

PRODEMAND

YMMS: 2003 Ford Ranger
Engine: 4.0L Eng
VIN:

Aug 19, 2020



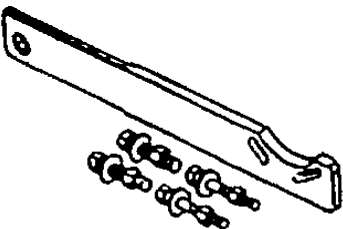
License:
Odometer:

DISASSEMBLY AND ASSEMBLY [TRANSFER CASE - MECHANICAL SHIFT]

Transfer Case

Special Tool(s)

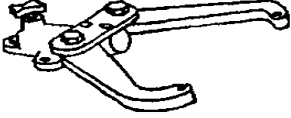
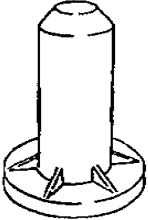
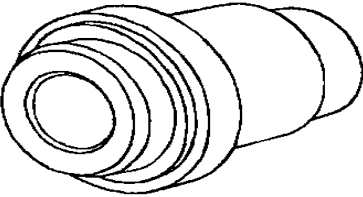
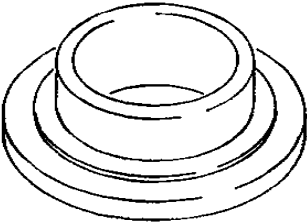
Fig 152: Identifying Special Tools (1 Of 4)

	Adapter for (Handle) 303-224 205-153 (T80T-4000-W)
	Collet (1 Inch to 1-1/4 Inch) 303-D021 (D80L-100-S) or equivalent
	Holding Fixture, Drive Pinion Flange 205-126 (T78P-4851-A)

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Courtesy of FORD MOTOR CO.

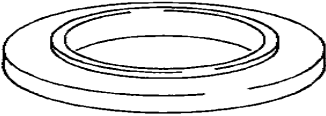

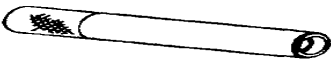


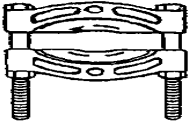

Fig 153: Identifying Special Tools (2 Of 4)

	Holding Fixture, Transmission 307-003 (T57L-500-B)
	Installer, Drive Pinion Oil Seal 205-304 (T90T-4676-A)
	Installer, Input Shaft Bearing 308-085 (T83T-7025-C)
	Installer, Needle Bearing 308-089 (T83T-7127-A)

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Courtesy of FORD MOTOR CO.

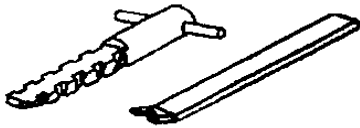
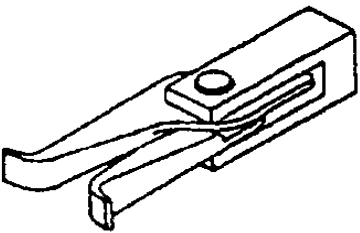
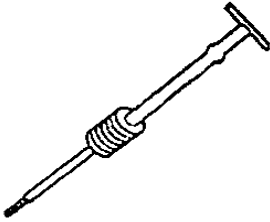
Fig 154: Identifying Special Tools (3 Of 4)

	Installer, Shaft Bearing Cone 308-169 (T88T-7025-B)
	Installer, Transmission Output Shaft Flange 205-495
	Installer, Valve Stem Oil Seal 303-367 (T90P-6510-AH)
	Installer, Wheel Hub Bearing Cup 204-020 (T73T-1202-A)
	Plate, Bearing Oil Seal 205-090 (T75L-1165-B)
	Puller, Bearing 205-D064 (D84L-1123-A) or equivalent
	Remover, Input Shaft Bearing 308-201 (T91T-7127-A)

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Courtesy of FORD MOTOR CO.

Fig 155: Identifying Special Tools (4 Of 4)

	Remover, Oil Seal 303-409 (T92C-6700-CH)
	Remover, Stator Bearing 307-318 (T94P-77001-KH)
	Slide Hammer 100-001 (T50T-100-A)

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Courtesy of FORD MOTOR CO.

Material

Fig 156: Material

Item	Specification
Motorcraft MERCON® Multi-Purpose (ATF) Transmission Fluid XT-2-QDX or equivalent	MERCON®
Premium Long Life Grease XG-1-K or equivalent	ESA-M1C75-A
Ultra Silicone Sealant E7TZ-19554-AA or equivalent	Dana 5-17

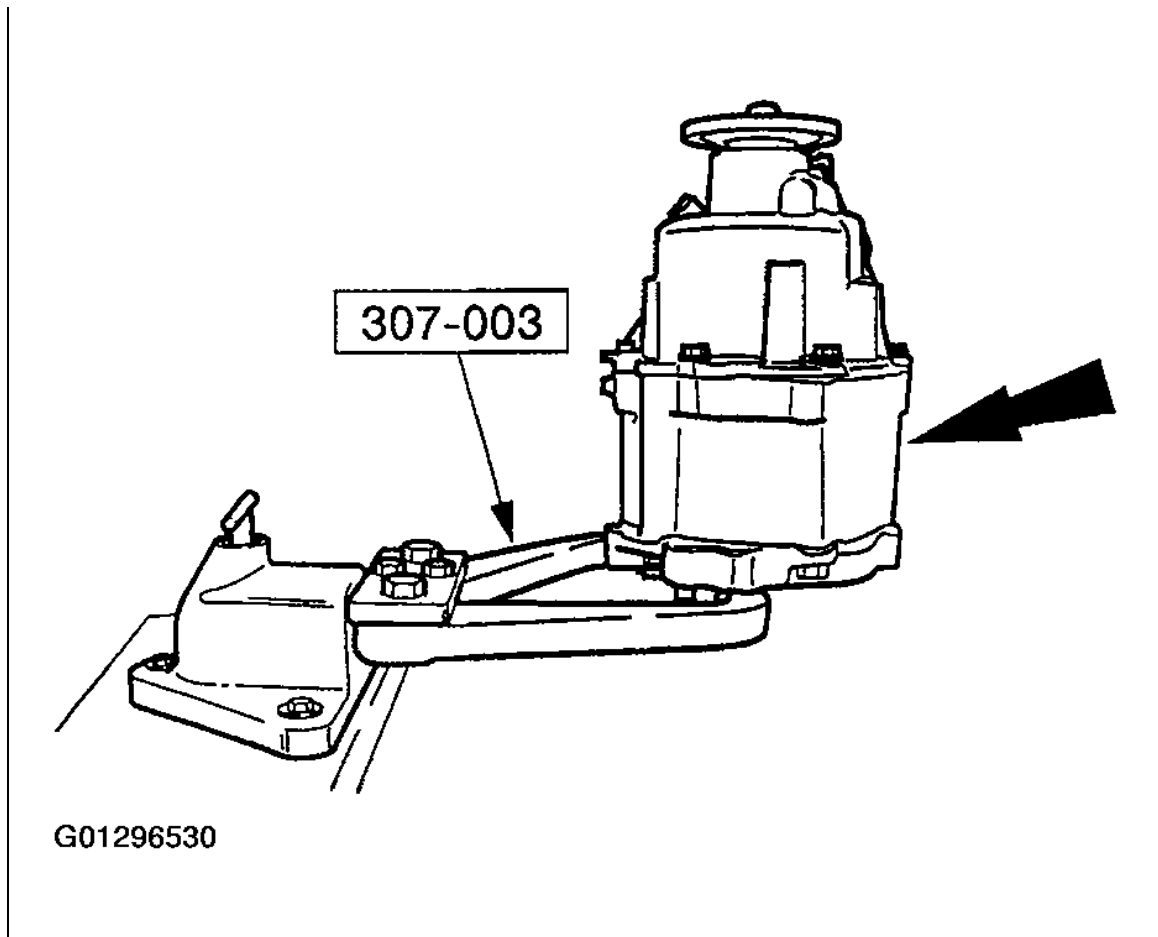
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Courtesy of FORD MOTOR CO.

Disassembly

1. Remove the transfer case from the vehicle. For additional information, refer to TRANSFER CASE.
2. Attach the transfer case to the special tool.

Fig 157: Attaching Transfer Case To Special Tool



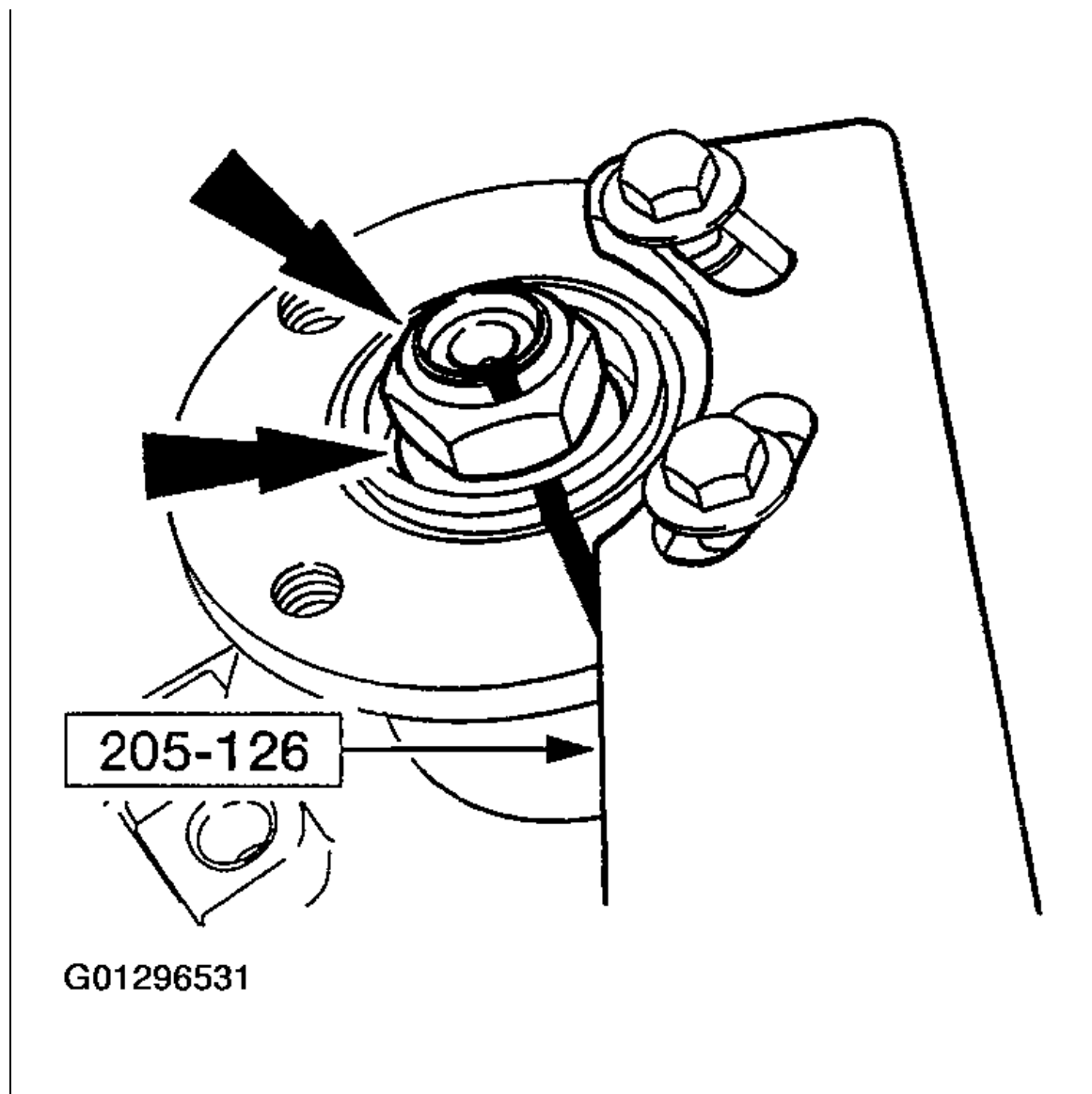
Courtesy of FORD MOTOR CO.

3. Use the special tool to prevent the flange from turning. Remove and discard the nut and the washer.

CAUTION: Index-mark the rear output shaft and the flange.

CAUTION: The nut has a self-locking feature. Discard the nut and the washer after removing them.

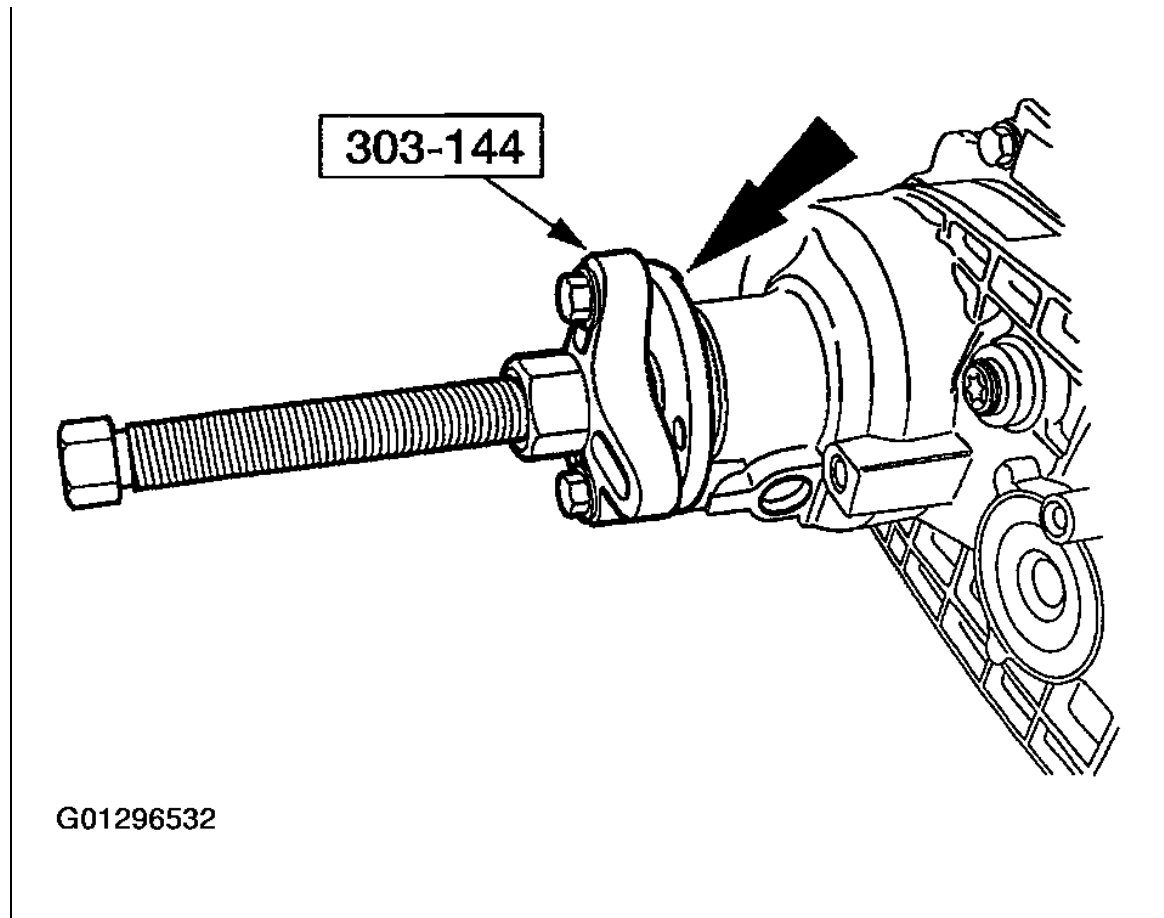
Fig 158: Removing Nut & Washer Using Special Tool



Courtesy of FORD MOTOR CO.

4. Using a suitable puller, remove the flange.

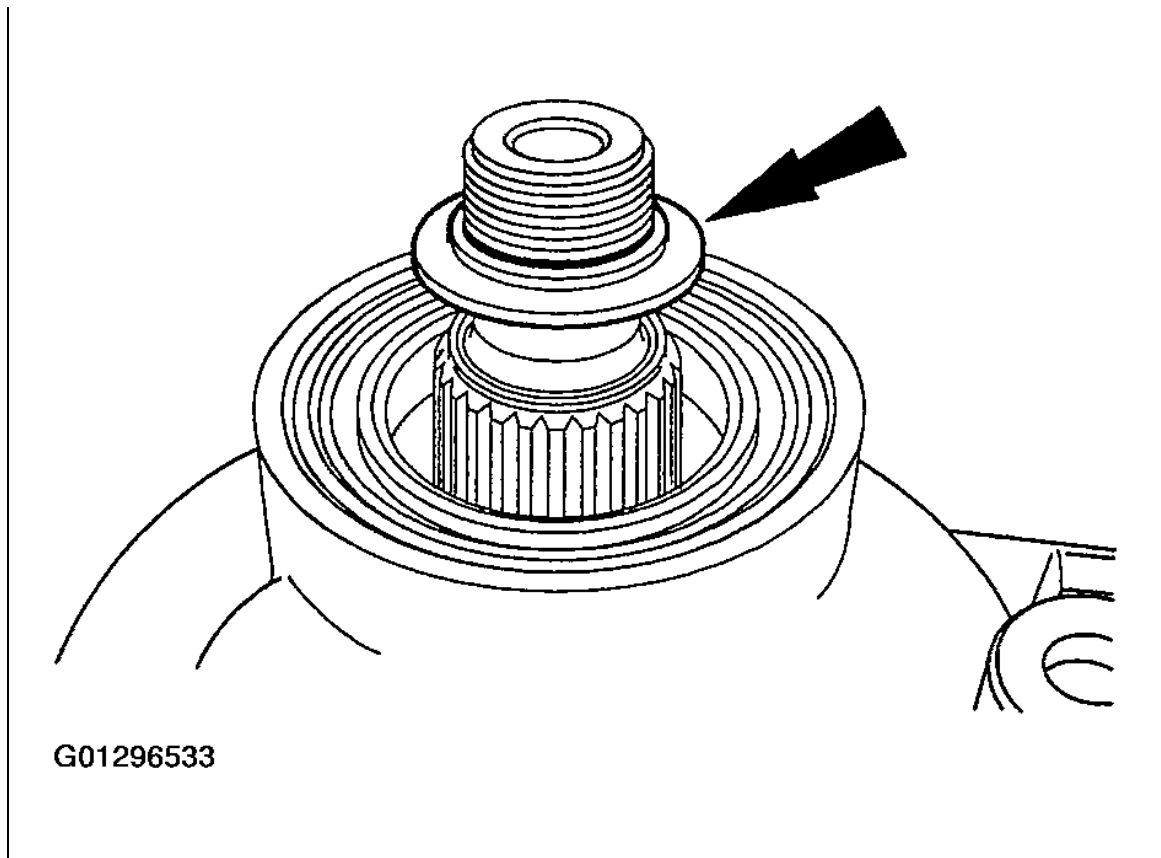
Fig 159: Removing Flange



Courtesy of FORD MOTOR CO.

5. Remove the oil seal if it remains on the rear output shaft.

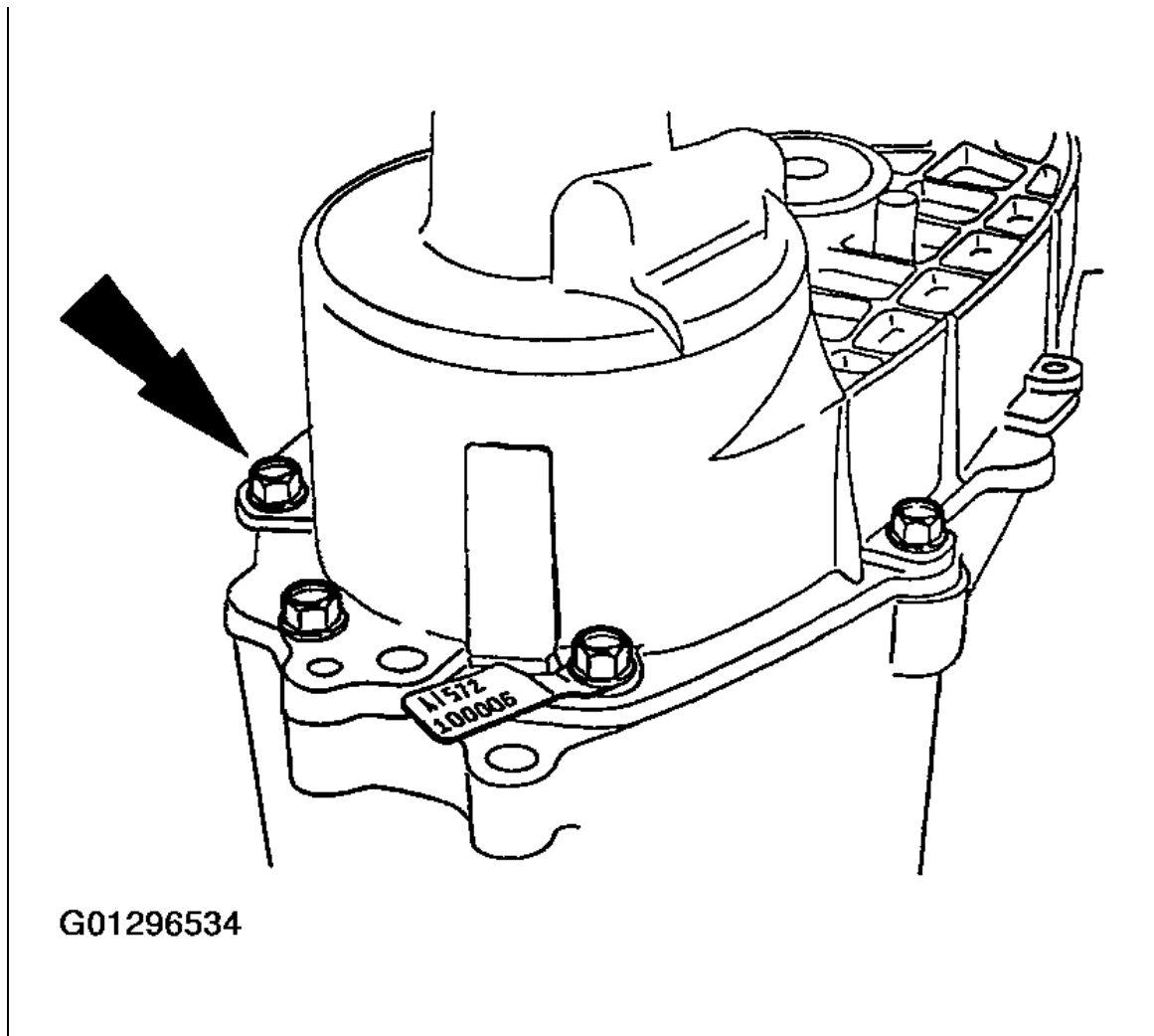
Fig 160: Removing Oil Seal If It Remains On Rear Output Shaft



Courtesy of FORD MOTOR CO.

6. Remove the bolts that retain the transfer case cover to the transfer case.

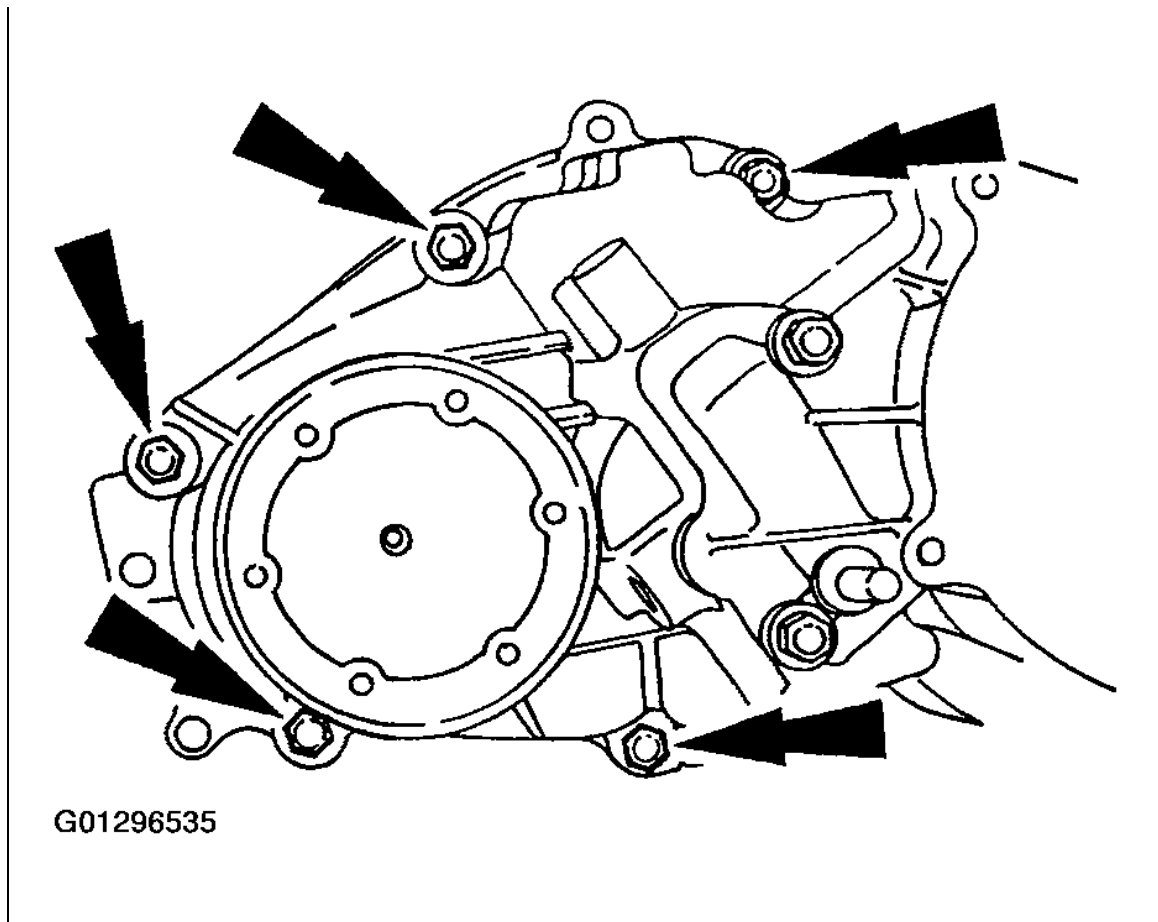
Fig 161: Removing Bolts That Retain Transfer Case Cover To Transfer Case



Courtesy of FORD MOTOR CO.

7. Remove the bolts that retain the transfer case to the transfer case cover.

Fig 162: Removing Bolts That Retain Transfer Case To Transfer Case Cover



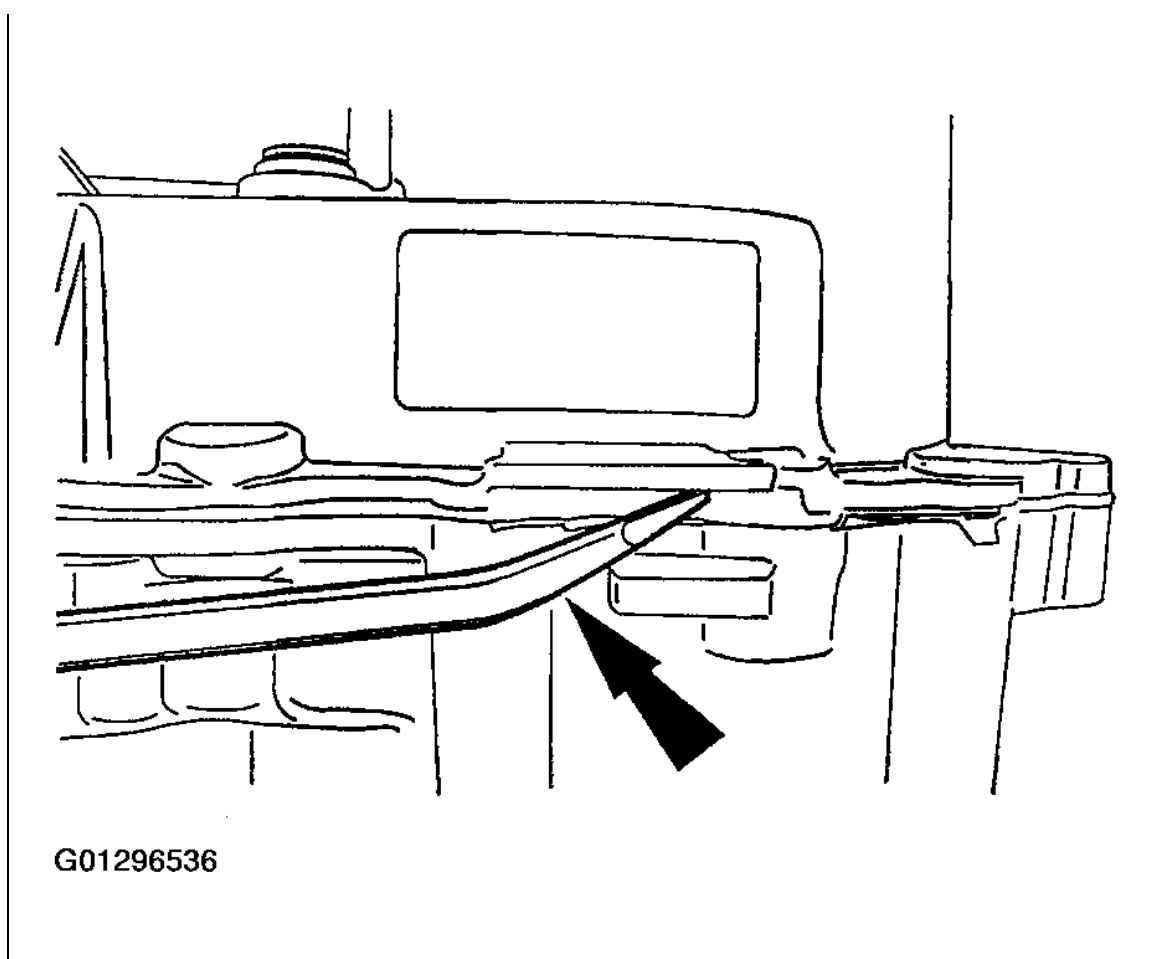
Courtesy of FORD MOTOR CO.

8. Insert a breaker bar between the pry bosses, and separate the transfer case cover from the transfer case.

NOTE: Position the assembly so that the front of the transfer case is facing downward.

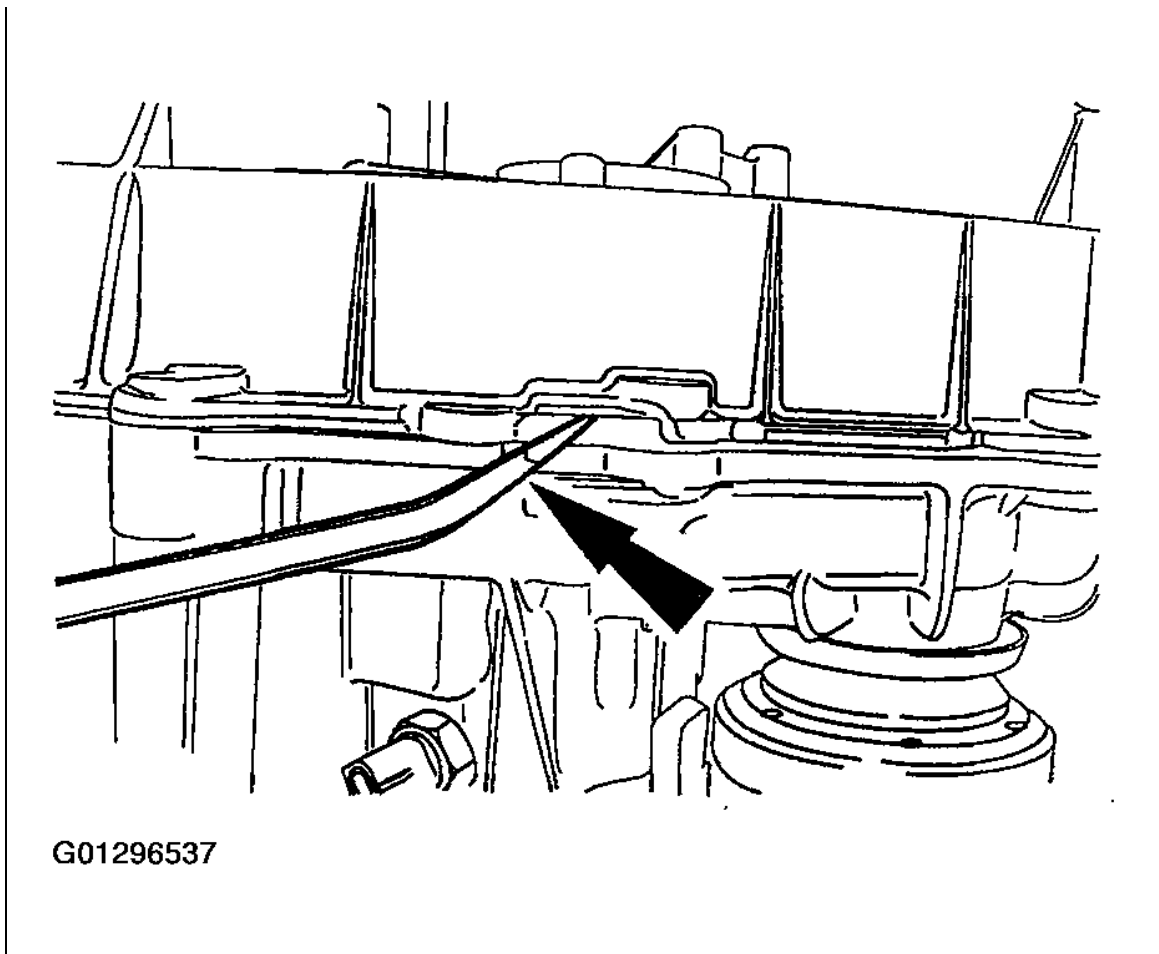
1. Remove the old sealant. Do not damage the mating surfaces of the aluminum case.

Fig 163: Separating Transfer Case Cover From Transfer Case (1 Of 2)



Courtesy of FORD MOTOR CO.

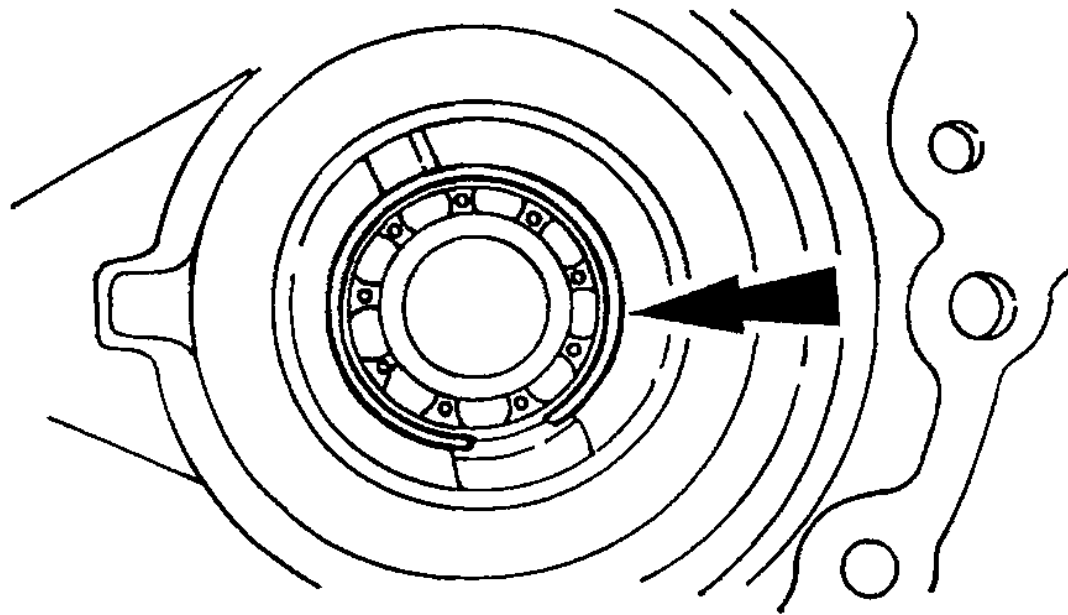
Fig 164: Separating Transfer Case Cover From Transfer Case (2 Of 2)



Courtesy of FORD MOTOR CO.

9. Remove the snap ring that retains the bearing in the case.

Fig 165: Removing Snap Ring That Retains Bearing In Case



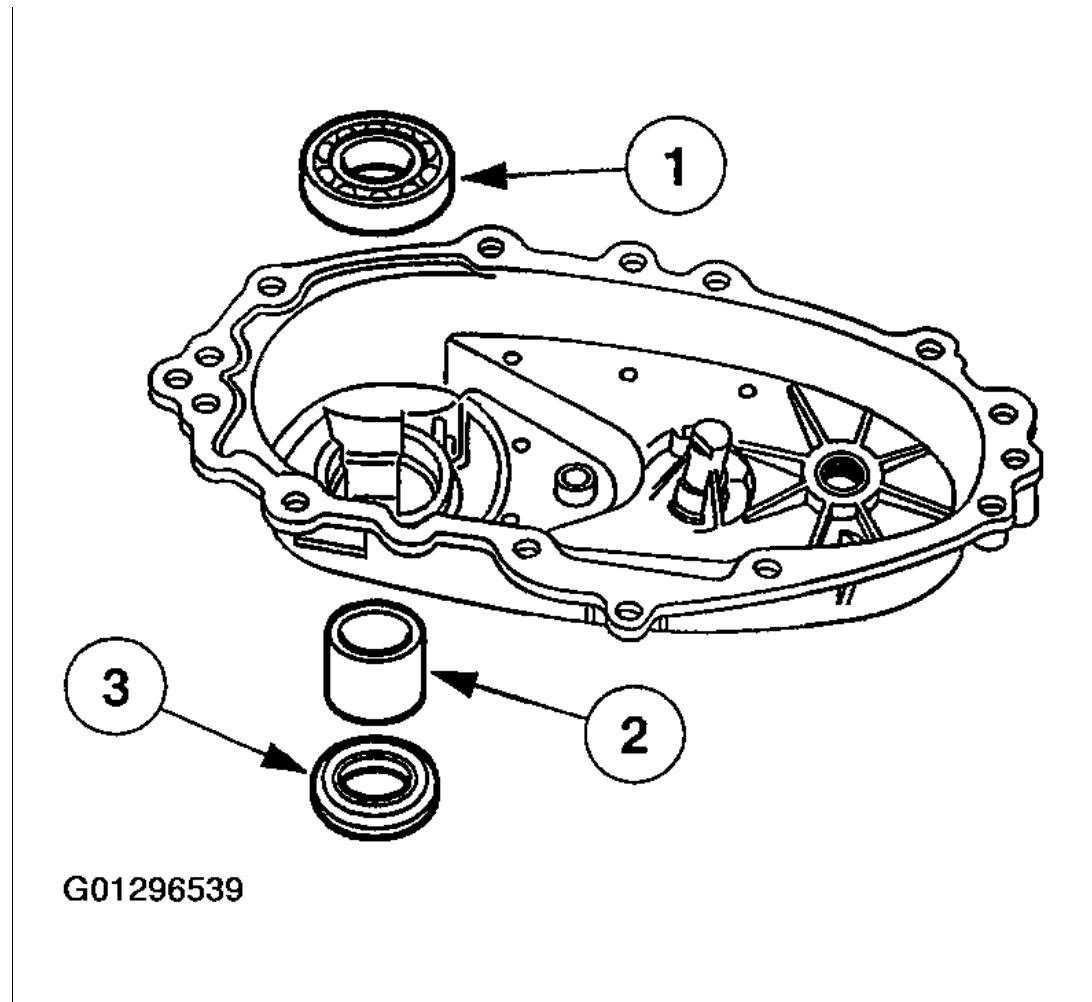
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Courtesy of FORD MOTOR CO.

10. Remove the bearing, spacer and seal.

1. From outside of the case, remove the bearing with a suitable drift.
2. Remove the spacer.
3. From inside the case, remove the seal using a suitable drift.

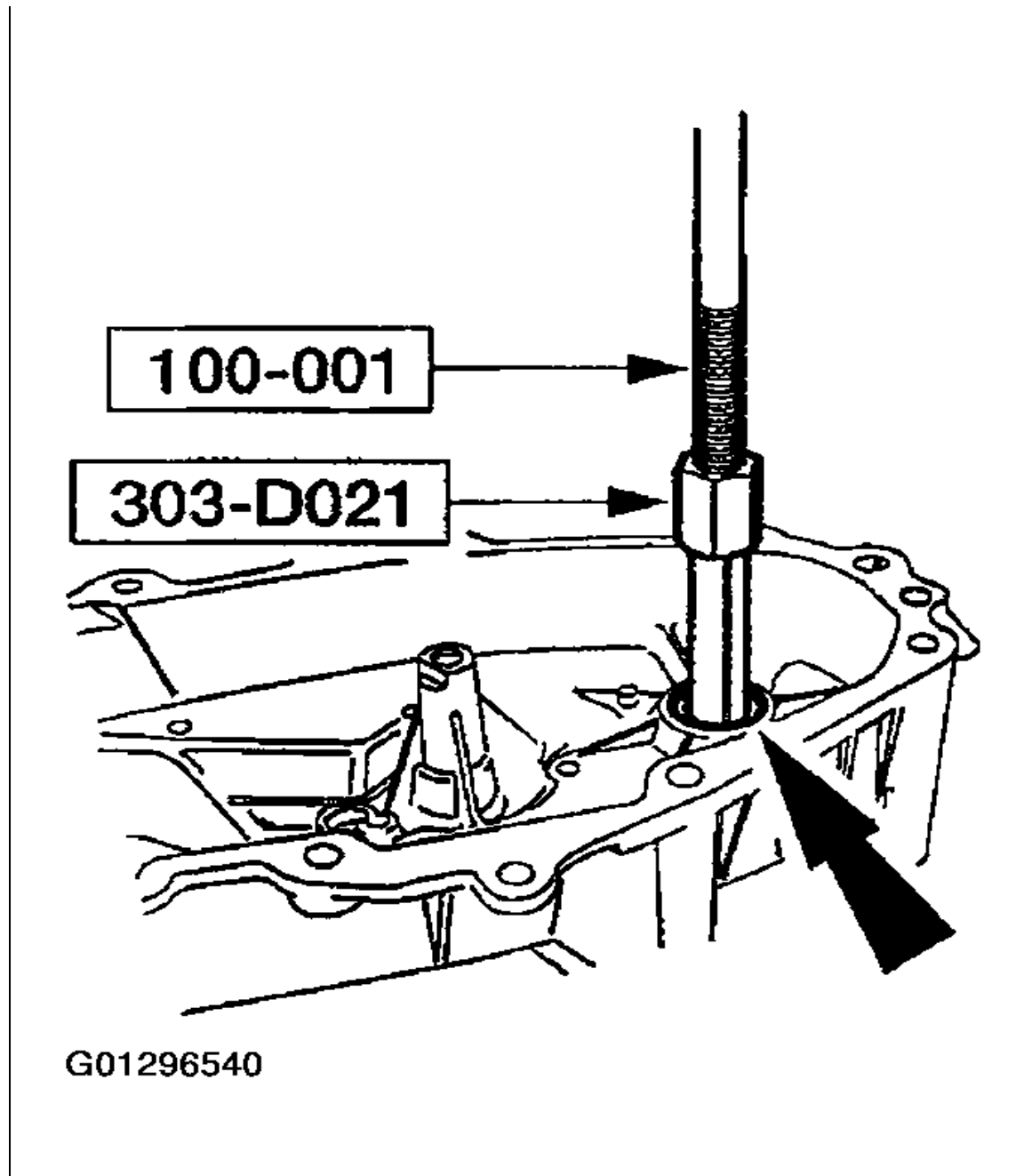
Fig 166: Removing Bearing, Spacer & Seal



Courtesy of FORD MOTOR CO.

11. Using the special tools, remove the needle bearing.

Fig 167: Removing Needle Bearing

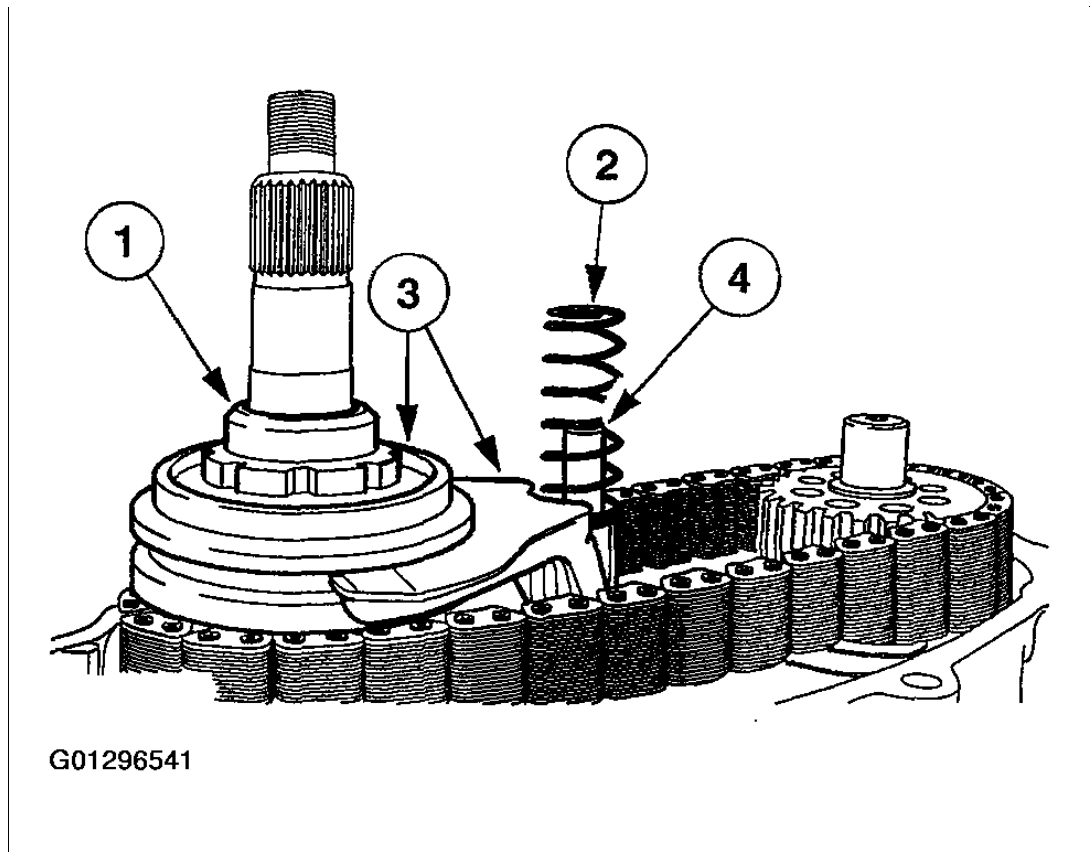


Courtesy of FORD MOTOR CO.

12. Remove the following:

1. Remove the shift collar hub.
2. Remove the return spring.
3. Remove the lockup collar and the lockup fork as an assembly.
4. Remove the shift rail.

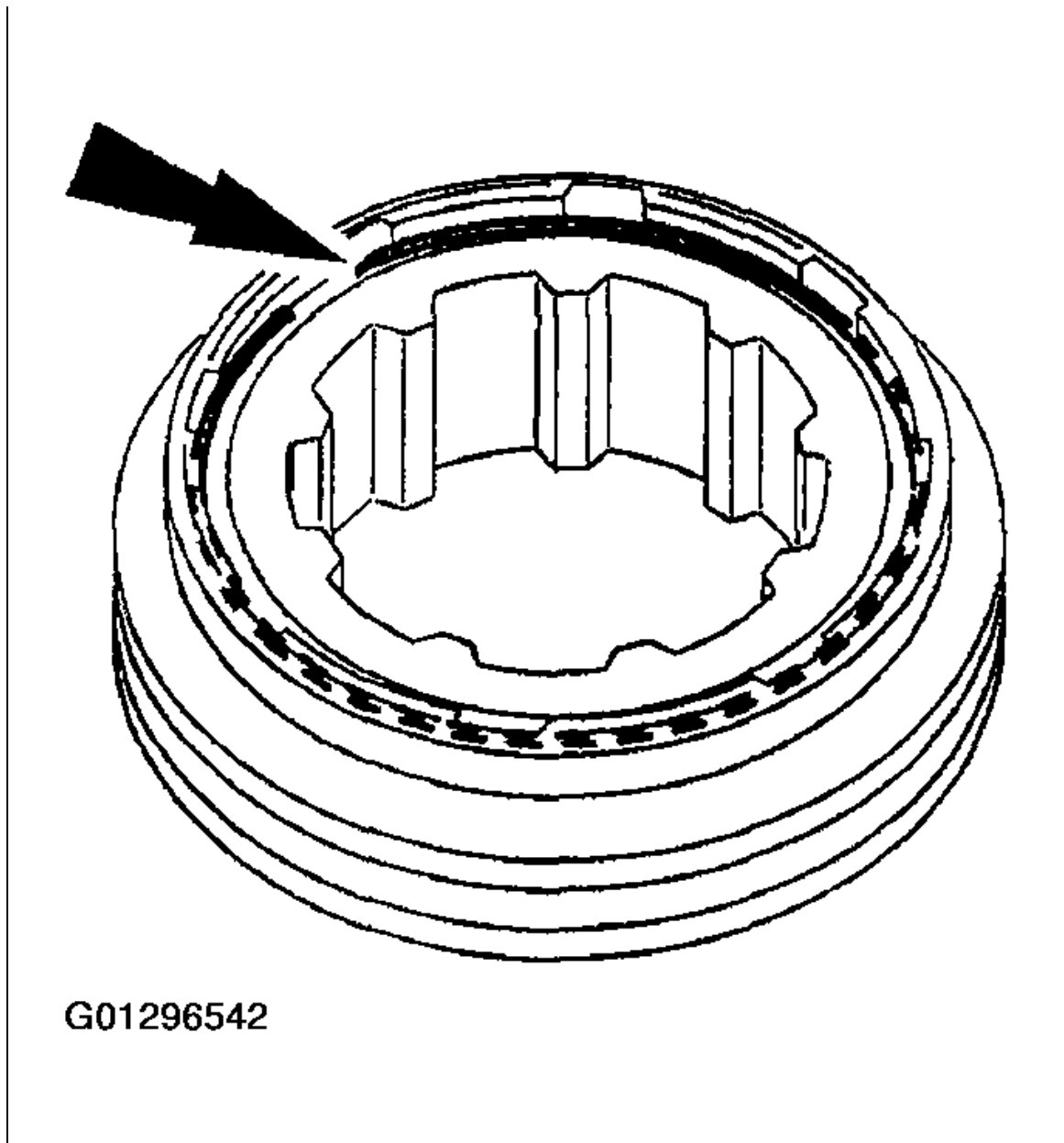
Fig 168: Removing Shift Collar Hub, Return Spring, Lockup Collar, Lockup Fork & Shift Rail



Courtesy of FORD MOTOR CO.

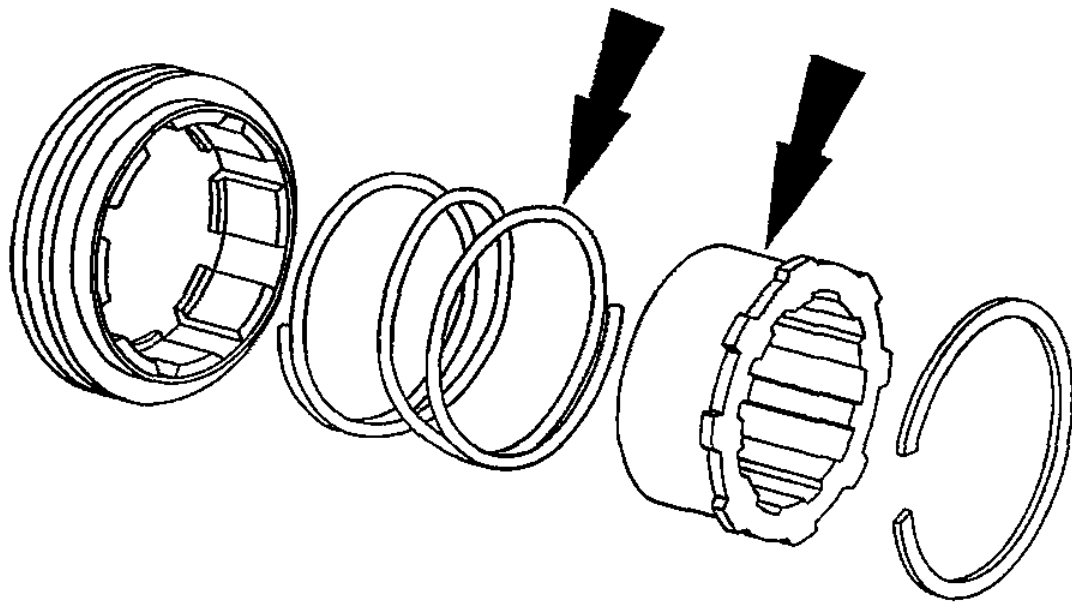
13. Remove the snap ring, then remove the lockup hub and the sleeve return spring from the lockup collar.

Fig 169: Removing Snap Ring



Courtesy of FORD MOTOR CO.

Fig 170: Removing Lockup Hub & Sleeve Return Spring From Lockup Collar

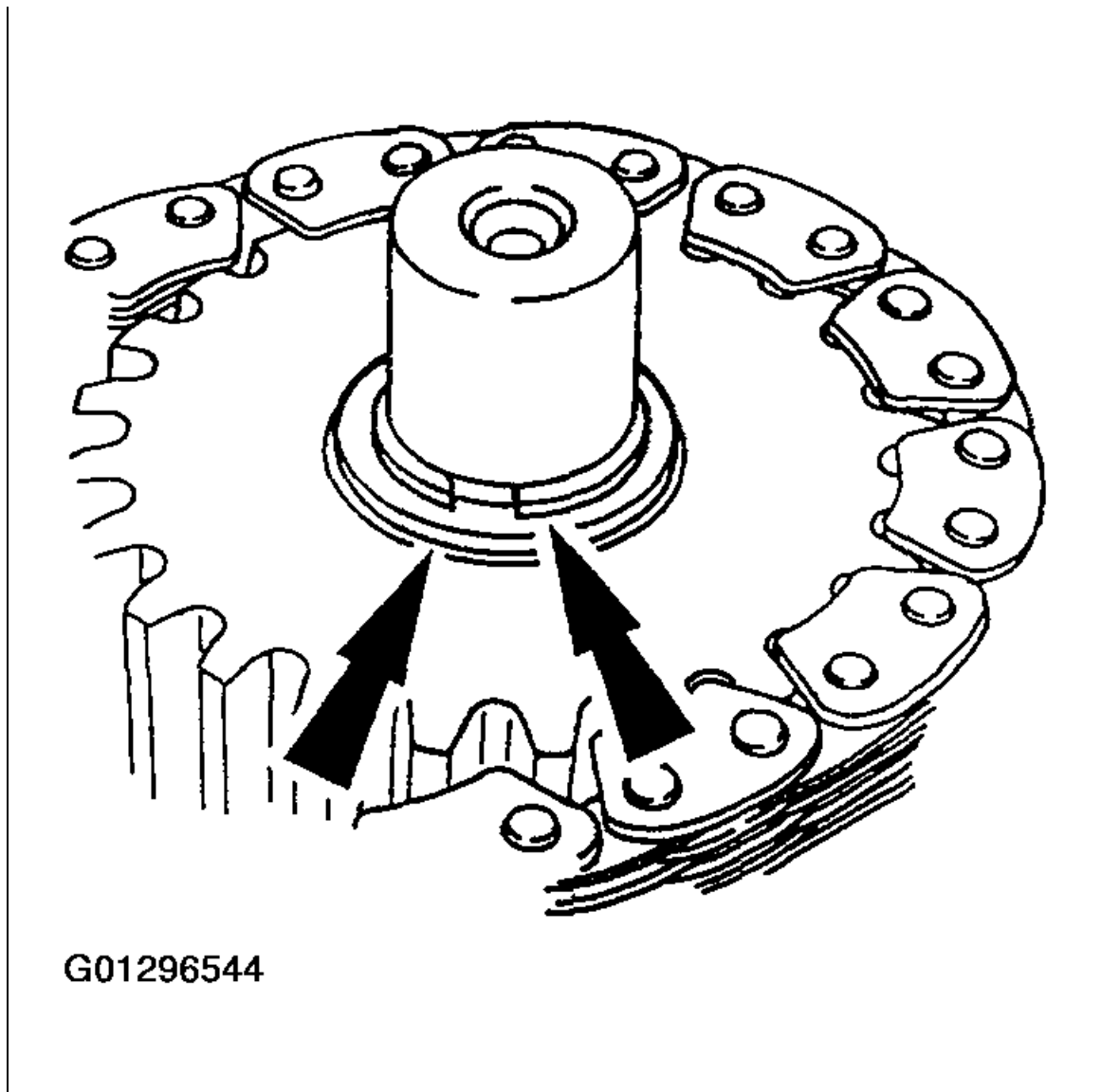


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Courtesy of FORD MOTOR CO.

14. Remove the snap ring and the spacer.

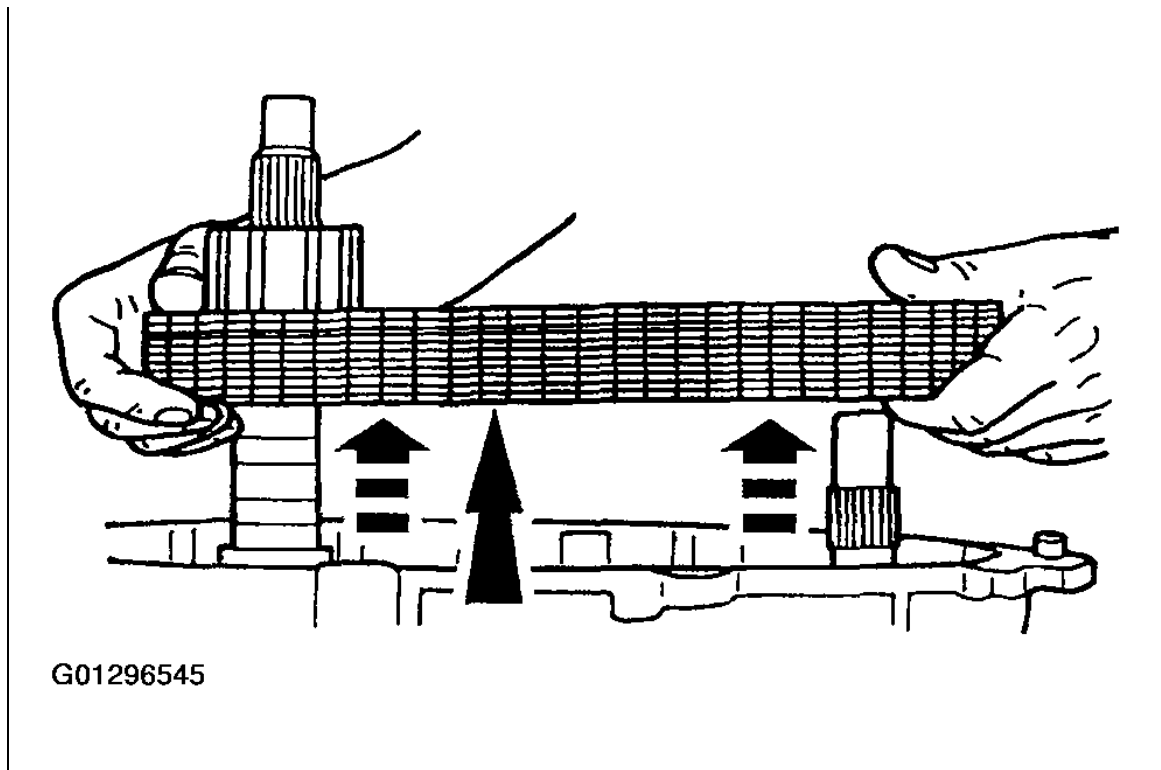
Fig 171: Removing Snap Ring & Spacer



Courtesy of FORD MOTOR CO.

15. Remove the drive chain, the driven sprocket, and the drive sprocket as an assembly.

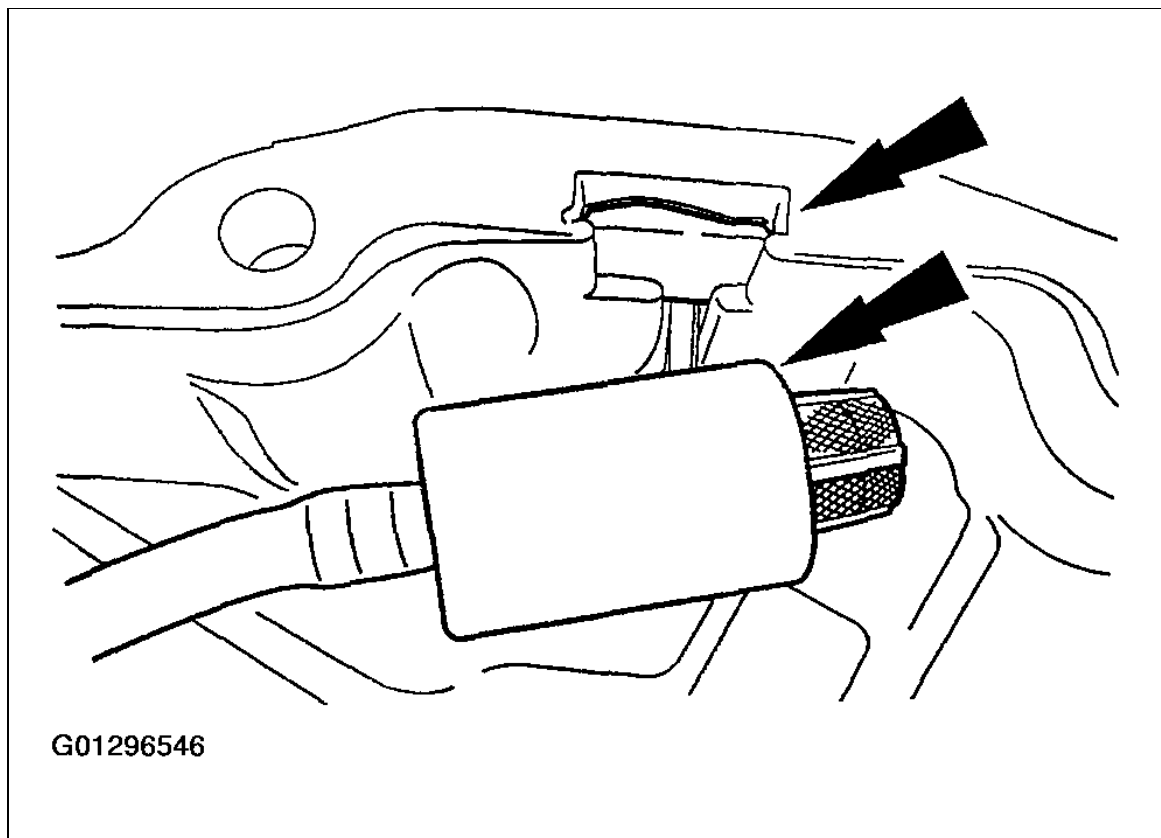
Fig 172: Removing Drive Chain & Driven Sprocket



Courtesy of FORD MOTOR CO.

16. Remove the magnet and the oil strainer from the slot in the transfer case.

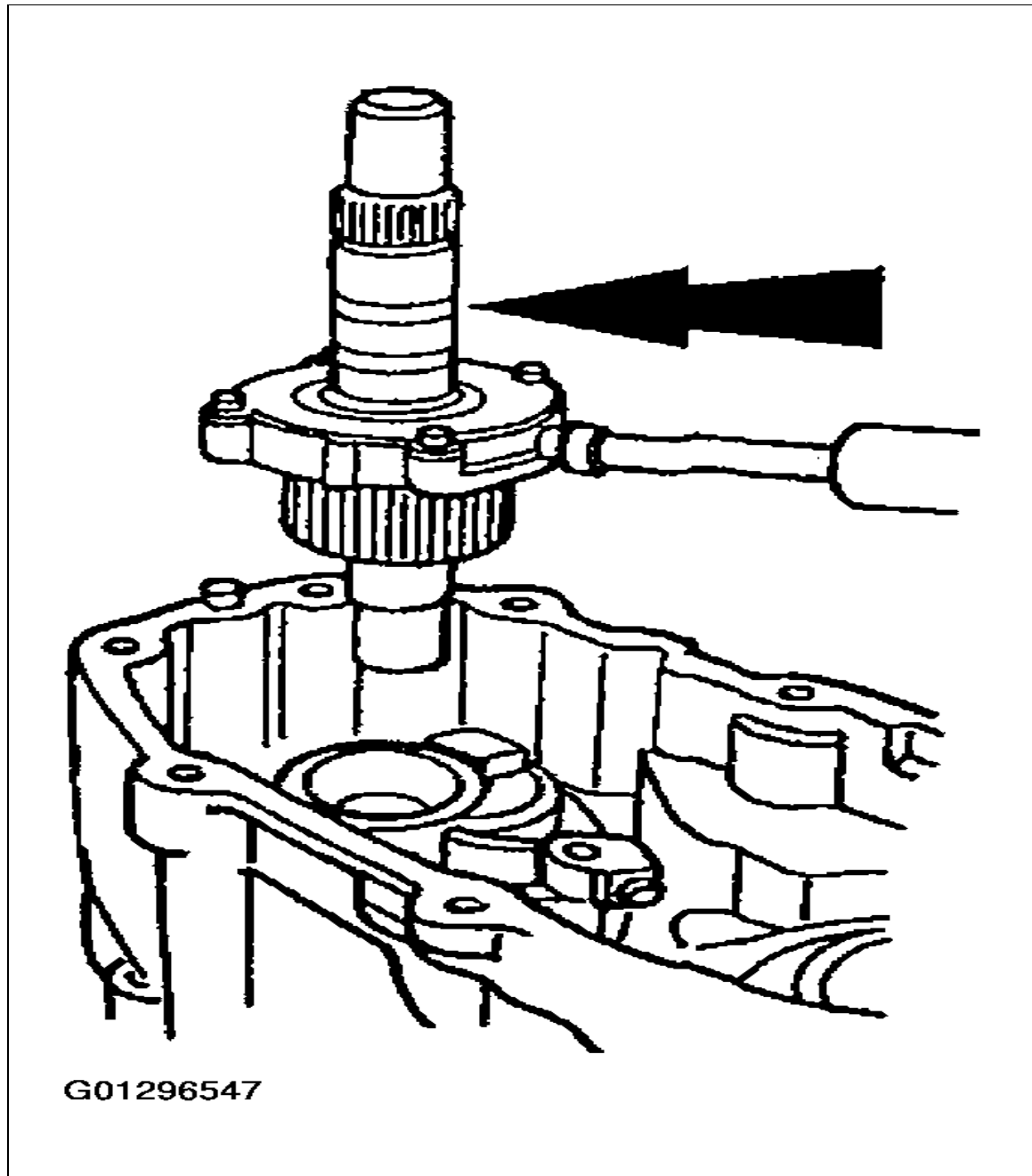
Fig 173: Removing Magnet & Oil Strainer From Slot In Transfer Case



Courtesy of FORD MOTOR CO.

17. Remove the rear output shaft and the pump assembly as an assembly.

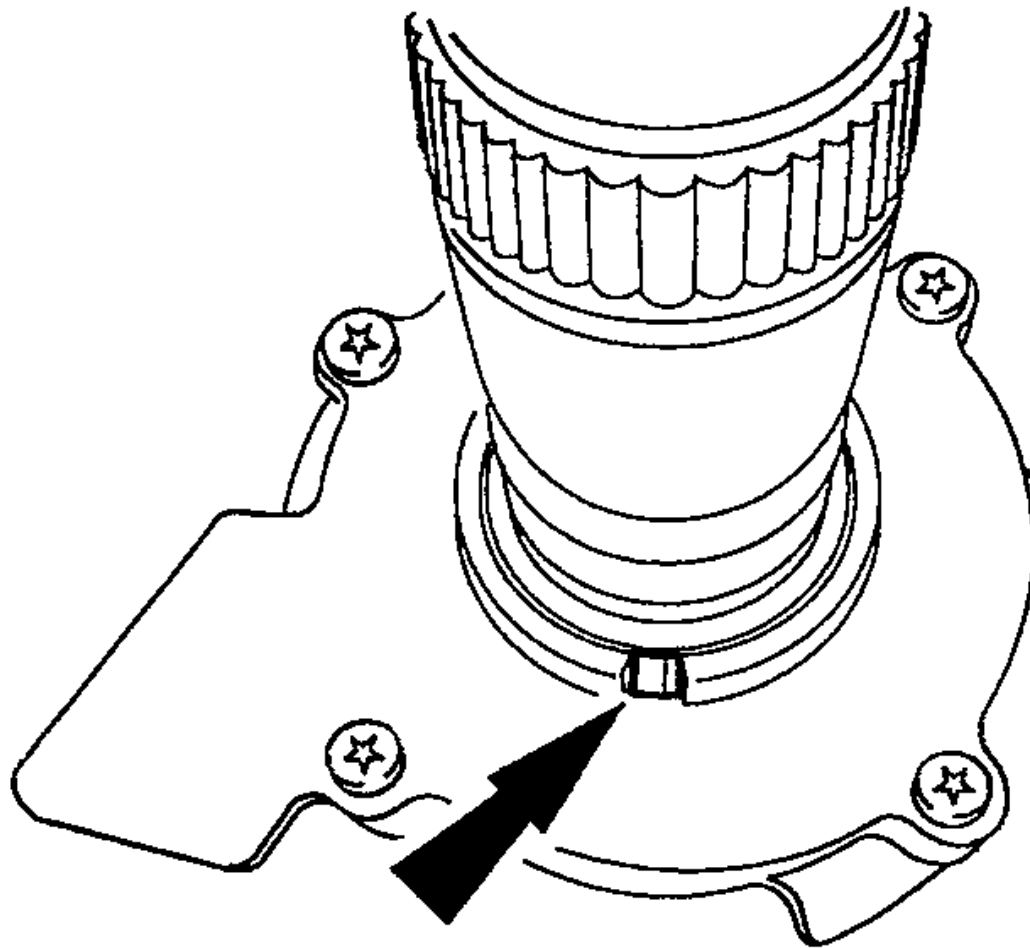
Fig 174: Removing Rear Output Shaft & Pump Assembly



Courtesy of FORD MOTOR CO.

18. Rotate the pump assembly to align the keyway in the cover and the spring pin in the rear output shaft, and separate the pump from the shaft.
1. If it is necessary to install a new spring pin:
 1. Measure and record the spring pin height above the output, shaft diameter
 2. Remove the spring pin.

Fig 175: Rotating Pump Assembly

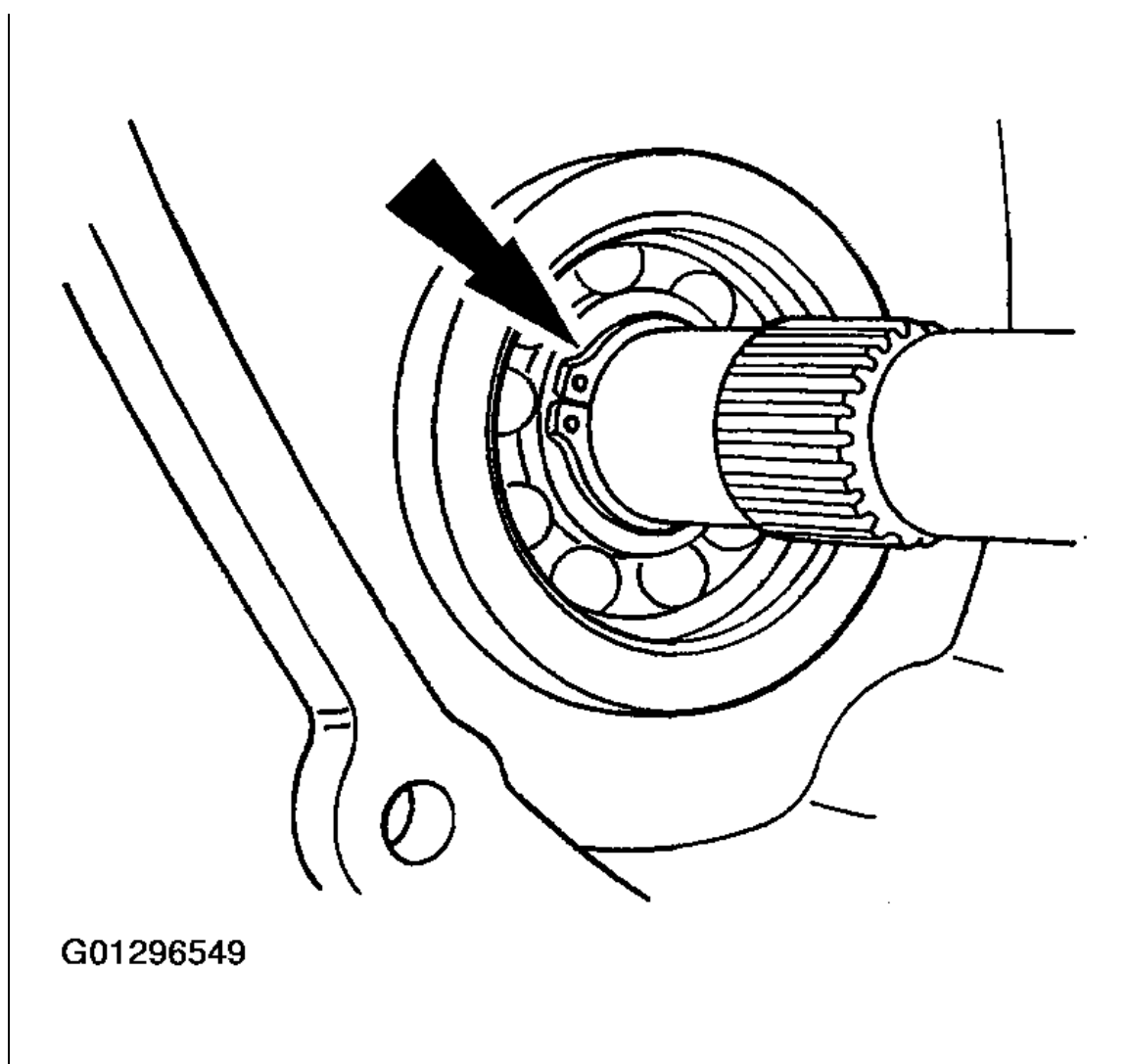
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Courtesy of FORD MOTOR CO.

19. Holding the bottom of the front output shaft, remove the snap ring. Discard the snap ring if deformed during removal. Remove the front output shaft assembly.

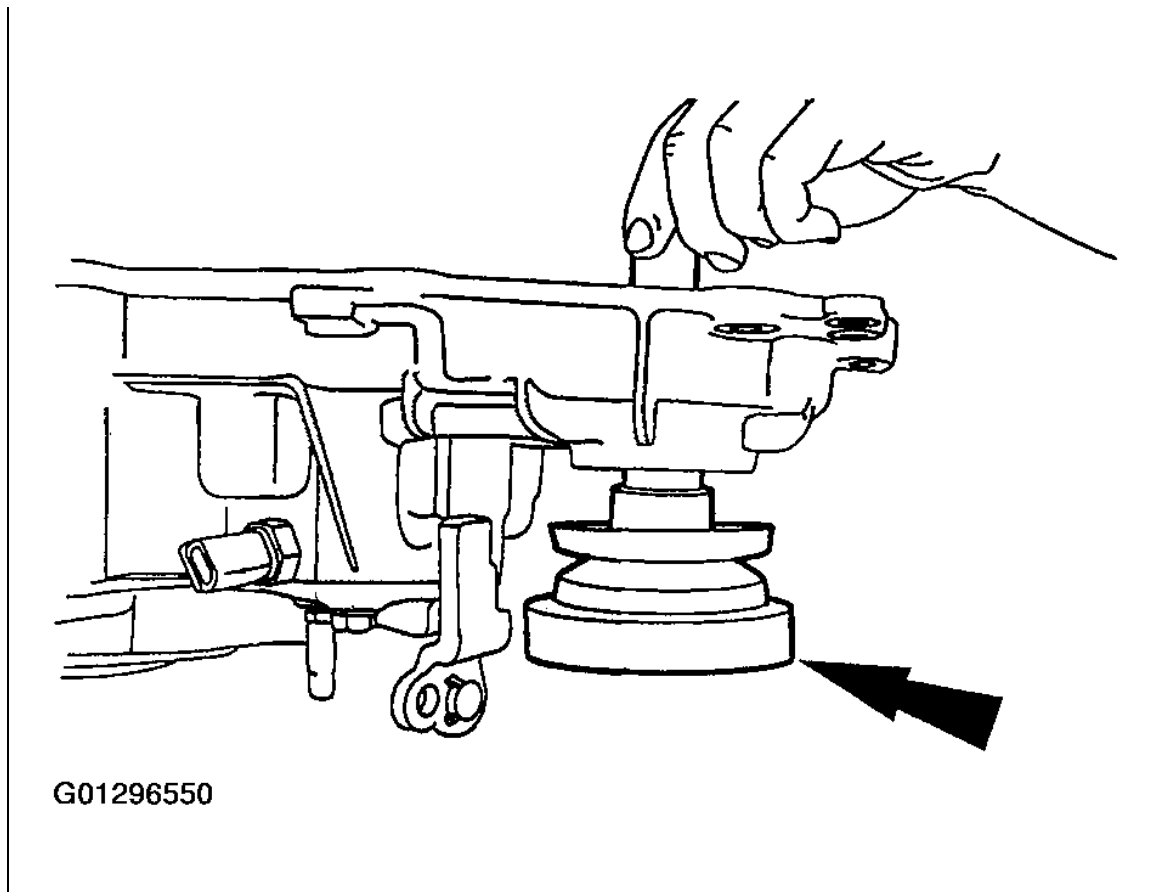
CAUTION: Do not let the front output shaft assembly fall out of the case while removing the snap ring.

Fig 176: Removing Snap Ring



Courtesy of FORD MOTOR CO.

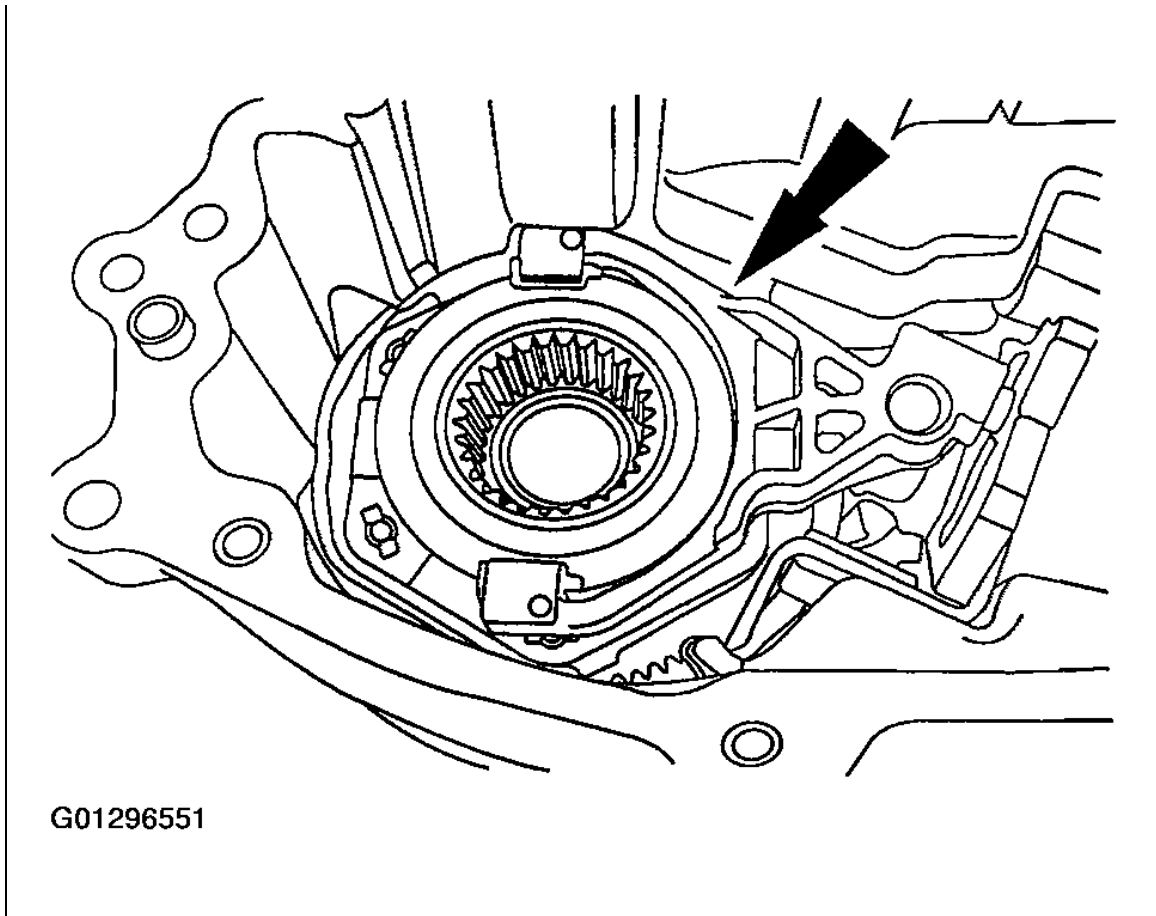
Fig 177: Removing Front Output Shaft Assembly



Courtesy of FORD MOTOR CO.

20. Remove the reduction fork assembly and the reduction hub as an assembly.

Fig 178: Removing Reduction Fork Assembly & Reduction Hub As An Assembly

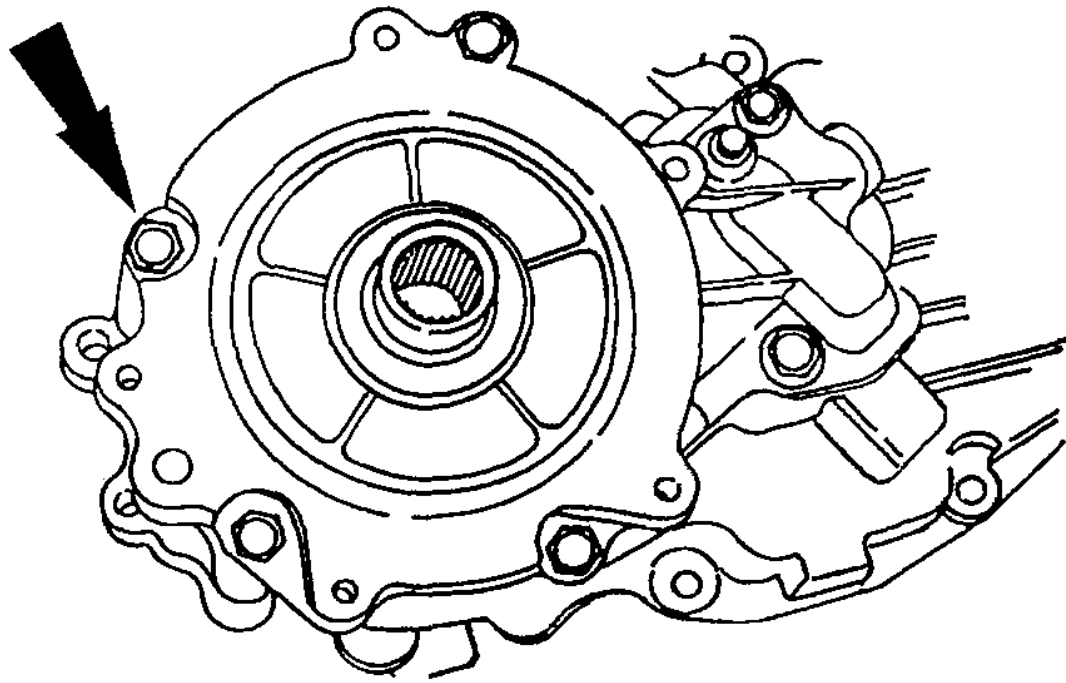


Courtesy of FORD MOTOR CO.

21. Remove the case from the holding fixture and place it on the bench.
22. Remove the front adapter assembly to case bolts.

NOTE: Rotate the front case until the front adapter is pointing upward.

Fig 179: Removing Front Adapter Assembly To Case Bolts

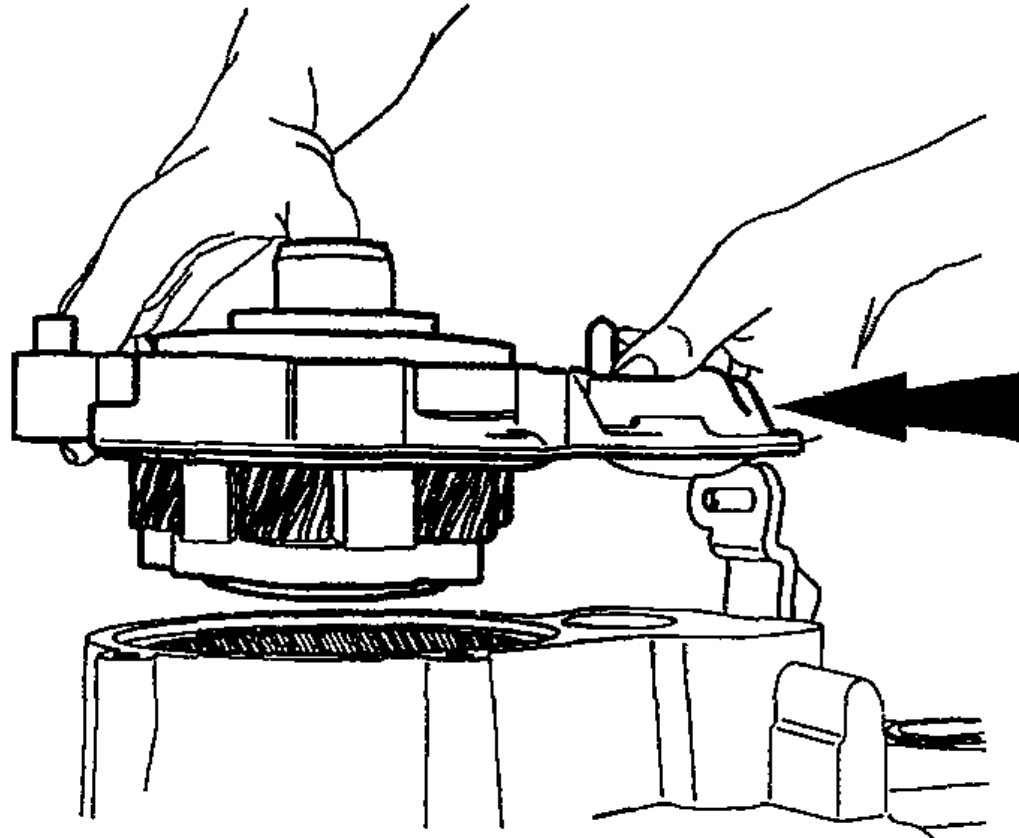


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Courtesy of FORD MOTOR CO.

23. Remove the front adapter, the input shaft, and the complete carrier as an assembly.
 1. Lightly tap around the front adapter to break the seal.
 2. Remove the old sealant. Clean the mating surface of the carrier.

Fig 180: Removing Front Adapter, Input Shaft & Complete Carrier

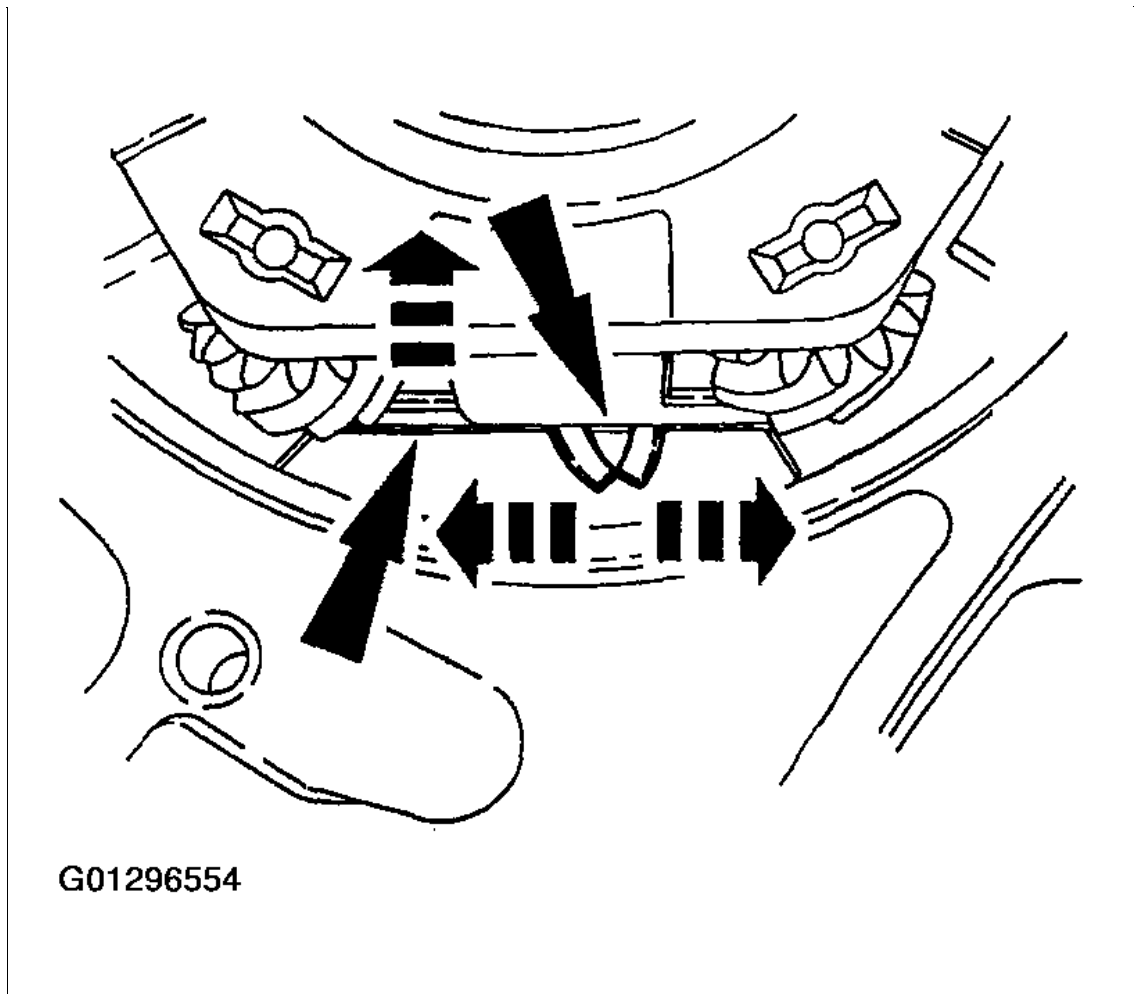


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Courtesy of FORD MOTOR CO.

24. Using snap ring pliers, expand the tangs of the large snap ring and remove the complete carrier assembly and the input shaft assembly from the front adapter.
 1. Expand the tangs of the large snap ring in the main drive gear bearing retainer. With the input shaft against the bench, push the main drive gear bearing retainer down and slide it off the bearing. Lift the input shaft and front planet from the main drive gear bearing retainer.

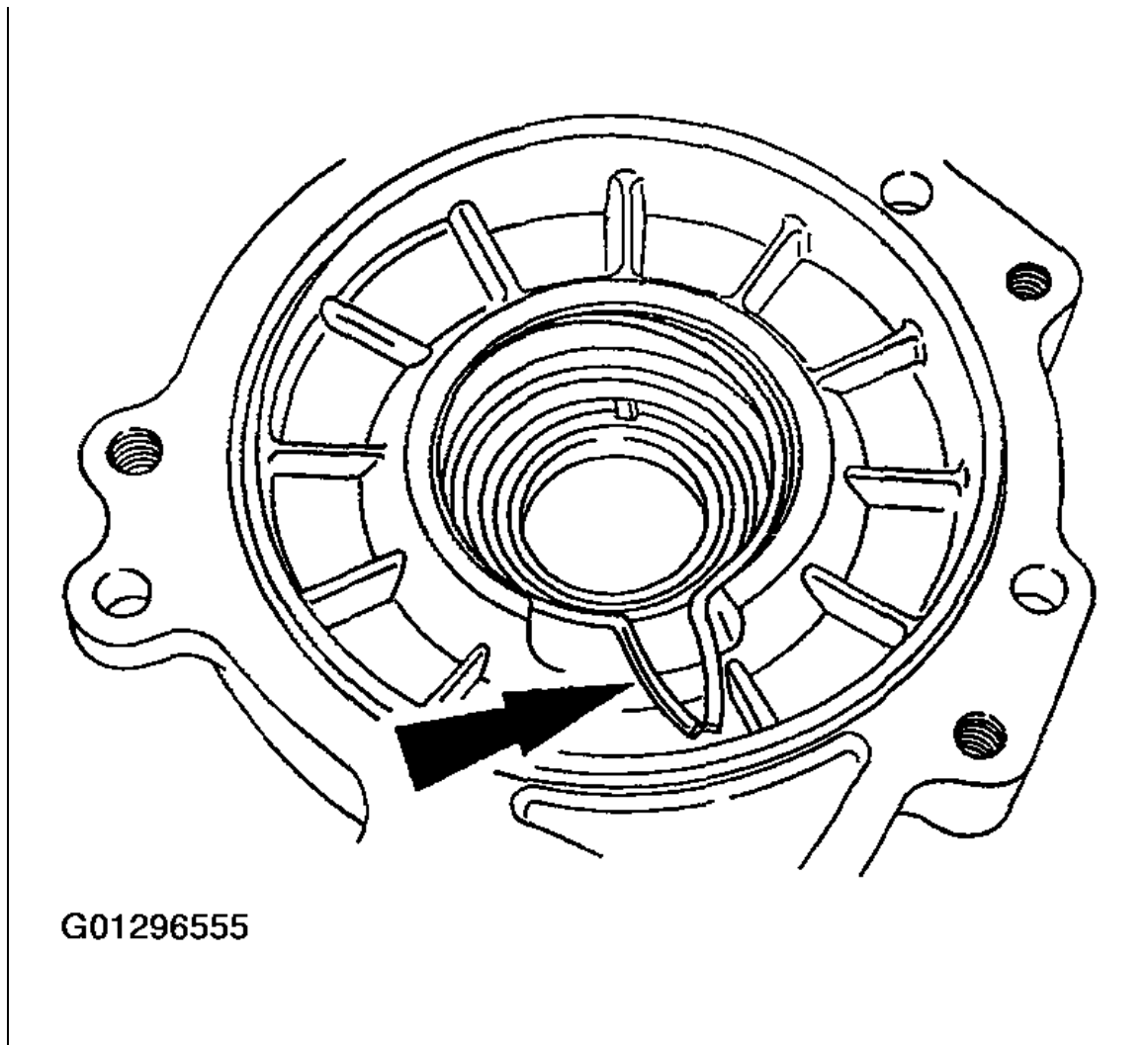
Fig 181: Removing Complete Carrier Assembly & Input Shaft Assembly From Front Adapter



Courtesy of FORD MOTOR CO.

25. Remove the large snap ring from the front adapter.

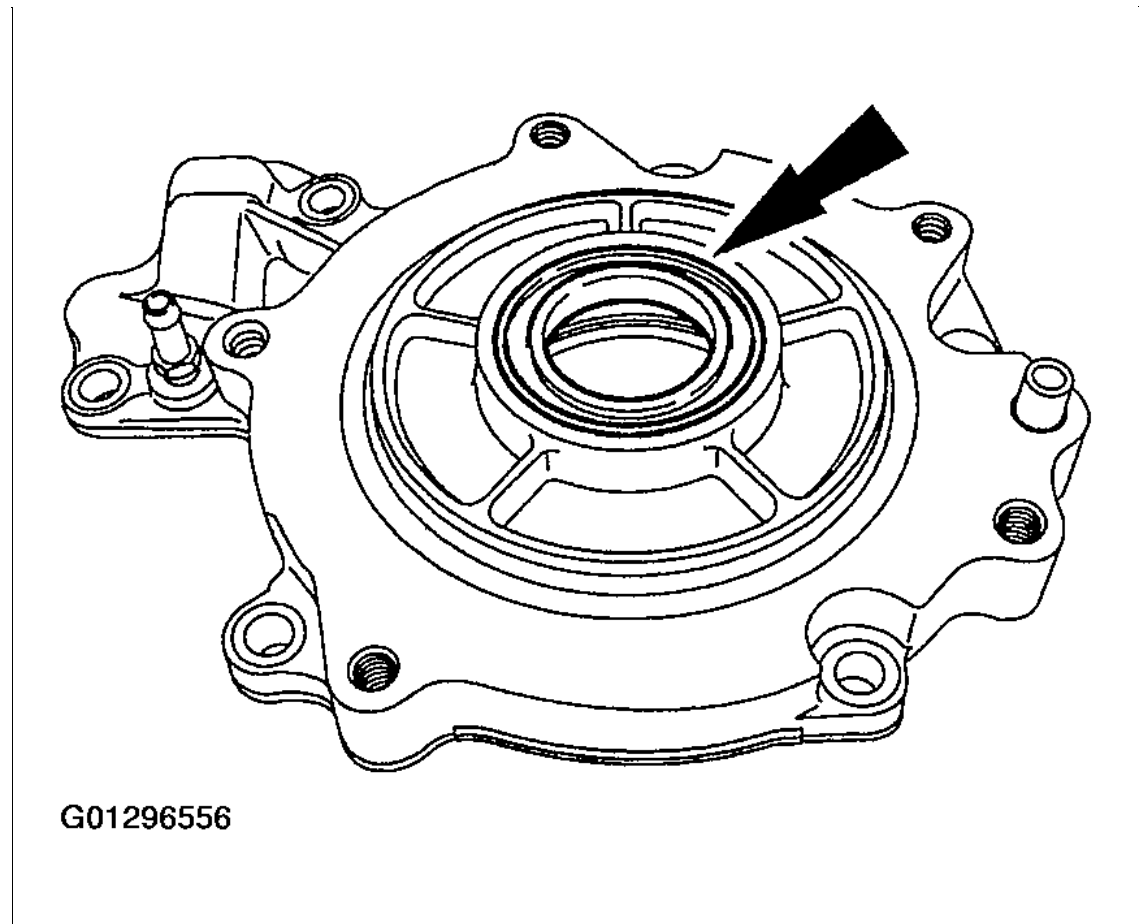
Fig 182: Removing Large Snap Ring From Front Adapter



Courtesy of FORD MOTOR CO.

26. Using a suitable tool, remove the oil seal from the front adapter.
 1. Using a suitable drift, remove from inside the front adapter.

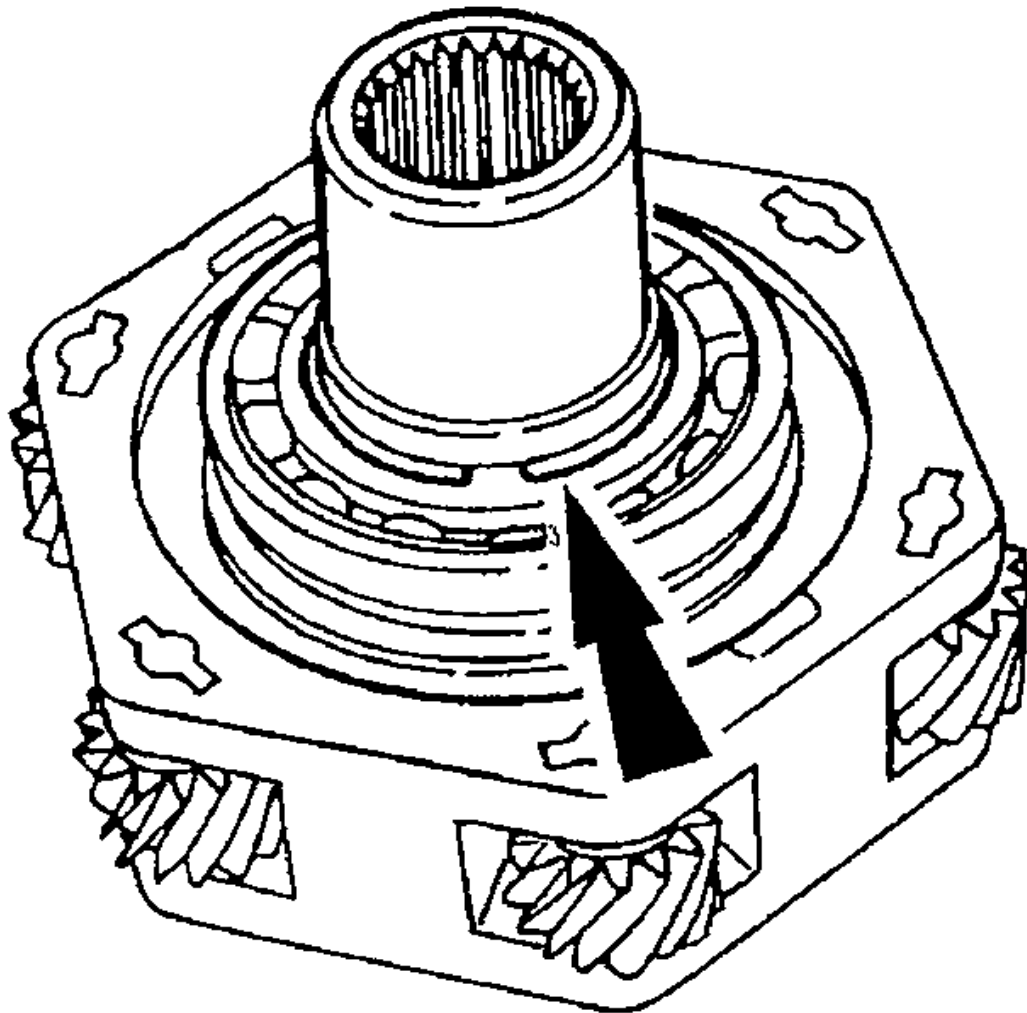
Fig 183: Removing Oil Seal From Front Adapter



Courtesy of FORD MOTOR CO.

27. Remove the snap ring.

Fig 184: Removing Snap Ring

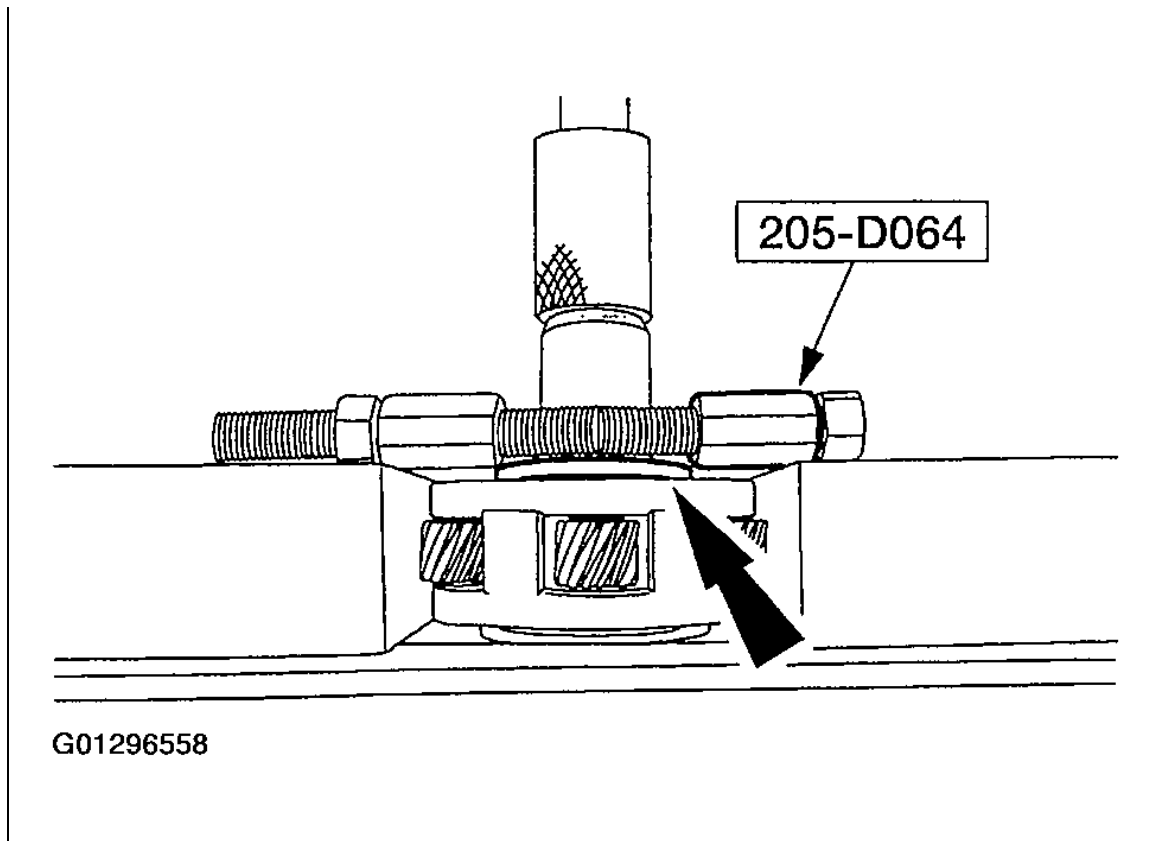


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Courtesy of FORD MOTOR CO.

28. Using the special tool, press the bearing from the input shaft.

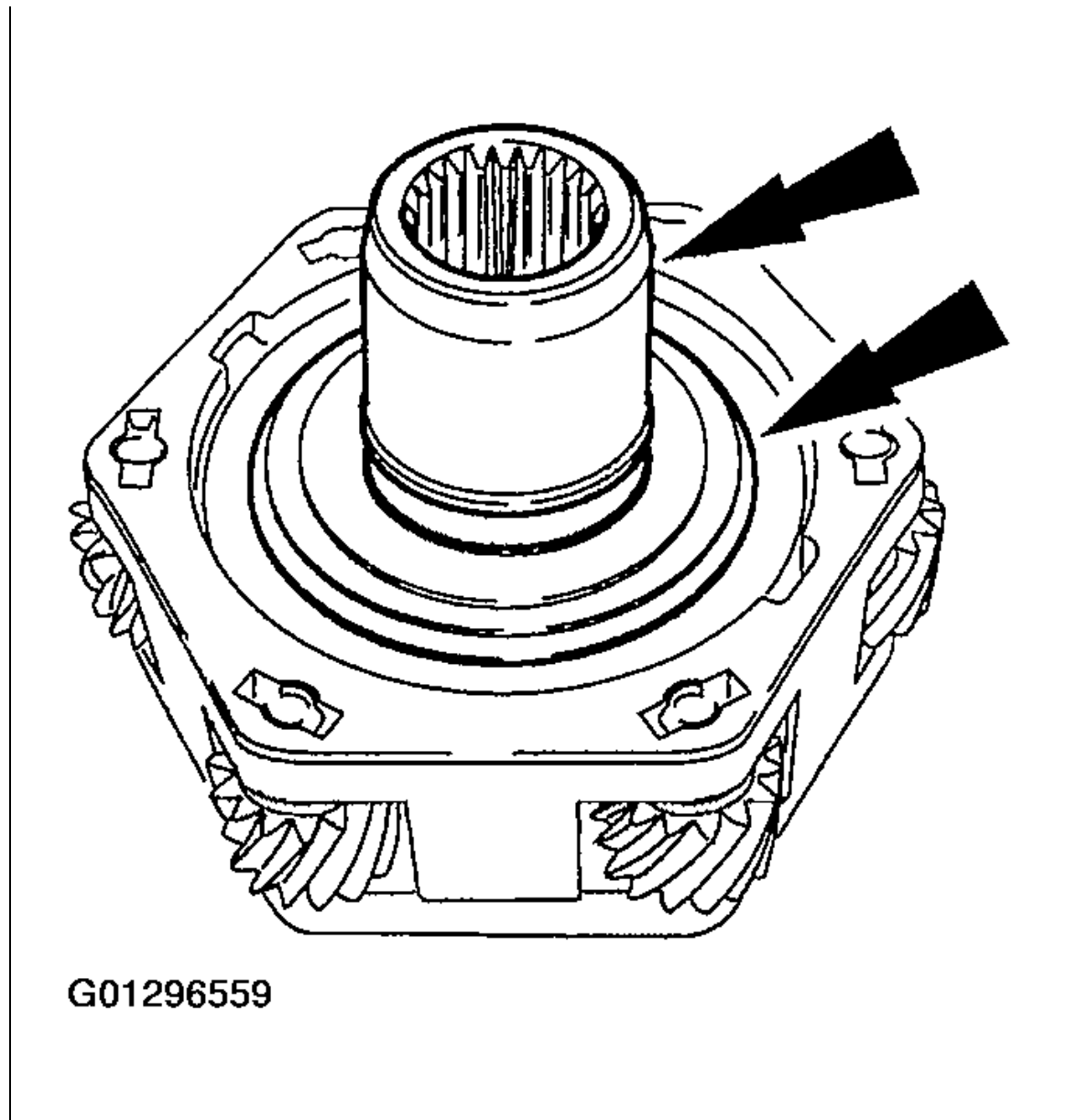
Fig 185: Pressing Bearing From Input Shaft



Courtesy of FORD MOTOR CO.

29. Remove the thrust washer and the input shaft assembly.

Fig 186: Removing Thrust Washer & Input Shaft Assembly

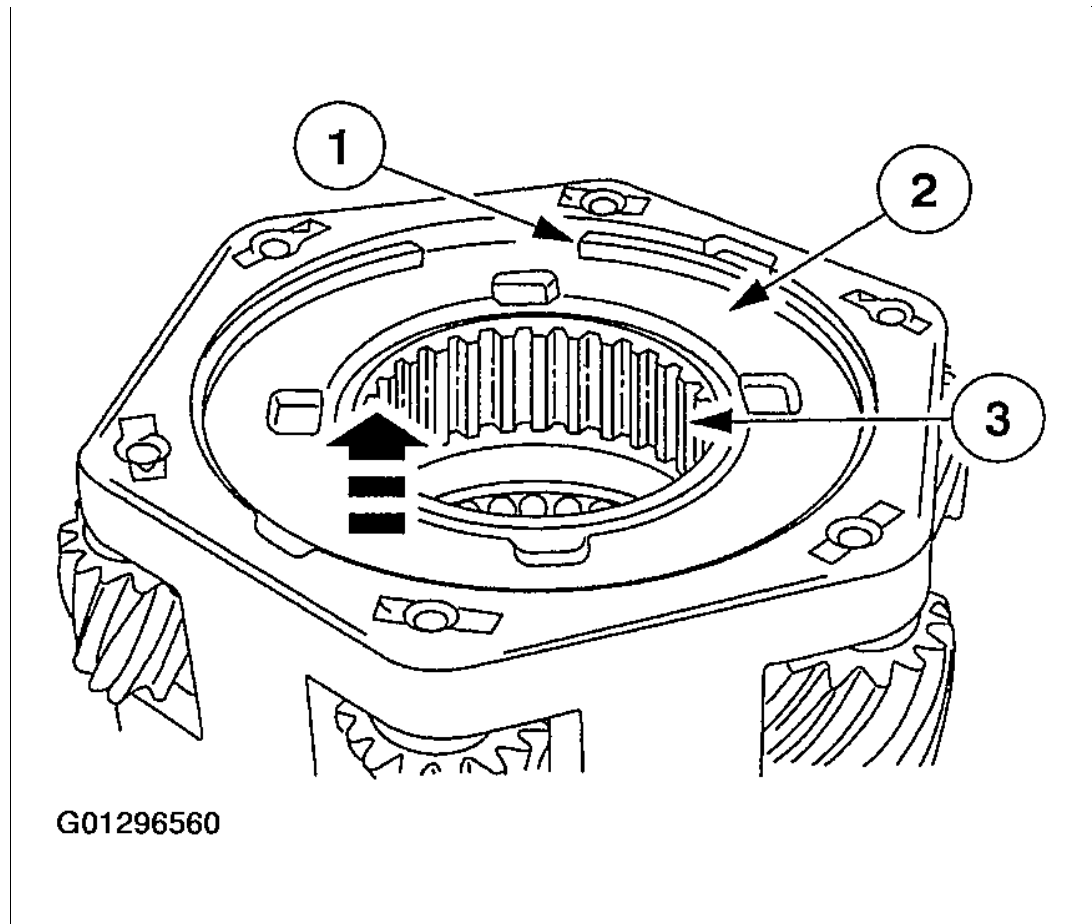


Courtesy of FORD MOTOR CO.

30. Disassemble the planetary gear

1. Remove the snap ring.
2. Remove the thrust plate.
3. Remove the sun gear.

Fig 187: Disassembling Planetary Gear

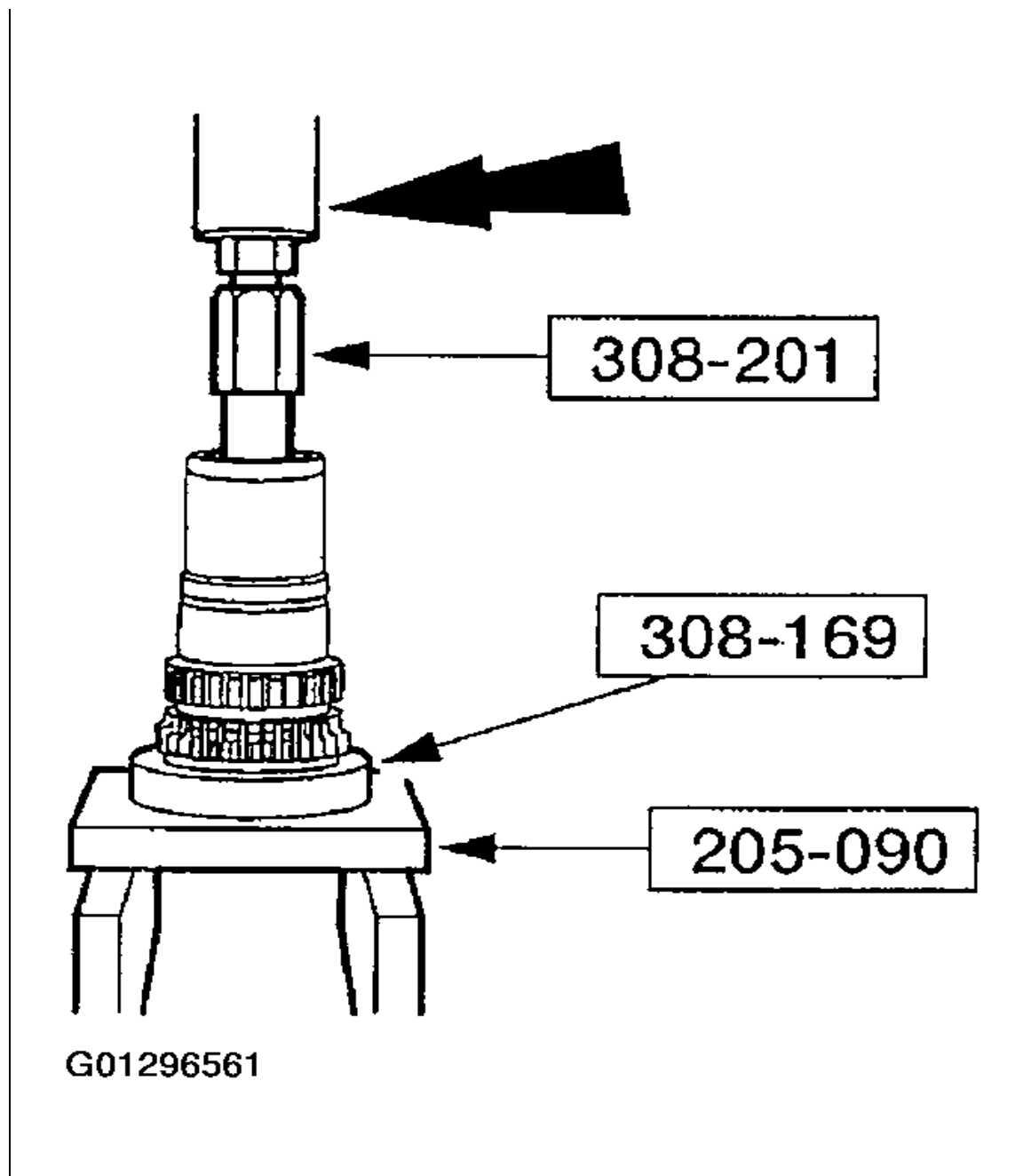


Courtesy of FORD MOTOR CO.

31. Using the special tools and a suitable press, remove the needle bearing and the sleeve bearing from the input shaft.

NOTE: *Inspect the bushing and bearing. If either one is worn or damaged, remove and discard both the bushing and the needle bearing. Install new ones as a set.*

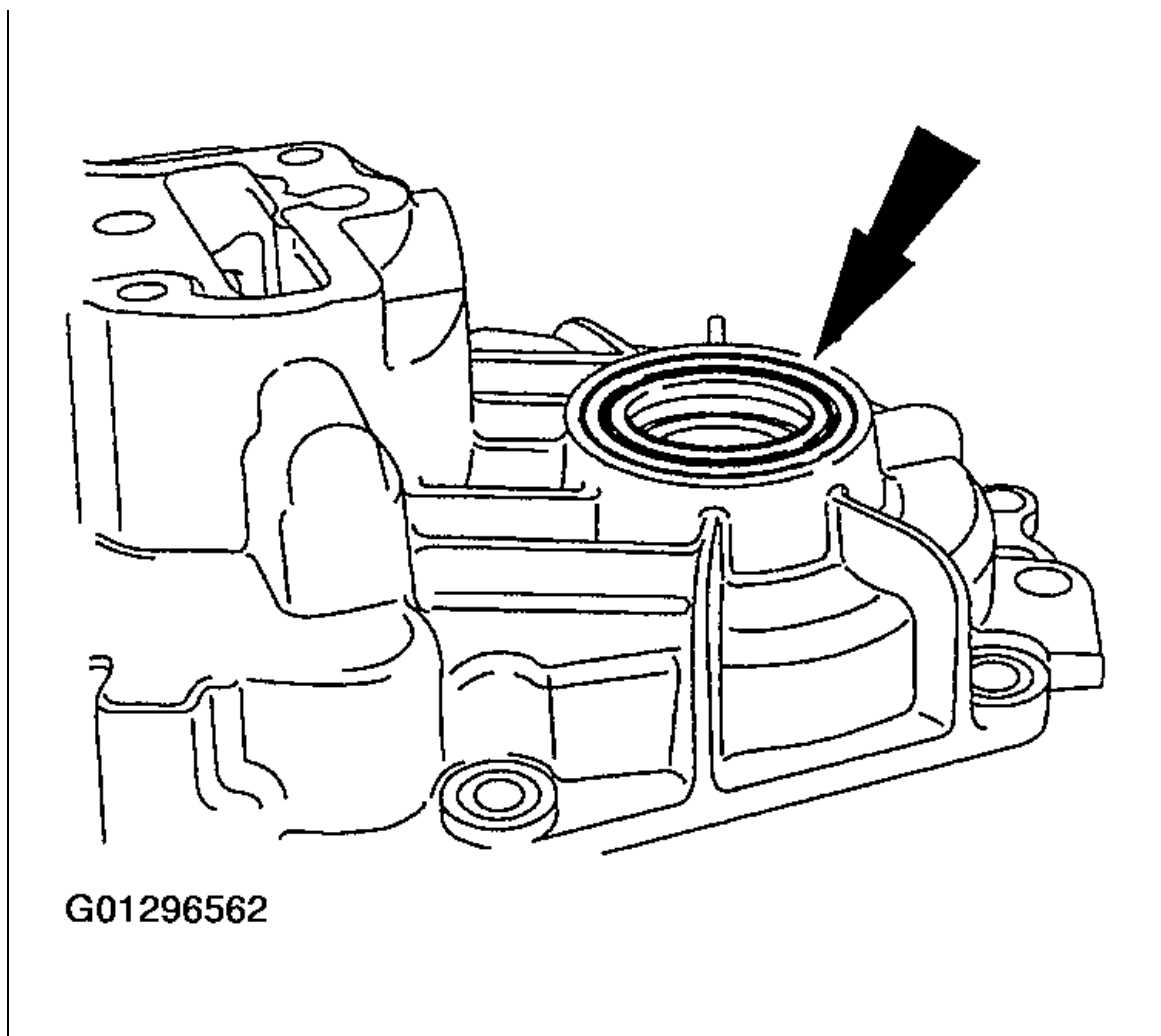
Fig 188: Removing Needle Bearing & Sleeve Bearing From Input Shaft



Courtesy of FORD MOTOR CO.

32. Using a suitable tool, remove the oil seal.

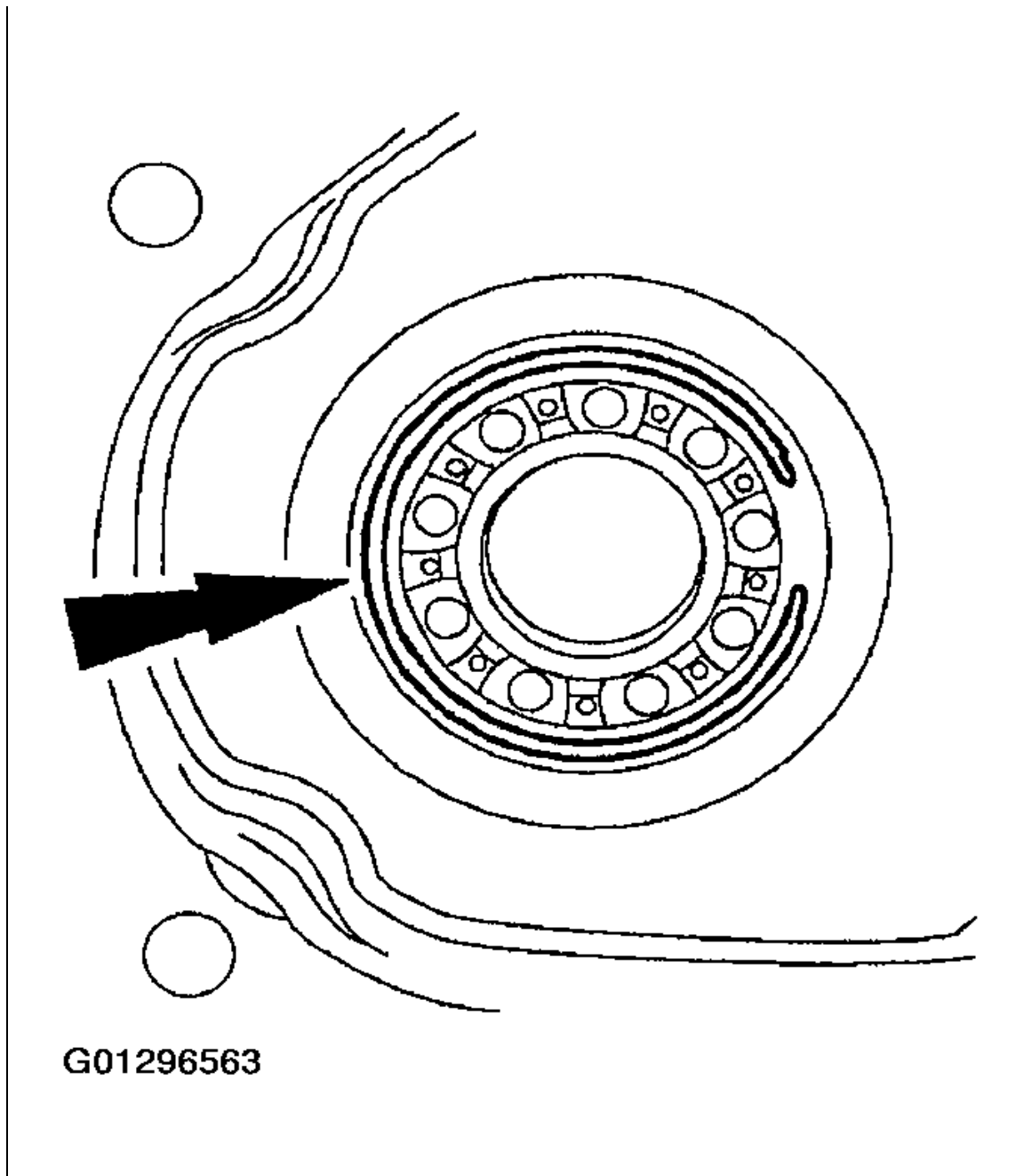
Fig 189: Removing Oil Seal



Courtesy of FORD MOTOR CO.

33. Remove the snap ring retaining the bearing to the case.

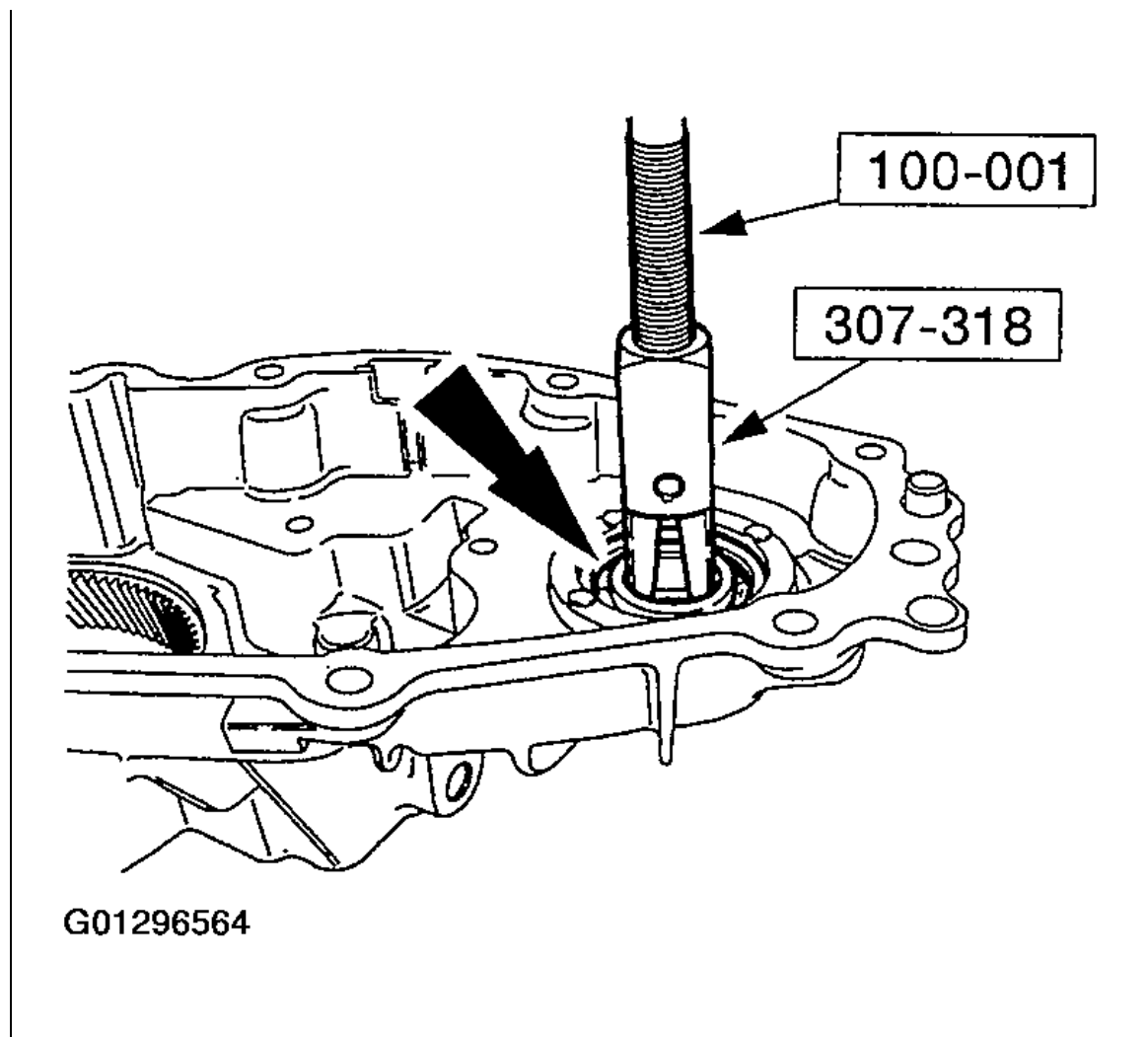
Fig 190: Removing Snap Ring Retaining Bearing To Case



Courtesy of FORD MOTOR CO.

34. Using the special tools, remove the bearing.

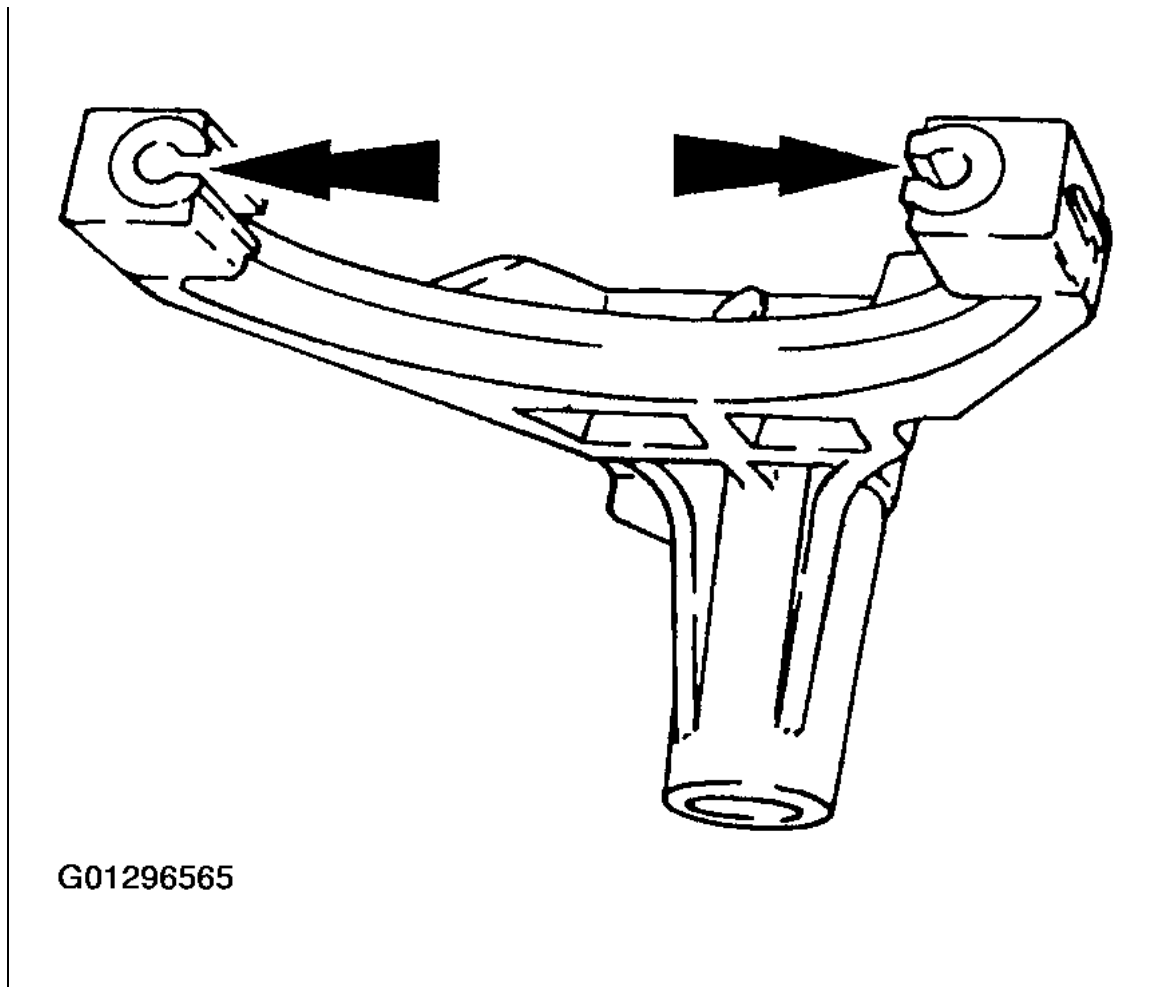
Fig 191: Removing Bearing



Courtesy of FORD MOTOR CO.

35. Remove the shift fork facings.

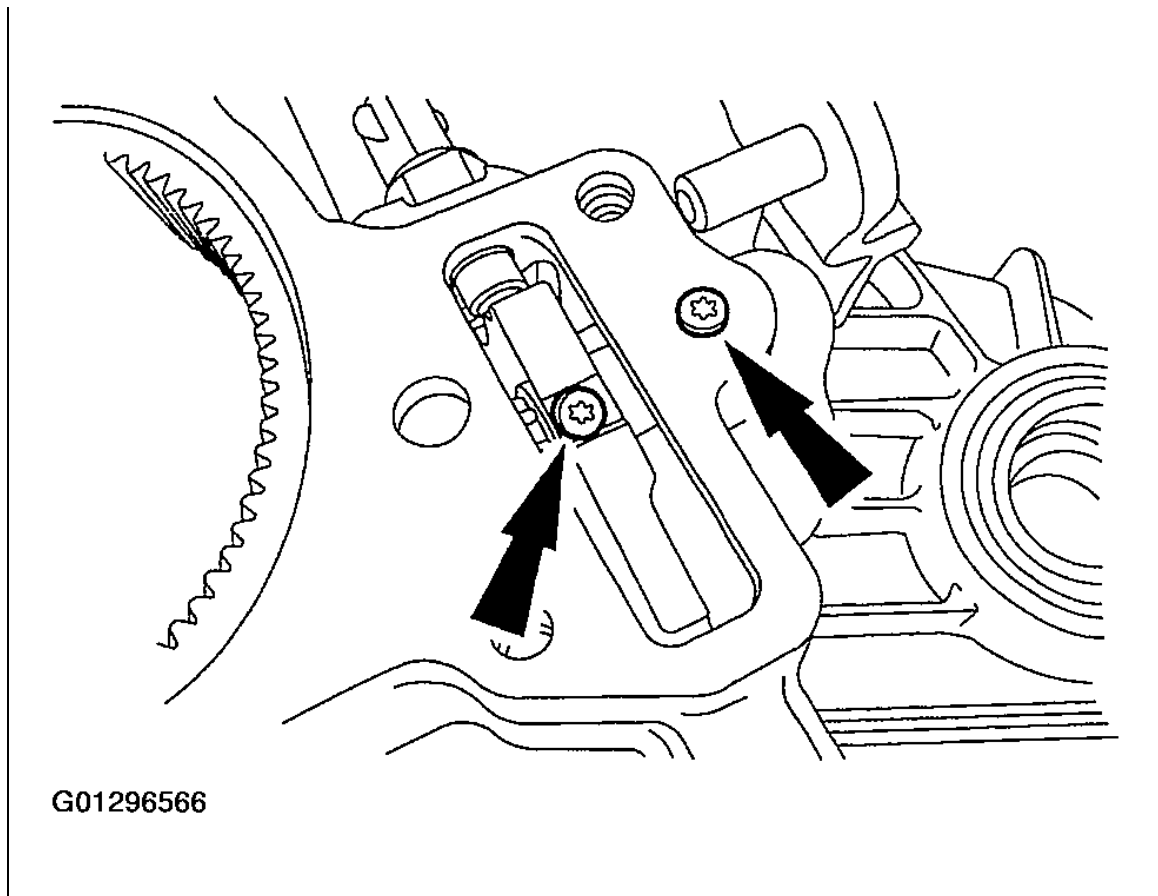
Fig 192: Removing Shift Fork Facings



Courtesy of FORD MOTOR CO.

36. Remove the set screws.

Fig 193: Removing Set Screws



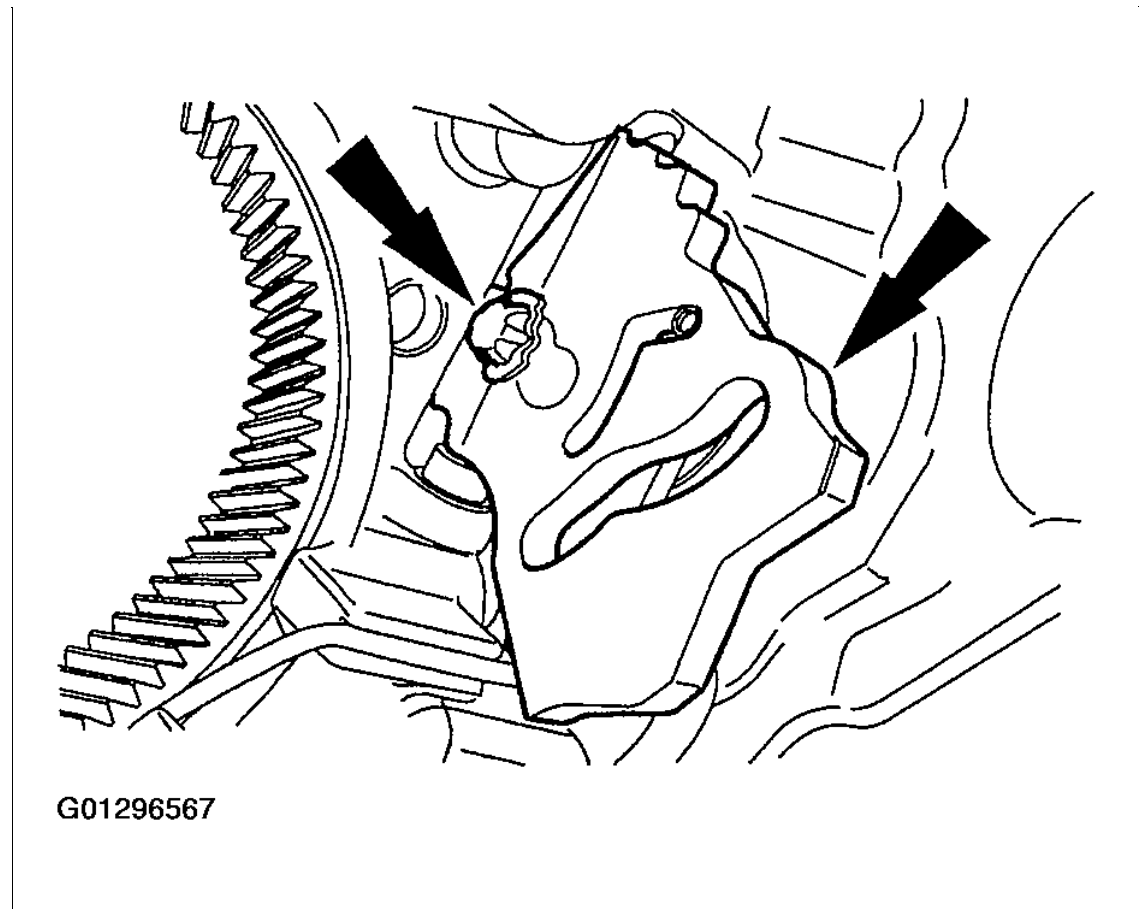
Courtesy of FORD MOTOR CO.

37. Remove the clip, then pry the shift shaft out of the front case and the shift cam.

NOTE: The shift lever and shift cam do not have to be disassembled unless new components are being installed. Turn the front case over.

1. Remove and discard the O-ring from the shift shaft.

Fig 194: Removing Clip & Prying Shift Shaft Out Of Front Case & Shift Cam



Courtesy of FORD MOTOR CO.

38. Remove the four-wheel drive switch.

Fig 195: Removing Four-Wheel Drive Switch



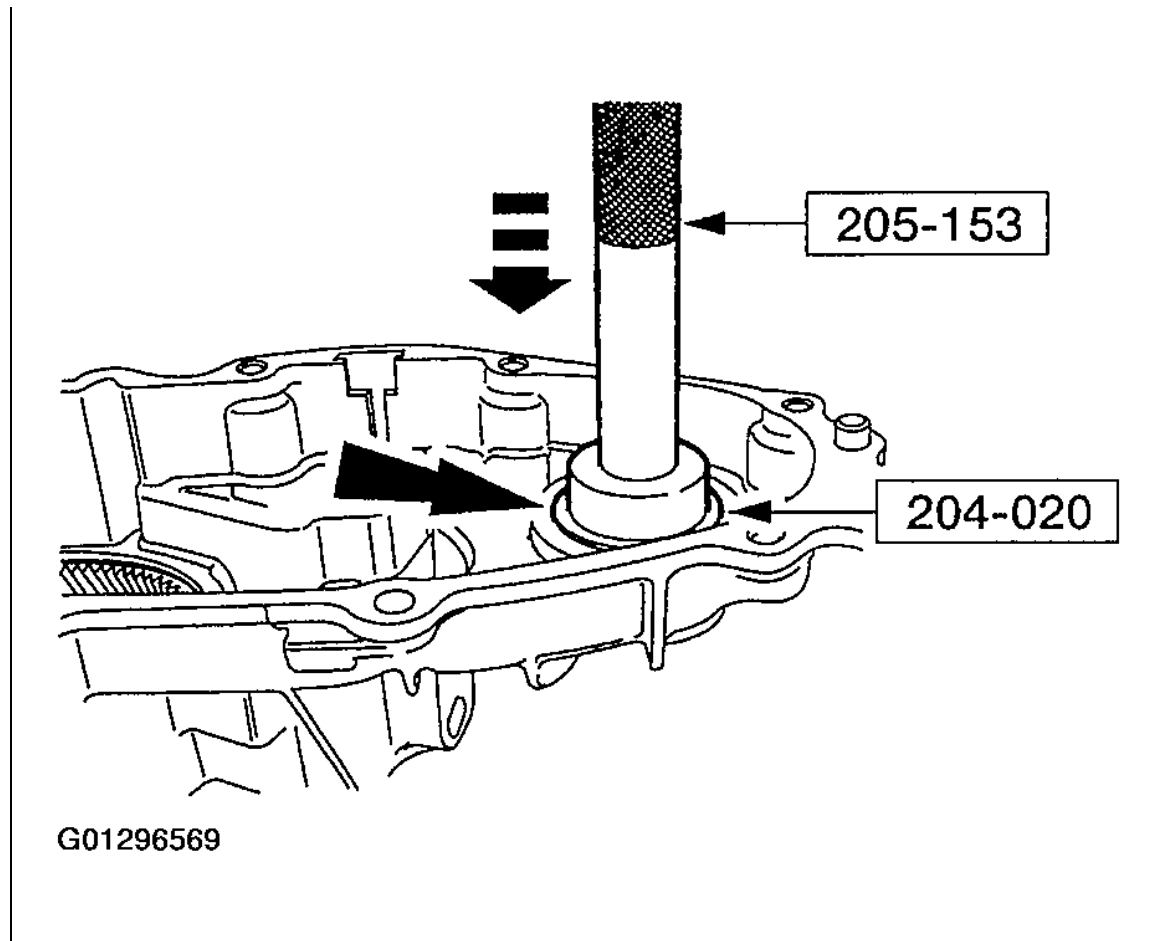
Courtesy of FORD MOTOR CO.

Assembly

NOTE: Prior to assembly, lubricate all parts with MERCON® Multi-Purpose (ATF) Transmission Fluid.

1. Using the special tools, press a new bearing into the transfer case.

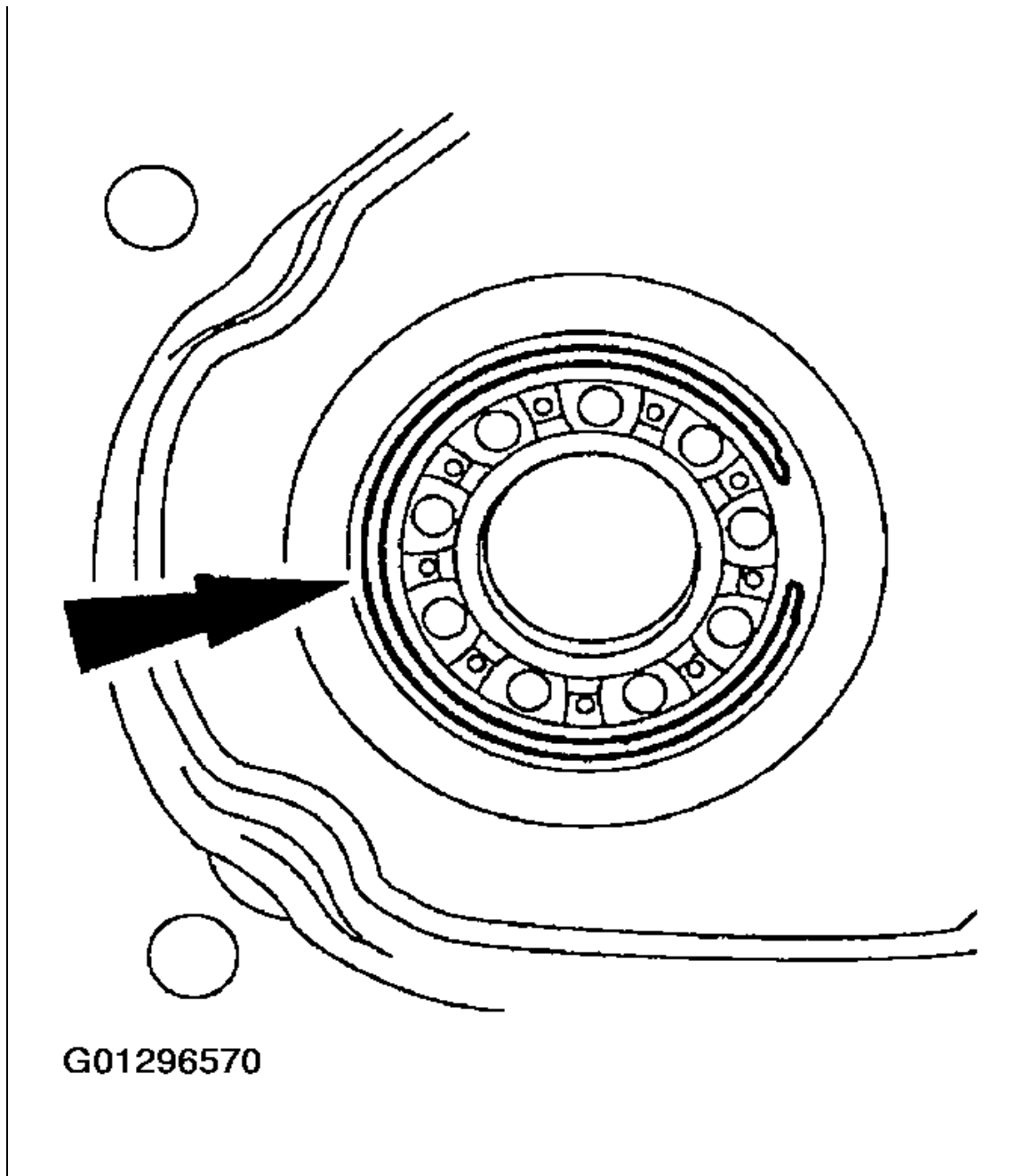
Fig 196: Pressing Bearing Into Transfer Case



Courtesy of FORD MOTOR CO.

2. Install the snap ring.

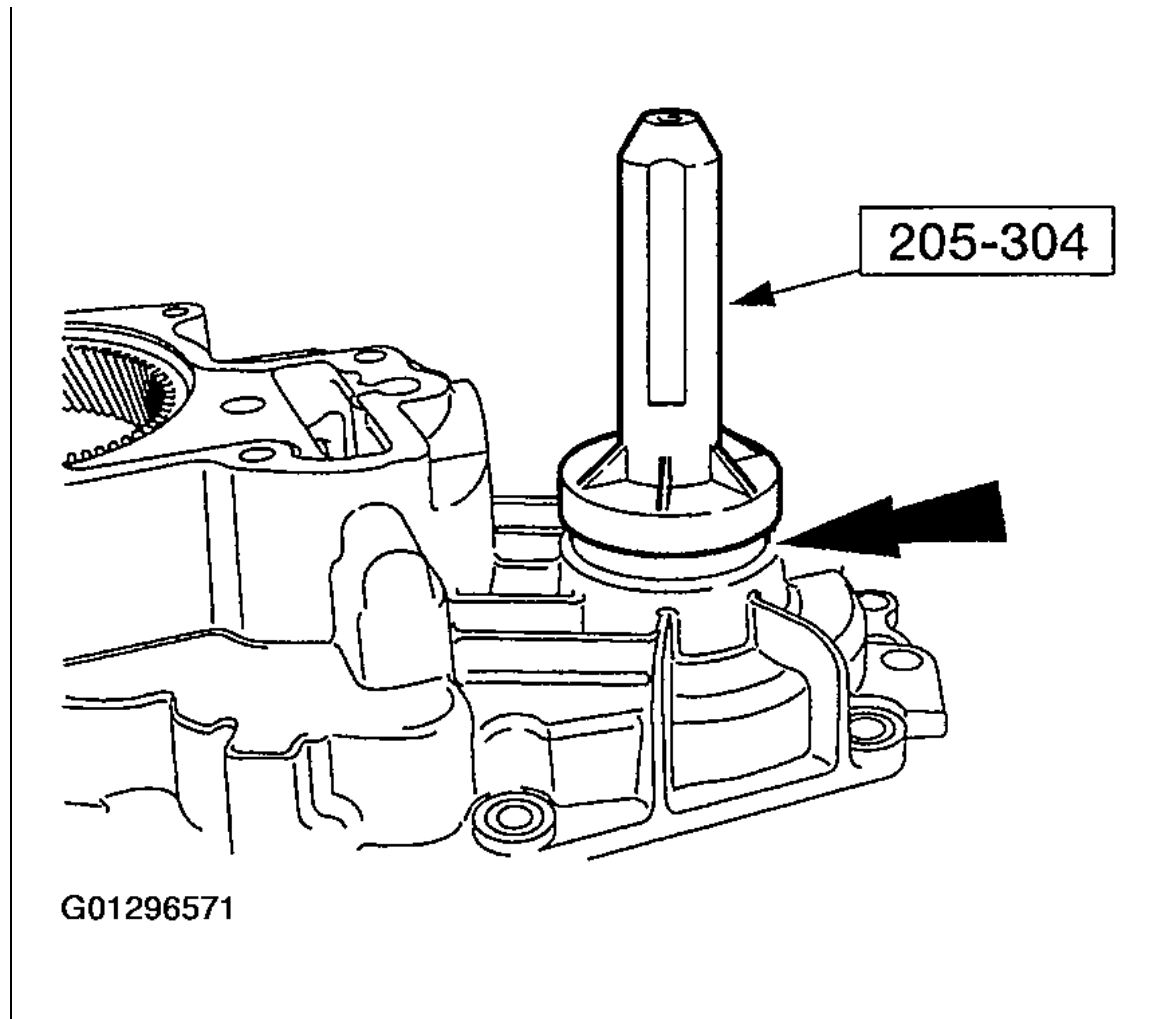
Fig 197: Installing Snap Ring



Courtesy of FORD MOTOR CO.

3. Using the special tool, install the oil seal.

Fig 198: Installing Oil Seal



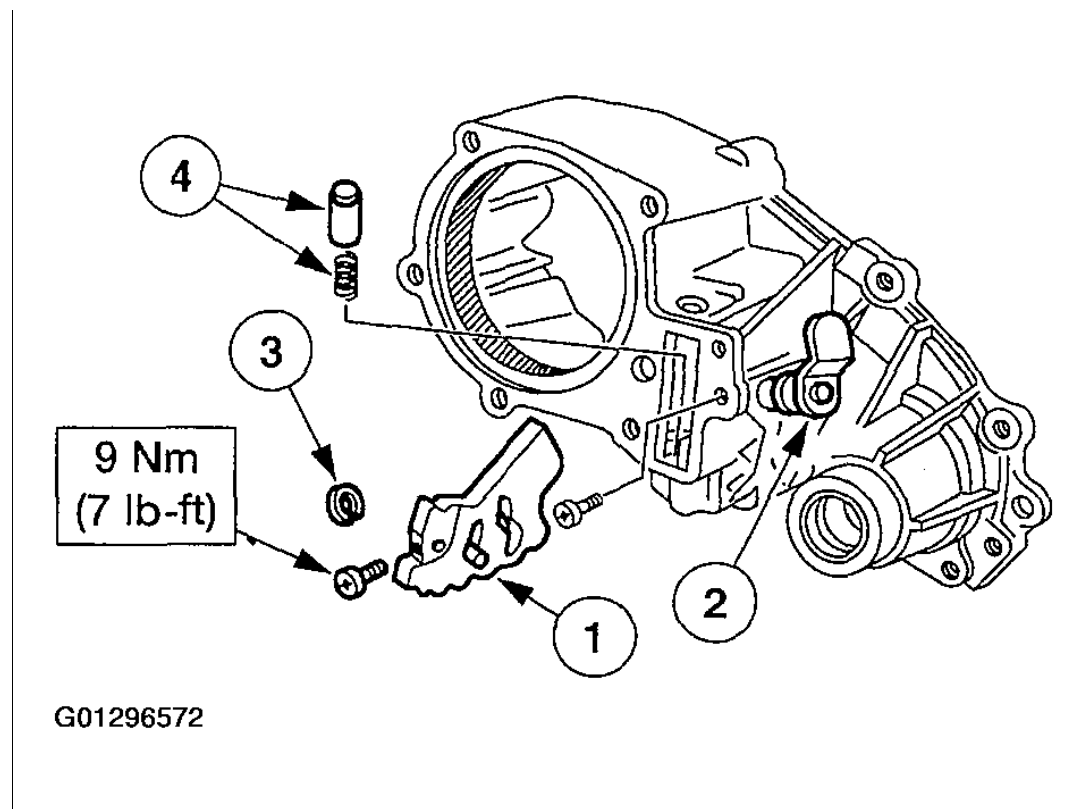
Courtesy of FORD MOTOR CO.

4. Install the shift mechanism into the case.

NOTE: Fill the second groove of the shift shaft with grease, and install a new O-ring.

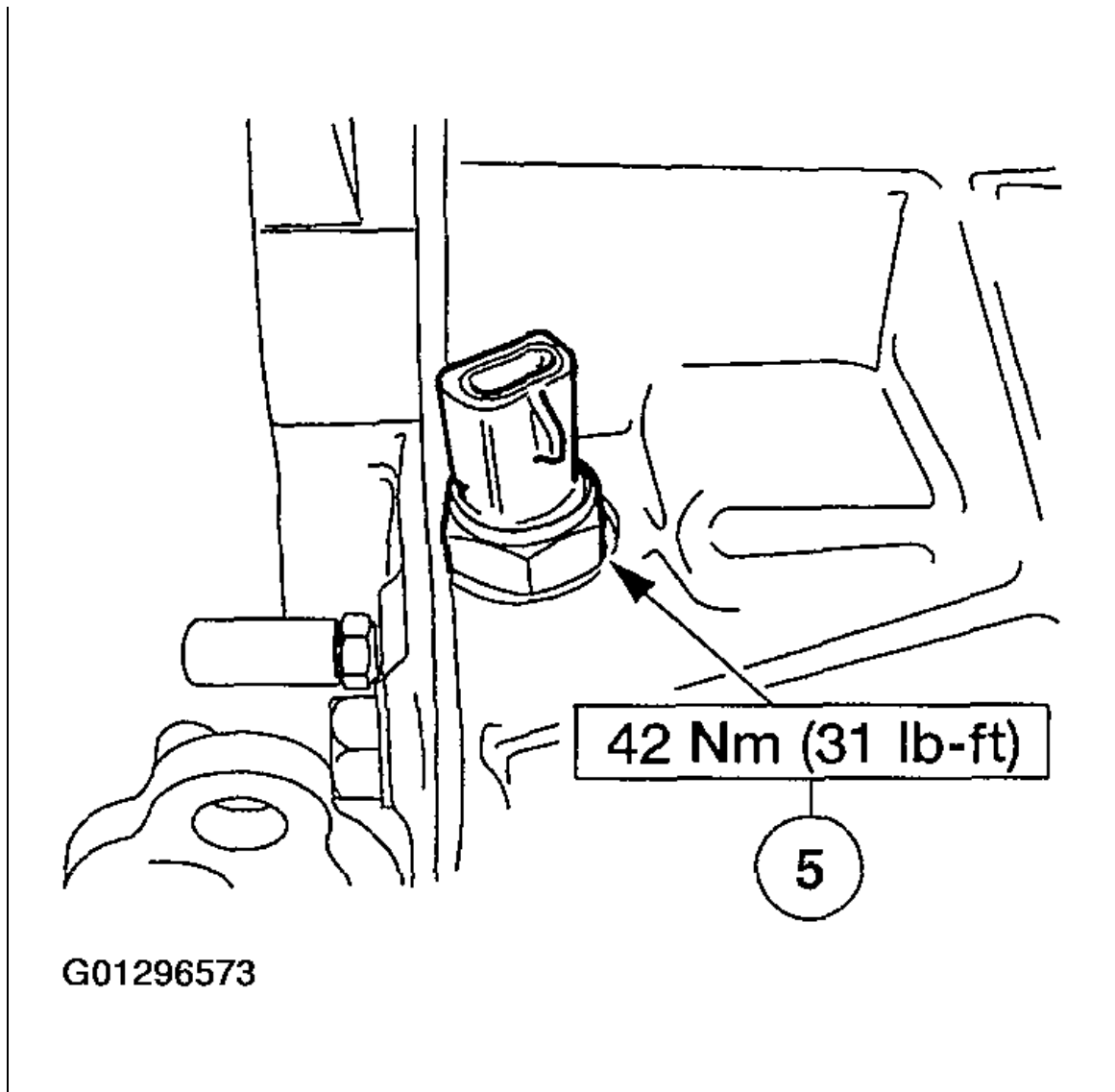
1. Install the shift cam.
2. Install the shift shaft.
3. Install the clip.
4. Install the detent.
5. Install the four-wheel drive switch.

Fig 199: Installing Shift Mechanism Into Case



Courtesy of FORD MOTOR CO.

Fig 200: Installing Four-Wheel Drive Switch



Courtesy of FORD MOTOR CO.

5. After the shift cam, shift shaft and C-clip have been installed in the front case and with the shift shaft positioned in the 4H detent position, place the spring roller into part-position on the 90 degree bent tang of the spring and insert the roller into the spring/roller slot of the shift cam. Position the middle section of the spring into the groove of the front case pivot boss and push to lock the upper end of the assist spring behind the front case spring anchor tab.

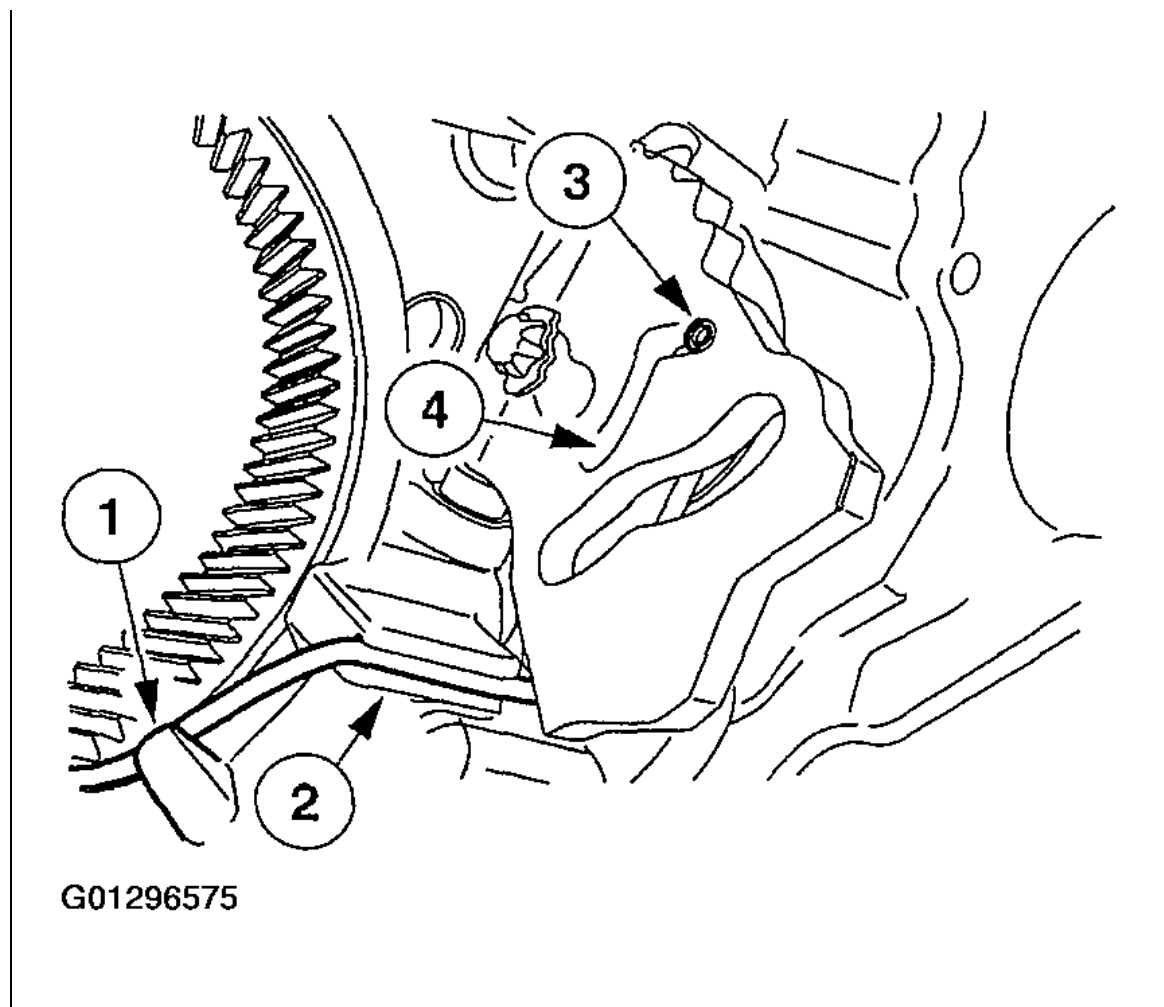
Fig 201: Component Identification Table

Item	Description
1	Anchor Tab
2	Pivot Boss
3	Roller On 90 Degree Bent Tang
4	Spring Roller Slot
5	Spring
6	Shift Cam
7	Detent Spring
8	Detent Plunger
9	Four-Wheel Drive Switch

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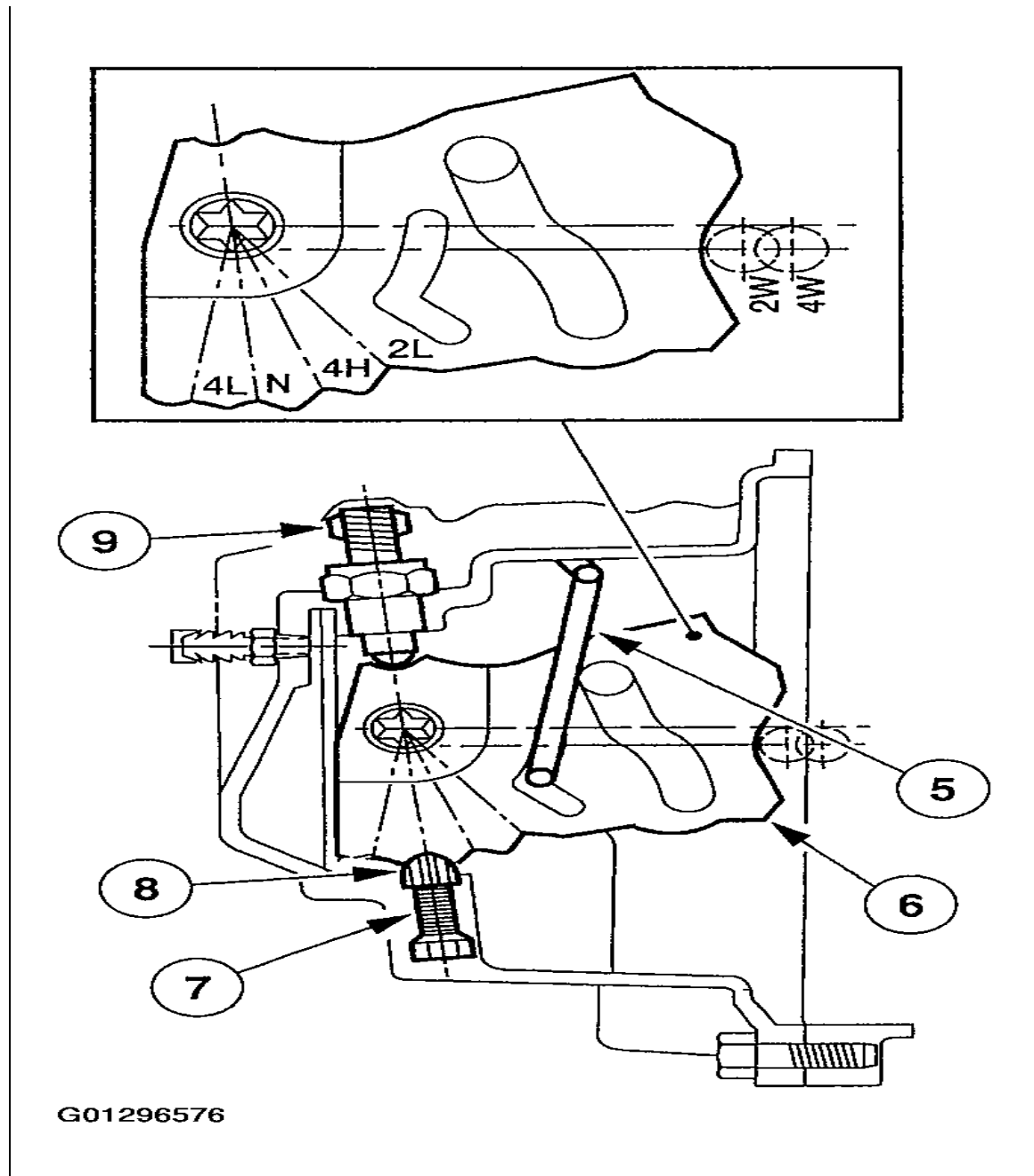
Courtesy of FORD MOTOR CO.

Fig 202: Installing Anchor Tab, Pivot Boss & Roller Into Spring/Roller Slot Of Shift Cam



Courtesy of FORD MOTOR CO.

Fig 203: Positioning Middle Section Of Spring Into Groove Of Front Case Pivot Boss

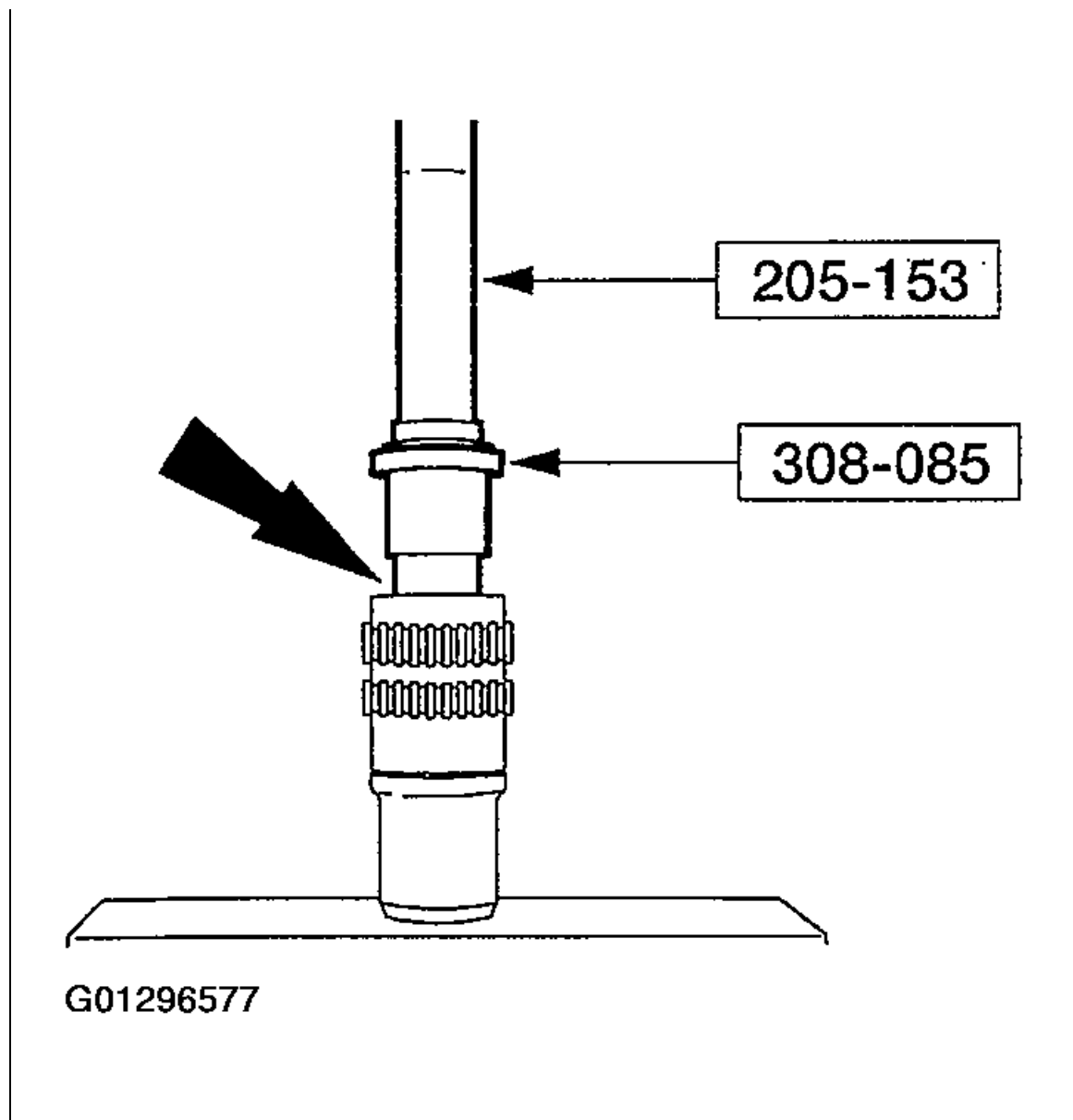


Courtesy of FORD MOTOR CO.

6. Using the special tools and a suitable press, install the needle bearing.

CAUTION: Do not crush the needle bearing.

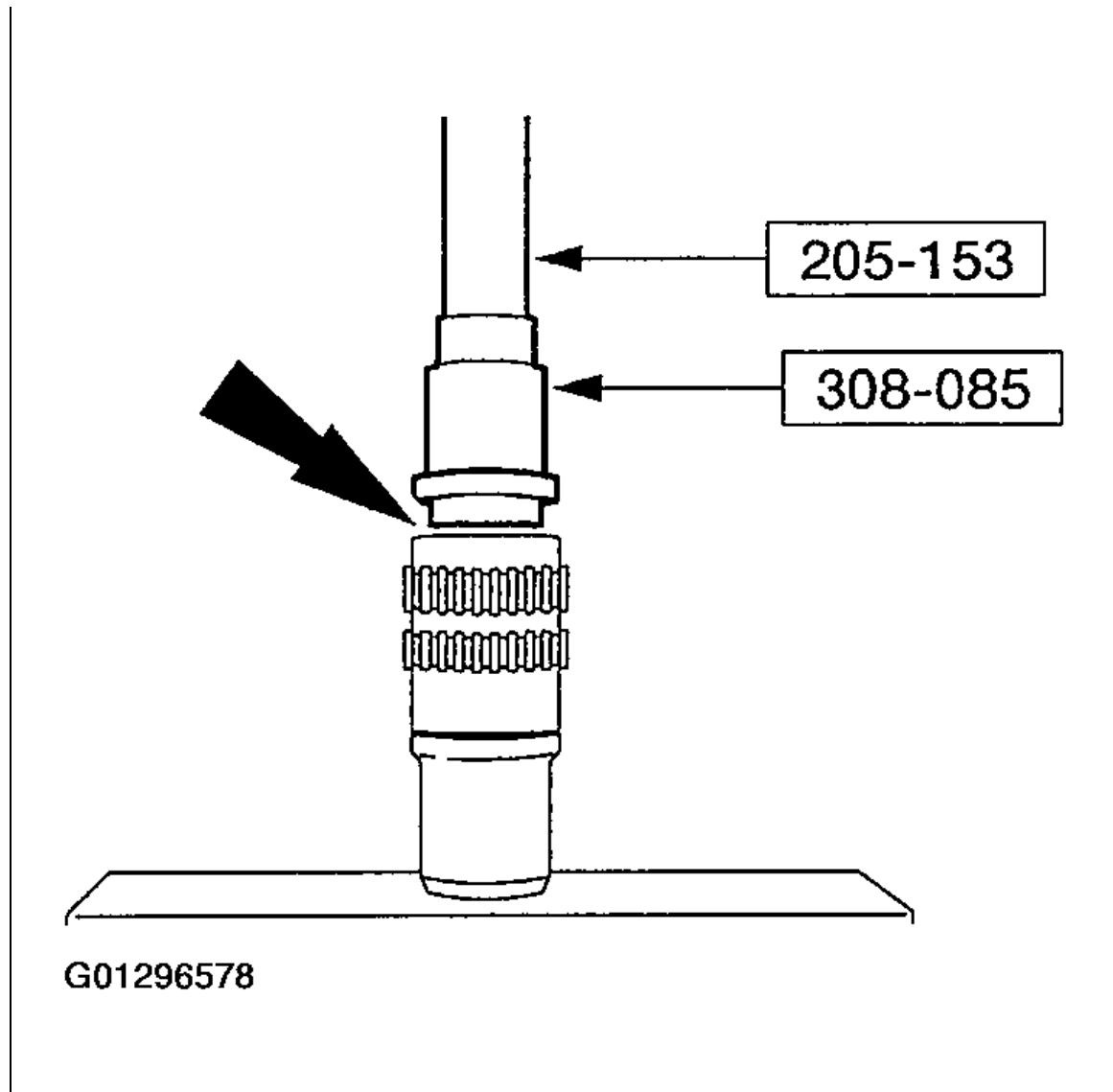
Fig 204: Installing Needle Bearing



Courtesy of FORD MOTOR CO.

7. Using the special tools and a suitable press, install the sleeve bearing.

Fig 205: Installing Sleeve Bearing

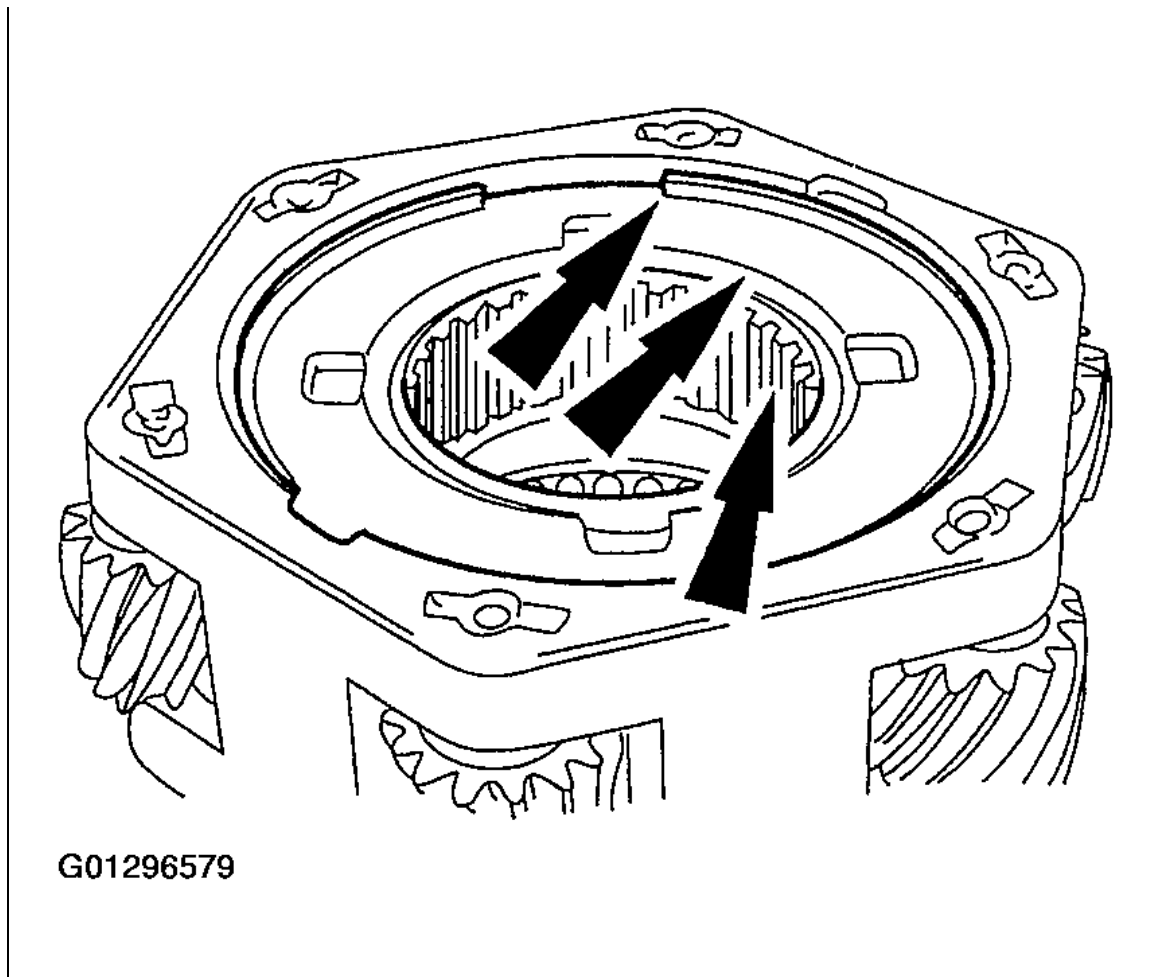


Courtesy of FORD MOTOR CO.

8. Install the sun gear, the thrust plate, and the snap ring.

NOTE: *The recessed face of the sun gear must face the rear of the transfer case.*

Fig 206: Installing Sun Gear, Thrust Plate & Snap Ring

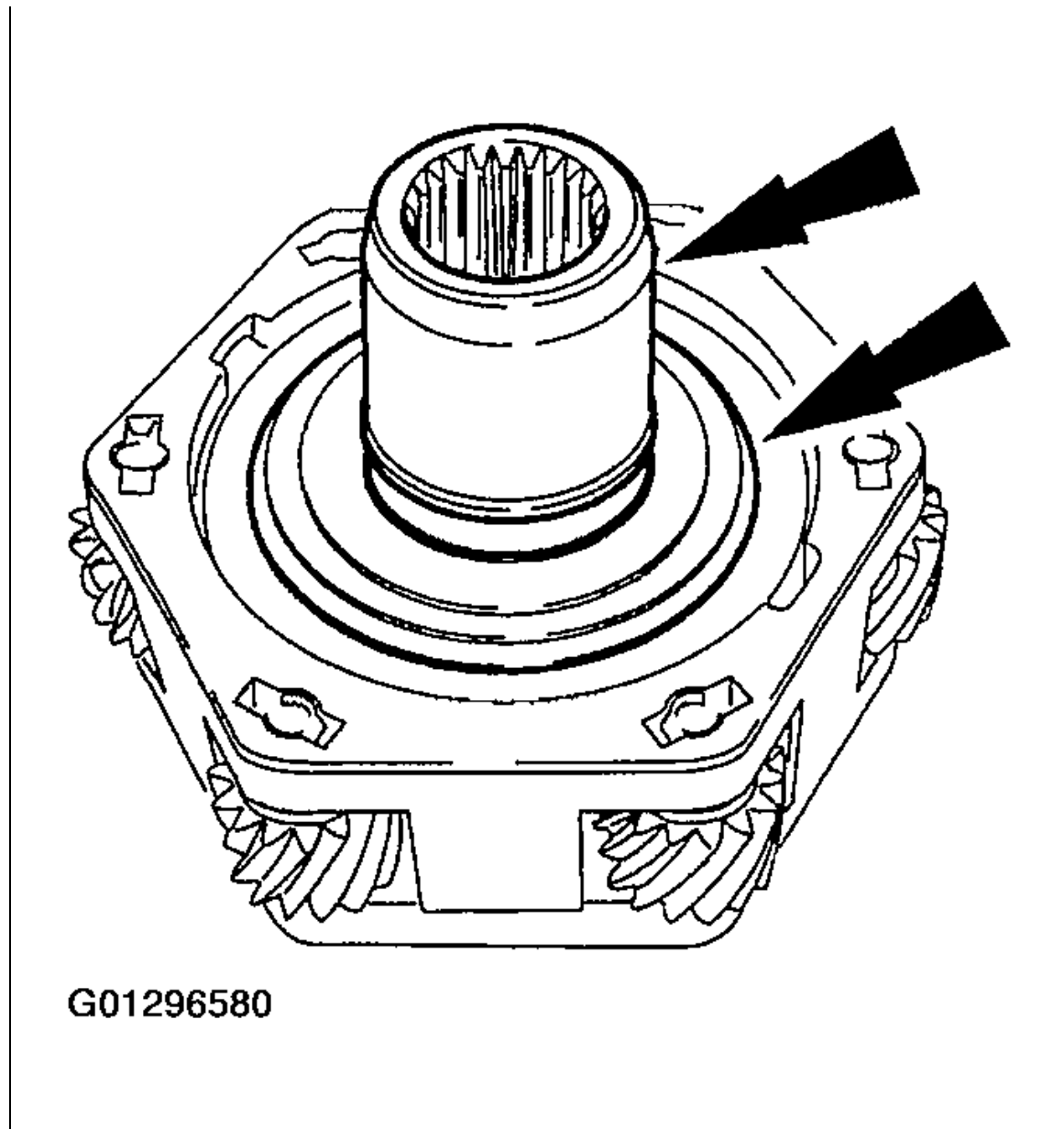


Courtesy of FORD MOTOR CO.

9. Install the input shaft assembly and the thrust washer.

NOTE: *The stepped face of the thrust washer must face upward.*

Fig 207: Installing Input Shaft Assembly & Thrust Washer

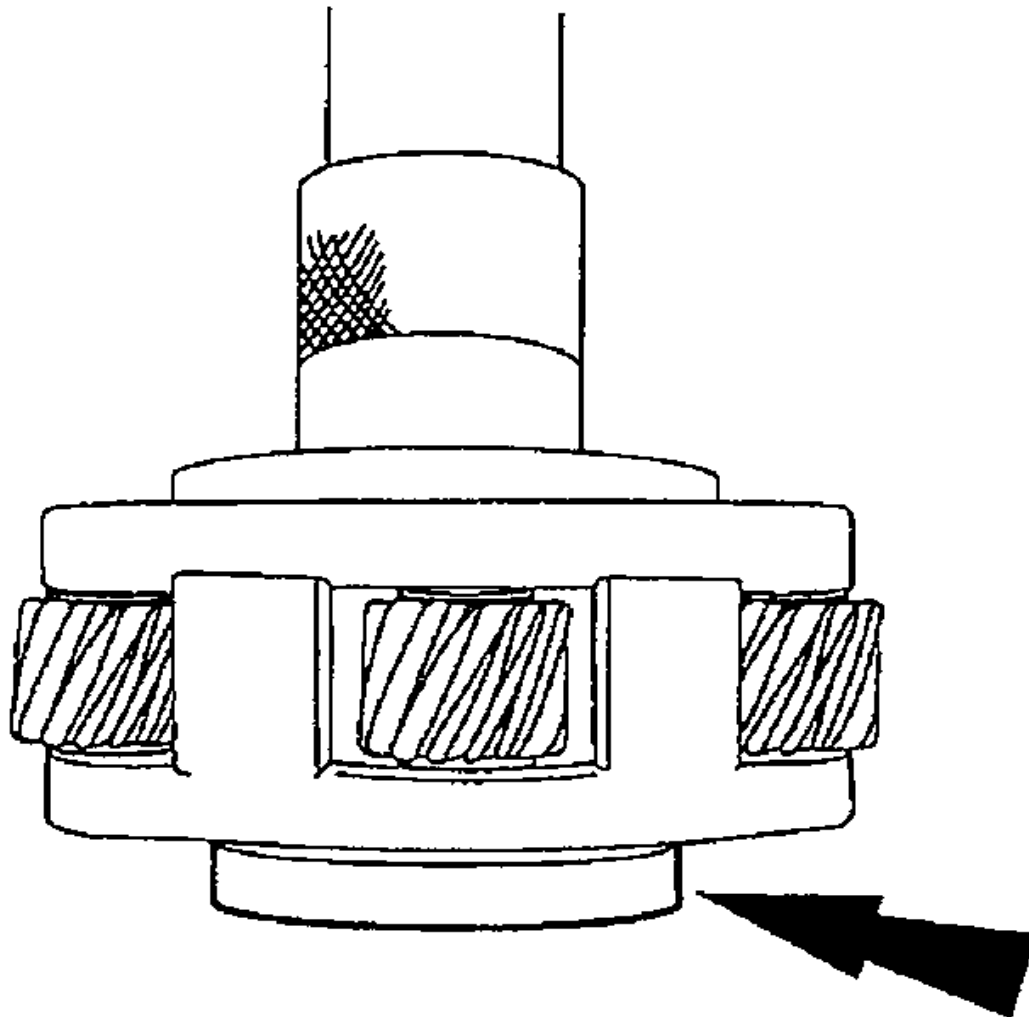


Courtesy of FORD MOTOR CO.

10. Using a suitable press, install the bearing.

NOTE: Install the bearing on the input shaft assembly so that the snap ring groove in the bearing is closest to the top of the planet carrier.

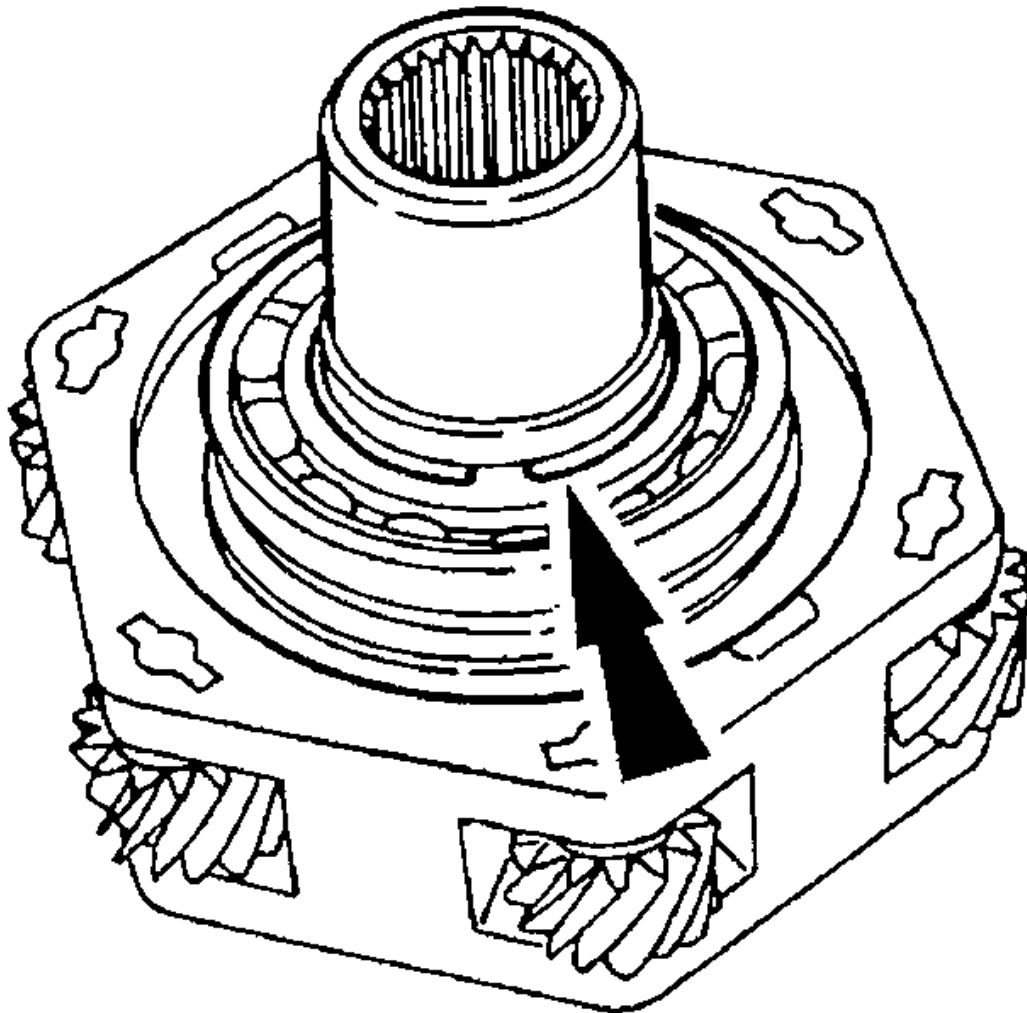
Fig 208: Installing Bearing

**G01296581**

Courtesy of FORD MOTOR CO.

11. Install the snap ring.

Fig 209: Installing Snap Ring

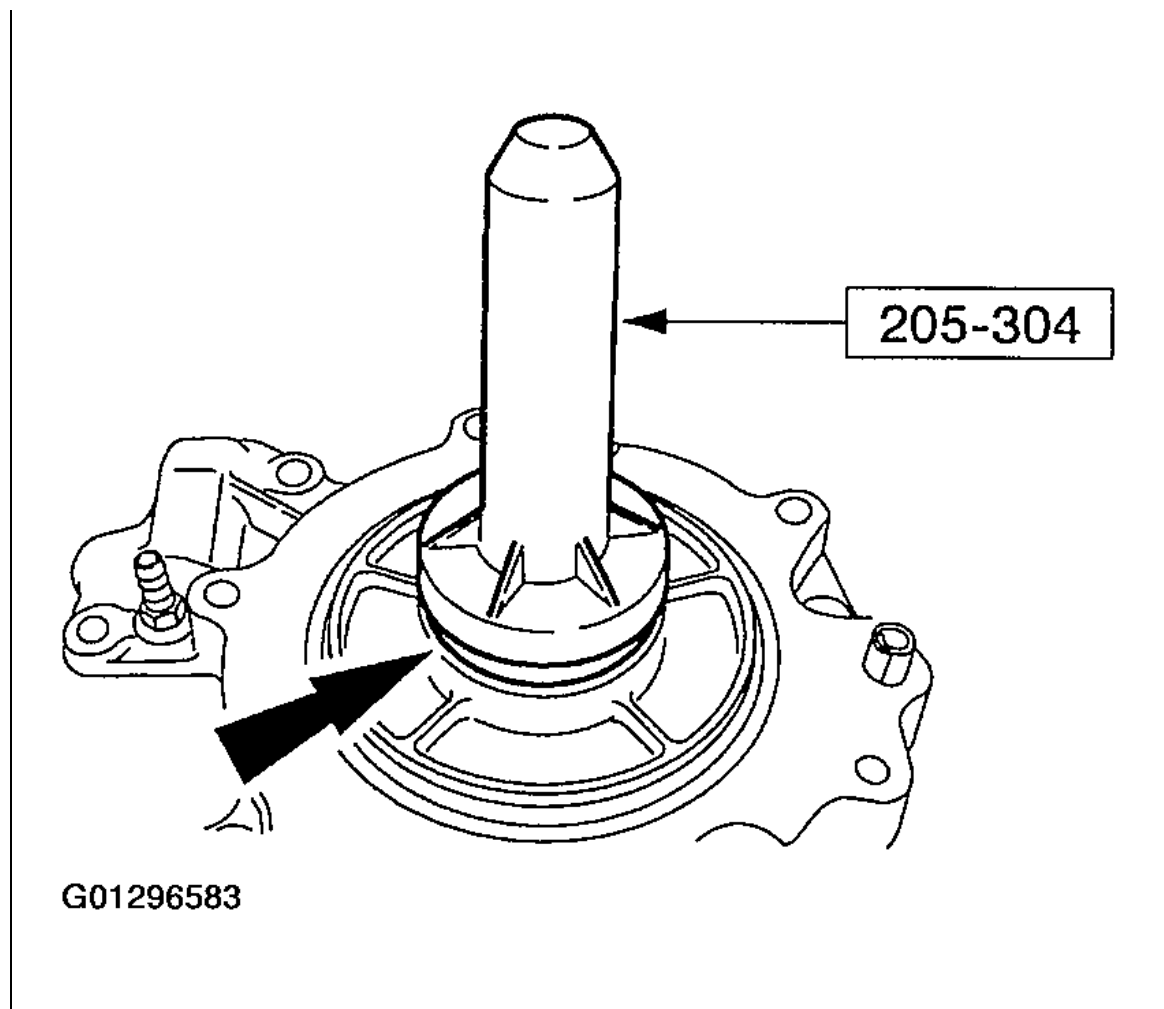


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Courtesy of FORD MOTOR CO.

12. Using the special tool, install the oil seal.

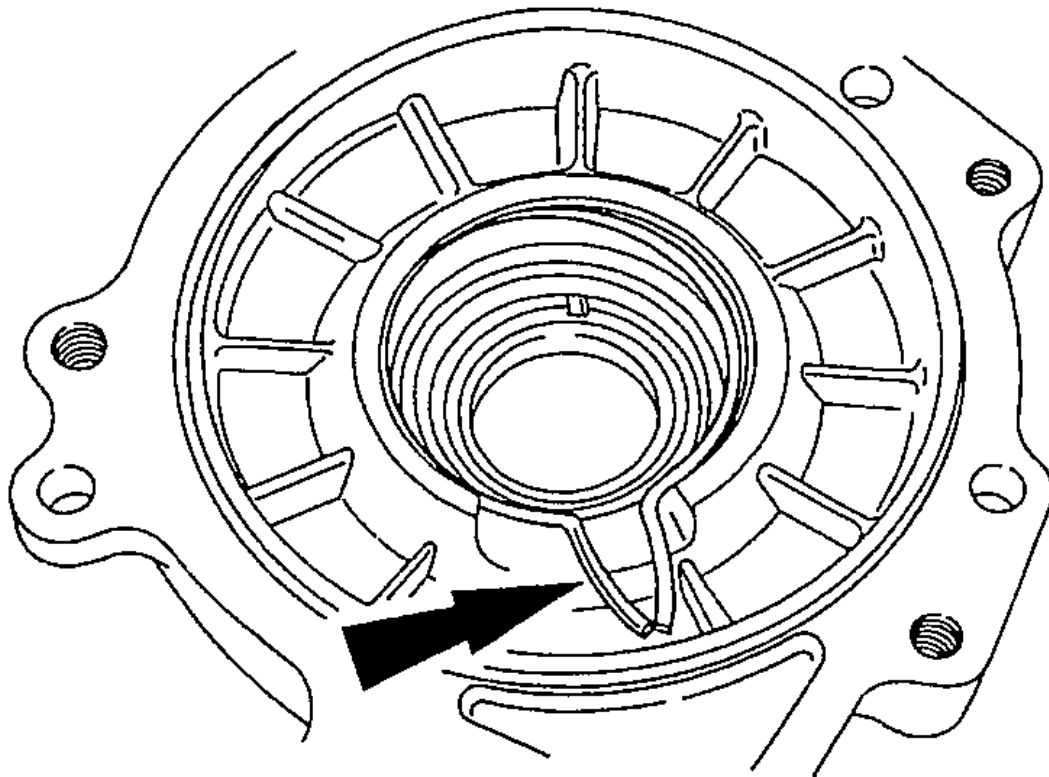
Fig 210: Installing Oil Seal



Courtesy of FORD MOTOR CO.

13. Install the large snap ring in the groove in the front adapter.

Fig 211: Installing Large Snap Ring In Groove In Front Adapter

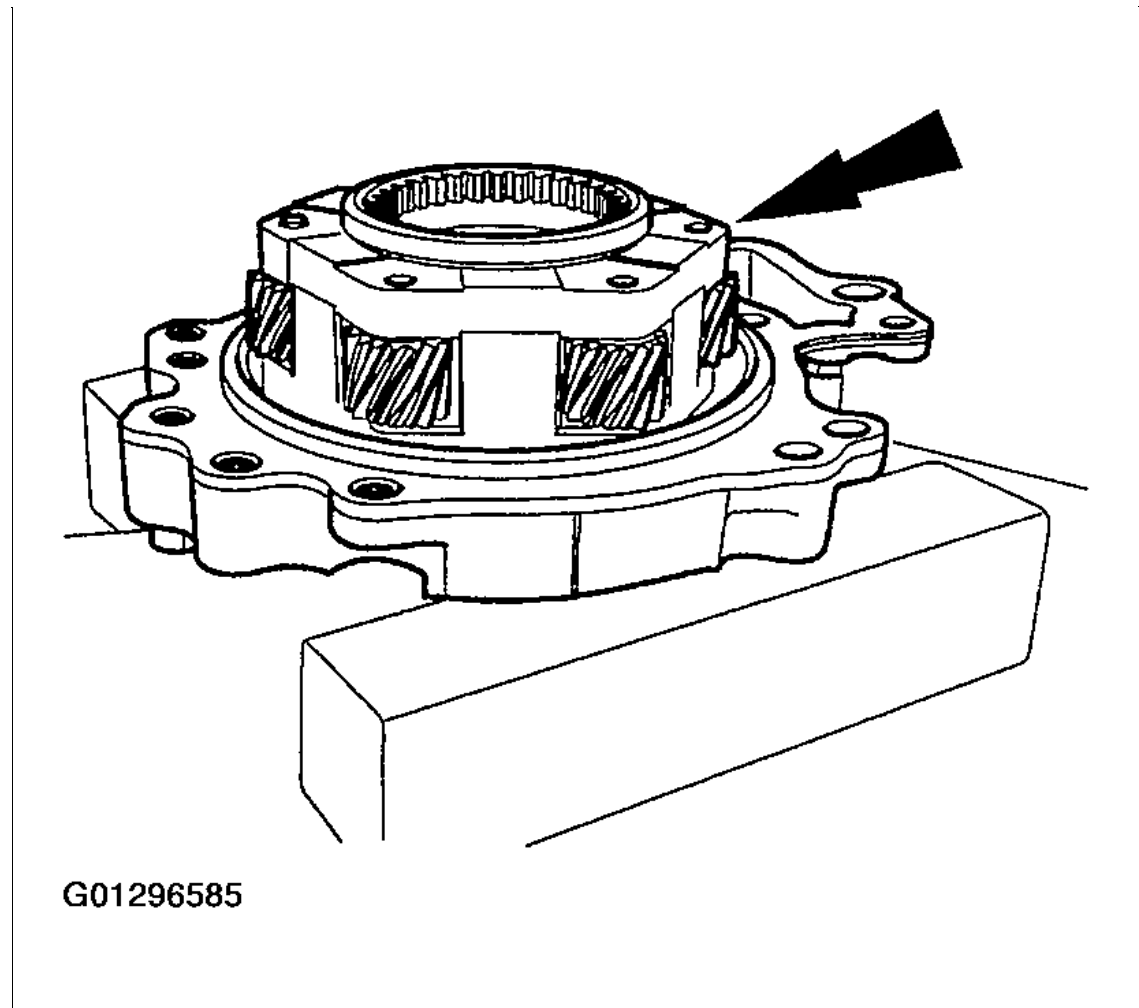


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Courtesy of FORD MOTOR CO.

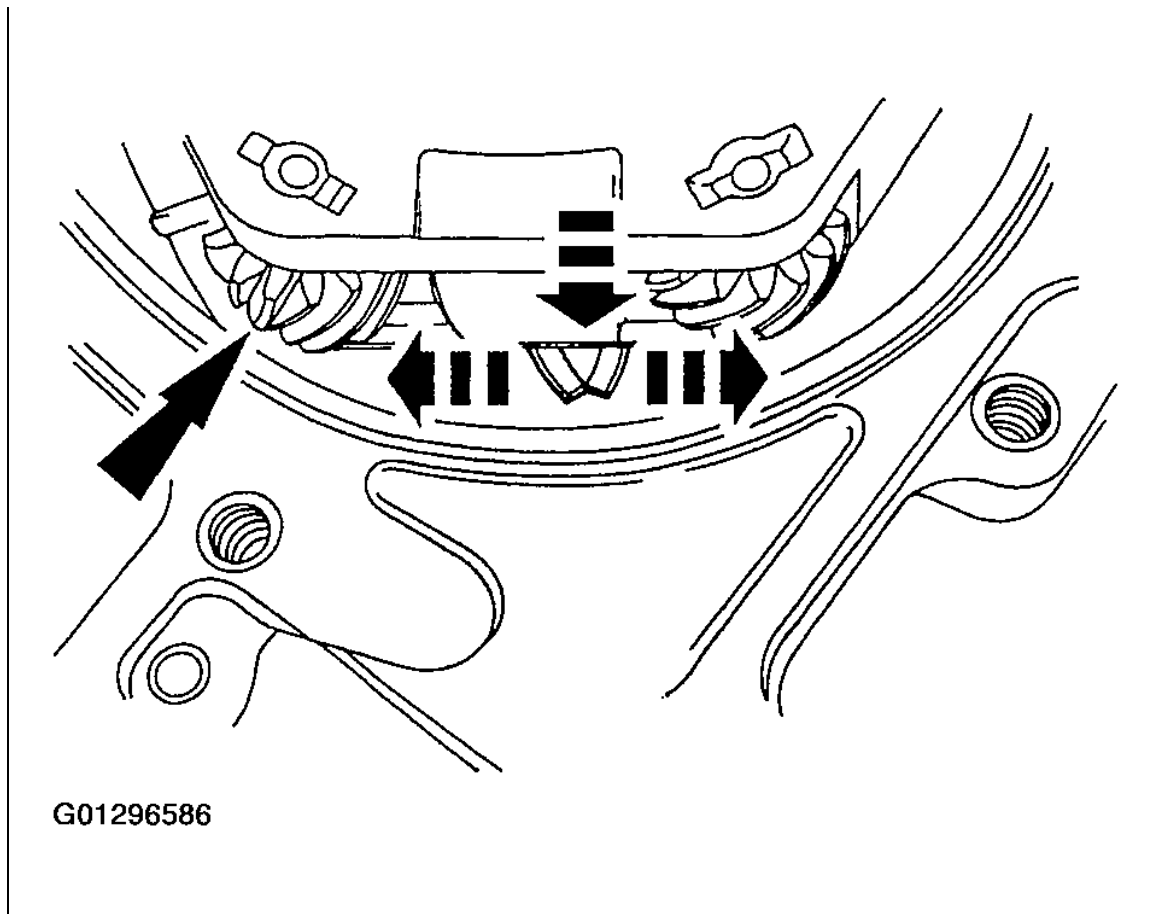
14. Install the input shaft assembly and the complete carrier assembly as an assembly.
 1. Align the pinion gears gear teeth and the ring gear teeth. Expand the snap ring and push inward on the planet carrier until the input shaft assembly seats fully in the front adapter. Verify that the snap ring engaged the assembly by holding the front adapter and lightly tapping the face of the input shaft assembly against a wooden block.

Fig 212: Installing Input Shaft Assembly & Complete Carrier Assembly



Courtesy of FORD MOTOR CO.

Fig 213: Aligning Pinion Gears Gear Teeth & Ring Gear Teeth

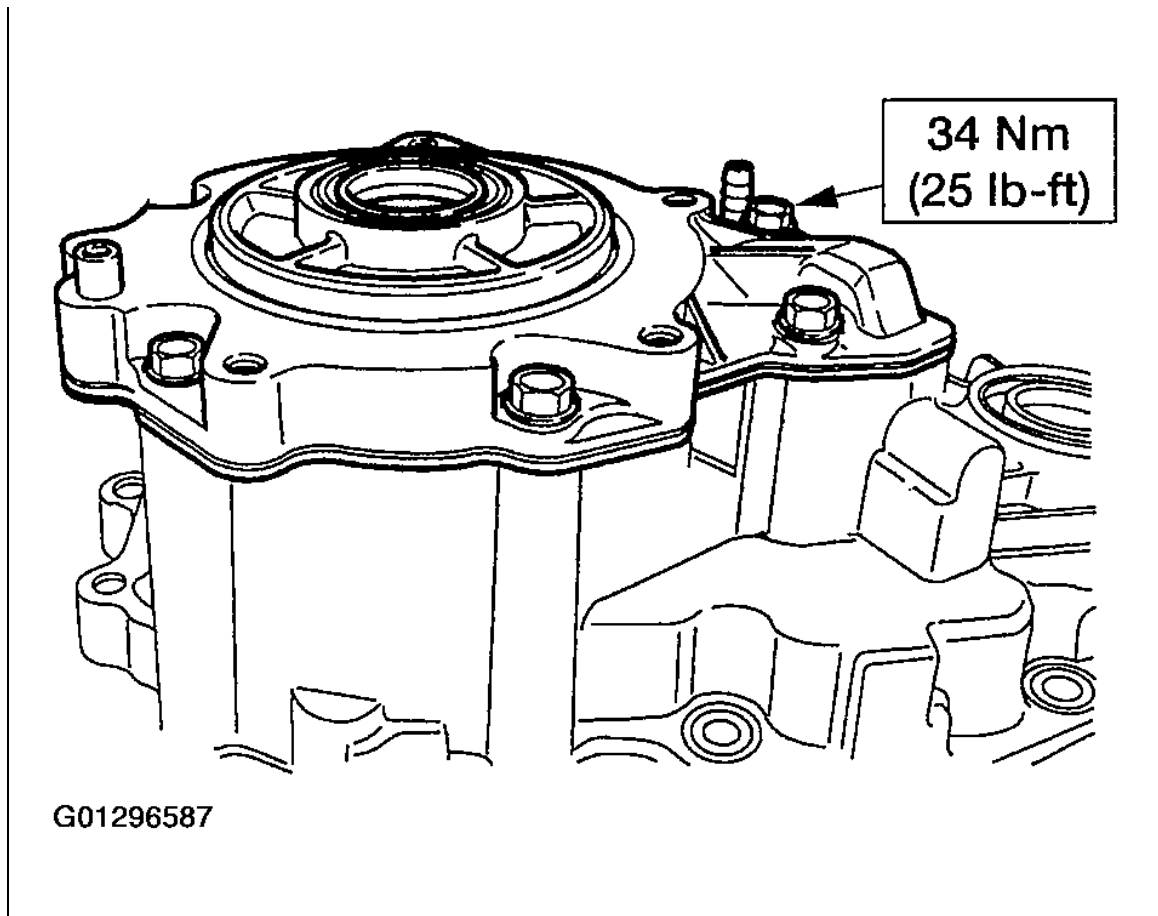


Courtesy of FORD MOTOR CO.

15. Apply a 3 mm (1/8 inch) bead of silicone sealant to the front adapter mounting surface, then position the front adapter on the transfer case, and install the six bolts.

CAUTION: Install the front adapter within 15 minutes of applying the silicone sealant or it will be necessary to apply new sealant. If possible, allow one hour before filling the transfer case with lubricant to allow the silicone sealant to cure

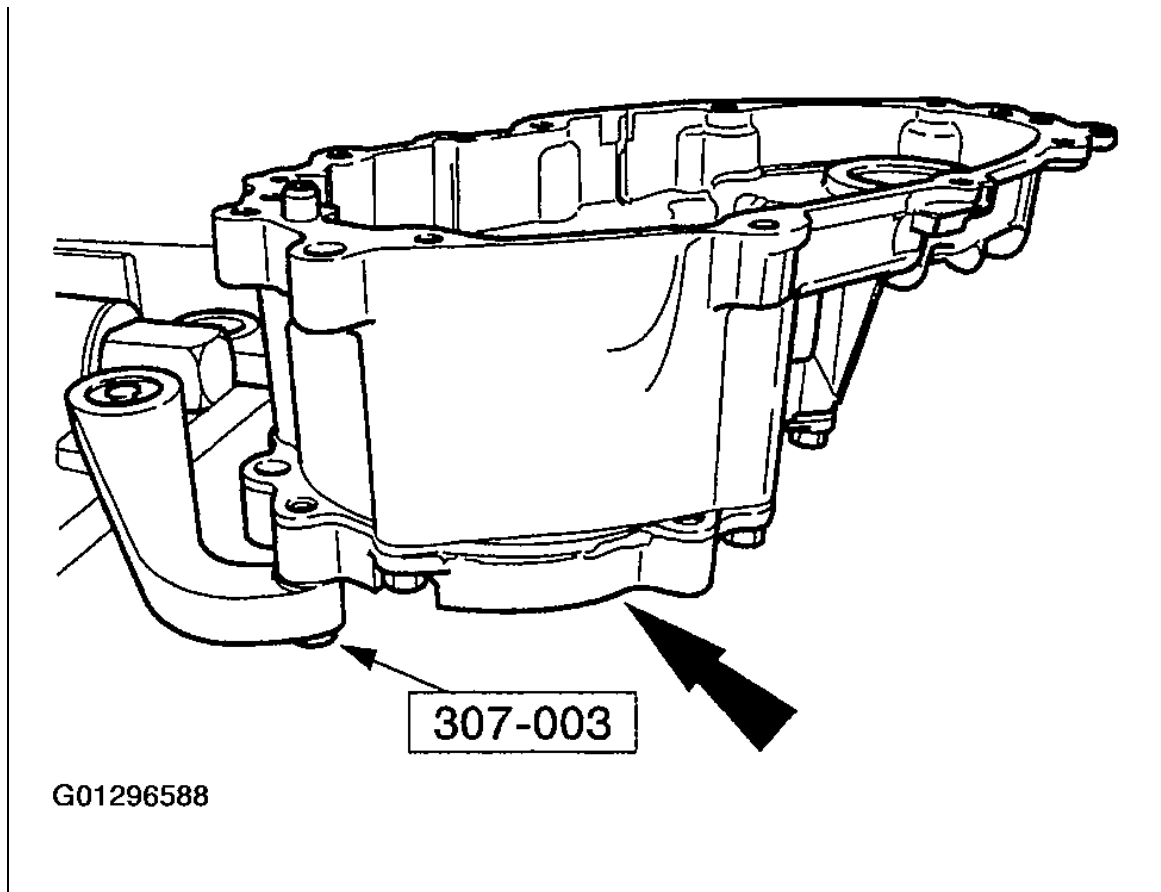
Fig 214: Applying Bead Of Silicone Sealant To Front Adapter Mounting Surface



Courtesy of FORD MOTOR CO.

16. Attach the front case to the special tool.

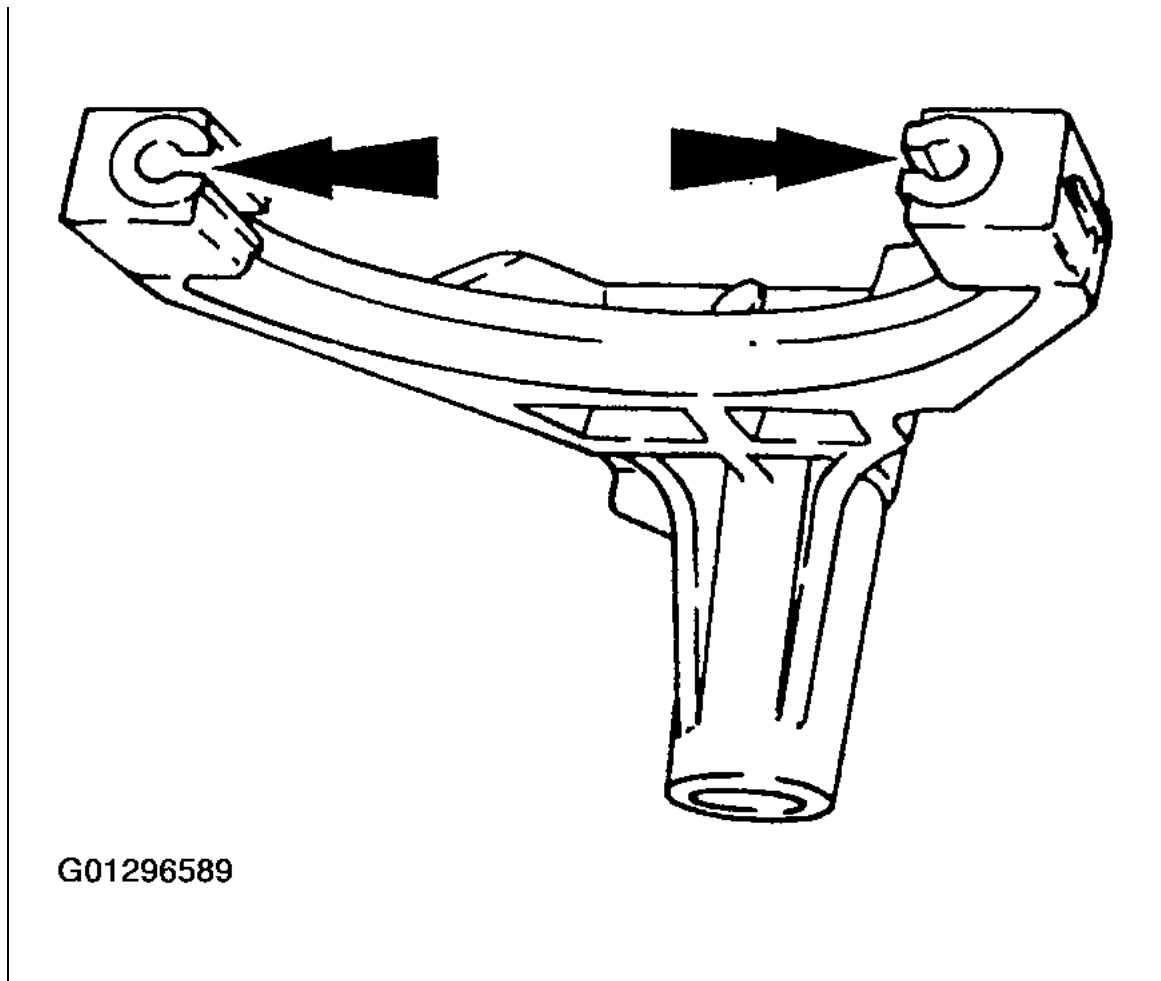
Fig 215: Attaching Front Case To Special Tool



Courtesy of FORD MOTOR CO.

17. Install the new shift fork facings. Verify that they snap securely into place.

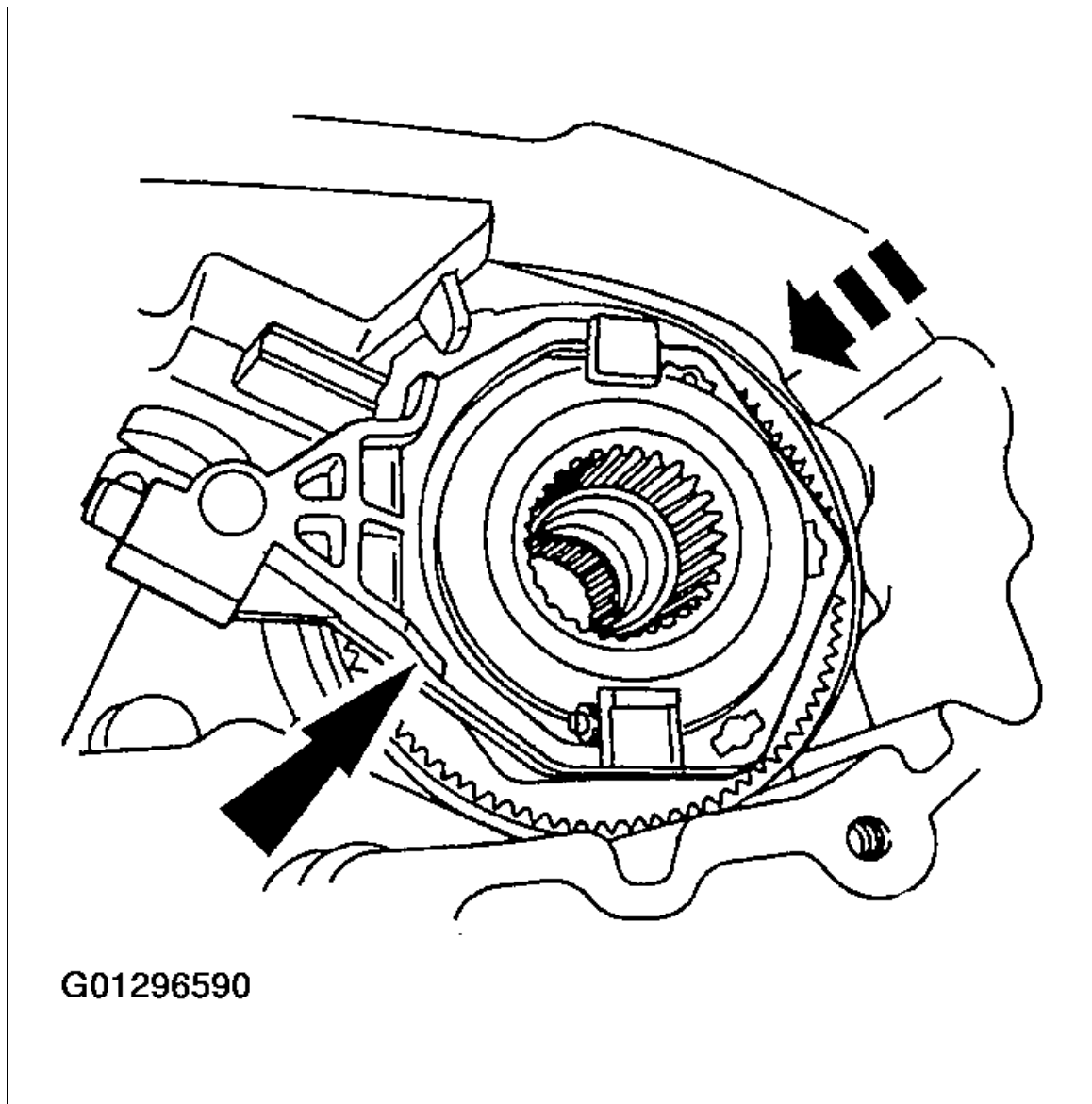
Fig 216: Installing Shift Fork Facings



Courtesy of FORD MOTOR CO.

18. Install the reduction hub and the reduction fork assembly as an assembly.

Fig 217: Installing Reduction Hub & Reduction Fork Assembly



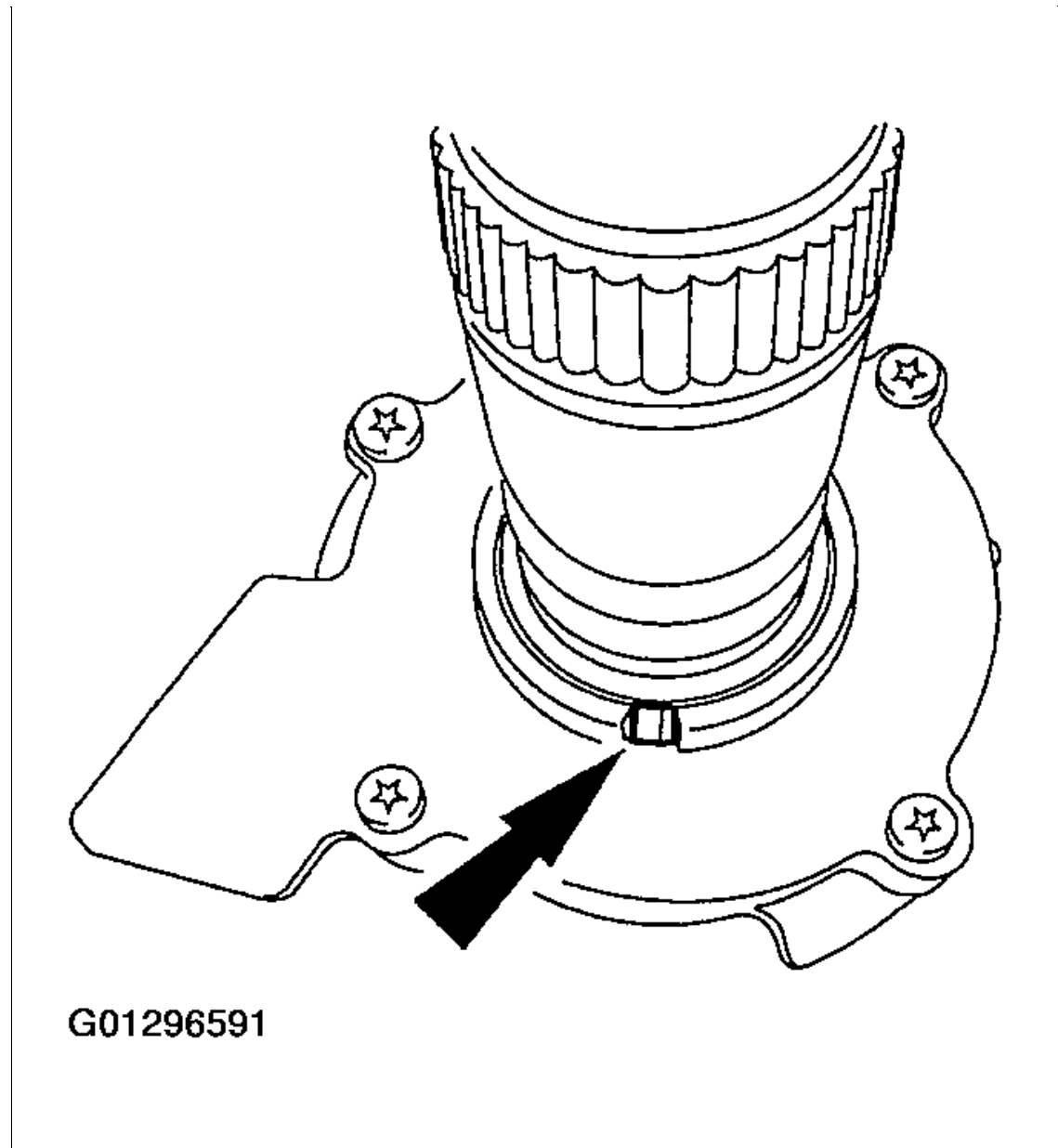
Courtesy of FORD MOTOR CO.

19. Install the pump assembly on the rear output shaft.

NOTE: Do not remove the plastic insert from the bore of a new pump assembly. Discard it after it slides out of the bore during the pump assembly installation on the rear output shaft.

1. Align the keyway in the cover and the spring pin in the rear output shaft and fully seat the pump assembly on the shaft. The shaft will rotate freely in the pump assembly when the pump assembly is fully seated.

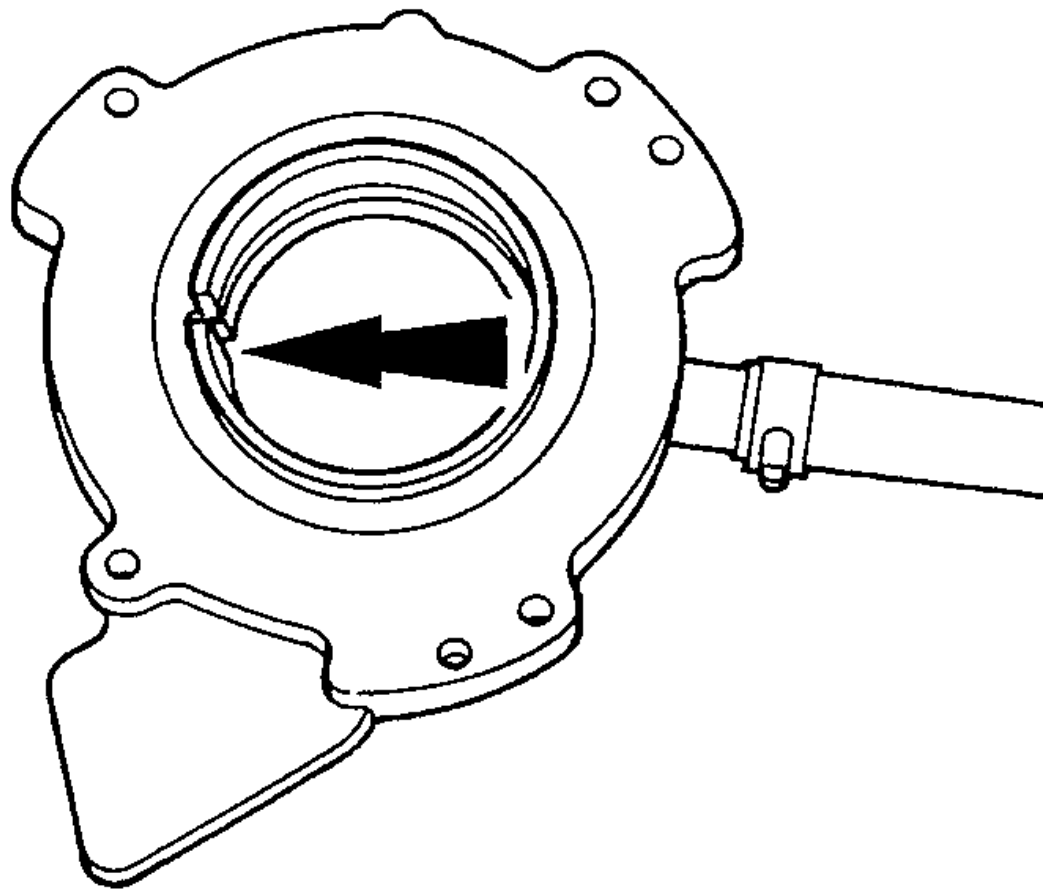
Fig 218: Installing Pump Assembly On Rear Output Shaft



Courtesy of FORD MOTOR CO.

20. If the pump assembly does not turn freely, realign the keyway and the spring pin and jiggle the pump assembly until it seats fully and rotates freely on the shaft.

Fig 219: Adjusting Pump Assembly Until It Seats Fully & Rotates Freely On Shaft

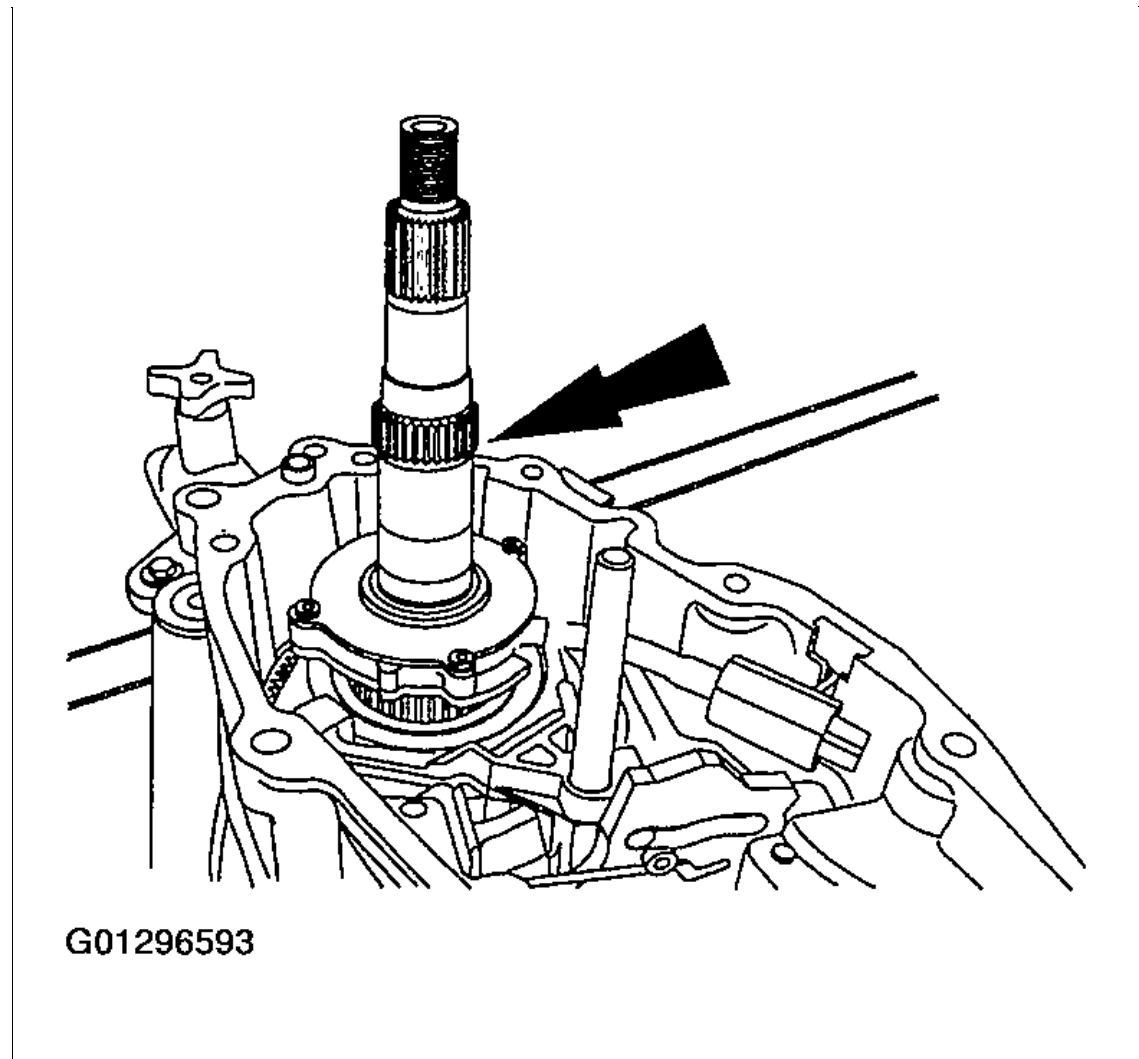


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Courtesy of FORD MOTOR CO.

21. Prime the pump assembly.
 1. Submerge the pump in a container full of clean MERCON Multi-Purpose (ATF) Transmission Fluid.
22. Install the rear output shaft and the pump assembly.
 1. Make sure the external splines of the output shaft engage the internal splines of the lockup hub. Make sure the oil pump retainer arm and the oil filter leg are in the groove and notch of the front case.

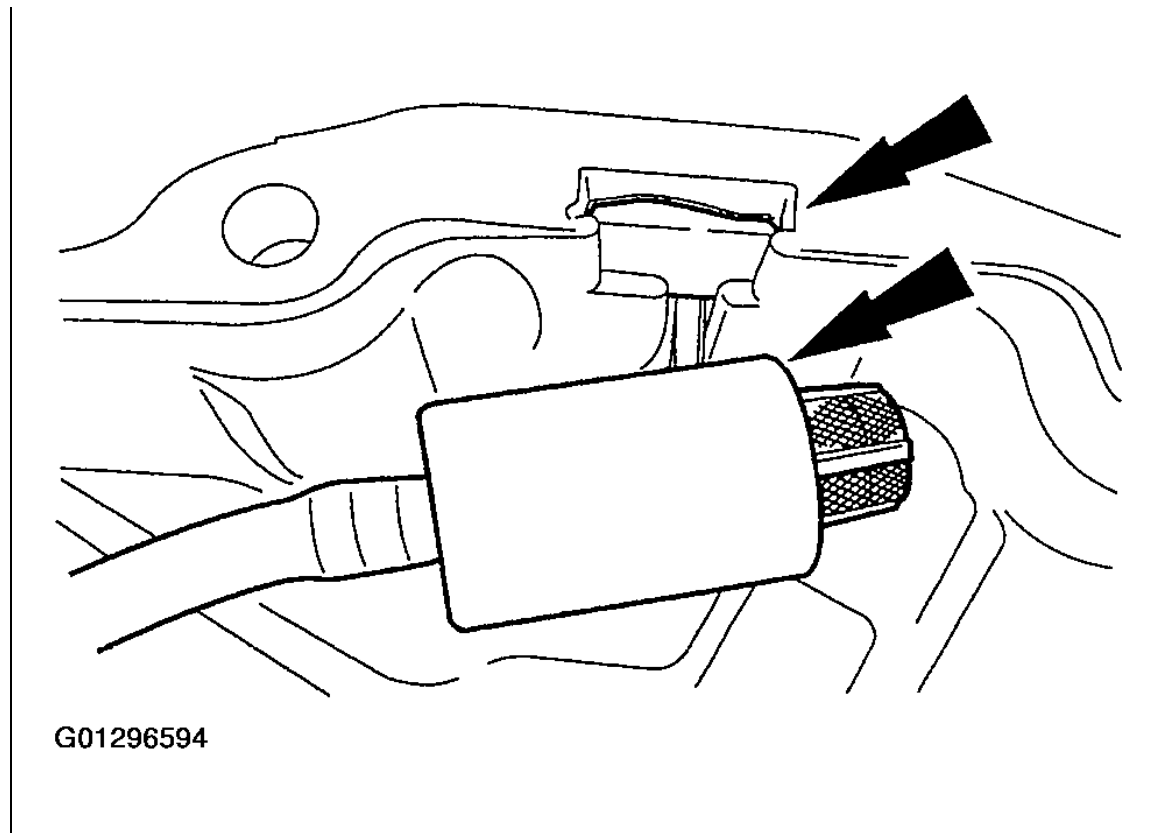
Fig 220: Installing Rear Output Shaft & Pump Assembly



Courtesy of FORD MOTOR CO.

23. Install the oil strainer and the magnet in the slot in the case.

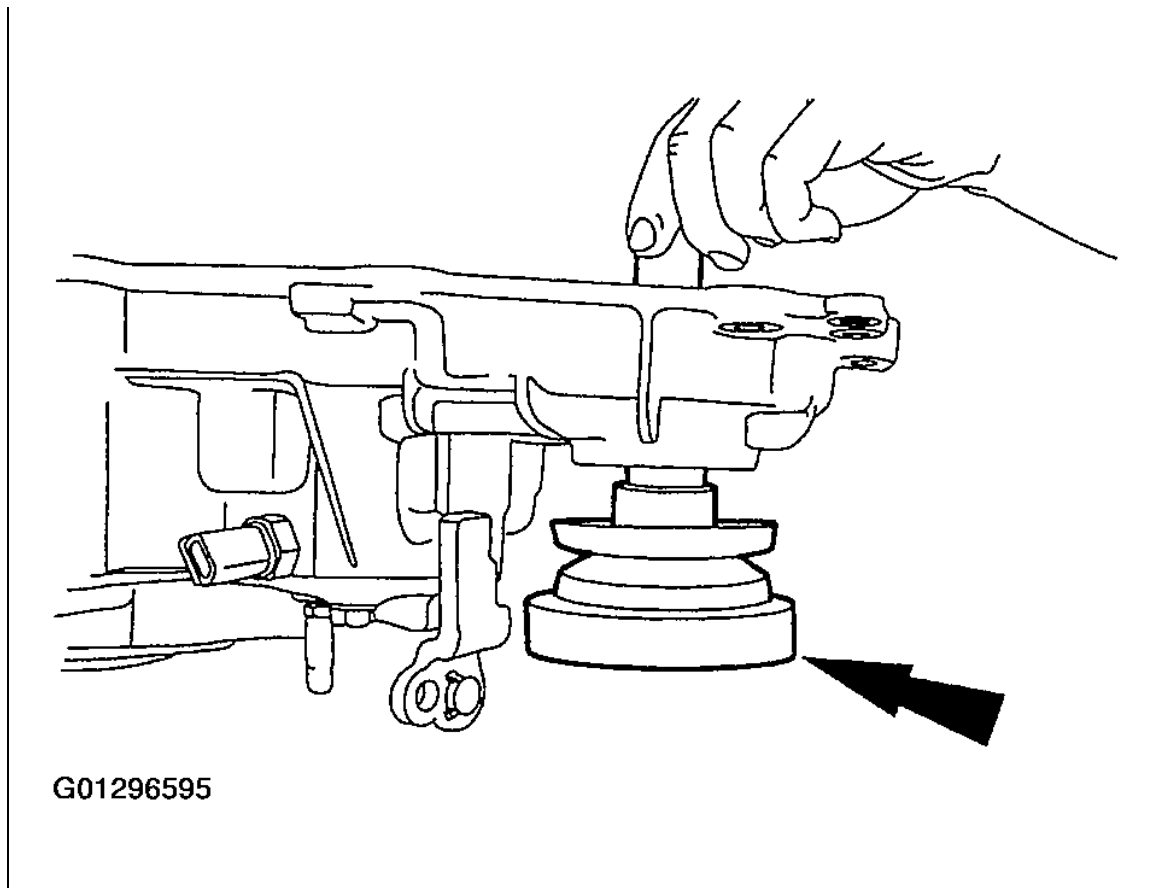
Fig 221: Installing Oil Strainer & Magnet In Slot In Case



Courtesy of FORD MOTOR CO.

24. Install the front output shaft assembly.

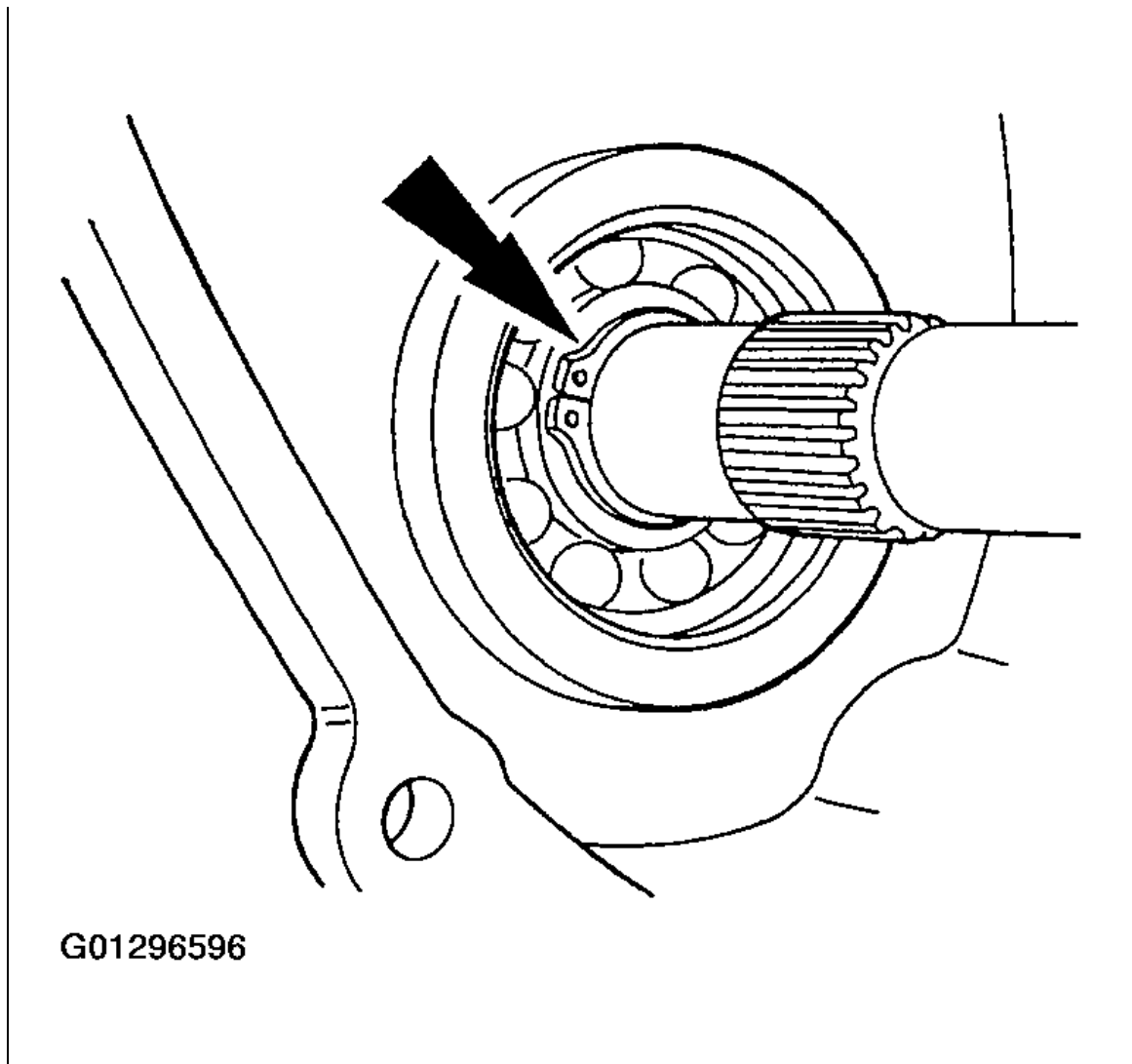
Fig 222: Installing Front Output Shaft Assembly



Courtesy of FORD MOTOR CO.

25. Install the snap ring.

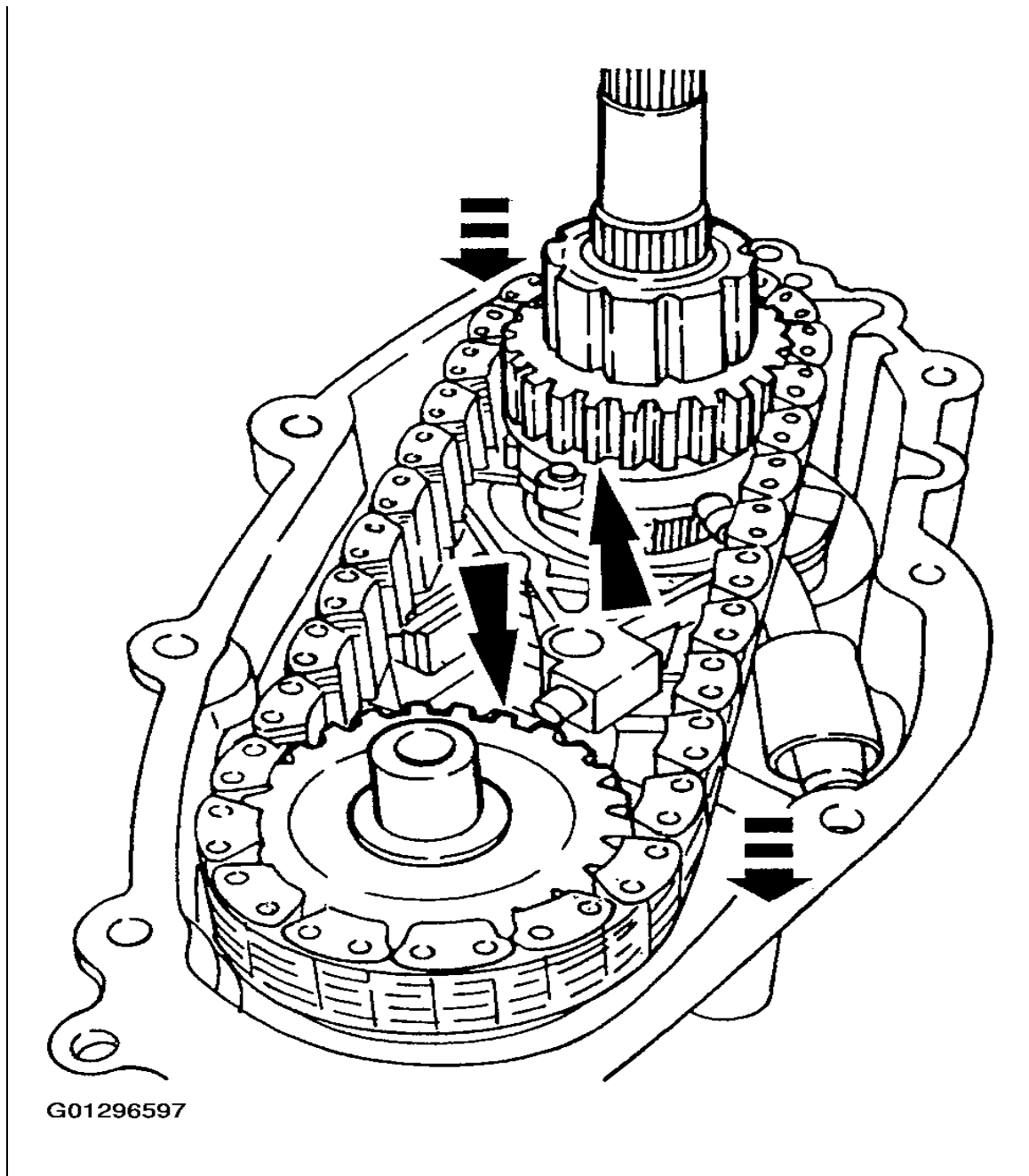
Fig 223: Installing Snap Ring



Courtesy of FORD MOTOR CO.

26. Install the drive chain, the drive sprocket and the driven sprocket as an assembly.

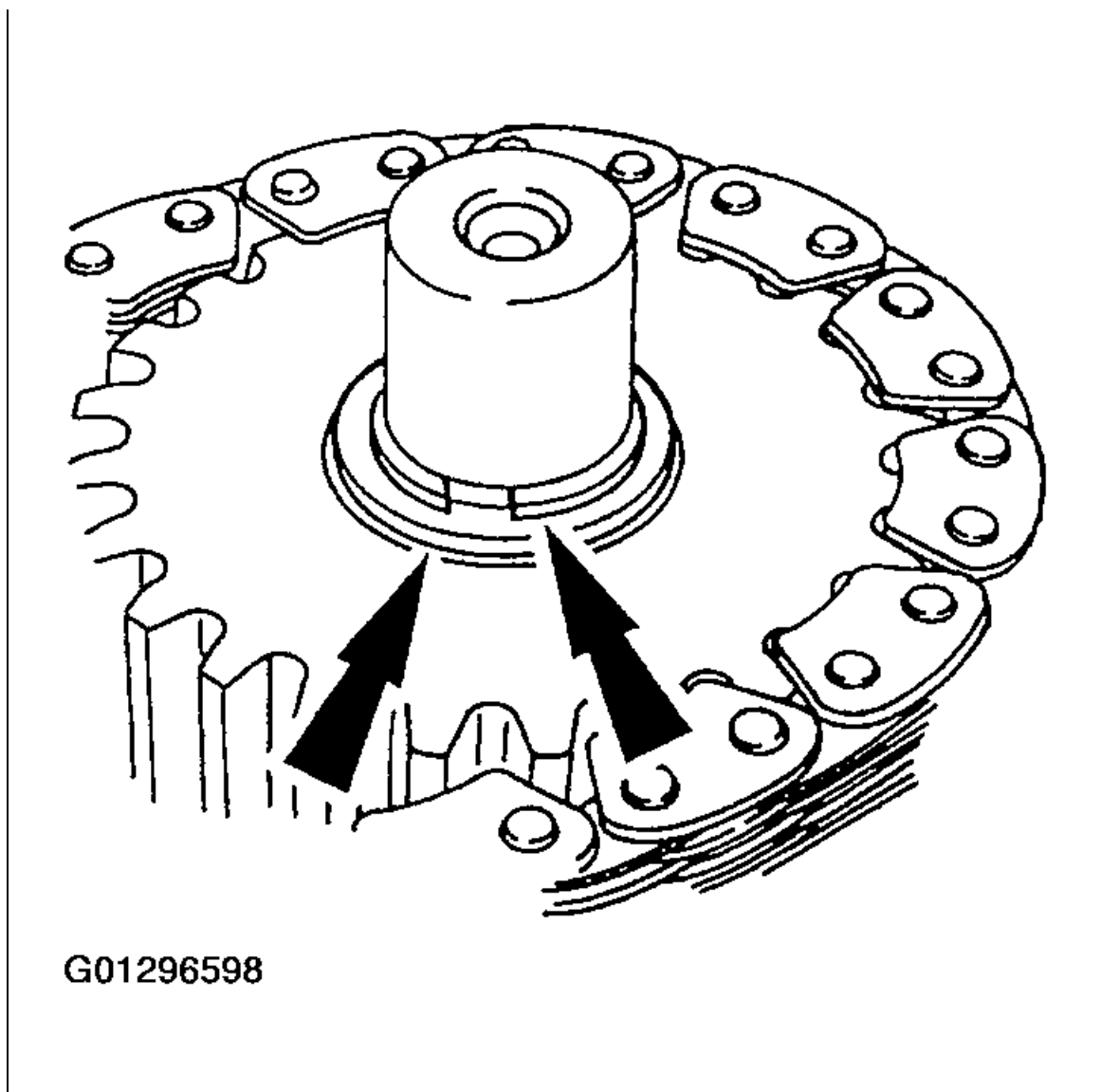
Fig 224: Installing Drive Chain, Drive Sprocket & Driven Sprocket



Courtesy of FORD MOTOR CO.

27. Install the spacer and the snap ring.

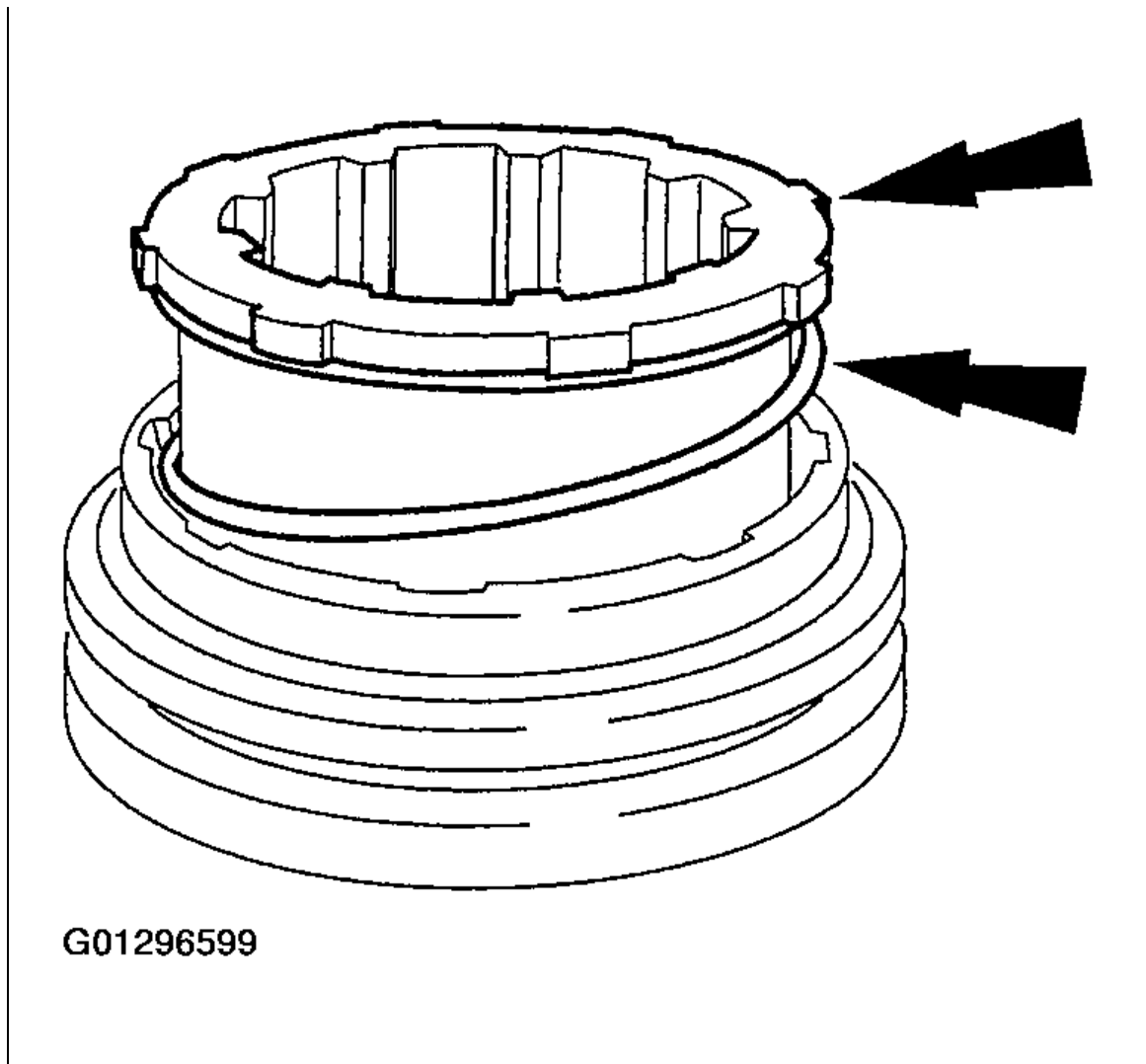
Fig 225: Installing Spacer & Snap Ring



Courtesy of FORD MOTOR CO.

28. Install the shift rail through the reduction shift fork. Verify that the shift rail seats in the case bore.
29. Assemble the lockup assembly.

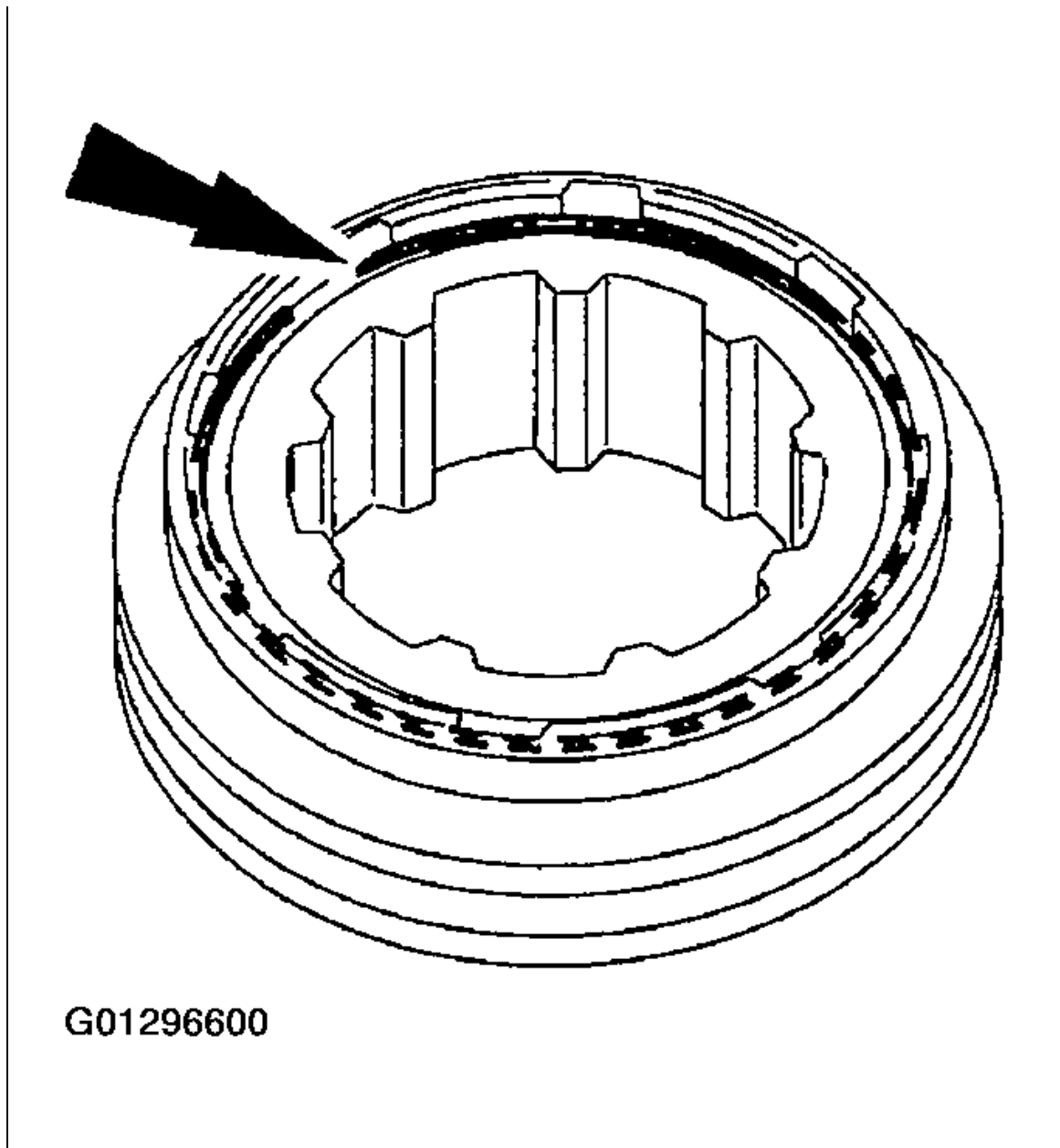
Fig 226: Assembling Lockup Assembly



Courtesy of FORD MOTOR CO.

30. Press downward on the lockup hub and install the snap ring.

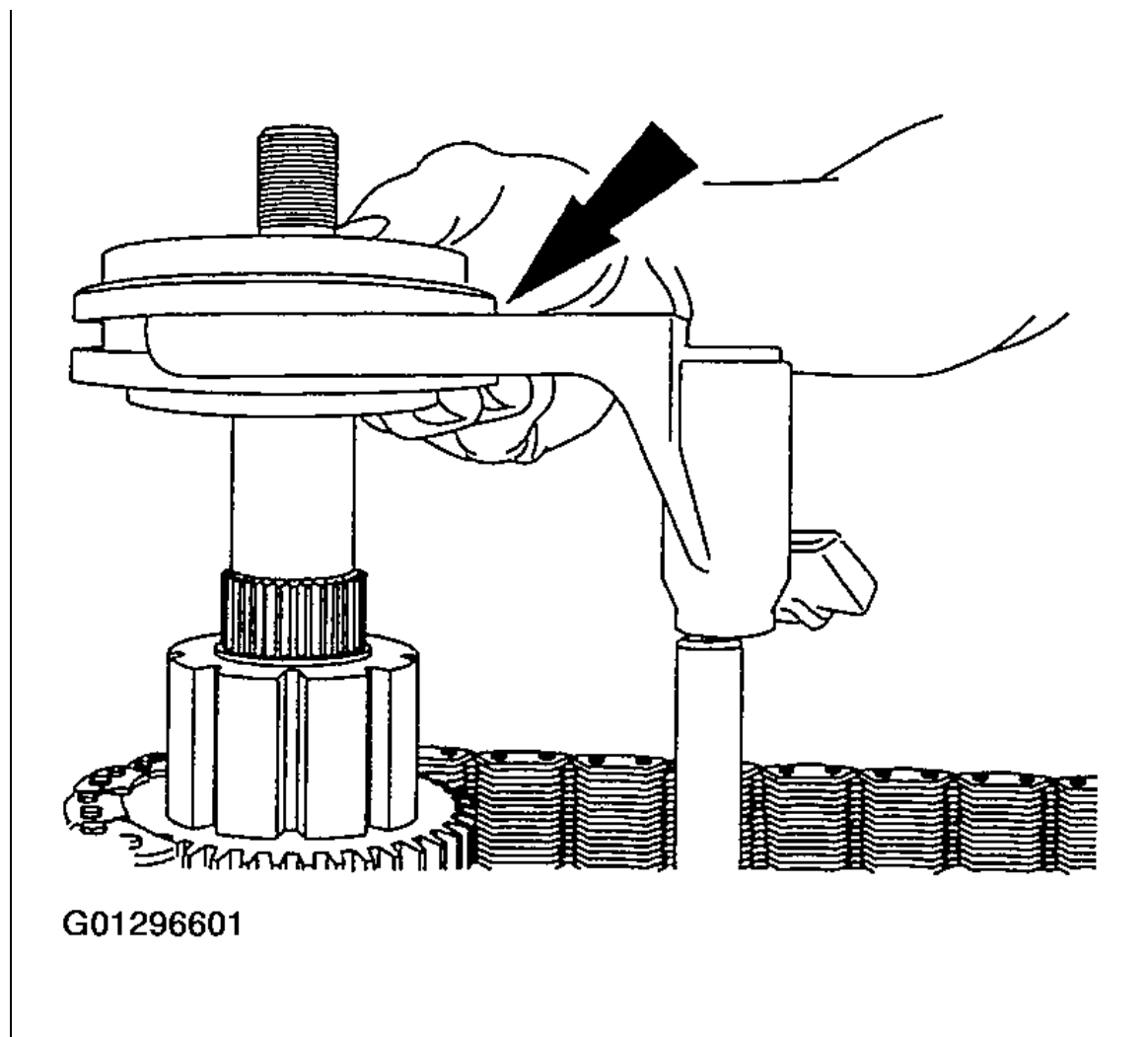
Fig 227: Pressing Downward On Lockup Hub & Installing Snap Ring



Courtesy of FORD MOTOR CO.

31. Install the lockup fork and the lockup collar as an assembly.

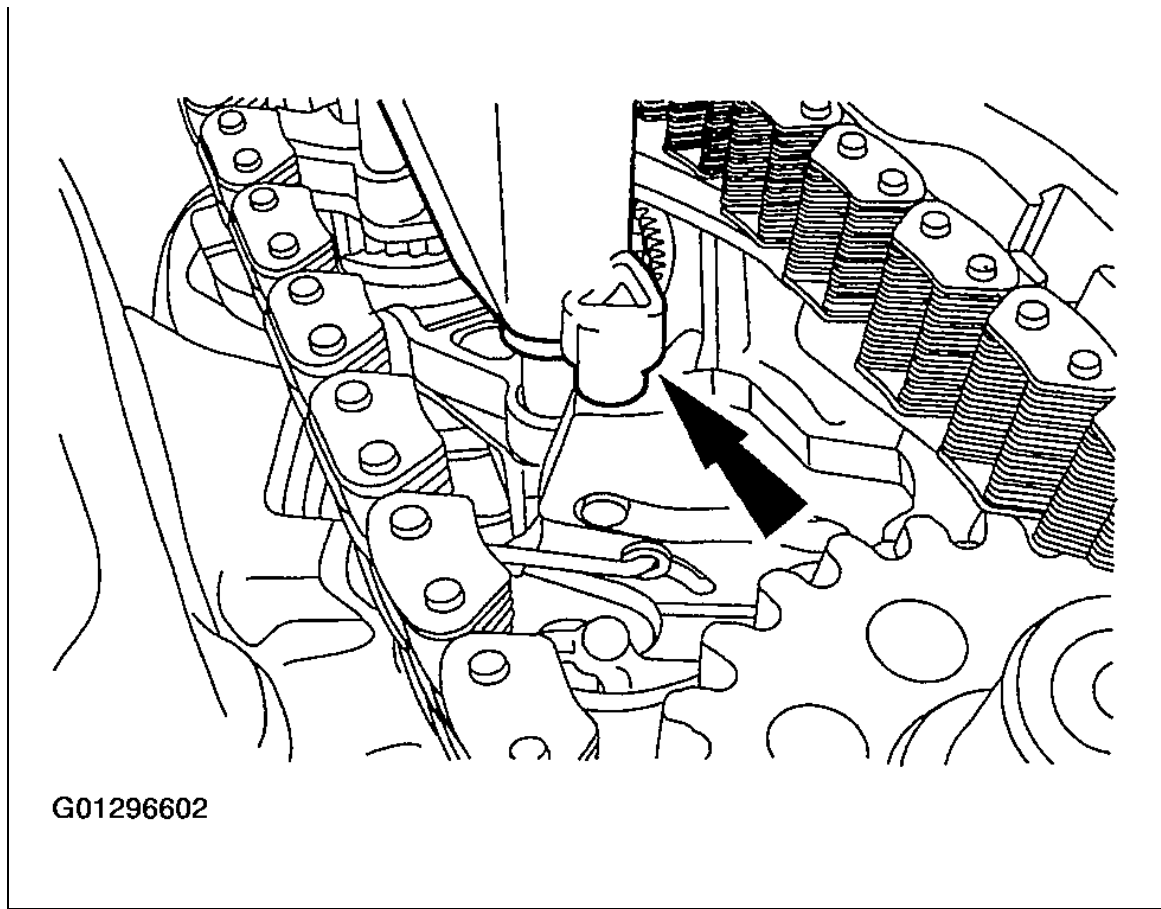
Fig 228: Installing Lockup Fork & Lockup Collar As An Assembly



Courtesy of FORD MOTOR CO.

32. The triangular shaft will be in the two-wheel high (2H) position at final assembly.

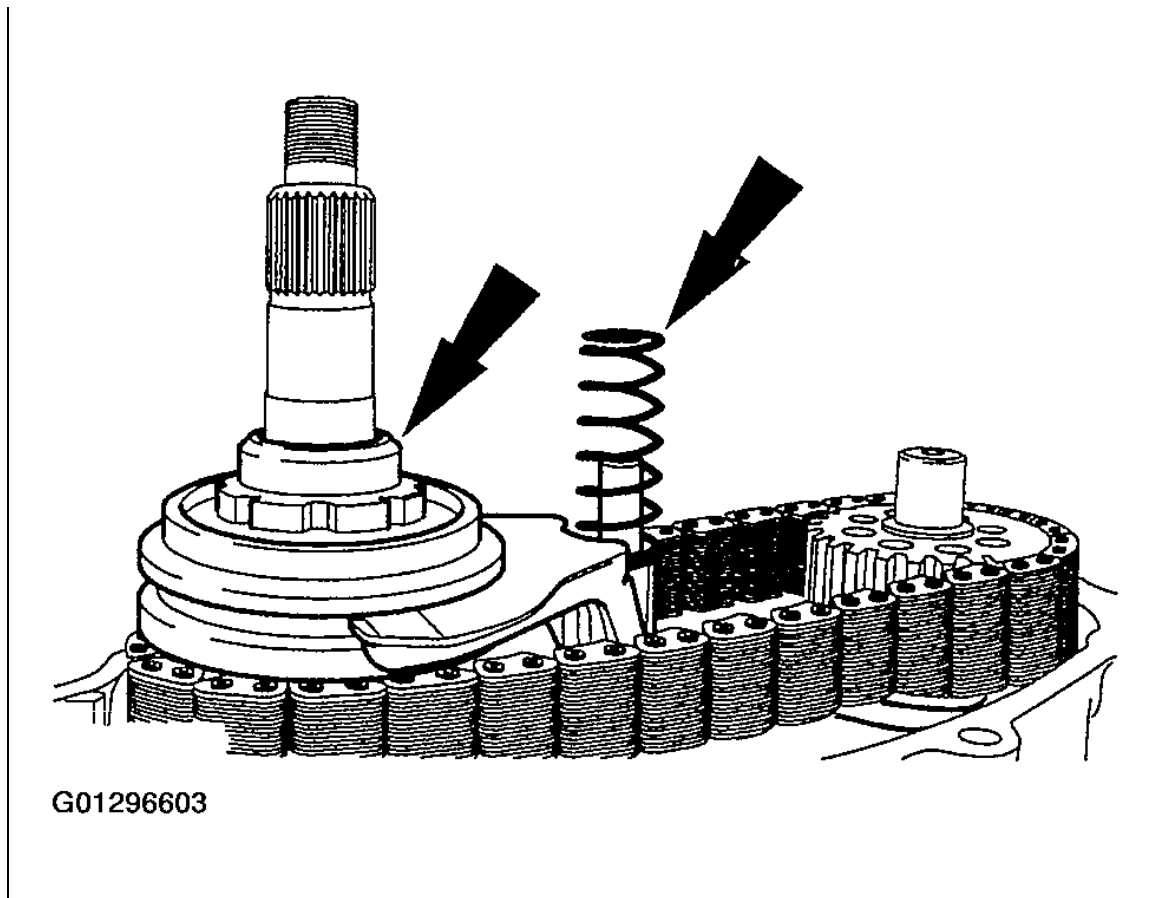
Fig 229: Checking That Triangular Shaft Is In Two-Wheel High Position At Final Assembly



Courtesy of FORD MOTOR CO.

33. Install the shift collar hub and the return spring.

Fig 230: Installing Shift Collar Hub & Return Spring

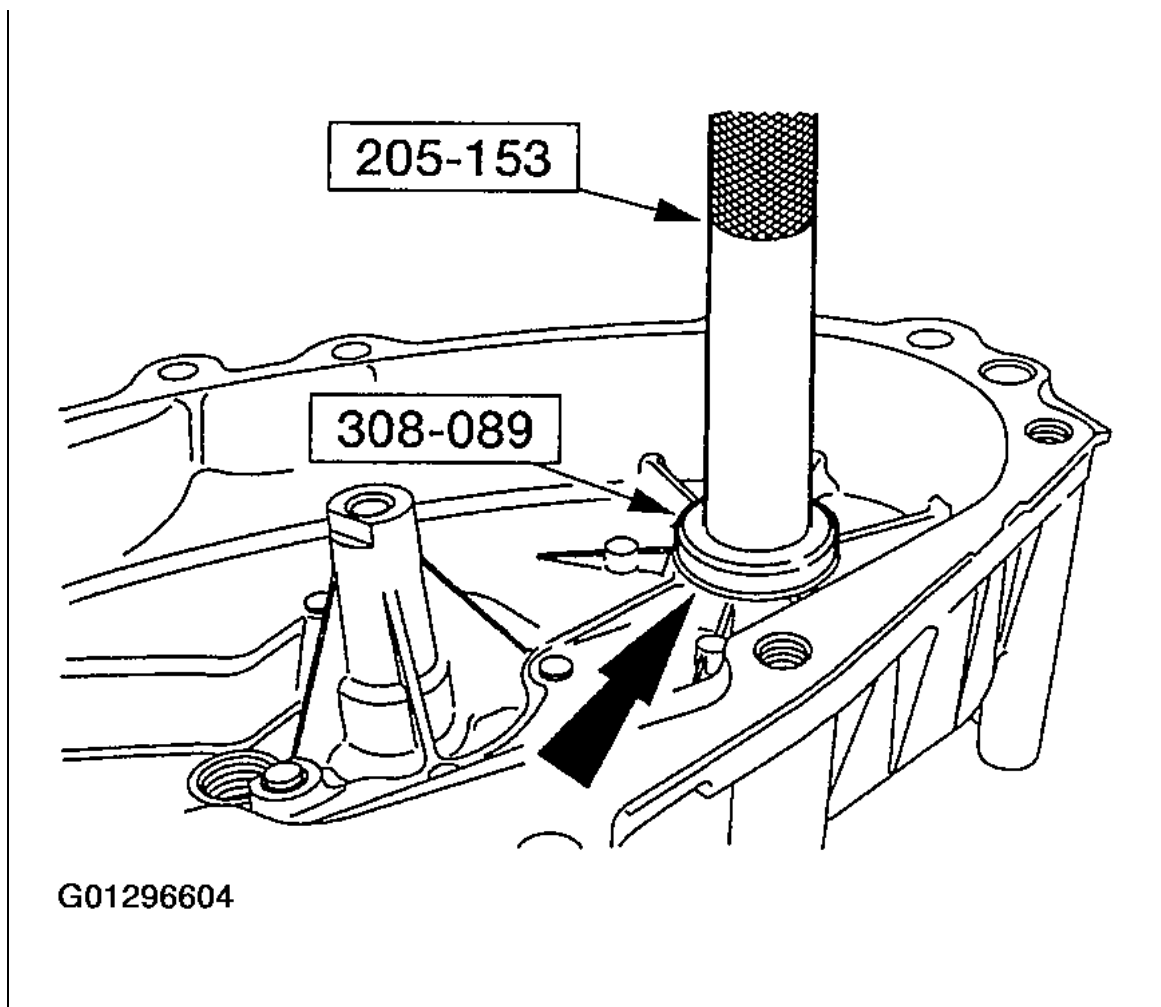


Courtesy of FORD MOTOR CO.

34. Using the special tools, press the needle bearing into the housing.

CAUTION: *Do not crush the needle bearing.*

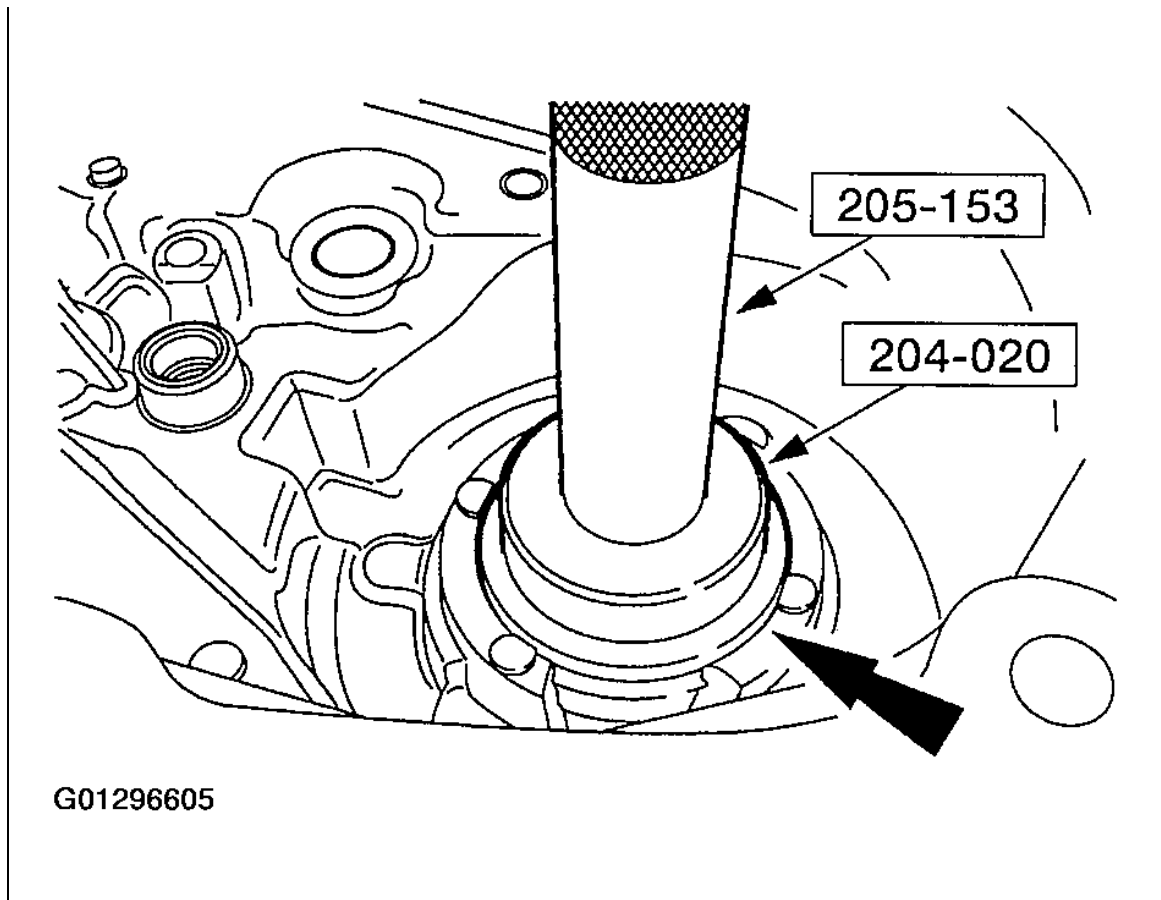
Fig 231: Pressing Needle Bearing Into Housing



Courtesy of FORD MOTOR CO.

35. Using the special tools, press the bearing into the housing.

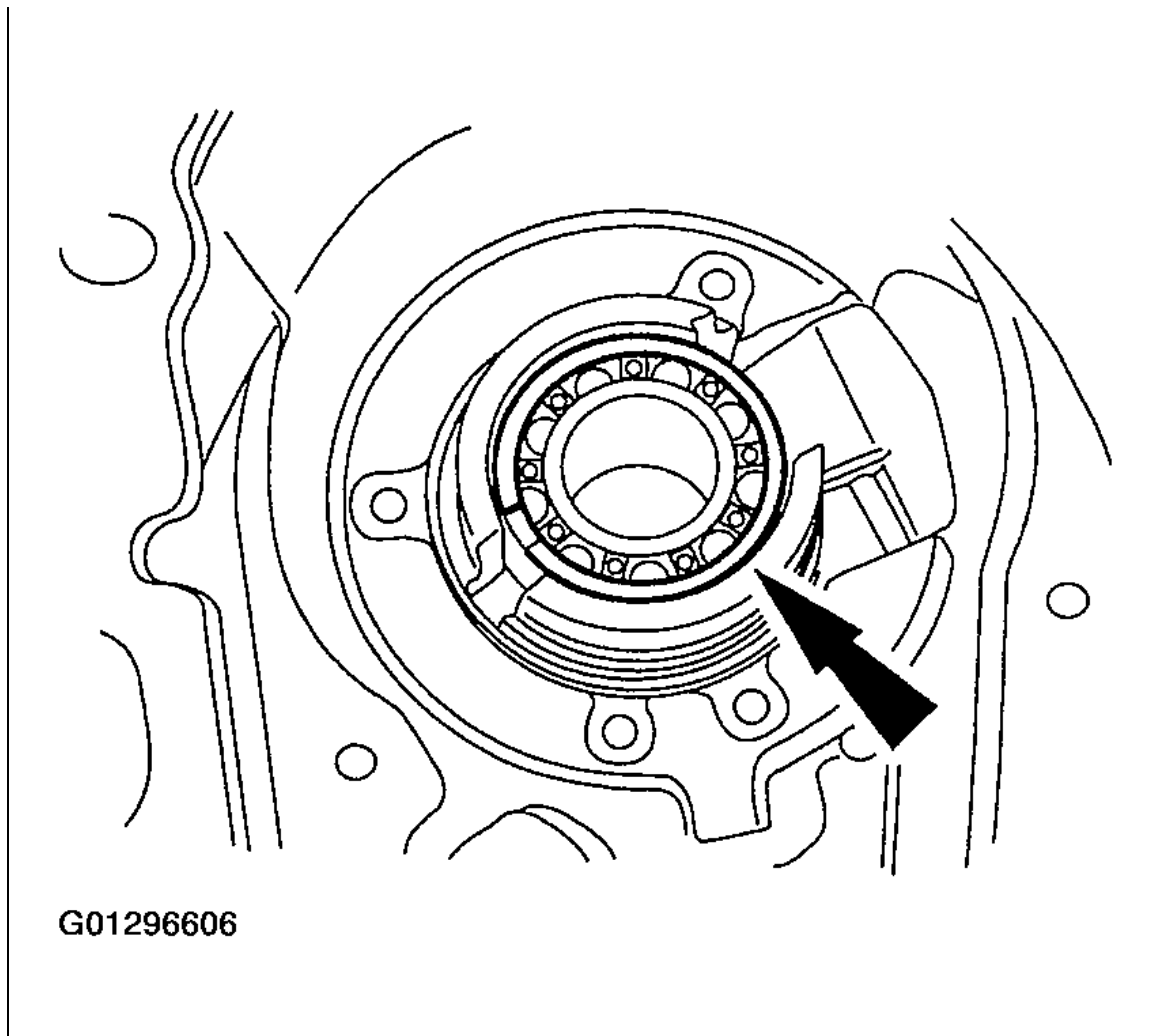
Fig 232: Pressing Bearing Into Housing



Courtesy of FORD MOTOR CO.

36. Install the snap ring that retains the bearing to the transfer case cover.

Fig 233: Installing Snap Ring That Retains Bearing To Transfer Case Cover



Courtesy of FORD MOTOR CO.

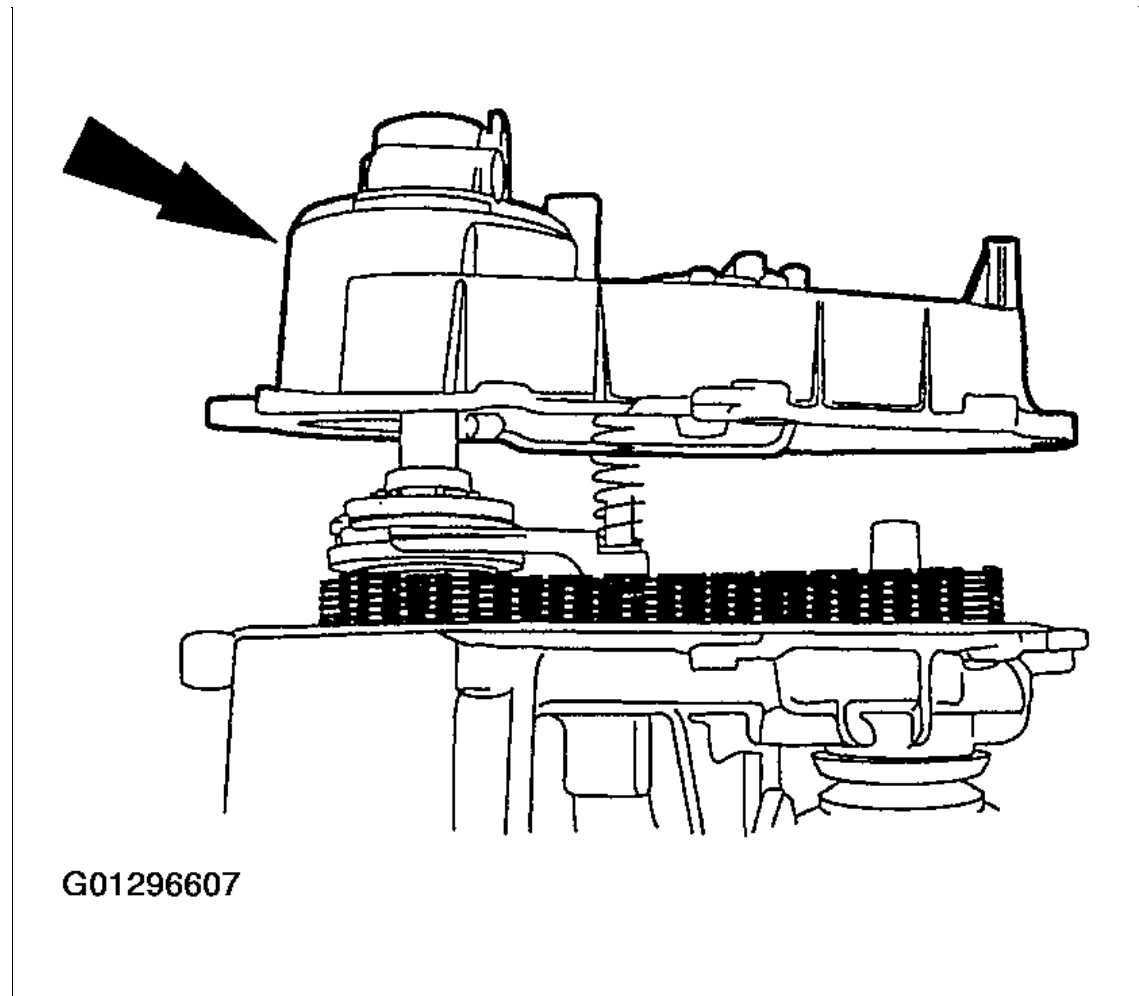
37. Apply a 3 mm (1/8 in) bead of silicone sealant to the mating surface of the front case.

CAUTION: Assemble the cases within 15 minutes of applying the silicone sealant or it will be necessary to apply new sealant. If possible, allow one hour before filling the transfer case with lubricant to allow the silicone sealant to cure.

38. Assemble the cases.

1. Align the output shaft, the shift shaft, and the return spring to their respective bores in the transfer case cover.

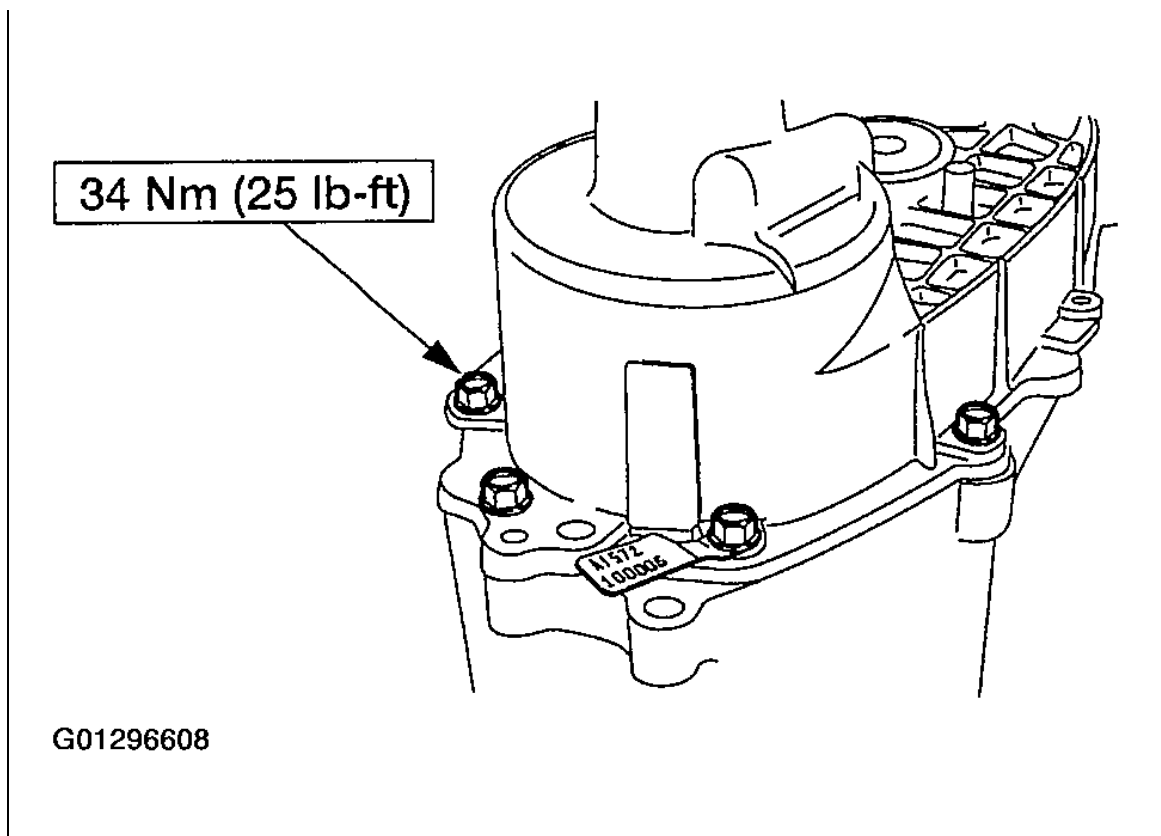
Fig 234: Assembling Cases



Courtesy of FORD MOTOR CO.

39. Install the bolts.

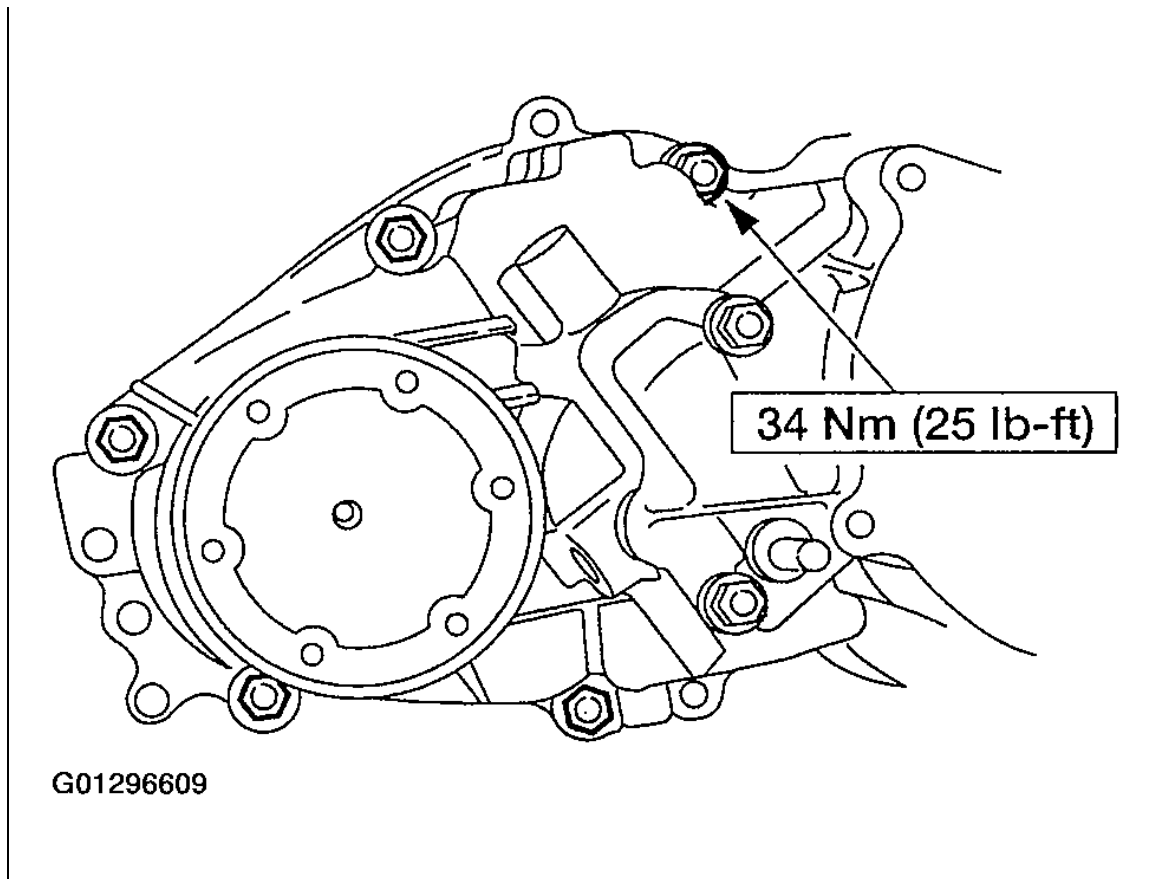
Fig 235: Installing Bolts



Courtesy of FORD MOTOR CO.

40. Install the bolts.

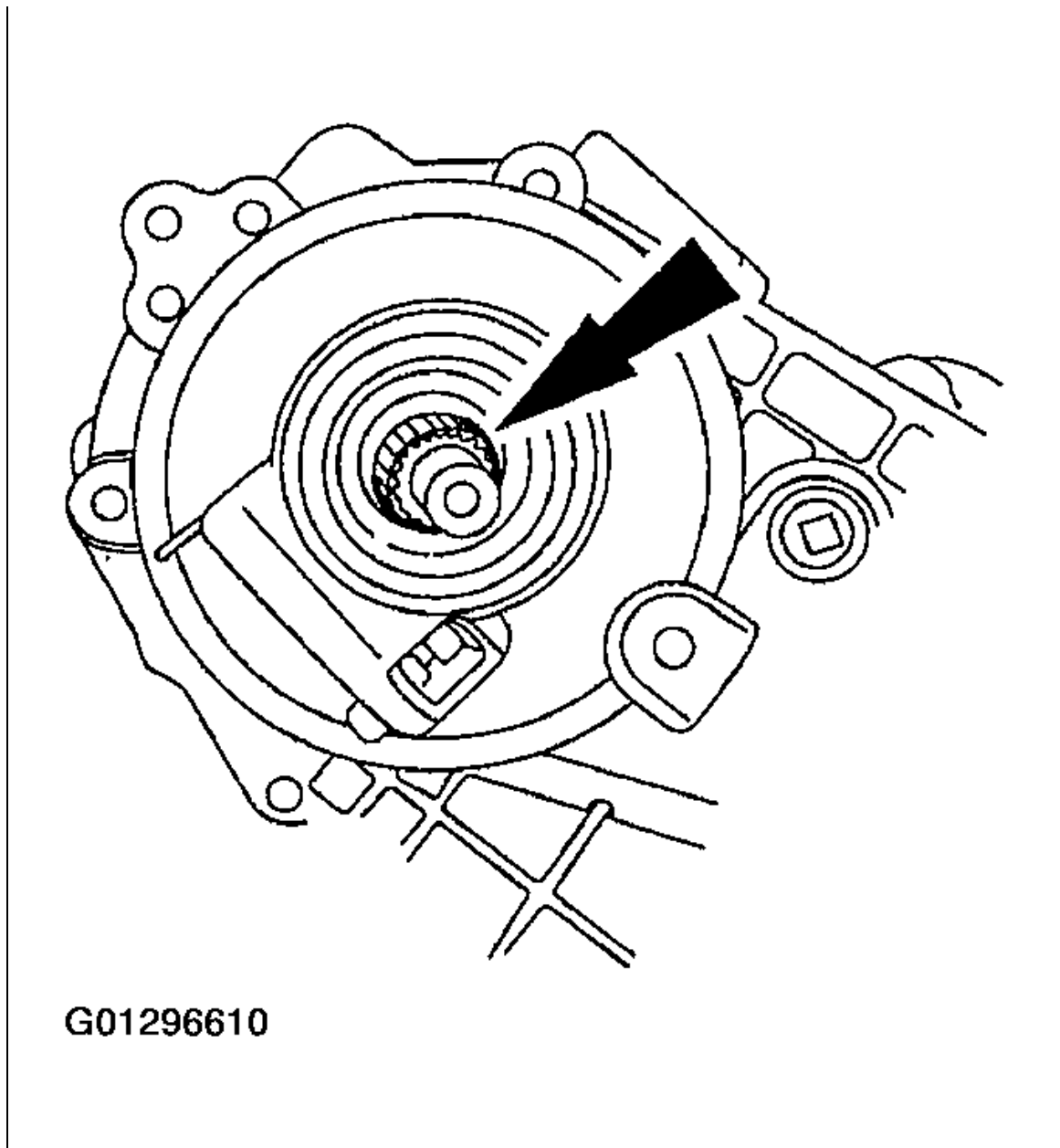
Fig 236: Installing Bolts



Courtesy of FORD MOTOR CO.

41. Install the spacer on the rear output shaft.

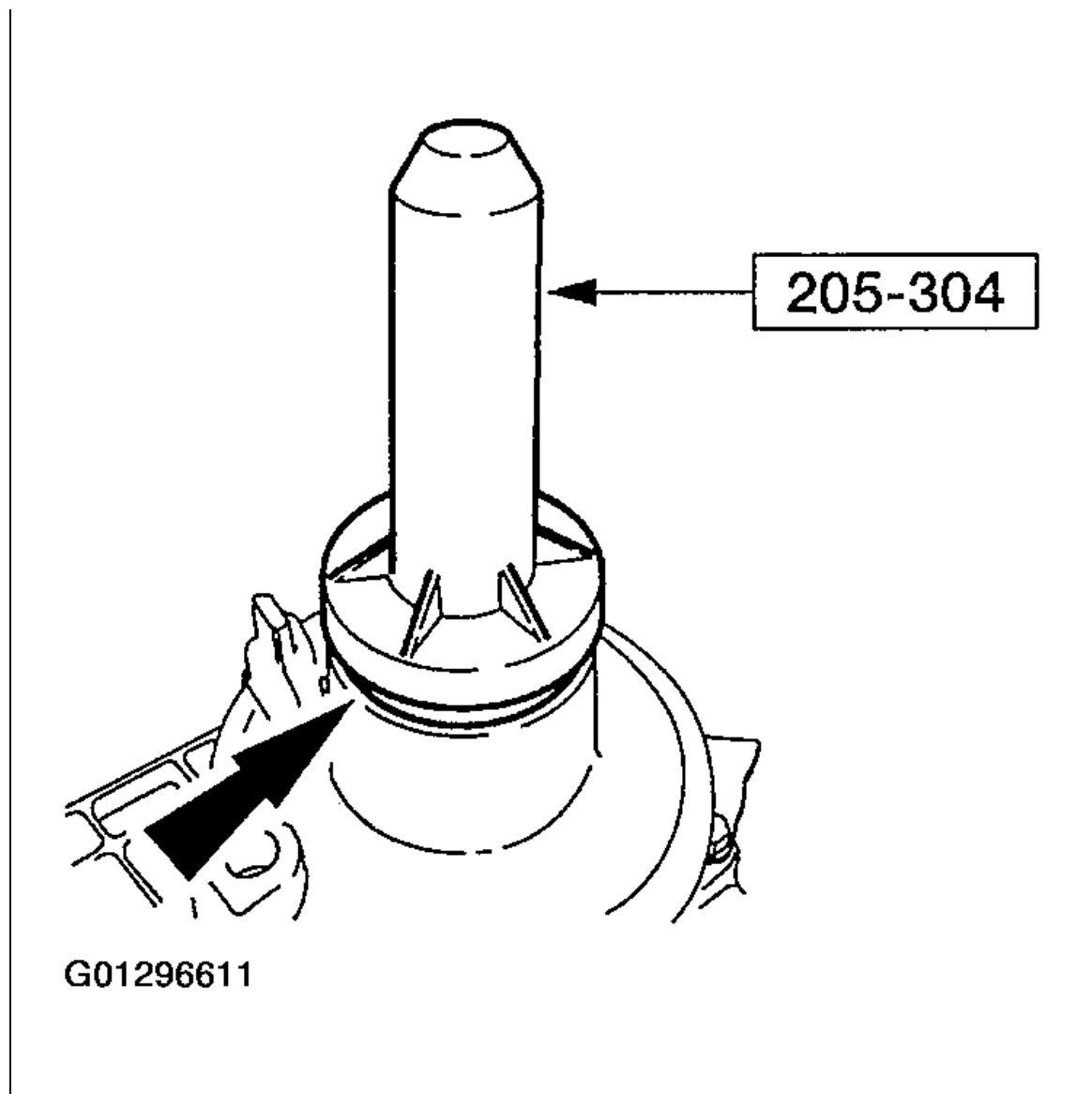
Fig 237: Installing Spacer On Rear Output Shaft



Courtesy of FORD MOTOR CO.

42. Using the special tool, install the oil seal.

Fig 238: Installing Oil Seal



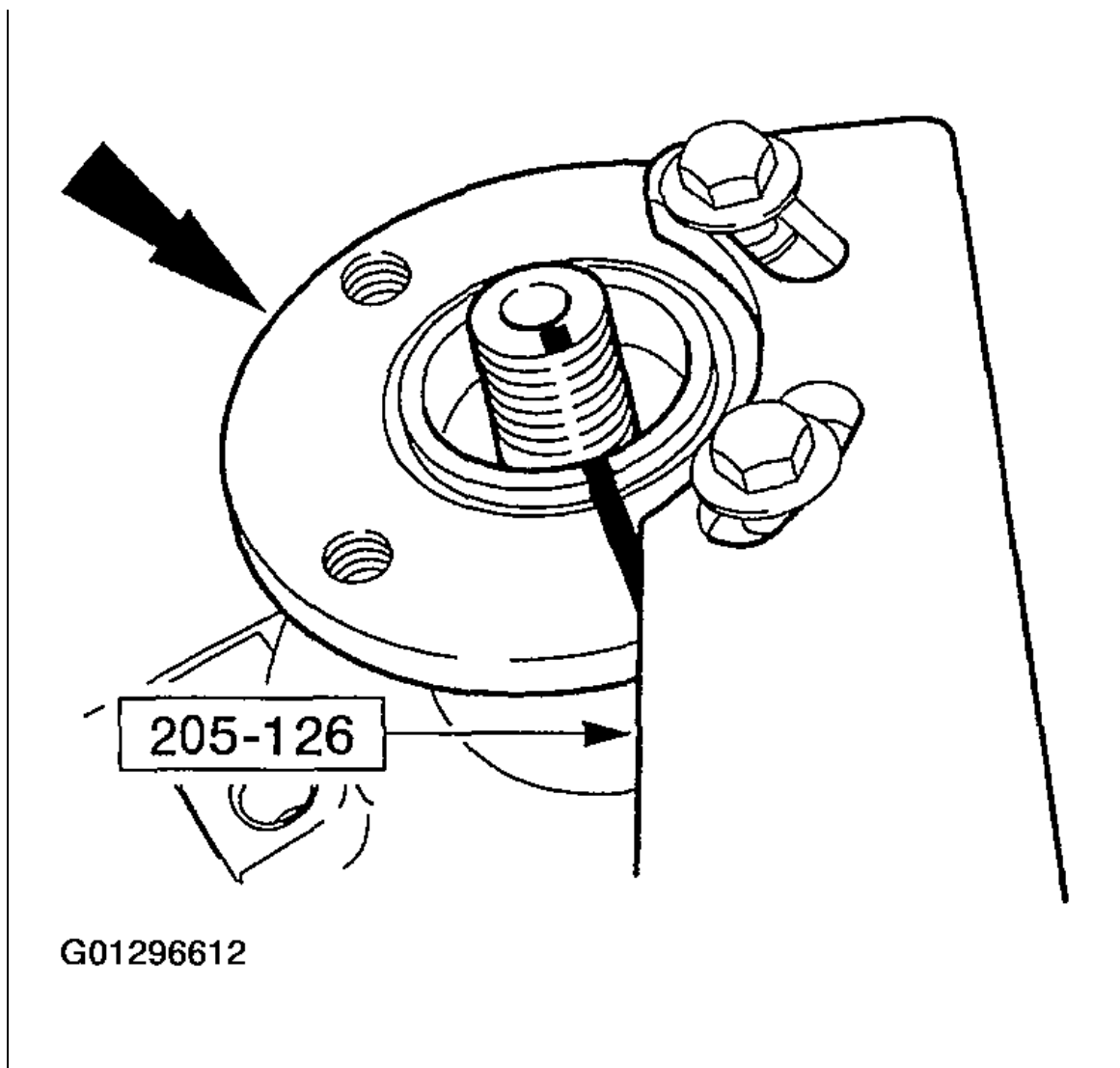
Courtesy of FORD MOTOR CO.

43. Position the flange on the rear output shaft.

CAUTION: *Align the index marks.*

NOTE: *Make sure the oil seal is not on the shaft before installing the flange.*

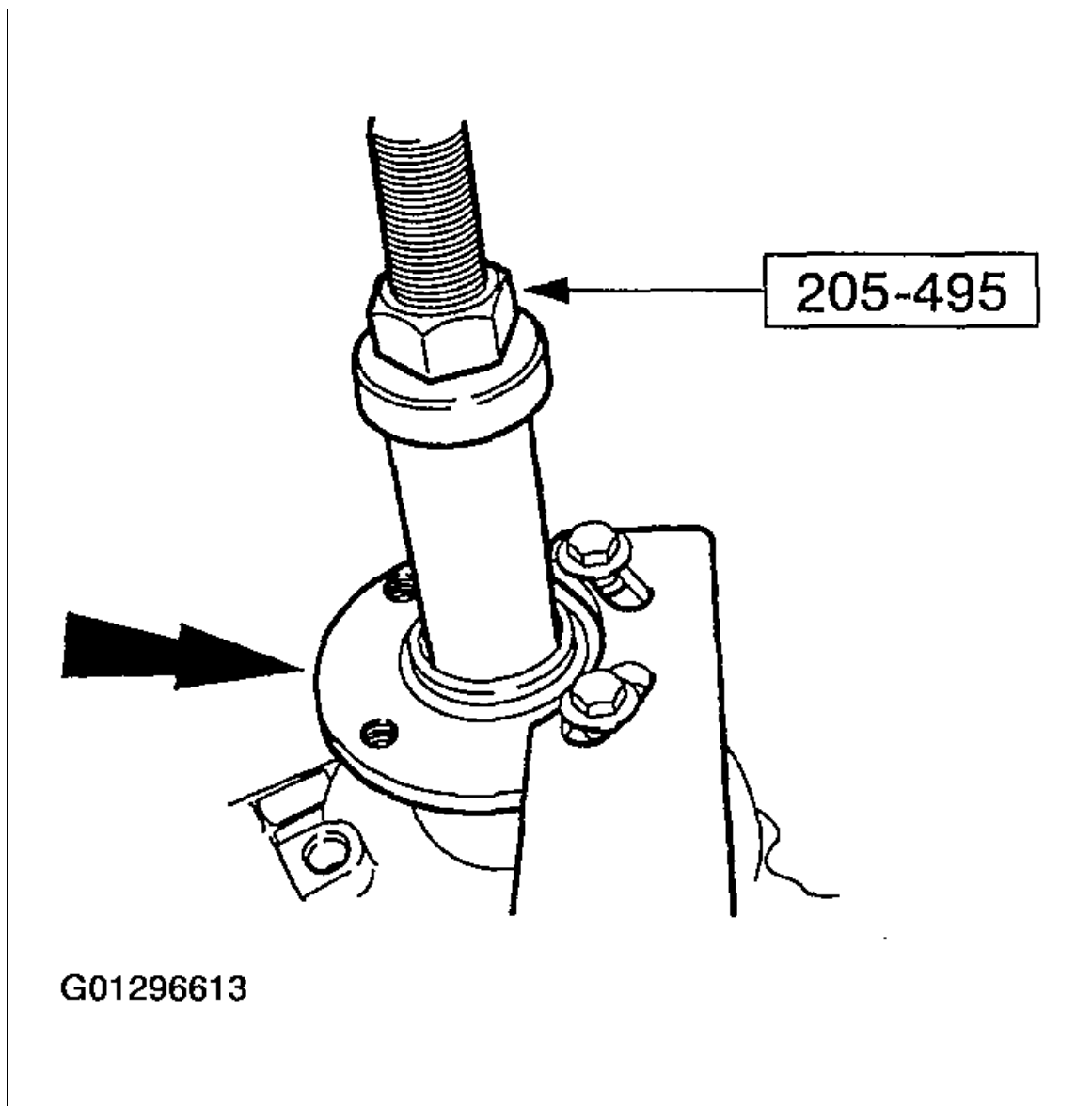
Fig 239: Positioning Flange On Rear Output Shaft



Courtesy of FORD MOTOR CO.

44. Install a new oil seal in the flange.
45. Using the special tool, install the flange, the washer and a new nut. Tighten the new nut on the special tool to 54 Nm (40 lb-ft) to seat the flange on the shaft.

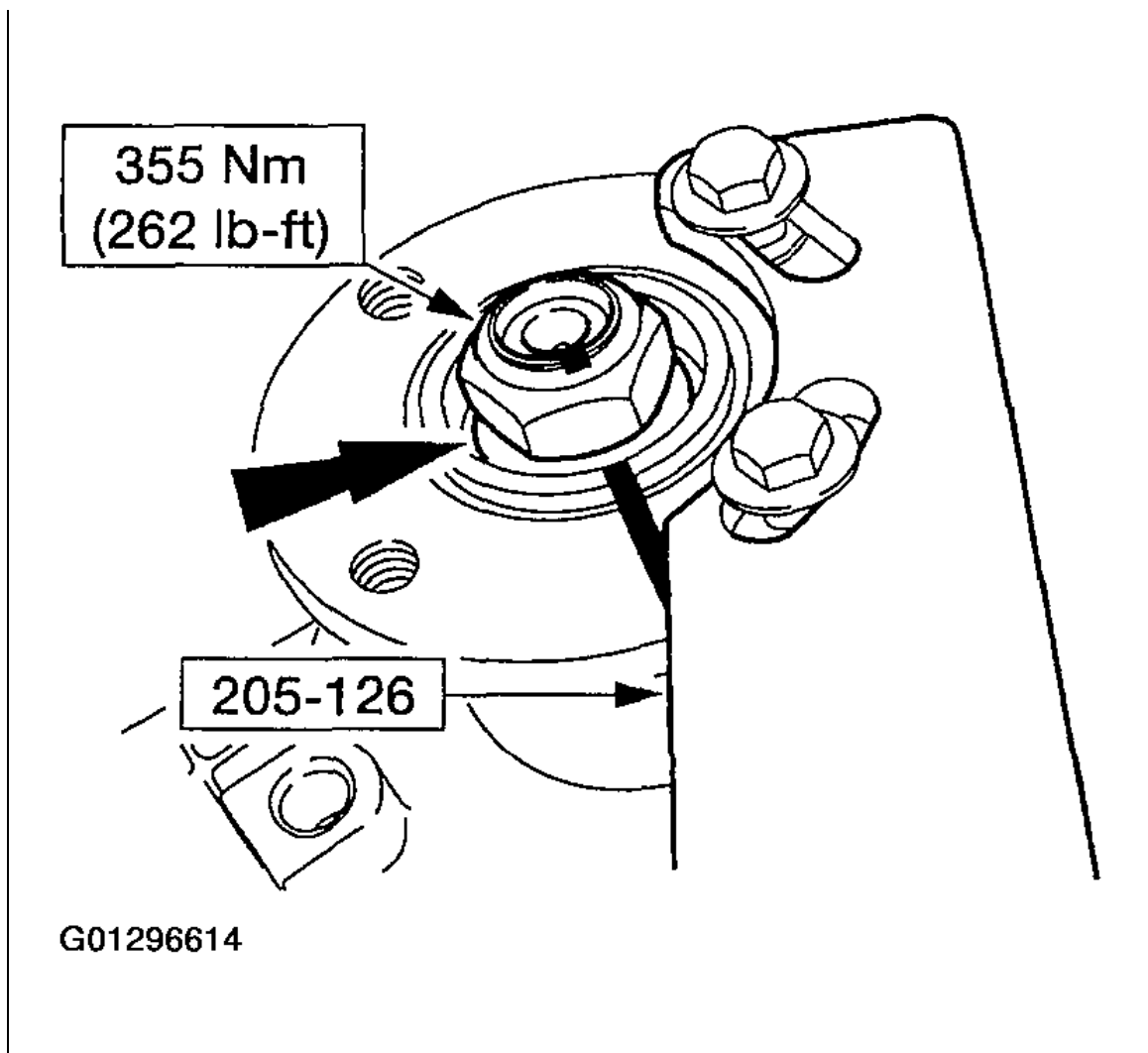
Fig 240: Installing Flange, Washer & Nut



Courtesy of FORD MOTOR CO.

46. Use the special tool to prevent the flange from turning. Install the new washer and the new nut.

Fig 241: Install Flange Washer & Nut



Courtesy of FORD MOTOR CO.

47. Install the transfer case. For additional information, refer to TRANSFER CASE.