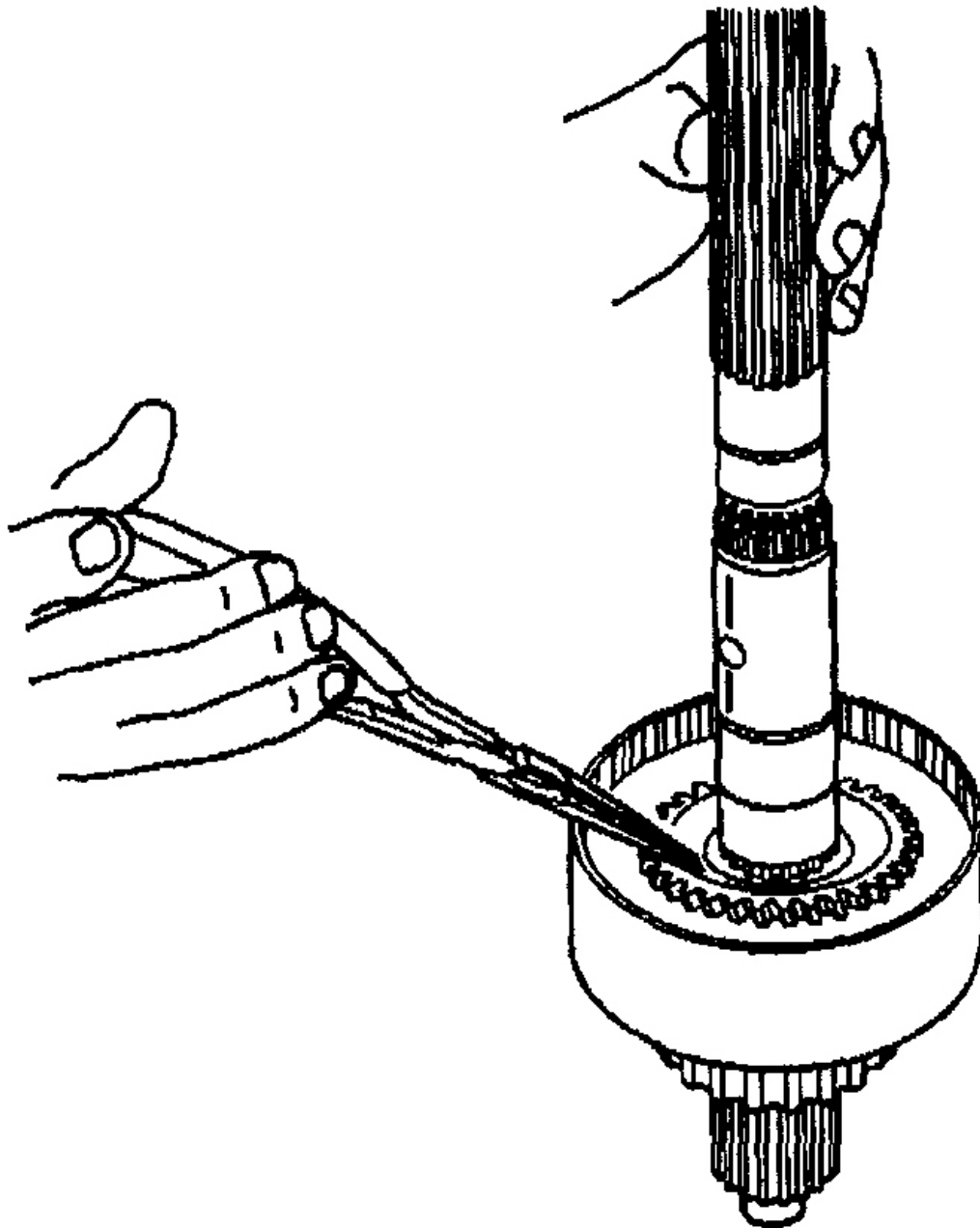
43. Remove the clutch spring.



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**Fig. 37: Removing Clutch Spring**

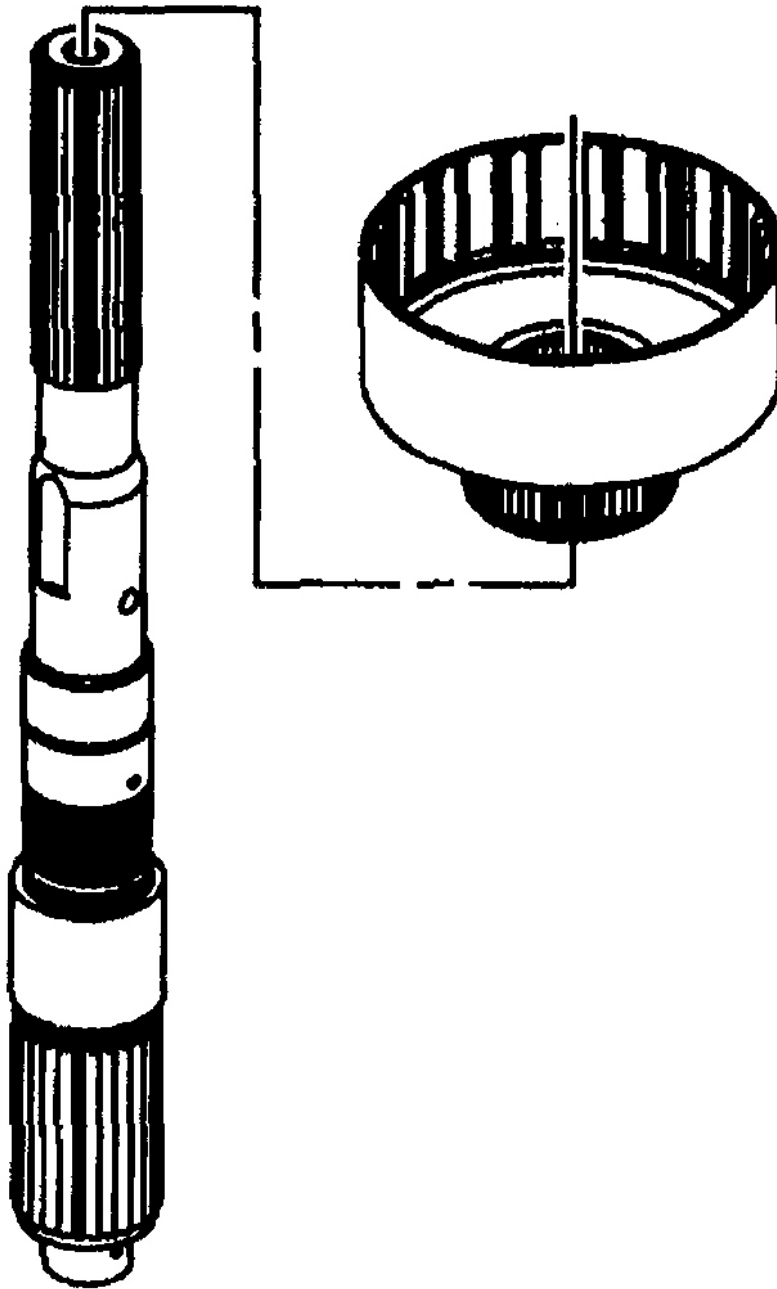
44. Remove the clutch hub retaining ring.



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**Fig. 38: Removing Clutch Hub Retaining Ring**

45. Remove the clutch housing assembly.

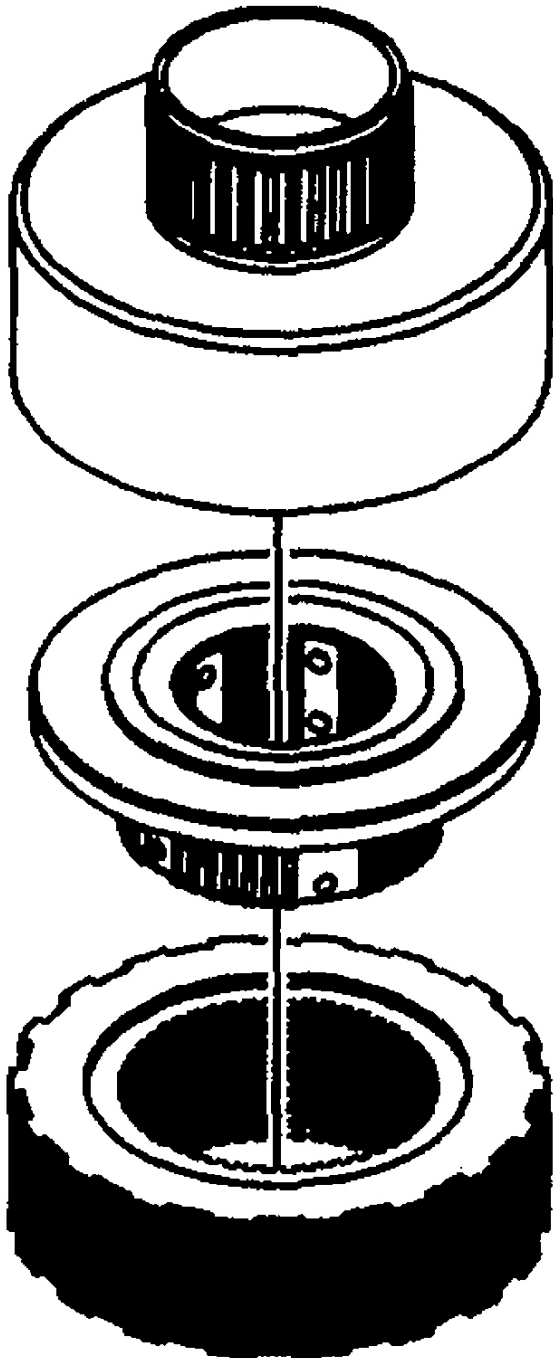


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**Fig. 39: Removing Clutch Housing Assembly**

46. Hold on to the clutch plates, and turn the clutch housing over on a work bench.
47. Remove the clutch housing from the clutch plates and the clutch hub.

48. Remove the clutch hub from the clutch plates.



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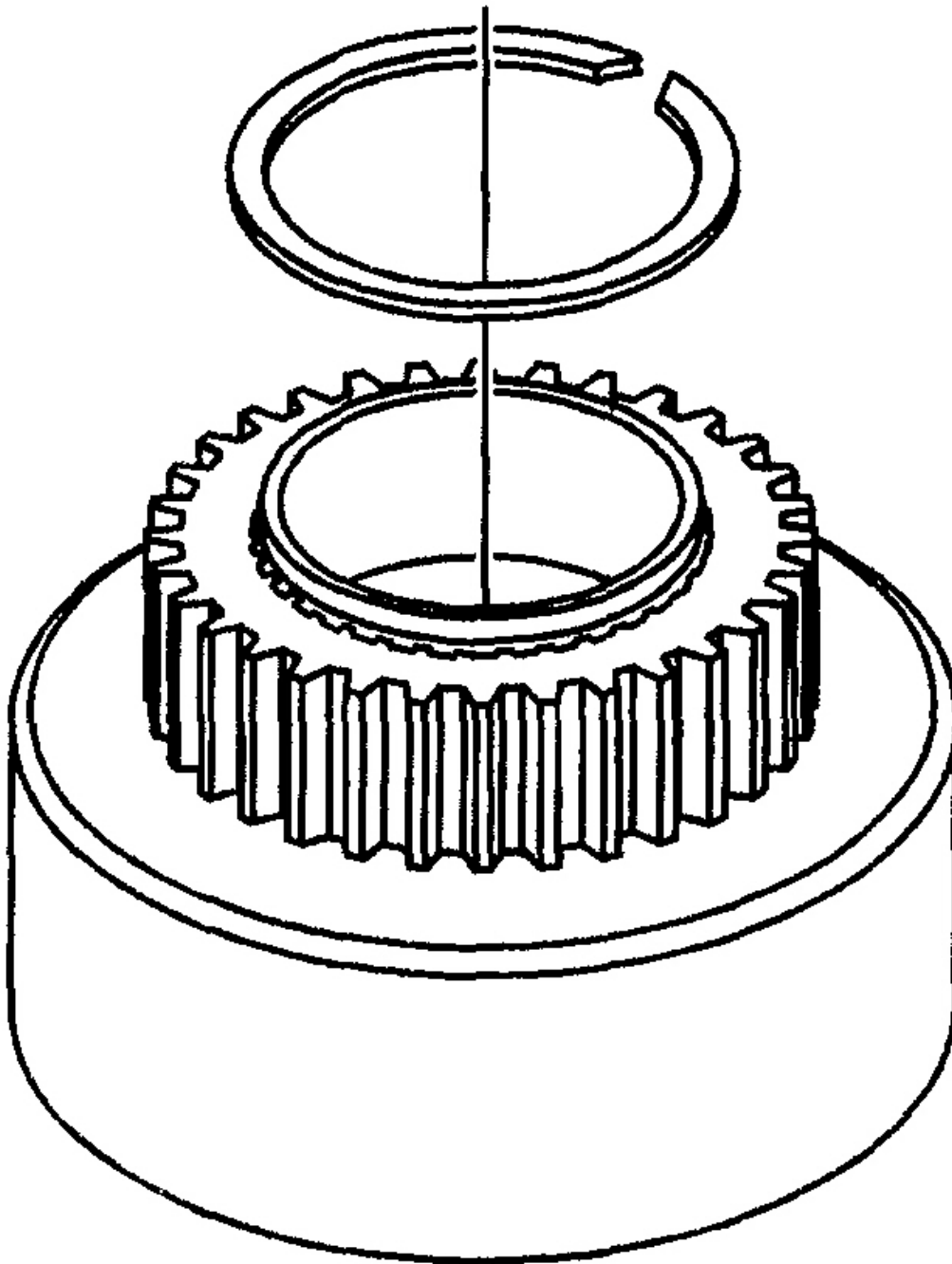
**Fig. 40: Removing Clutch Housing From Clutch Plates & Clutch Hub**

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49. Remove the drive sprocket retaining ring from the clutch housing.

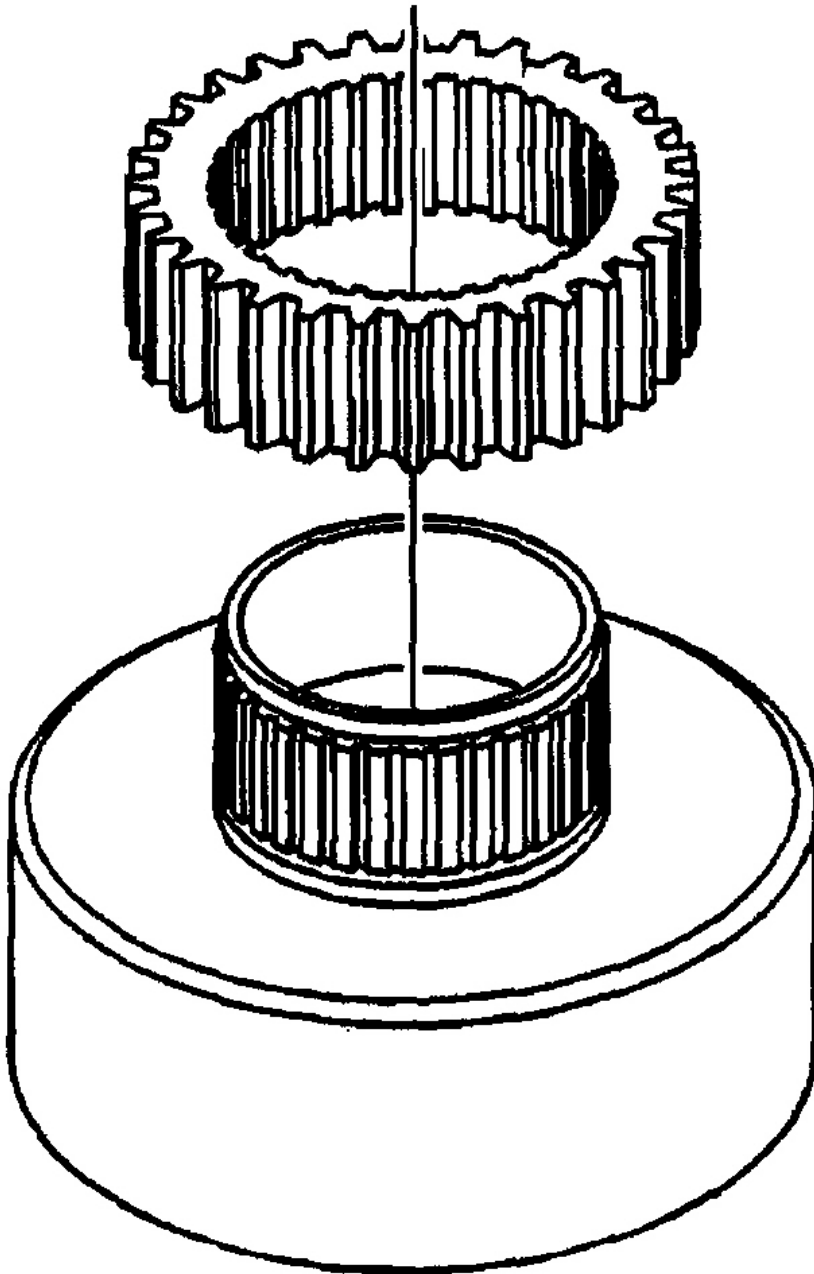




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**Fig. 41: Removing Drive Sprocket Retaining Ring From Clutch Housing**

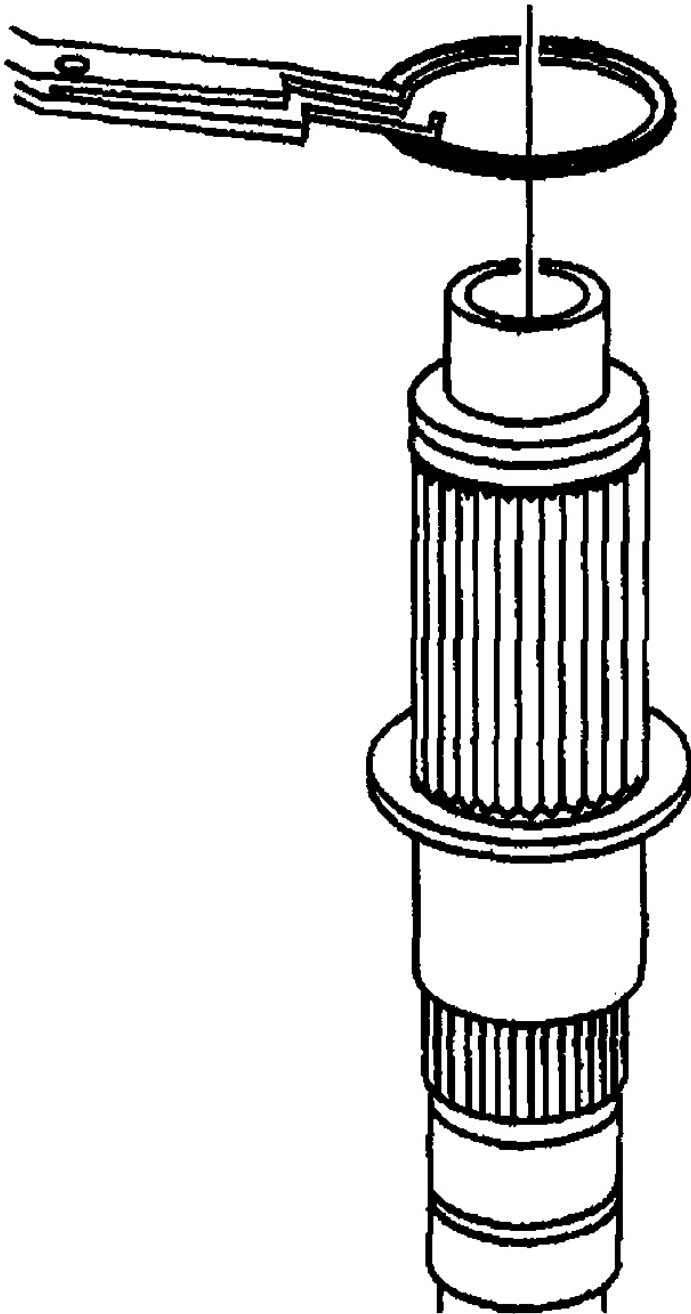
50. Remove the drive sprocket from the clutch housing.



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**Fig. 42: Removing Drive Sprocket From Clutch Housing**

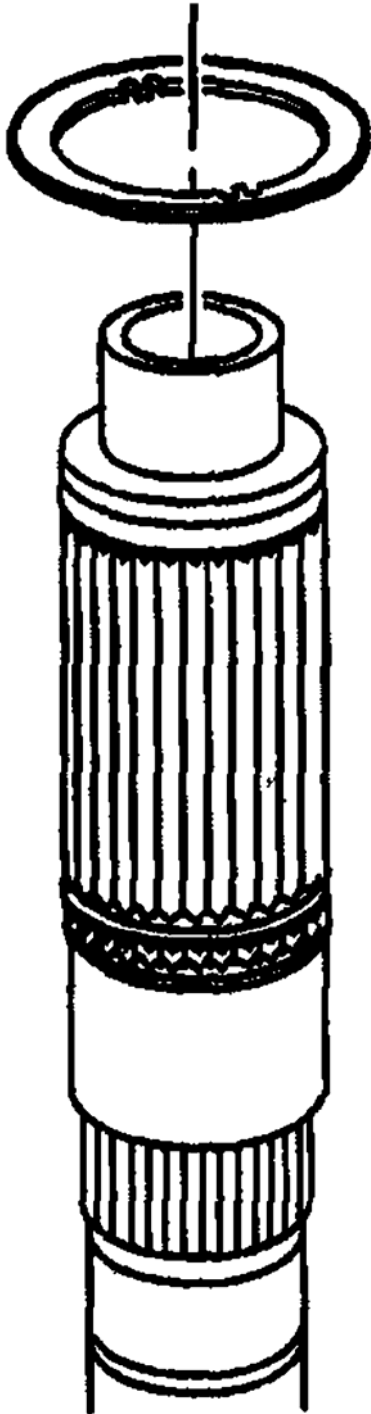
51. Remove the clutch housing retaining ring from the rear output shaft.



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**Fig. 43: Removing Clutch Housing Retaining Ring From Rear Output Shaft**

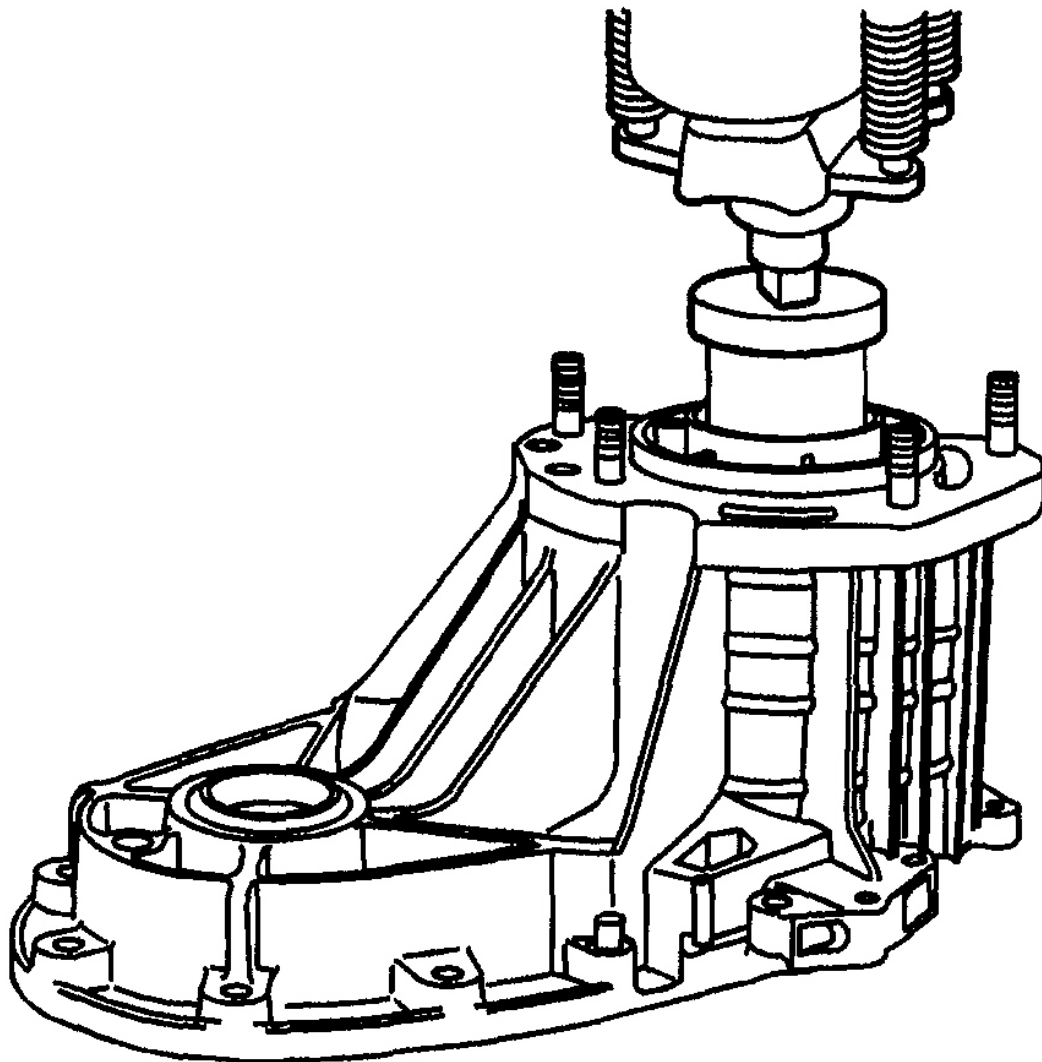
52. Remove the rear output shaft rear thrust washer.



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**Fig. 44: Removing Rear Output Shaft Rear Thrust Washer**

53. Using a press, remove the input gear.
1. Support the front case half on press plates to allow the input gear removal.
  2. Use a suitable adapter to press on the input gear.

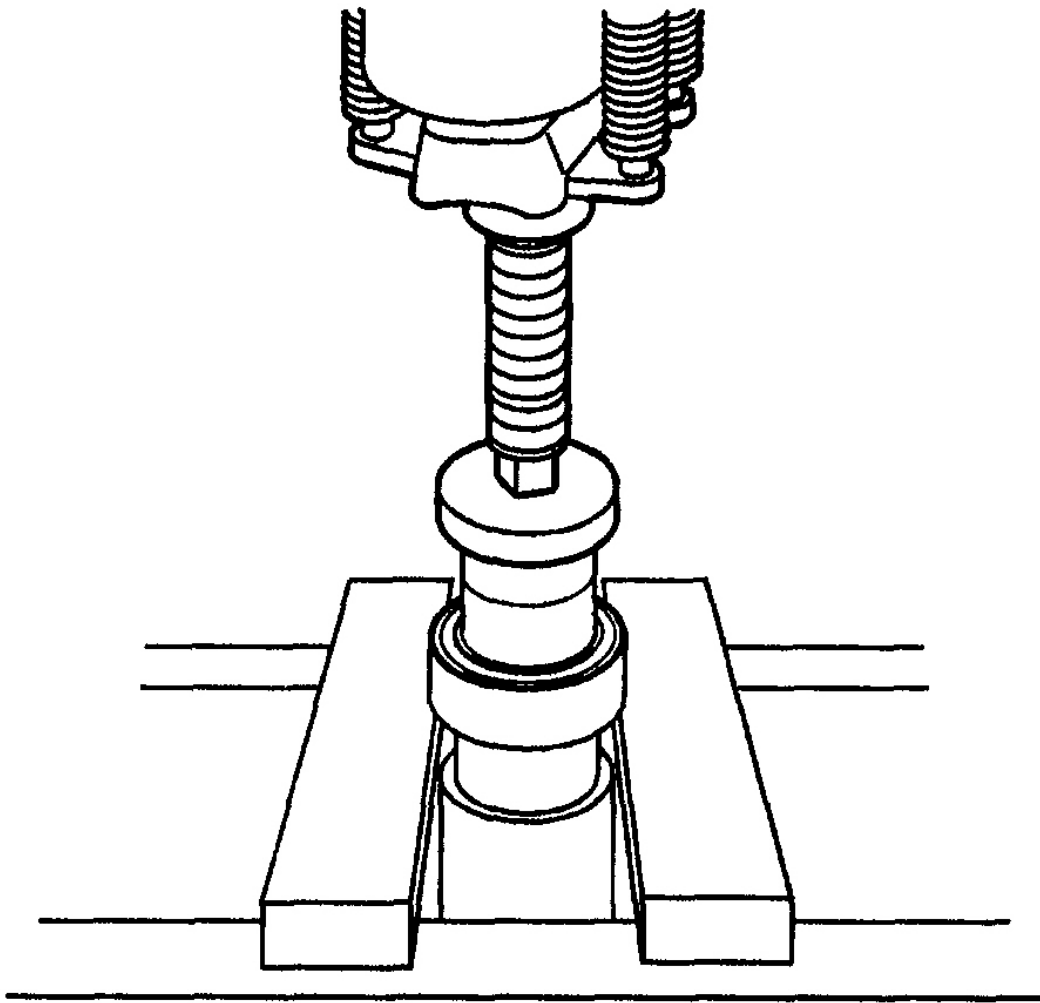


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**Fig. 45: Removing Input Gear**

**IMPORTANT:** The input gear bearing may come out with the input gear, or it may remain in the case. If the input gear bearing comes out with the input gear, use the following procedure:

54. Using a press, remove the input gear bearing.



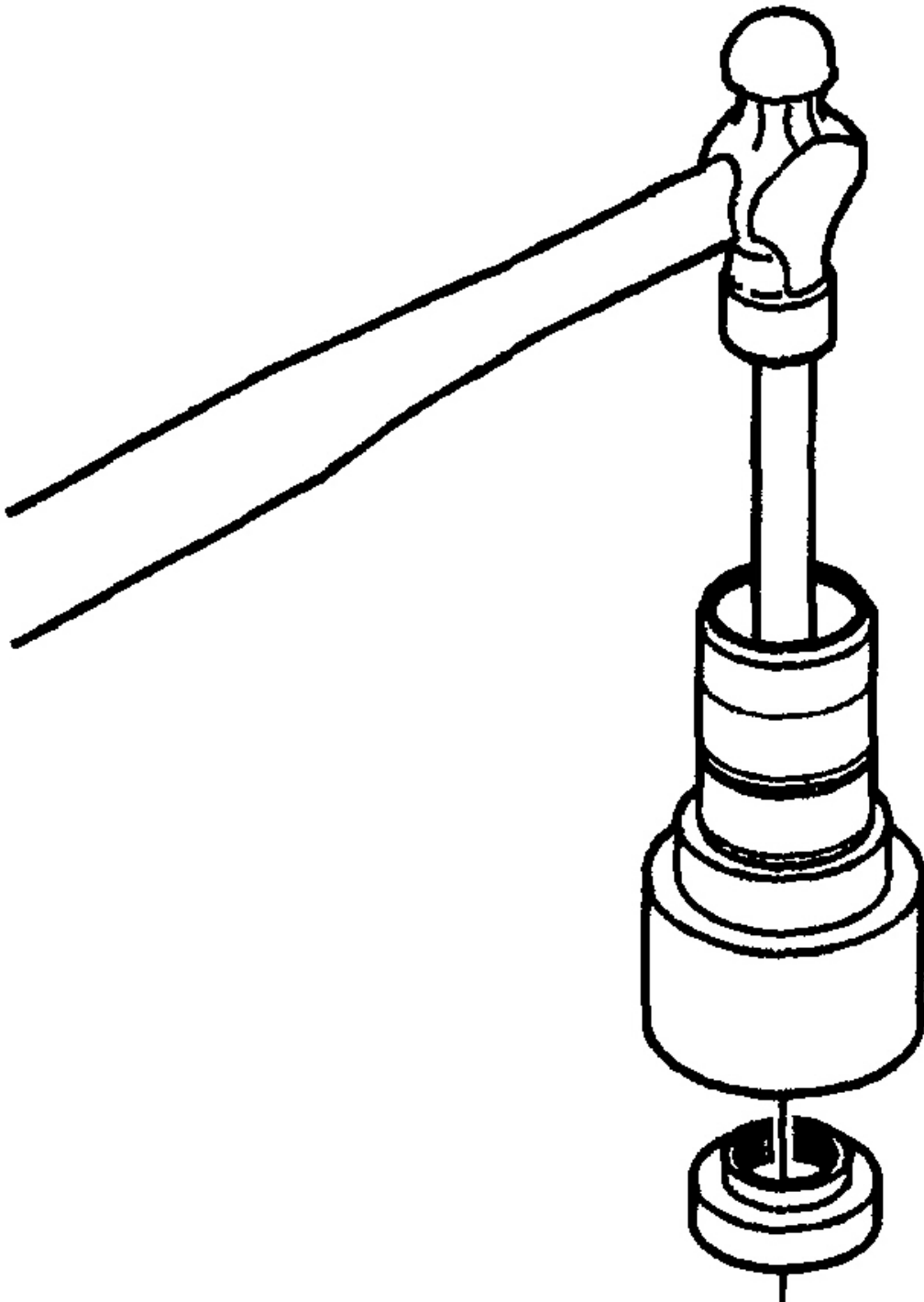
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**Fig. 46: Removing Input Gear Bearing**

55. If necessary, remove the input gear thrust bearing from the input gear.

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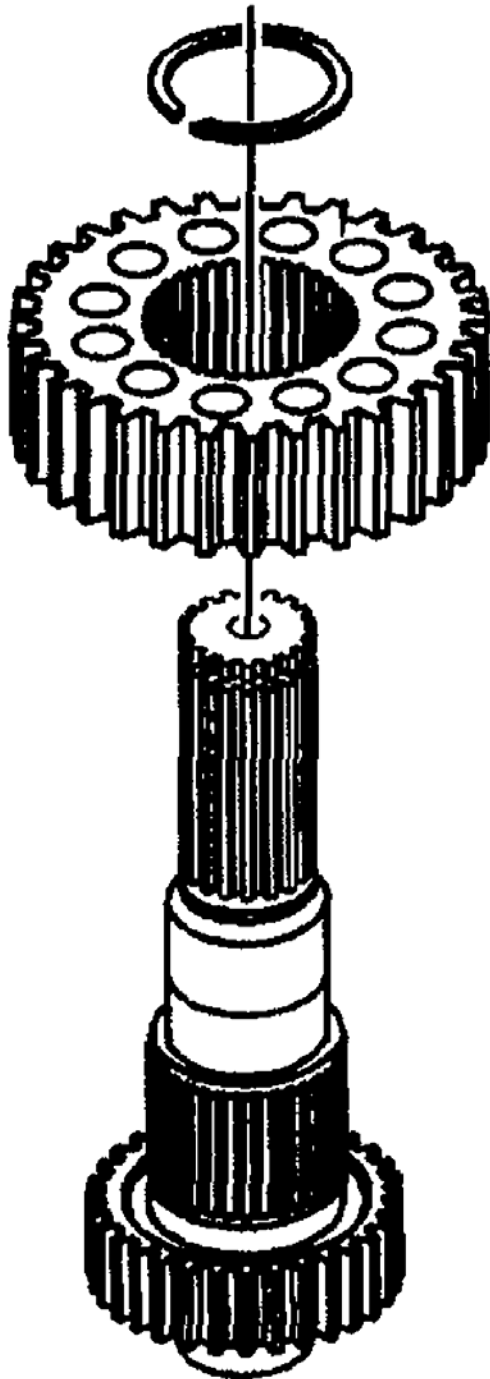
## 2003 Isuzu Ascender

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### **Fig. 47: Removing Input Gear Thrust Bearing From Input Gear**

56. Remove the driven gear retaining ring from the front output shaft.
57. Remove the driven gear from the front output shaft.

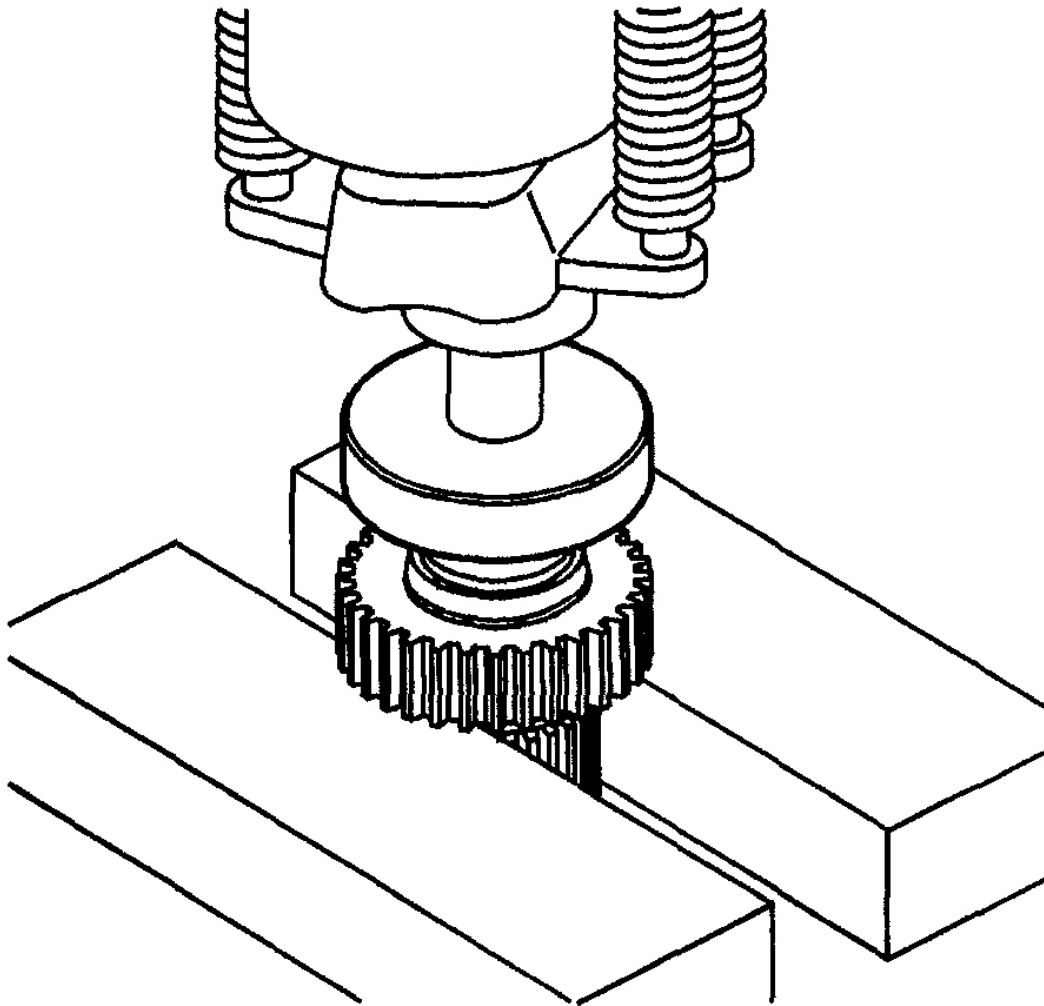




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**Fig. 48: Removing Driven Gear & Retaining Ring From Front Output Shaft**

58. Using a hydraulic press and a suitable adapter on the front input shaft, remove the front speed sensor reluctor wheel.



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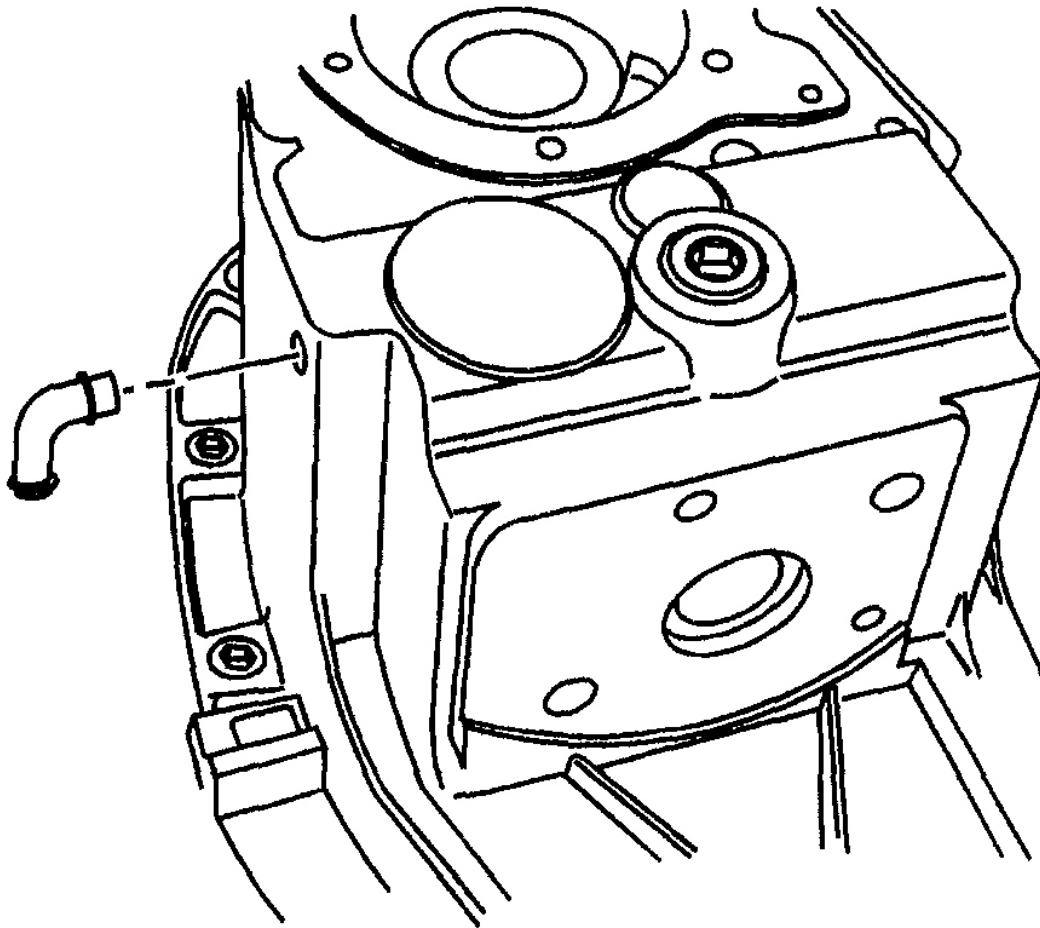
**Fig. 49: Removing Front Speed Sensor Reluctor Wheel**

**IMPORTANT:** The vent only requires removal if it is damaged.

59. Remove the vent.

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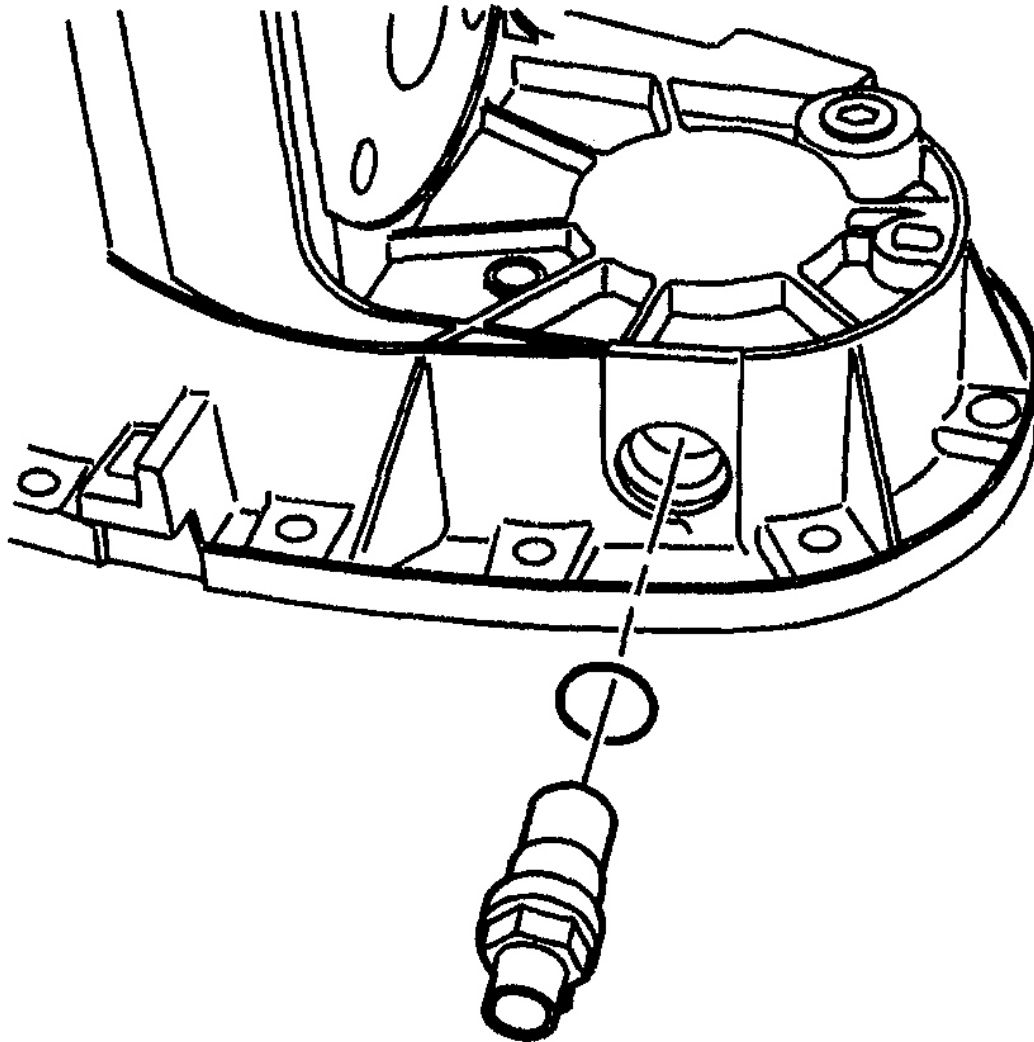
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**Fig. 50: Removing Vent**

60. Remove the front output shaft VSS and O-ring seal from the rear case.

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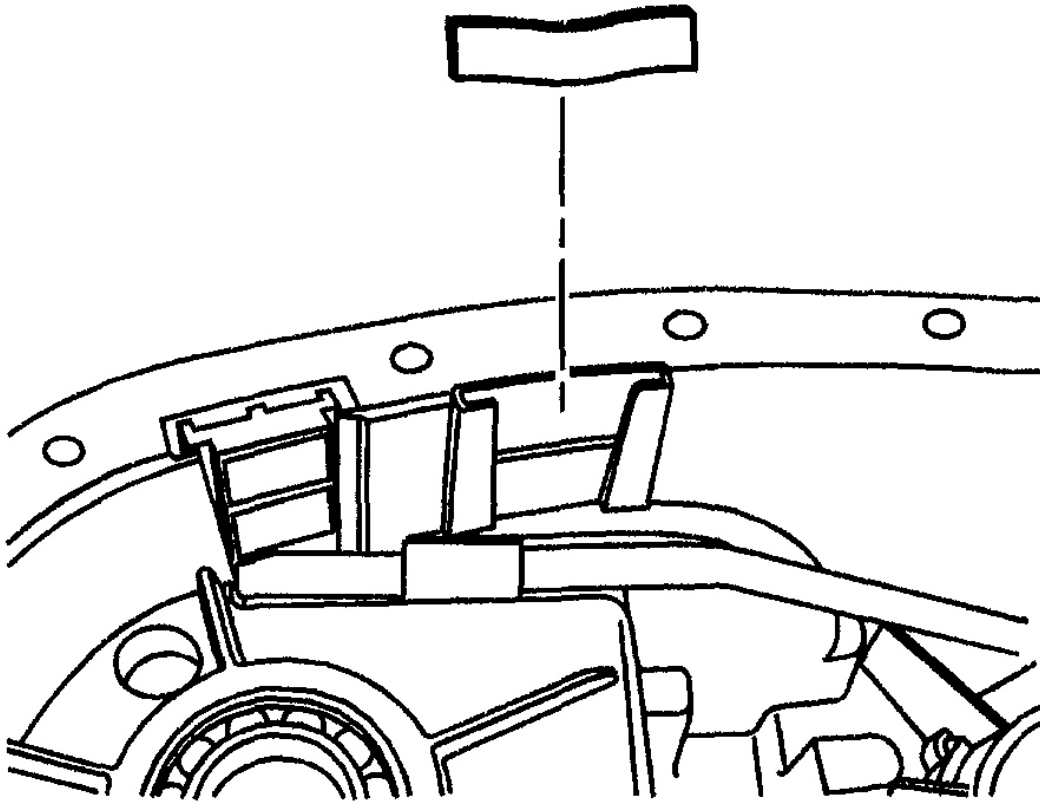
2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer



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**Fig. 51: Removing Front Output Shaft Vehicle Speed Sensor & O-Ring Seal From Rear Case**

61. Remove the chip collector magnet from the rear case.



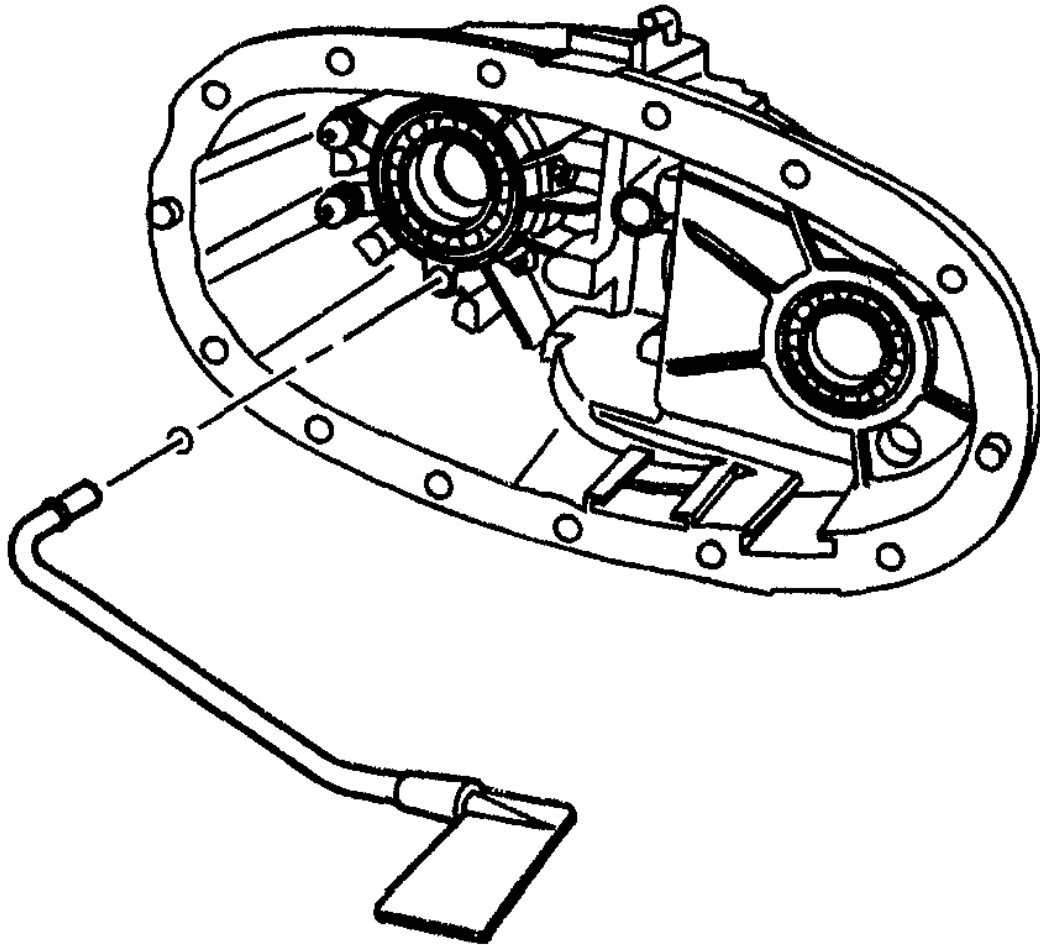
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**Fig. 52: Removing Chip Collector Magnet From Rear Case**

62. Remove the oil pump suction pipe with the oil pump screen.

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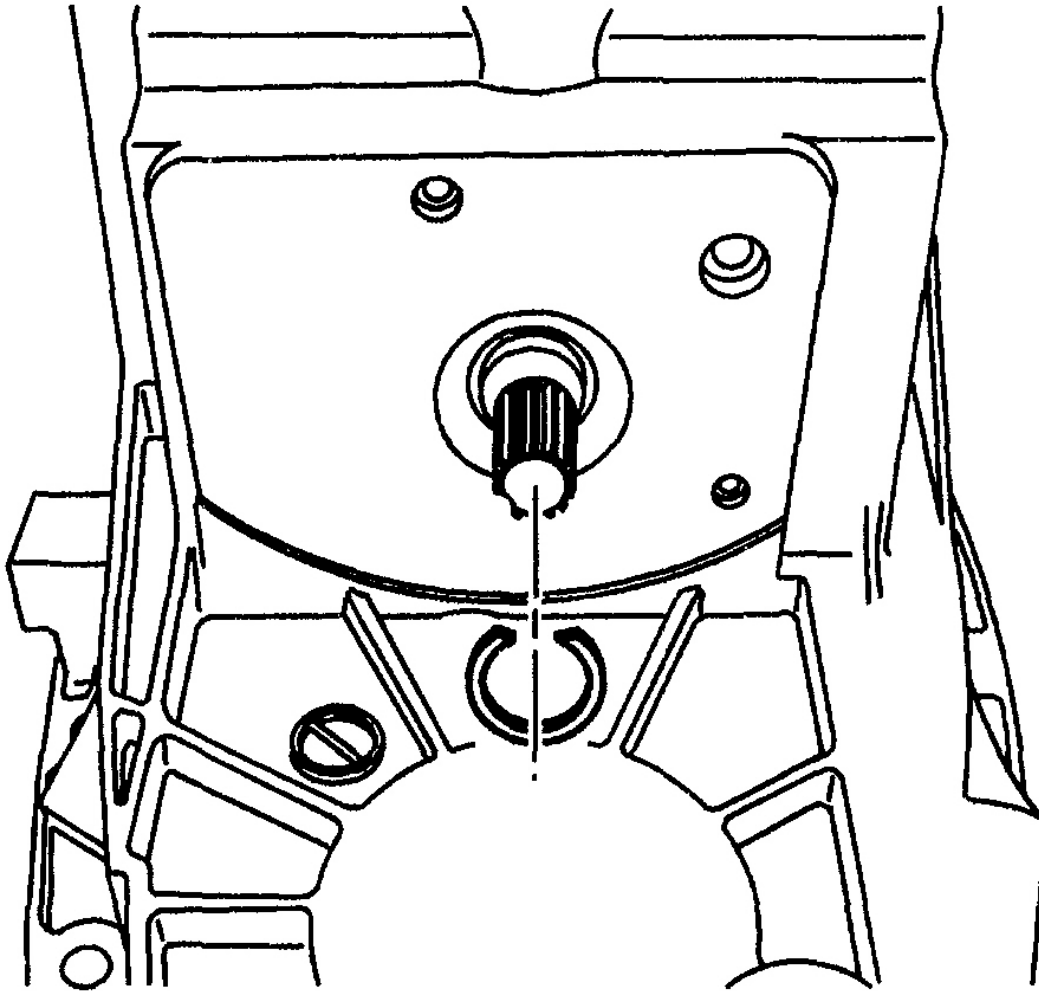
2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer



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**Fig. 53: Removing Oil Pump Suction Pipe With Oil Pump Screen**

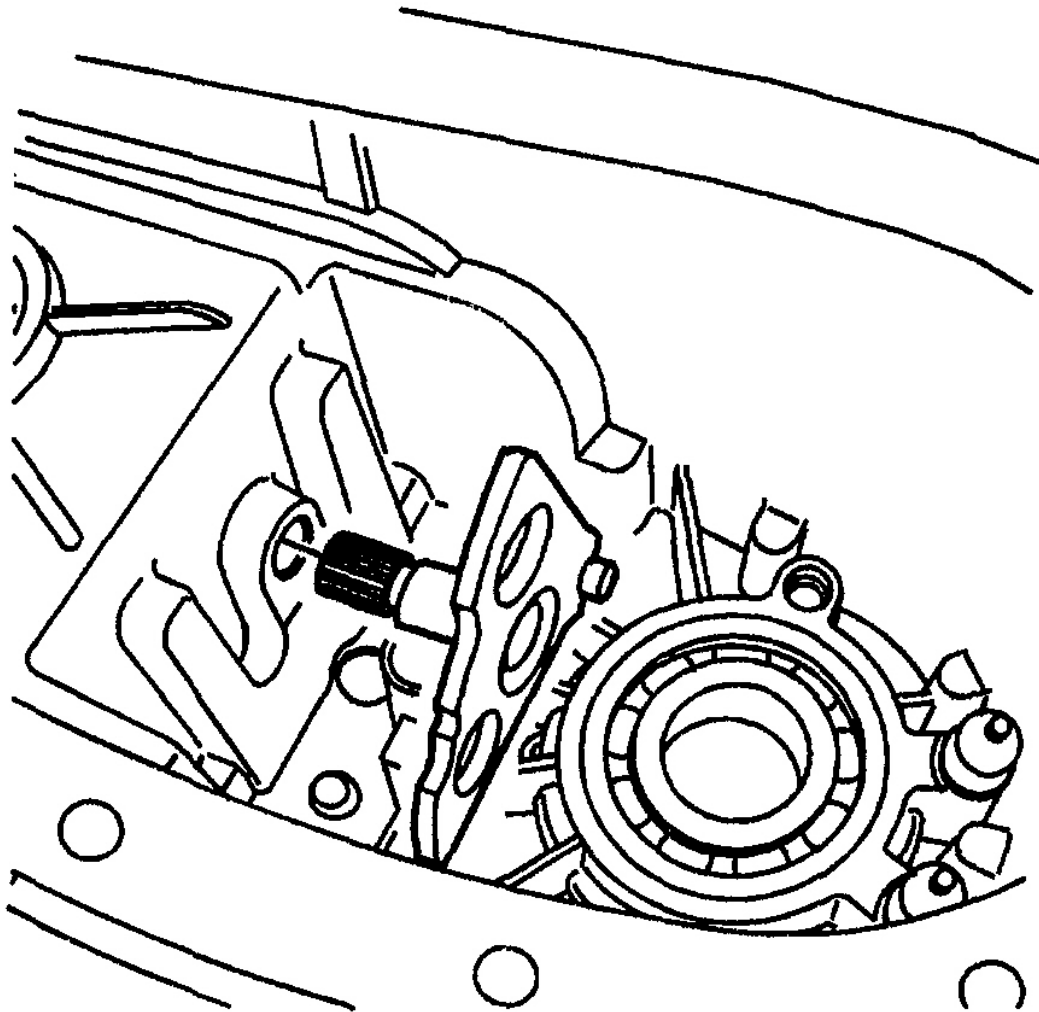
63. Remove the retaining ring for the control actuator lever shaft.
64. Discard the retaining ring.



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**Fig. 54: Removing Control Actuator Lever Shaft Retaining Ring**

65. Remove the control actuator lever shaft from the rear case.



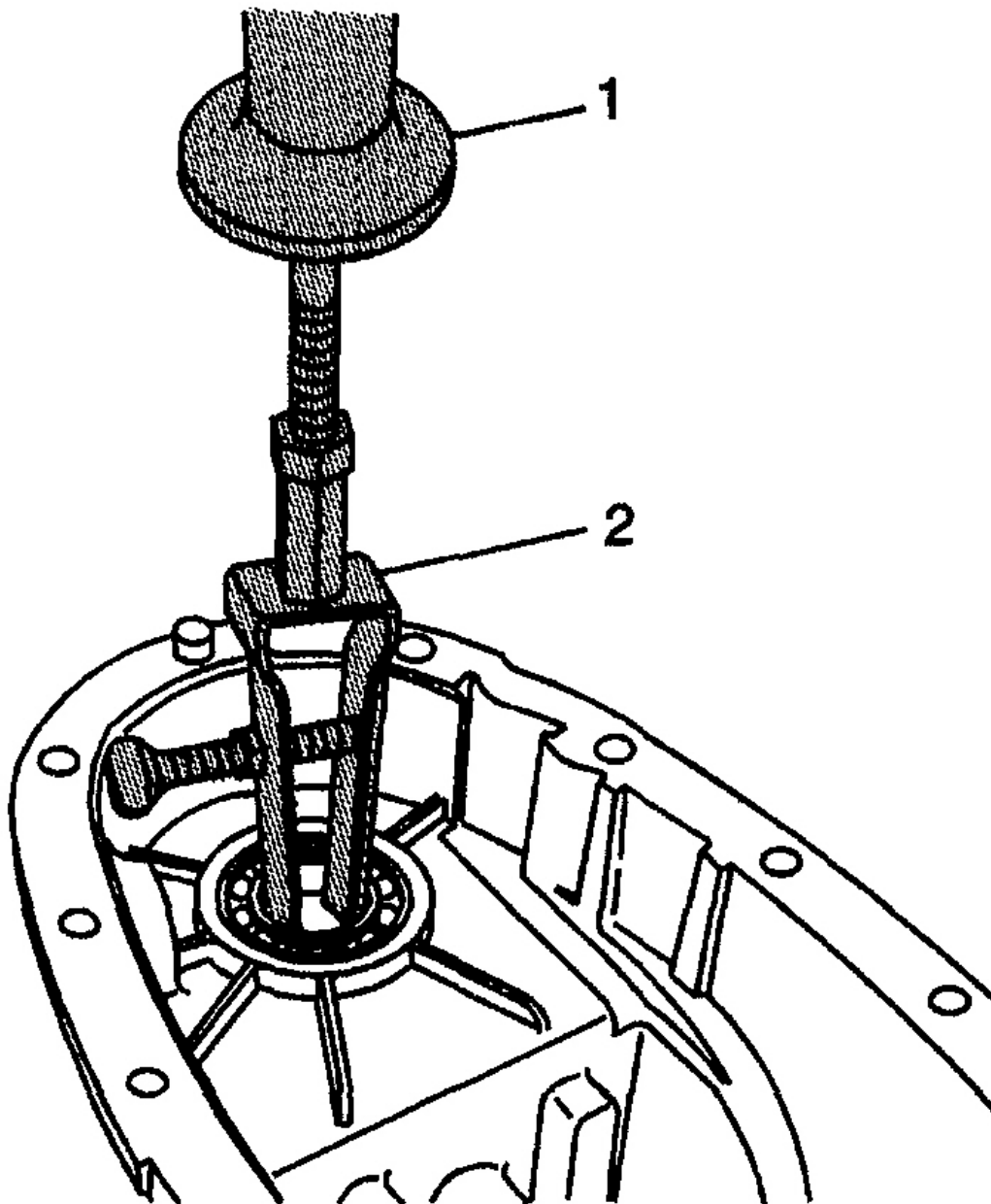
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**Fig. 55: Removing Control Actuator Lever Shaft From Rear Case**

**IMPORTANT:** Only remove the bearings if they are faulty. Do not use the bearings again.

66. Inspect the front output shaft rear bearing for being faulty. Refer to **Cleaning and Inspection** .
67. Using the J 23907 (1) and the J 26941 (2), remove the rear bearing for the front output shaft.





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**Fig. 56: Removing Rear Bearing For Front Output Shaft**

**IMPORTANT:** Only remove the bearings if they are faulty. Do not use the bearings again.

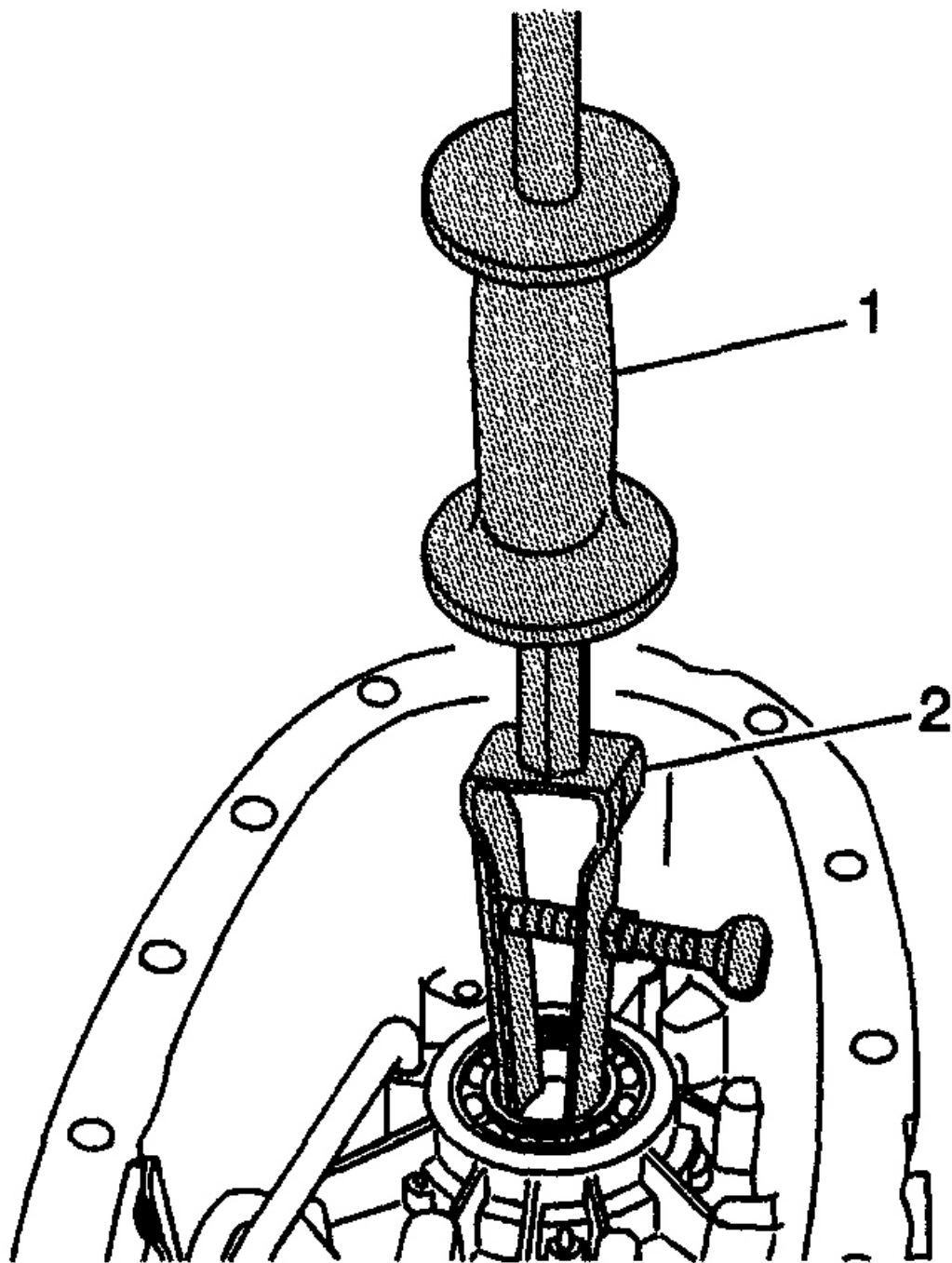
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68. Inspect the rear output shaft bearings for being faulty. Refer to **Cleaning and Inspection** .

**IMPORTANT: The bushing surface for the oil pump is located by the output shaft bearing. When using the J 26941, the jaws must not come in contact with the oil pump bushing surface.**

69. Using the J 23907 (1) and the J 26941 (2), remove the rear output shaft bearing from the rear case. Ensure the jaws on the J 26941 are between the bearing and the oil pump bushing.

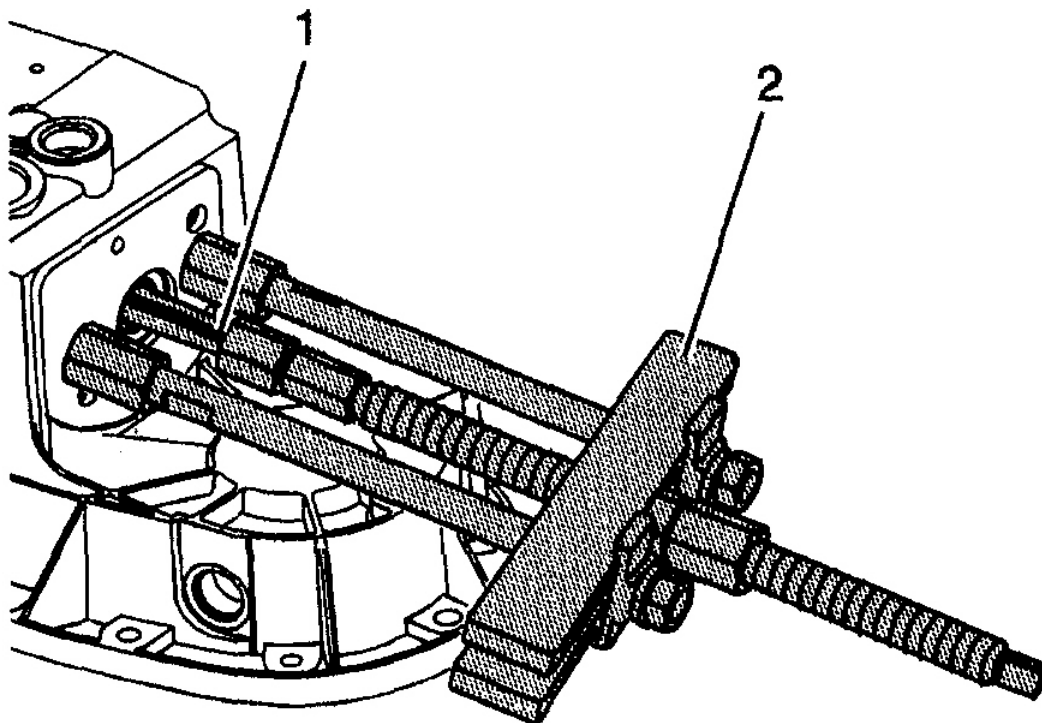


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**Fig. 57: Removing Rear Output Shaft Bearing From Rear Case**

**IMPORTANT:** Only remove the bearings if they are faulty. Do not use the bearings again.

70. Inspect the control actuator lever shaft bearing for being faulty. Refer to Cleaning and Inspection .
71. Using the J 44707 (2) and the J 44737 (1), remove the control actuator lever shaft bearing.

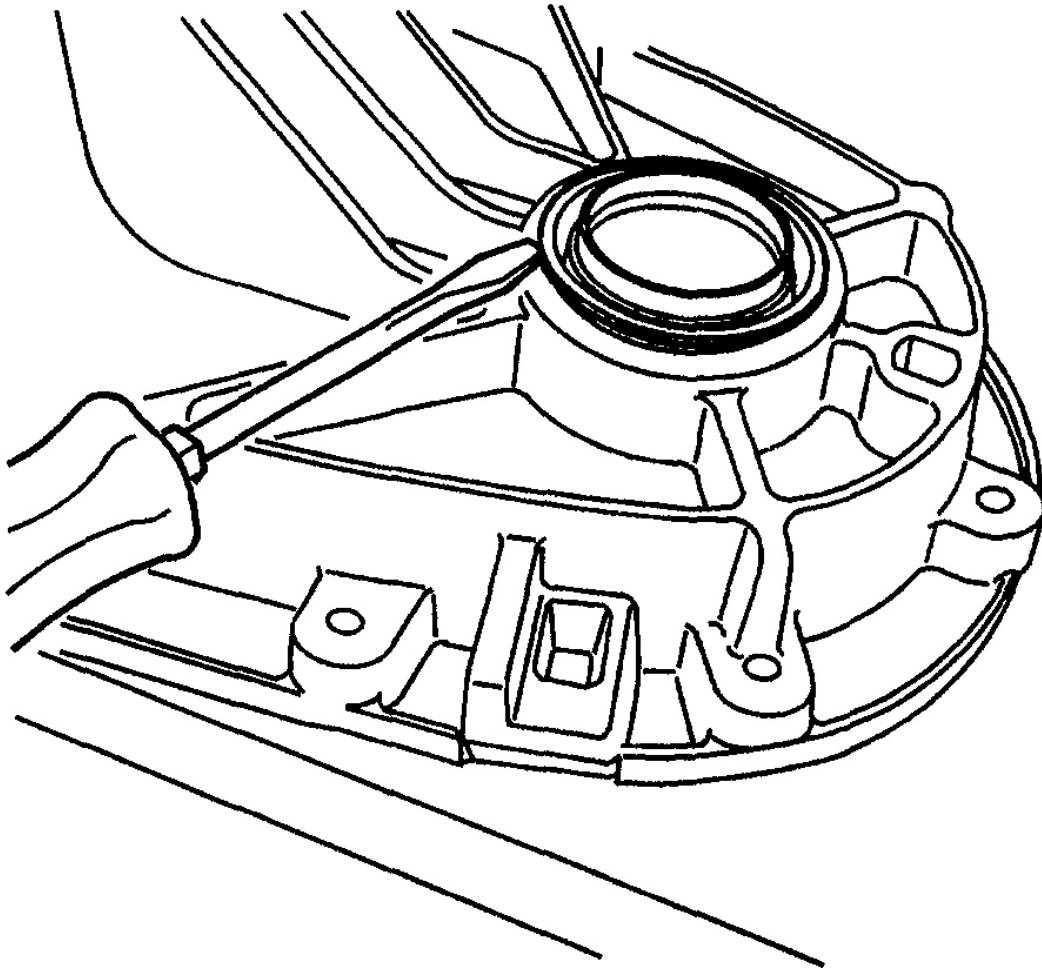


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**Fig. 58: Removing Control Actuator Lever Shaft Bearing**

**NOTE:** Refer to **TRANSFER CASE SEAL REMOVAL NOTICE** in **Cautions and Notices**.

72. Using a suitable prying tool, remove the front output shaft seal.
73. Discard the seal.

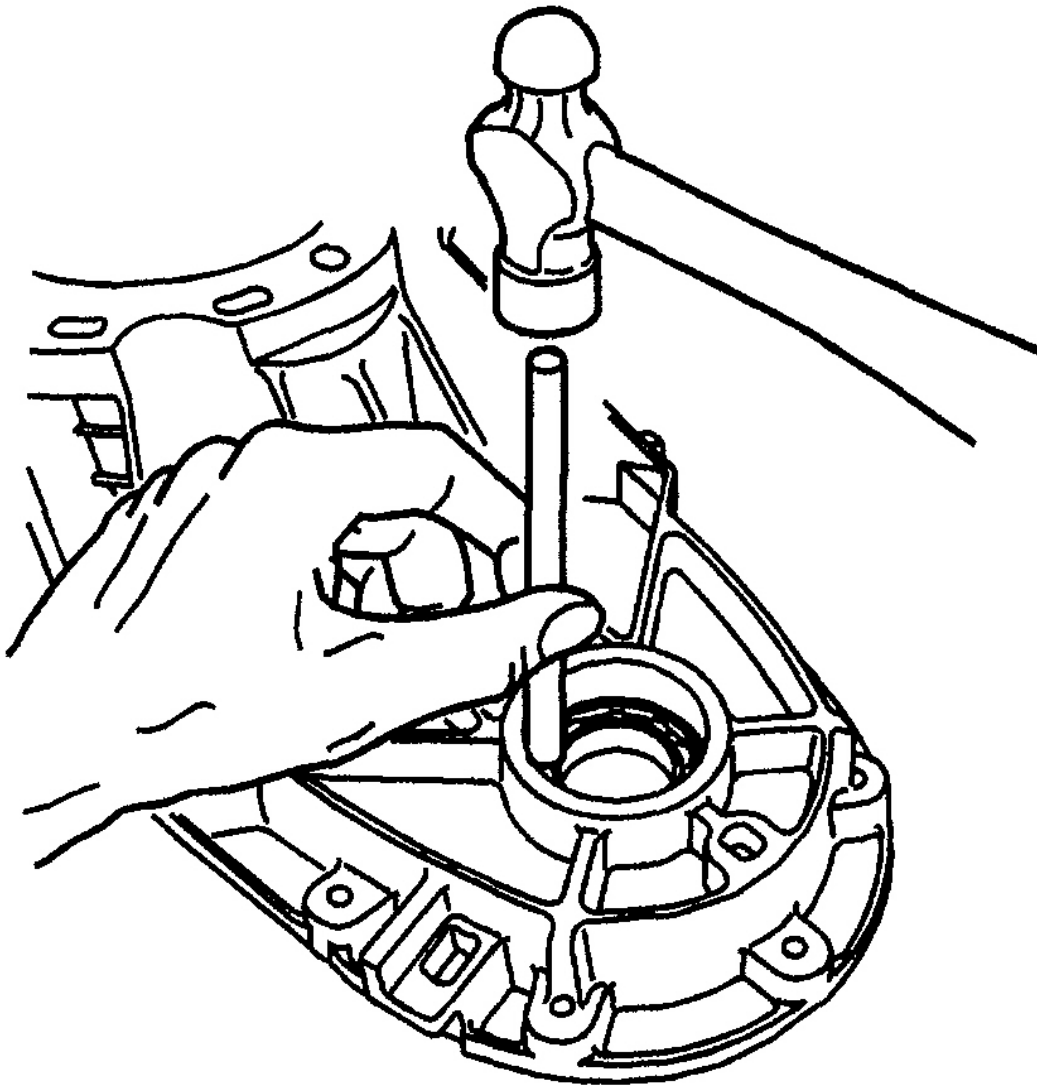


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**Fig. 59: Removing Front Output Shaft Seal**

**IMPORTANT:** Only remove the bearings if they are faulty. Do not use the bearings again.

74. Inspect the front output shaft front bearing for being faulty. Refer to **Cleaning and Inspection** .
75. Using a hammer and a punch, remove the front bearing, for the front output shaft, from the front case.
76. Clean and inspect all the internal parts of the transfer case. Refer to **Cleaning and Inspection** .



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**Fig. 60: Removing Front Bearing From Front Case**

## CLEANING AND INSPECTION

### Front Case Half

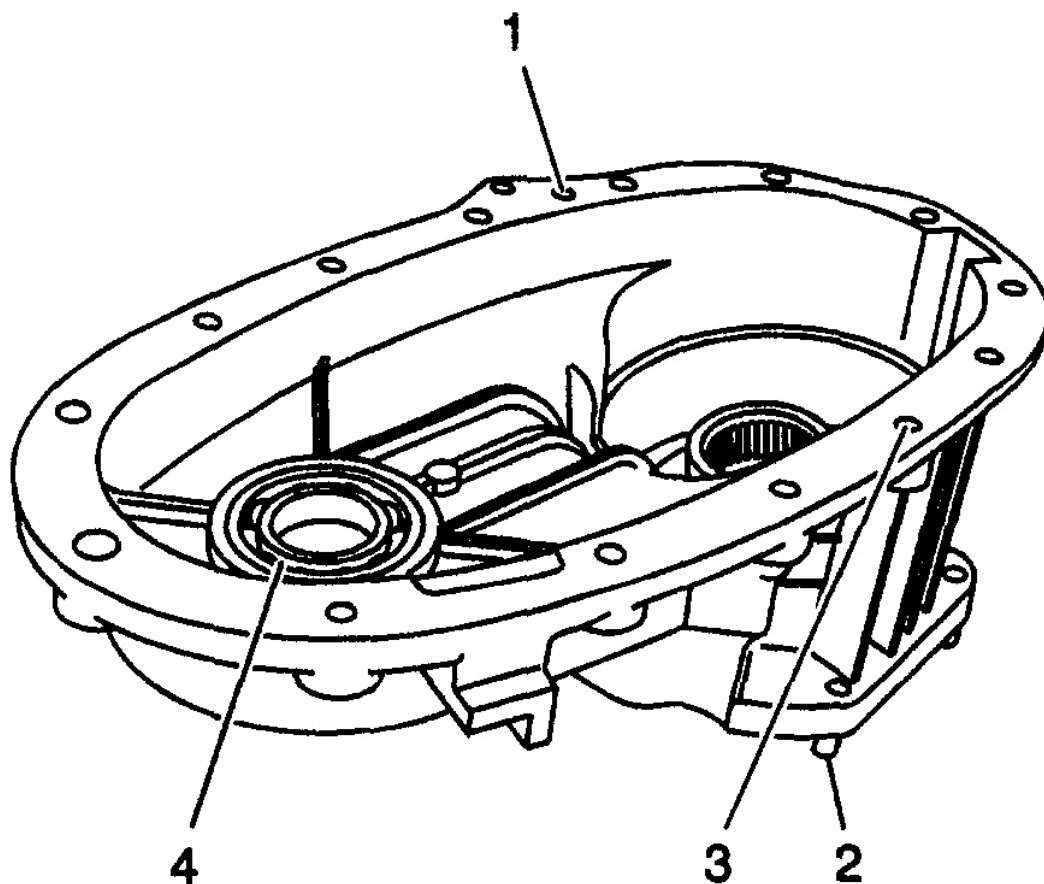
1. Clean the front case half in cleaning solvent and air dry.

**NOTE:** Refer to **MACHINED SURFACE DAMAGE NOTICE** in Cautions and Notices.

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2. Remove the sealer from the case sealing surfaces.
3. Inspect the front output shaft front bearing (4) for:
  - Roughness
  - Brinelling
  - Pitting
4. Replace the front output shaft front bearing if any of the above conditions are found. Refer to **Transfer Case Disassemble** and **Transfer Case Assemble** .
5. Inspect the case for spun bearings.
6. Replace the case if a bearing has spun.
7. Inspect the case for being broken or cracked.
8. Replace the case if it is broken or cracked.
9. Inspect the sealing surfaces (1) for damage.
10. Repair small scratches or nicks with a soft stone.
11. Inspect the front case to transmission case mounting surface for damage.
12. Inspect the case threaded bolt holes (3) for damage.
13. Replace any damaged threads.
14. Inspect the transmission to transfer case studs (2) for damage.
15. Replace any damaged studs.



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**Fig. 61: View Of Front Case Half**

**Rear Case Half**

1. Clean the rear case half in cleaning solvent and air dry.

**NOTE:** Refer to **MACHINED SURFACE DAMAGE NOTICE** in **Cautions and Notices**.

2. Remove the sealer from the case sealing surfaces.
3. Inspect the front output shaft rear bearing (5) for the following:
  - Roughness
  - Brinelling
  - Pitting
4. Replace the front output shaft rear bearing if any of the above conditions are found. Refer to **Transfer**



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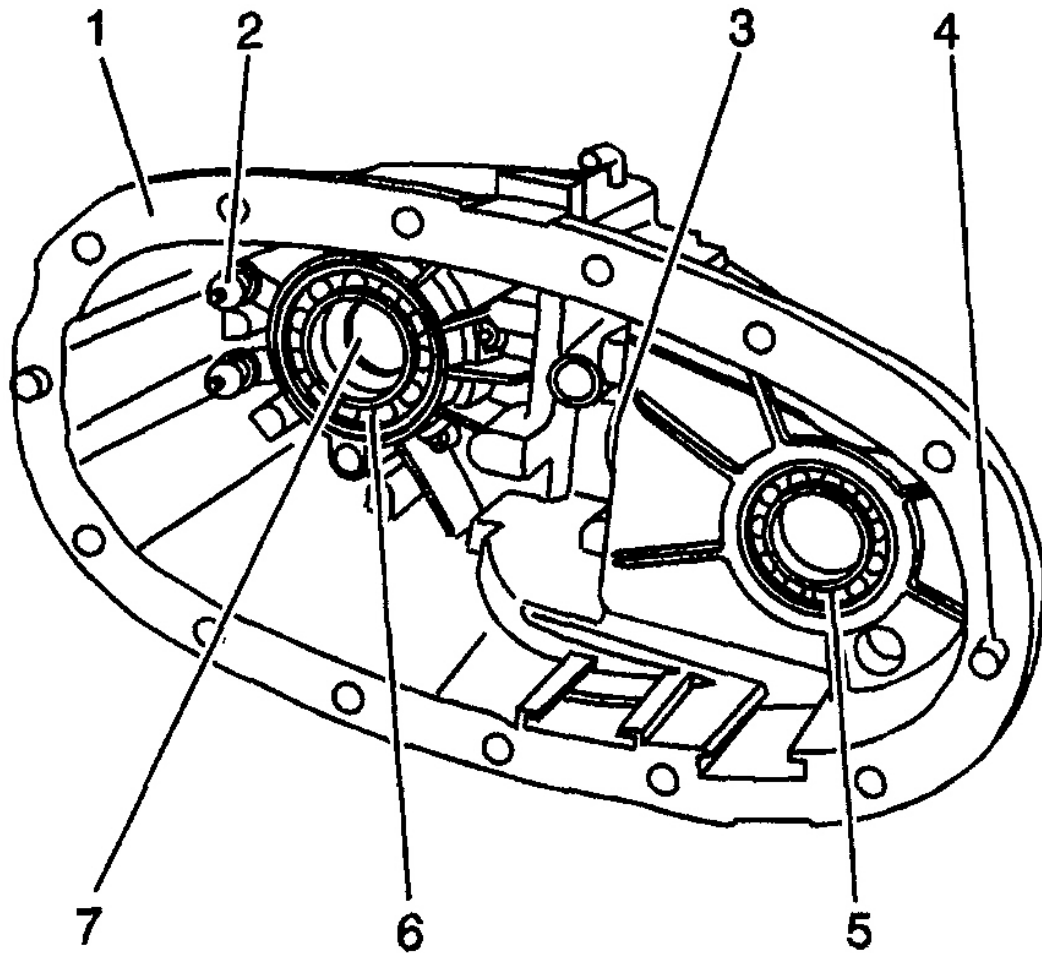
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### **Case Disassemble and Transfer Case Assemble .**

5. Inspect the rear output shaft bearing (6) for the following:
  - Roughness
  - Brinelling
  - Pitting
6. Replace the rear output shaft bearing if any of the above conditions are found. Refer to **Transfer Case Disassemble** and **Transfer Case Assemble** .
7. Inspect the case for spun bearings.
8. Replace the case if a bearing has spun.
9. Inspect the control actuator lever shaft bearing and seal (3) for the following:
  - Leakage
  - Roughness
  - Brinelling
  - Pitting
10. Replace the control actuator lever shaft seal and bearing if any of the above conditions are found.

Refer to **Transfer Case Disassemble** and **Transfer Case Assemble** .

11. Inspect the case for being broken or cracked.
12. Replace the case if it is broken or cracked.
13. Inspect the sealing surfaces (1) for damage.
14. Repair small scratches or nicks with a soft stone.
15. Inspect the case threaded bolt holes for damage.
16. Repair any damaged threads.
17. Inspect the dowel pins (4) for being loose or missing.
18. Repair or replace any damaged dowel pins.
19. Inspect the oil pump bushing bore (7) for scoring or damage.
20. Replace the case if the oil pump bushing bore is damaged.
21. Inspect the clutch lever studs (2) for wear.
22. Replace the case if the clutch lever studs are worn.



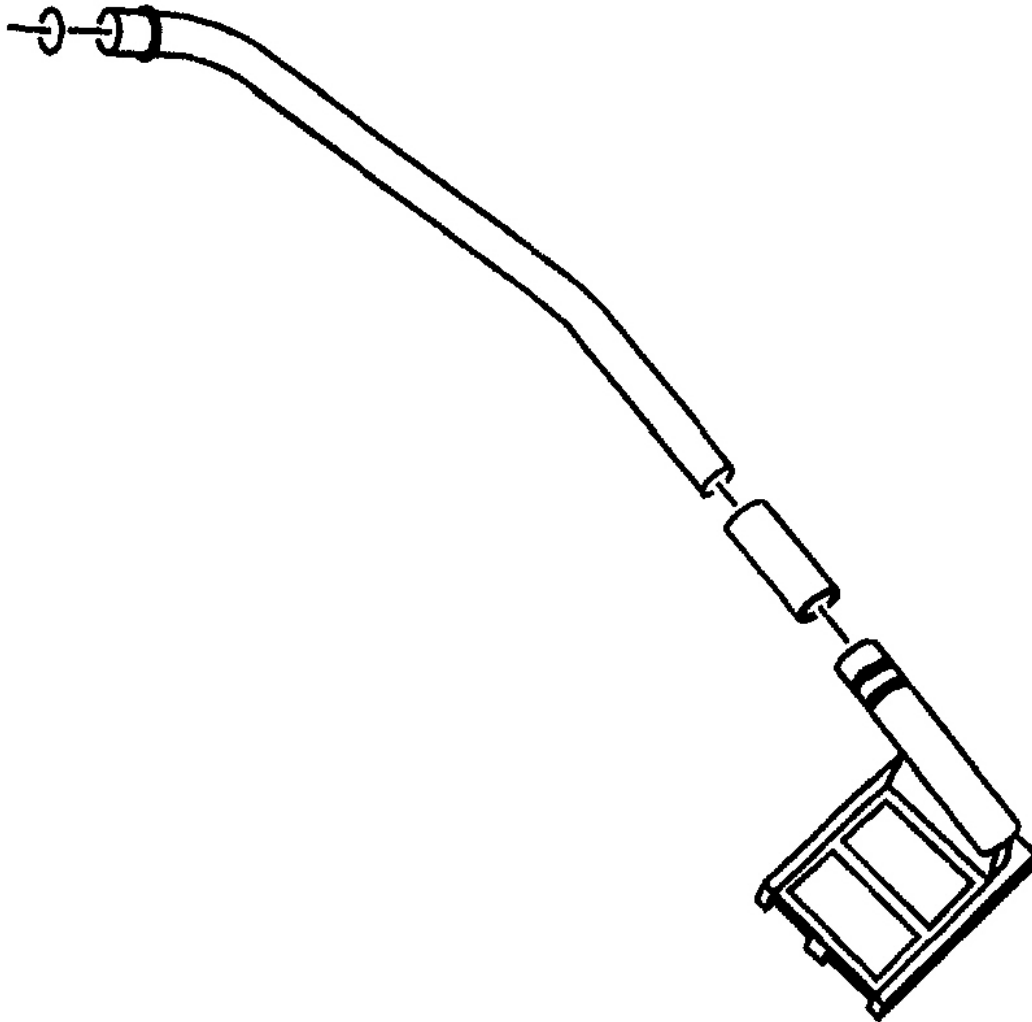
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**Fig. 62: View Of Rear Case Half**

23. Remove the oil pump suction pipe and the oil pump suction hose from the oil pump screen.
24. Clean the pipe, hose, and screen in cleaning solvent and air dry.
25. If the screen is embedded with debris, replace the screen.
26. Inspect the hose for cracking or tears.
27. Replace the hose if faulty.

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**Fig. 63: View Of Oil Pump Suction Pipe, Oil Pump Suction Hose & Oil Pump Screen**

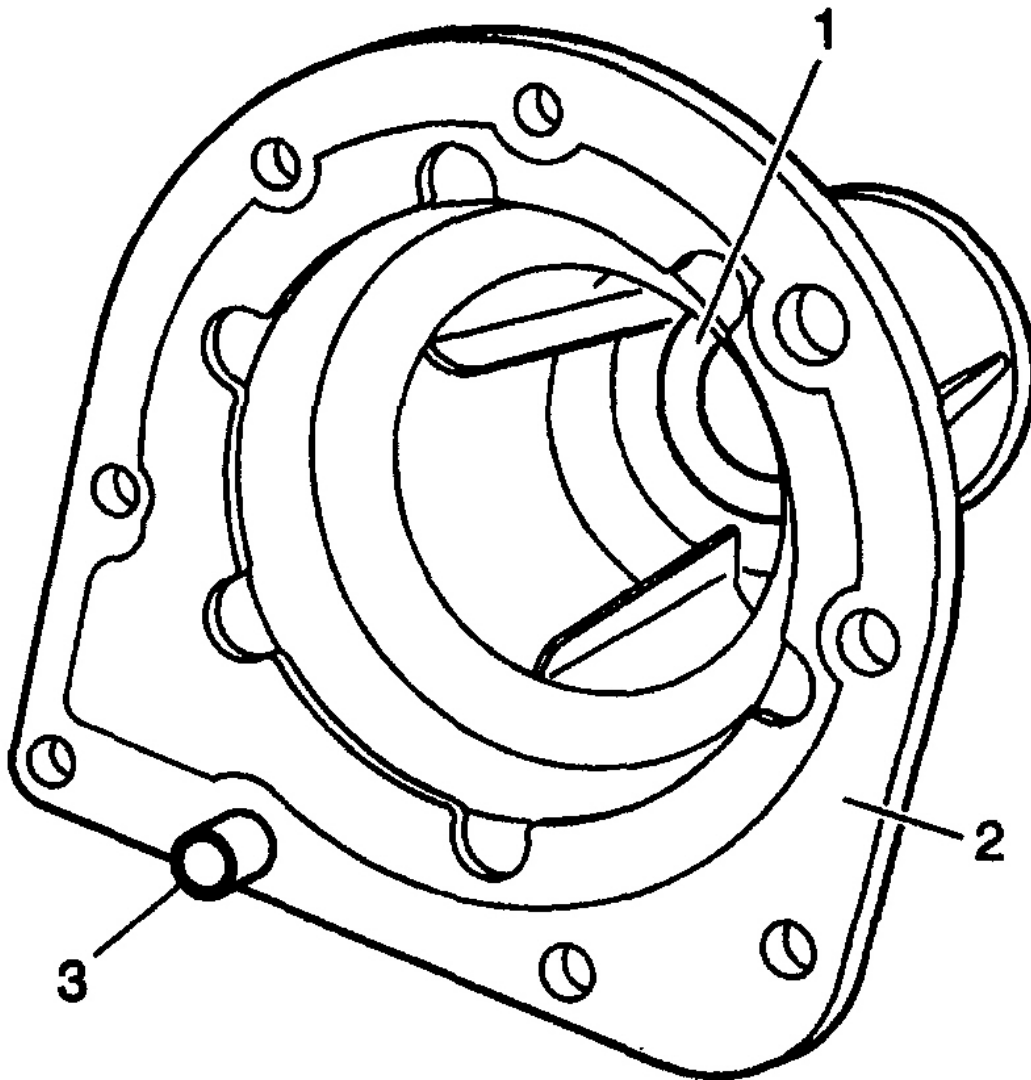
### Rear Extension

1. Clean the rear extension in cleaning solvent and air dry.

**NOTE:** Refer to **MACHINED SURFACE DAMAGE NOTICE** in **Cautions and Notices**.

2. Remove the sealer from the extension sealing surfaces (2).
3. Inspect the extension for being broken or cracked.
4. Replace the extension if it is broken or cracked.

5. Inspect the sealing surfaces for damage.
6. Repair small scratches or nicks with a soft stone.
7. Inspect the dowel pins (3) for being loose or missing.
8. Repair or replace a damaged dowel pin.
9. Inspect the rear extension bushing (1) for scoring and excessive wear.



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**Fig. 64: View Of Rear Extension**

10. Replace the rear extension bushing if damaged or worn. Refer to **Transfer Case Disassemble** and

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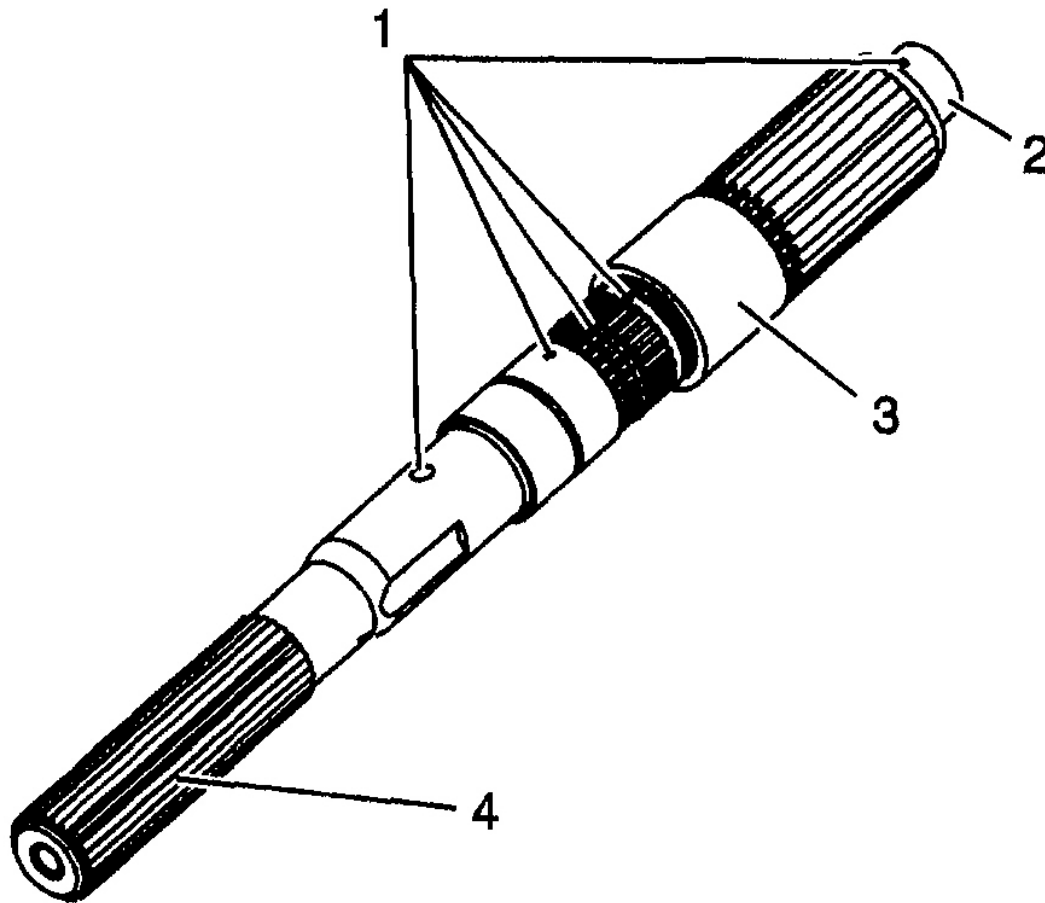
### Transfer Case Assemble .

#### Rear Output Shaft

1. Clean the rear output shaft in cleaning solvent.
2. Clean the rear output shaft oil galleries (1) and air dry.

**IMPORTANT: Do not attempt to smooth any roughness in the bearing journals or seal surfaces.**

3. Inspect the input gear thrust bearing surface (2) and the clutch housing bearing surface (3) for the following:
  - Scoring
  - Pitting
  - Brinelling
  - Excessive wear
4. Inspect the rear output shaft splines (4) for damage or excessive wear. Witness marks at the location of the gears is normal.
5. Replace the rear output shaft if any of the above conditions are found.

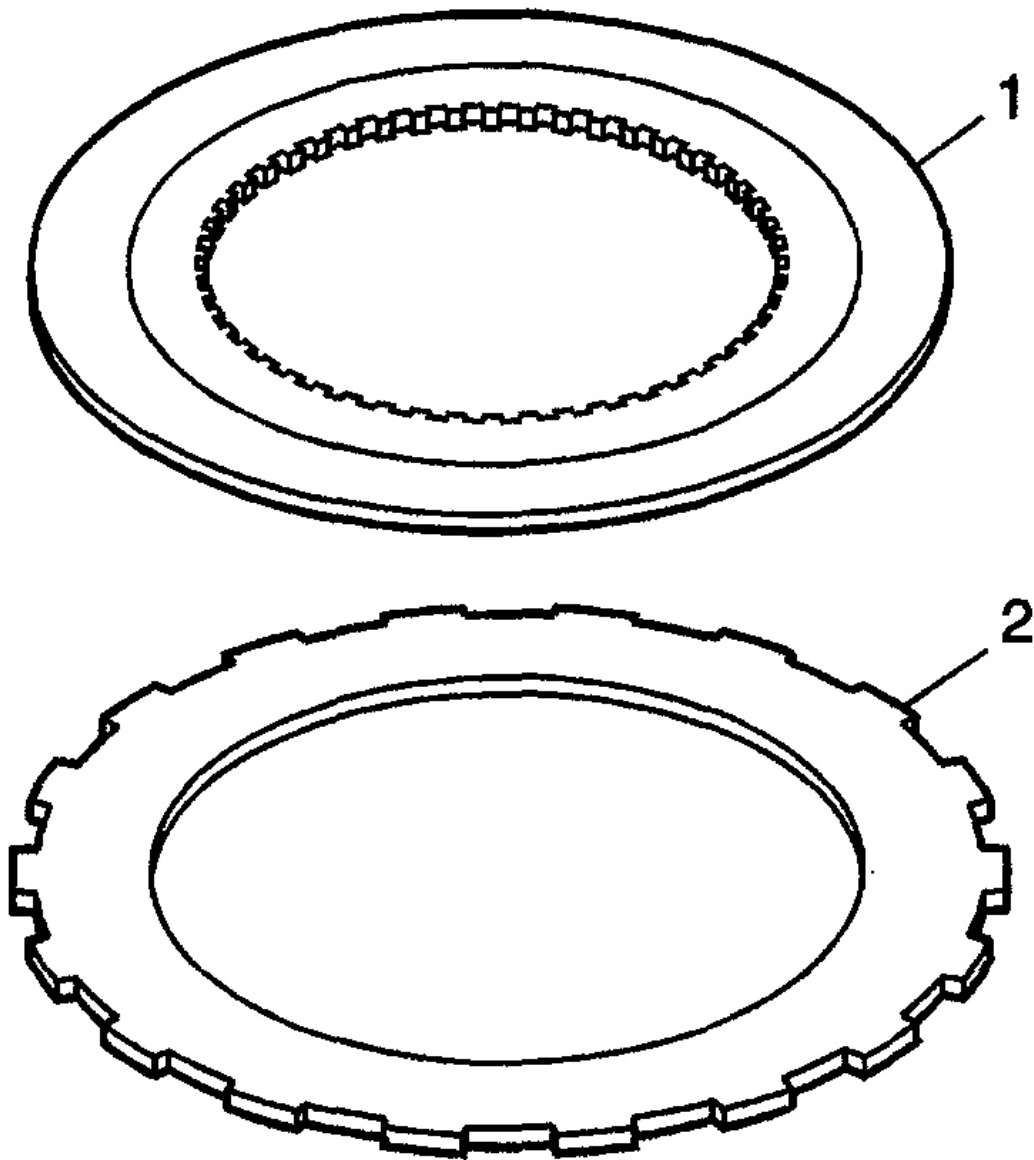


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**Fig. 65: View Of Rear Output Shaft**

**Clutch Components**

1. Do not clean the inner clutch discs (1) and outer clutch discs (2) in cleaning solvent.
2. Inspect the clutch discs for the following:
  - Worn friction material
  - Grooved or scored friction material
  - Warped
  - Burnt
3. Replace the clutch discs if any of the above conditions are found.

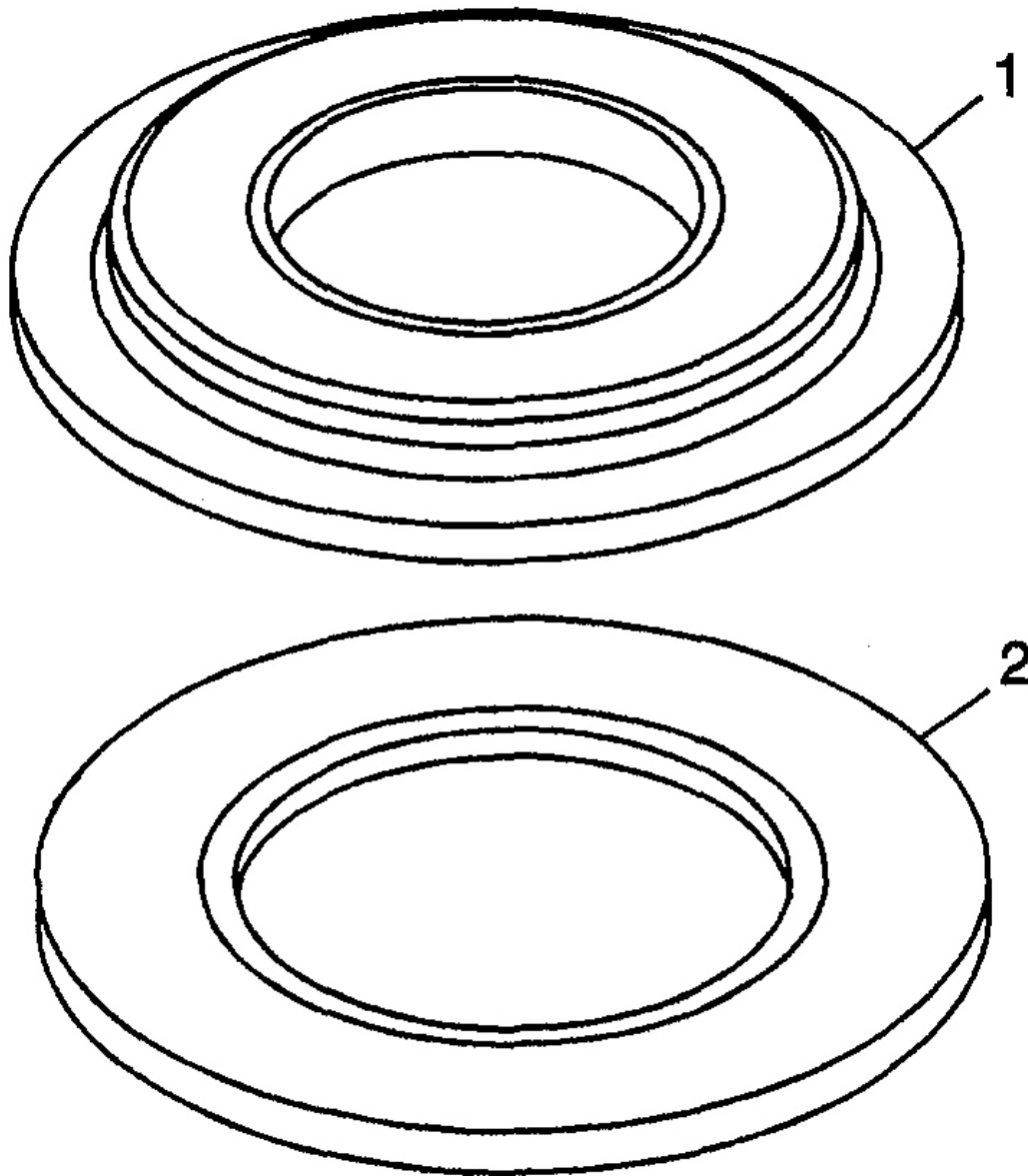


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**Fig. 66: Identifying Inner & Outer Clutch Disc**

4. Clean the clutch inner plate (1) and the clutch pressure plate bearing (2) in cleaning solvent and air dry.
5. Inspect the pressure plate bearing for roughness and smooth movement.
6. Replace the pressure plate bearing if damaged or worn.
7. Inspect the clutch inner plate inner bushing for wear or damage.

8. Inspect the clutch inner plate for wear.
9. Replace the clutch inner plate if any of the above conditions are found.



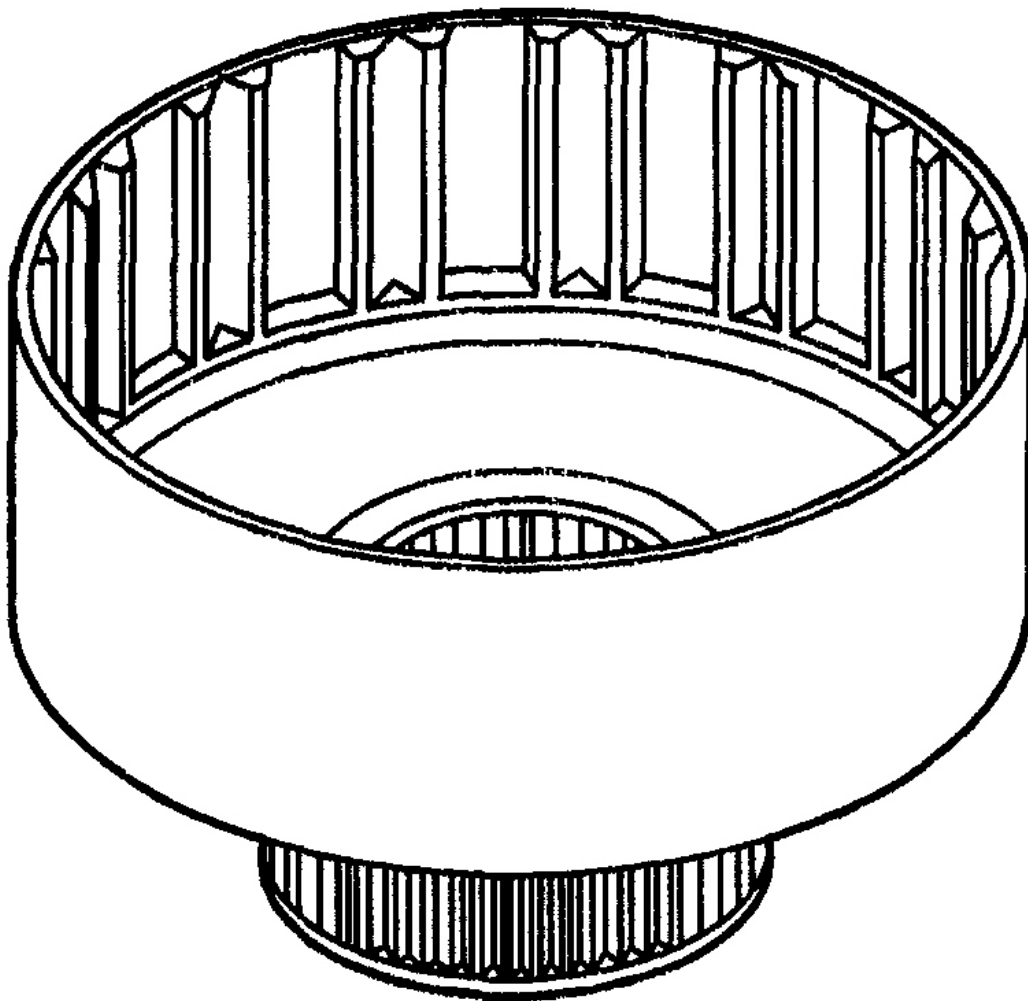
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**Fig. 67: Identifying Clutch Inner Plate & Clutch Pressure Plate Bearing**

10. Clean the clutch housing, with the bearing, in cleaning solvent.



11. Air dry and ensure all solvent is removed from the bearing.
12. Inspect the bearing for wear or damage.
13. Inspect the clutch housing disc teeth for excessive wear. Excessive wear can be identified by the steps in the teeth, which prevents the clutch disc from moving freely.
14. Replace the clutch housing if the bearing is faulty or if the clutch disc teeth are worn. The bearing is not serviced separately.

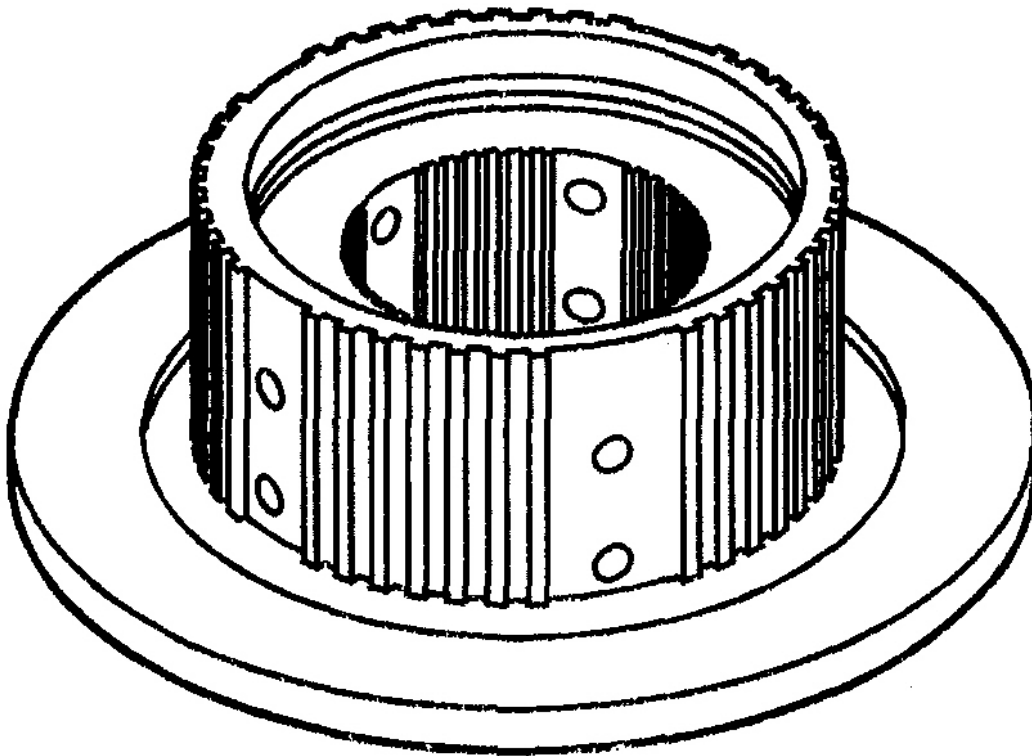


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**Fig. 68: Identifying Clutch Housing**

15. Clean the clutch hub in cleaning solvent and air dry.

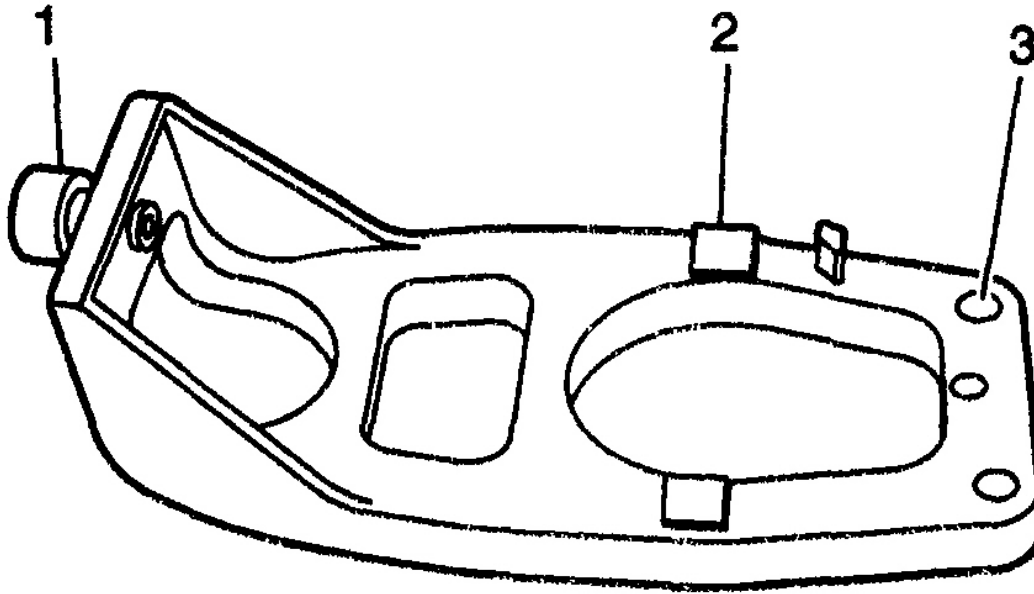
16. Inspect the inner splines of the clutch hub for wear or damage.
17. Inspect the clutch inner hub on the rear output shaft for excessive wear on the splines.
18. Inspect the clutch hub teeth for excessive wear. Excessive wear can be identified by the steps in the teeth, which prevents the clutch disc from moving freely.
19. Replace the clutch hub if any of the above conditions are found.



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**Fig. 69: Identifying Clutch Hub**

20. Clean the clutch lever in cleaning solvent and air dry.
21. Inspect the clutch lever roller (1) for the following:
  - Wear
  - Rotates easily
22. Inspect the clutch lever for worn wear pads (2).
23. Inspect the clutch lever for wear at the pivot pin sockets (3).
24. Replace the clutch lever if the above conditions are found.



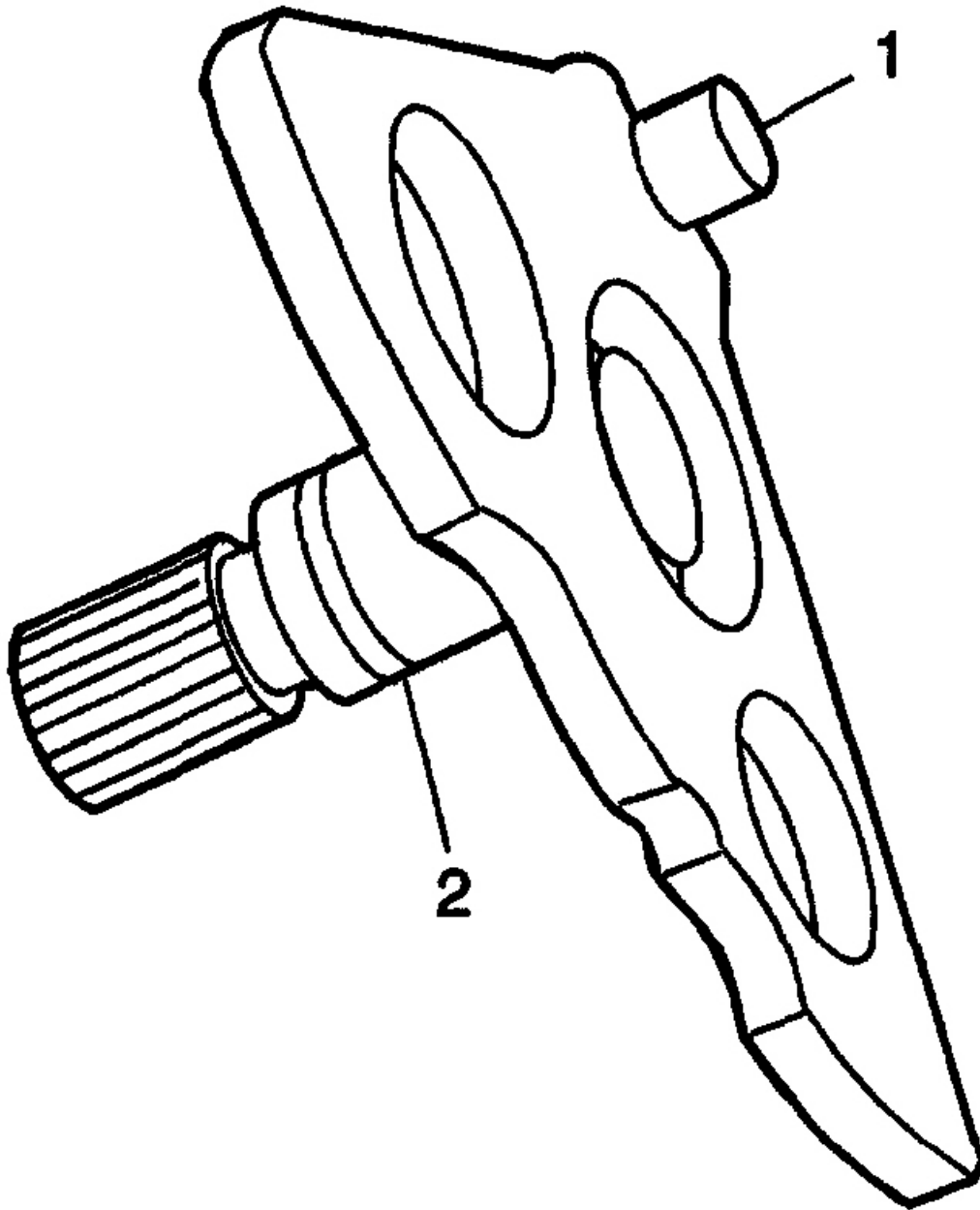
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**Fig. 70: Identifying Clutch Lever Components**

25. Clean the control actuator lever shaft in cleaning solvent and air dry.
26. Inspect the roller (1) on the control actuator lever shaft for the following:
  - Wear
  - Rotates easily
27. Inspect the bearing (2) and the seal surface on the control actuator lever shaft for the following:
  - Pitted
  - Wear
  - Corrosion
28. Replace the control actuator lever shaft if any of the above conditions are found.

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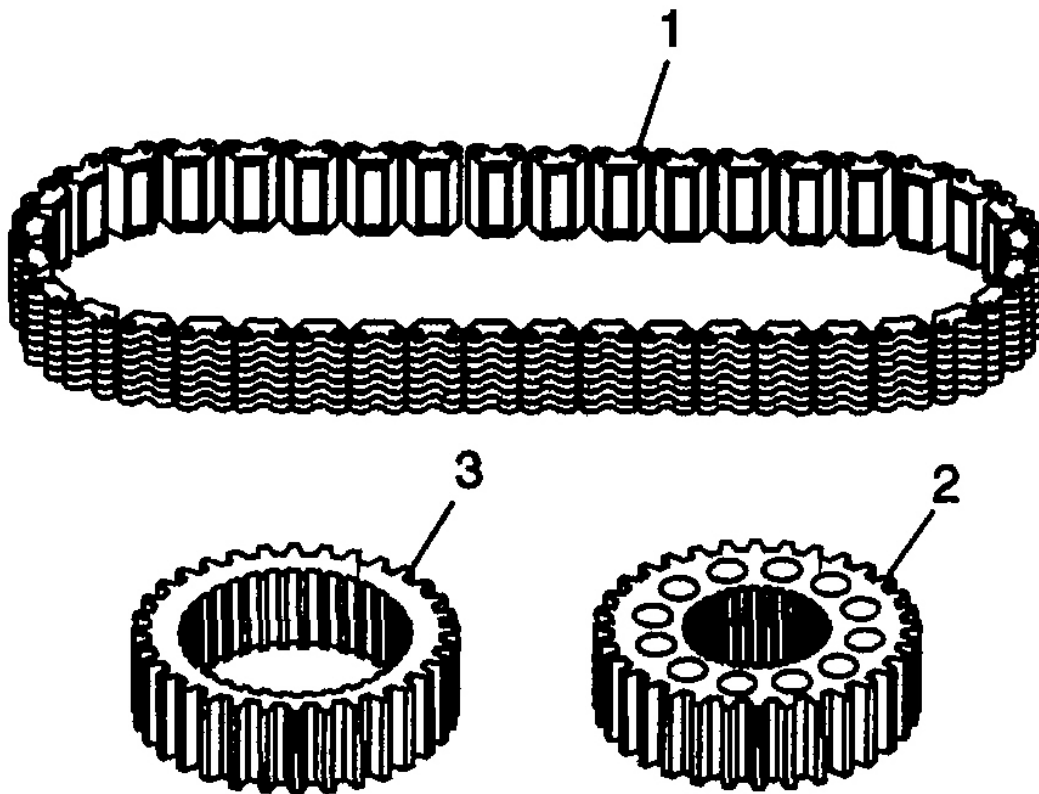
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**Fig. 71: Identifying Control Actuator Lever Shaft, Roller & Bearing**

1. Clean the drive chain (1), drive sprocket (3), and driven sprocket (2) in cleaning solvent and air dry.
2. Inspect the drive chain (1) for the following:
  - Loose link pins
  - Binding or stiff links
  - Debris embedded in the links
  - Worn teeth surfaces
3. Replace the chain if any of the above conditions are found.
4. Inspect the driven sprocket (2) and the drive sprocket (3) for the following:
  - Chipped teeth
  - Excessive worn gear surfaces, slight wear marks are normal
  - Debris embedded in the root of the teeth
5. Replace the sprocket if any of the above conditions are found. The chain and sprockets may be replaced separately.

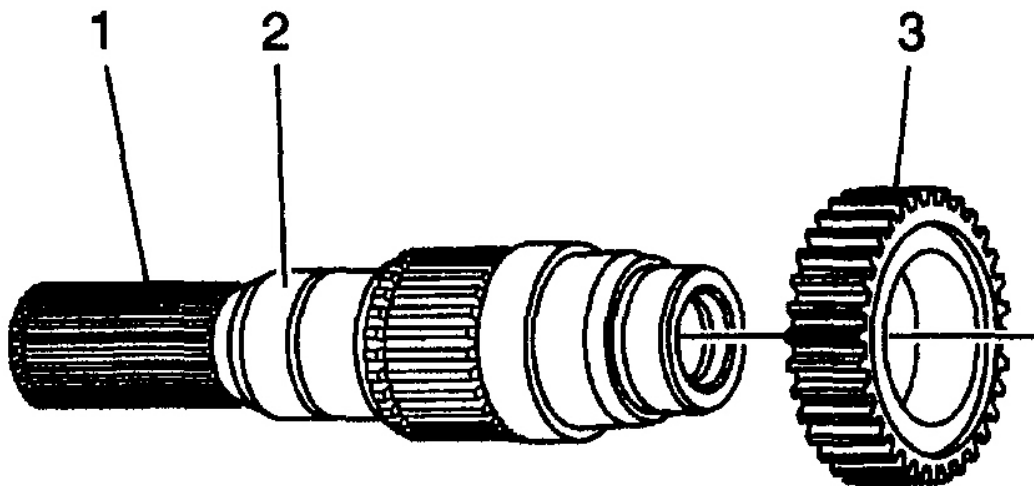


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**Fig. 72: Identifying Drive Chain, Drive Sprocket & Driven Sprocket**

**Front Output Shaft**

1. Clean the front output shaft in cleaning solvent and air dry.
2. Inspect the teeth on the speed sensor reluctor wheel (3) for damage.
3. Replace the speed sensor reluctor wheel if damaged.
4. Inspect the front output shaft seal surface (2) for wear or damage.
5. Inspect the front output shaft splines (1) for damage.
6. Replace the front output shaft if damaged.



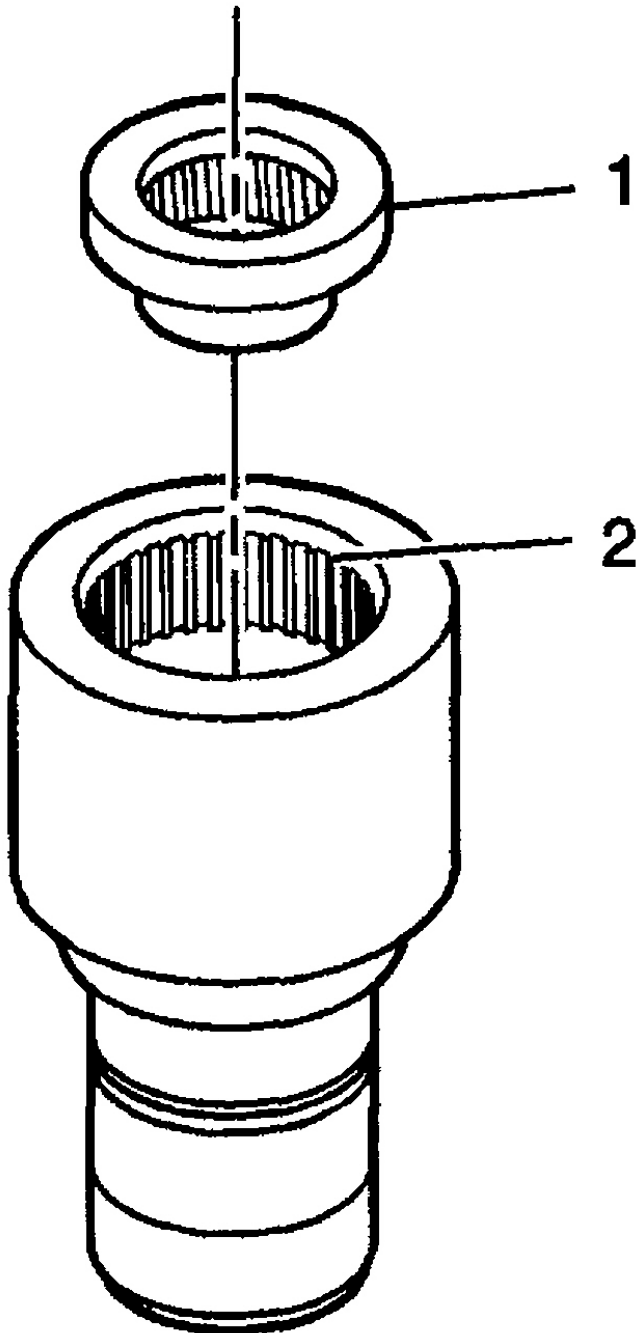
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**Fig. 73: Identifying Front Output Shaft Components****Input Gear**

1. Clean the input gear, with thrust bearing, in cleaning solvent.
2. Air dry, and ensure all solvent is removed from the thrust bearing.
3. Inspect the thrust bearing (1) for the following:
  - Pitted
  - Wear
  - Corrosion
4. Replace the input gear thrust bearing if any of the above conditions are found. Refer to **Transfer Case Disassemble** and **Transfer Case Assemble**.
5. Inspect the internal splines (2) for:
  - Wear

- Spalding

6. Replace the input gear if any of the above conditions are found.



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**Fig. 74: Identifying Input Gear & Thrust Bearing**

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### TRANSFER CASE ASSEMBLE

#### Tools Required

- J 3289-20 Holding Fixture
- J 8092 Universal Driver Handle
- J 36371 Output Shaft Bearing Installer
- J 36373 Input Sun Gear Ball Bearing Installer
- J 37668-A Seal Installer
- J 42738 Seal Installer
- J 45235 Rear Speed Sensor Reluctor Wheel Installer
- J 45236 Front Output Shaft Seal Installer
- J 45237 Input Gear Thrust Bearing Installer
- J 45239 Needle Bearing Installer
- J 45380 Transfer Case Rear Bushing Remover and Installer
- J 45759 Assembly Fixture

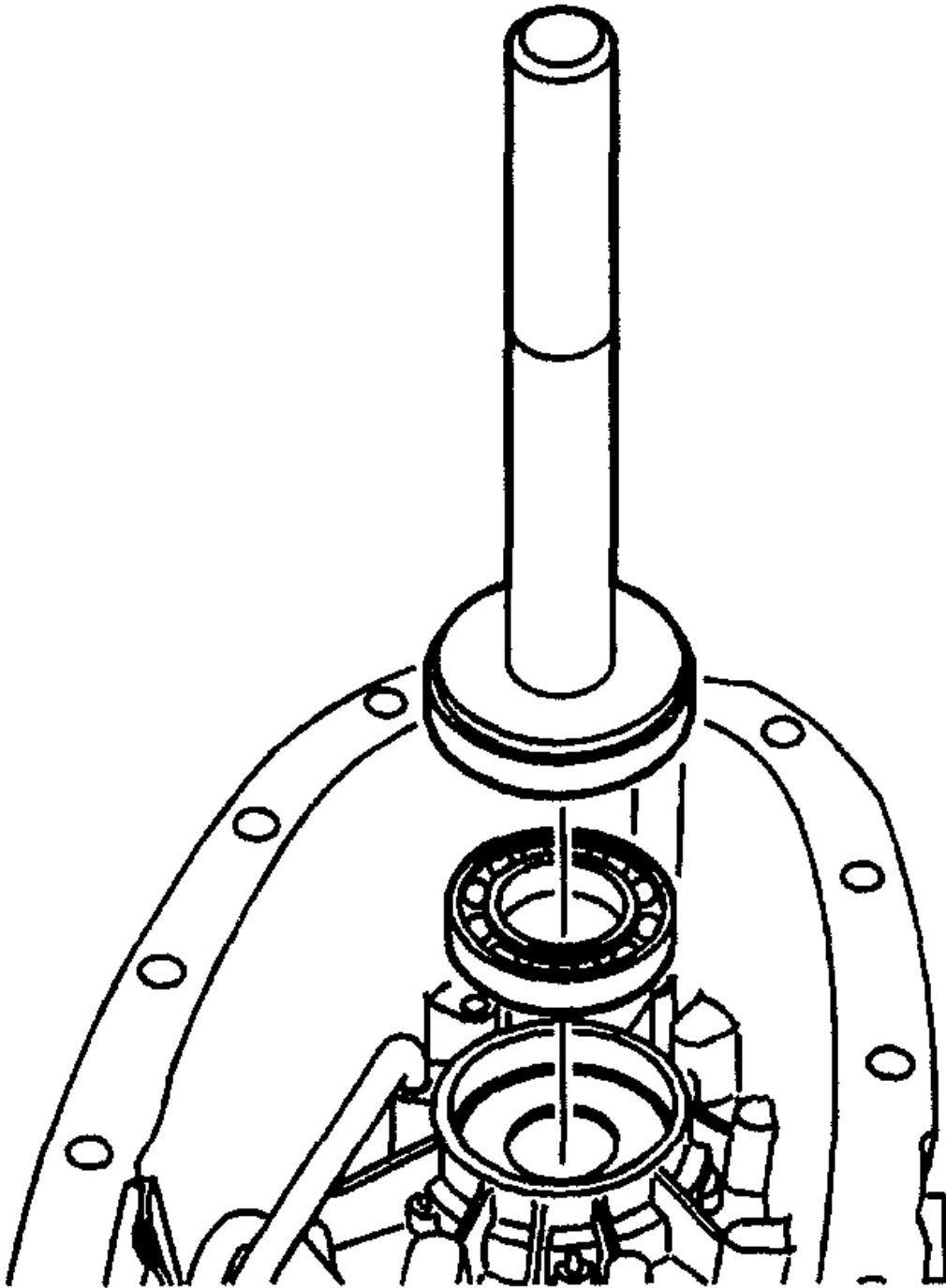
#### IMPORTANT:

- **Install the input gear seal after the transfer case is assembled.**
  - **Do not cock the bearing when installing. Ensure to squarely install the bearing in the bore.**
1. Using a suitable bearing installer, install the rear output shaft bearing. Ensure the bearing installer is used against the outer race of the bearing.



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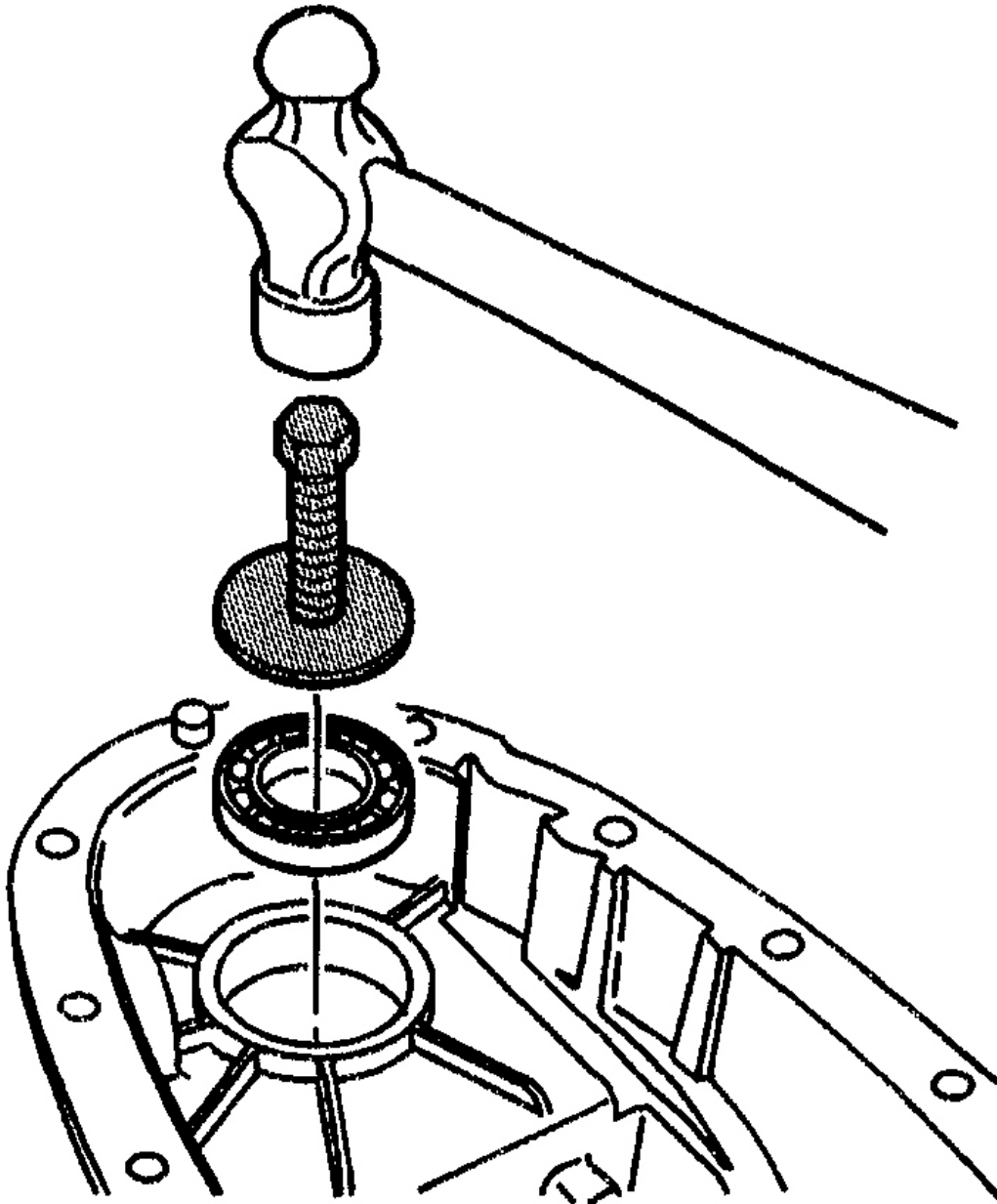
2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer



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**Fig. 75: Installing Rear Output Shaft Bearing**

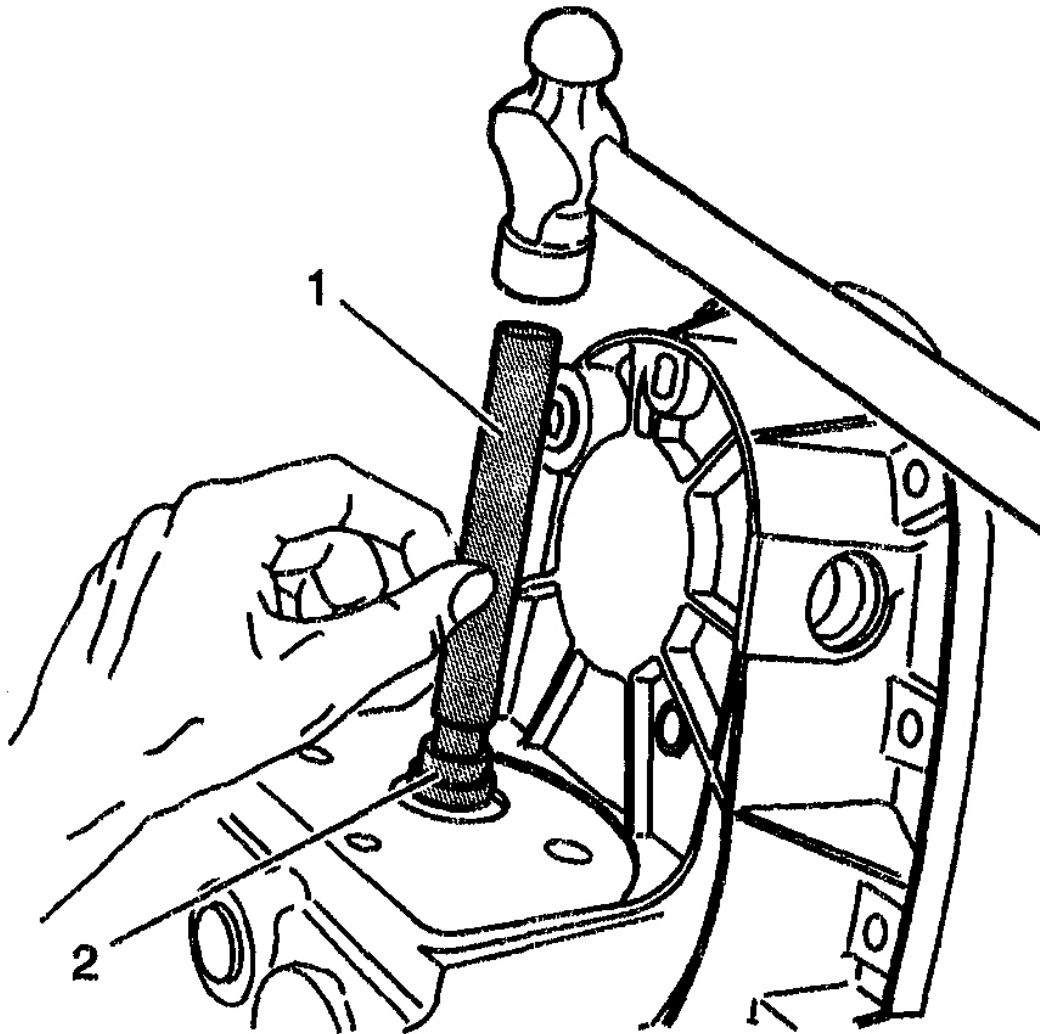
2. Using the driver of the J 36371, install the front output shaft rear bearing into the rear case half.



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**Fig. 76: Installing Front Output Shaft Rear Bearing Into Rear Case Half**

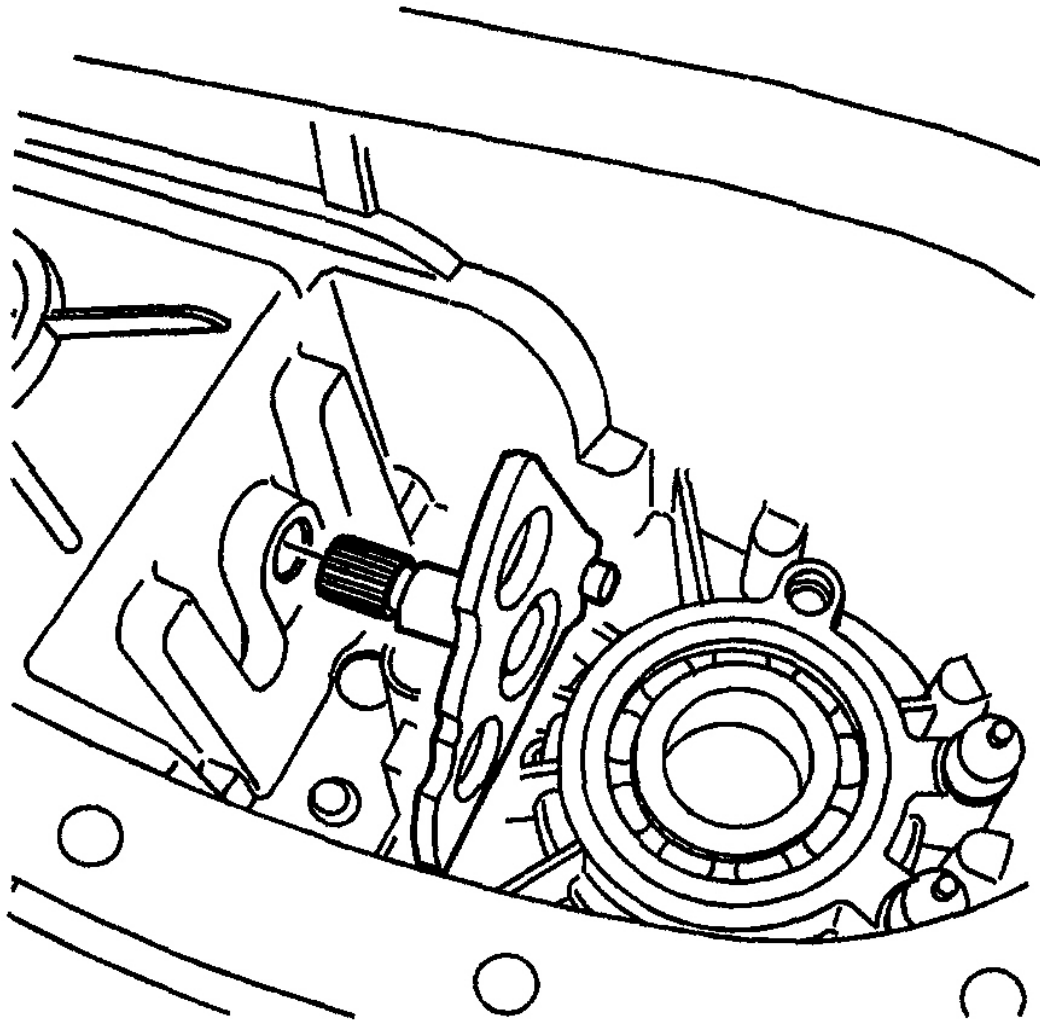
3. Using the J 8092 (1) and the J 45239 (2), install the control actuator lever shaft bearing until it bottoms in the bore. The seal side of the bearing faces the encoder motor.



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**Fig. 77: Installing Control Actuator Lever Shaft Bearing**

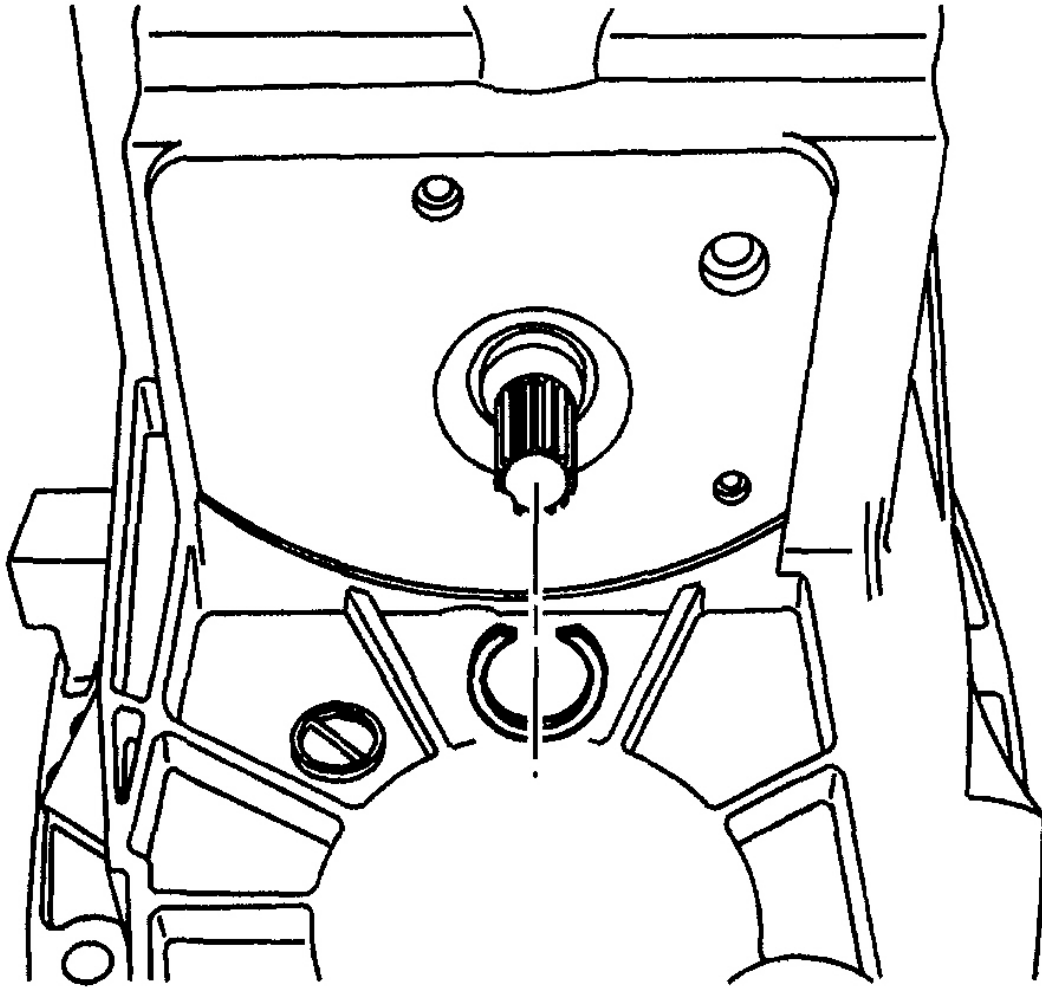
4. Install the control actuator lever shaft in the rear case half.



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**Fig. 78: Installing Control Actuator Lever Shaft In Rear Case Half**

5. Install a new control actuator lever shaft retaining ring.



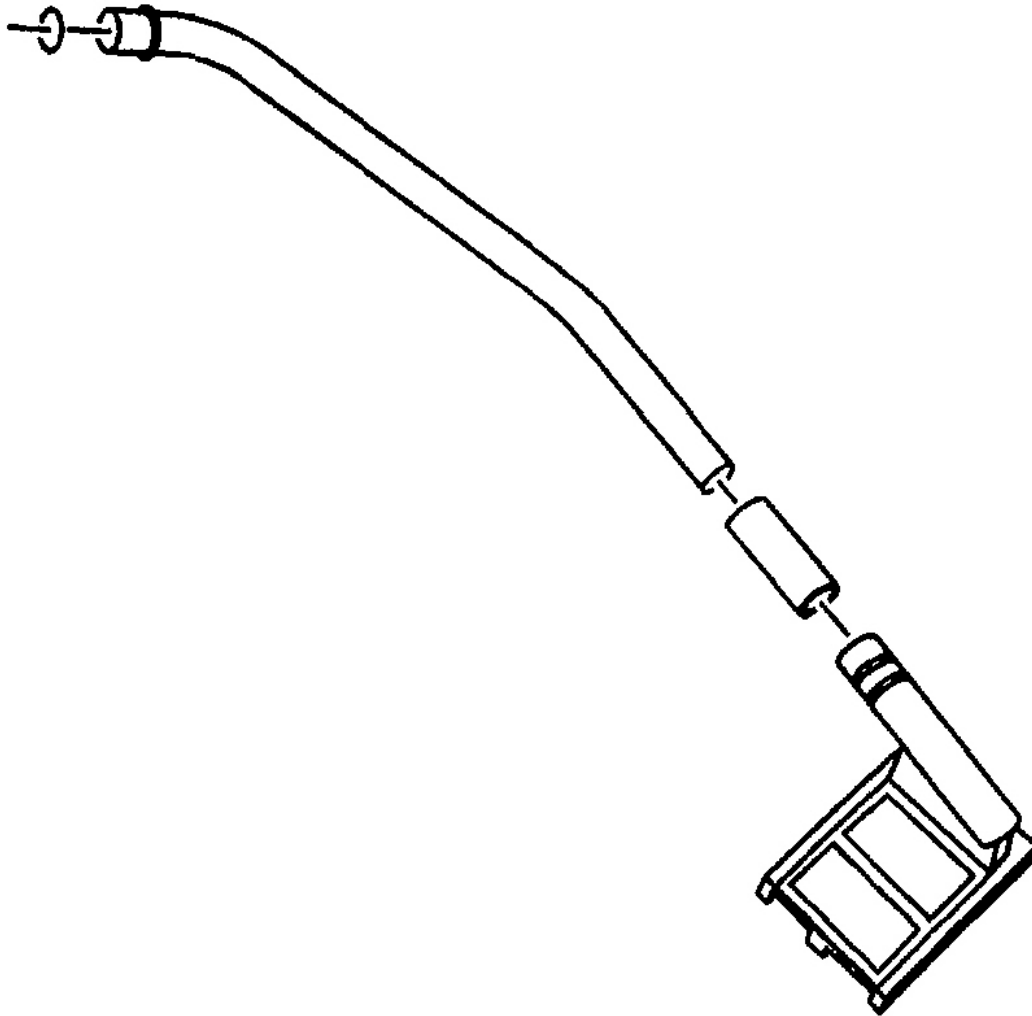
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**Fig. 79: Installing Control Actuator Lever Shaft Retaining Ring**

6. Install the oil pump screen and oil pump hose to the oil pump suction pipe.

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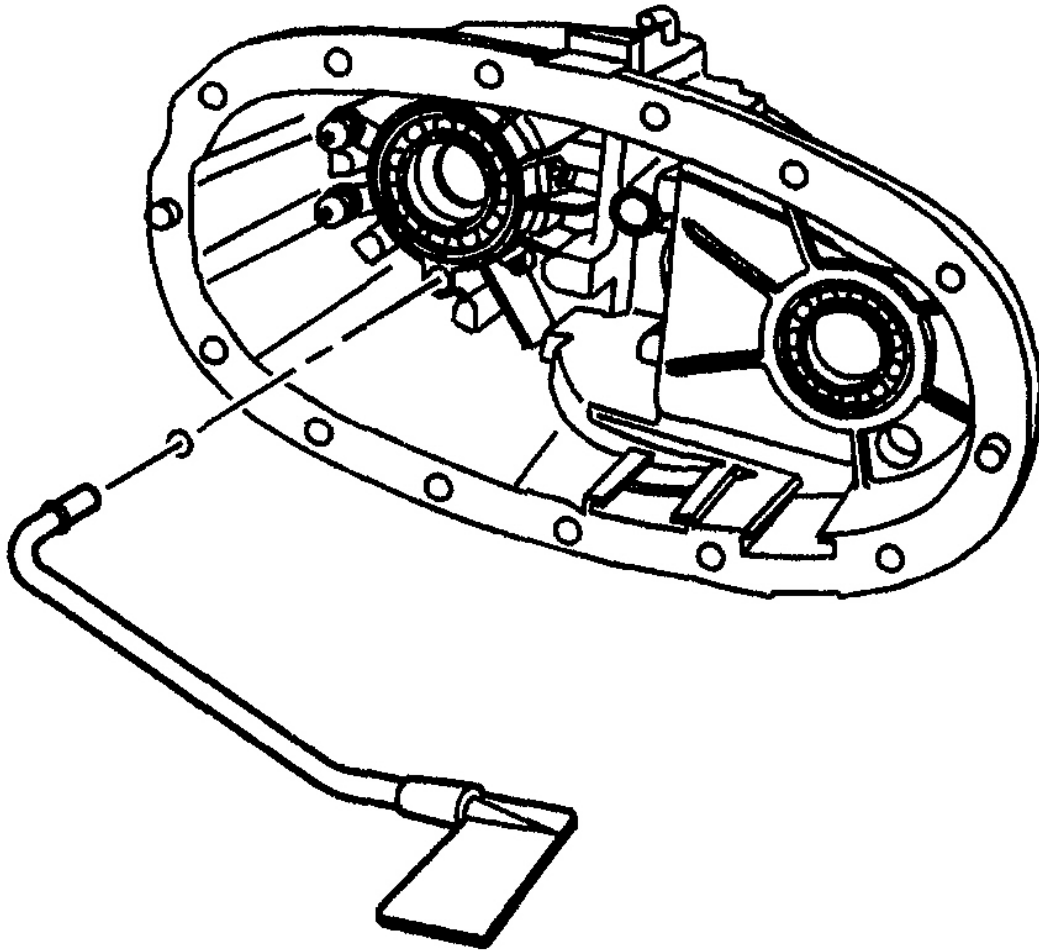
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**Fig. 80: Installing Oil Pump Screen, Oil Pump Hose & Oil Pump Suction Pipe**

7. Install a new O-ring onto the oil pump suction pipe.
8. Lightly lubricate the O-ring seal with transfer case oil.
9. Install the oil pump suction pipe assembly in the rear case half. Ensure the oil pump suction pipe is fully seated.

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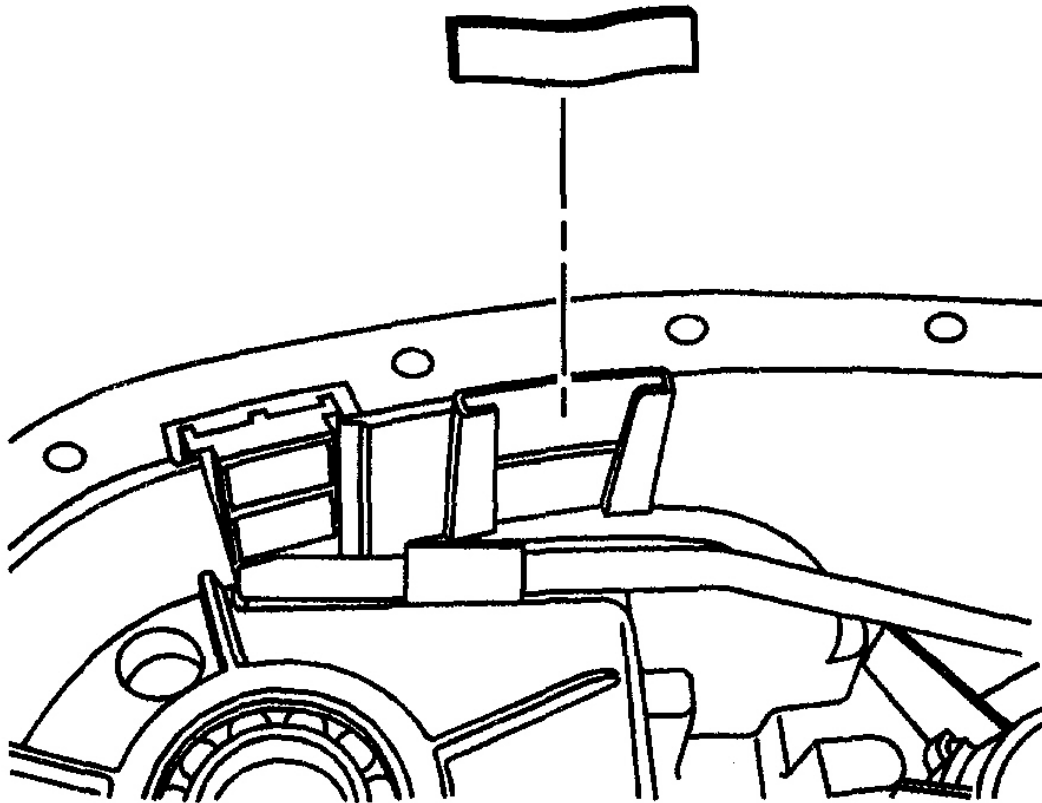
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**Fig. 81: Installing Oil Pump Suction Pipe Assembly**

10. Install the chip collector magnet in the rear case half.

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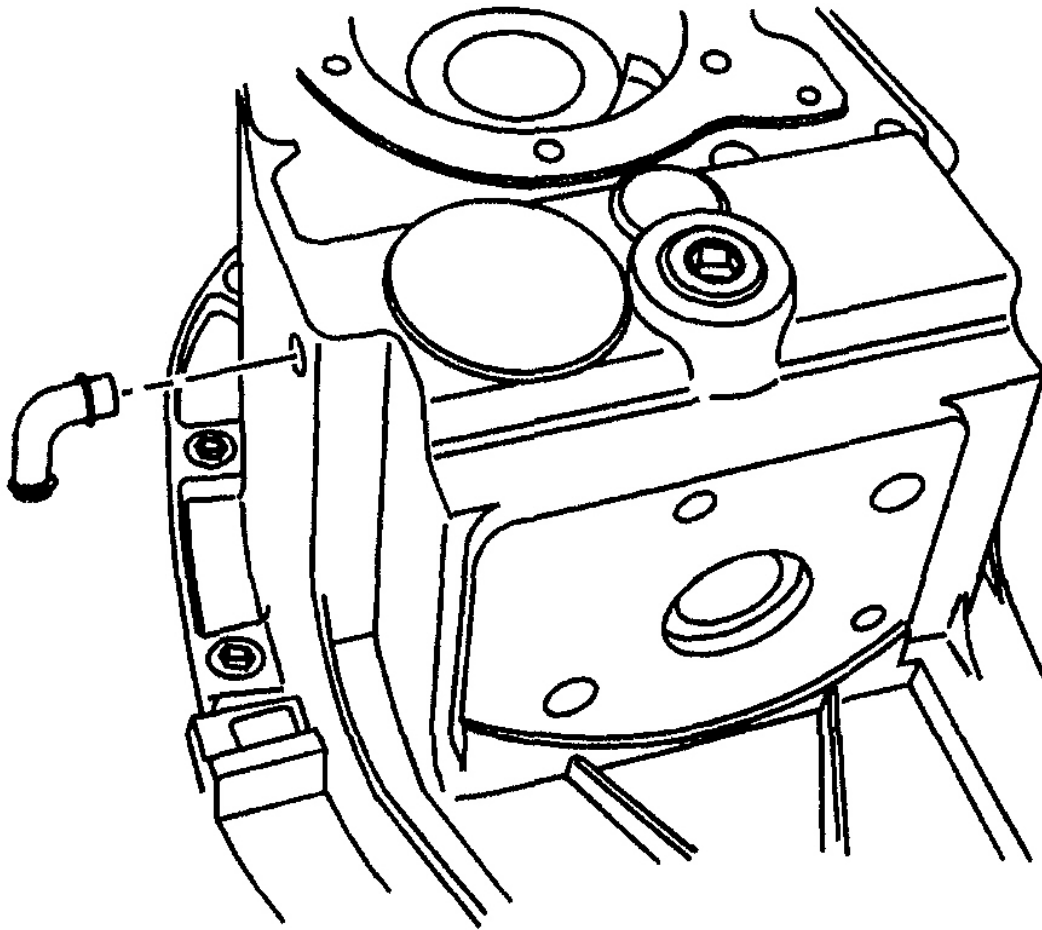
**Fig. 82: Installing Chip Collector Magnet In Rear Case Half**

11. Apply a thin layer of retaining compound GM P/N 12377901 (Canadian P/N 10953504) or equivalent to the vent, if removed.
12. Tap the vent into the case. Ensure the vent is aligned in the direction shown.



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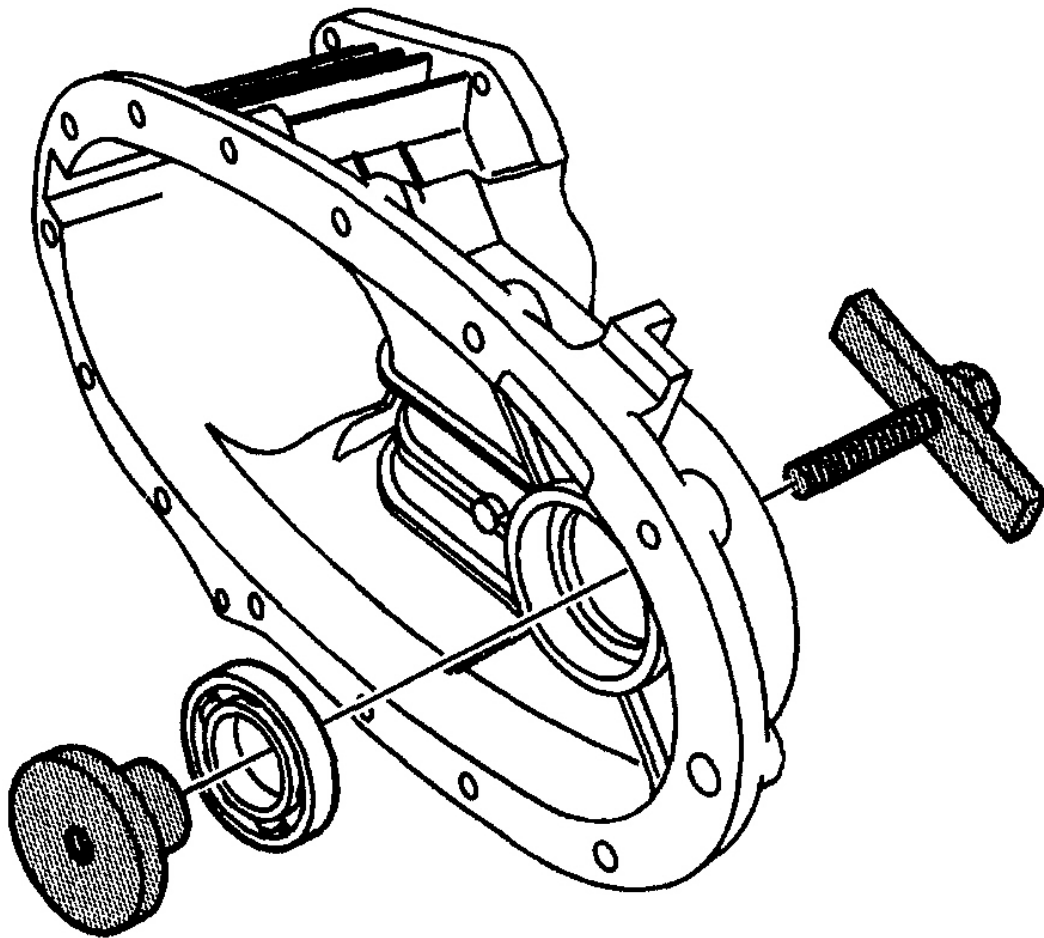


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**Fig. 83: Installing Vent Into Case**

**IMPORTANT:** Install the front output shaft seal after the transfer case is assembled.

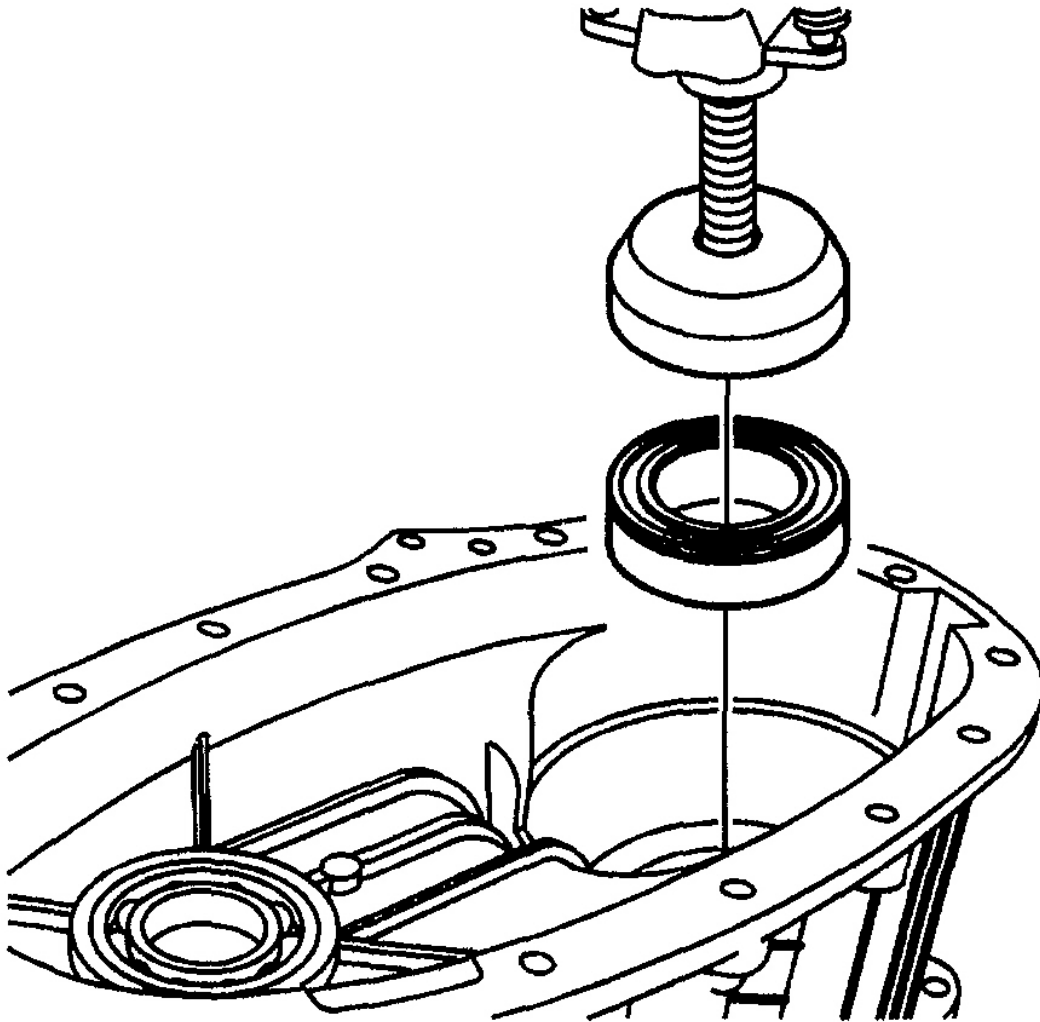
13. Using the J 36371, install the front output shaft front bearing into the front case.



G01364407

**Fig. 84: Installing Front Output Shaft Front Bearing Into Front Case**

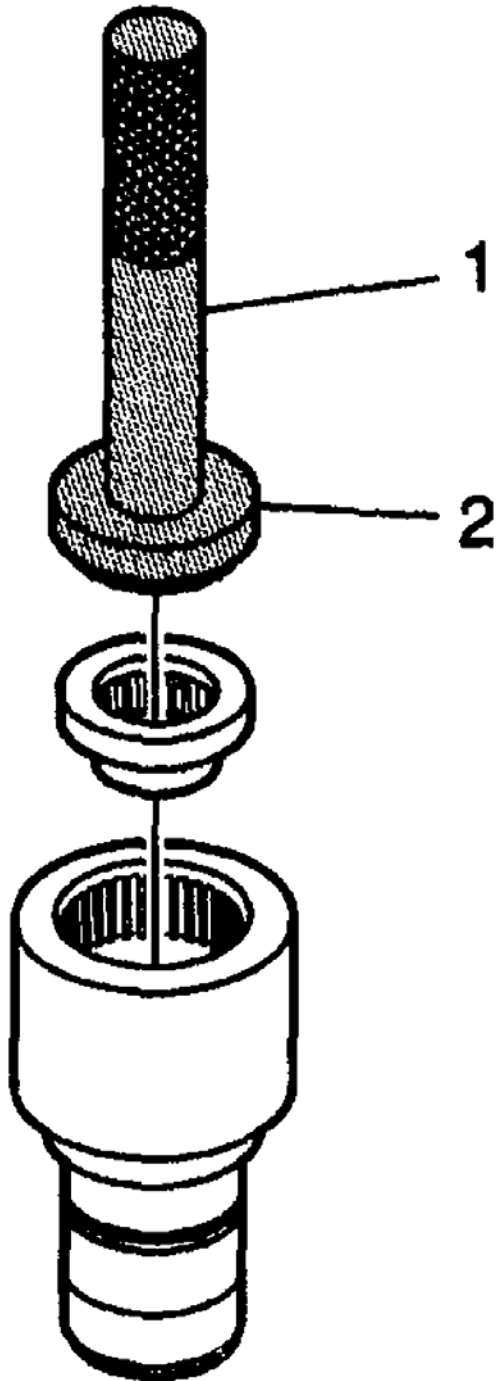
14. Using a press, install the input gear bearing into the front case.
  - Ensure the press plates fit properly on the case.
  - Use a suitable press tool that fits to the bearing outer race.



G01364408

**Fig. 85: Installing Input Gear Bearing Into Front Case**

15. If removed, install the input gear thrust bearing into the input gear using the J 8092 (1) and the J 45237 (2).

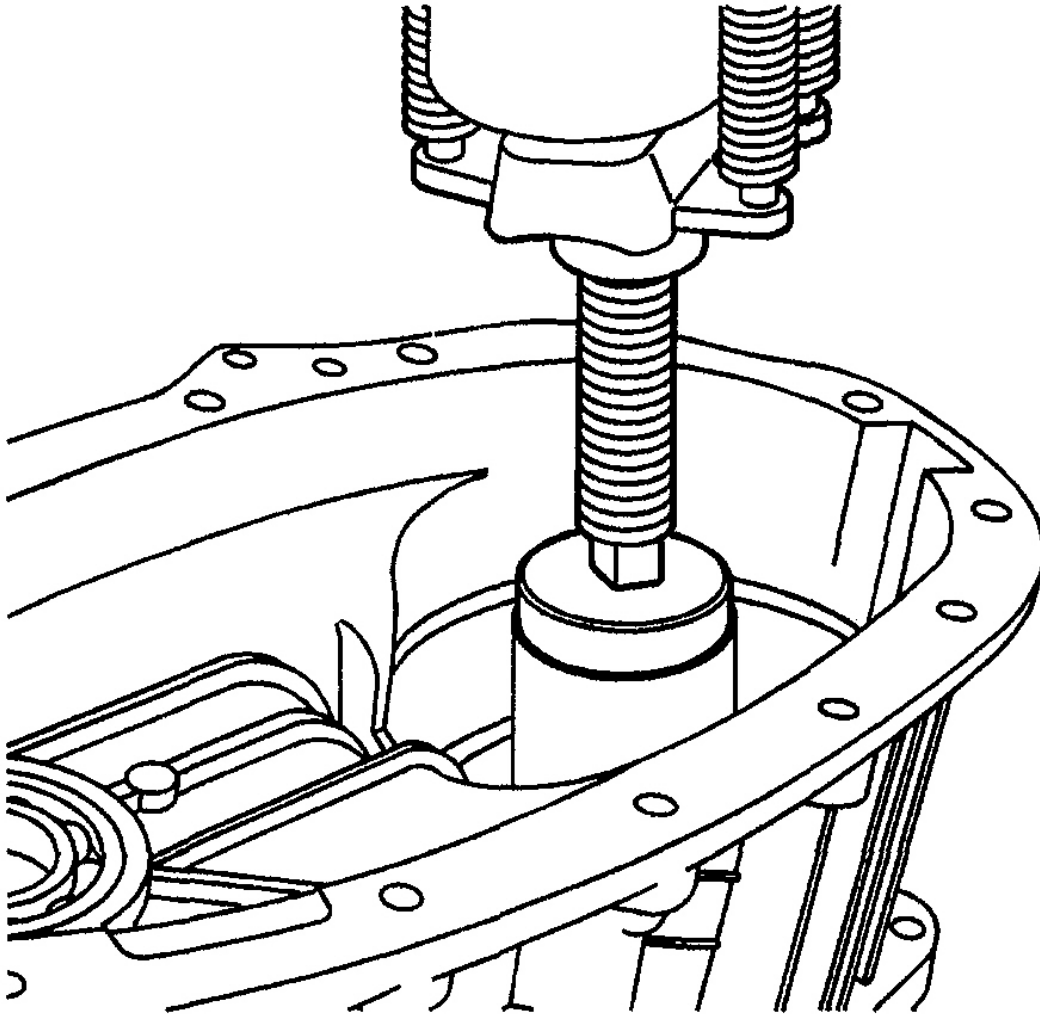


G01364409

**Fig. 86: Installing Input Gear Thrust Bearing Into Input Gear**

16. Using a press, press the input gear assembly into the input gear bearing.
  1. Support the front case half on press plates to allow the input gear to protrude.

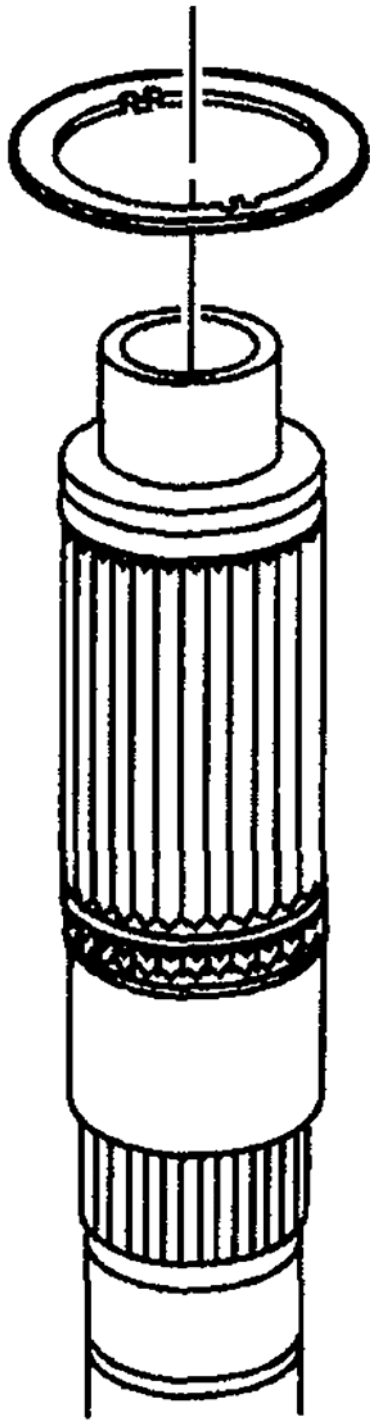
2. Support the inner race of the input gear bearing.
3. Use a suitable press plate on the end of the input gear.
4. Press on the input gear until fully seated against the input gear bearing.



G01364410

**Fig. 87: Pressing Input Gear Assembly Into Input Gear Bearing**

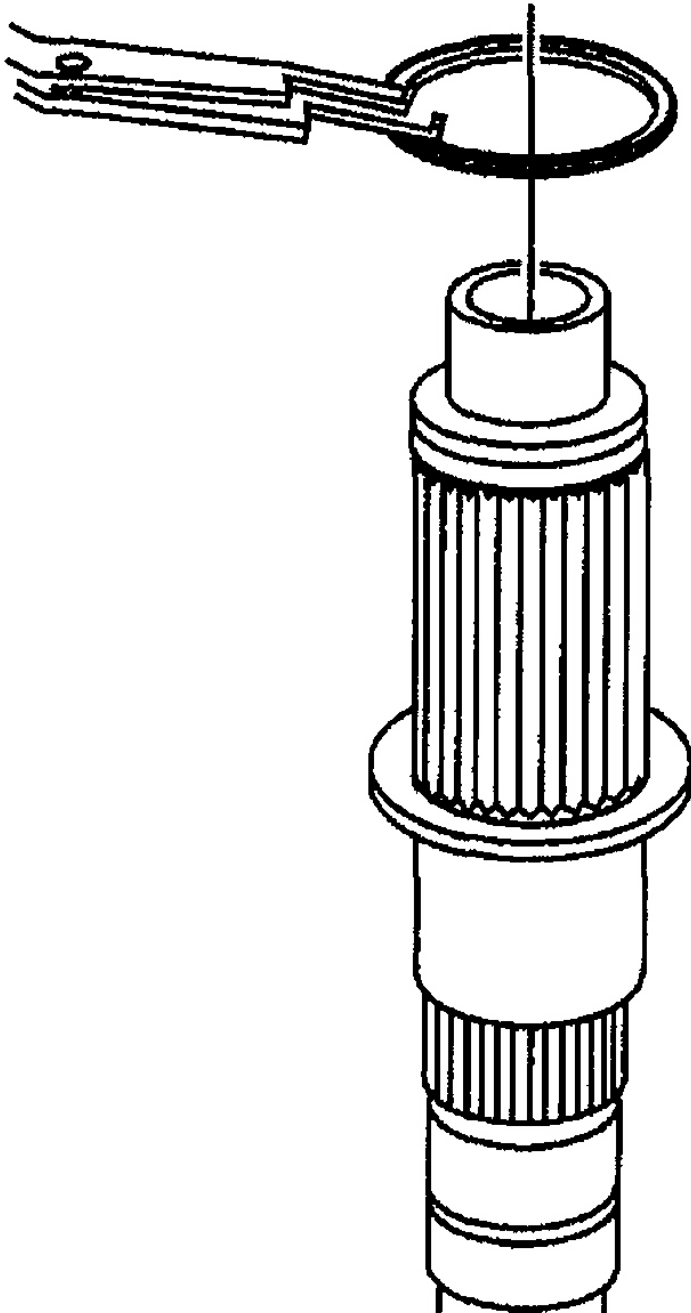
17. Install the rear output shaft thrust washer. Align the tabs with the shaft splines.



G01364411

**Fig. 88: Installing Rear Output Shaft Thrust Washer**

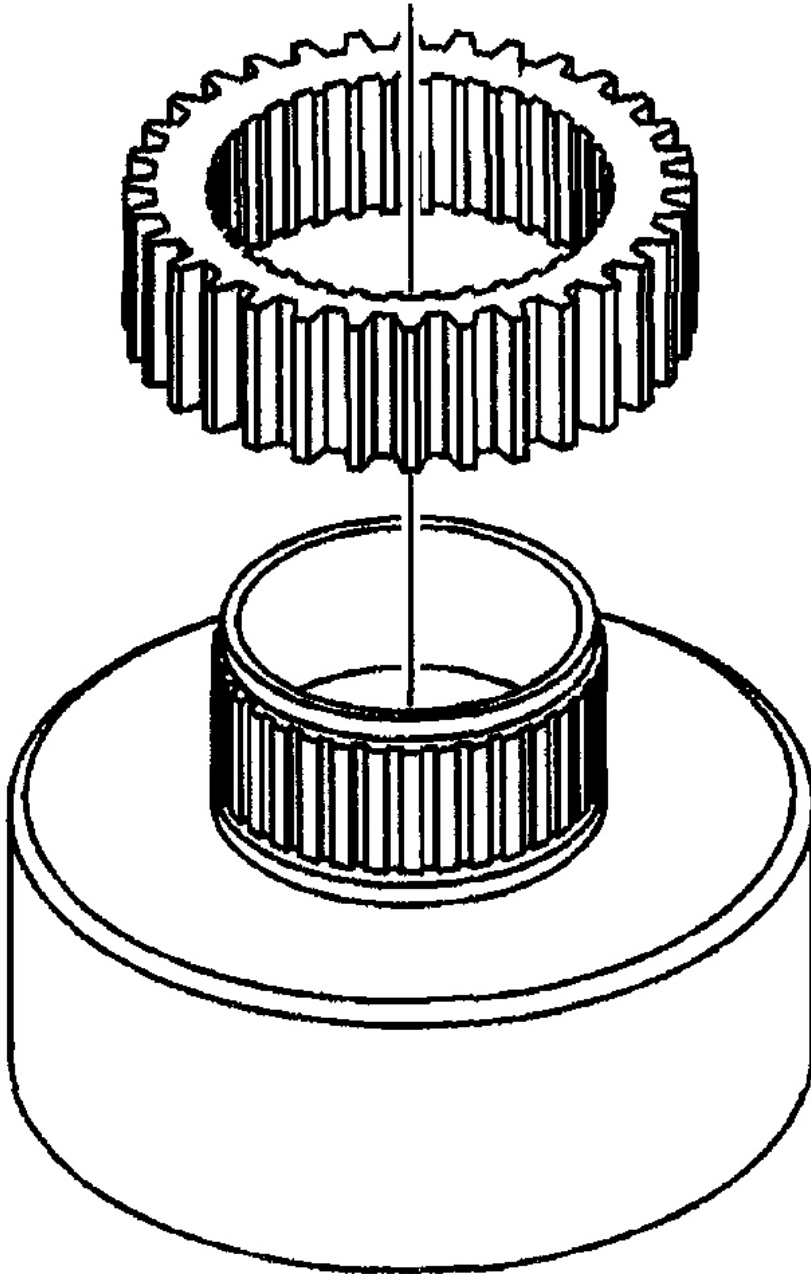
18. Install the new retaining ring, for the clutch housing, on the rear output shaft. Ensure the retaining ring is properly installed in the groove.



G01364412

**Fig. 89: Installing New Retaining Ring On Rear Output Shaft**

19. Install the drive sprocket onto the clutch housing.

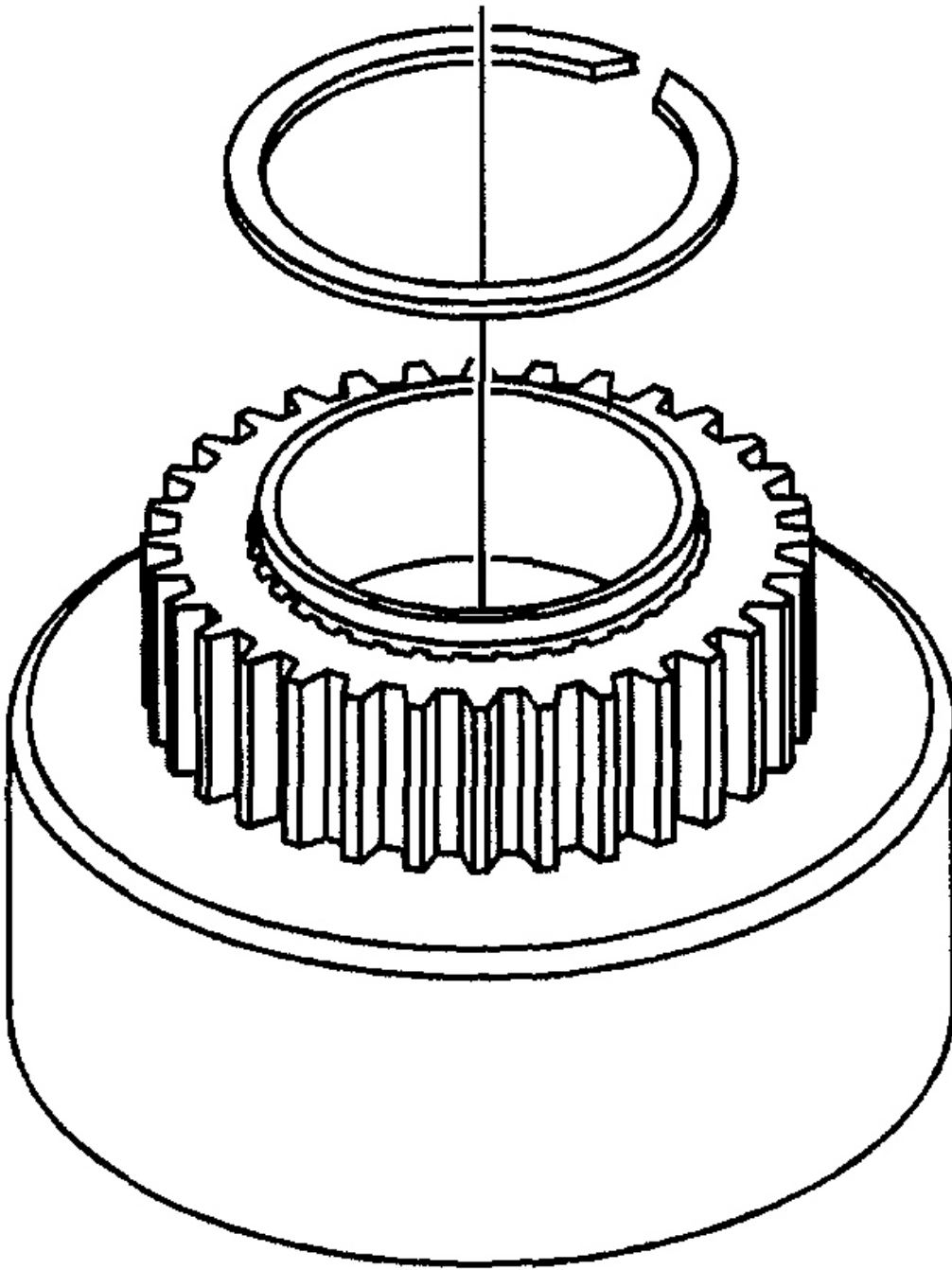


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**Fig. 90: Installing Drive Sprocket Onto Clutch Housing**

20. Install a new retaining ring for the drive sprocket on the clutch housing.





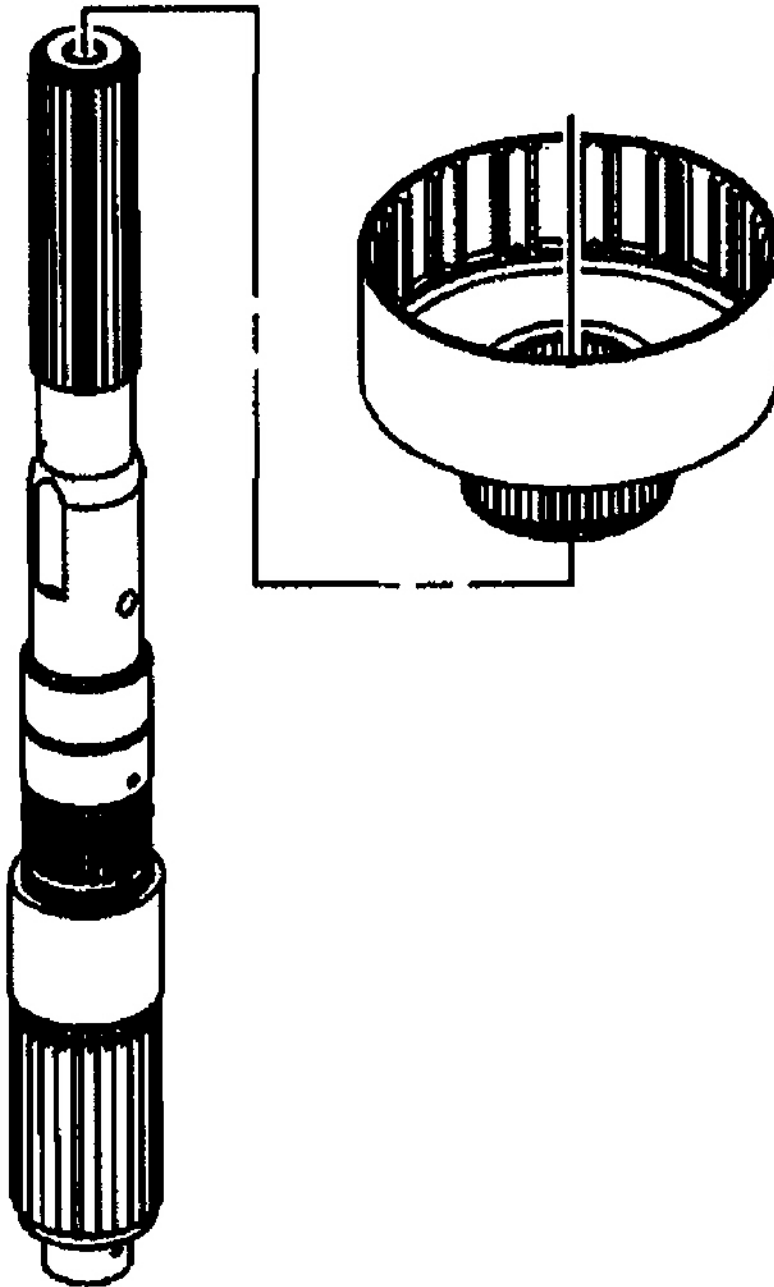
G01364414

**Fig. 91: Installing Drive Sprocket Retaining Ring On Clutch Housing**

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21. Lightly lubricate the clutch housing inner bearing with transfer case fluid.
22. Install the clutch housing onto the rear output shaft.



G01364415

**Fig. 92: Installing Clutch Housing Onto Rear Output Shaft**

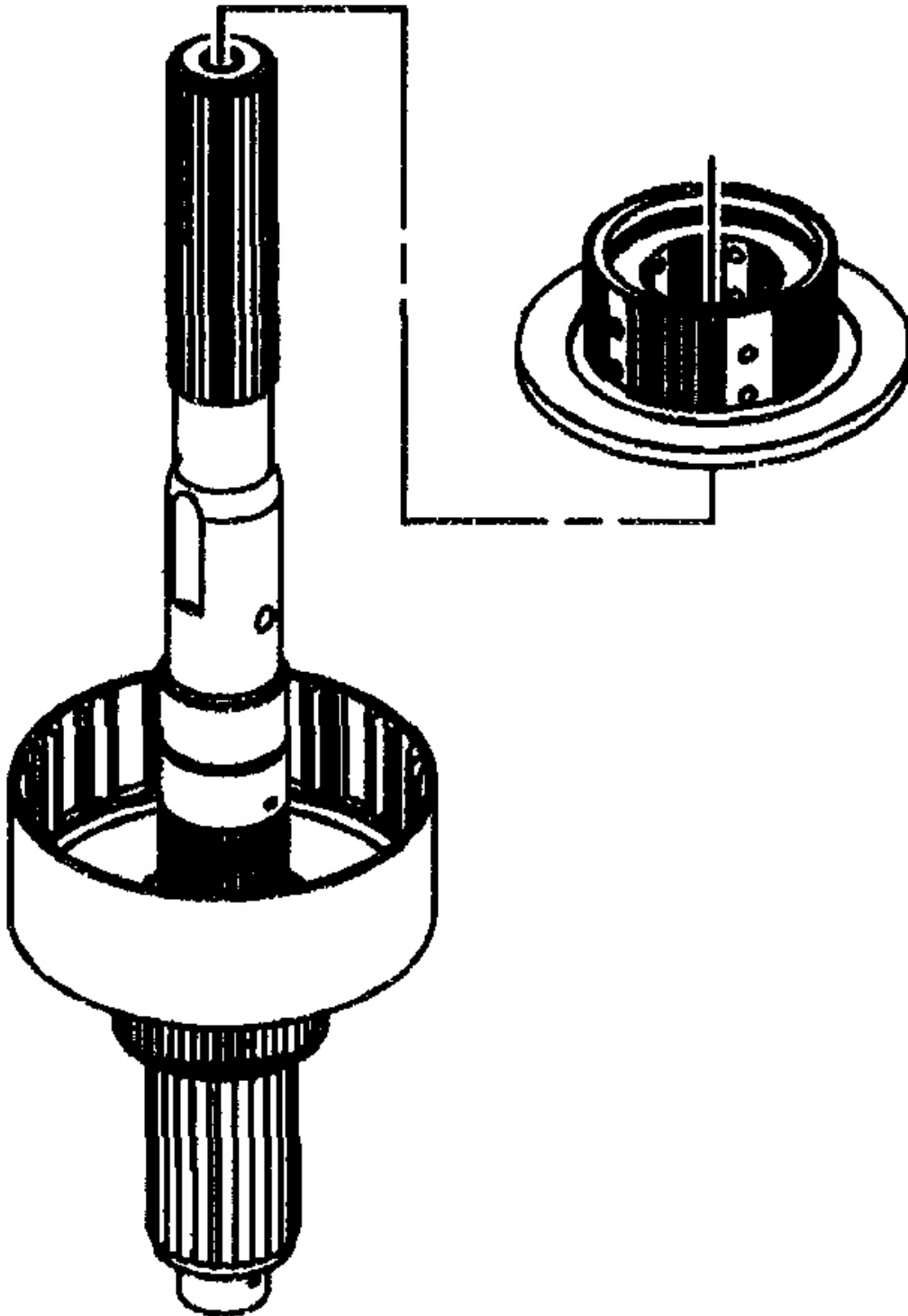
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23. Install the clutch hub into the clutch housing.

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## 2003 Isuzu Ascender

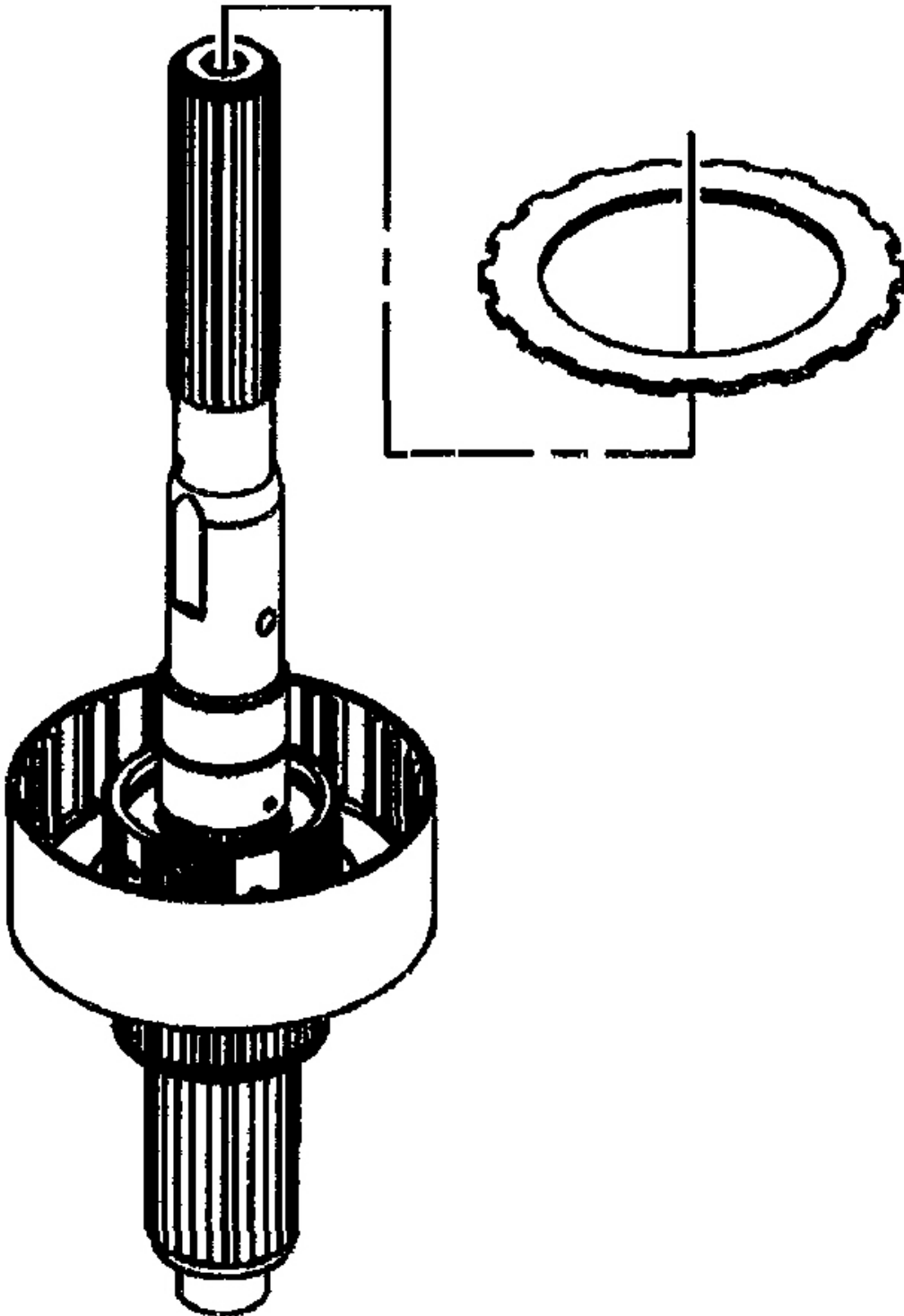
2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

### **Fig. 93: Installing Clutch Hub Into Clutch Housing**

24. With the friction material facing down, install an outer clutch disc into the clutch housing.

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## 2003 Isuzu Ascender

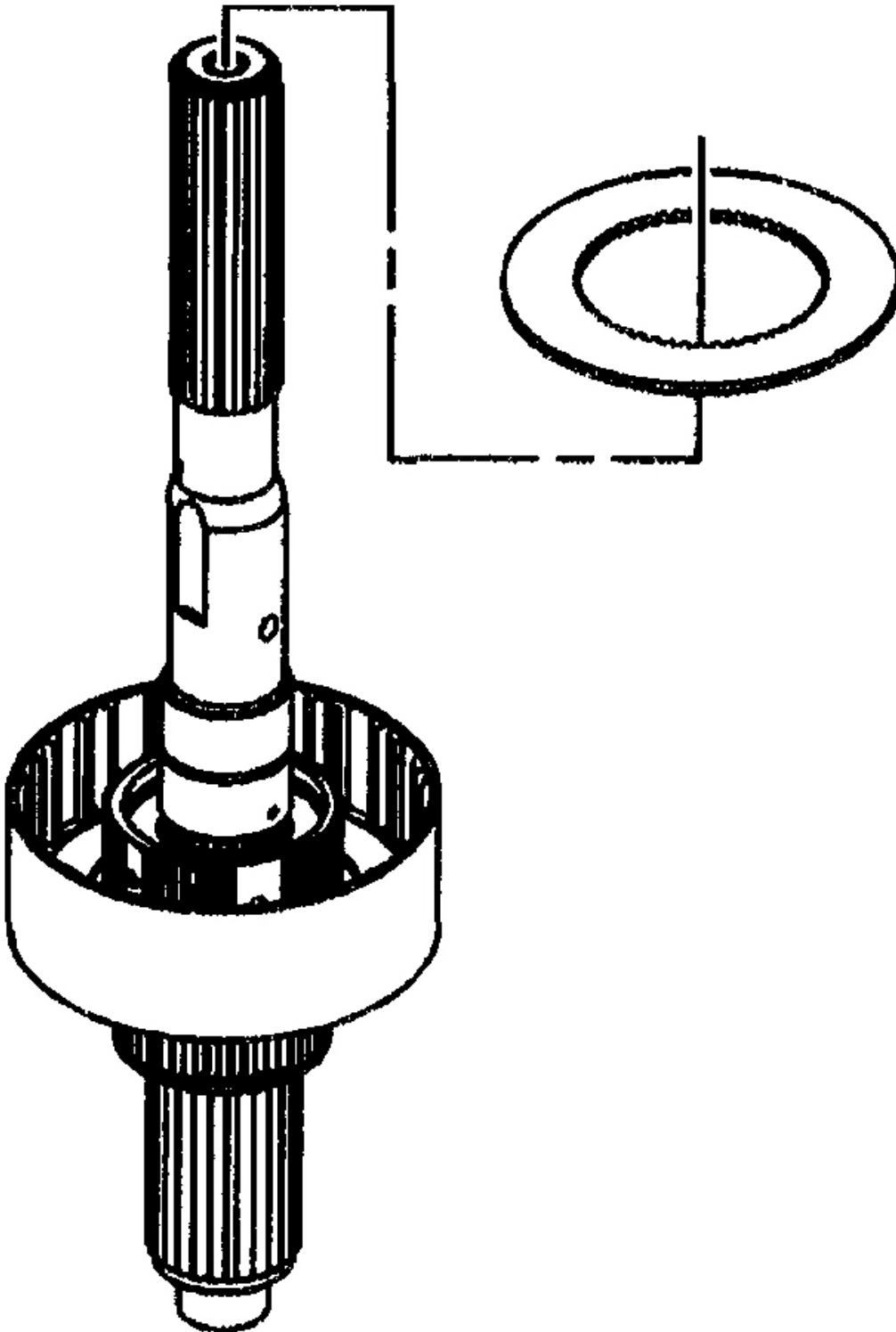
2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

### **Fig. 94: Installing Outer Clutch Disc Into Clutch Housing**

25. With the friction material facing down, install an inner clutch disc into the clutch housing.
26. Continue to install the outer clutch disc and inner clutch disc, alternating until 9 of each are installed.

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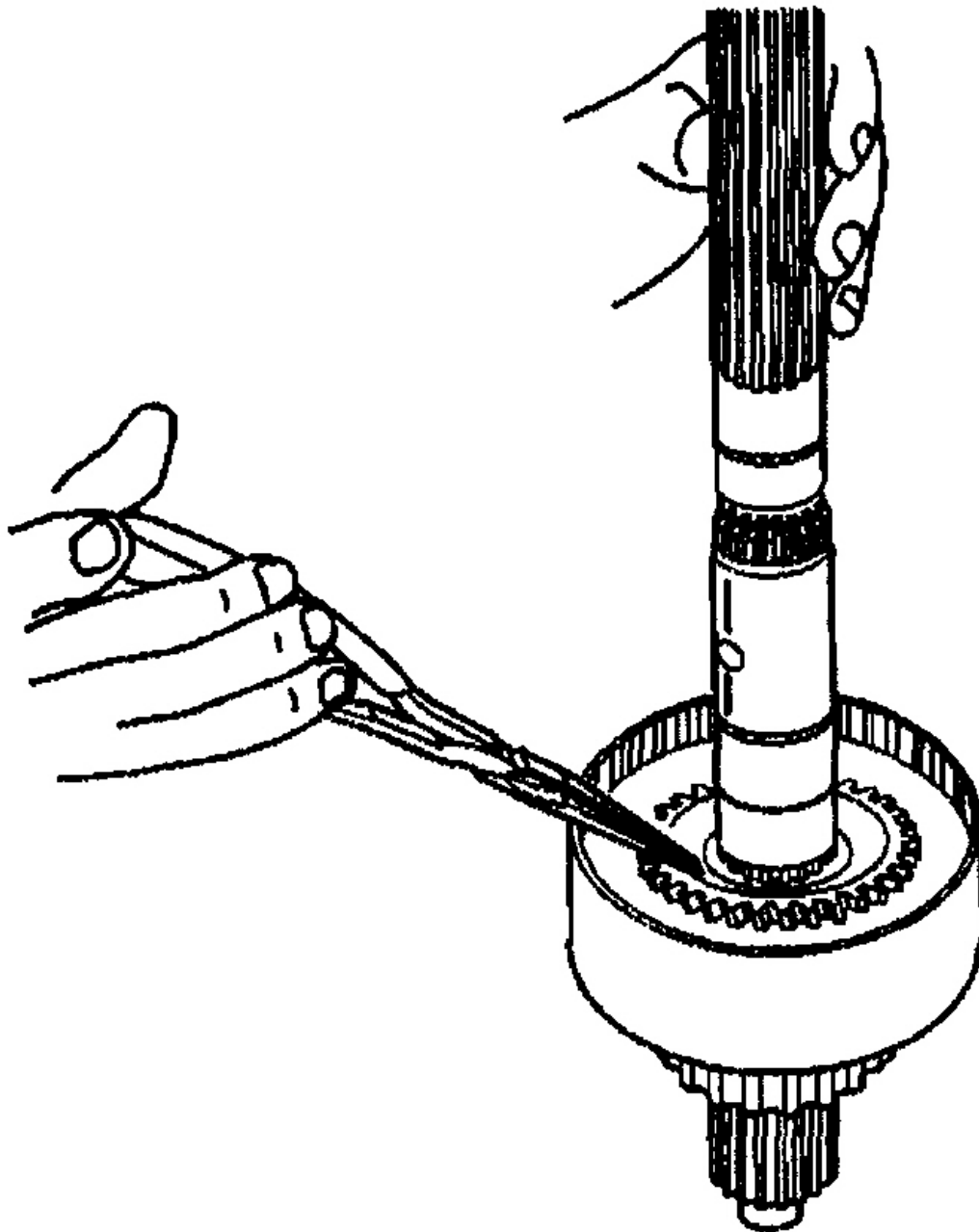


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### **Fig. 95: Installing Inner Clutch Disc Into Clutch Housing**

27. Install a new clutch hub retaining ring onto the rear output shaft.



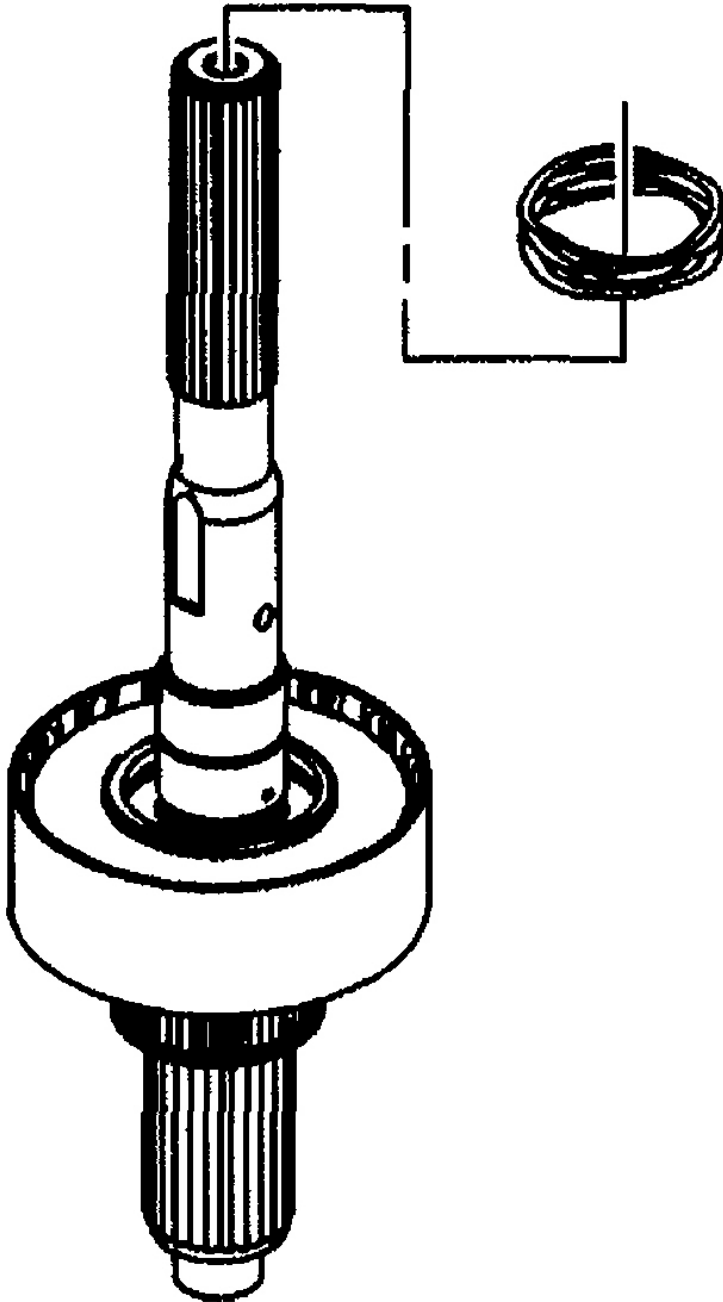
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**Fig. 96: Installing Clutch Hub Retaining Ring Onto Rear Output Shaft**

28. Install the clutch spring.

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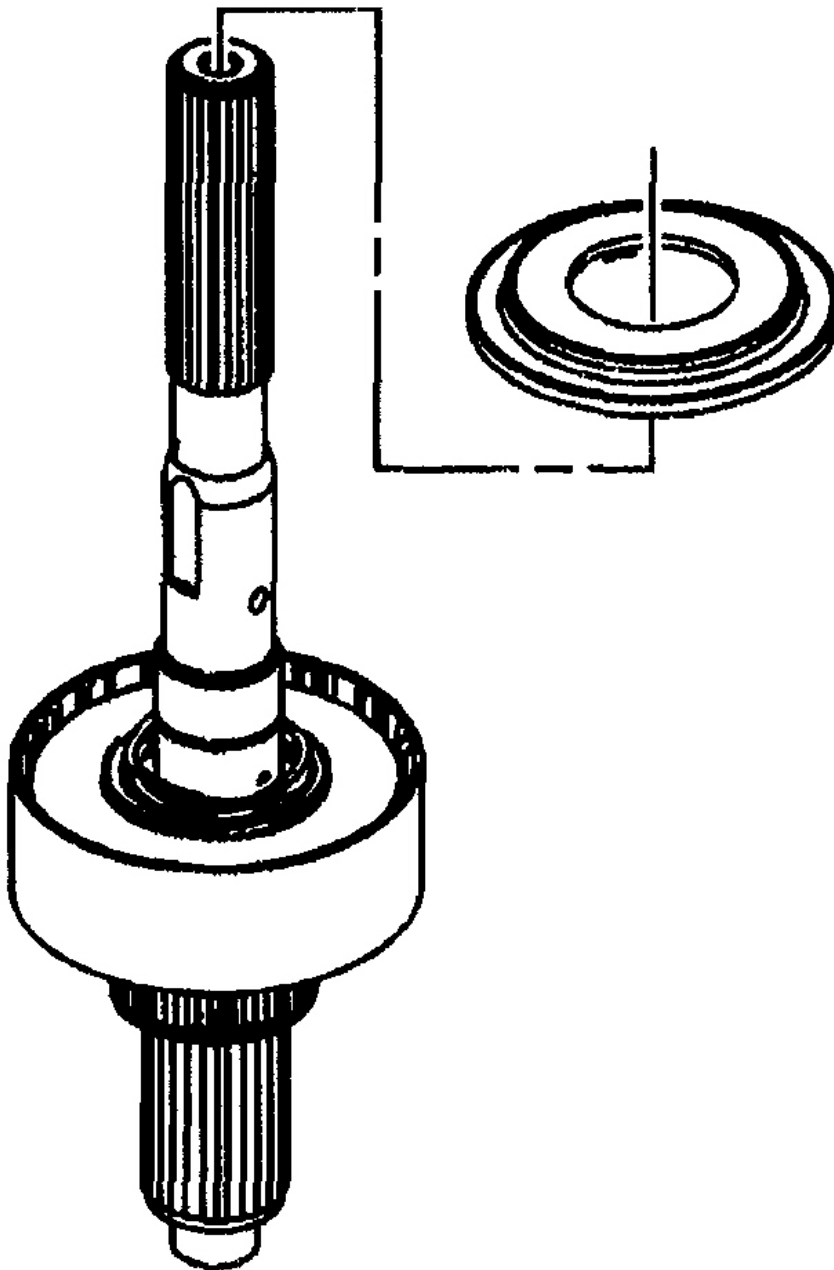


G01364420

**Fig. 97: Installing Clutch Spring**

29. Install the clutch apply plate.
  - Ensure the clutch apply plate tabs are aligned with the clutch hub.

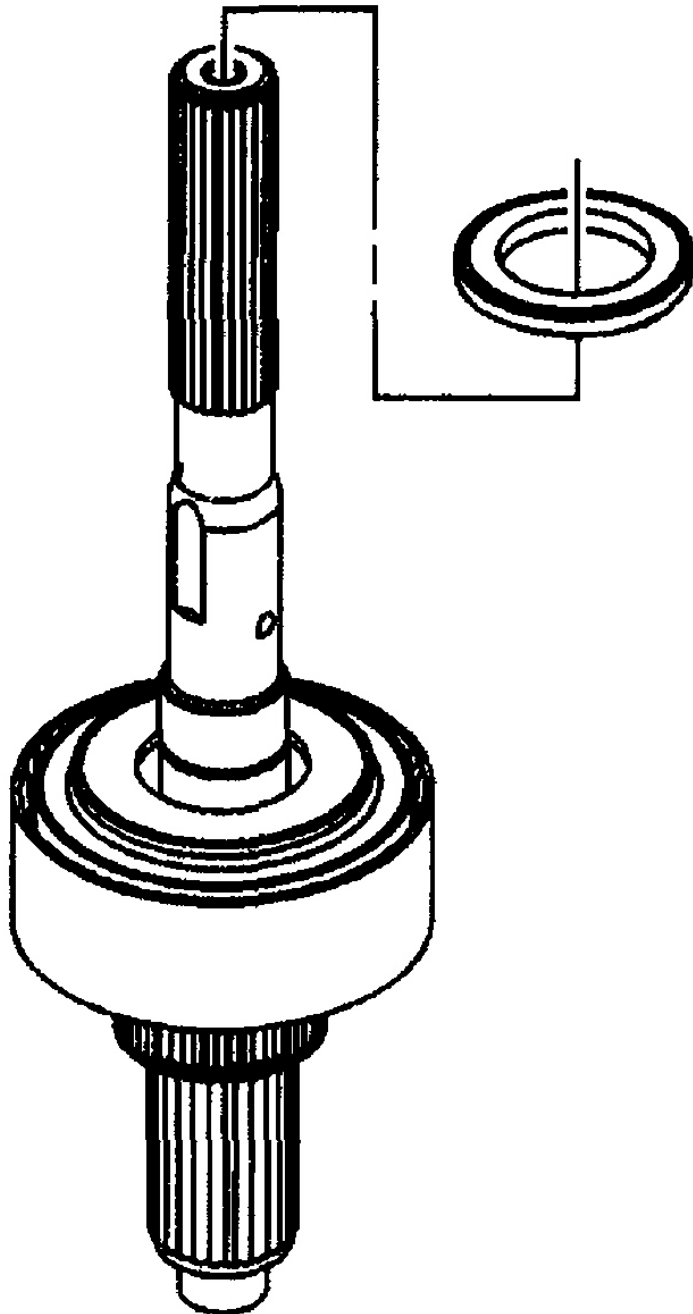
- Ensure the clutch spring is seated properly in the underside groove of the clutch apply plate.



G01364421

**Fig. 98: Installing Clutch Apply Plate**

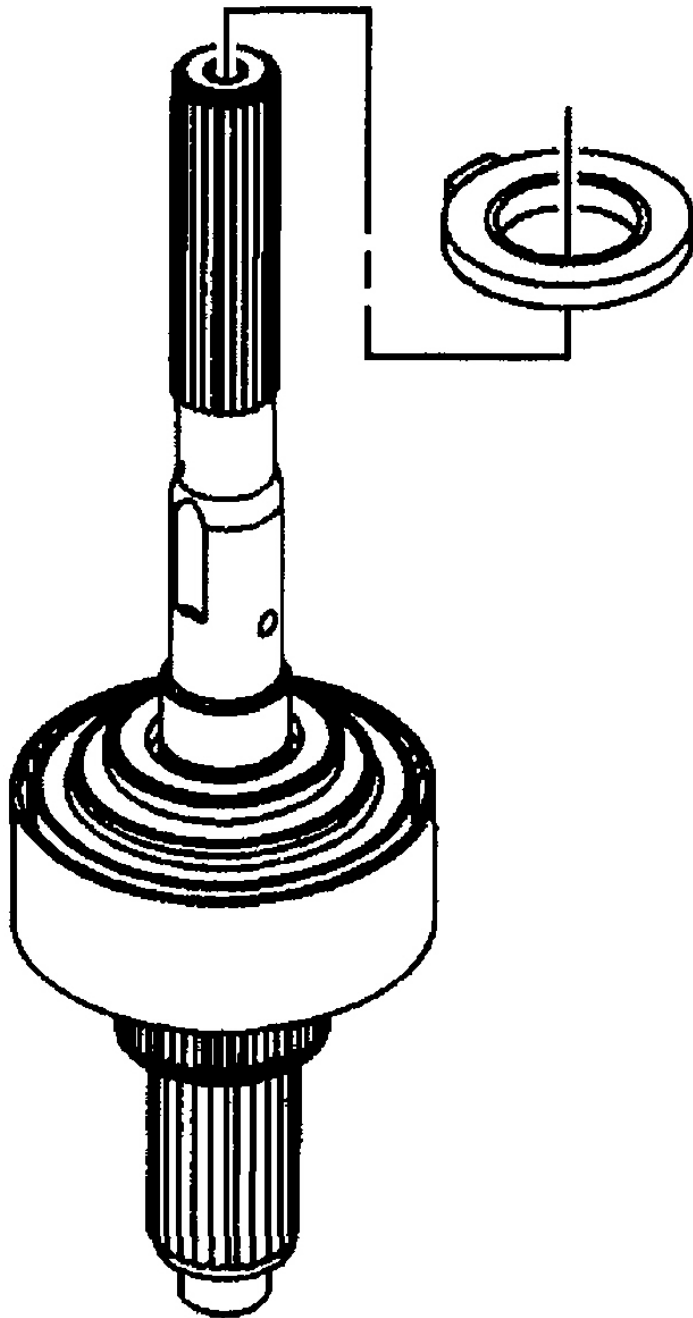
30. Install the clutch pressure plate bearing. The bearing will only install in one direction. The bearing will fit flush to the inner plate when properly installed.



G01364422

**Fig. 99: Installing Clutch Pressure Plate Bearing**

31. Install the clutch inner plate.

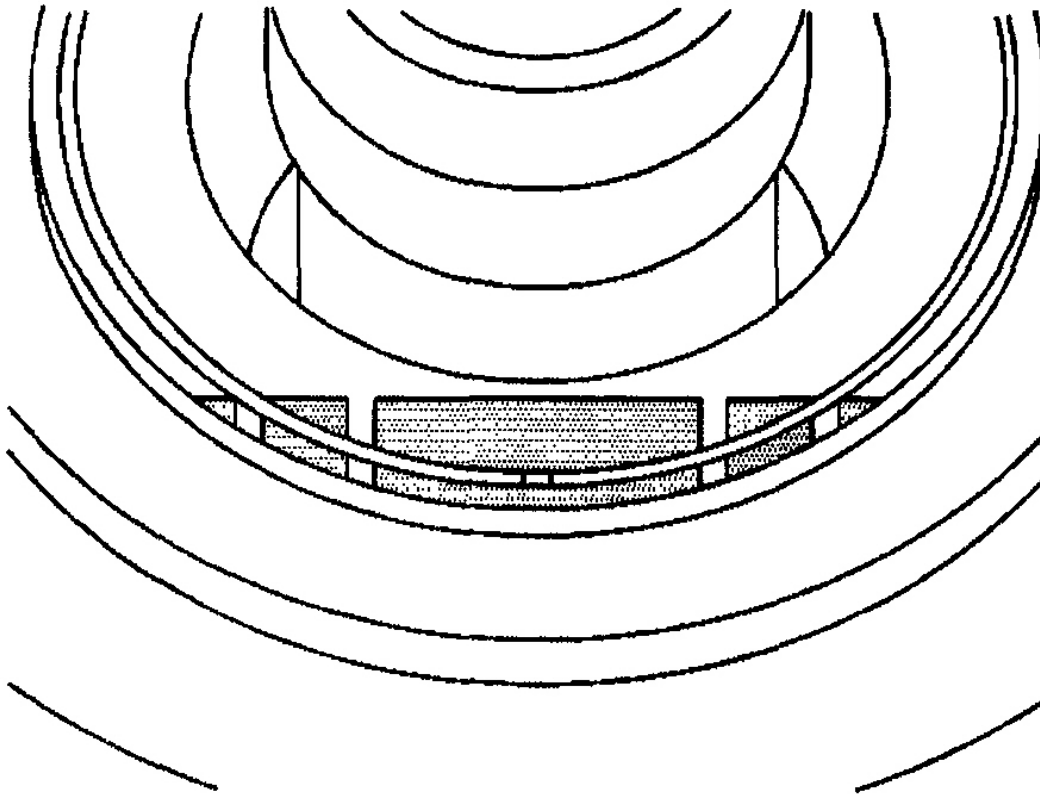


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**Fig. 100: Installing Clutch Inner Plate**

**IMPORTANT:** The marks on the clutch pressure plate bearing must be aligned before installing the clutch apply plate retaining ring.

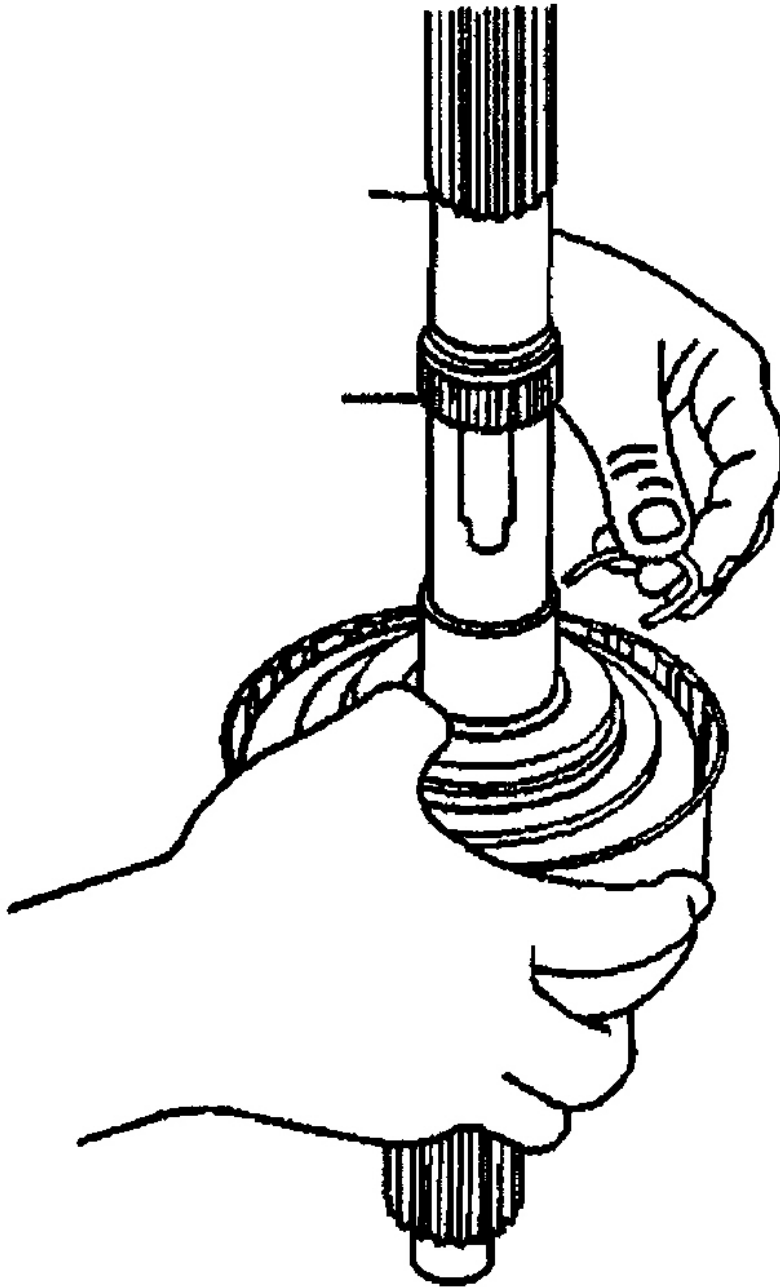
32. Align the markings on the clutch pressure plate bearing.



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**Fig. 101: Aligning Markings On Clutch Pressure Plate Bearing**

33. While pushing down on the clutch apply plate, install the clutch apply plate retaining ring.



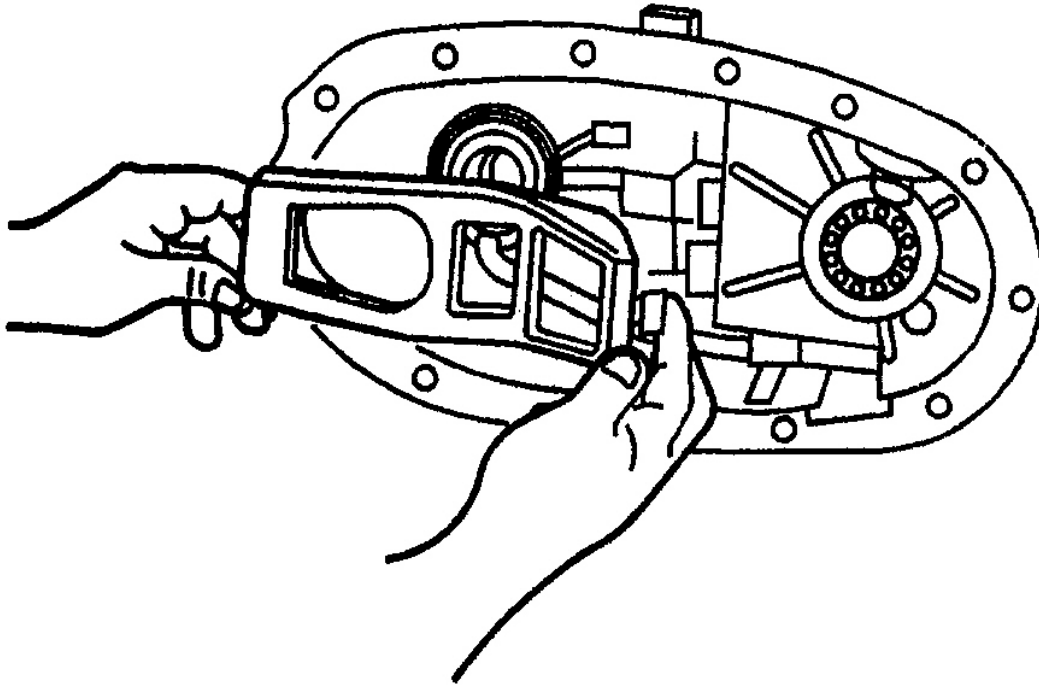
G01364425

**Fig. 102: Installing Clutch Apply Plate Retaining Ring**

34. Install the clutch lever to the rear case half.
  - Position the clutch lever onto the 2 pivot pins.



- Shift the control actuator lever shaft to the neutral position.

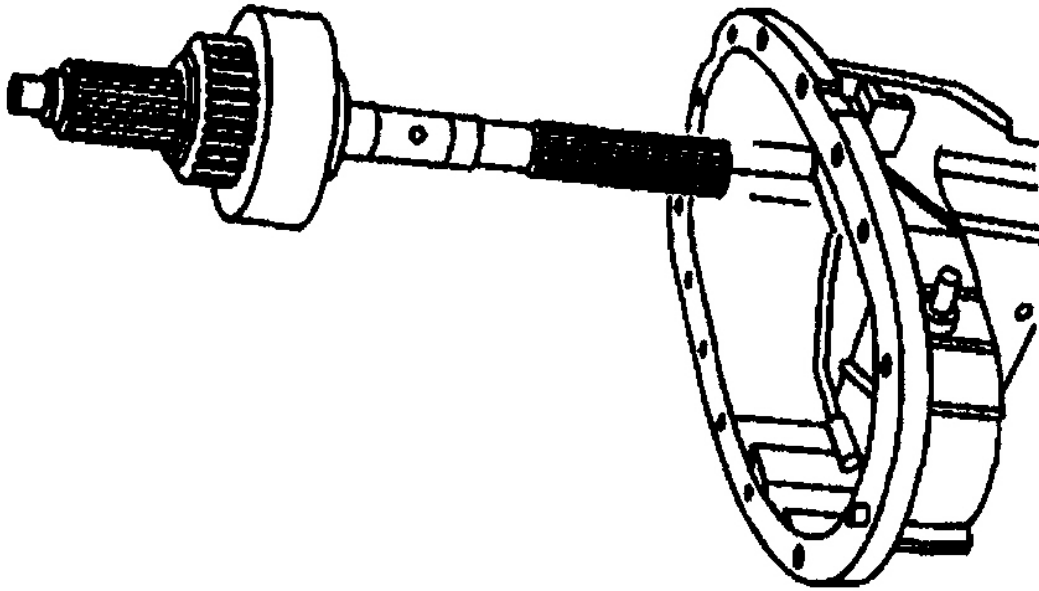


G01364426

**Fig. 103: Installing Clutch Lever To Rear Case Half**

**IMPORTANT:** Ensure the flat area on the rear output shaft is aligned with the shift fork.

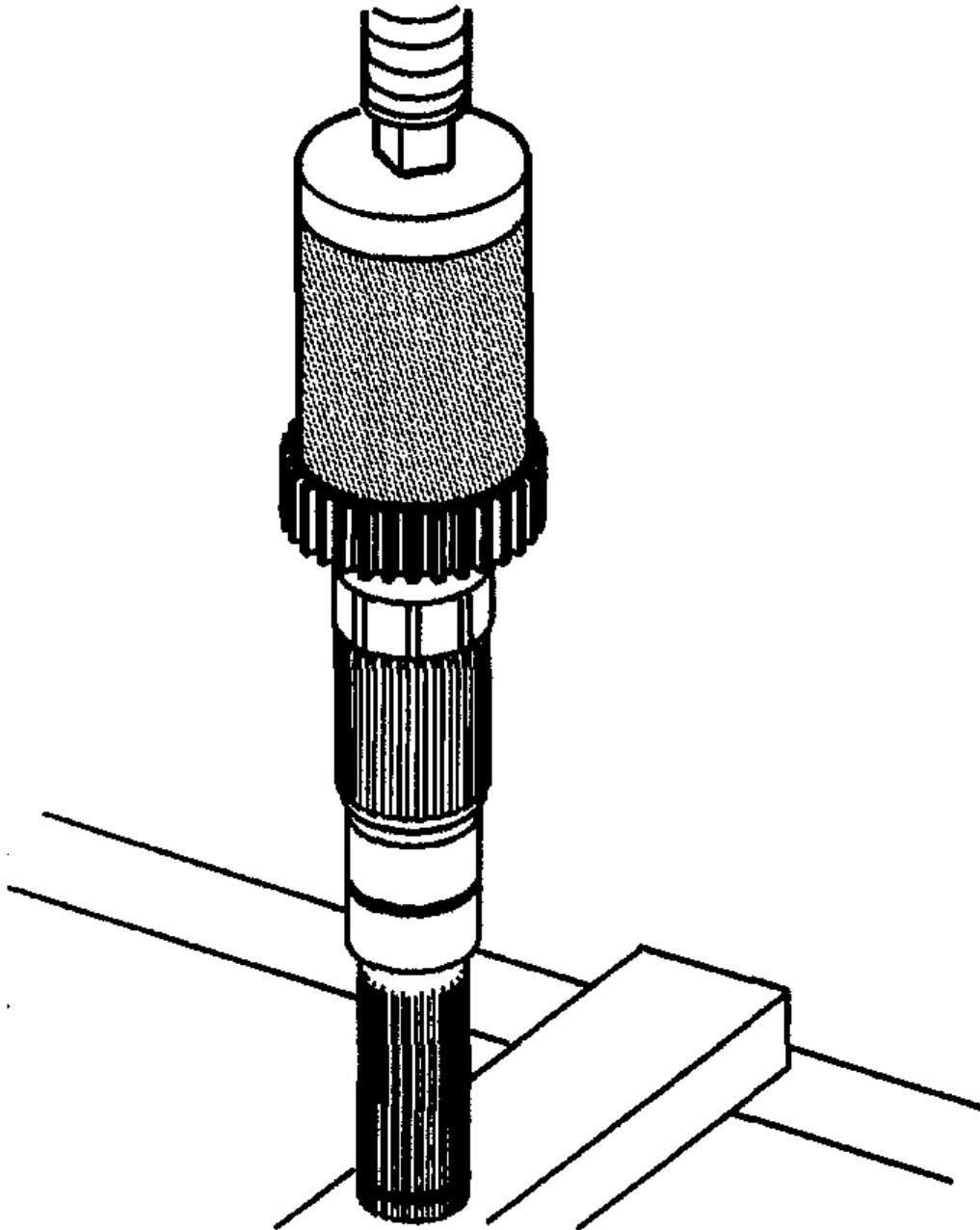
35. Install the rear output shaft assembly.



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**Fig. 104: Installing Rear Output Shaft Assembly**

36. Using a hydraulic press and the J 36373, install a new front speed sensor reluctor wheel onto the front output shaft.

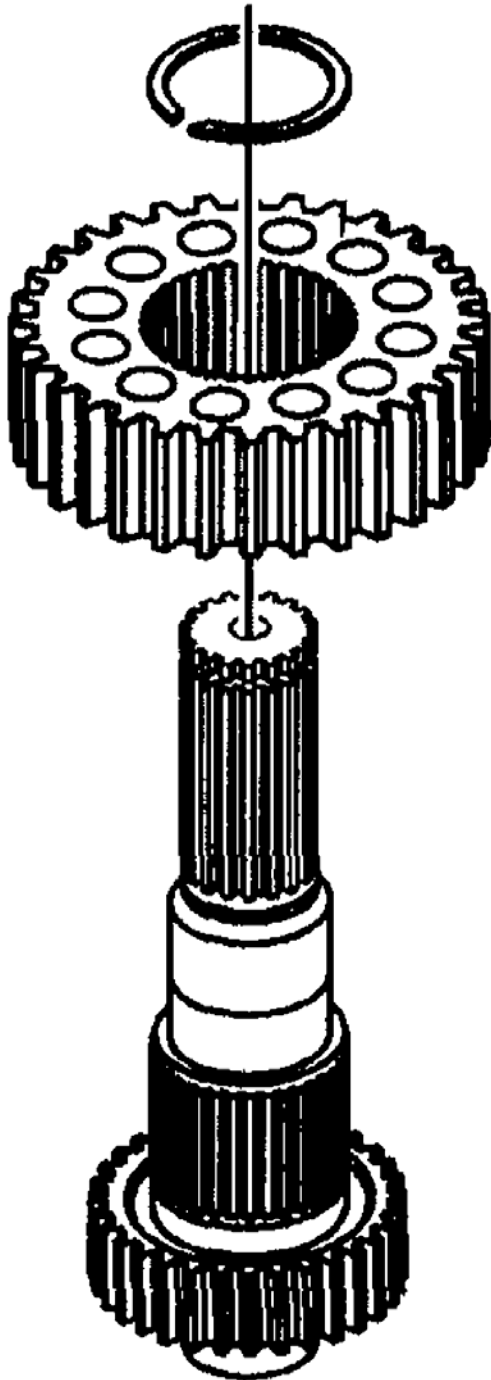


G01364428

**Fig. 105: Installing Front Speed Sensor Reluctor Wheel Onto Front Output Shaft**

37. Install the driven sprocket onto the front output shaft.

38. Install a new driven sprocket retaining ring onto the front output shaft.

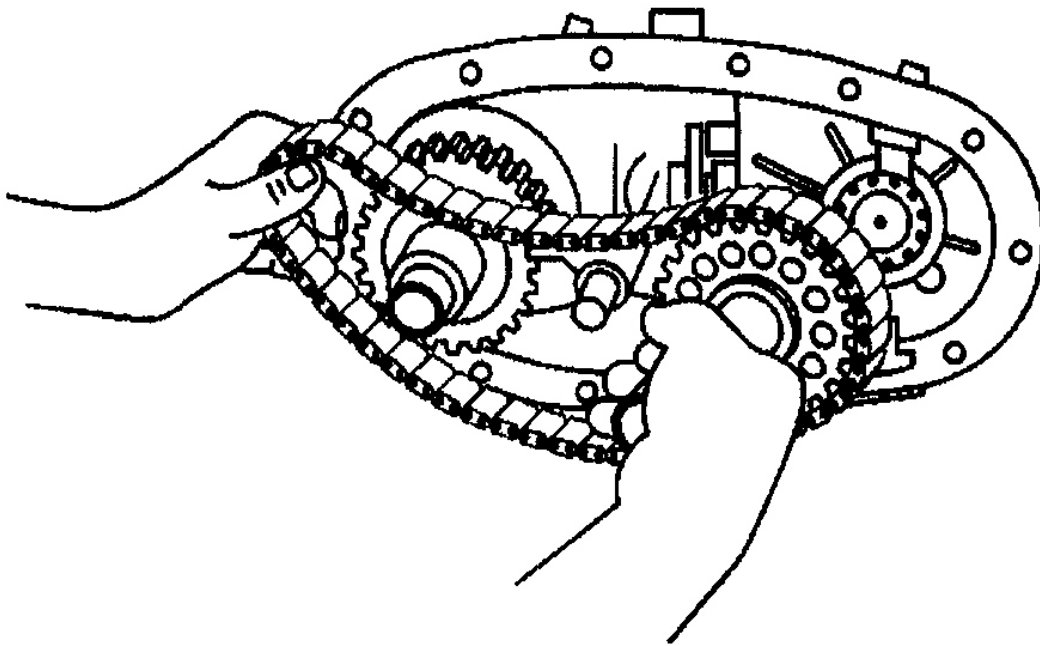


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**Fig. 106: Installing Driven Sprocket Retaining Ring Onto Front Output Shaft**

**IMPORTANT: If using the drive chain again, align the marks made during disassembly for proper wear pattern alignment.**

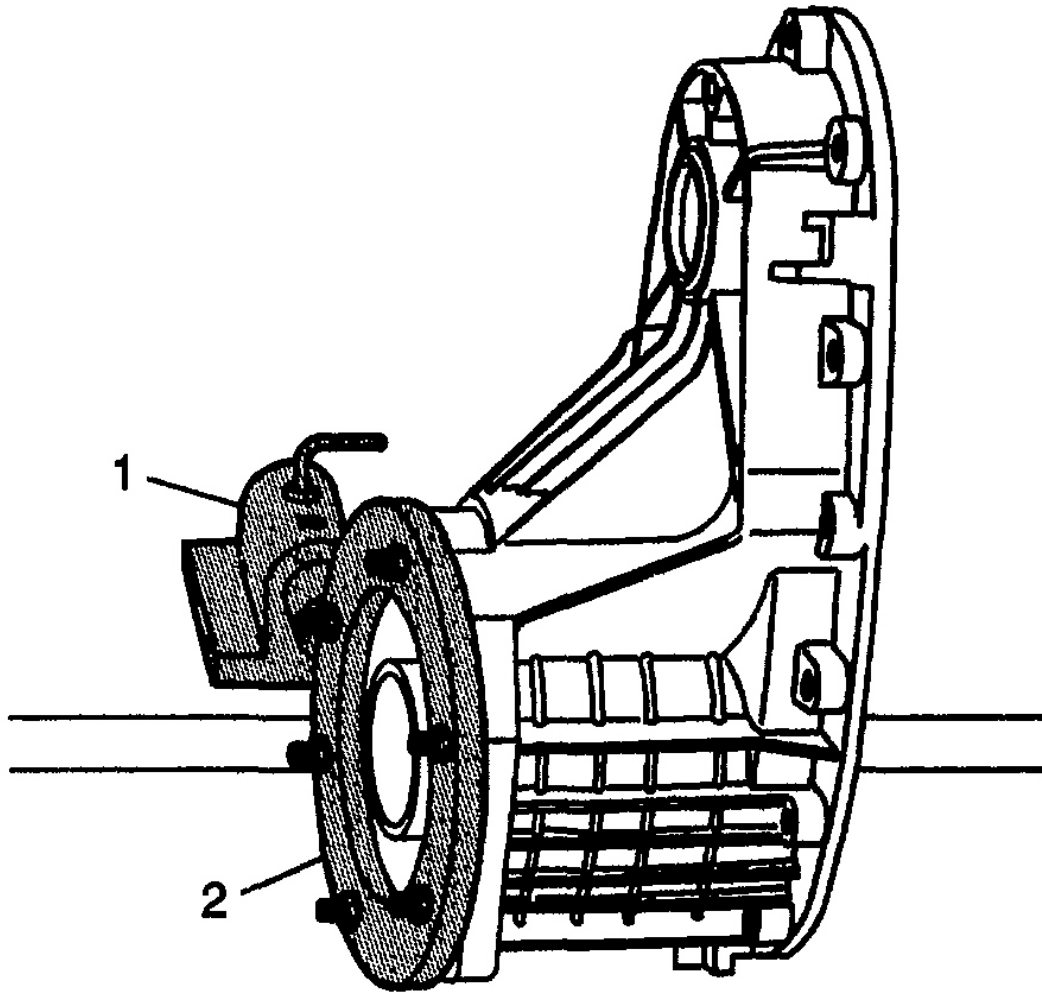
39. Install the drive chain assembly.
  1. Position the drive chain on the driven sprocket on the front output shaft.
  2. Position the drive chain on the drive sprocket on the rear output shaft.
  3. Install the front output shaft into the front output shaft rear bearing.



G01364430

**Fig. 107: Installing Drive Chain Assembly**

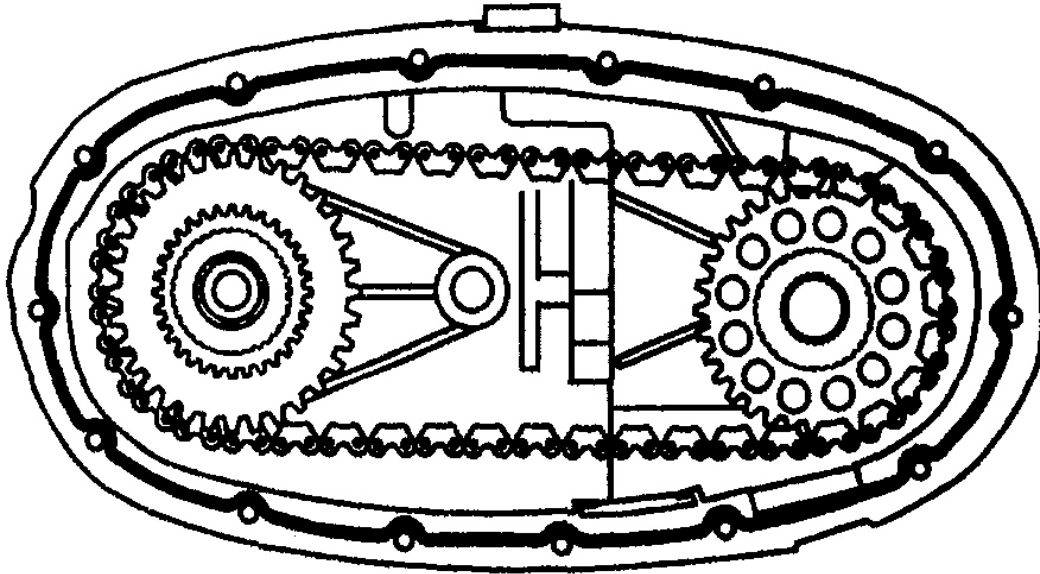
40. Attach the J 45759 (2) to the transfer case front half.
41. Install the J 45759 (2) into the J 3289-20 (1) and secure with the pivot pin.



G01364431

**Fig. 108: Attaching Tool To Transfer Case Front Half**

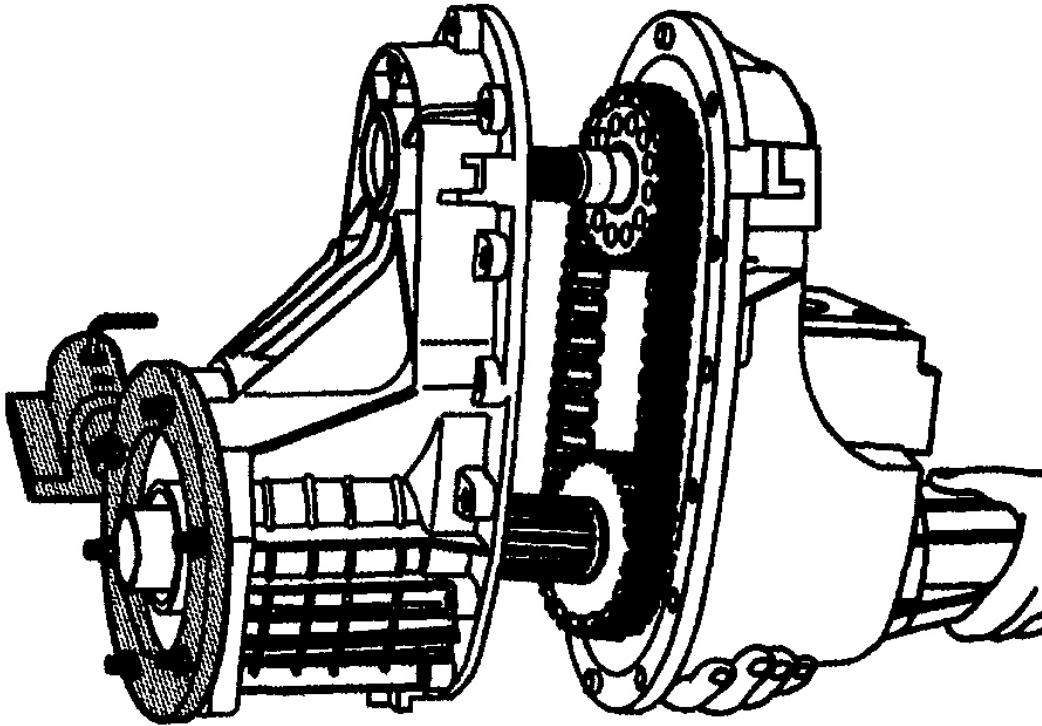
42. Apply a 3 mm (1/8 in) bead of sealant GM P/N 12345739 (Canadian P/N 10953541) or equivalent onto the rear case half.
43. Inspect to ensure the location pins are installed in the front case half.
44. Install any missing location pins in the front case half.



G01364432

**Fig. 109: Identifying Location Pins In Front Case Half**

45. Install the front case half to the rear case half.
  - Rotating the output shaft will align the splines with the input gear.
  - The case halves should come together without any resistance.
  - The rear case half should align on the front case half location pins.



G01364433

**Fig. 110: Installing Front Case Half To Rear Case Half**

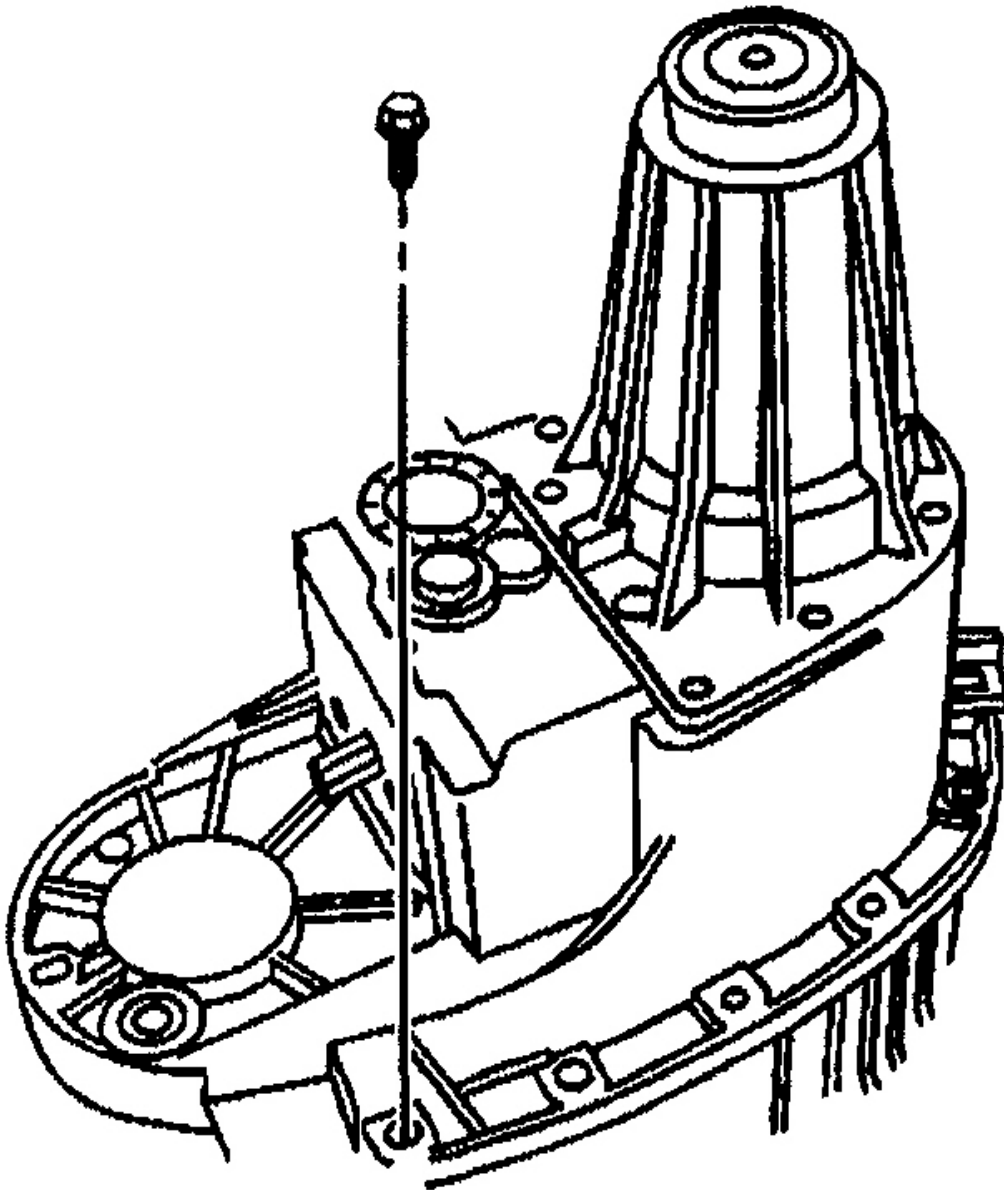
**NOTE:** Refer to FASTENER NOTICE in Cautions and Notices.

46. Install the front case half to rear case half bolts.

**Tighten**

Tighten the case half bolts to 22 N.m (16 lb ft).

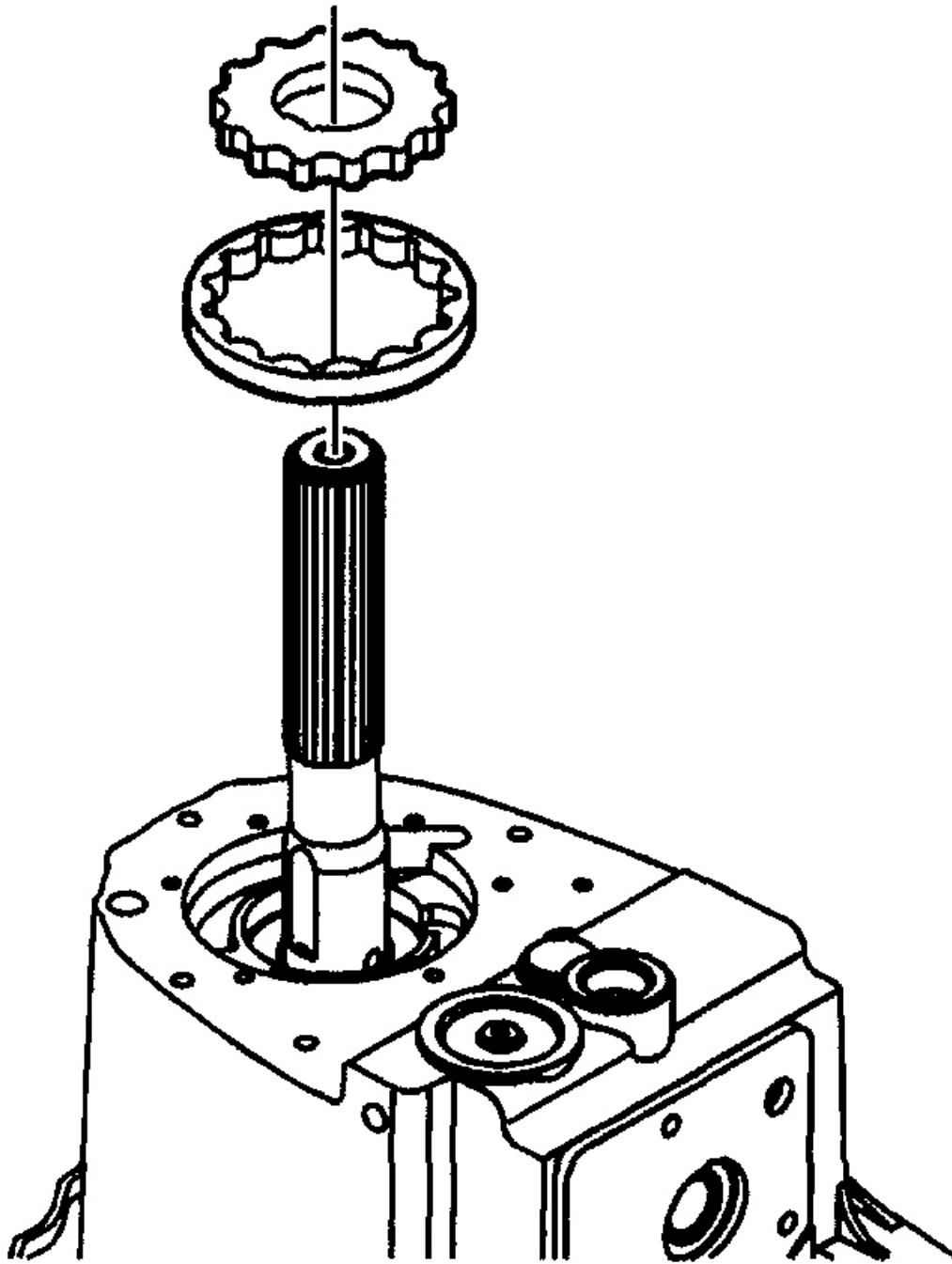




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**Fig. 111: Installing Front Case Half To Rear Case Half Bolts**

47. Install the oil pump driven gear, the outer rotor.
48. Install the oil pump drive gear, the inner rotor. The flat on the inner rotor aligns to the flat area on the rear output shaft.



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**Fig. 112: Installing Oil Pump Driven Gear (Outer Rotor) & Oil Pump Drive Gear (Inner Rotor)**

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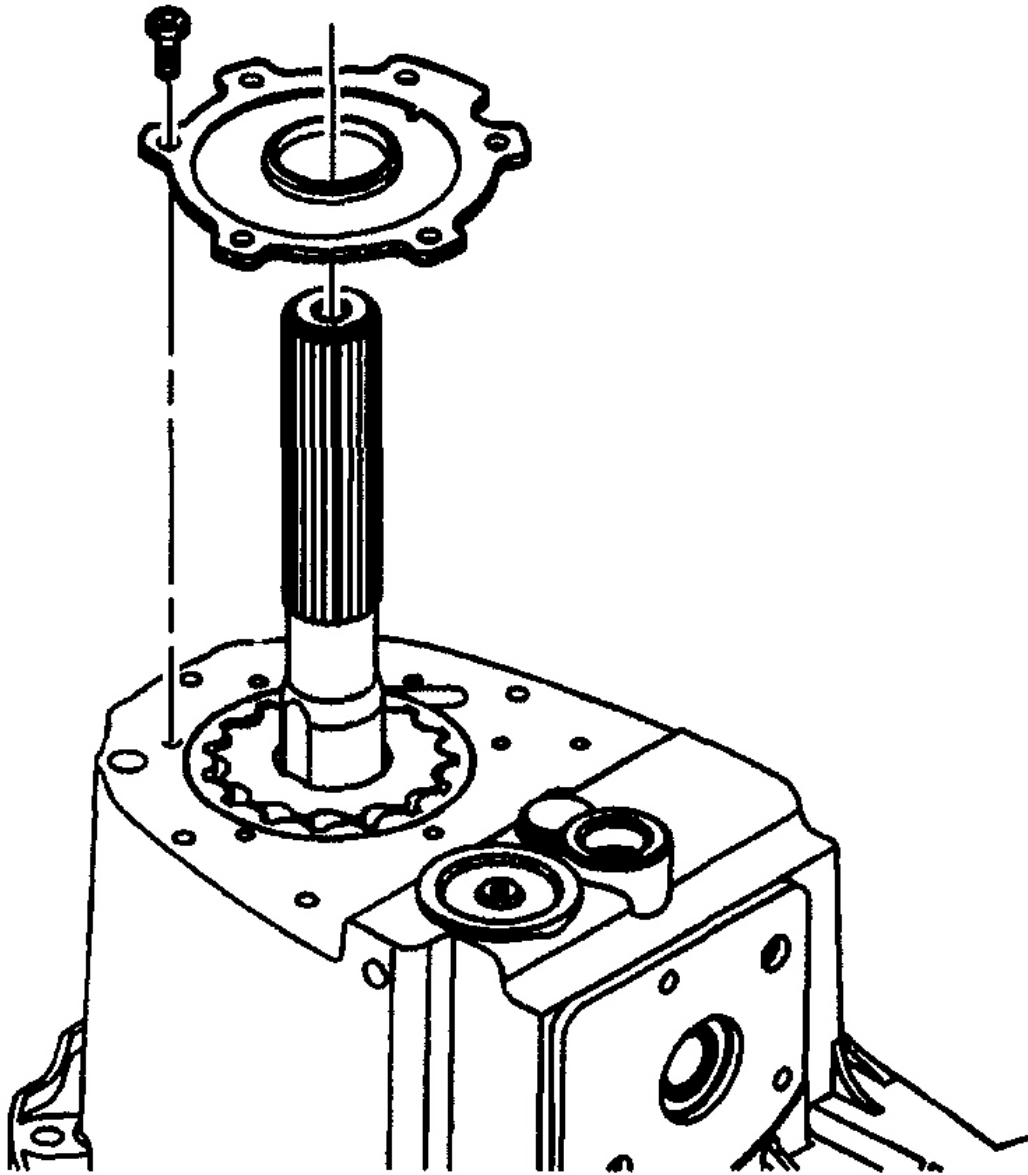
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**IMPORTANT: DO NOT use sealer on the oil pump cover.**

49. Install the oil pump cover.
50. Install the oil pump cover mounting bolts.

### **Tighten**

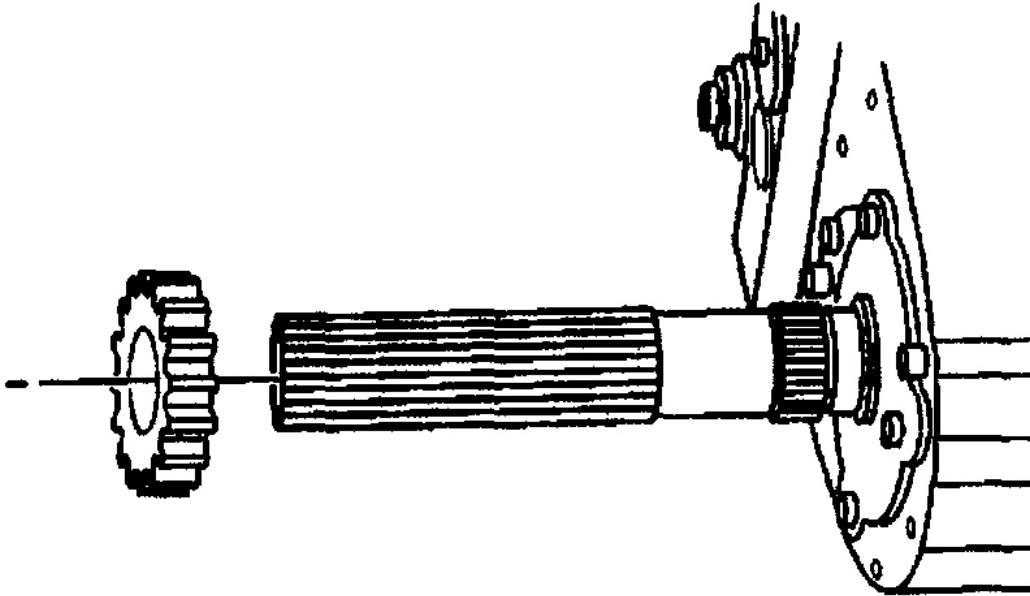
Tighten the oil pump cover mounting bolts to 11 N.m (9 lb ft).



G01364436

**Fig. 113: Installing Oil Pump Cover & Mounting Bolts**

51. Position the NEW speed sensor reluctor wheel onto the rear output shaft.

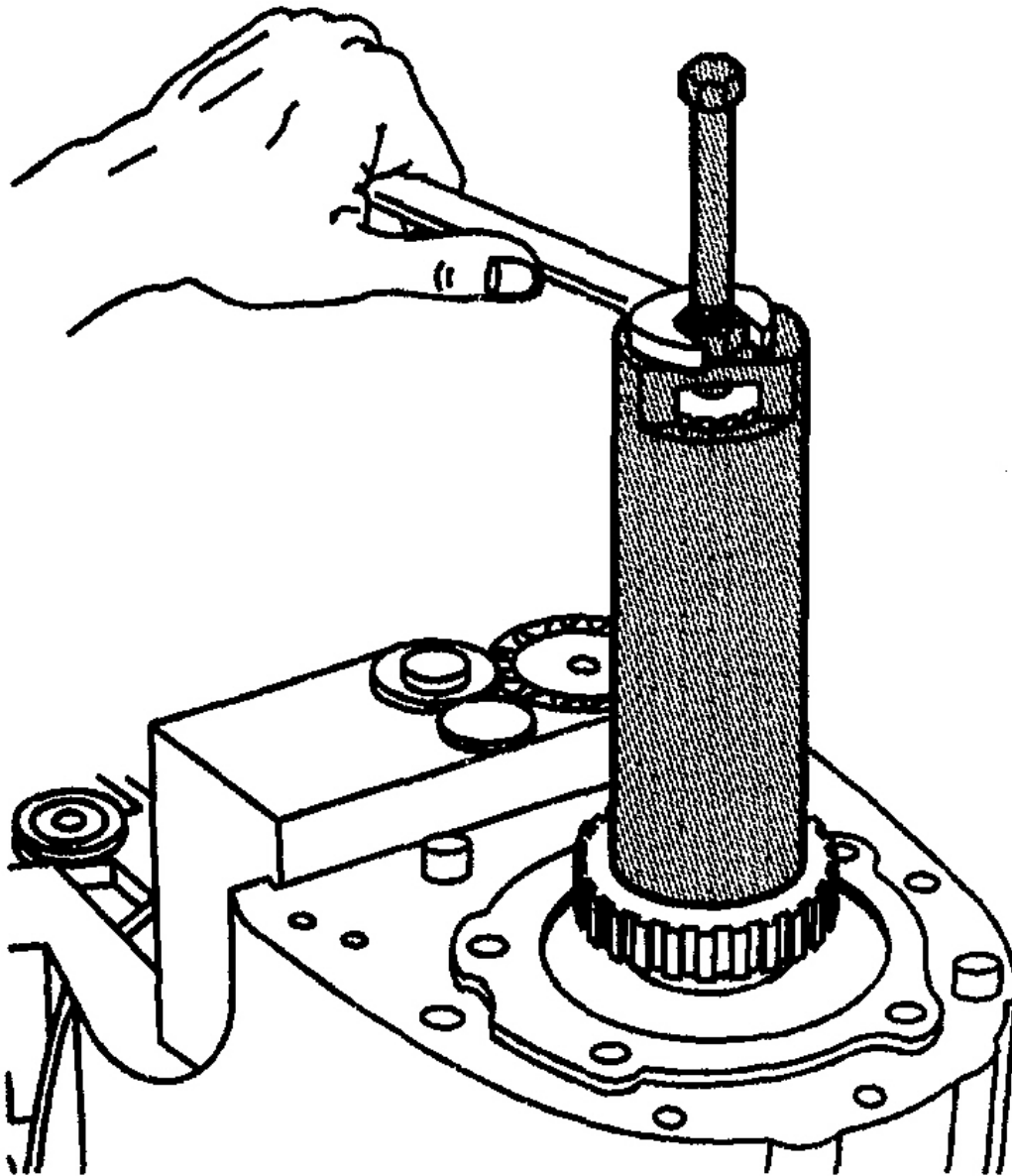


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**Fig. 114: Positioning Speed Sensor Reluctor Wheel Onto Rear Output Shaft**

**IMPORTANT:** Use the J 45235 to install the rear speed sensor reluctor wheel to the proper specifications.

52. Using the J 45235 on the rear output shaft, install the rear speed sensor reluctor wheel.



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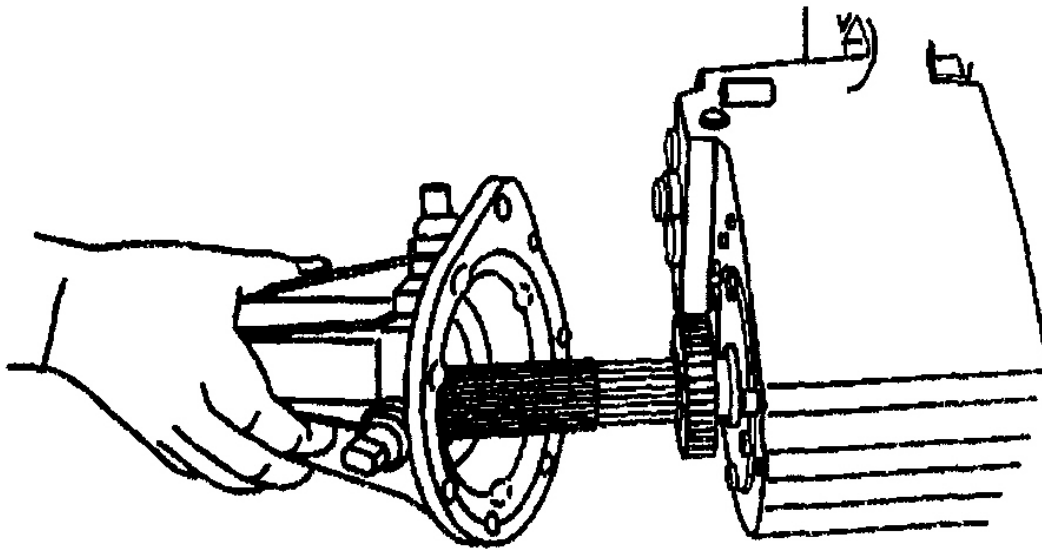
**Fig. 115: Installing Rear Speed Sensor Reluctor Wheel**

53. Inspect to ensure the rear extension location pins are installed in the rear case half.
54. Install any missing location pins in the rear case half.
55. Apply a 3 mm (1/8 in) bead of sealant GM P/N 12345739 (Canadian P/N 10953541) or equivalent onto the rear extension.

56. Install the rear extension to the rear case half. Align on the location pins.
57. Install the rear extension bolts.

**Tighten**

Tighten the rear extension bolts to 22 N.m (16 lb ft).



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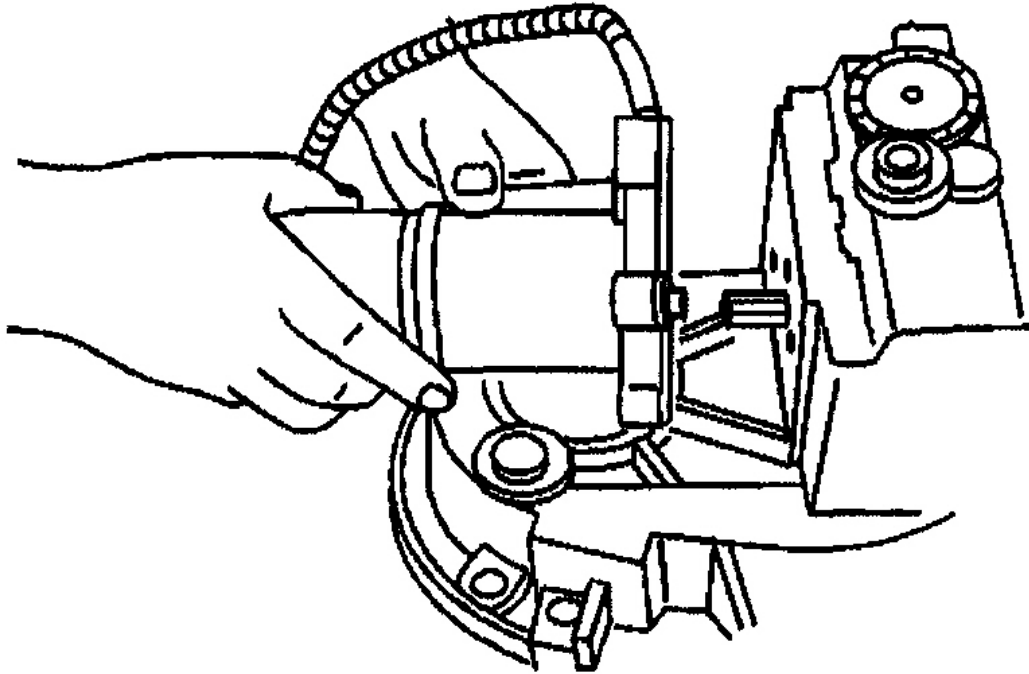
**Fig. 116: Installing Rear Extension To Rear Case Half**

**IMPORTANT:** The shift control detent must be in the neutral position when installing the motor/encoder.

58. Shift the shift control detent into the neutral position.

**IMPORTANT:** A new motor/encoder will not have location pins.

59. Inspect to ensure the location pins are installed in the motor/encoder.
60. Install any missing location pins in the motor/encoder.
61. Install the motor/encoder assembly.



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**Fig. 117: Installing Motor/Encoder Assembly**

62. Install the motor/encoder mounting bolts.

**Tighten**

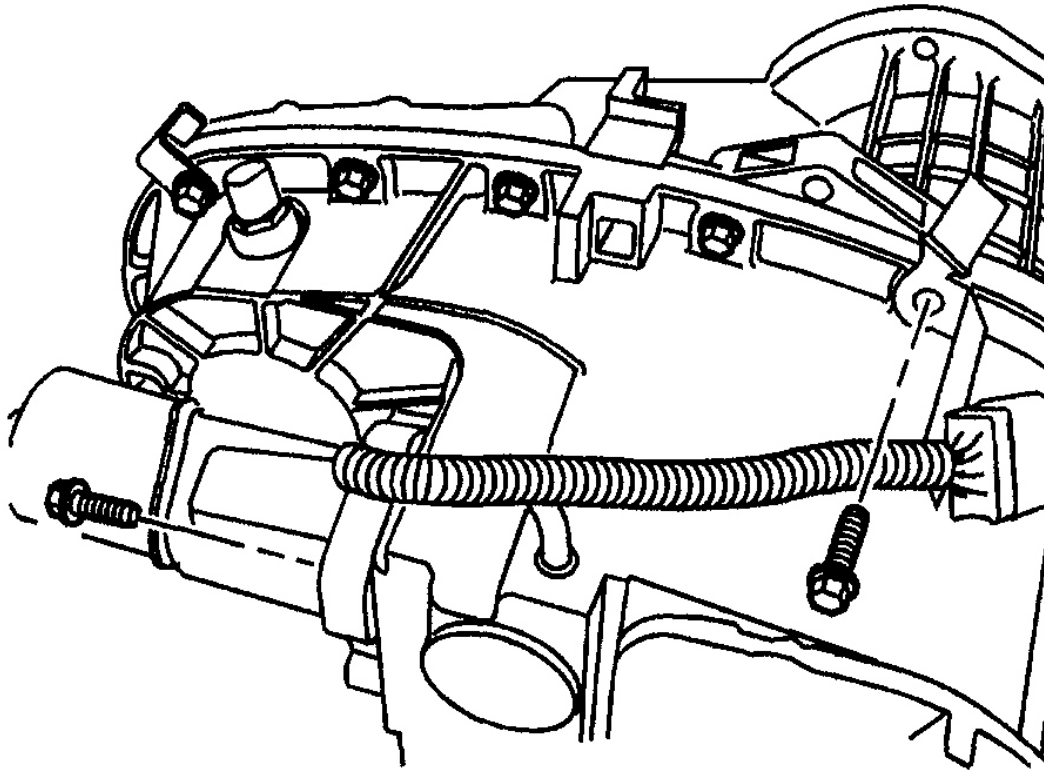
Tighten the motor/encoder mounting bolts to 16 N.m (12 lb ft).

63. Install the motor/encoder wiring harness bracket and case half bolt.

**Tighten**

Tighten the case half bolt to 22 N.m (16 lb ft).





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**Fig. 118: Installing Motor/Encoder Mounting Bolts**

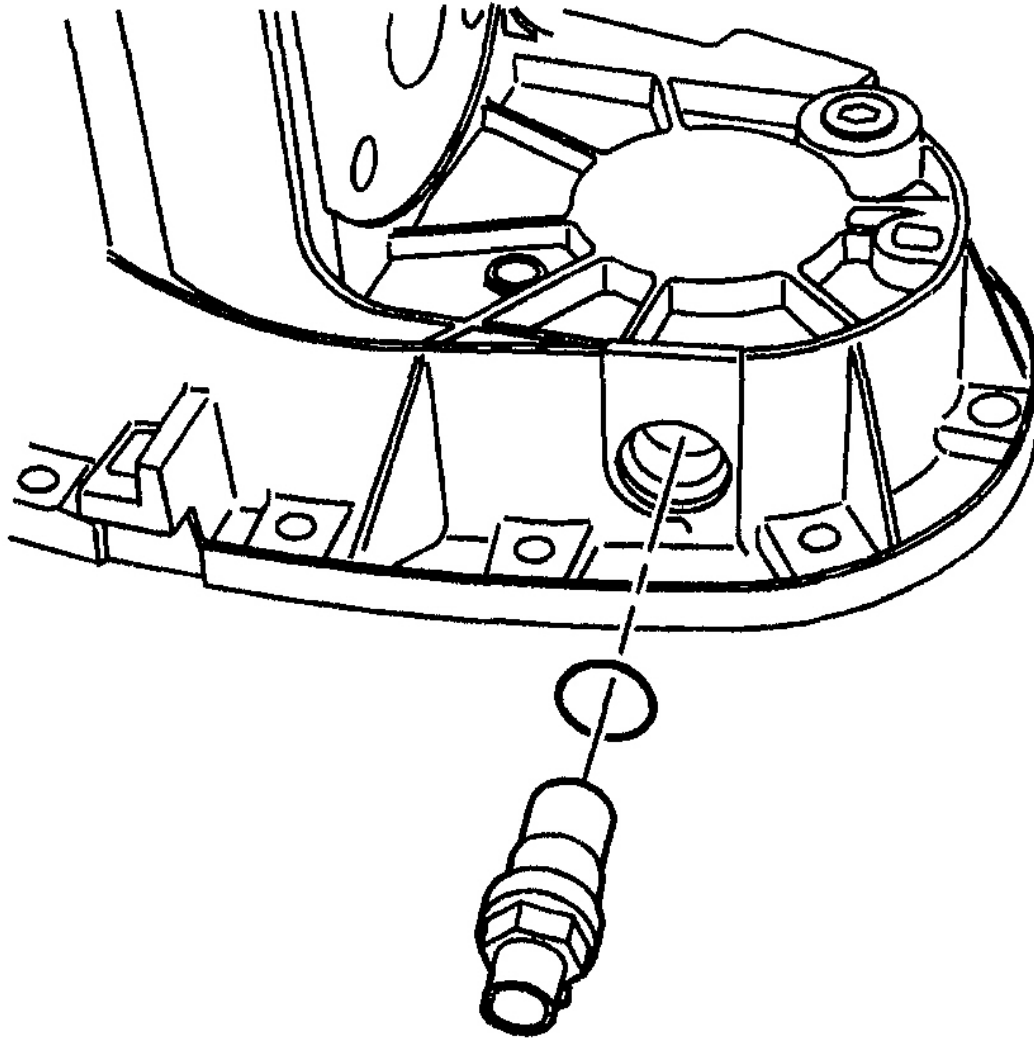
64. Install the front vehicle speed sensor (VSS).

**Tighten**

Tighten the front VSS to 17 N.m (13 lb ft).

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**Fig. 119: Installing Front Vehicle Speed Sensor**

65. Install the right rear VSS.

### **Tighten**

Tighten the right rear VSS to 17 N.m (13 lb ft).

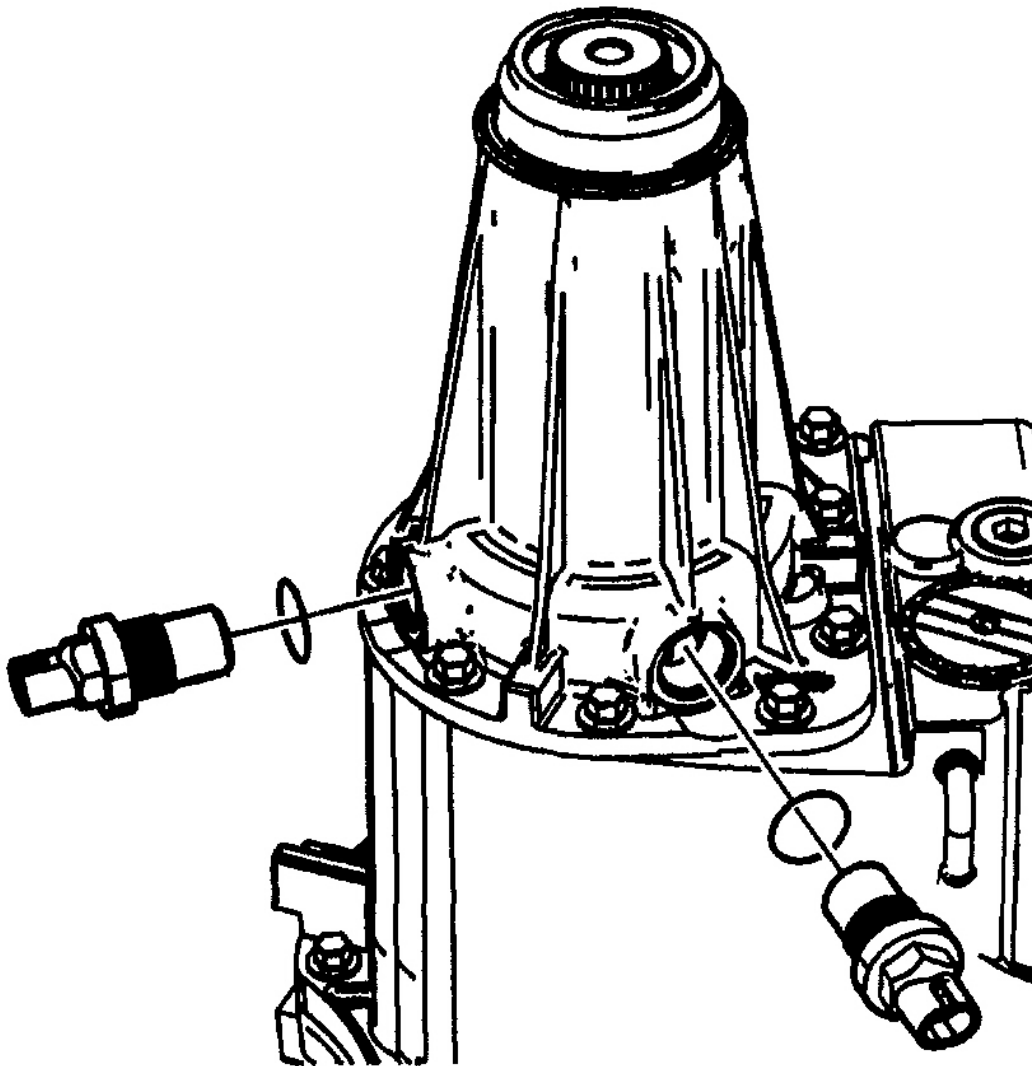
66. Install the left rear VSS.

### **Tighten**

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Tighten the left rear VSS to 17 N.m (13 lb ft).



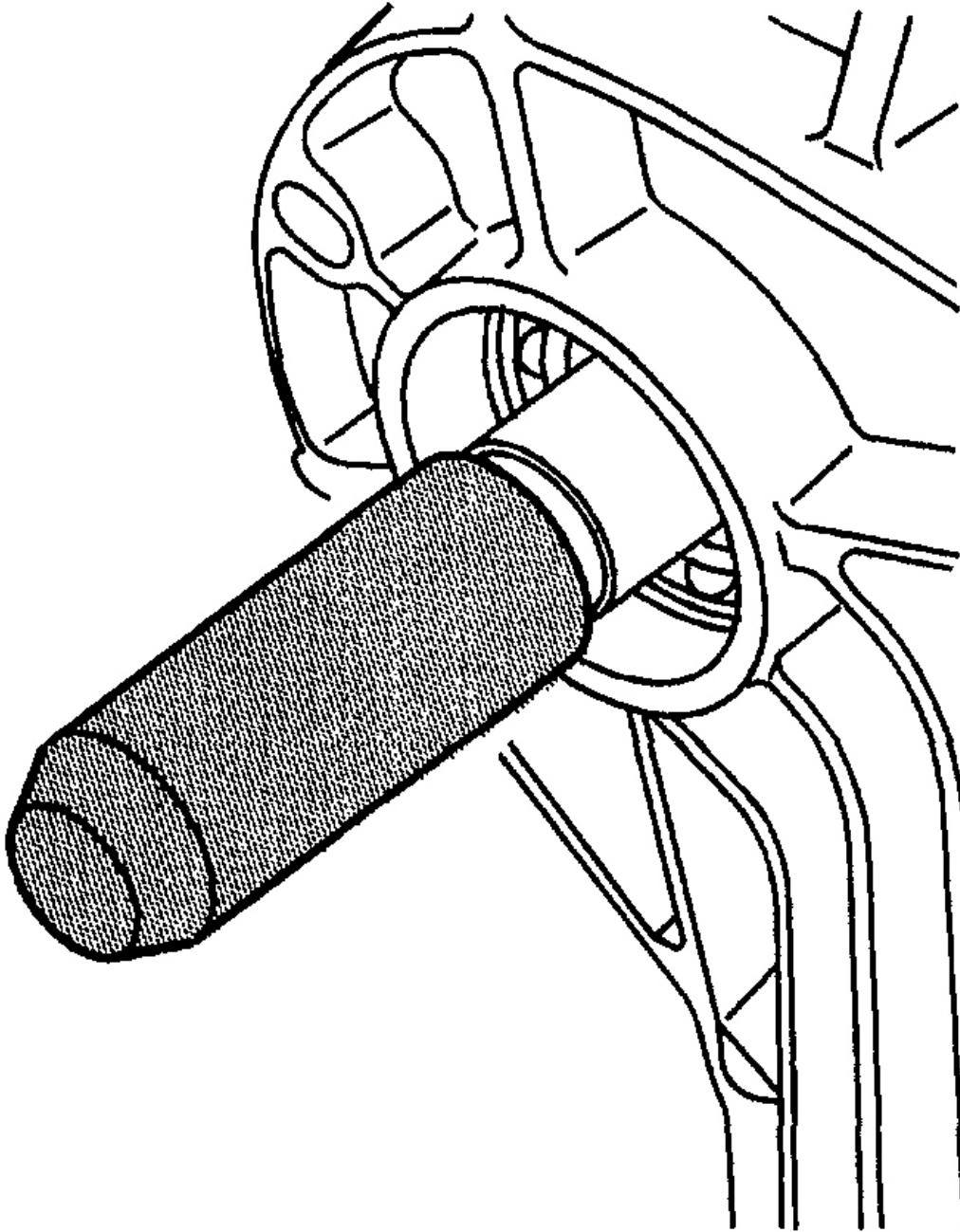
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**Fig. 120: Installing Rear Vehicle Speed Sensors**

67. Install the J 45236-2 onto the front output shaft.

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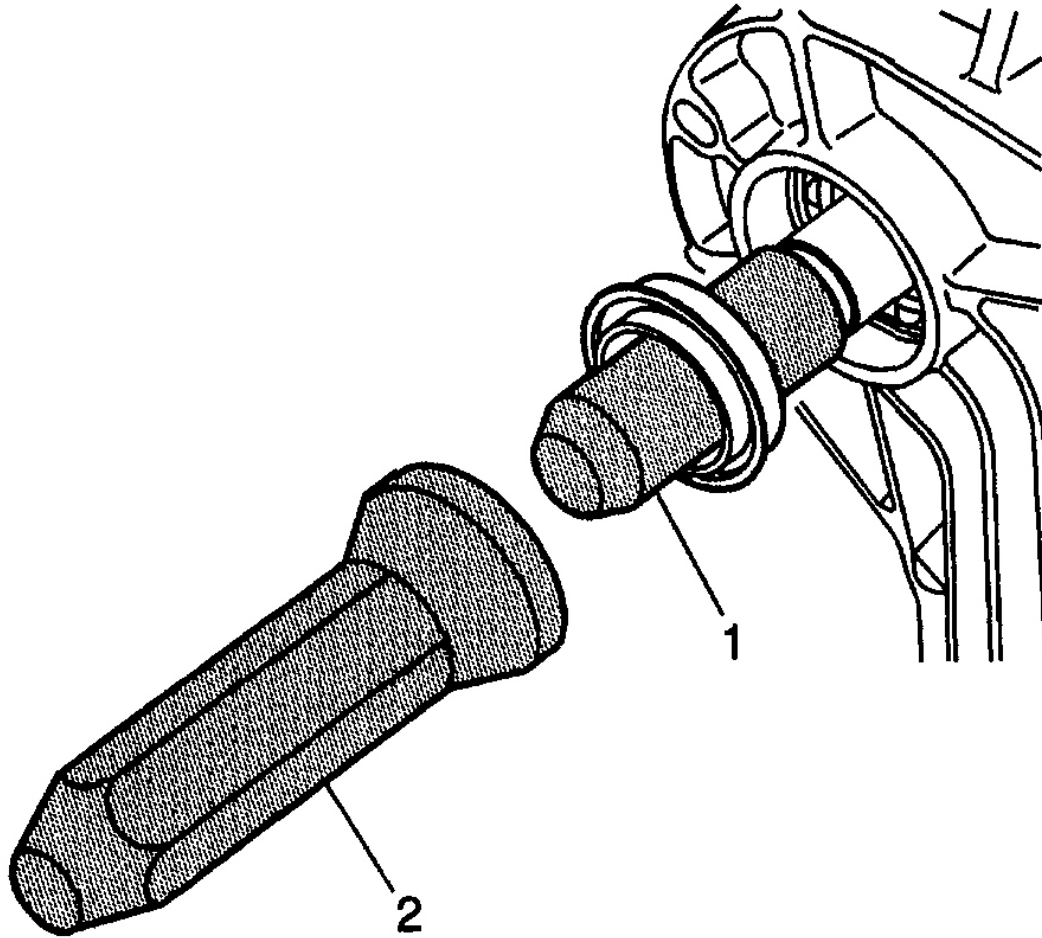
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**Fig. 121: Installing Tool Onto Front Output Shaft**

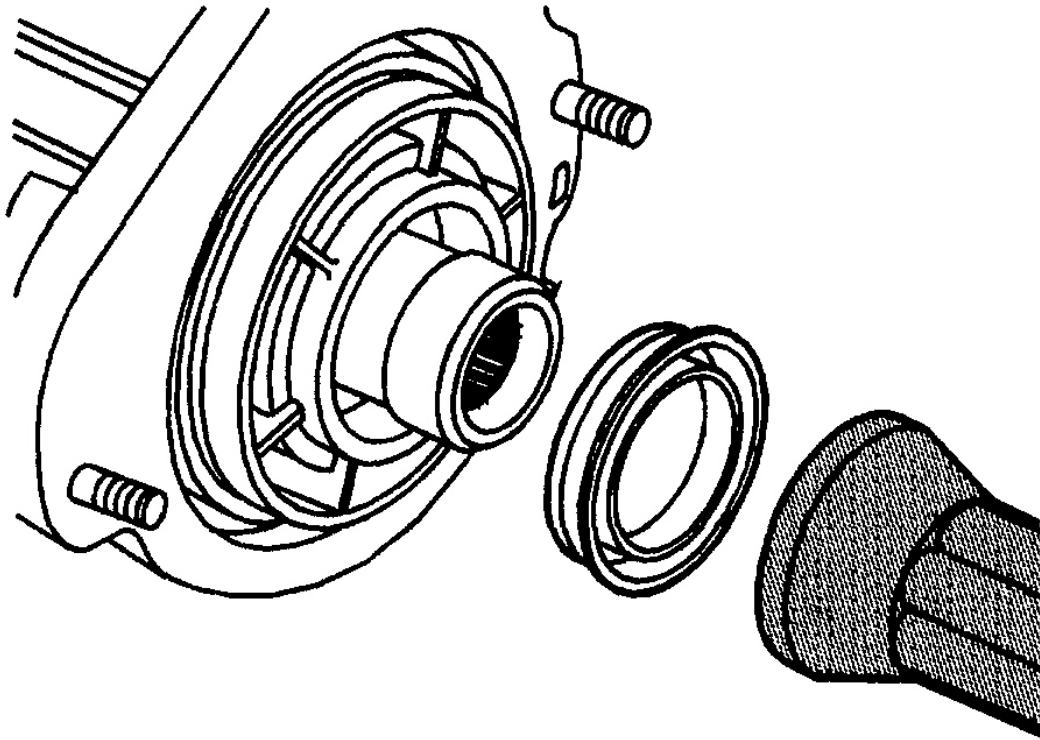
68. Install the seal onto the J 45236-2 (1).
69. Using the J 45236-1 (2), install the front output shaft seal.



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**Fig. 122: Installing Front Output Shaft Seal**

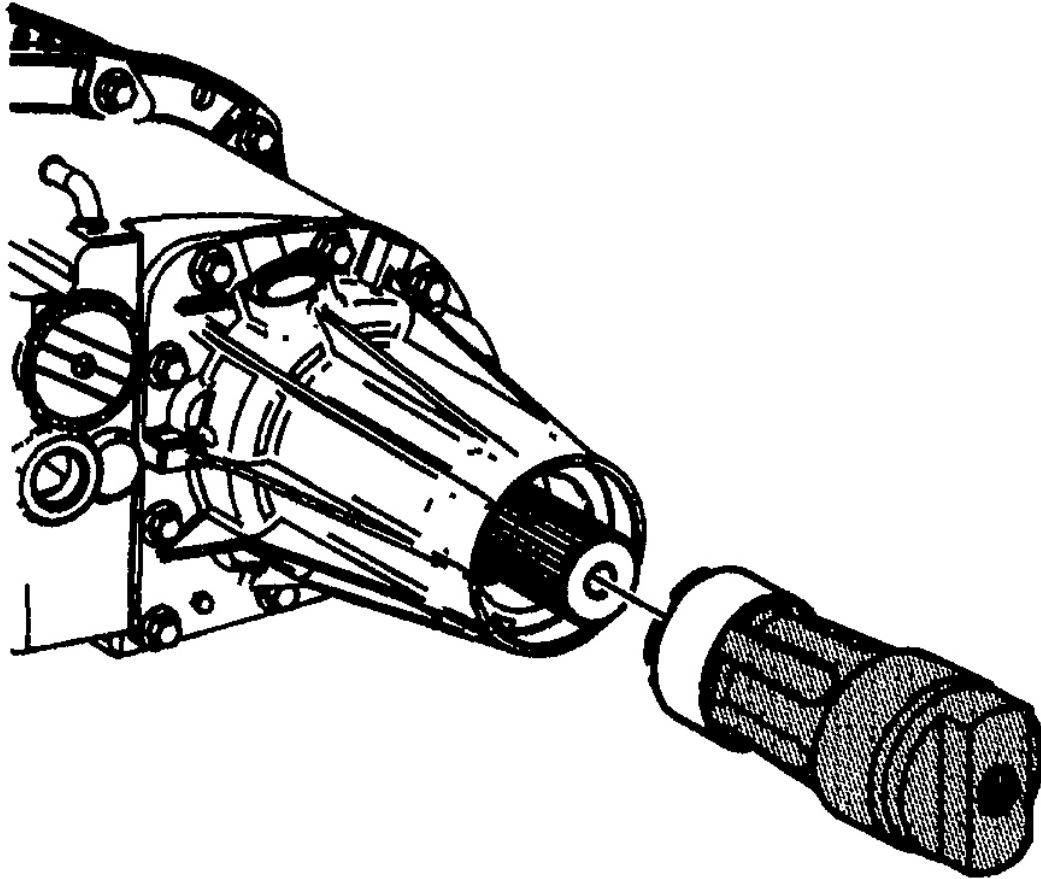
70. Using the J 42738, install the front input shaft seal.



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**Fig. 123: Installing Front Input Shaft Seal**

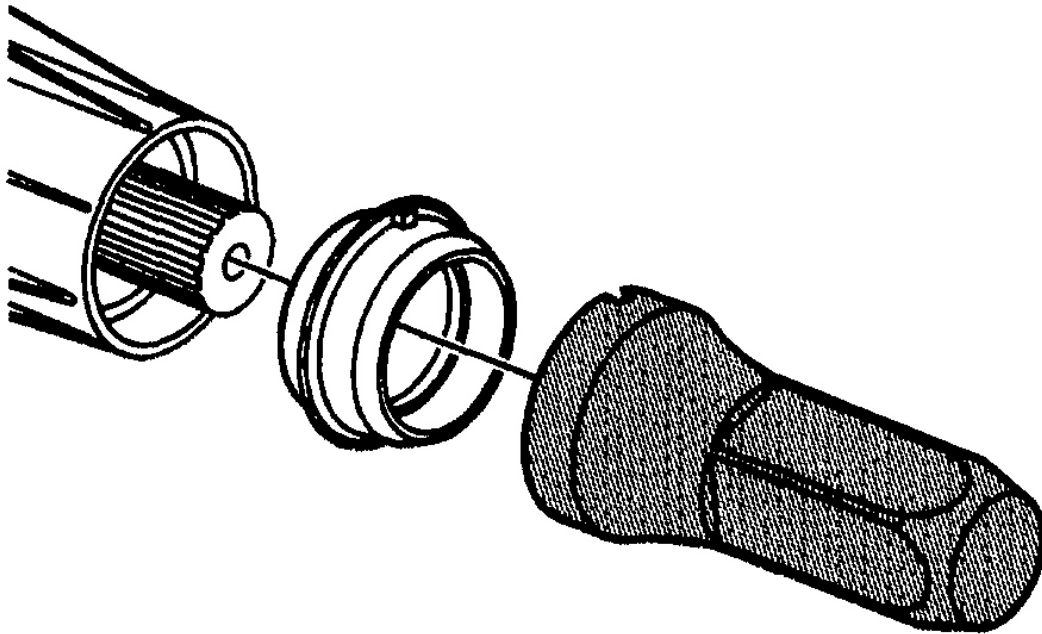
71. Using the J 45380, install a new rear output shaft bushing.
  1. Install the bushing on the finger section of the J 45380.
  2. Install the finger section to the main body of the J 45380.
  3. Position the bushing and tool to the case.
  4. Using a hammer and the J 45380, install the bushing.



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**Fig. 124: Installing Rear Output Shaft Bushing**

72. Using the J 37668-A, install the rear output shaft seal.
  1. Align the notch on the J 37668-A with the tab on the seal.
  2. Install the seal with the tab at the top and the weep hole at the bottom.



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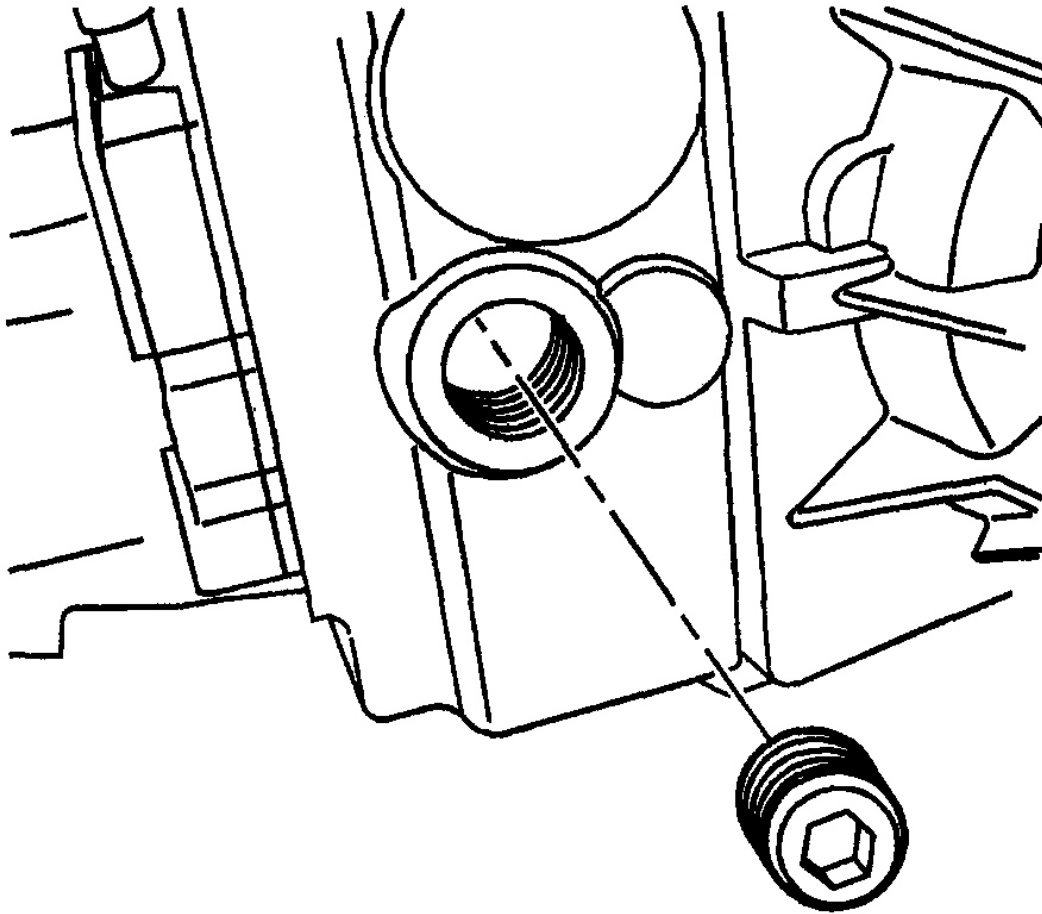
**Fig. 125: Installing Rear Output Shaft Seal**

73. Apply pipe sealant GM P/N 12346004 (Canadian P/N 10953480) or equivalent to the fill plug threads.
74. Install the fill plug.

**Tighten**

Tighten the fill plug to 27 N.m (20 lb ft).





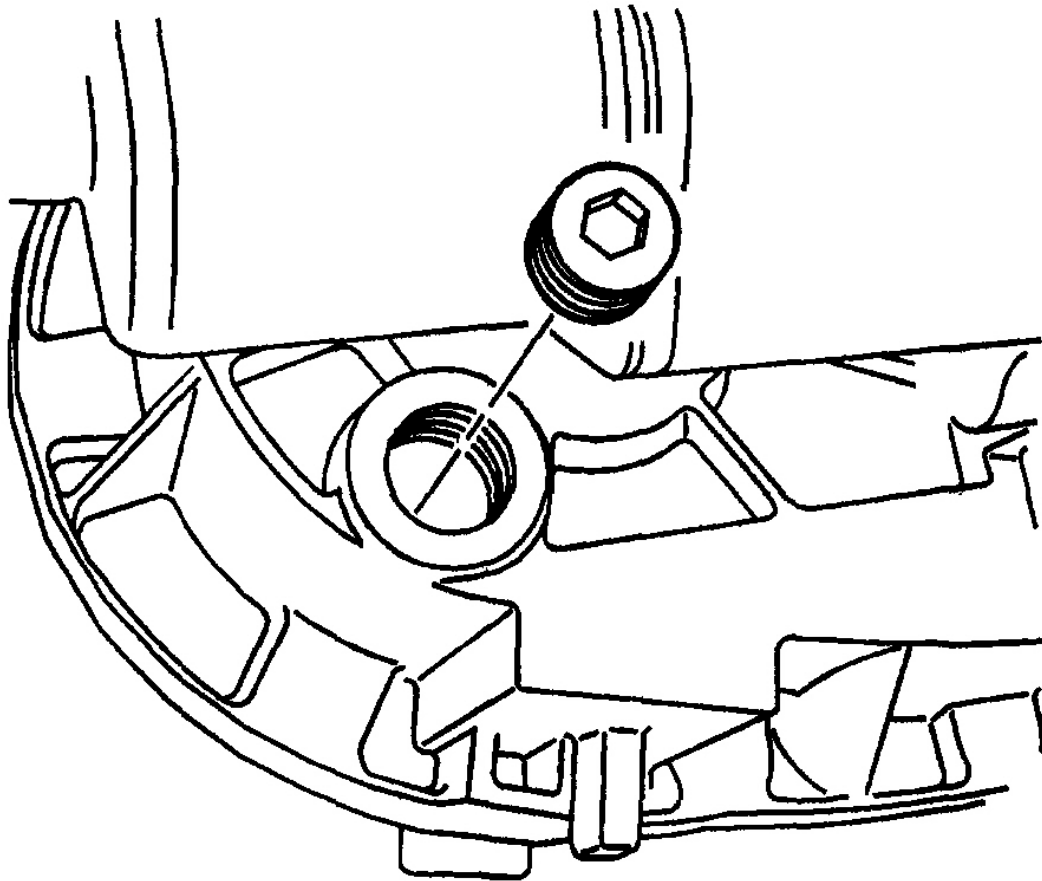
G01364449

**Fig. 126: Installing Fill Plug**

75. Apply pipe sealant GM P/N 12346004 (Canadian P/N 10953480) or equivalent to the drain plug threads.
76. Install the drain plug.

**Tighten**

Tighten the drain plug to 27 N.m (20 lb ft).



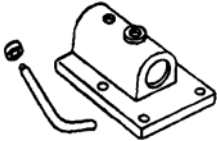
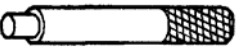

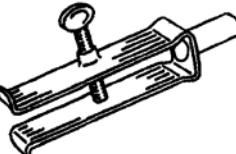
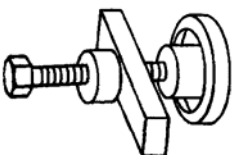
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**Fig. 127: Installing Drain Plug**

## **SPECIAL TOOLS AND EQUIPMENT**

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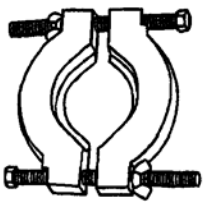
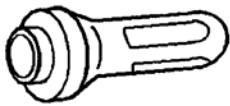
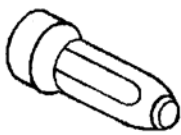

Illustration	Tool Number/Description
	J 3289-20 Holding Fixture
	J 8092 Universal Driver Handle
	J 23907 Slide Hammer with Bearing Adapter
	J 26941 Bushing and Bearing Remover – 3–4 Inch
	J 36371 Output Shaft Bearing Installer

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**Fig. 128: Identifying Special Tools & Equipment (1 Of 4)**

## 2003 Isuzu Ascender

2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

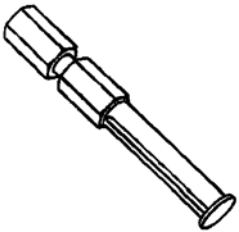
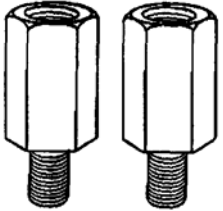
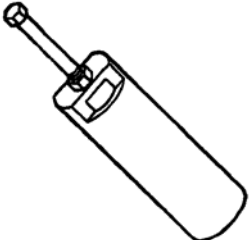
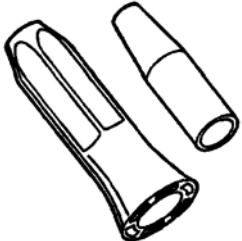

Illustration	Tool Number/Description
	J 36373 Input Sun Gear Ball Bearing Installer
	J 36513 Gear and Bearing Separator Plate
	J 37668-A Output Shaft Seal Installer
	J 42738 Seal Installer
	J 44707 T Bar Push Puller

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**Fig. 129: Identifying Special Tools & Equipment (2 Of 4)**

## 2003 Isuzu Ascender

2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

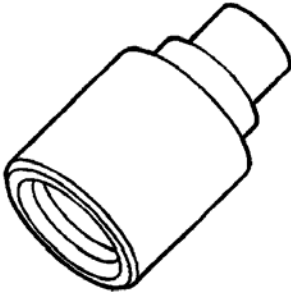
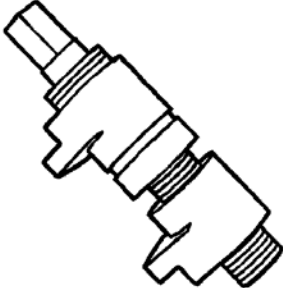
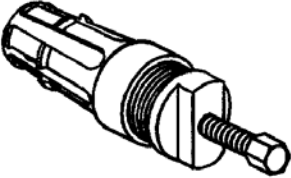
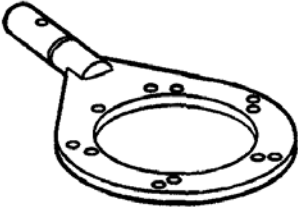
Illustration	Tool Number/Description
	J 44737 Shift Rail Bearing Remover
	J 44759 Adapter 3/8 NC to 5/8 NF
	J 45235 Speed Sensor Reluctor Wheel Installer - Rear
	J 45236 Output Shaft Seal Installer - Front
	J 45237 Input Shaft Bore Seal Installer

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**Fig. 130: Identifying Special Tools & Equipment (3 Of 4)**

## 2003 Isuzu Ascender

2003 TRANSMISSION Transfer Case - NVG 126-NP4 (Unit Repair) - Ascender, Bravada, Envoy & TrailBlazer

Illustration	Tool Number/Description
	J 45239 Needle Bearing Installer
	J 45358 Case Spreader
	J 45380 Transfer Case Rear Bushing Remover and Installer
	J 45759 Assembly Fixture

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**Fig. 131: Identifying Special Tools & Equipment (4 Of 4)**