

2002 Ford Focus LX

2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

2002 TRANSMISSION

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SPECIFICATIONS

LUBRICANTS, FLUIDS, SEALERS AND ADHESIVES SPECIFICATIONS

Item	Specification
High-temperature grease	ESD-M1C220-A
Sealer	WSK-M2G348-A5
Slave cylinder sealer	ESK-M4G269-A
Manual transmission fluid	WSD-M2C200-C
DOT 3 brake fluid	ESA-M6C25-A

MANUAL TRANSMISSION FLUID CAPACITIES

	Litres
Manual transmission fluid (0 - 5 mm below the lower edge of the filler hole)	1.9

TRANSAXLE RATIOS

	2.0L Zetec-E Engine
1st gear	3.667
2nd gear	2.136
3rd gear	1.448
4th gear	1.028
5th gear	0.767
Reverse gear	3.727
Final drive	3.820

REQUIRED SHIM THICKNESS

Type	Input Shaft	Output Shaft	Differential
	mm	mm	mm
Measuring shims	1.00	1.00	1.10
Determined end float	+ 0.22	+ 0.33	+ 0.36
Preload figure	-	+ 0.13	+ 0.33
End float	-0.05	-	-
Required shim			

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thickness	= 1.17	= 1.46	= 1.79
Shims available	1.15 - 1.71 (in 0.01 mm steps)	1.31 - 1.91 (in 0.02 mm steps)	1.40 - 2.20 (in 0.05 mm steps)

TORQUE SPECIFICATIONS

Description	Nm	lb-ft	lb-in
Transaxle to engine flange bolts	47	35	-
Starter motor to transaxle housing	35	26	-
Intermediate shaft center bearing	25	18	-
Engine rear mount bracket to transaxle	80	59	-
Engine rear mount (four nuts)	48	35	-
Engine rear mount (center nut)	133	98	-
Roll restrictor to transaxle	48	35	-
Roll restrictor to subframe	48	35	-
Catalytic converter to exhaust	47	35	-
Lower suspension arm ball joint to spindle carrier	47	35	-
Suspension strut top mount retaining nuts	25	18	-
Clutch slave cylinder to transaxle	10	-	89
Transaxle housing flange bolts	32	24	-
Reverse gear idler shaft mounting	34	25	-
Spur gear to differential	88	65	-
Selector finger to selector shaft	28	21	-
Selector gate to housing	10	-	89
Gearshift lever to selector shaft	40	30	-
Transmission fluid drain plug	45	33	-
Transmission fluid filler plug	45	33	-
Reversing lamp switch	10	-	89
Ball joint to selector lever shaft	15	11	-
Gearshift lever to gearshift lever shaft	30	22	-
Cover of internal selector mechanism	10	-	89
Reversing light actuating pin	25	18	-
Reverse gear idler shaft	24	18	-
Selector mechanism to transaxle	23	17	-
Battery tray to body	25	18	-

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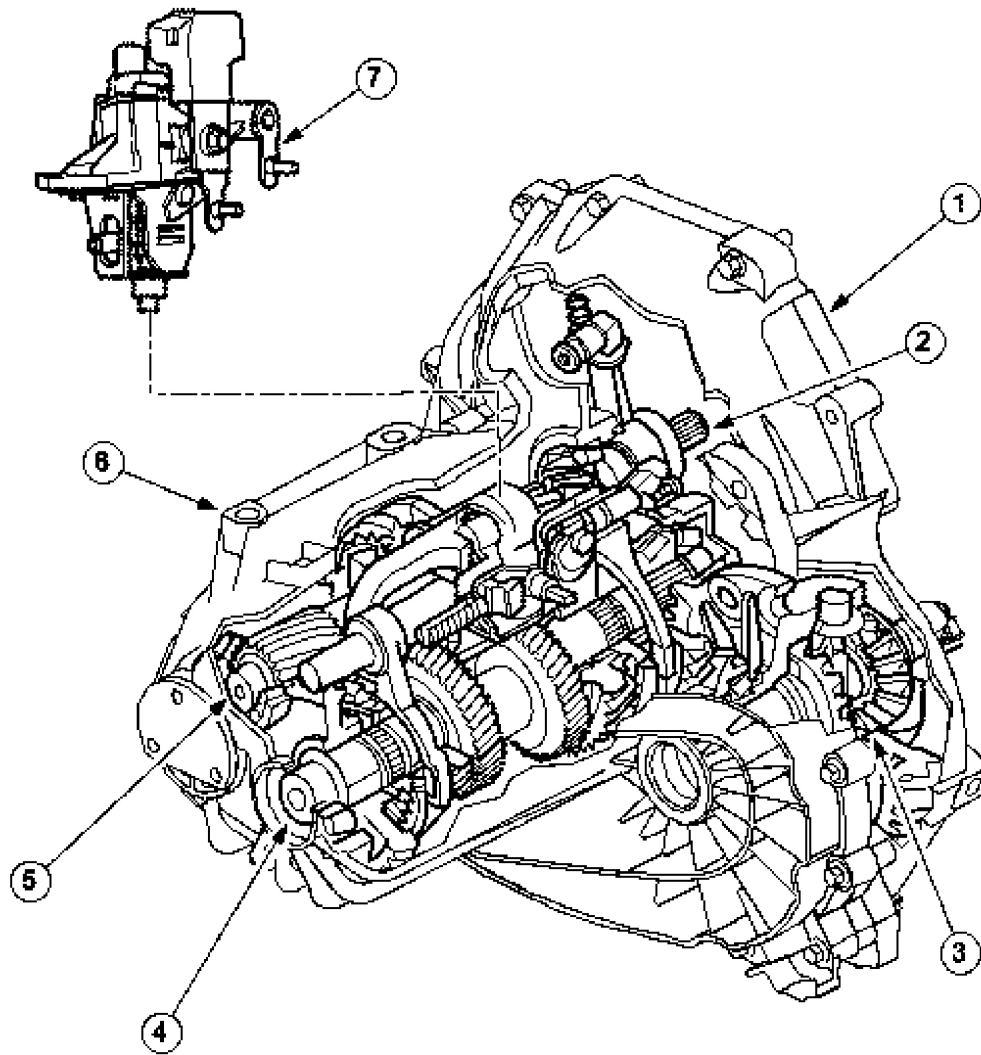
DESCRIPTION AND OPERATION

MANUAL TRANSAXLE

MTX-75 transaxle - Vehicles built up to 01/2000

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Item	Part Number	Description
1	-	Transaxle housing, clutch side
2	-	Clutch slave cylinder
3	-	Differential
4	-	Output shaft
5	-	Input shaft
6	-	Transaxle housing
7	-	Selector mechanism

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Fig. 1: Identifying MTX-75 Transaxle - Vehicles Built Up To 01/2000 Components
Description

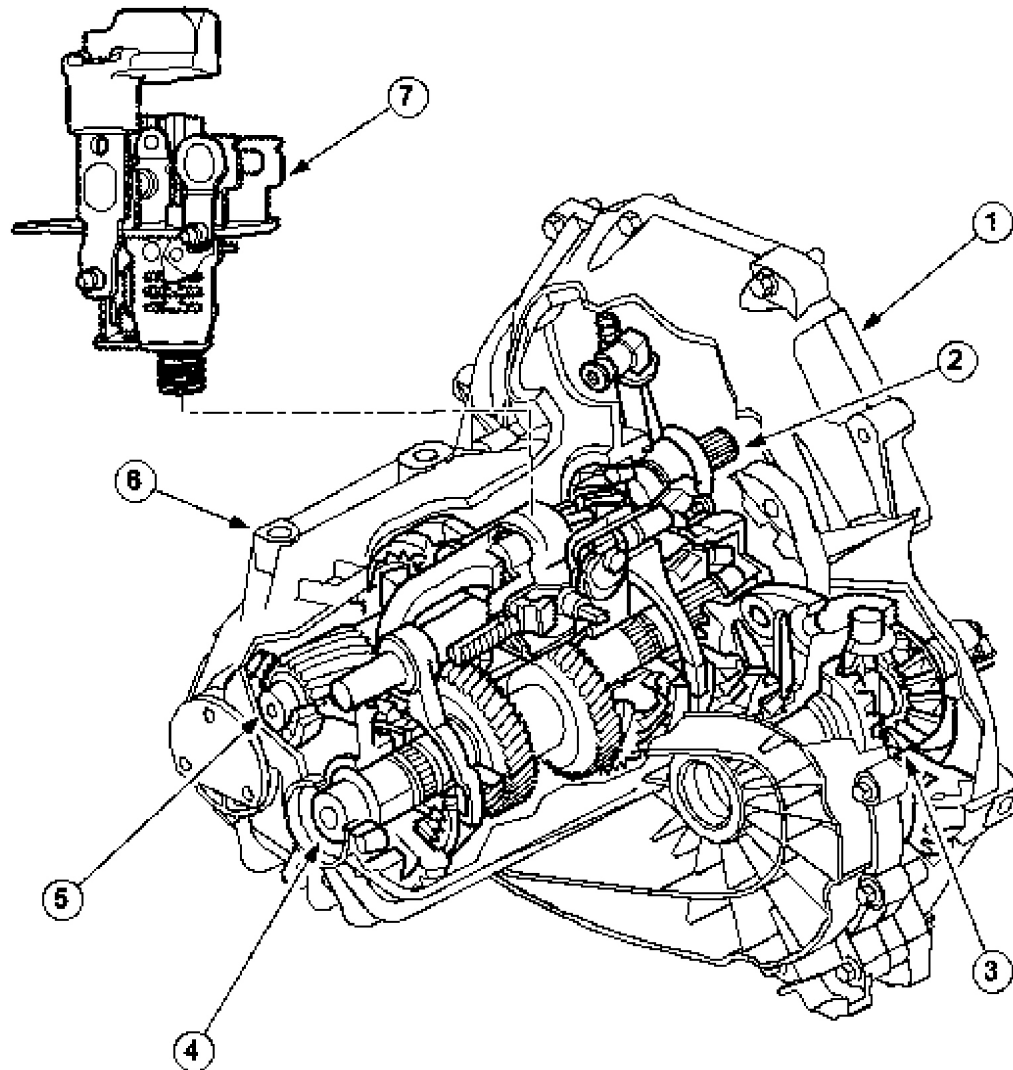
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Courtesy of FORD MOTOR CO.

MTX-75 transaxle - Vehicles built 01/2000 onwards

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Item	Part Number	Description
1	-	Transaxle housing, clutch side
2	-	Clutch slave cylinder
3	-	Differential
4	-	Output shaft
5	-	Input shaft
6	-	Transaxle housing
7	-	Selector mechanism

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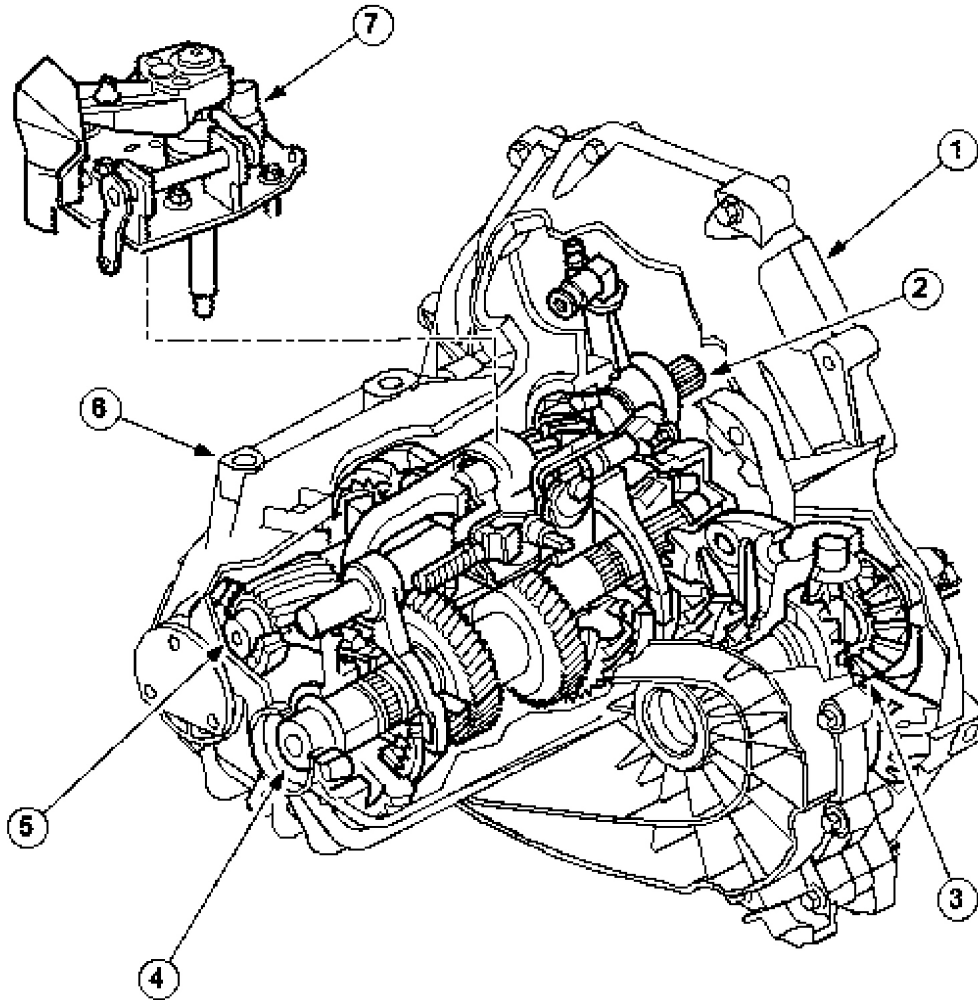
Fig. 2: Identifying MTX-75 Transaxle - Vehicles Built 01/2000 Onwards Components Description

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Courtesy of FORD MOTOR CO.

MTX-75 transaxle - Vehicles built 10/2001 onwards.



Item	Part Number	Description
1	-	Transaxle housing - clutch side
2	-	Clutch slave cylinder
3	-	Differential
4	-	Output shaft
5	-	Input shaft
6	-	Transaxle housing - transaxle side
7	-	External shift mechanism

Fig. 3: Identifying MTX-75 Transaxle - Vehicles Built 10/2001 Onwards Components**Description****Courtesy of FORD MOTOR CO.**

The MTX-75 manual transaxle is a 2-shaft transaxle.

MTX-75 means:

- M: Manual
- T: Transmission
- X: Transaxle (front wheel drive)
- 75: Distance between input and output shaft in mm.

The aluminum transaxle housing comprises two closed sections. Additional reinforcement ribbing has been added to the transaxle housing to reduce noise and vibrations.

All the gear wheels in the "2-shaft transaxle" are in constant mesh. In each gear the required transaxle ratio is achieved by means of a pair of gear wheels.

When reverse gear is selected, an idler gear changes the direction of rotation of the output shaft.

The input and output shafts run in roller bearings.

To further improve stability and gear shifting, the selector mechanism has been revised to incorporate a maintenance-free cable operating mechanism.

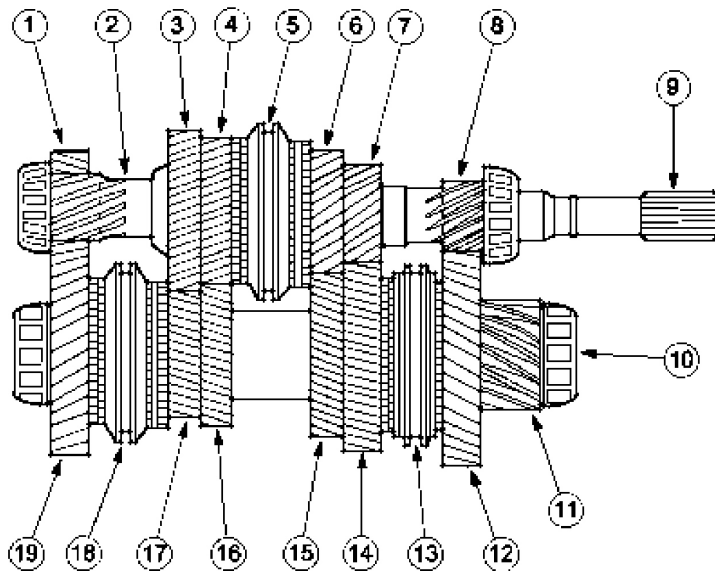
All the gear wheels, including reverse gear, are bevel-cut, synchronized and run on needle roller bearings.

The first, second and third gears (vehicles built up to 08/2000) are dual-synchronized.

Input and Output Shaft**General View of the Input and Output Shaft**

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Item	Part Number	Description
1	-	Reverse gear idler
2	-	Reverse gear gearing
3	-	Fifth gear wheel
4	-	Fourth gear wheel
5	-	Third and fourth gear synchronizer
6	-	Third gear wheel
7	-	Second gear gearing
8	-	First gear gearing
9	-	Input shaft
10	-	Output shaft
11	-	Output drive pinion
12	-	First gear wheel
13	-	First and second gear synchronizer
14	-	Second gear wheel
15	-	Third gear gearing
16	-	Fourth gear gearing
17	-	Fifth gear wheel
18	-	Fifth and reverse gear synchronizer
19	-	Reverse gear wheel

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Fig. 4: General View Of Input And Output Shaft
Courtesy of FORD MOTOR CO.

In neutral, none of the gears are connected to the input or output shaft via the relevant

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synchronizer unit. No torque is transmitted to the differential.

The input and output shafts are each seated in one roller bearing in the transaxle housing section on the clutch side and one roller bearing in the transaxle housing section on the transaxle side.

The output drive pinion is in constant mesh with the differential drive annulus.

The third and fourth gear wheels and the third and fourth gear synchronizer are located on the input shaft. The gearing for first, second and reverse gears is an integral part of the input shaft.

The first, second, fifth and reverse gearwheels and the first and second gear synchronizer and fifth and reverse gear synchronizer are located on the output shaft. On vehicles built up to 07/2000 the gearing for third and fourth gear is an integral part of the output shaft.

Differential

The main components of the differential are:

- Output gear wheel
- Spur gear
- Four pinions at right angles to one another
- Differential housing with two roller bearings

The transaxle and differential are installed in a two-part aluminum housing which is flange-mounted to the engine.

The input shafts have serrated teeth and are secured with a snap ring.

The torque is transmitted from the spur gear to the input shafts via two differential pinions mounted on the differential pinion shaft and the input shaft pinions.

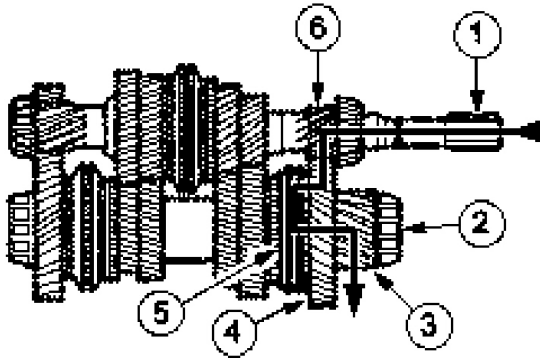
When cornering, the drive gears need to turn at different speeds as the road wheels travel different distances. This is achieved by means of the differential pinions which turn on their own shaft and mesh with the input shaft pinions turning at different rates.

Power Flow

First Gear

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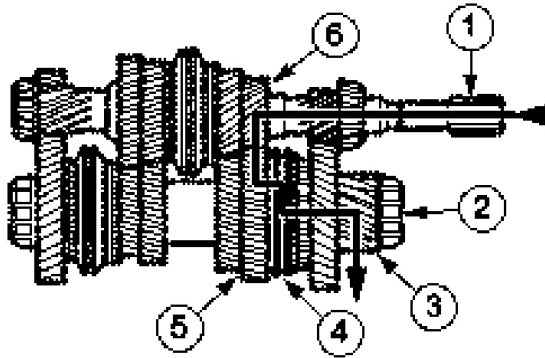


Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	First gear wheel
5	-	First and second gear synchronizer
6	-	First gear gearing

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Fig. 5: Identifying Power Flow - First Gear
Courtesy of FORD MOTOR CO.

Second Gear



Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	First and second gear synchronizer
5	-	Second gear wheel
6	-	Second gear gearing

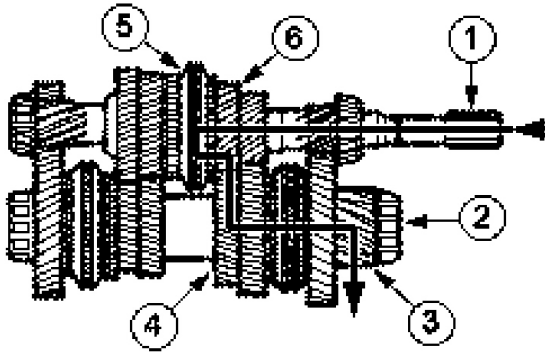
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Fig. 6: Identifying Power Flow - Second Gear
Courtesy of FORD MOTOR CO.

Third Gear

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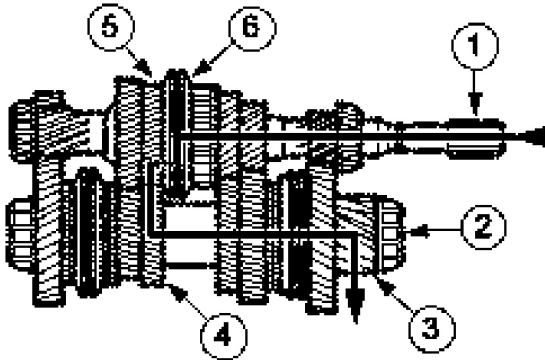


Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	Third gear gearing
5	-	Third and fourth gear synchronizer
6	-	Third gear wheel

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Fig. 7: Identifying Power Flow - Third Gear
Courtesy of FORD MOTOR CO.

Fourth Gear



Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	Fourth gear gearing
5	-	Fourth gear wheel
6	-	Third and fourth gear synchronizer

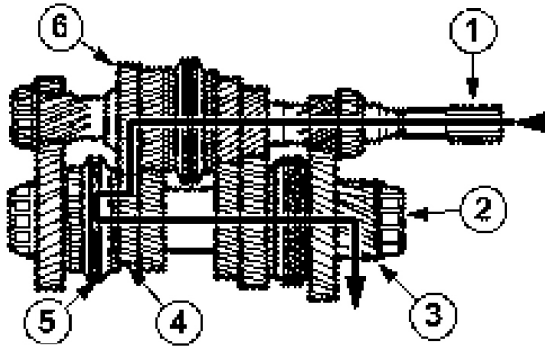
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Fig. 8: Identifying Power Flow - Fourth Gear
Courtesy of FORD MOTOR CO.

Fifth Gear

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Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	Fifth gear wheel
5	-	Fifth and reverse gear synchronizer
6	-	Fifth gear wheel

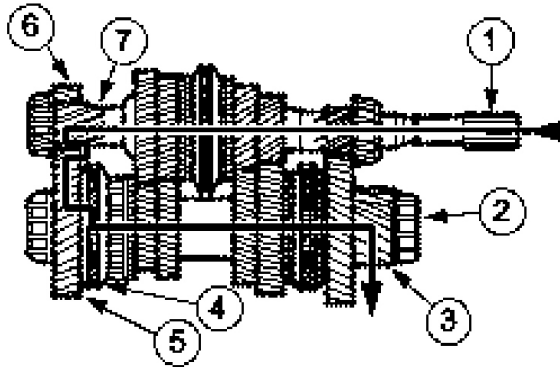
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Fig. 9: Identifying Power Flow - Fifth Gear
Courtesy of FORD MOTOR CO.

Reverse Gear

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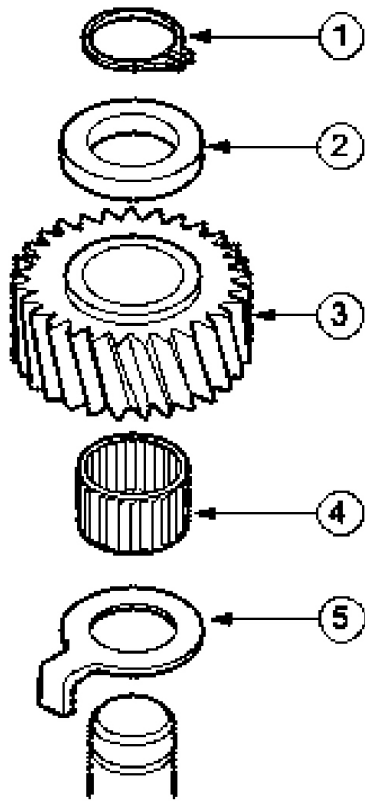


Item	Part Number	Description
1	-	Input shaft
2	-	Output shaft
3	-	Output drive pinion
4	-	Fifth and reverse gear synchronizer
5	-	Reverse gear wheel
6	-	Reverse gear idler
7	-	Reverse gear gearing

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Fig. 10: Identifying Power Flow - Reverse Gear
Courtesy of FORD MOTOR CO.

Reverse Gear Idler



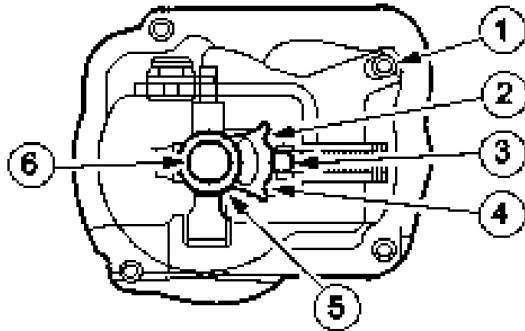
Item	Part Number	Description
1	-	Snap ring
2	-	Top thrust washer
3	-	Reverse gear idler
4	-	Needle roller bearing
5	-	Bottom thrust washer

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Fig. 11: Identifying Reverse Gear Idler Components Description
Courtesy of FORD MOTOR CO.

The reverse gear idler is driven by the input shaft. Its function is to reverse the direction of rotation of the output shaft in reverse gear.

The reverse gear idler is located on the idler gear shaft together with a needle roller bearing.



Item	Part Number	Description
1	-	Selector mechanism housing
2	-	Position of first, third and fifth gear selector finger
3	-	Idle position of selector finger
4	-	Position of second, fourth and reverse gear selector finger
5	-	Selector finger
6	-	Selector shaft

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Fig. 12: Selector Interlock Mechanism Components Description
Courtesy of FORD MOTOR CO.

The selector interlock mechanism and the selector finger are mounted on a sleeve in the selector mechanism housing and keep the selected gear engaged with the aid of a spring-loaded ball until another gear is selected.

The selector interlock mechanism has three positions.

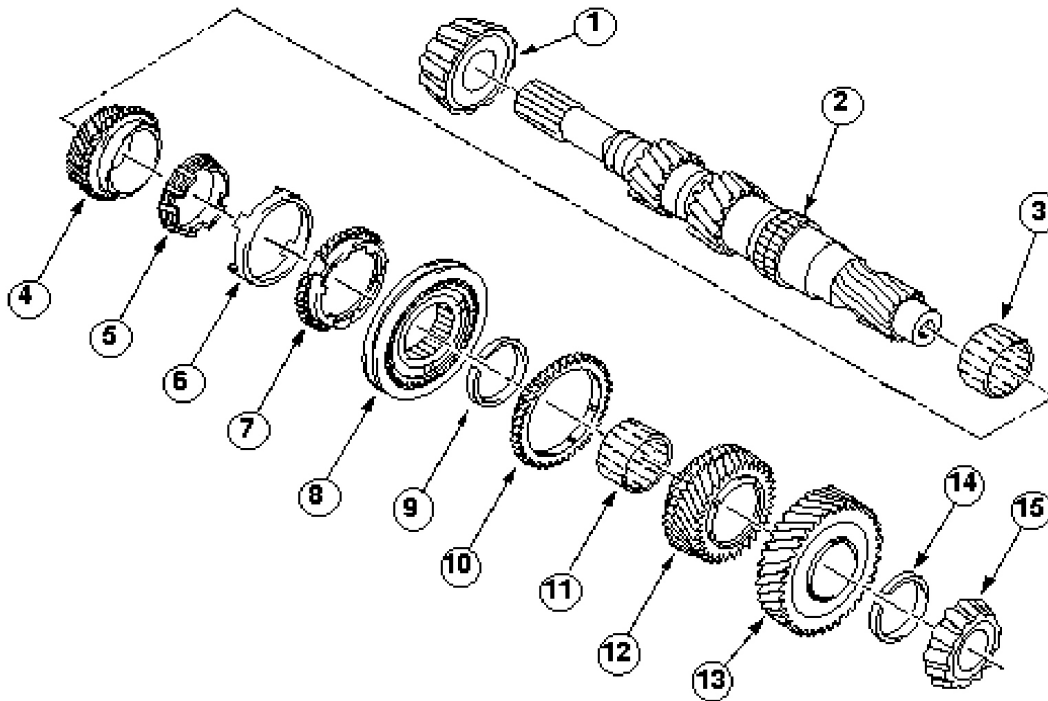
The reversing lamp switch is mounted on the side of the selector mechanism housing.

General Illustrations

Input Shaft - Vehicles built up to 08/2001

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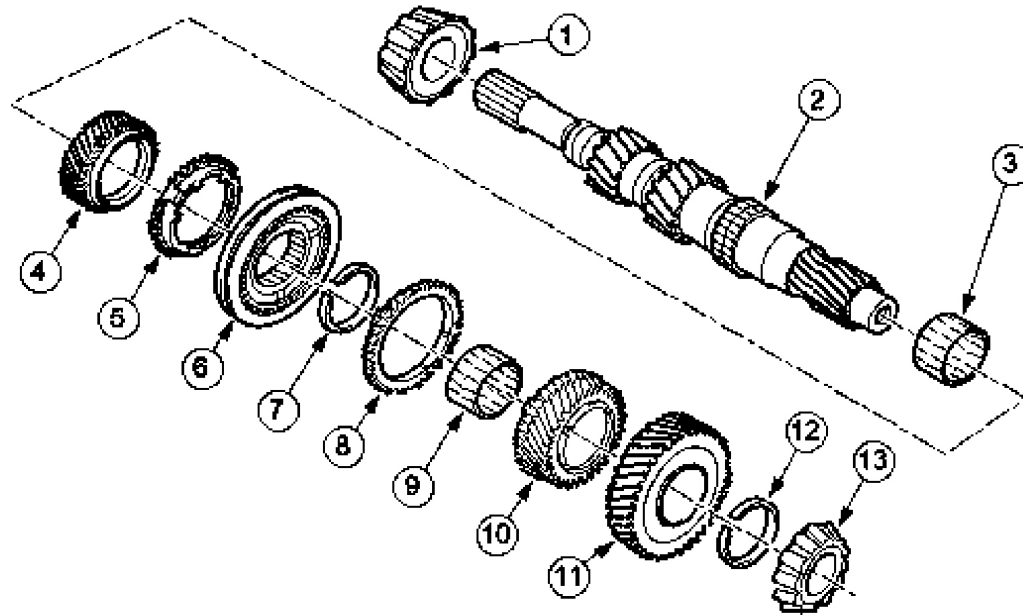
Item	Part Number	Description
1	-	Roller bearing
2	-	Input shaft
3	-	Needle roller bearing for third gear wheel
4	-	Third gear wheel
5	-	Third gear inner synchronizer ring
6	-	Third gear synchronizer cone
7	-	Third gear outer synchronizer ring
8	-	Third and fourth gear synchronizer assembly
9	-	Snap ring
10	-	Fourth gear synchronizer ring
11	-	Fourth gear needle roller bearing
12	-	Fourth gear wheel
13	-	Fifth gear wheel
14	-	Snap ring
15	-	Roller bearing

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Fig. 13: Identifying Input Shaft Components Description - Vehicles Built Up To 08/2001

Courtesy of FORD MOTOR CO.

Input Shaft - Vehicles built 08/2001 onwards



Item	Part Number	Description
1	-	Roller bearing
2	-	Input shaft
3	-	Third gear wheel needle roller bearing
4	-	Third gear wheel
5	-	Third gear synchronizer ring
6	-	Third and fourth gear synchronizer assembly
7	-	Snap ring
8	-	Fourth gear synchronizer ring
9	-	Fourth gear needle roller bearing
10	-	Fourth gear wheel
11	-	Fifth gear wheel
12	-	Snap ring
13	-	Roller bearing

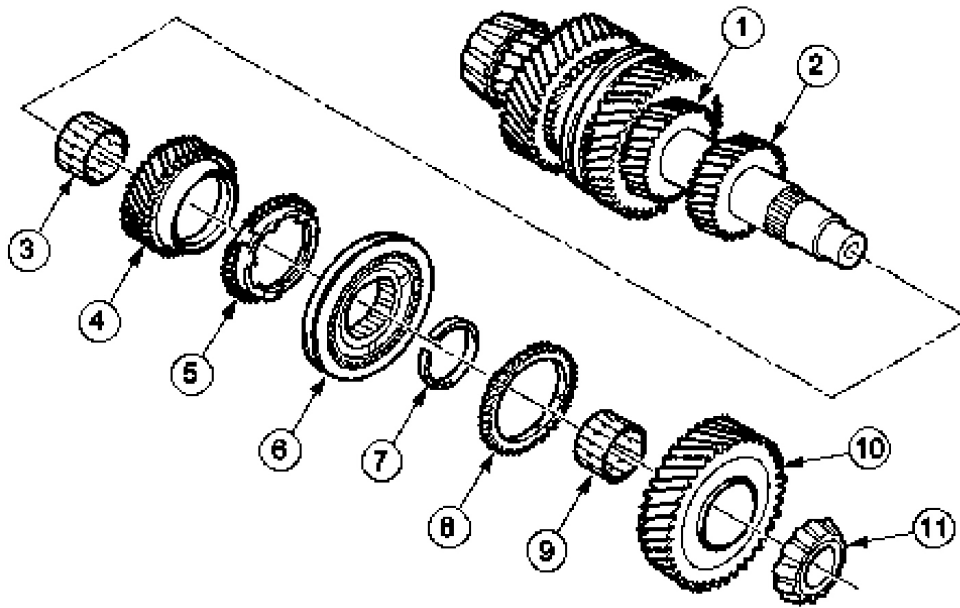
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Fig. 14: Identifying Input Shaft Components Description - Vehicles Built 08/2001

Onwards

Courtesy of FORD MOTOR CO.

Third, Fourth, Fifth and Reverse Gear Output Shaft - Vehicles built up to 07/2000



Item	Part Number	Description
1	-	Third gear wheel
2	-	Fourth gear wheel
3	-	Needle roller bearing
4	-	Fifth gear wheel
5	-	Fifth gear synchronizer ring
6	-	Fifth and reverse gear synchronizer assembly
7	-	Snap ring
8	-	Reverse gear synchronizer ring
9	-	Needle roller bearing
10	-	Reverse gear wheel
11	-	Roller bearing

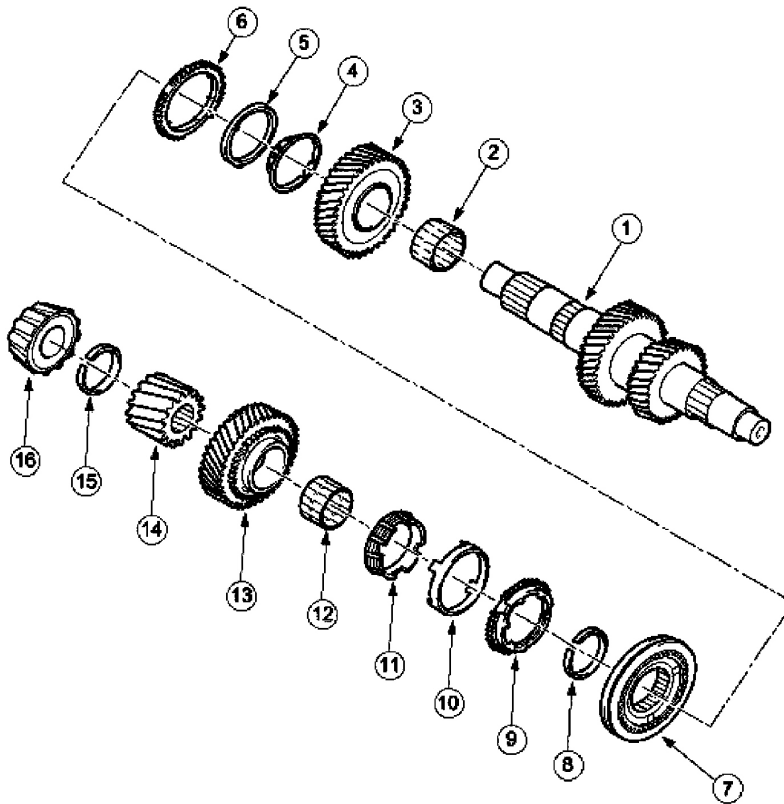
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Fig. 15: Identifying Third, Fourth, Fifth And Reverse Gear Output Shaft Components

Description - Vehicles Built Up To 07/2000

Courtesy of FORD MOTOR CO.

First and Second Gear Output Shaft - Vehicles built up to 07/2000



Item	Part Number	Description
1	-	Output shaft
2	-	Needle roller bearing
3	-	Second gear wheel
4	-	Inner synchronizer ring
5	-	Synchronizer cone
6	-	Outer synchronizer ring
7	-	First and second gear synchronizer assembly
8	-	Snap ring
9	-	Outer synchronizer ring
10	-	Synchronizer cone
11	-	Inner synchronizer ring
12	-	Needle roller bearing
13	-	First gear wheel
14	-	Output drive pinion
15	-	Snap ring
16	-	Roller bearing

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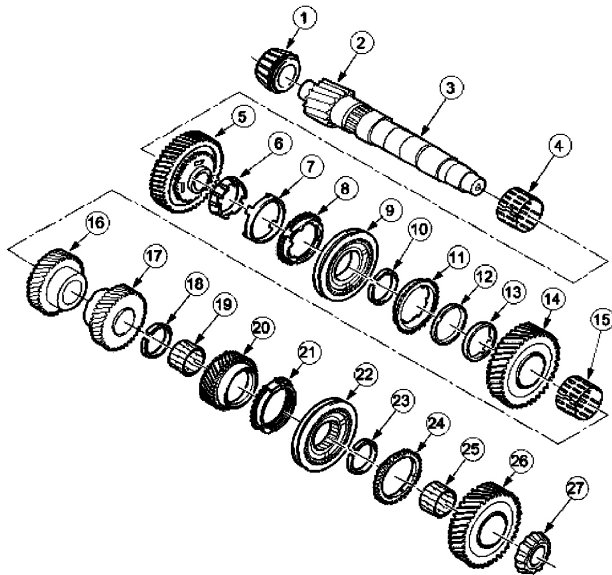
Fig. 16: Identifying First And Second Gear Output Shaft Components Description - Vehicles Built Up To 07/2000

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Courtesy of FORD MOTOR CO.

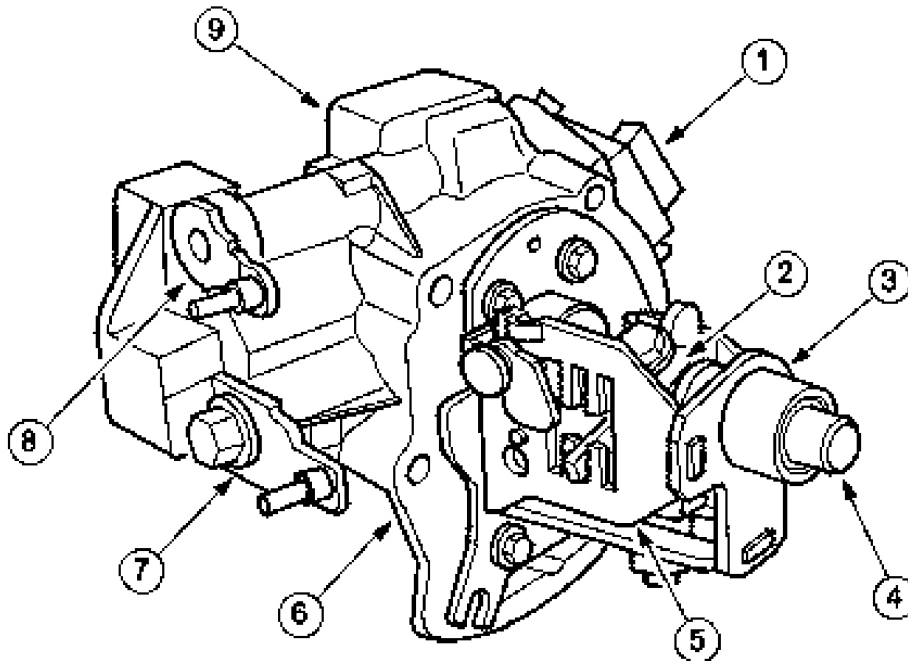
Output Shaft - Vehicles built 08/2000 onwards



Item	Part Number	Description
1	-	Roller bearing
2	-	Output drive pinion
3	-	Output shaft
4	-	First gear needle roller bearing
5	-	First gear wheel
6	-	First gear inner synchronizer ring
7	-	First gear synchronizer cone
8	-	First gear outer synchronizer ring
9	-	First and second gear synchronizer assembly
10	-	Snap ring
11	-	Second gear synchronizer ring
12	-	Second gear synchronizer cone
13	-	Second gear inner synchronizer ring
14	-	Second gear wheel
15	-	Second gear needle roller bearing
16	-	Third gear wheel
17	-	Fourth gear wheel
18	-	Snap ring
19	-	Fifth gear needle roller bearing
20	-	Fifth gear wheel
21	-	Fifth gear synchronizer ring
22	-	Fifth gear and reverse gear synchronizer assembly
23	-	Snap ring
24	-	Reverse gear synchronizer ring
25	-	Reverse gear needle roller bearing
26	-	Reverse gear wheel
27	-	Roller bearing

Fig. 17: Identifying Output Shaft Components Description - Vehicles Built 08/2000 Onwards
Courtesy of FORD MOTOR CO.

Selector Mechanism - Vehicles built up to 01/2000



Item	Part Number	Description
1	-	Reversing lamp switch
2	-	Selector finger
3	-	Selector finger bracket
4	-	Selector shaft
5	-	Selector gate
6	-	Selector mechanism housing
7	-	Selector lever
8	-	Gearshift lever
9	-	Selector mechanism cover

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Fig. 18: Identifying Selector Mechanism Components Description - Vehicles Built Up To

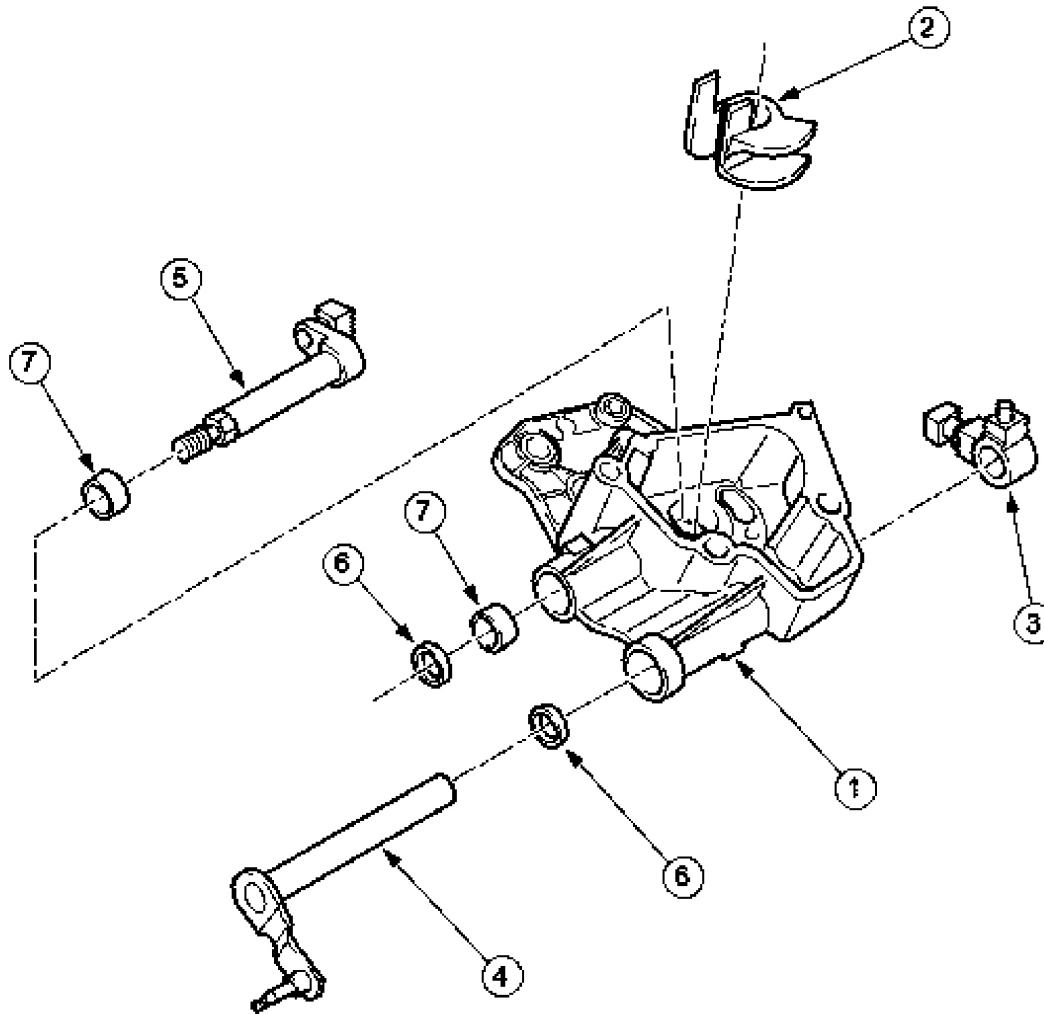
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01/2000
Courtesy of FORD MOTOR CO.

Selector Mechanism Housing - Vehicles built up to 01/2000

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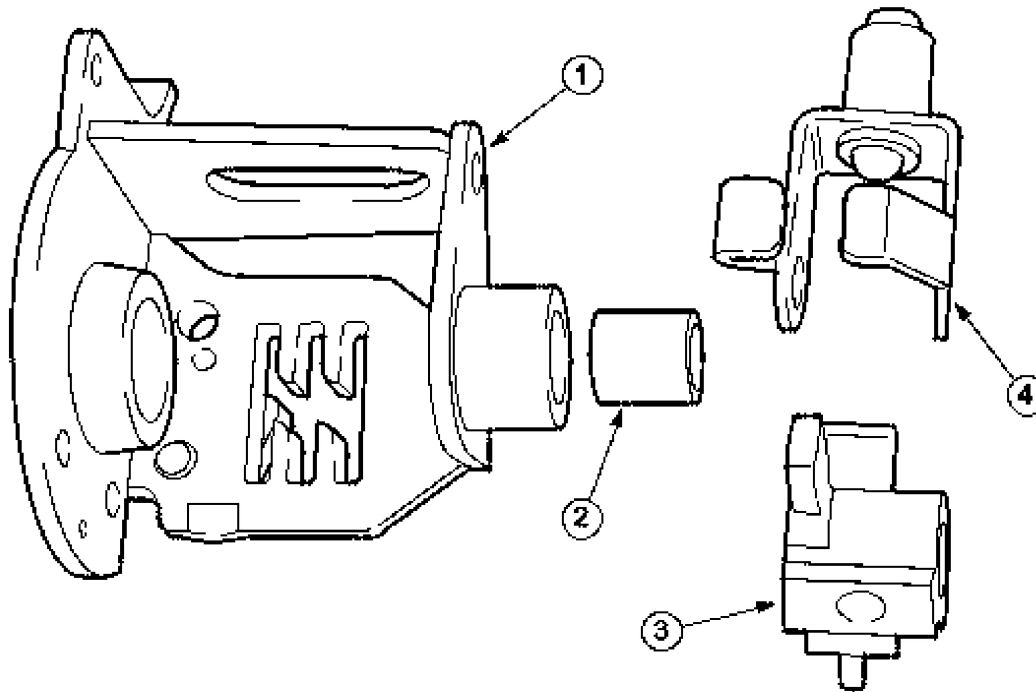
Item	Part Number	Description
1	-	Selector mechanism housing
2	-	Guide bracket - gearshift and selector lever shaft
3	-	Selector joint
4	-	Selector lever and selector lever shaft
5	-	Gearshift lever shaft
6	-	Oil seal
7	-	Needle roller bearing

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Fig. 19: Identifying Selector Mechanism Housing Components Description - Vehicles Built Up To 01/2000

Courtesy of FORD MOTOR CO.

Selector Gate - Vehicles built up to 01/2000



Item	Part Number	Description
1	-	Selector gate
2	-	Selector shaft ball sleeve
3	-	Selector finger
4	-	Selector finger bracket and ball of selector interlock mechanism

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Fig. 20: Identifying Selector Gate Components Description - Vehicles Built Up To 01/2000
Courtesy of FORD MOTOR CO.

DIAGNOSIS AND TESTING

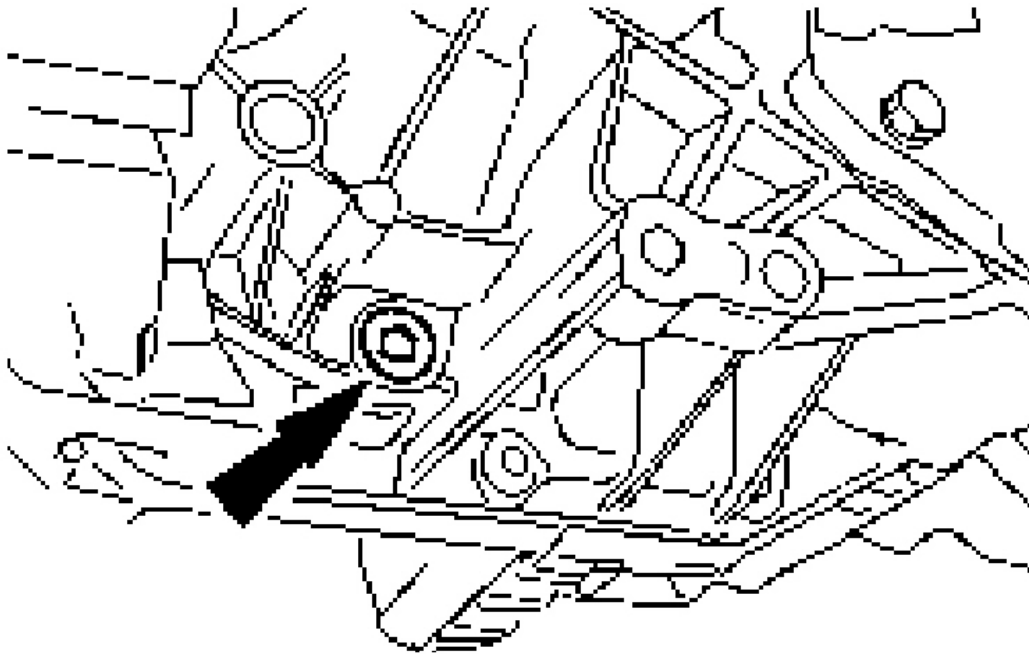
MANUAL TRANSAXLE - VEHICLES WITH: MANUAL TRANSAXLE

REFER to MANUAL TRANSMISSION/TRANSAXLE AND CLUTCH - GENERAL INFORMATION .

GENERAL PROCEDURES

DRAIN PROCEDURE

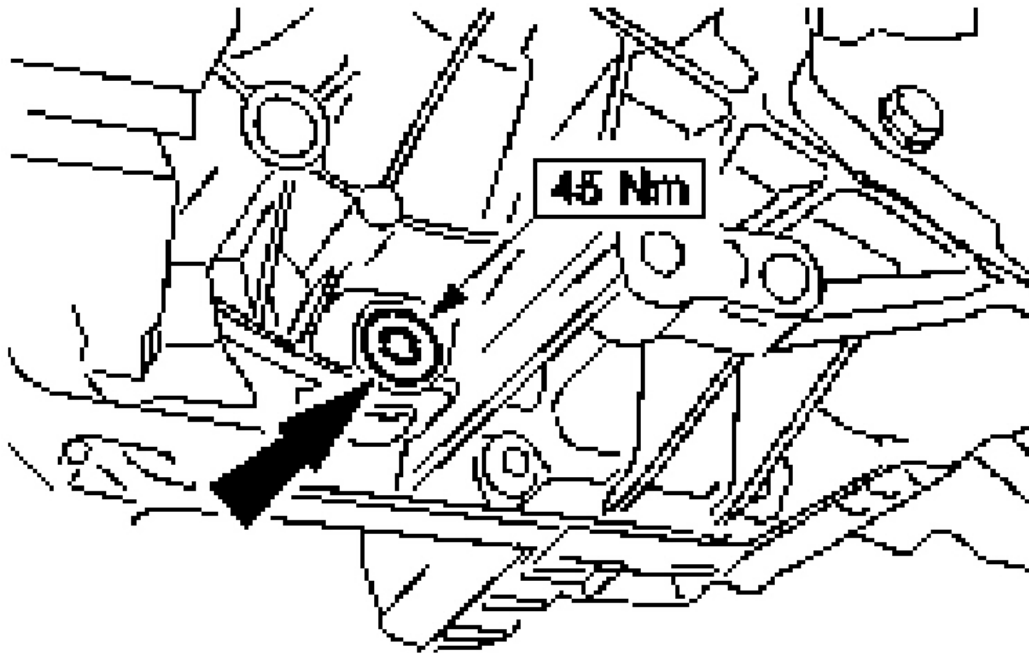
1. Raise and support the vehicle.
2. Remove the drain plug and drain the fluid into a suitable container.



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Fig. 21: Removing Drain Plug
Courtesy of FORD MOTOR CO.

3. Install the drain plug.



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Fig. 22: Installing Drain Plug
Courtesy of FORD MOTOR CO.

4. Lower the vehicle.

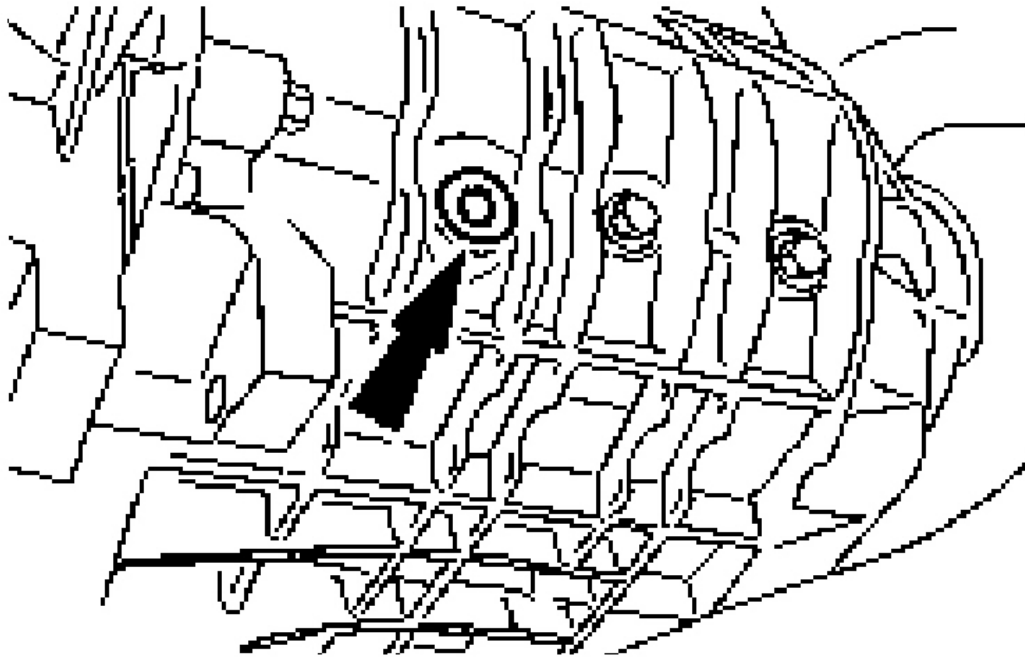
FILL PROCEDURE

Material

MATERIAL SPECIFICATION

Manual transmission fluid	WSD-M2C200-C
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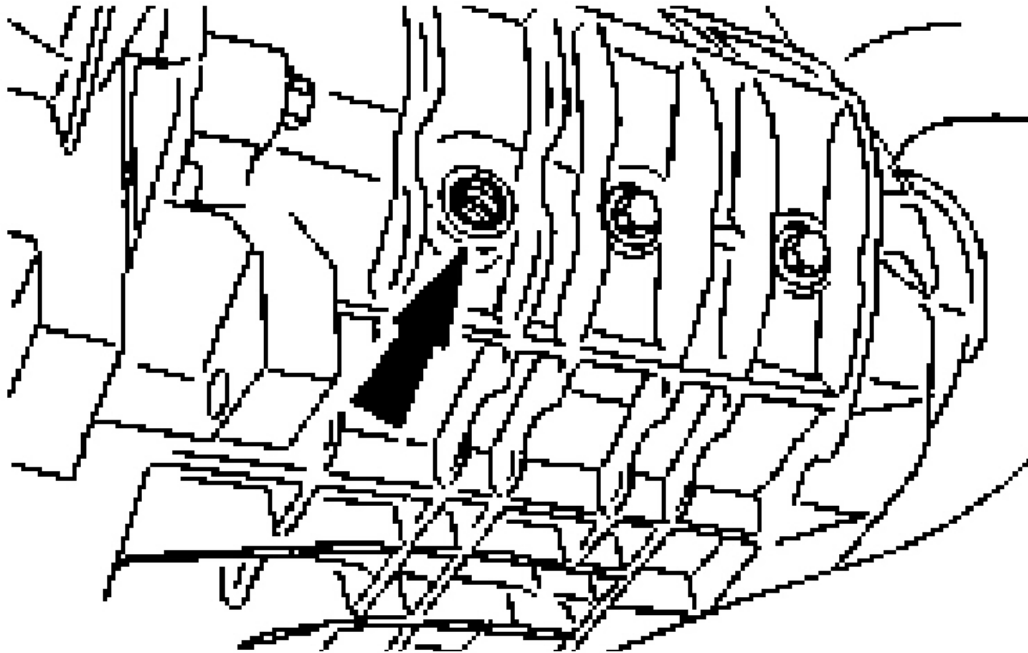
1. Raise and support the vehicle .
2. Remove the fill plug.



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Fig. 23: Removing Fill Plug
Courtesy of FORD MOTOR CO.

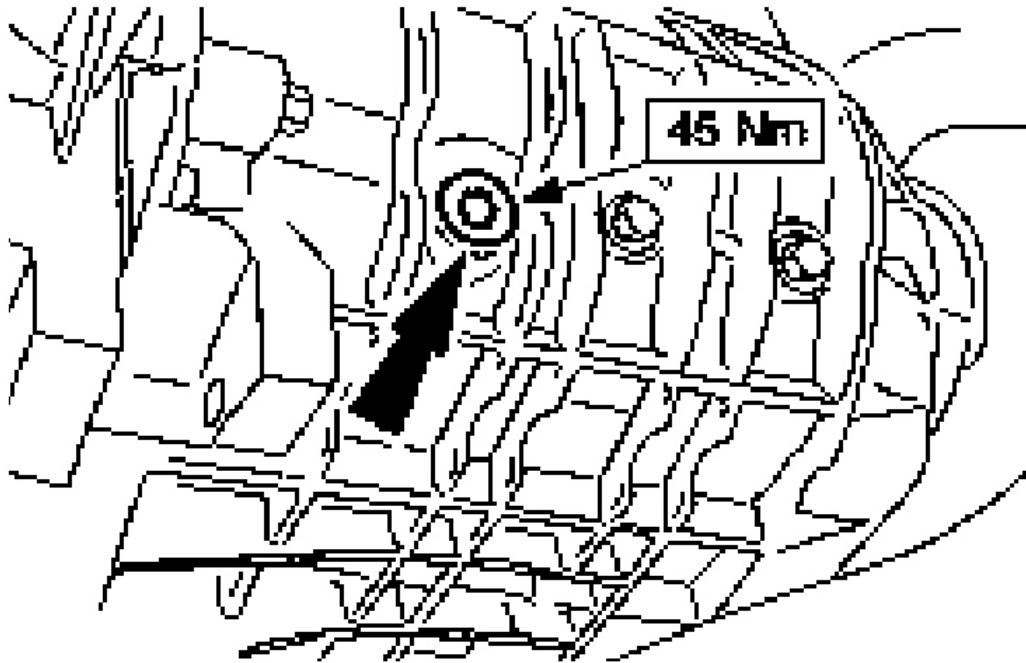
3. Fill the transaxle to 0-5mm below the lower edge of the filler plug bore.
 - Fill with manual transmission fluid.



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Fig. 24: Locating Filler Plug Bore
Courtesy of FORD MOTOR CO.

4. Install the fill plug.



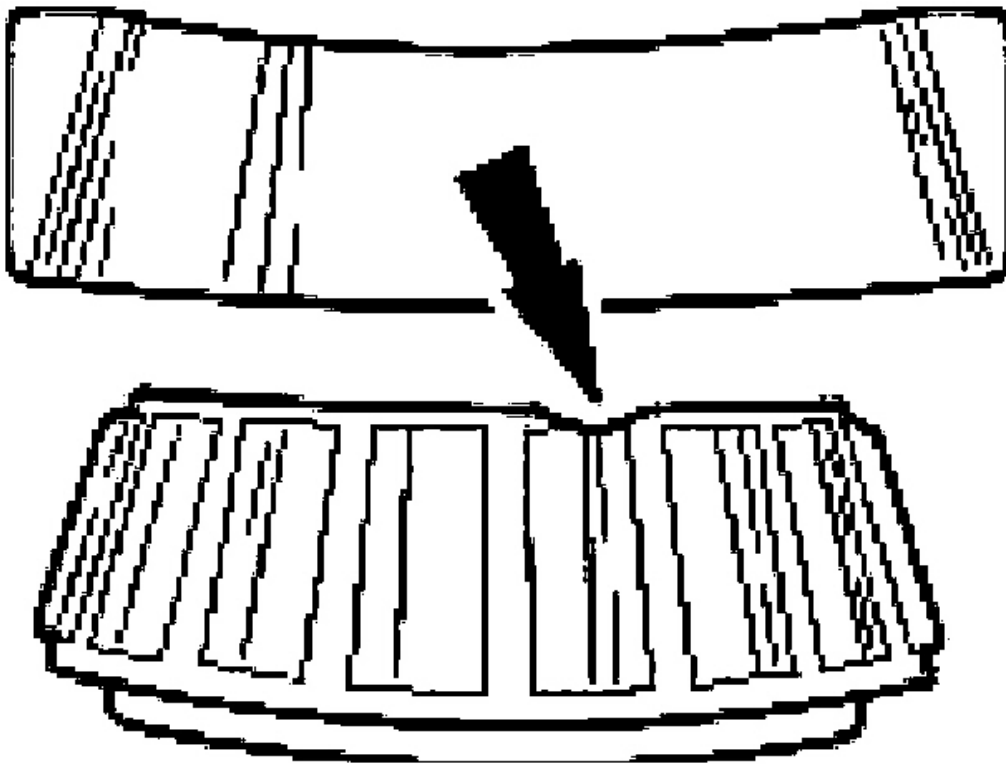
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Fig. 25: Installing Fill Plug
Courtesy of FORD MOTOR CO.

5. Lower the vehicle.

BEARING CHECK

NOTE: Establish the cause of the damage and resolve it.



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Fig. 26: Checking Bearing
Courtesy of FORD MOTOR CO.

1. Check whether the bearing cage is damaged at the top, side or at the openings is damaged because of the unprofessional use of a special tool or of the wrong tool.
 - Install a new bearing if necessary.
2. Check whether the ends of the taper rollers are discolored as a result of inadequate lubrication or overheating, possibly through excessive pre-load.
 - Install a new bearing and new seals if necessary.
 - Check the bearing is correctly lubricated.

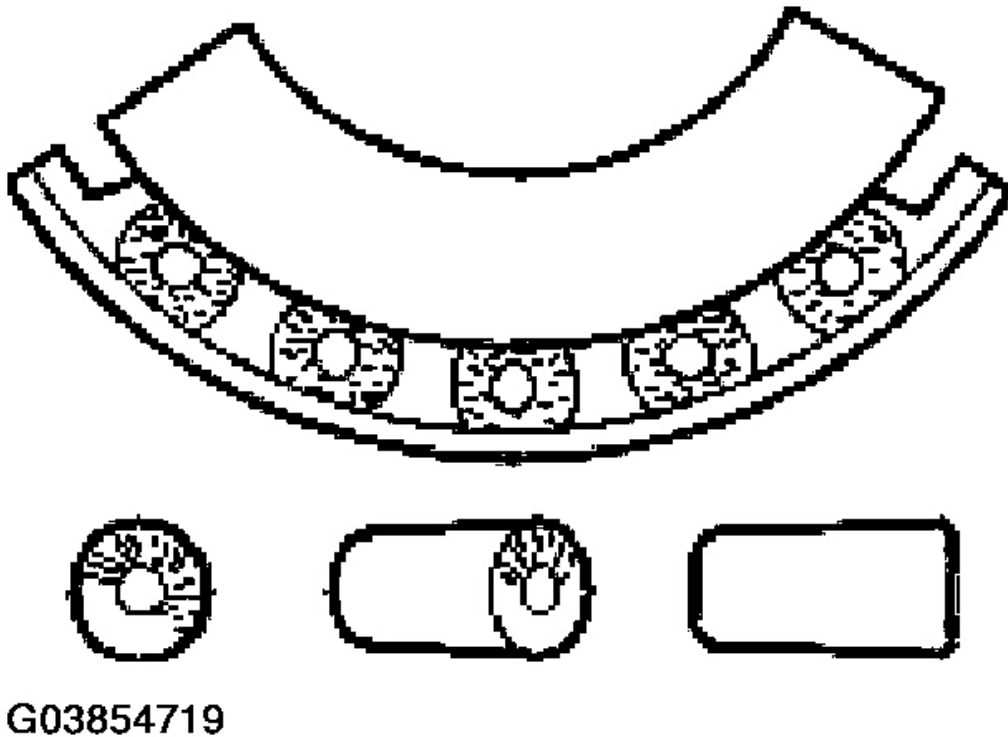


Fig. 27: Checking Taper Rollers (Discolored) Ends
Courtesy of FORD MOTOR CO.

3. Check whether the ends of the taper rollers are worn away due to incorrect installation, excessive pre-load or faulty bearing seating.
 - Install a new bearing and new seals if necessary.
 - Check the bearing is correctly lubricated.

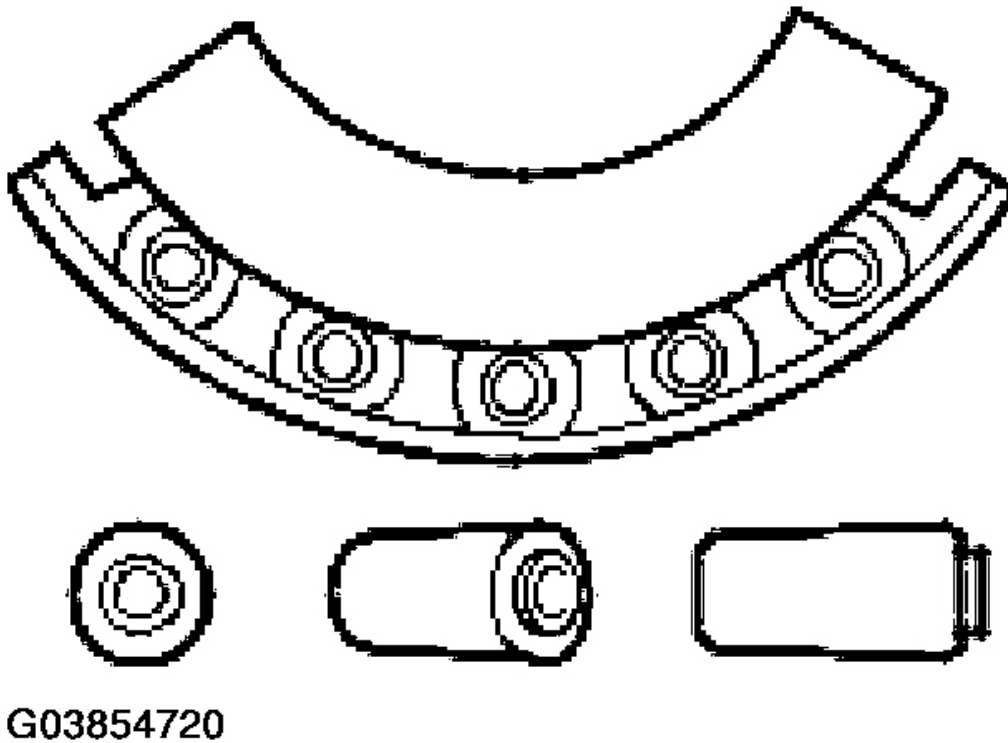
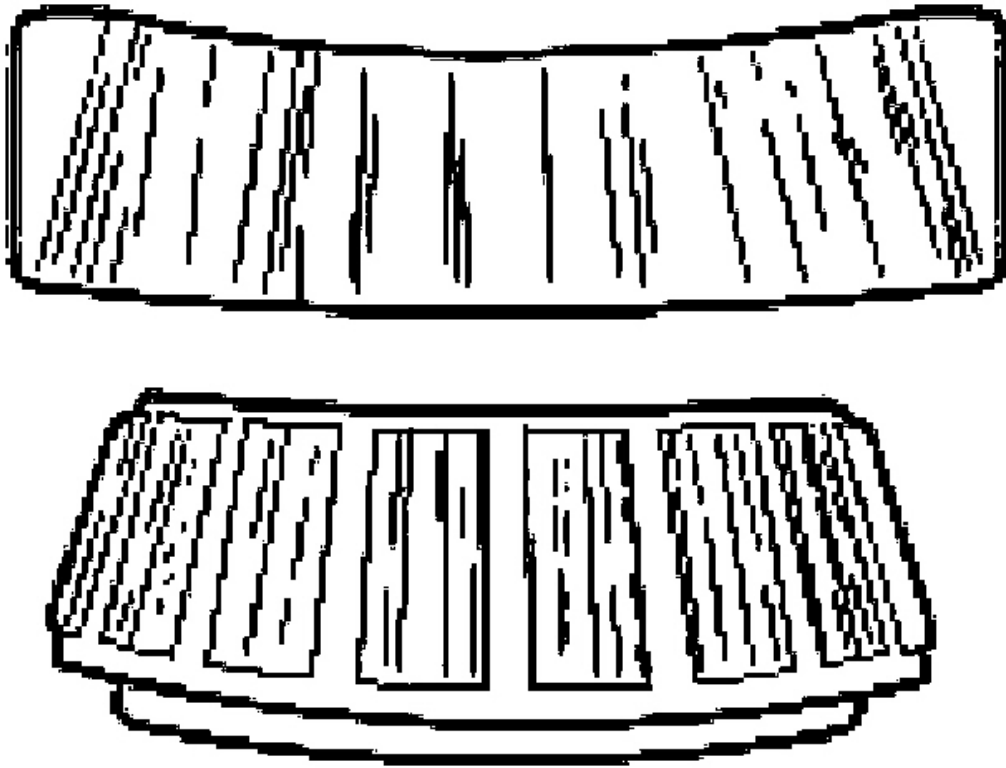


Fig. 28: Checking Taper Rollers (Worn Away) Ends
Courtesy of FORD MOTOR CO.

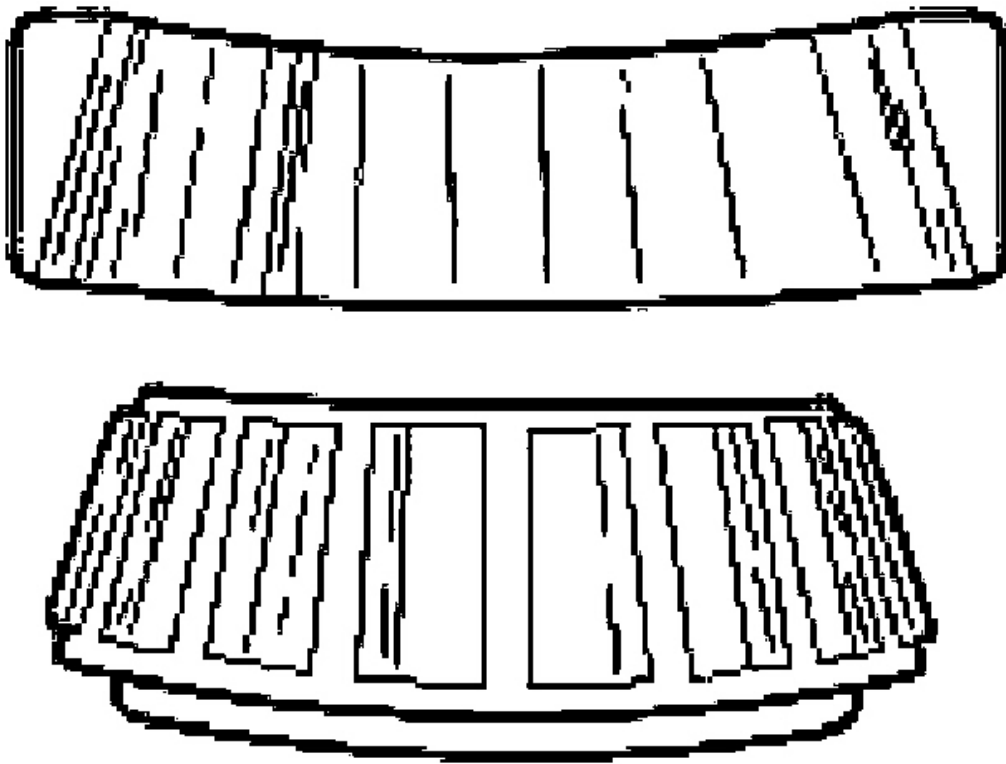
4. Check whether the bearing surfaces are grey or grey/black with deposits between the rollers.
 - Install a new bearing and new seals if necessary.
 - Check the bearing is correctly lubricated.



G03854721

Fig. 29: Checking Grey Or Grey/Black Bearing Surface
Courtesy of FORD MOTOR CO.

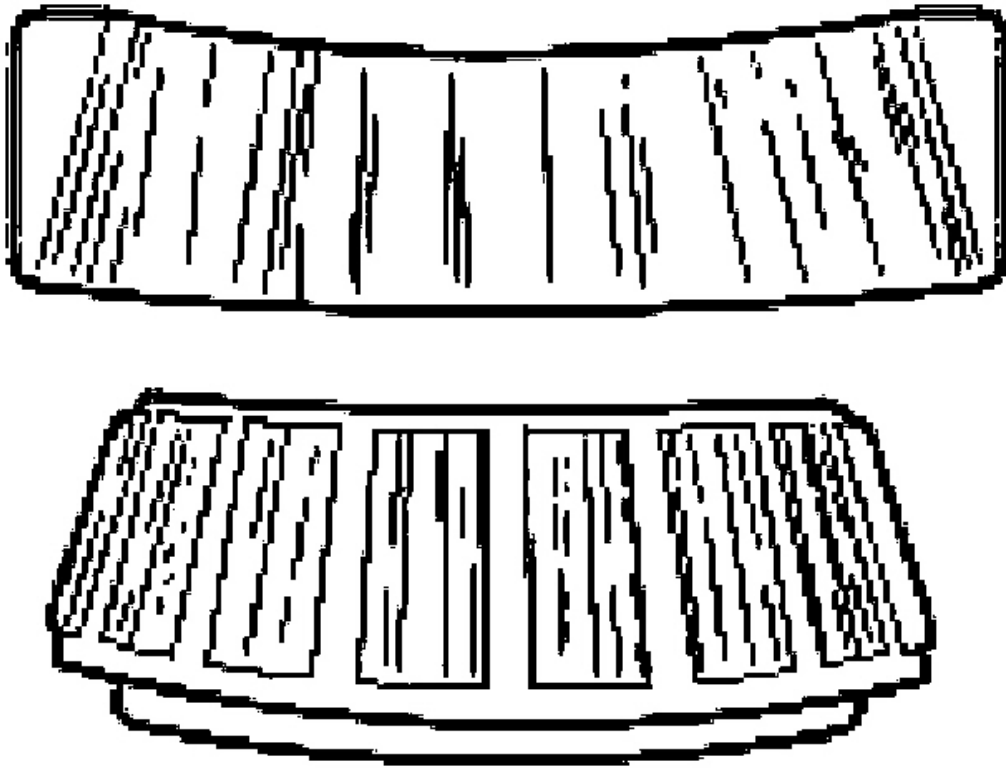
5. Check whether the bearing ring surfaces are grooved caused by static impact.
 - Install a new bearing if its surface is rough, or if it is noisy.



G03854722

Fig. 30: Checking Grooved Bearing Ring Surfaces
Courtesy of FORD MOTOR CO.

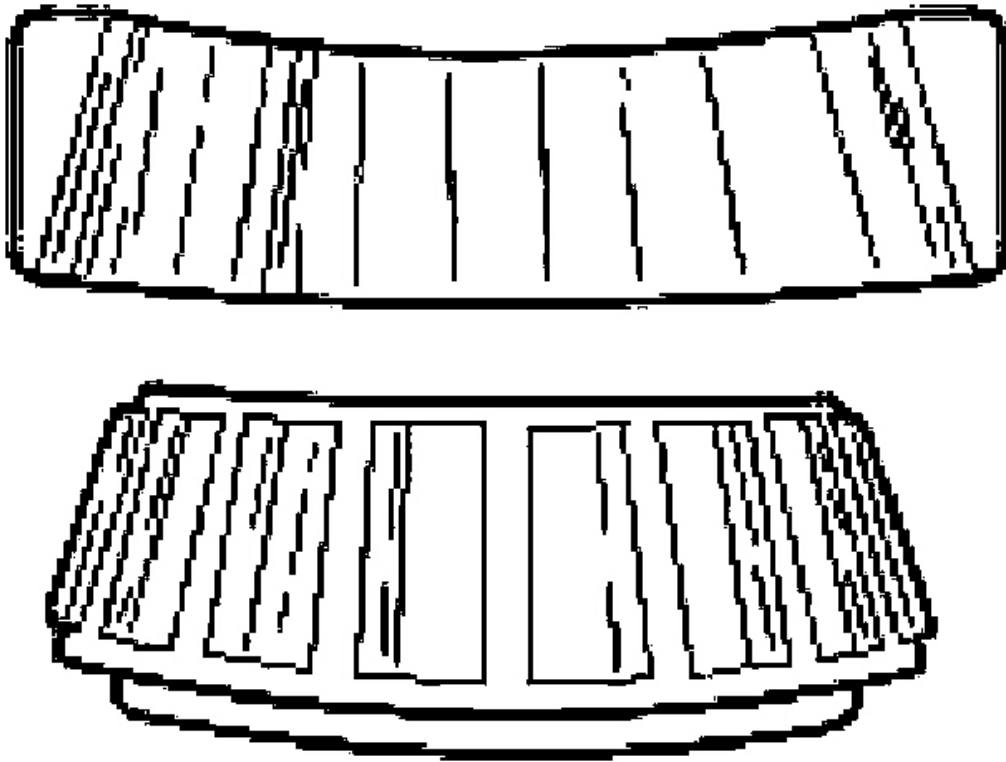
NOTE: Overheating can cause loss of surface hardness.



G03854723

Fig. 31: Checking Bearing For Dark Blue Color
Courtesy of FORD MOTOR CO.

6. Check for a dark blue color caused by overheating (yellow or brown is normal) due to excessive preload or inadequate lubrication.
 - Install a new bearing, new seals and check other components as necessary.
7. Check the surfaces for abrasion due to metal fatigue.
 - Install a new bearing and clean all other affected components as necessary.



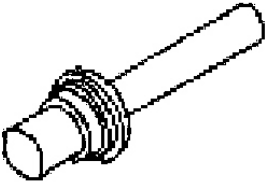
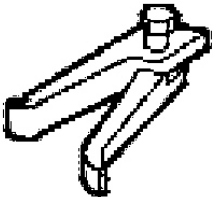
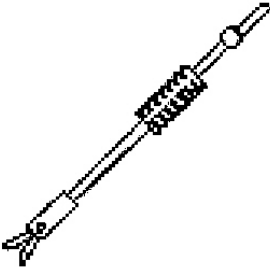
G03854724

Fig. 32: Checking Bearing Surfaces For Abrasion Due To Metal Fatigue
Courtesy of FORD MOTOR CO.

IN-VEHICLE REPAIR

HALFSHAFT SEAL LH

Special Tool(s)

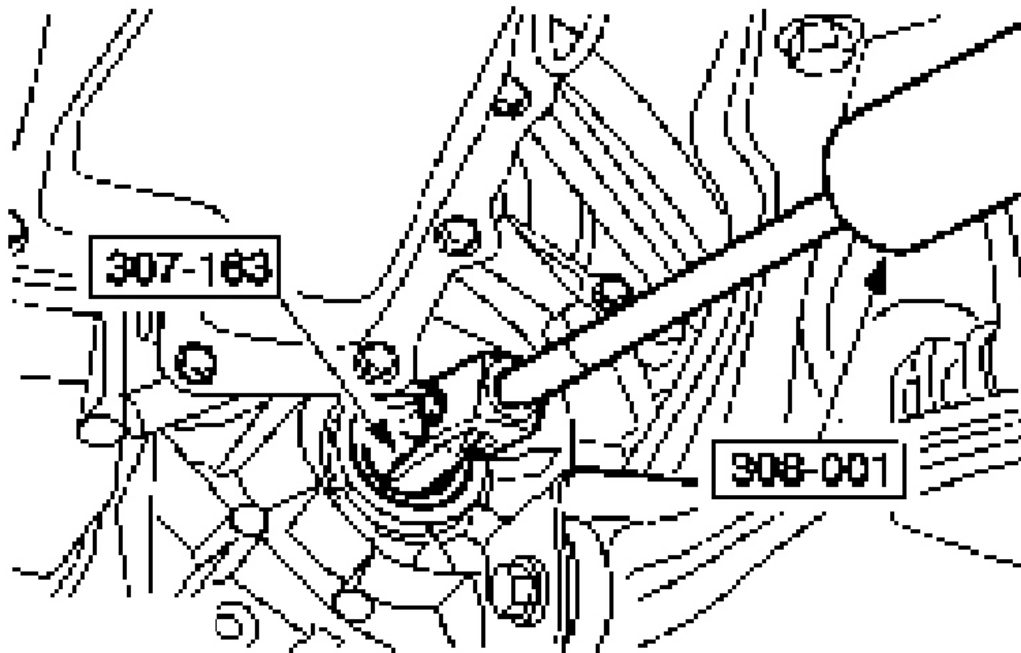
	Installer, Halfshaft Oil Seal 308-039
	Remover, Halfshaft Oil Seal 307-163 (T86P-70043-A)
	Remover, Pilot Bearing 308-001 (T58L-101-B)

G03854725

Fig. 33: Special Tools Specifications
Courtesy of FORD MOTOR CO.

Removal

1. Remove the halfshaft. Refer to **AXLE SHAFTS** .
2. Using the special tools, remove the halfshaft oil seal.

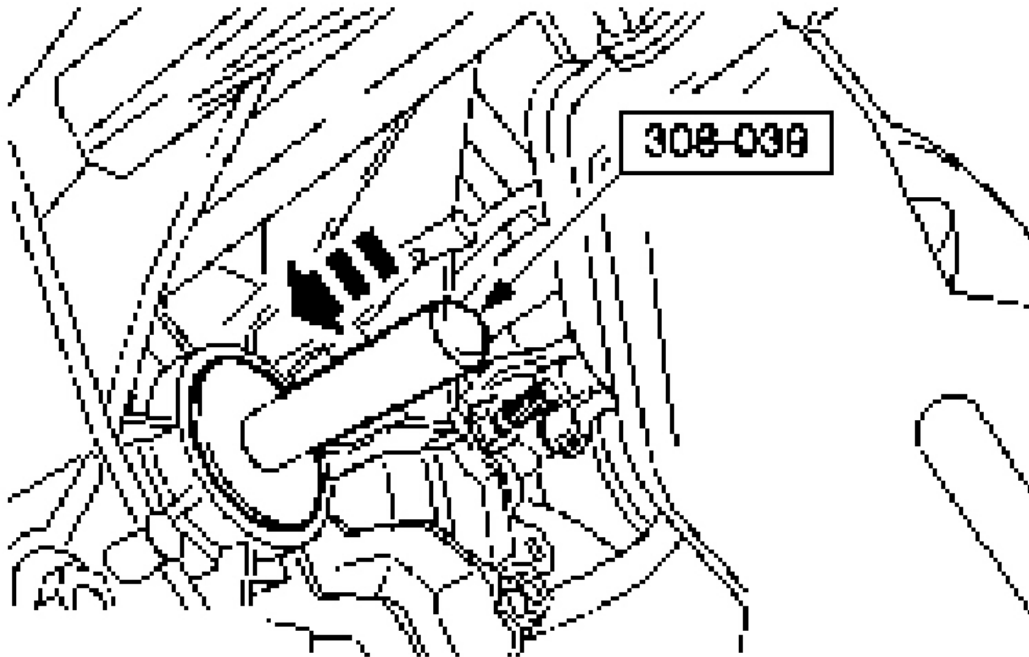


G03854726

Fig. 34: Removing Halfshaft Oil Seal LH
Courtesy of FORD MOTOR CO.

Installation

1. Using the special tool, install the halfshaft oil seal.



G03854727

Fig. 35: Installing Halfshaft Oil Seal LH
Courtesy of FORD MOTOR CO.

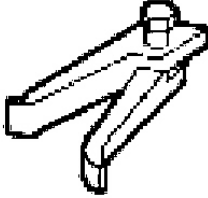
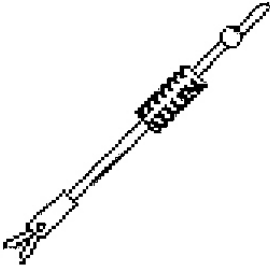
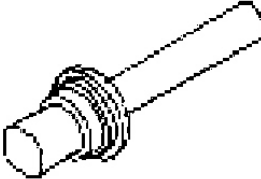
2. Install the halfshaft. Refer to AXLE SHAFTS .

HALFSHAFT SEAL LH

Special Tool(s)

2002 Ford Focus LX

2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

	Remover, Halfshaft Oil Seal 308-208 (T86P-70043-A)
	Remover, Pilot Bearing 308-001 (T58L-101-B)
	Installer, Halfshaft Oil Seal 308-039

G03854728

Fig. 36: Special Tools Specifications
Courtesy of FORD MOTOR CO.

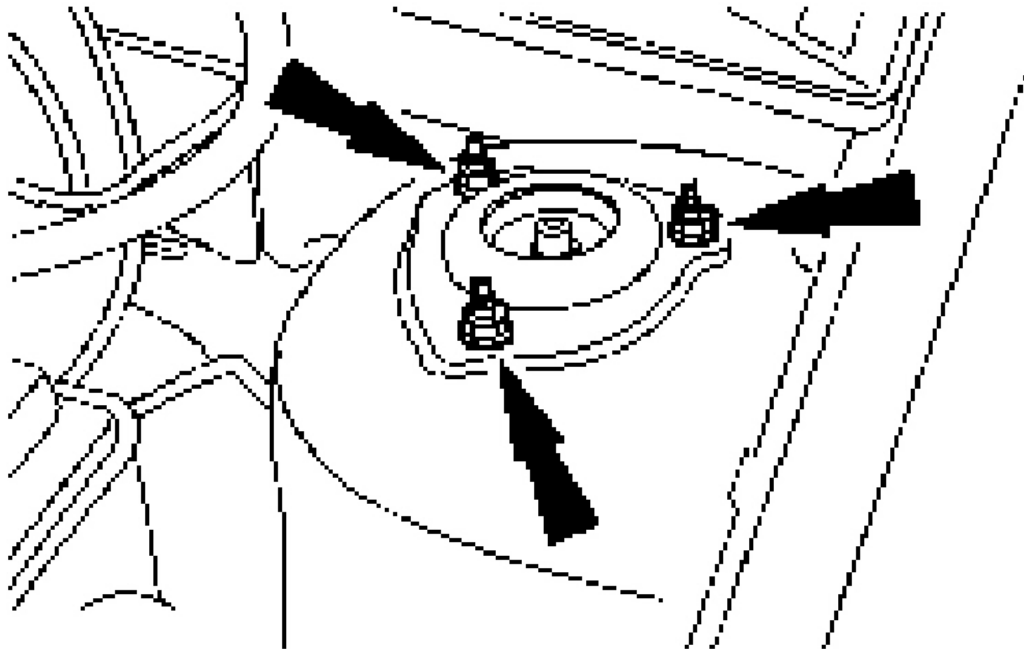
Material

MATERIAL SPECIFICATIONS

Manual transmission fluid	WSD-M2C200-C
---------------------------	--------------

Removal

1. Loosen the strut and spring assembly top mount nuts by five turns (left-hand side shown).

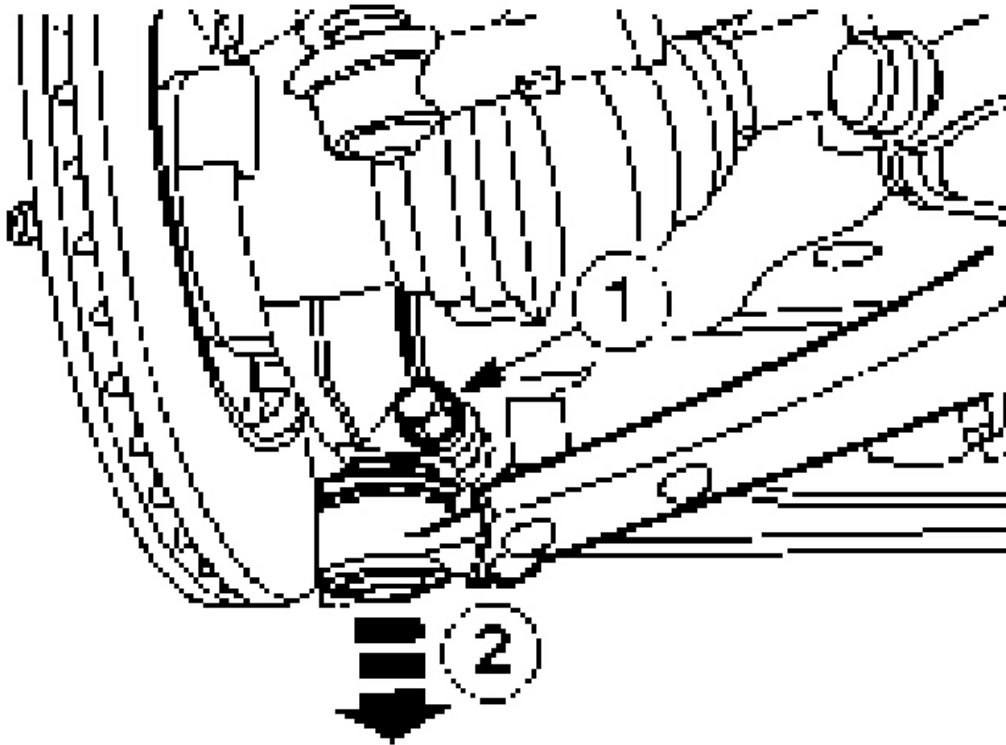


G03854729

Fig. 37: Loosening Strut And Spring Assembly Top Mount Nuts
Courtesy of FORD MOTOR CO.

2. Raise and support the vehicle.

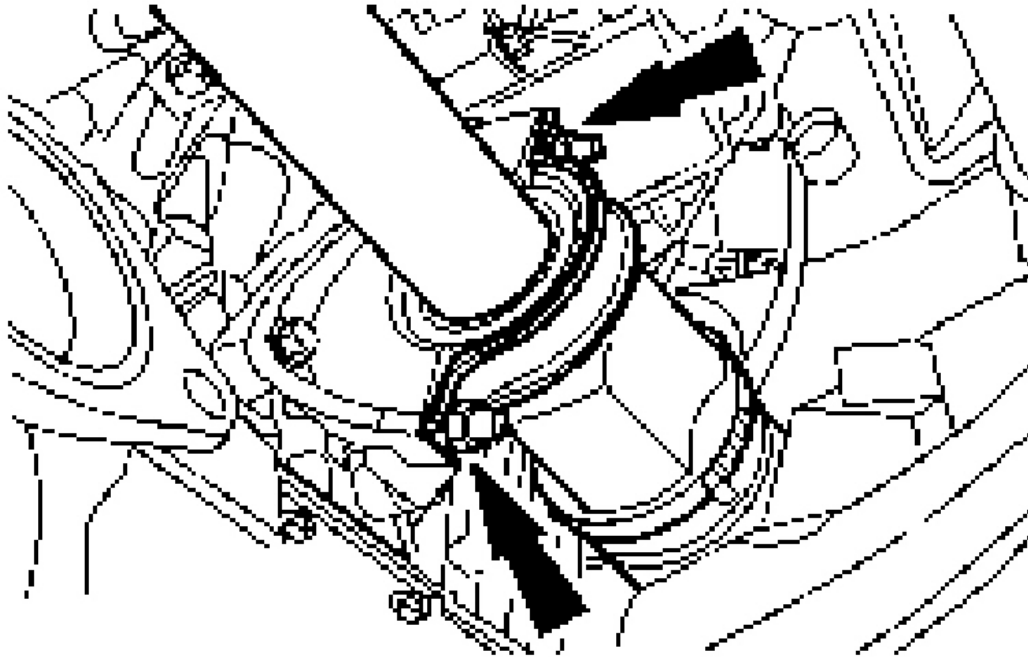
CAUTION: Protect the ball joint seal using a soft cloth to prevent damage.



G03854730

Fig. 38: Detaching Lower Arm Ball Joint
Courtesy of FORD MOTOR CO.

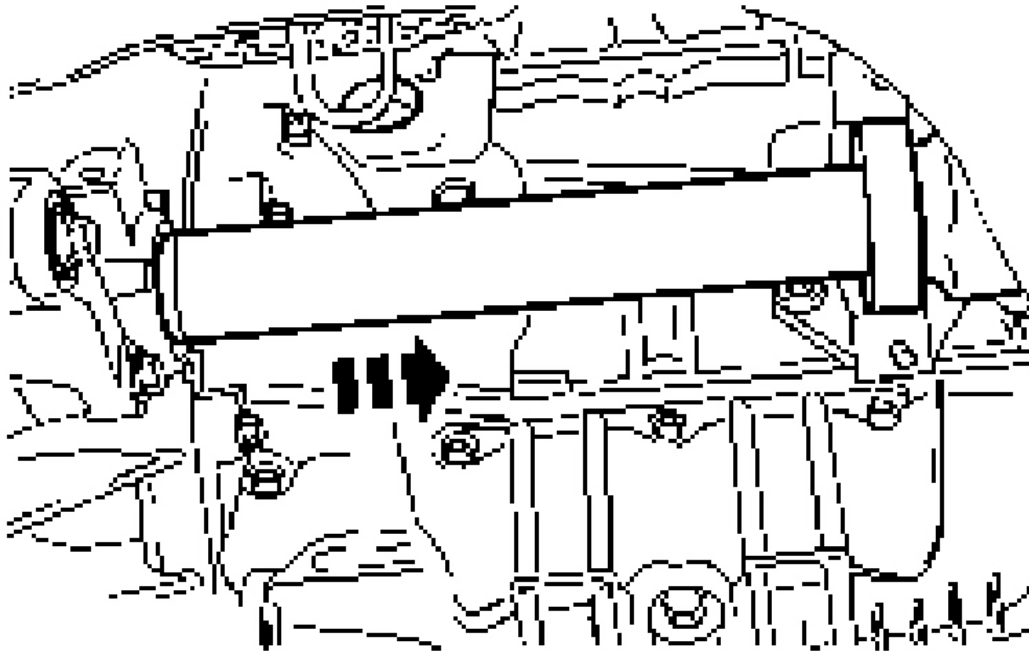
3. Detach the lower arm ball joint from the wheel knuckle.
 1. Remove the bolt
 2. Detach the lower arm ball joint
4. Remove the intermediate shaft center bearing retaining nuts and cap.
 - Discard the cap and nuts



G03854731

Fig. 39: Removing Intermediate Shaft Center Bearing Retaining Nuts And Cap
Courtesy of FORD MOTOR CO.

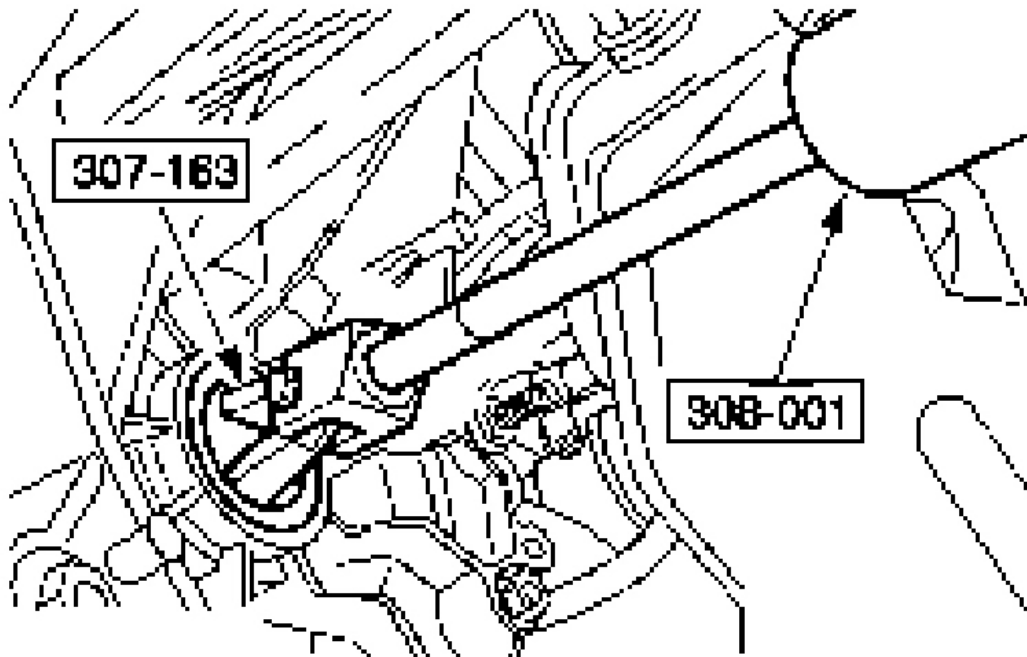
CAUTION: Support the halfshaft. The inner joint must not bent more than 18 degrees. The outer joint must be bent more than 45 degrees.



G03854732

Fig. 40: Detaching Intermediate Shaft And Halfshaft From Transaxle
Courtesy of FORD MOTOR CO.

5. Detach the intermediate shaft and halfshaft from the transaxle and secure it to one side.
 - Allow the oil to drain into a suitable container.
6. Using the special tools, remove the halfshaft oil seal (left-hand side shown right-hand side similar).

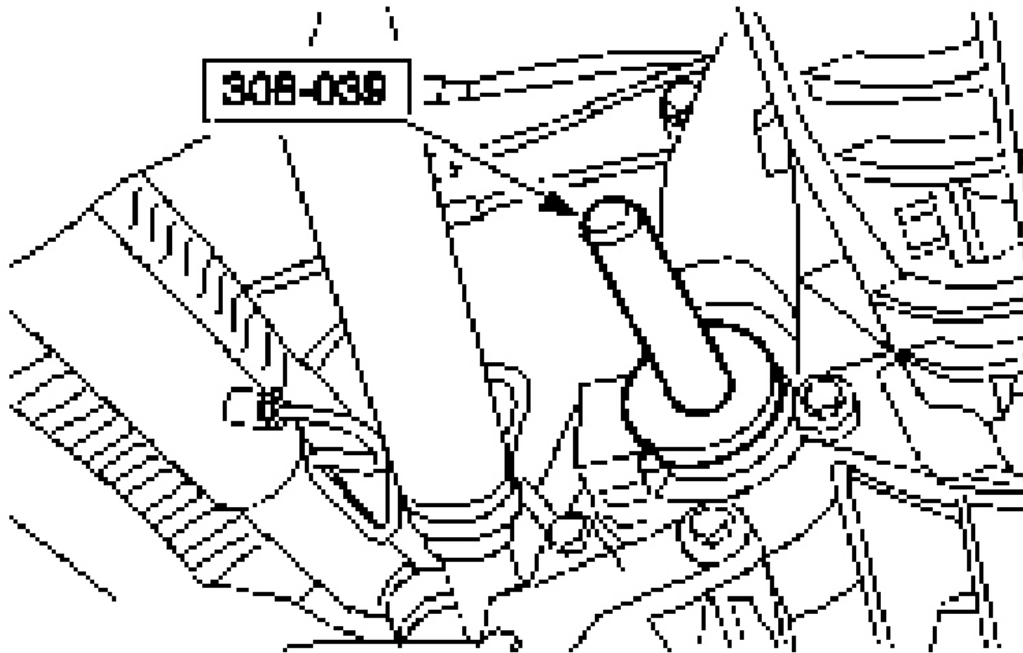


G03854733

Fig. 41: Removing Halfshaft Oil Seal RH
Courtesy of FORD MOTOR CO.

Installation

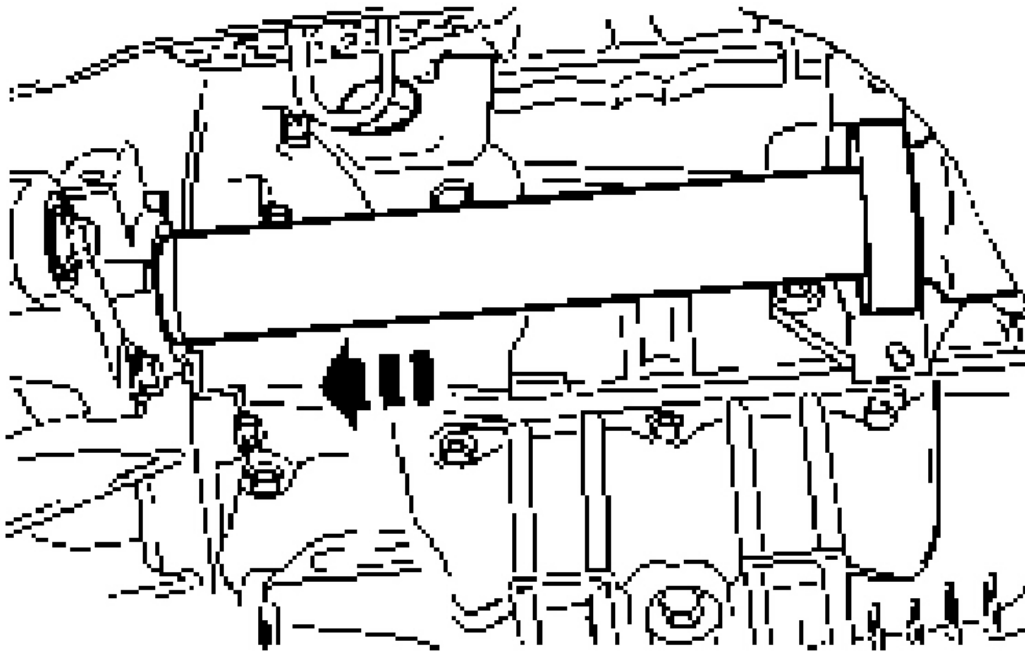
1. Using the special tool, install the halfshaft oil seal.



G03854734

Fig. 42: Installing Halfshaft Oil Seal RH
Courtesy of FORD MOTOR CO.

CAUTION: Support the halfshaft. The inner joint must not bent more than 18 degrees. The outer joint must be bent more than 45 degrees.

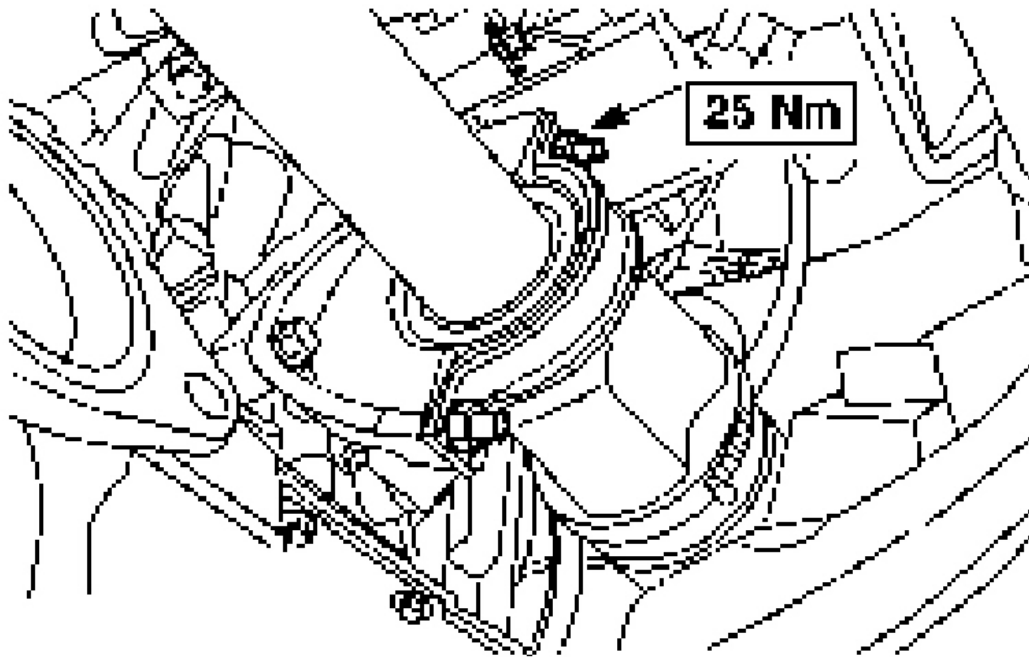


G03854735

Fig. 43: Attaching Intermediate Shaft And Halfshaft To Transaxle
Courtesy of FORD MOTOR CO.

2. Attach the intermediate shaft and halfshaft to the transaxle.

NOTE: Install a new intermediate shaft center bearing cap and nuts.

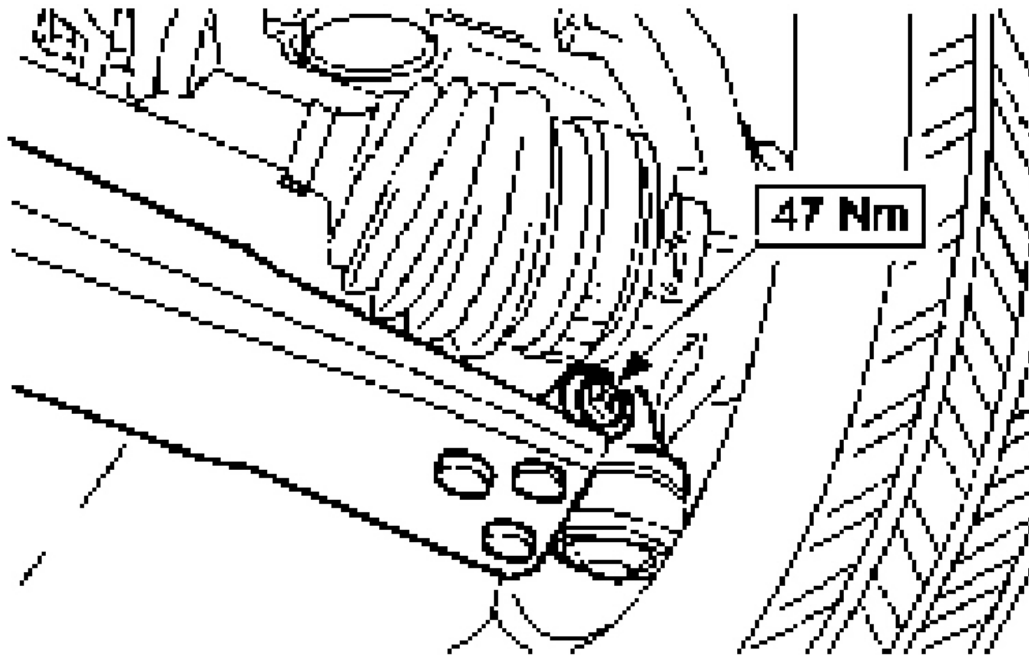


G03854736

Fig. 44: Identifying Tightening Torque Of Intermediate Shaft Center Bearing Cap
Courtesy of FORD MOTOR CO.

3. Install the intermediate shaft center bearing cap.

CAUTION: Protect the ball joint seal using a soft cloth to prevent damage.

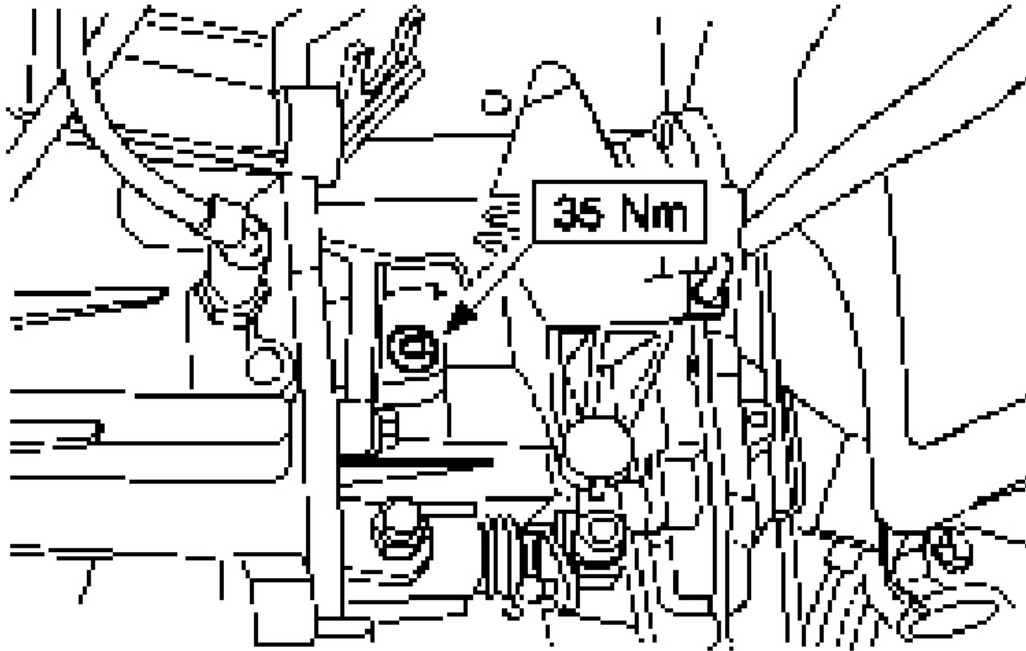


G03854737

Fig. 45: Attaching Lower Arm Ball Joint To Wheel Knuckle
Courtesy of FORD MOTOR CO.

4. Attach the lower arm ball joint to the wheel knuckle.

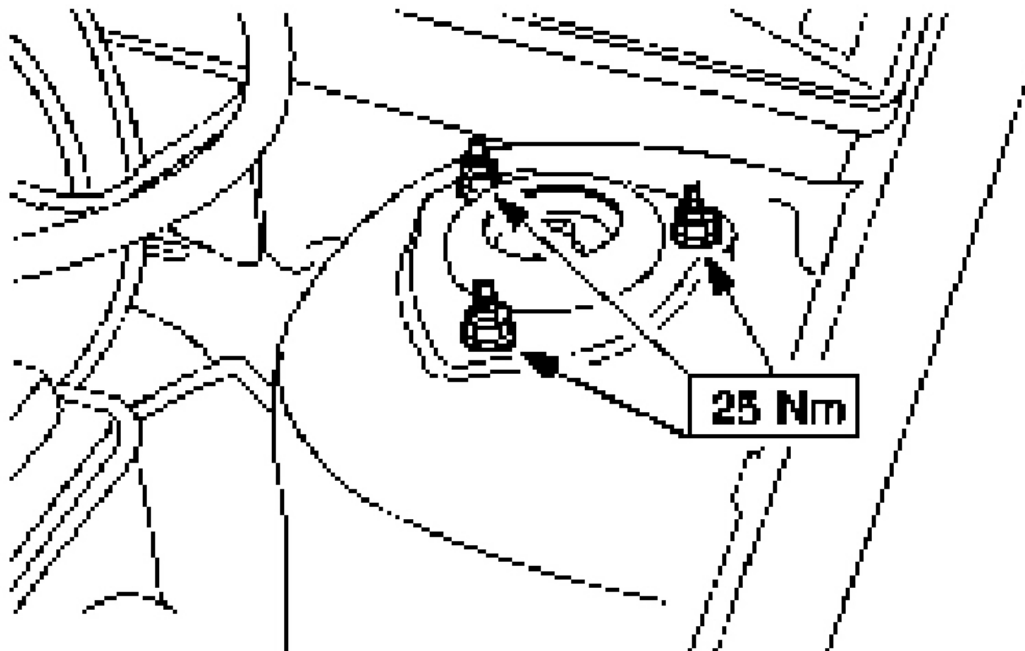
NOTE: The fill height is 5 - 10 mm below the lower edge of the filler hole.



G03854738

Fig. 46: Identifying Tightening Torque Of Fill Plug
Courtesy of FORD MOTOR CO.

5. Check the transaxle fluid level and top up with Manual transmission fluid if necessary.
6. Lower the vehicle.
7. Tighten the strut and spring assembly top mount nuts.



G03854739

Fig. 47: Identifying Tightening Torque Of Strut And Spring Assembly Top Mount Nuts

Courtesy of FORD MOTOR CO.

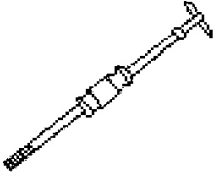
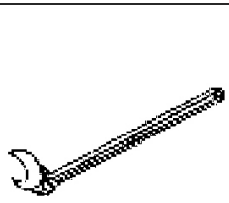
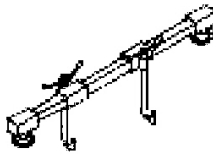
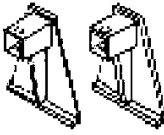
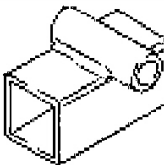
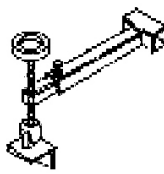
REMOVAL

TRANSAXLE

Special Tool(s)

2002 Ford Focus LX

2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

	Slide hammer 100-001 (T50T-100-A)
	Remover, Halfshaft 205-241 (T86P-3514-A)
	Support Bar, Engine 303-290A
	Adapter for 303-290A 303-290-01
	Adapter for 303-290A 303-290-02
	Adapter for 303-290A 303-290-03A

G03854740

Fig. 48: Special Tools Specifications (Transaxle)
Courtesy of FORD MOTOR CO.

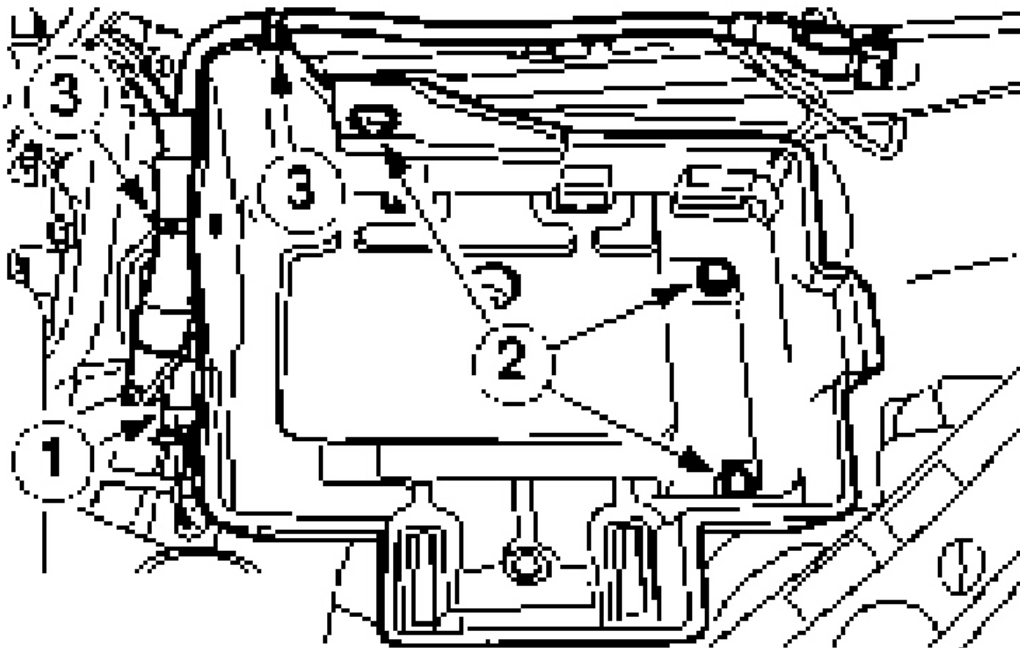
GENERAL EQUIPMENT

Retaining strap

Transmission jack

Removal

1. General Notes.
 - Operations for particular variants which do not apply to all vehicles are marked clearly with a note.
 - If necessary, remove the cable ties and install new ones when reinstalling the assembly.
2. Remove the battery.
3. Remove the battery tray.
 1. Disconnect and separate the connector.
 2. Remove the bolts.
 3. Unclip the wiring harness.

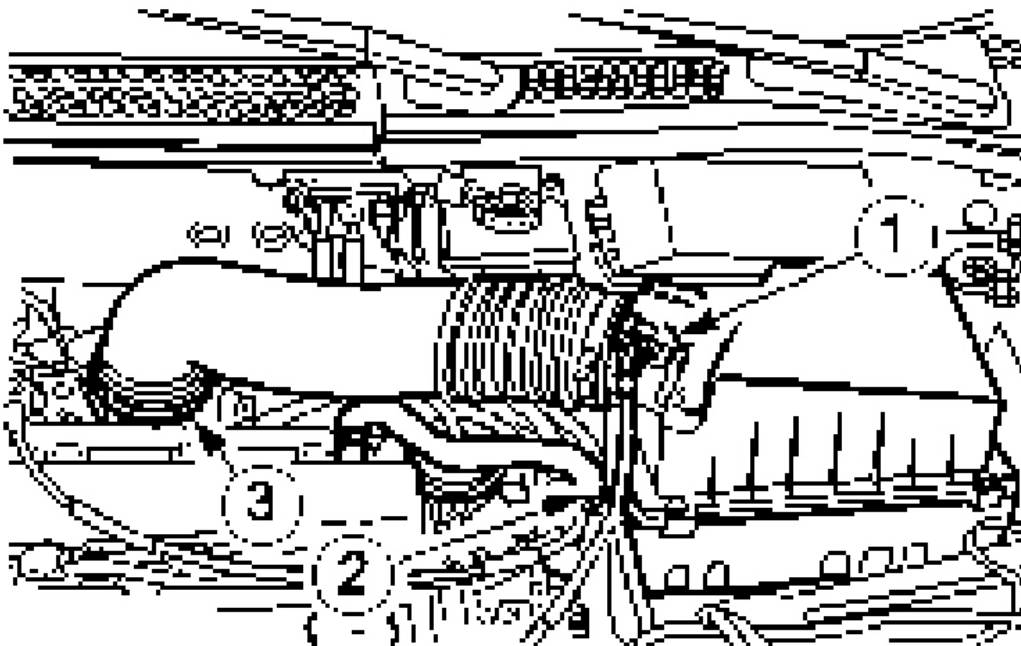


G03854741

Fig. 49: Removing Battery Tray

Courtesy of FORD MOTOR CO.

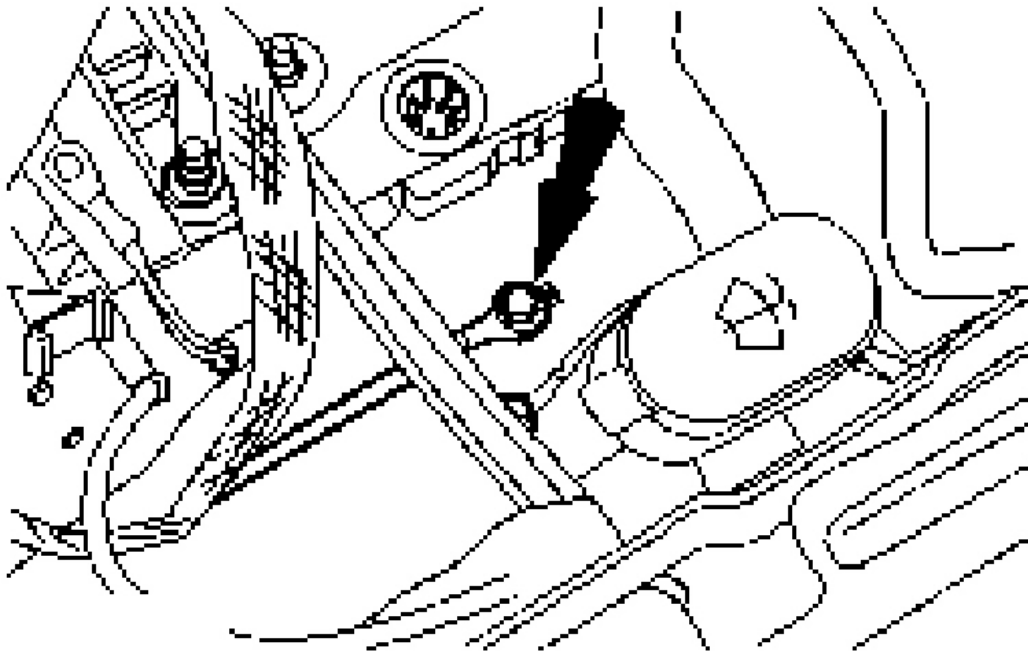
4. Remove the air cleaner housing.
 1. Disconnect the electrical connector at the mass air flow (MAF) sensor.
 2. Detach the crankcase ventilation hose.
 3. Detach the intake hose.
 - Remove the air cleaner housing from the rubber bushes.



G03854742

Fig. 50: Removing Air Cleaner Housing
Courtesy of FORD MOTOR CO.

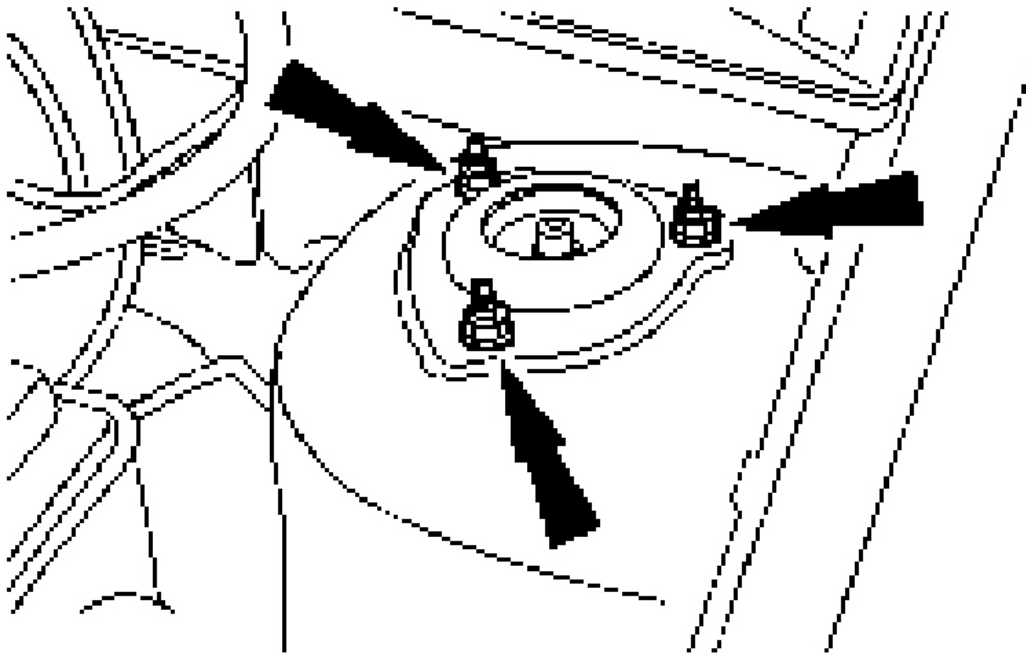
5. Disconnect the ground cable.



G03854743

Fig. 51: Disconnecting Ground Cable
Courtesy of FORD MOTOR CO.

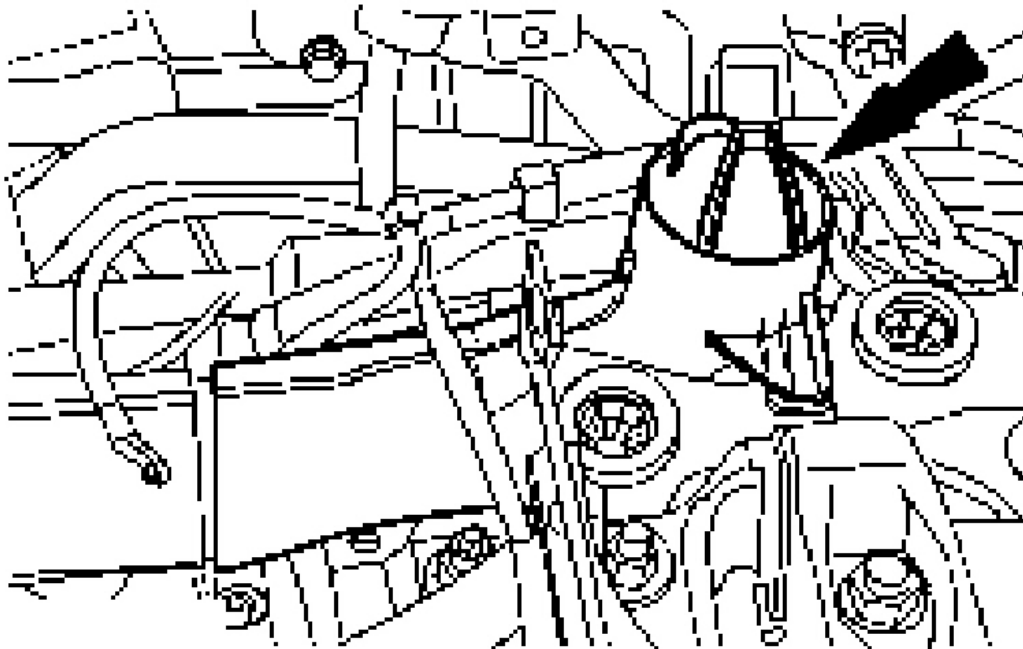
6. Loosen the strut and spring assembly top mount nuts by five turns on both sides.



G03854744

Fig. 52: Loosening Strut And Spring Assembly Top Mount Nuts
Courtesy of FORD MOTOR CO.

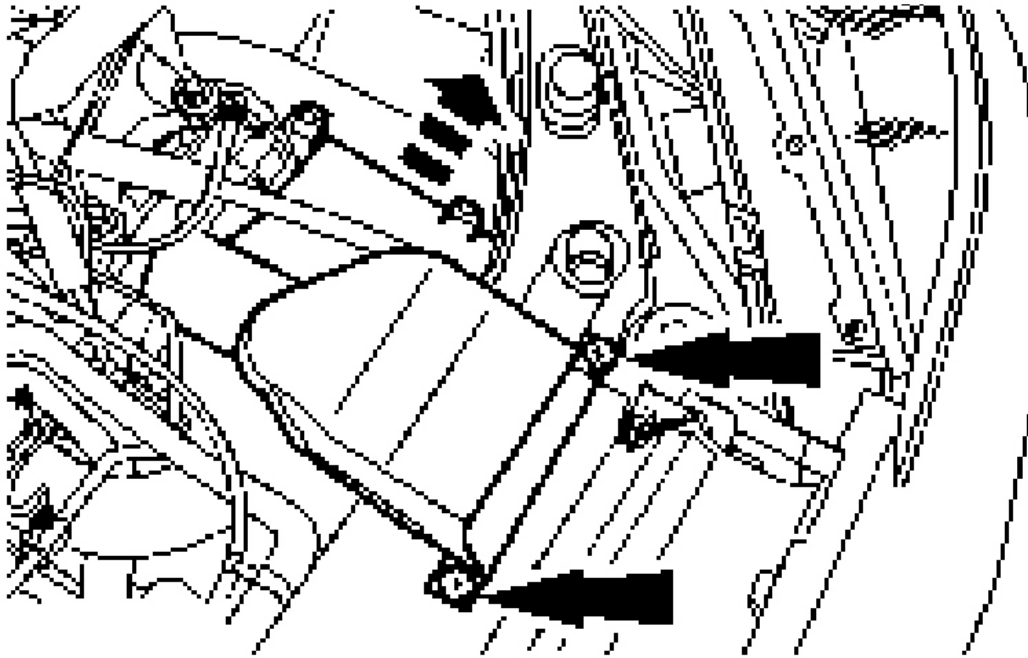
7. Remove the intake tube.



G03854745

Fig. 53: Removing Intake Tube
Courtesy of FORD MOTOR CO.

NOTE: The resonator is a push fit into the bracket.

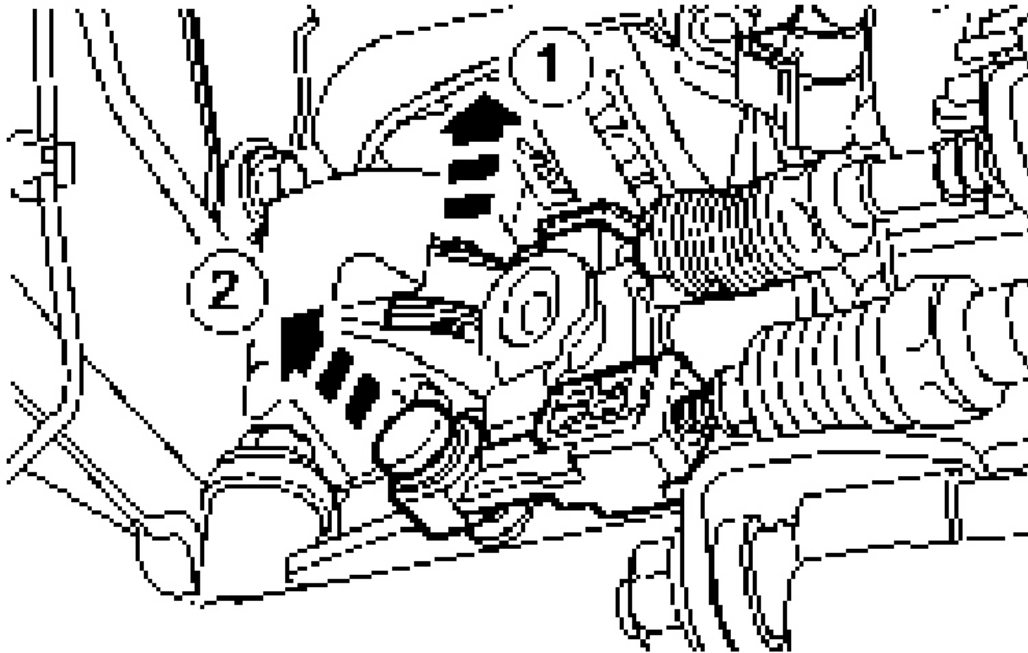


G03854746

Fig. 54: Removing Air Cleaner Intake And Resonator
Courtesy of FORD MOTOR CO.

8. Remove the air cleaner intake and resonator.

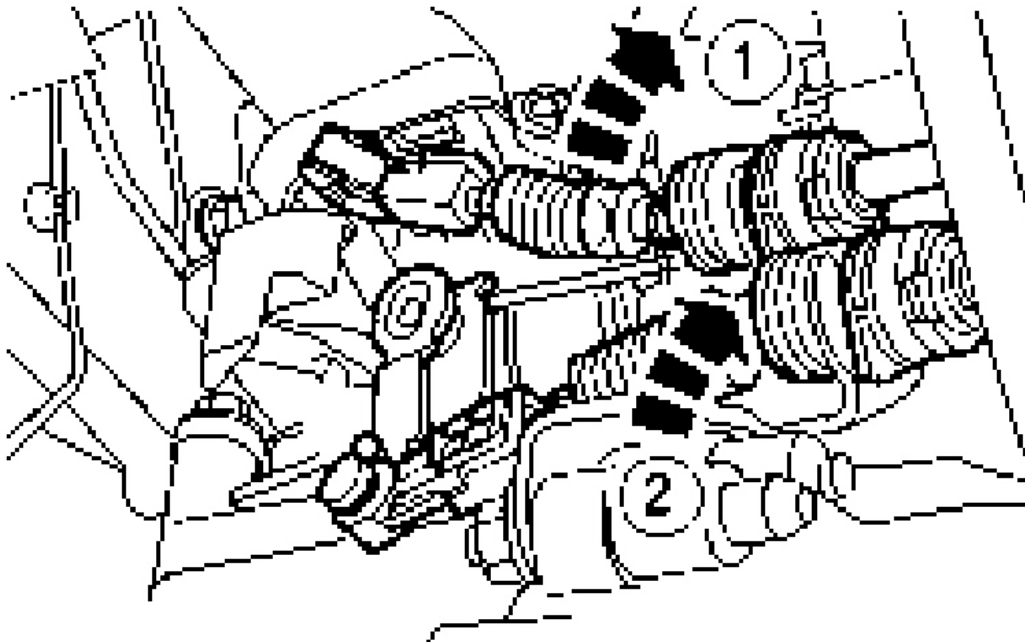
NOTE: Press the locking tab.



G03854747

Fig. 55: Detaching Gearshift Cables From Transaxle
Courtesy of FORD MOTOR CO.

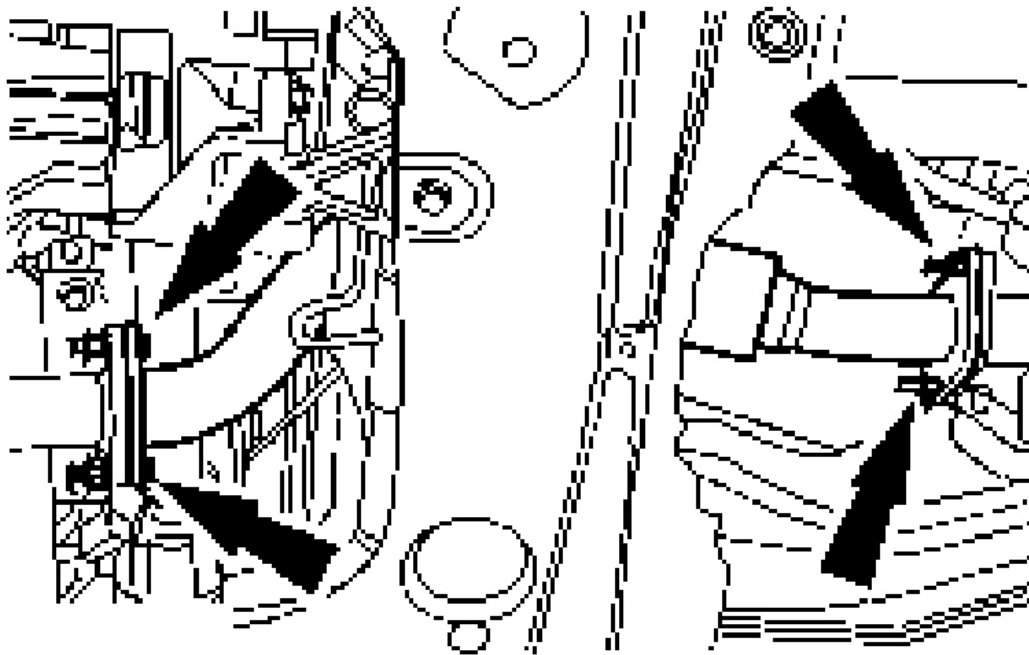
9. Detach the gearshift cables from the transaxle.
 1. Detach the shifter cable from the selector lever.
 2. Detach the selector cable from the selector lever.
10. Detach the gearshift cables from the bracket.
 1. Detach the shifter cable from the retaining bracket, turning the abutment sleeves counterclockwise.
 2. Detach the selector cable from the retaining bracket, turning the abutment sleeves counterclockwise.



G03854748

Fig. 56: Detaching Gearshift Cables From Bracket
Courtesy of FORD MOTOR CO.

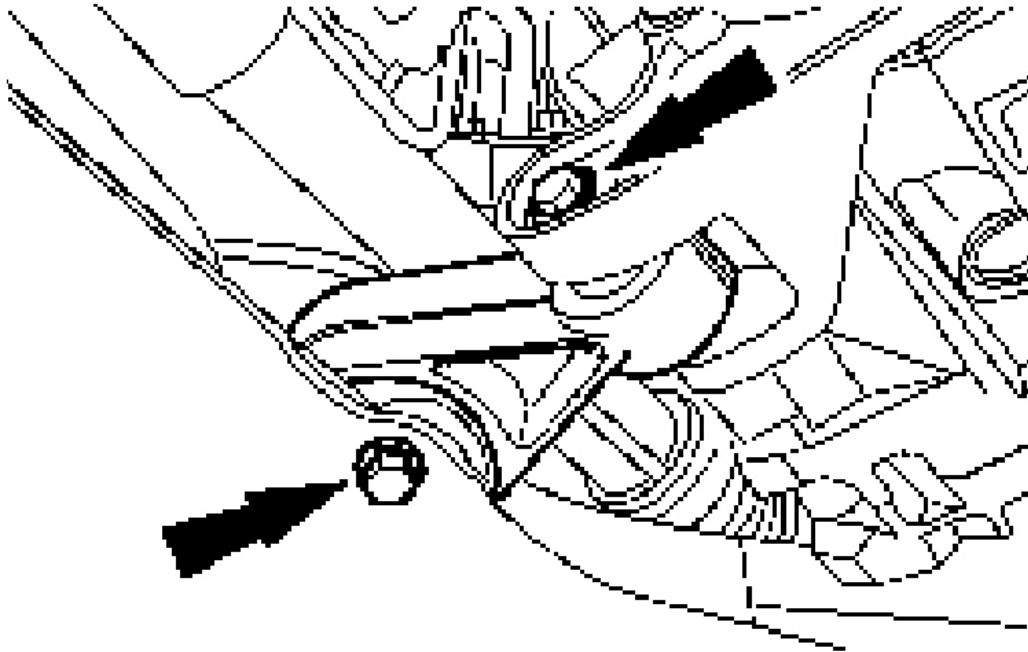
11. Raise and support the vehicle.
12. Remove the front wheels and tires.
13. Remove the exhaust flexible pipe.



G03854749

Fig. 57: Removing Exhaust Flexible Pipe
Courtesy of FORD MOTOR CO.

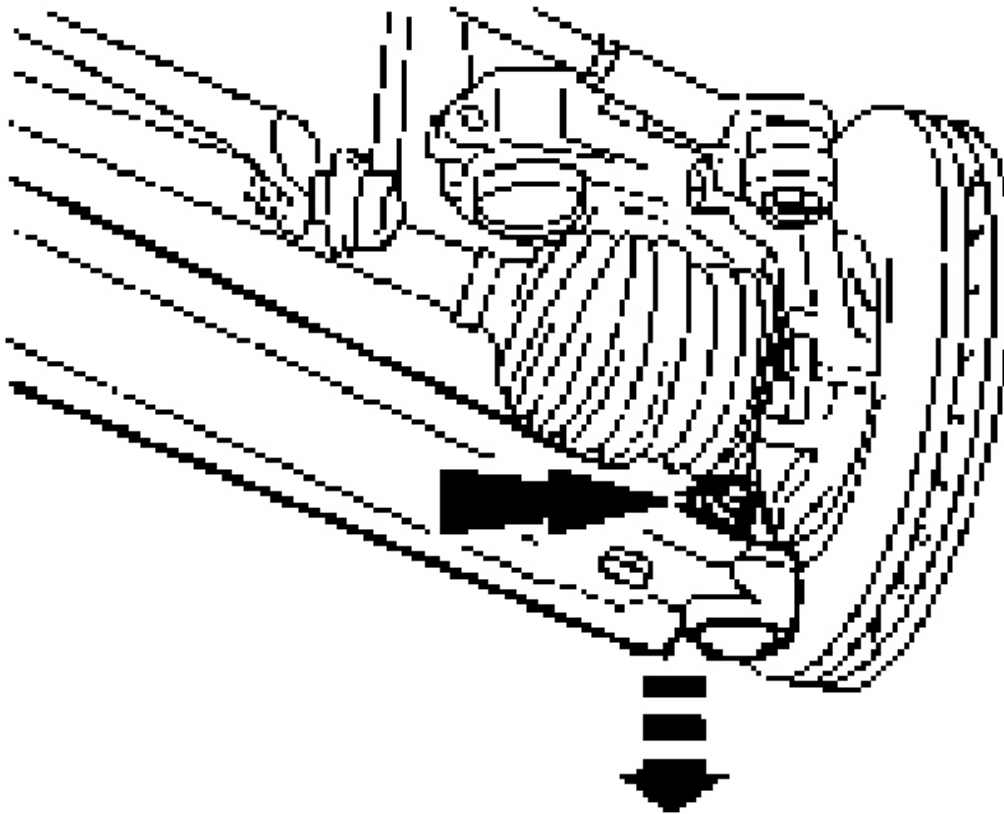
14. Remove the engine roll restrictor.



G03854750

Fig. 58: Removing Engine Roll Restrictor
Courtesy of FORD MOTOR CO.

CAUTION: Protect the ball joint seal using a soft cloth to prevent damage.

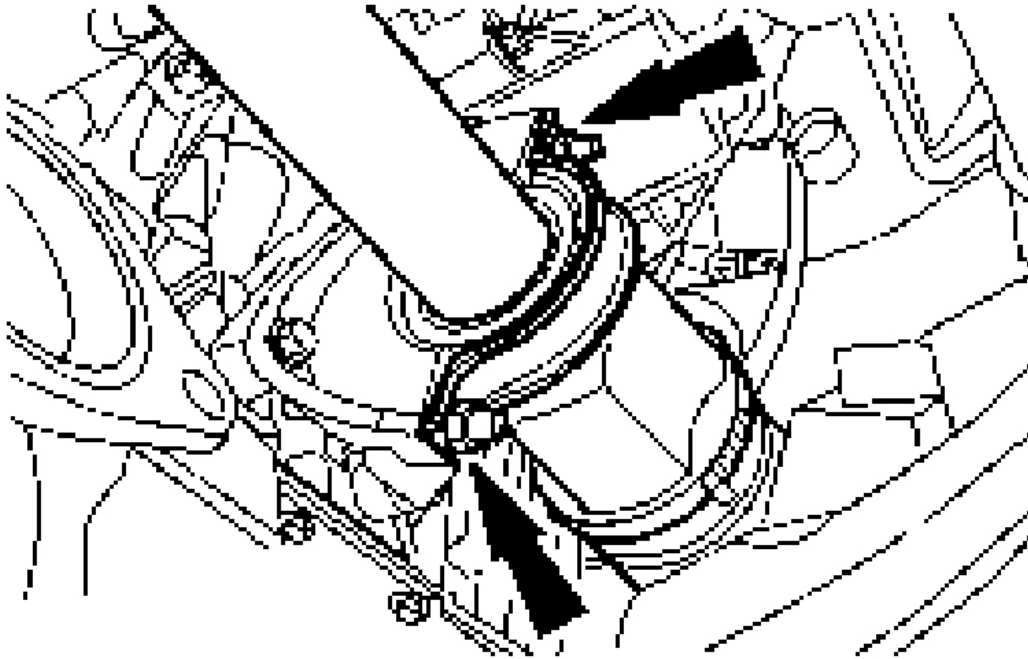


G03854751

Fig. 59: Removing Lower Arm Ball Joints
Courtesy of FORD MOTOR CO.

15. Remove the lower arm ball joints on both sides.
 - Remove the heat shield.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.



G03854752

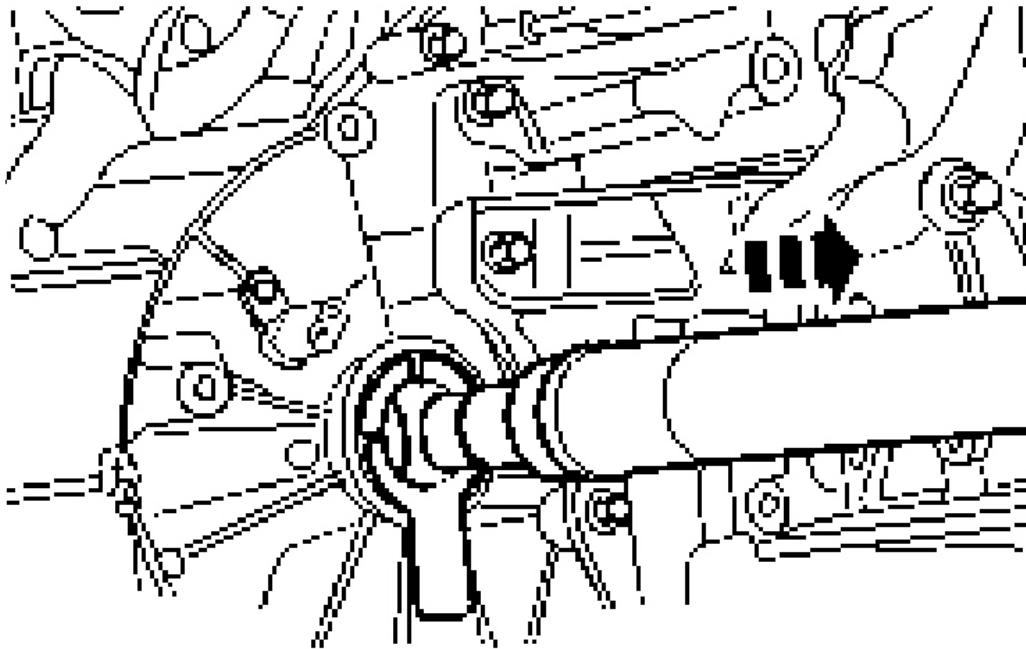
Fig. 60: Removing Intermediate Shaft Center Bearing Cap
Courtesy of FORD MOTOR CO.

16. Remove the intermediate shaft center bearing cap.
 - Discard the bearing cap and locknuts.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.

CAUTION: Do not damage the halfshaft seal.

CAUTION: Cap the transaxle to prevent oil loss and dirt ingress.



G03854753

Fig. 61: Detaching Right-Hand Halfshaft Together With Intermediate Shaft From Transaxle

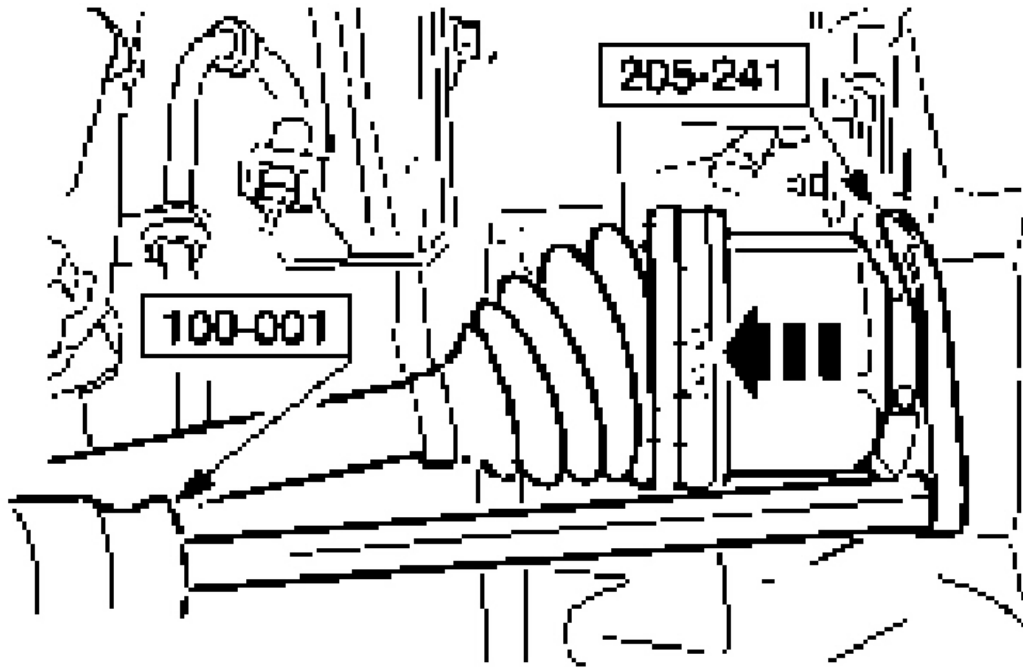
Courtesy of FORD MOTOR CO.

17. Detach the right-hand halfshaft together with the intermediate shaft from the transaxle and secure it to one side.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.

CAUTION: Do not damage the halfshaft seal.

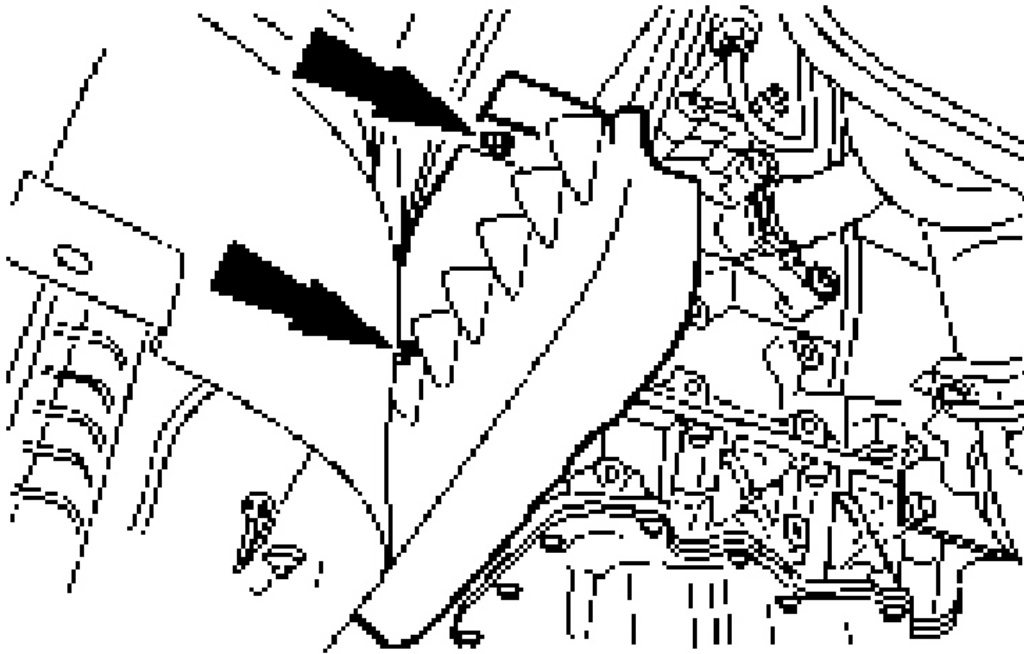
CAUTION: Cap the transaxle to prevent oil loss and dirt ingress.



G03854754

Fig. 62: Detaching Left-Hand Halfshaft From Transaxle
Courtesy of FORD MOTOR CO.

18. Using the special tool, detach the left-hand halfshaft from the transaxle and secure it to one side.
 - Discard the snap ring.
19. Remove the drive belt cover.



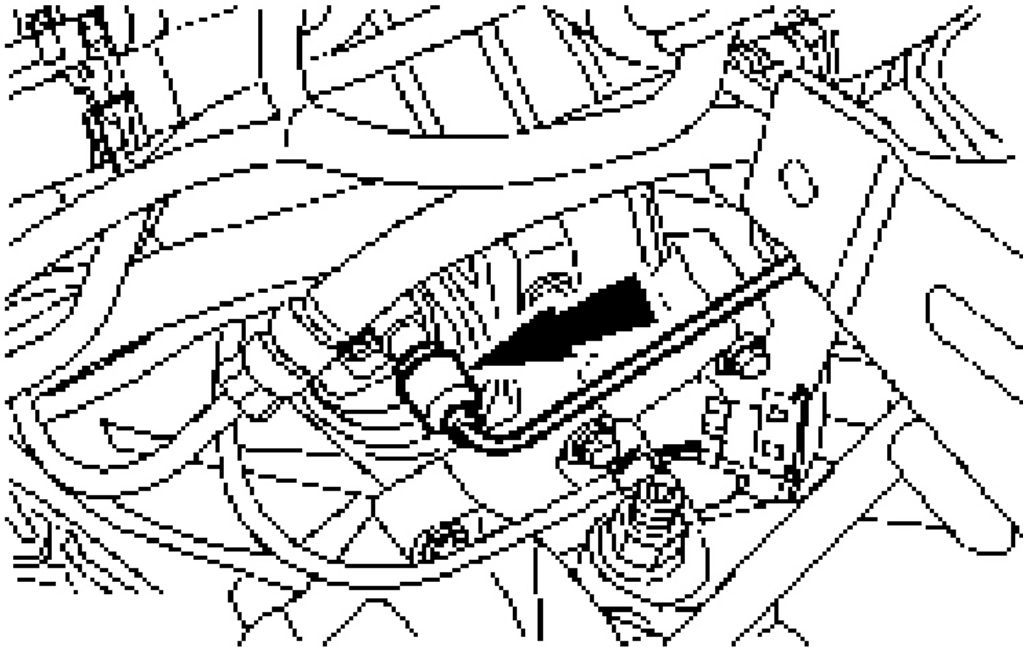
G03854755

Fig. 63: Removing Drive Belt Cover
Courtesy of FORD MOTOR CO.

20. Lower the vehicle.

WARNING: Escaping brake fluid. Do not allow brake fluid to come into contact with the skin or the eyes. If brake fluid does come into contact with the skin or the eyes, rinse the affected areas with water immediately. Failure to follow these instructions may result in personal injury.

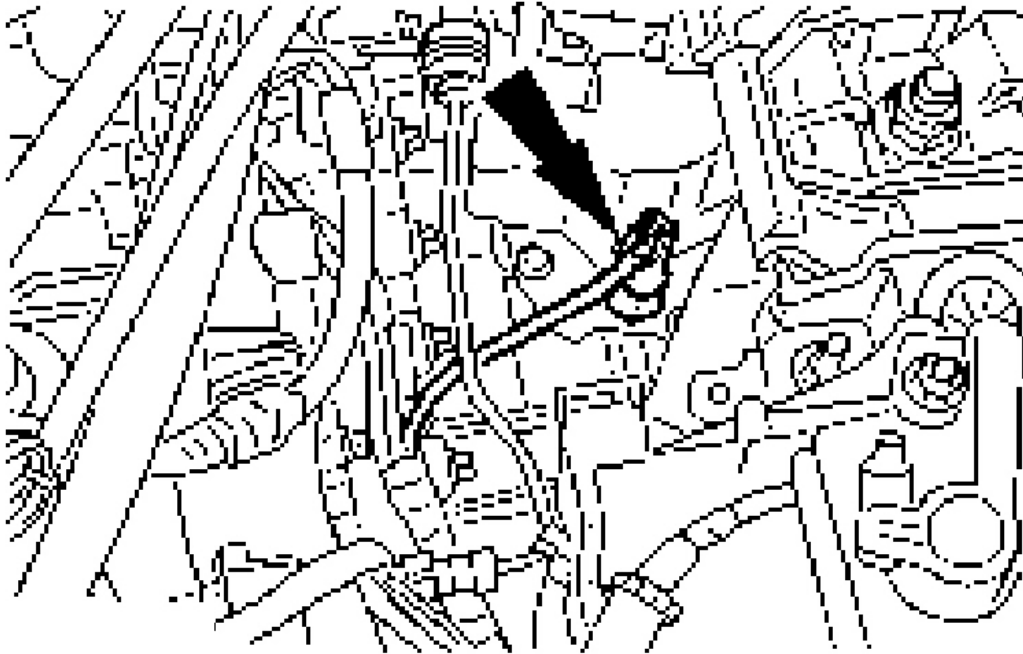
CAUTION: If brake fluid is spilt on the paintwork, the affected area must be immediately washed down with cold water.



G03854756

Fig. 64: Removing Clutch Slave Cylinder Supply Line
Courtesy of FORD MOTOR CO.

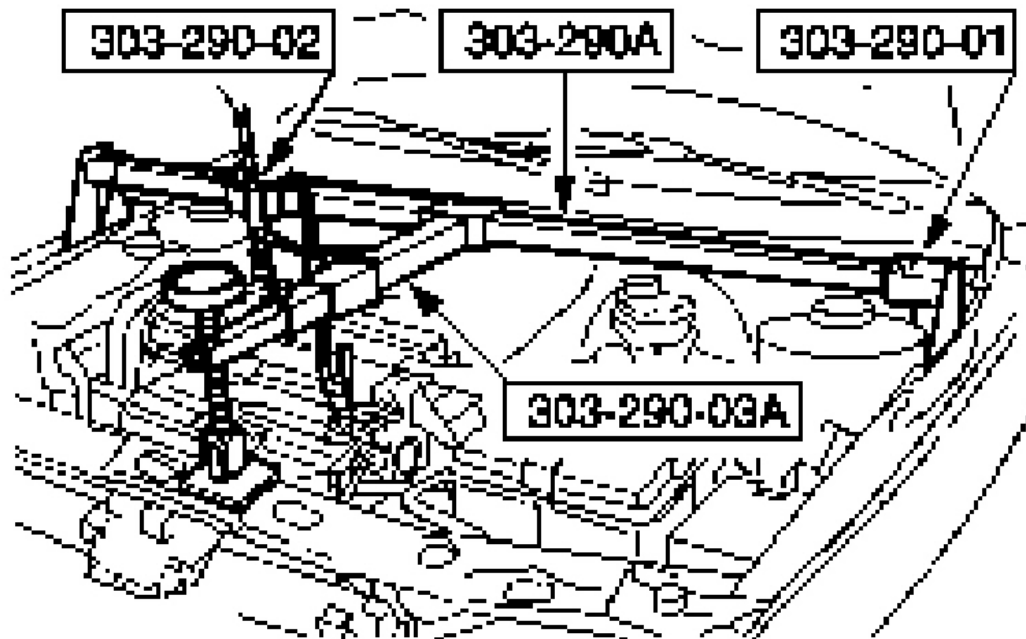
21. Remove the clutch slave cylinder supply line.
 - Remove the clip.
 - Remove the supply line and secure it to one side using cable ties.
22. Disconnect the reversing lamp switch electrical connector.



G03854757

Fig. 65: Disconnecting Reversing Lamp Switch Electrical Connector
Courtesy of FORD MOTOR CO.

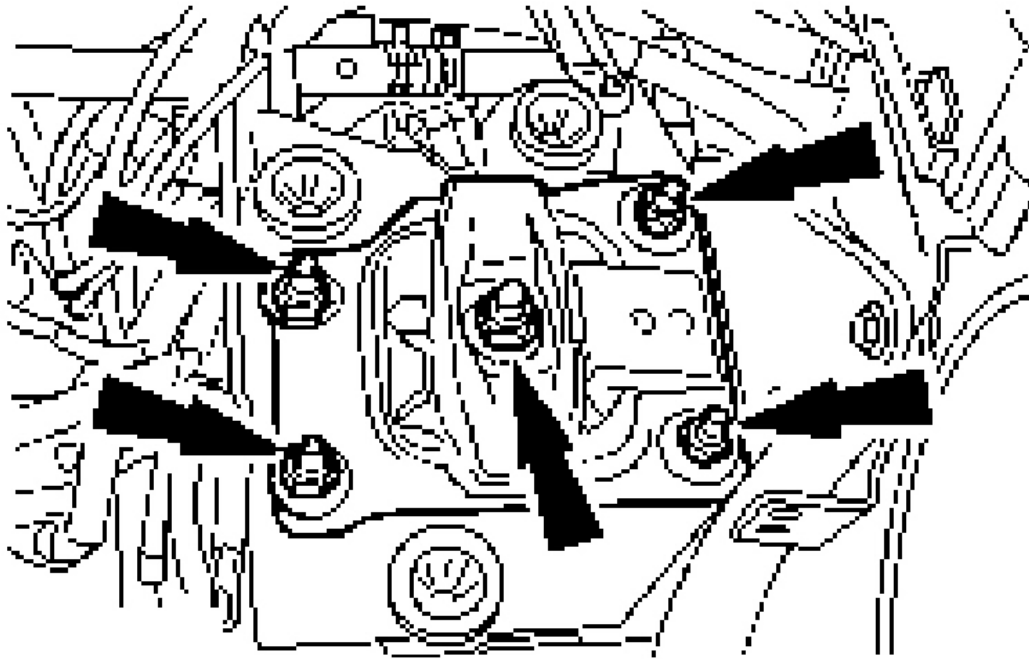
23. Install the special tools (illustration shows battery installed).



G03854758

Fig. 66: Installing Special Tools
Courtesy of FORD MOTOR CO.

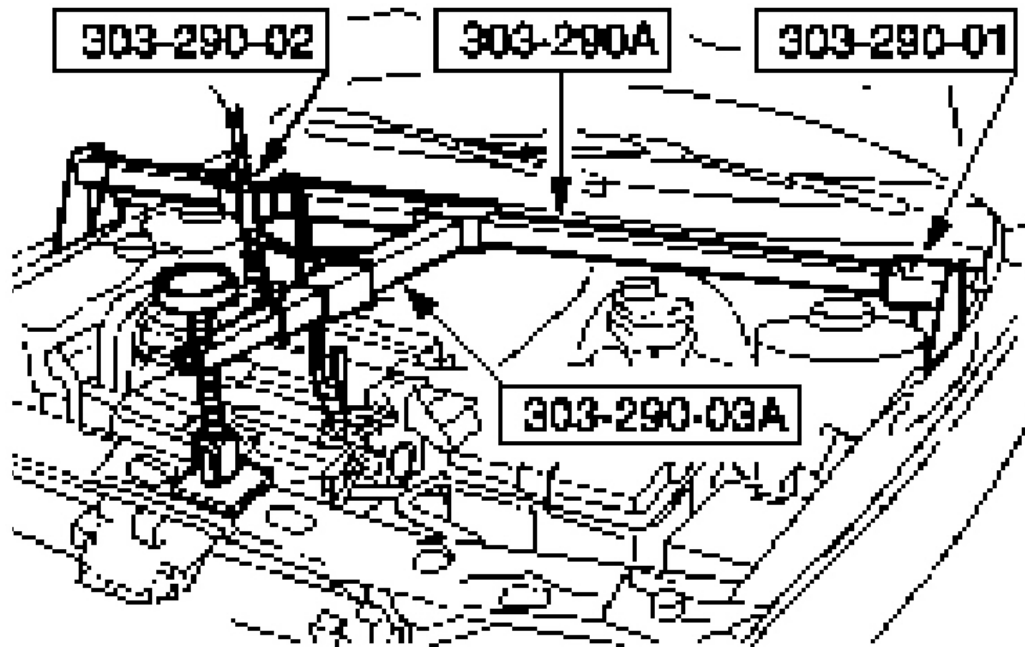
24. Remove the engine rear mount.



G03854759

Fig. 67: Removing Engine Rear Mount
Courtesy of FORD MOTOR CO.

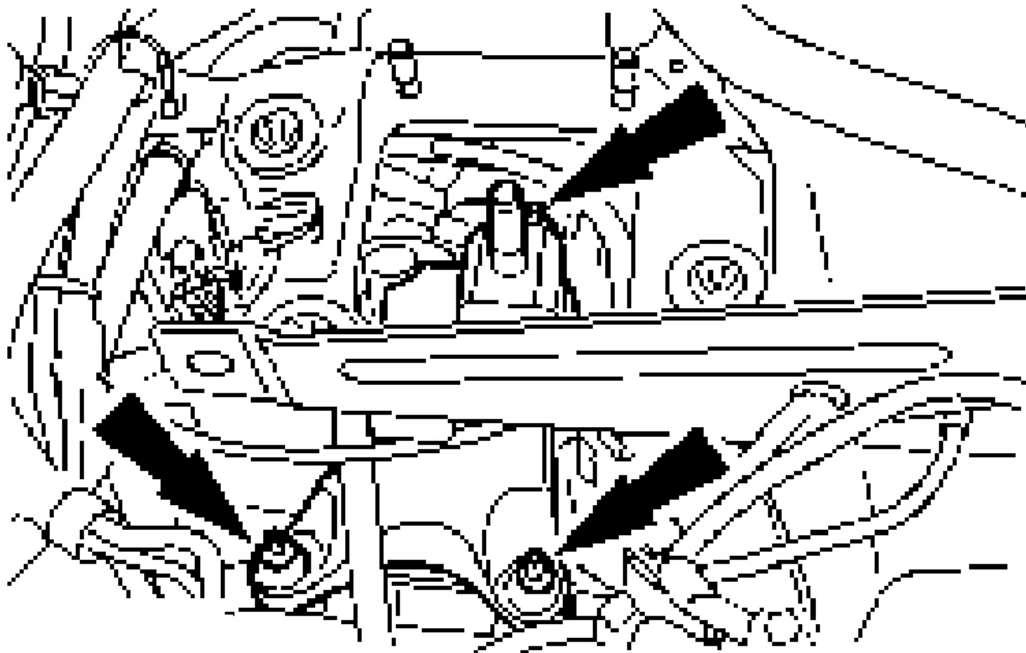
25. Using the special tools, lower the engine and transaxle assembly slightly.



G03854760

Fig. 68: Lowering Engine And Transaxle Assembly
Courtesy of FORD MOTOR CO.

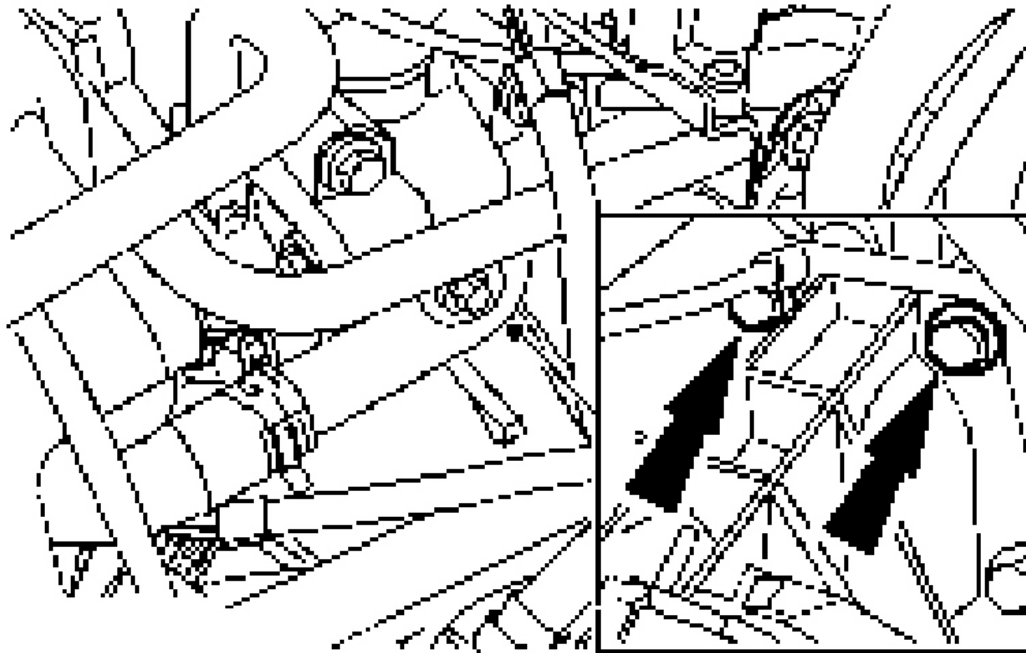
26. Remove the engine rear mount bracket.



G03854761

Fig. 69: Removing Engine Rear Mount Bracket
Courtesy of FORD MOTOR CO.

27. Remove the two transaxle upper flange bolts.

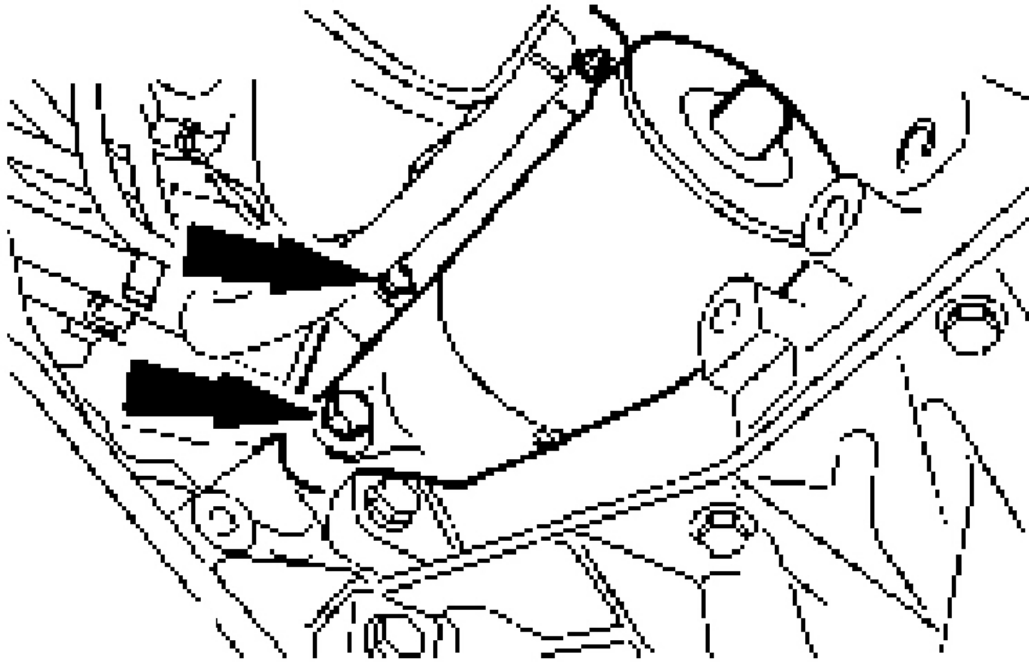


G03854762

Fig. 70: Removing Transaxle Upper Flange Bolts
Courtesy of FORD MOTOR CO.

28. Raise and support the vehicle.

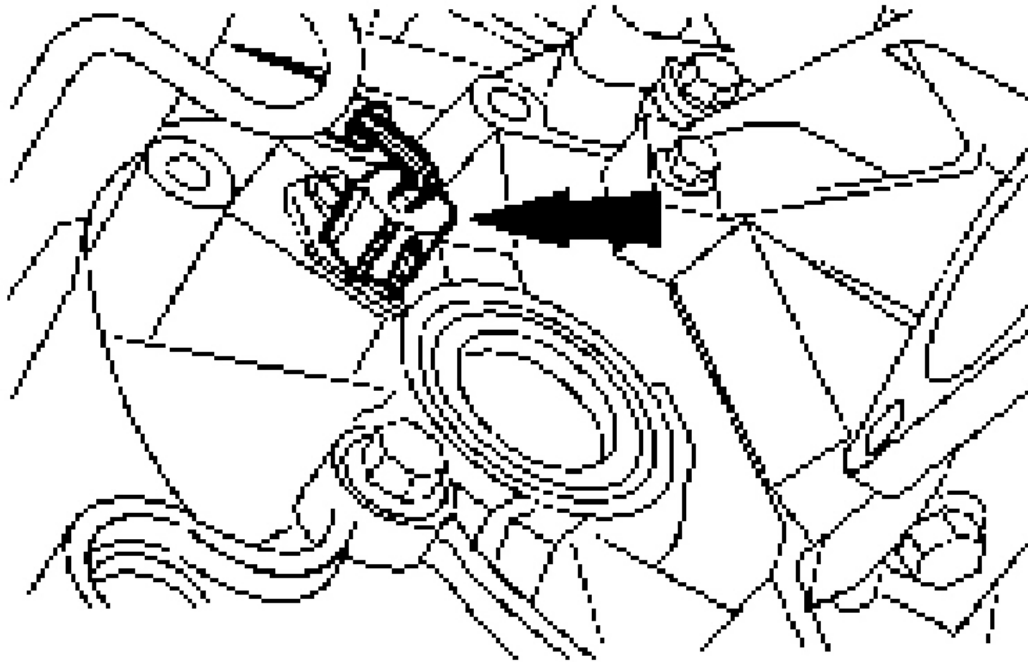
NOTE: Do not disconnect the starter motor.



G03854763

Fig. 71: Detaching Starter Motor From Transaxle
Courtesy of FORD MOTOR CO.

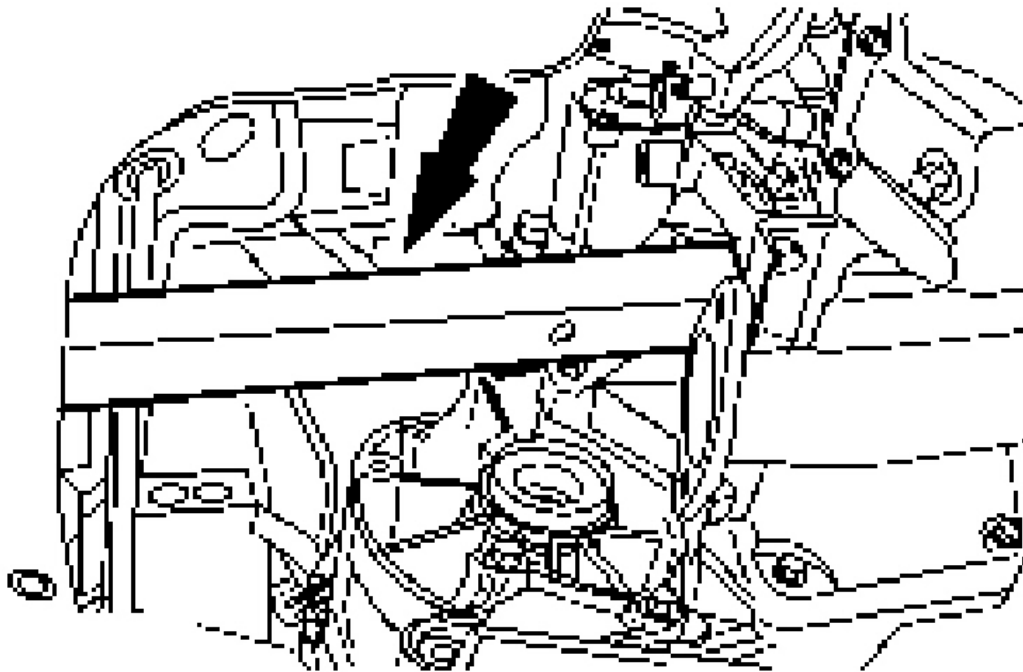
29. Detach the starter motor from the transaxle.
 - Remove the three bolts (two bolts shown).
 - Secure the starter motor to one side using cable ties.
30. Remove the vehicle speed sensor (VSS) electrical connector.



G03854764

Fig. 72: Removing Vehicle Speed Sensor (VSS) Electrical Connector
Courtesy of FORD MOTOR CO.

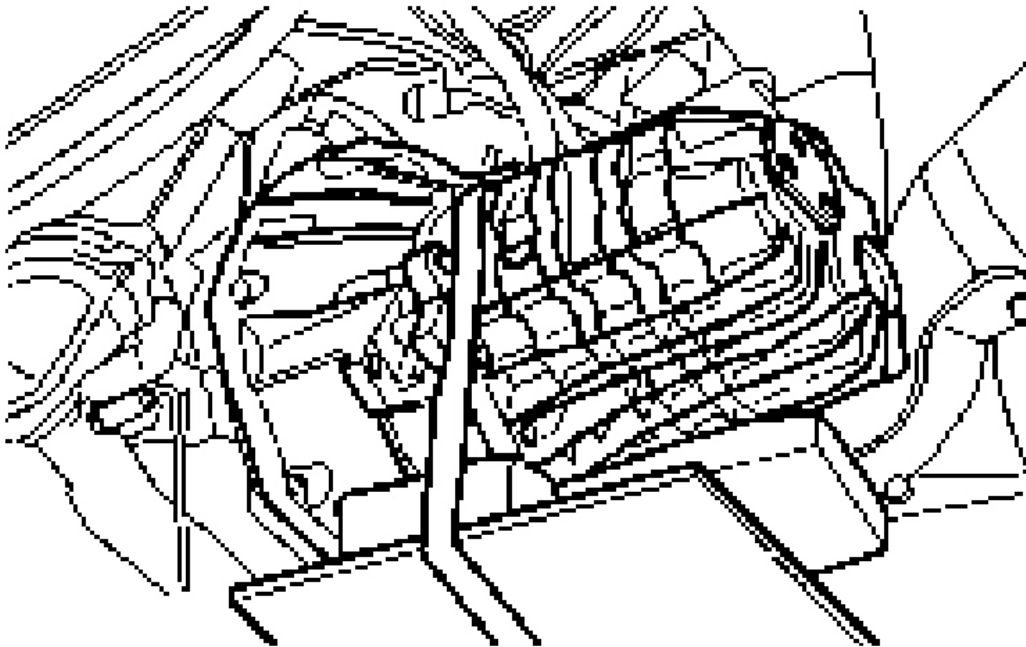
31. Push the engine and transaxle assembly forwards and insert an approximately 350 mm long wooden block between the engine and the crossmember.



G03854765

Fig. 73: Inserting Wooden Block Between Engine And Crossmember
Courtesy of FORD MOTOR CO.

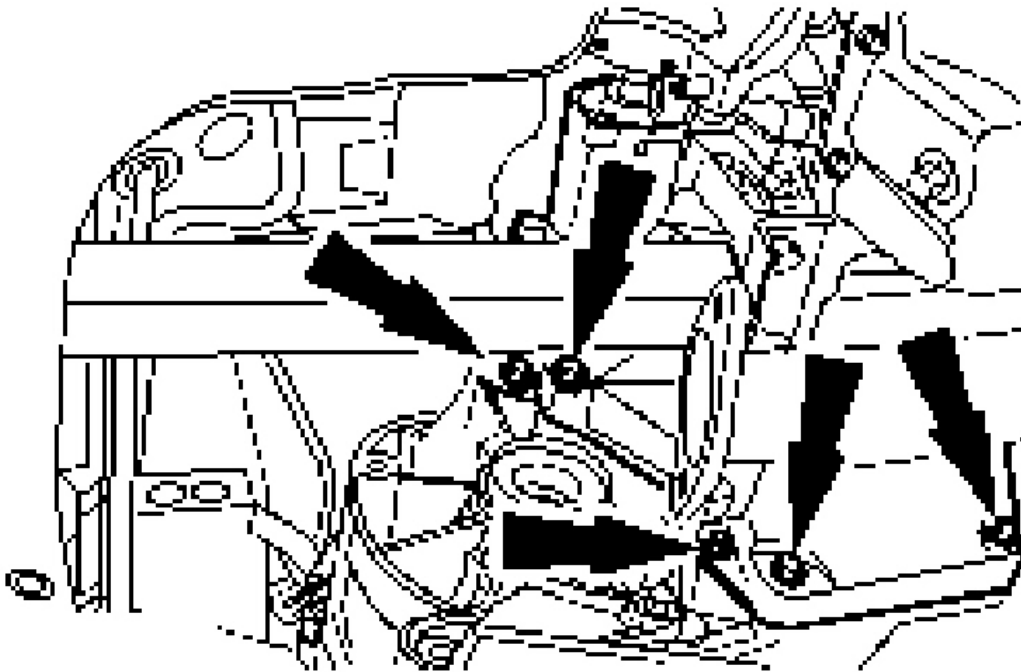
32. Position a suitable transmission jack under the transaxle and secure it with a retaining strap.



G03854766

Fig. 74: Positioning Transmission Jack Under Transaxle
Courtesy of FORD MOTOR CO.

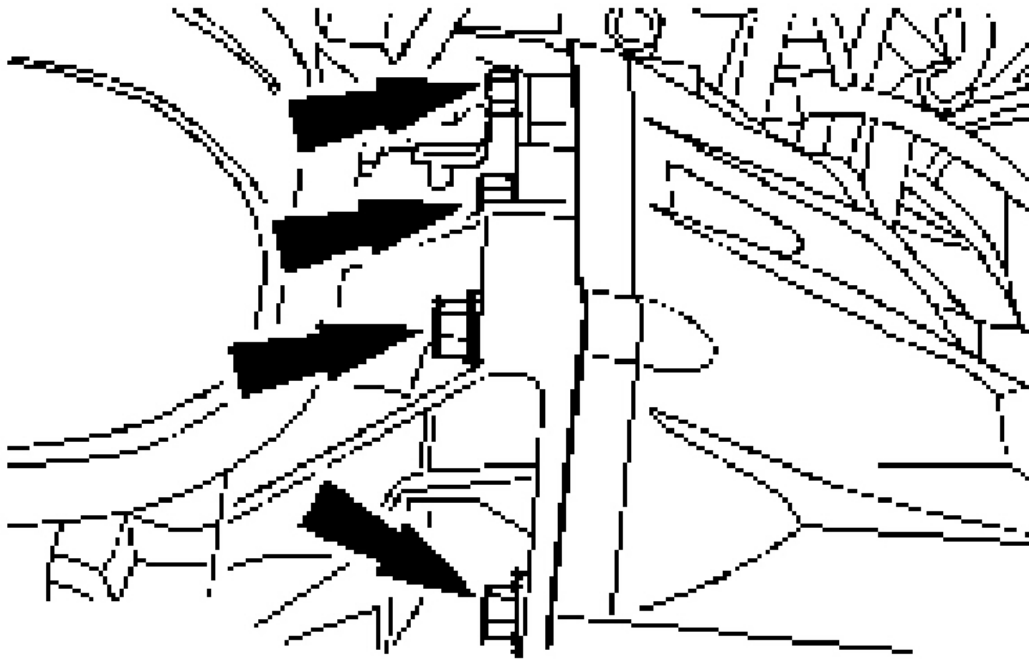
33. Remove the transaxle lower flange bolts (five bolts).



G03854767

Fig. 75: Removing Transaxle Lower Flange Bolts
Courtesy of FORD MOTOR CO.

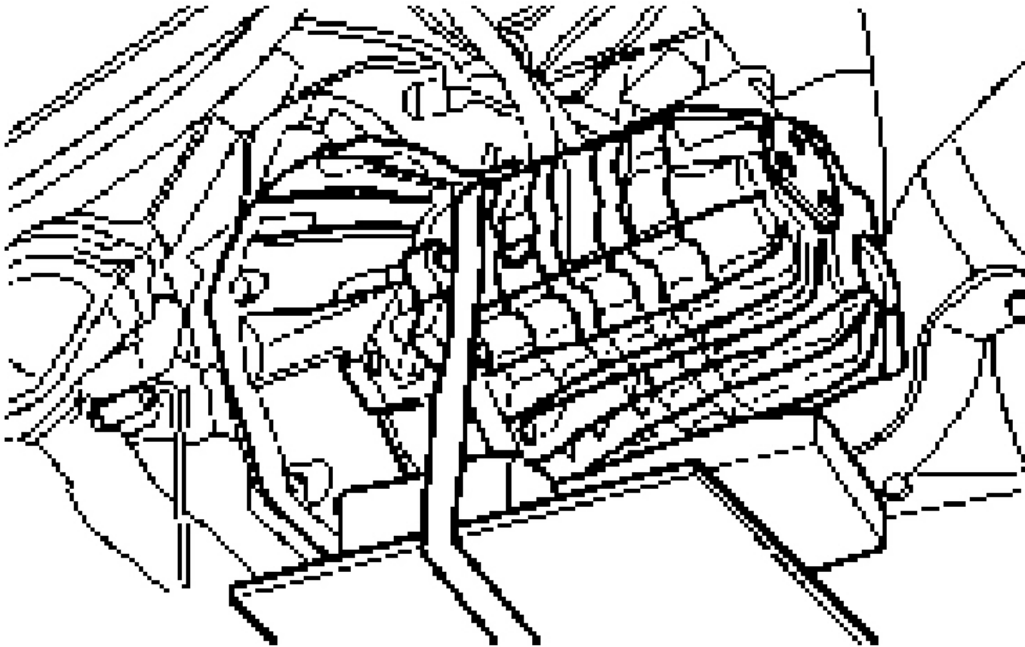
34. Remove the remaining transaxle flange bolts (four bolts).



G03854768

Fig. 76: Removing Remaining Transaxle Flange Bolts
Courtesy of FORD MOTOR CO.

35. Remove the transaxle from the engine and lower it using a transmission jack.



G03854769

Fig. 77: Removing Transaxle From Engine
Courtesy of FORD MOTOR CO.

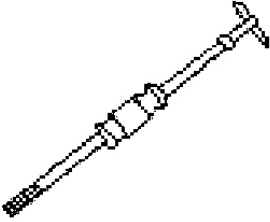

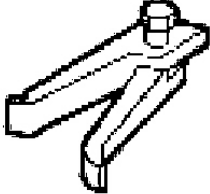

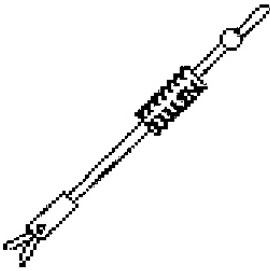
DISASSEMBLY

TRANSAXLE

Special Tool(s)

2002 Ford Focus LX

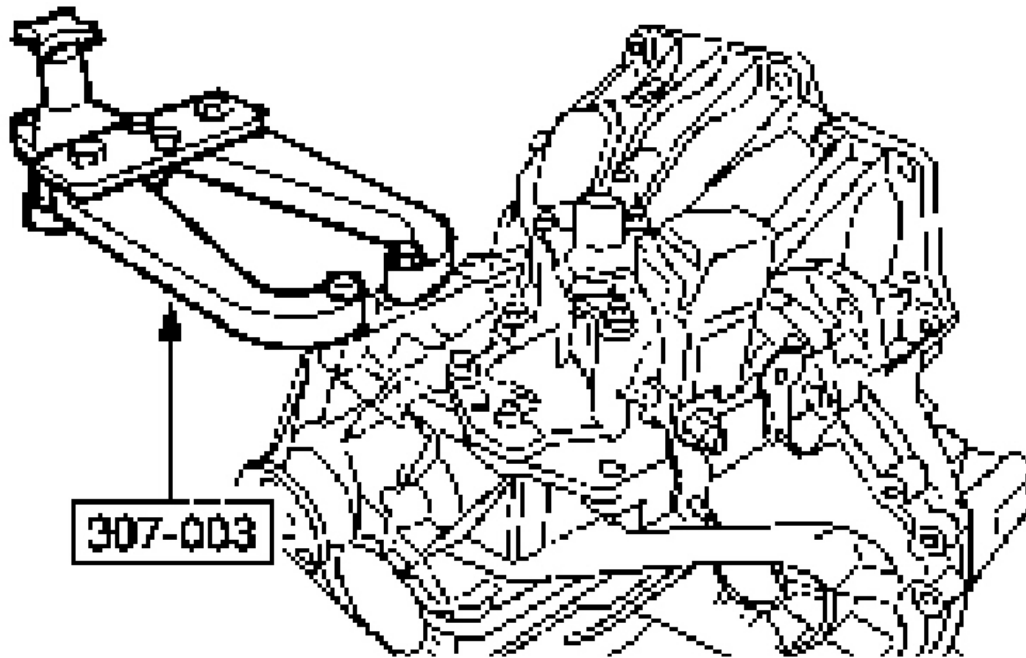
2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

	Slide Hammer 100-001 (T50T-100-A)
	Mounting Fixture, Transmission 307-003 (T57L-500-B)
	Remover, Stator Case Bearing 307-163 (T86P-70043-A)
	Remover, Torque Converter Oil Seal 307-272 (T94P-77000-B)
	Remover, Pilot Bearing 308-001 (T58L-101-B)

G03854770

Fig. 78: Special Tools Specifications
Courtesy of FORD MOTOR CO.

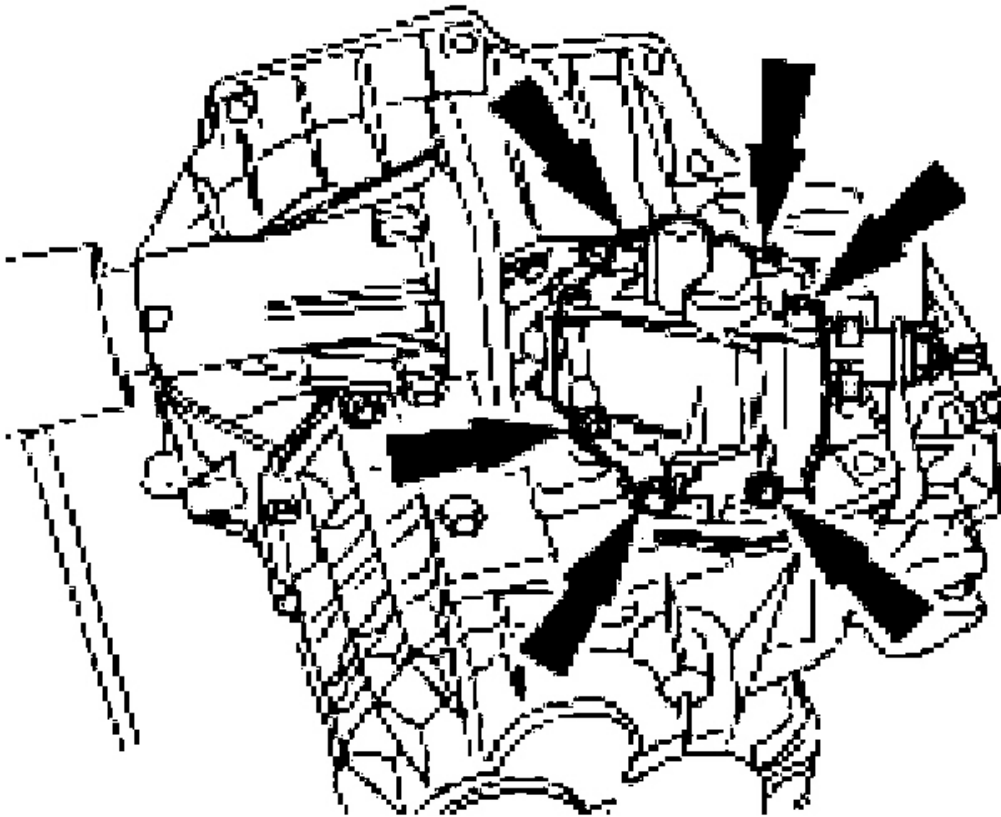
1. Install the special tool.



G03854771

Fig. 79: Installing Special Tool
Courtesy of FORD MOTOR CO.

2. Remove the selector mechanism.
 - Select neutral.
 - Remove the bolts.



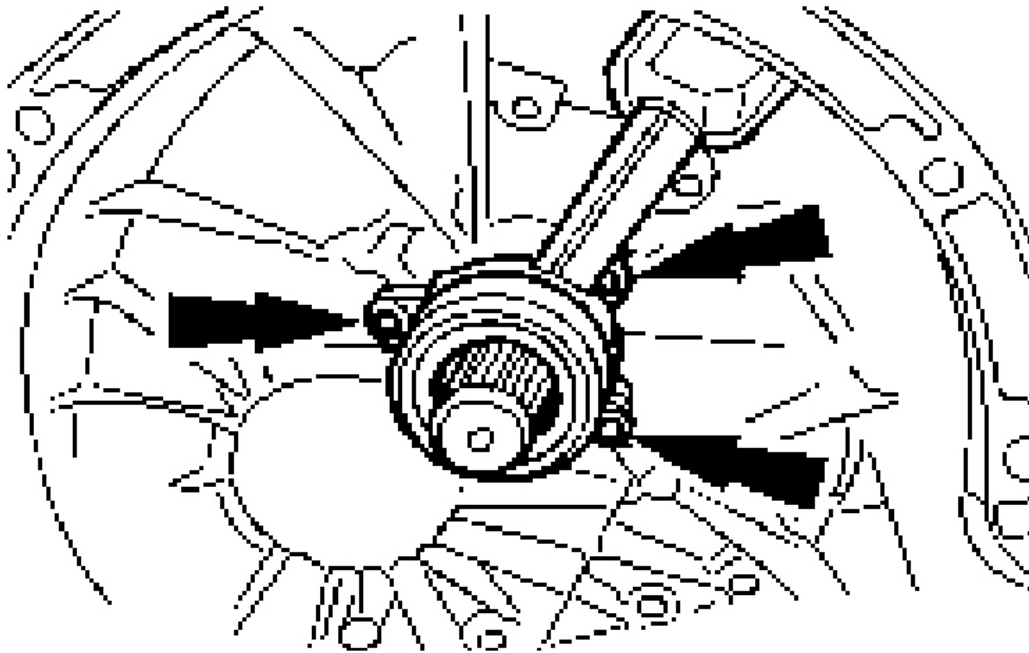
G03854772

Fig. 80: Removing Selector Mechanism
Courtesy of FORD MOTOR CO.

3. Clean any grease and foreign material from the input shaft.

CAUTION: Using suitable adhesive tape, cover the input shaft splines to prevent damage to the input shaft oil seal.

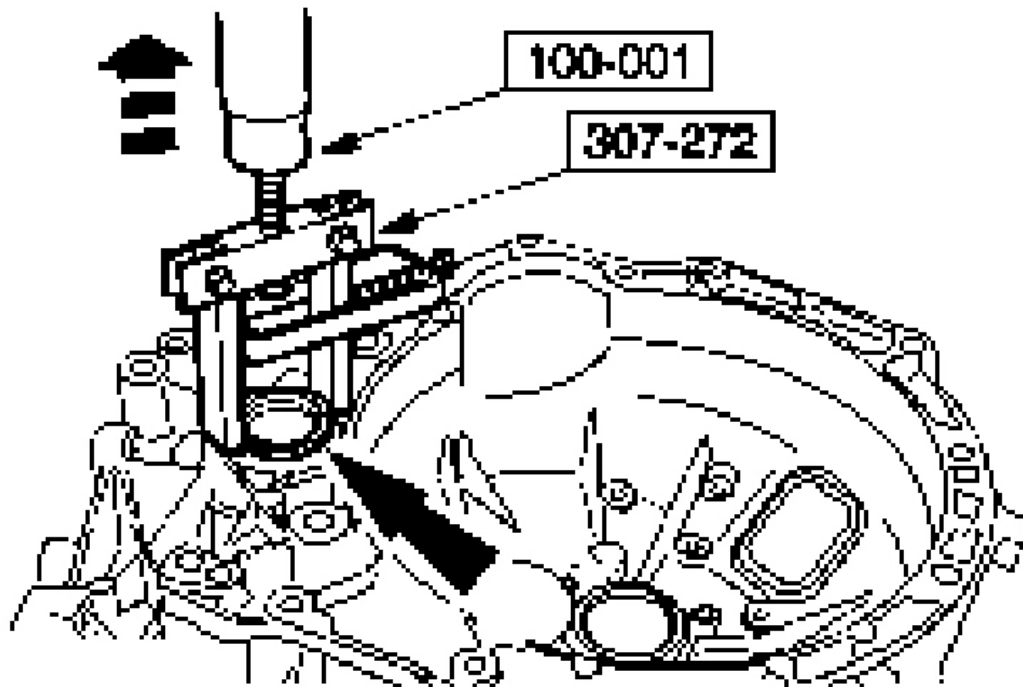
NOTE: Discard the clutch slave cylinder.



G03854773

Fig. 81: Removing Clutch Slave Cylinder
Courtesy of FORD MOTOR CO.

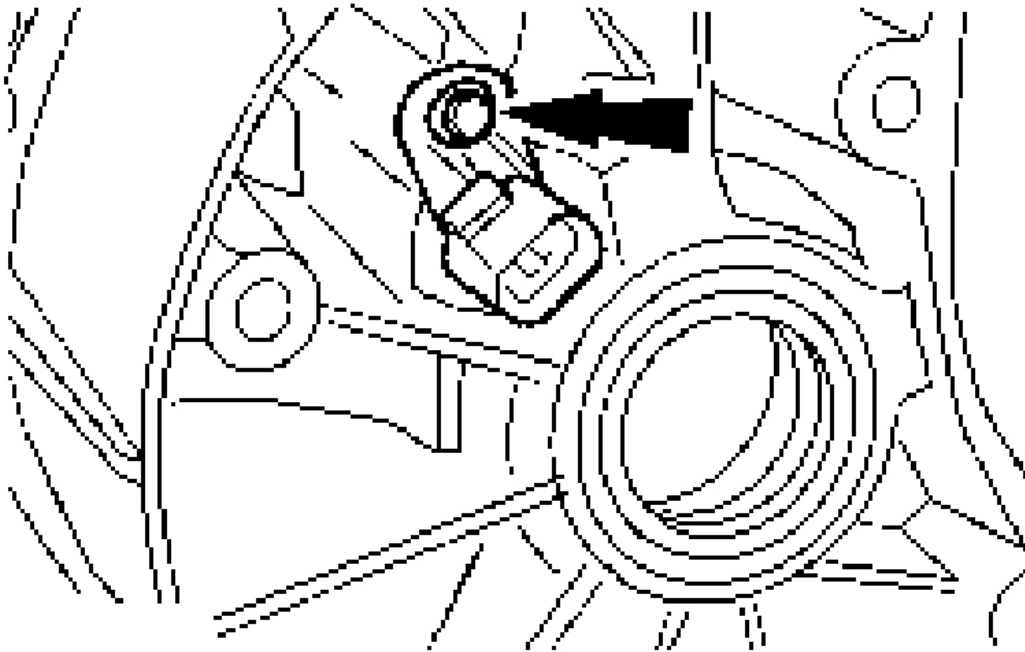
4. Remove the clutch the slave cylinder.
5. Remove the adhesive tape from the input shaft splines.
6. Using the special tool, remove the halfshaft oil seals.



G03854774

Fig. 82: Removing Halfshaft Oil Seals
Courtesy of FORD MOTOR CO.

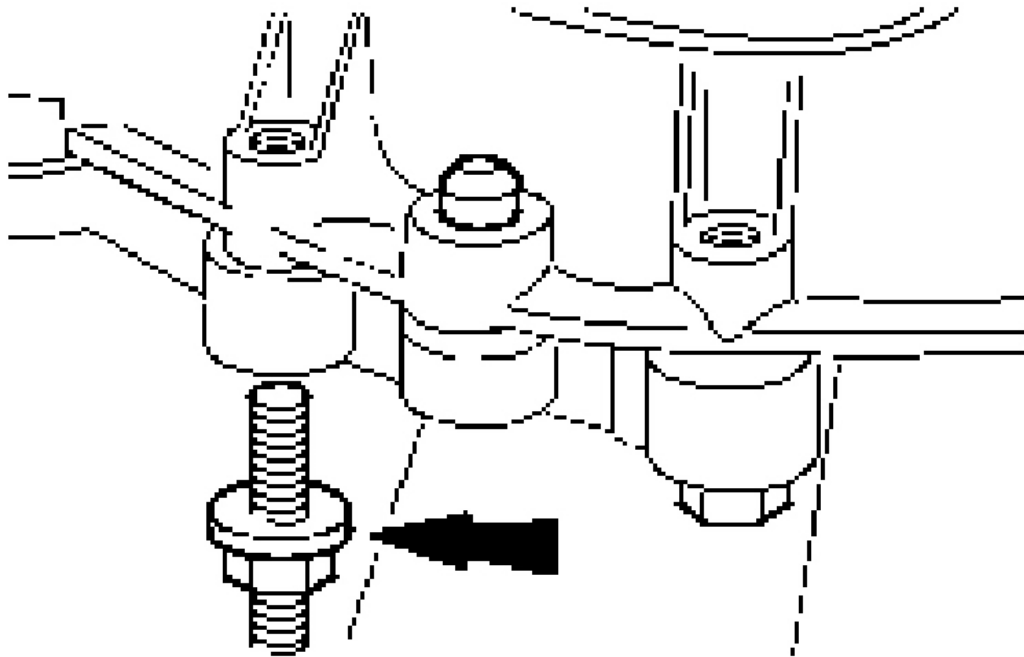
7. Remove the vehicle speed sensor (VSS).



G03854775

Fig. 83: Removing Vehicle Speed Sensor (VSS)
Courtesy of FORD MOTOR CO.

NOTE: Do not remove guide pegs.

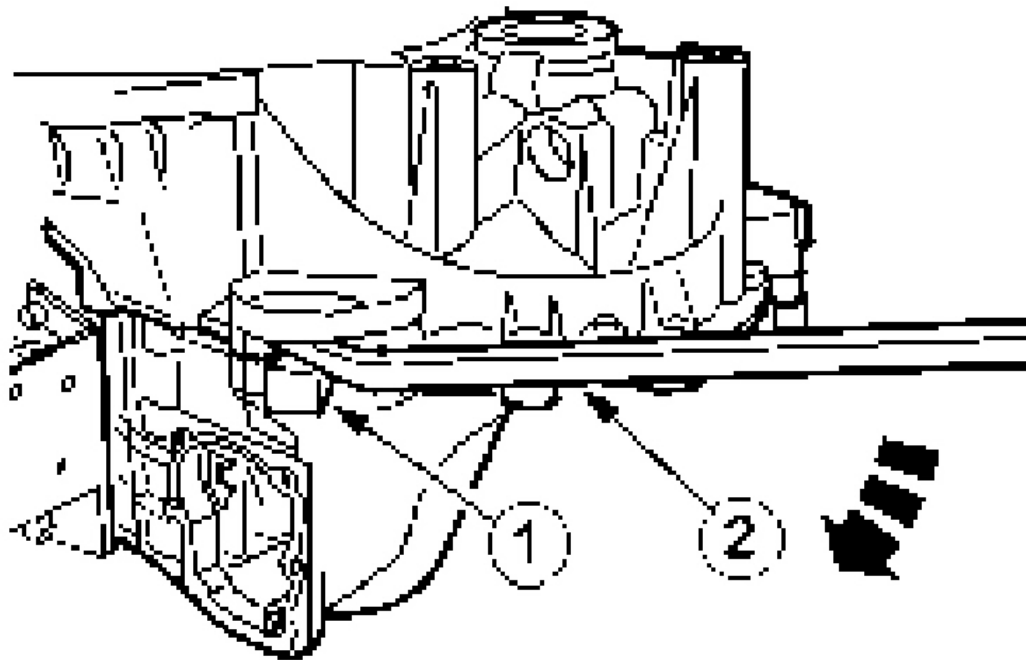


G03854776

Fig. 84: Removing Transaxle Flange Bolts
Courtesy of FORD MOTOR CO.

8. Remove the transaxle flange bolts.

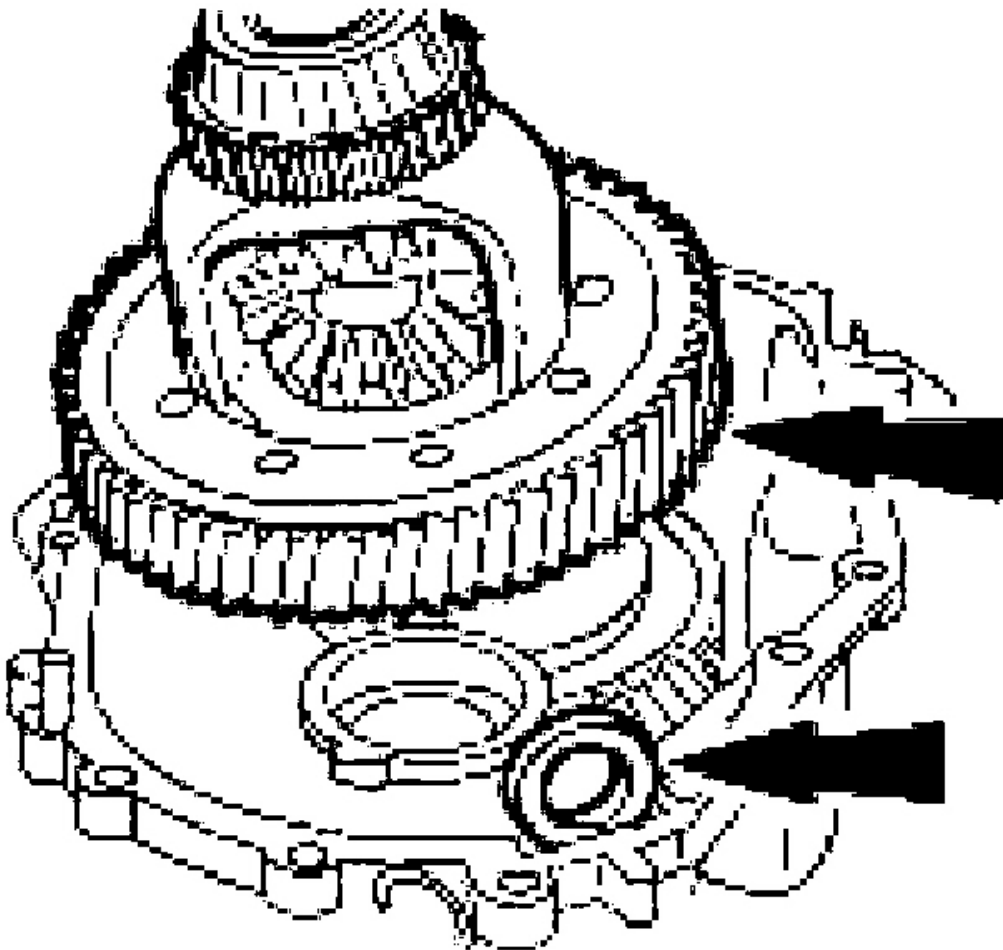
CAUTION: Take care not to damage the transaxle housing.



G03854777

Fig. 85: Separating Transaxle Housing
Courtesy of FORD MOTOR CO.

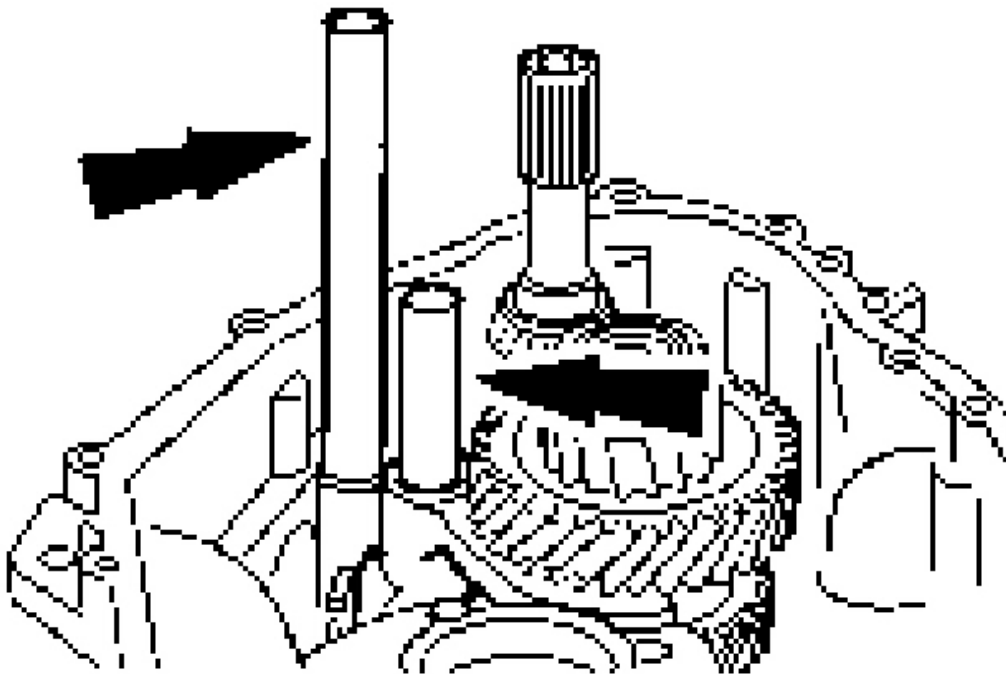
9. Separate the transaxle housing.
 1. Place supports underneath.
 2. Separate the transaxle housing using two tire bars.
10. Remove the differential.
 - Remove the magnetic disc.



G03854778

Fig. 86: Removing Differential
Courtesy of FORD MOTOR CO.

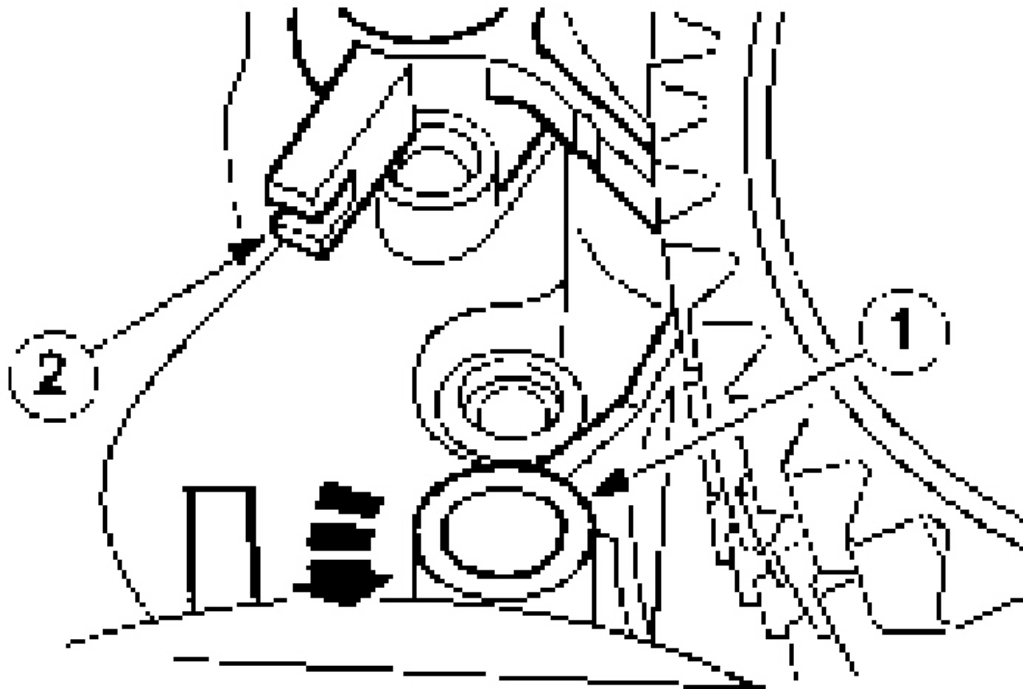
11. Remove the selector rods and the first and second gear selector fork.



G03854779

Fig. 87: Removing Selector Rods And First And Second Gear Selector Fork
Courtesy of FORD MOTOR CO.

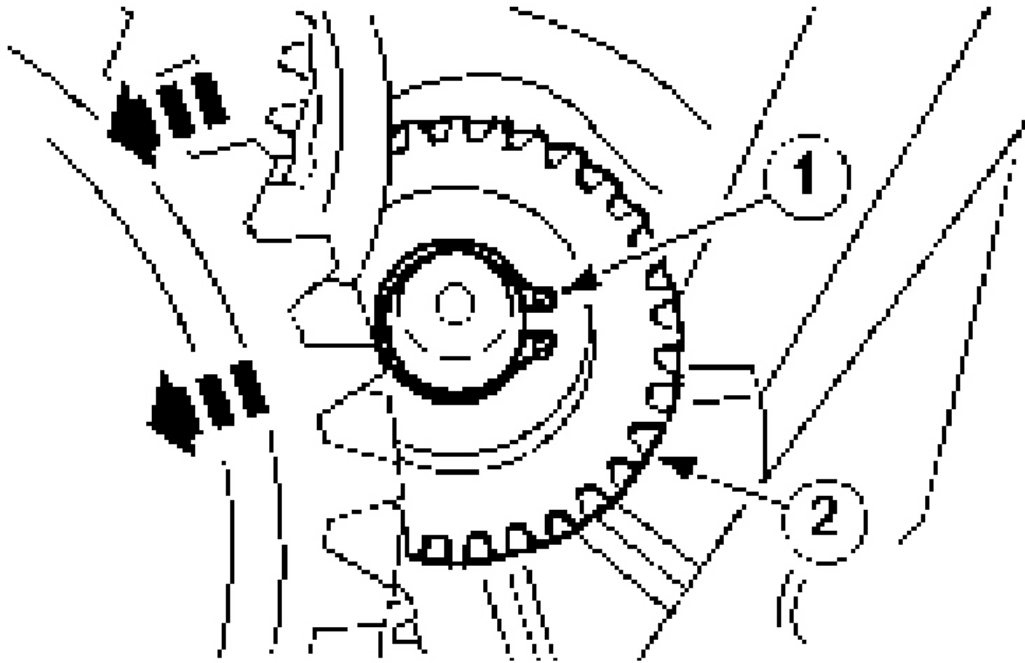
12. Remove the selector forks.
 1. Move the fifth and reverse gear selector fork to the side.
 2. Rotate the third and fourth gear selector fork and remove.
 - Remove the fifth and reverse gear selector fork.



G03854780

Fig. 88: Removing Selector Forks
Courtesy of FORD MOTOR CO.

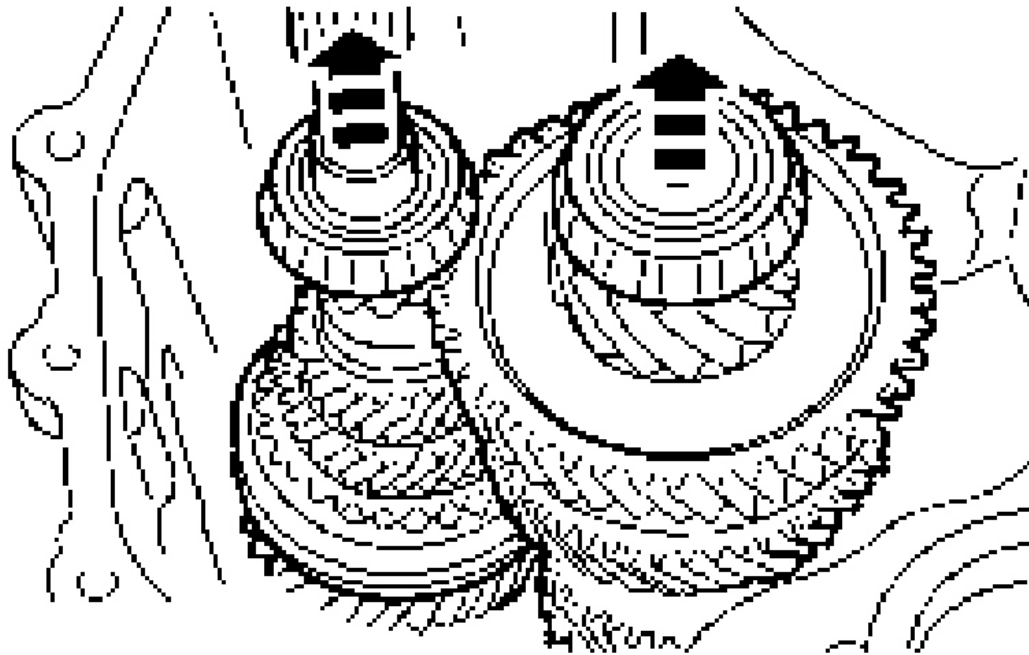
13. Remove the reverse idler gear.
 1. Remove the snap-ring.
 2. Tilt the input and output shafts to the side.
 - Lift out the idler gear.
 - Discard the snap-ring.



G03854781

Fig. 89: Removing Reverse Idler Gear
Courtesy of FORD MOTOR CO.

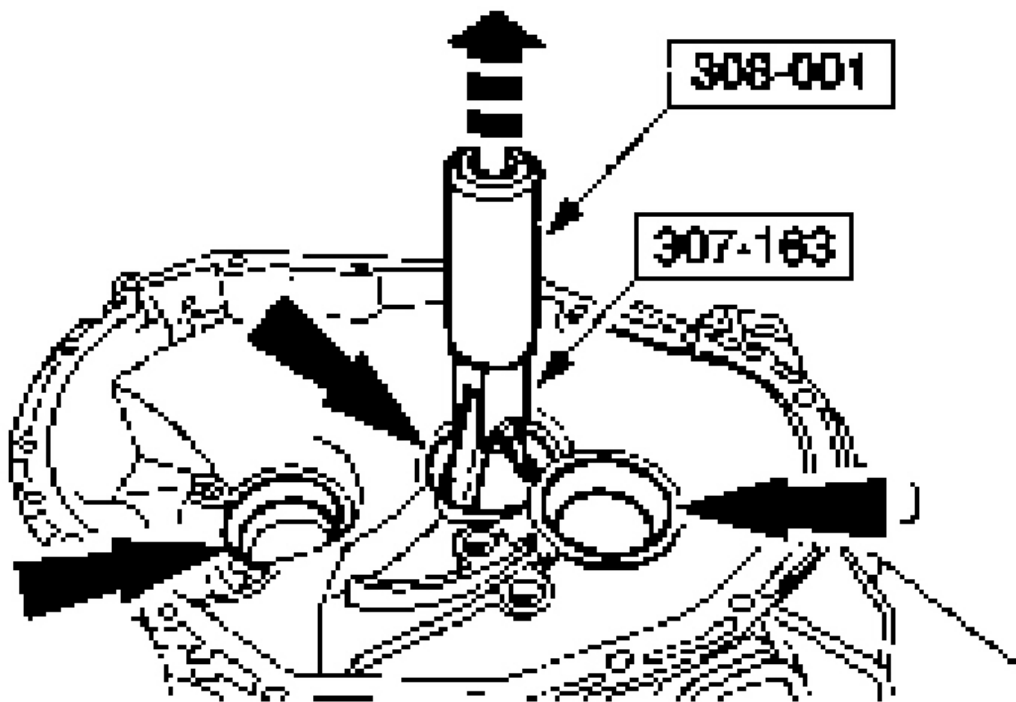
14. Remove the input and the output shaft.
 - Lift out the input and the output shaft from transaxle housing together.
 - Remove the bearing, reverse idler gear, needle roller bearing and thrust washers.



G03854782

Fig. 90: Removing Input And Output Shaft
Courtesy of FORD MOTOR CO.

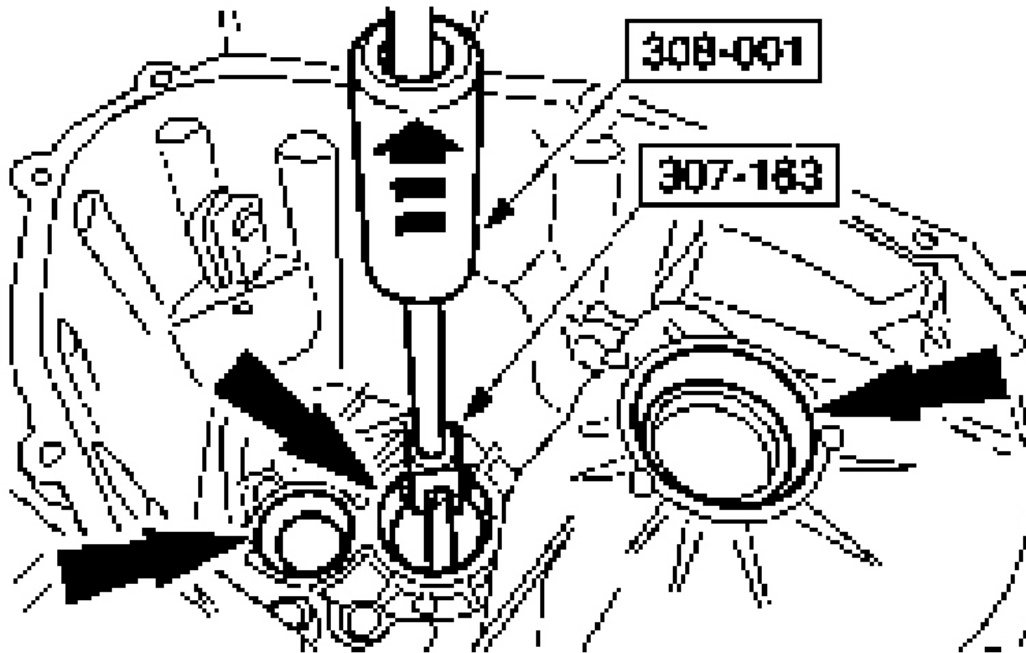
15. Using the special tools, remove the differential bearing outer race.



G03854783

Fig. 91: Removing Differential Bearing Outer Race
Courtesy of FORD MOTOR CO.

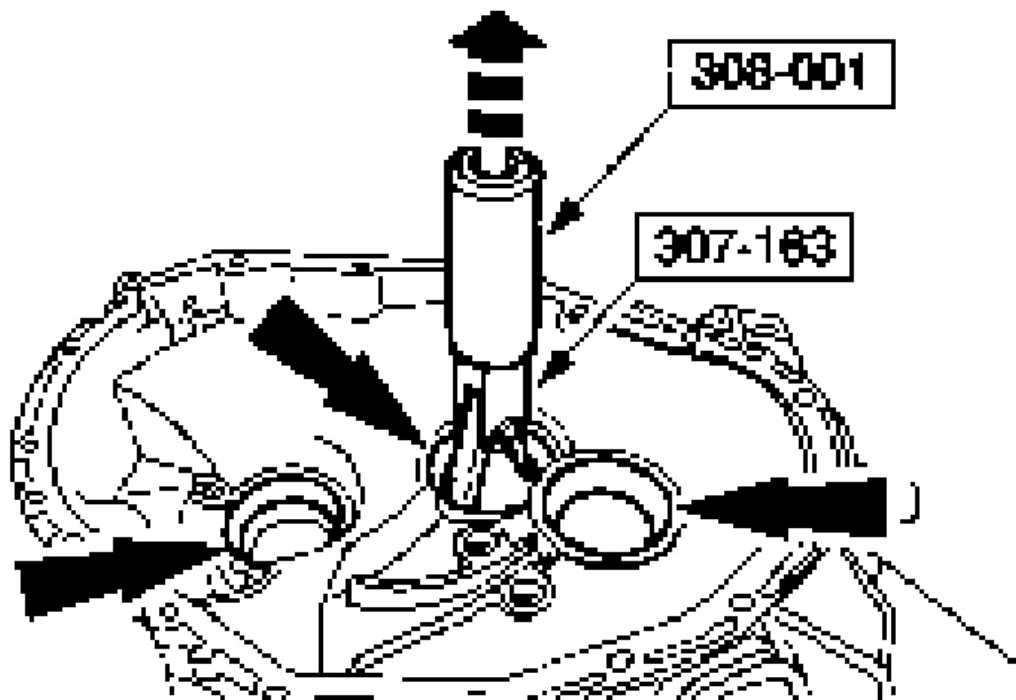
16. Using the special tools, remove the bearing outer races from the input and output shaft.



G03854784

Fig. 92: Removing Bearing Outer Races From Input And Output Shaft
Courtesy of FORD MOTOR CO.

17. Using the special tools, remove the bearing outer races and shims from the differential and input shaft.

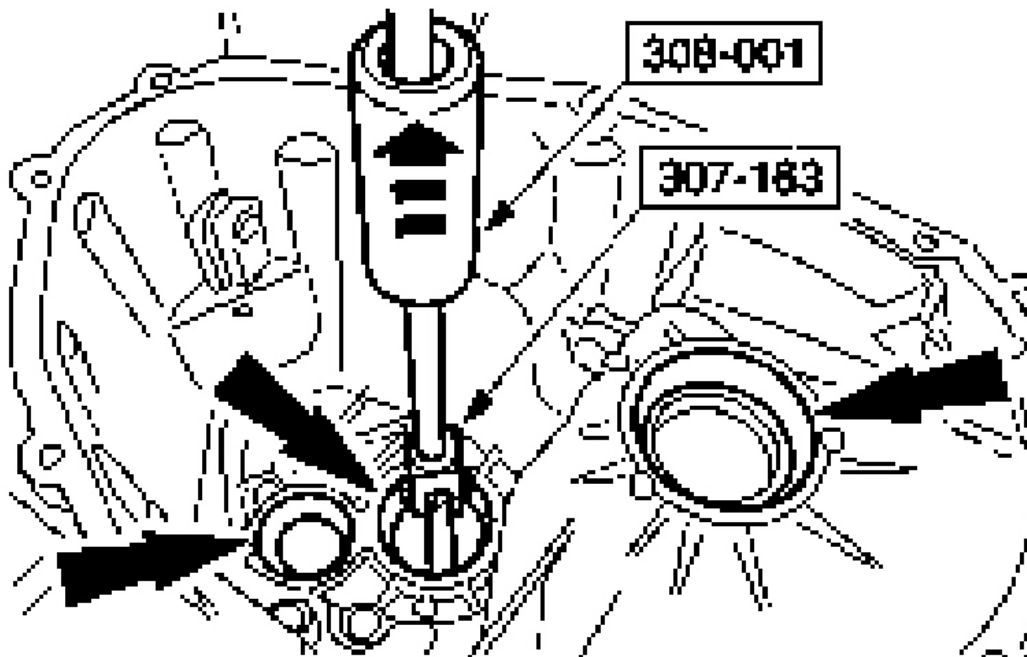


G03854785

Fig. 93: Removing Bearing Outer Races And Shims From Differential And Input Shaft

Courtesy of FORD MOTOR CO.

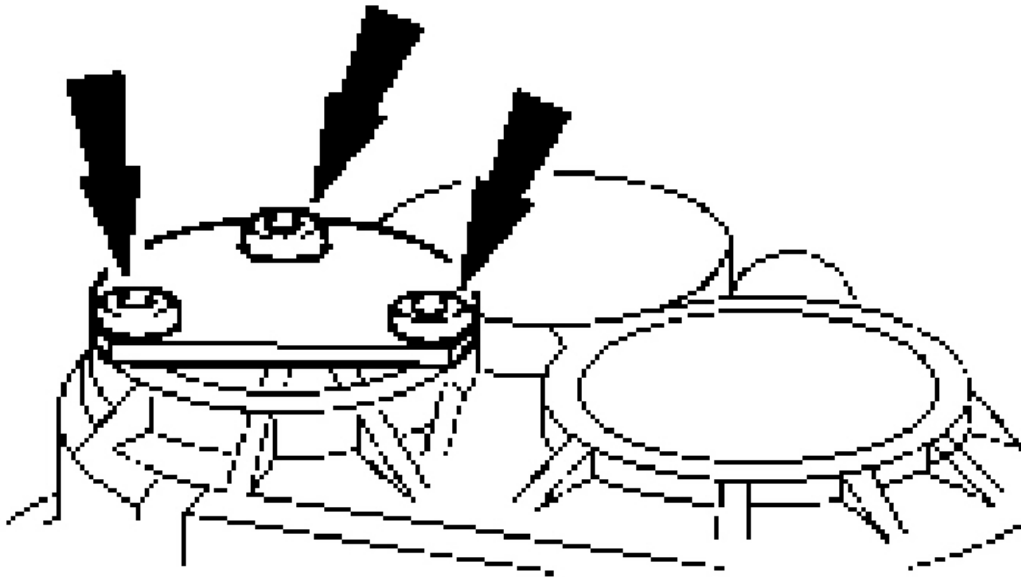
18. Using the special tools, remove the output shaft bearing outer race and shim.



G03854786

Fig. 94: Removing Output Shaft Bearing Outer Race And Shim
Courtesy of FORD MOTOR CO.

NOTE: Only remove the reverse gear idler shaft if there is evidence of damage or leaks.

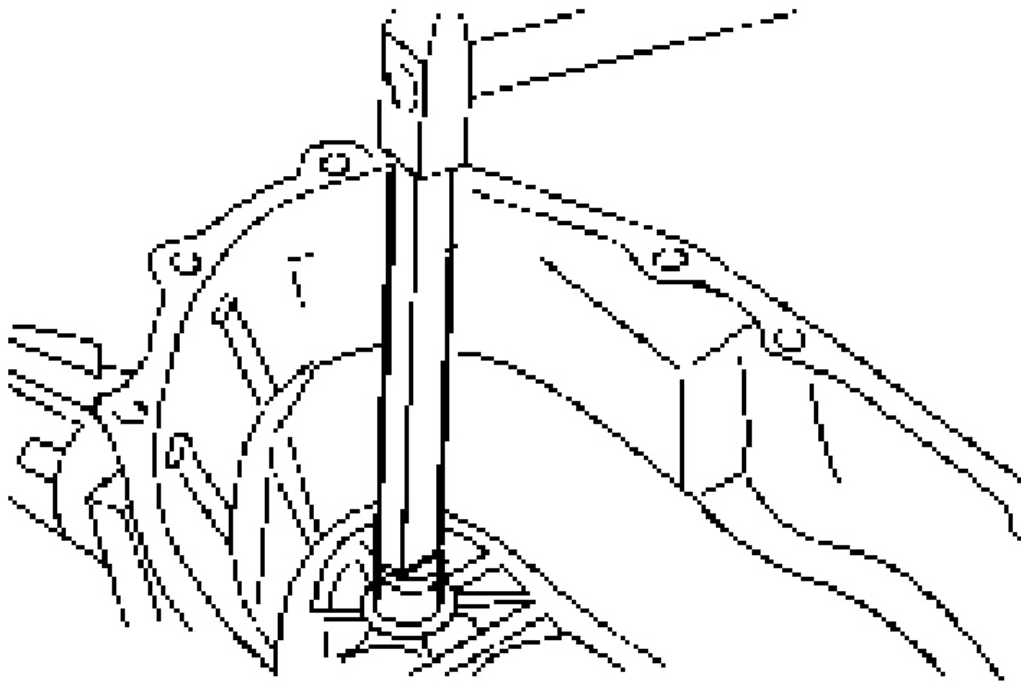


G03854787

Fig. 95: Removing Reverse Gear Idler Shaft Cover
Courtesy of FORD MOTOR CO.

19. Remove the reverse gear idler shaft cover.

NOTE: Only remove the reverse gear idler shaft if there is evidence of damage or leaks.



G03854788

Fig. 96: Removing Reverse Gear Idler Shaft
Courtesy of FORD MOTOR CO.

20. Using a wooden drift, remove the reverse gear idler shaft.

DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

SELECTOR PLATE

General Equipment

GENERAL EQUIPMENT

Hot air blower

Material

MATERIAL SPECIFICATIONS

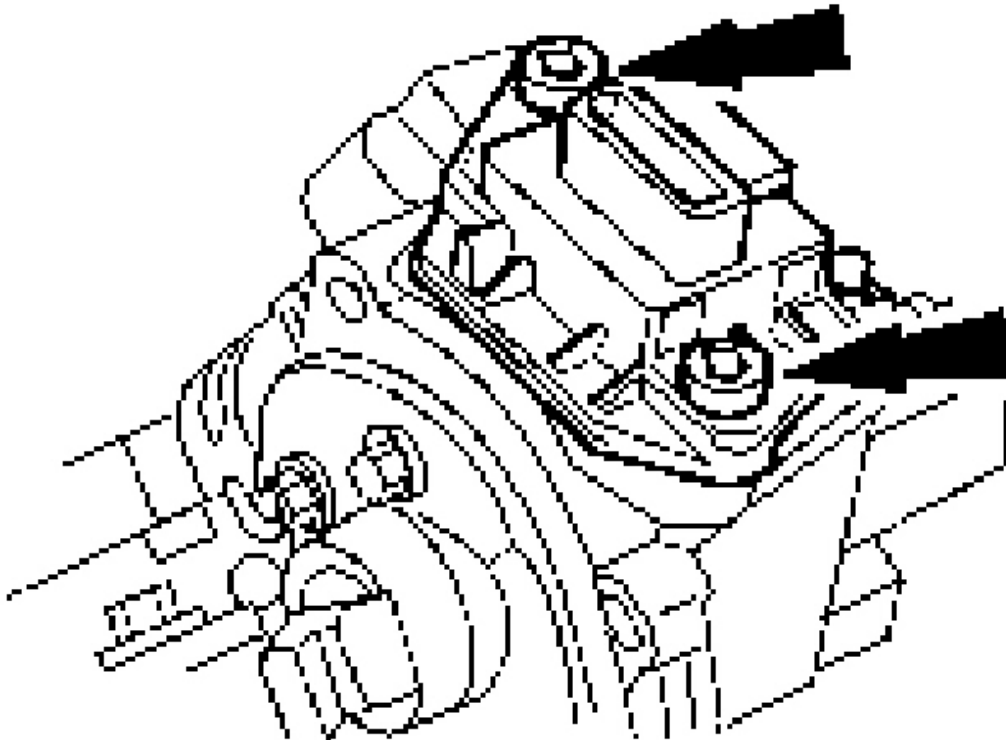
Sealer	ESDM-1G220-A

Sealer

WSK-M2G348-A5

Disassembly

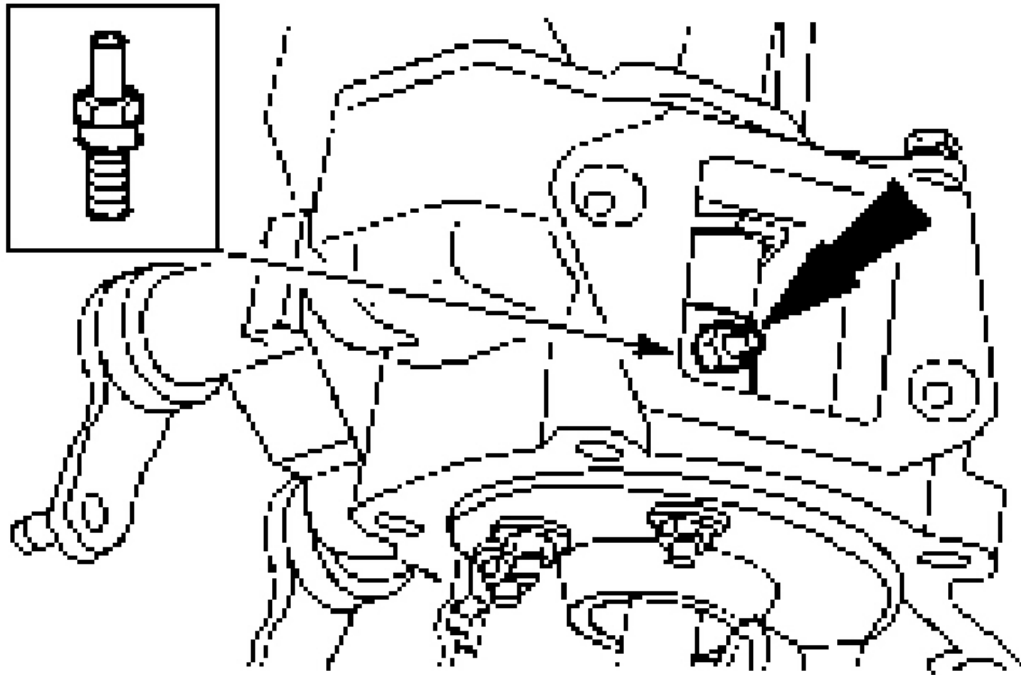
1. Remove the reversing light switch.



G03854789

Fig. 97: Removing Reversing Light Switch
Courtesy of FORD MOTOR CO.

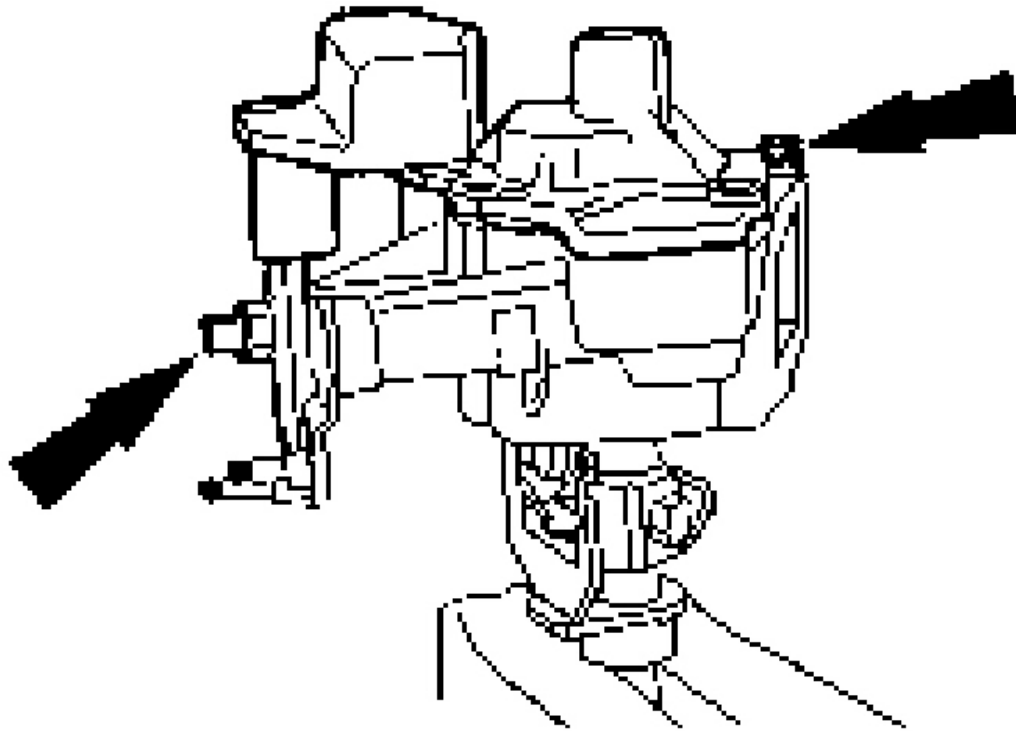
2. Remove the reversing light actuating pin.
 - Discard the bolt.



G03854790

Fig. 98: Removing Reversing Light Actuating Pin
Courtesy of FORD MOTOR CO.

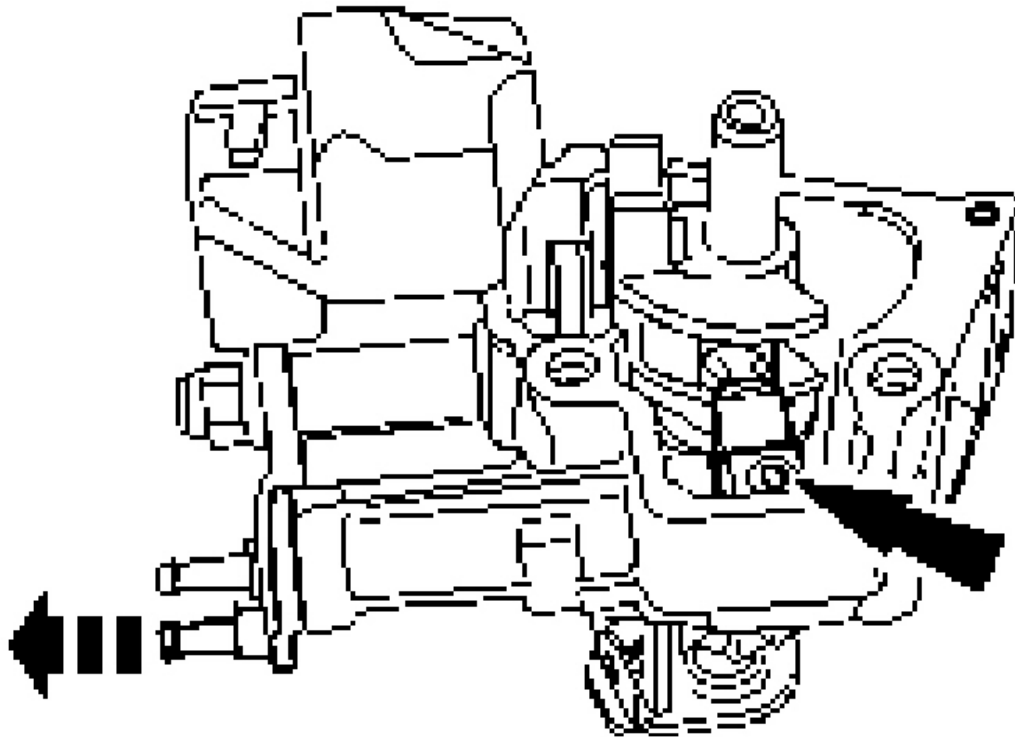
3. Remove the gearshift lever and the cover of the internal selector mechanism.



G03854791

Fig. 99: Removing Gearshift Lever And Cover Of Internal Selector Mechanism
Courtesy of FORD MOTOR CO.

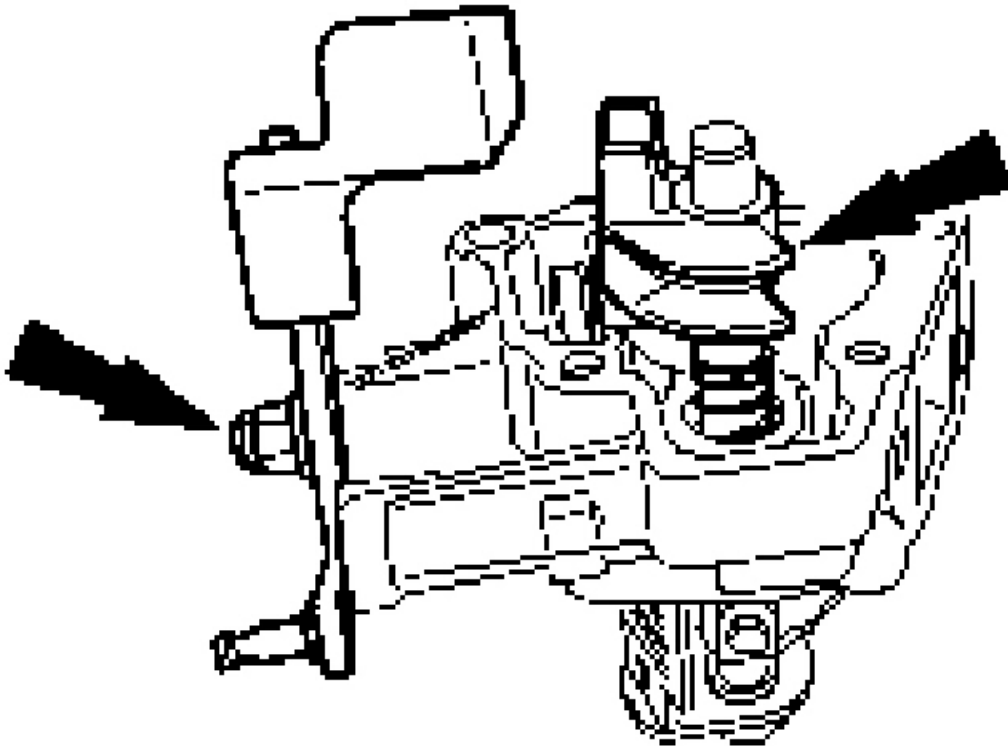
NOTE: The bolt is inserted with locking compound.



G03854792

Fig. 100: Removing Gearshift And Selector Lever Shaft Guide
Courtesy of FORD MOTOR CO.

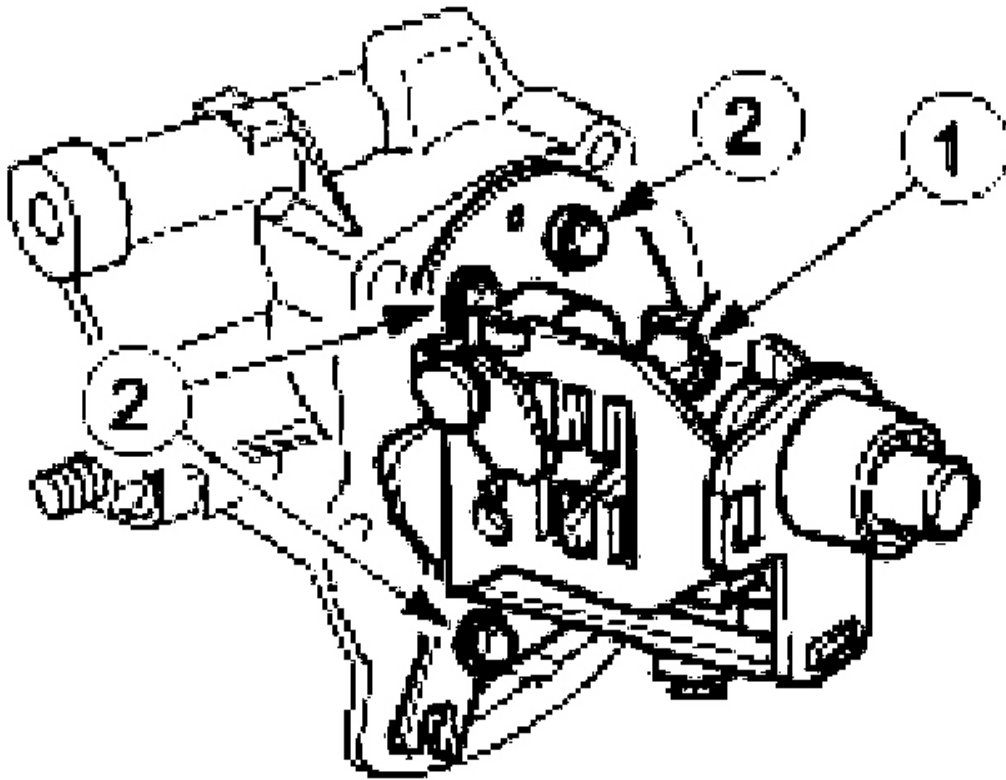
4. Loosen the bolt and remove the gearshift and selector lever shaft guide.
 - Heat the bolt to approx. 60 to 80°C using a hot air blower and remove it.
5. Remove the selector block and the spring, remove the shift lever.



G03854793

Fig. 101: Removing Selector Block And Spring, Shift Lever
Courtesy of FORD MOTOR CO.

6. Remove the selector gate and selector shaft from the selector mechanism housing.
 1. Remove the bolt.
 2. Remove the selector gate with the selector shaft.
 - Remove the spring.

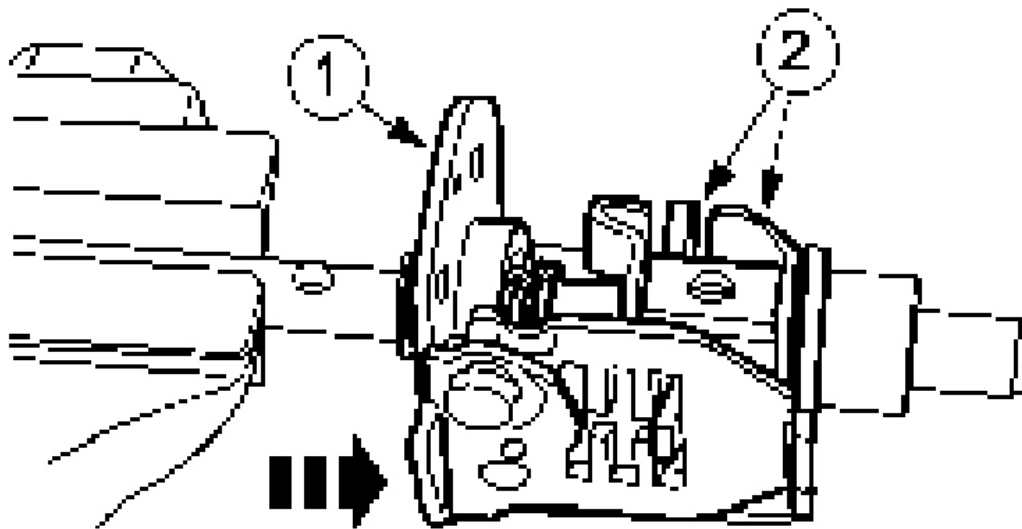


G03854794

Fig. 102: Removing Selector Gate And Selector Shaft From Selector Mechanism Housing

Courtesy of FORD MOTOR CO.

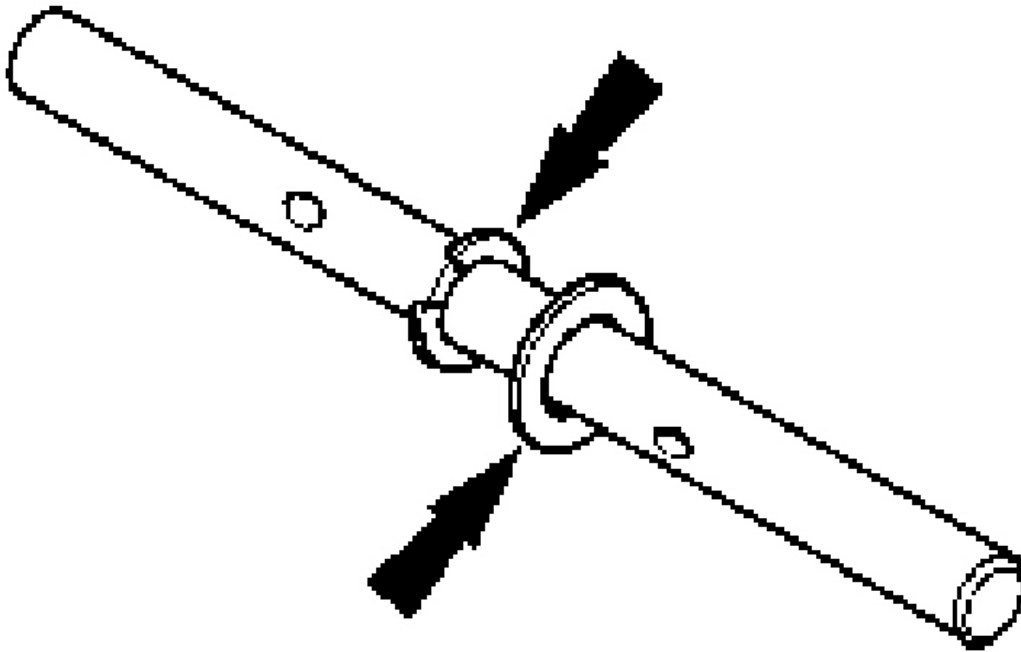
7. Remove the selector shaft.
 1. Pull out the selector gate form the selector shaft.
 2. Remove the selector finger and bracket.



G03854795

Fig. 103: Removing Selector Shaft
Courtesy of FORD MOTOR CO.

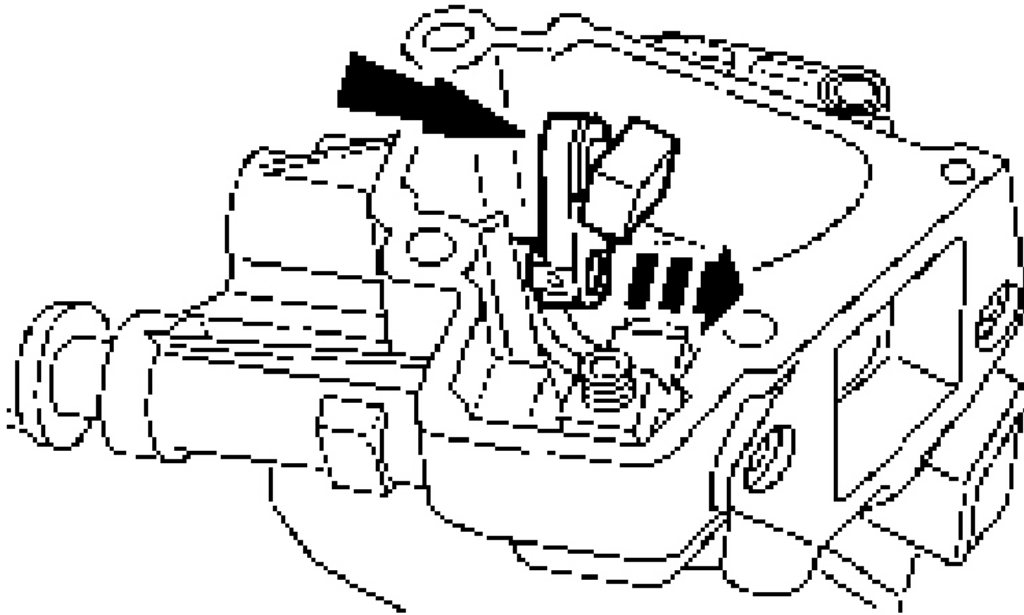
8. Remove the snap-ring and washer from the selector shaft.



G03854796

Fig. 104: Removing Snap-Ring And Washer From Selector Shaft
Courtesy of FORD MOTOR CO.

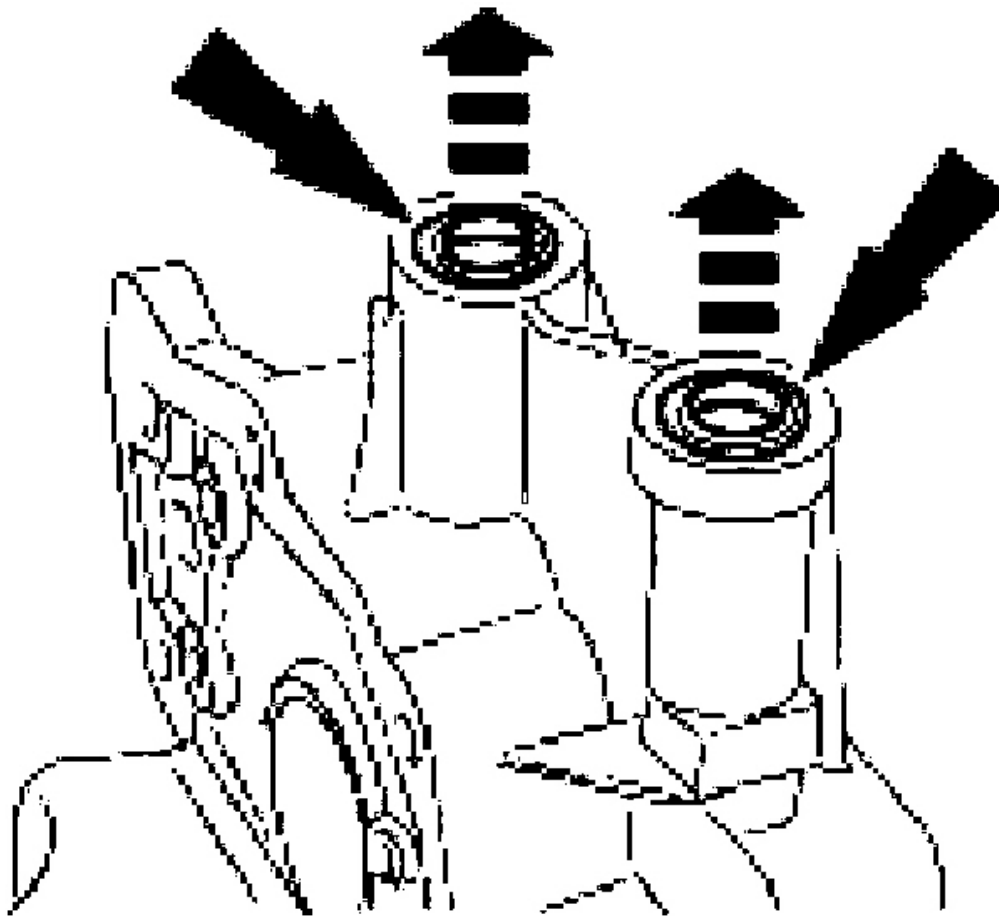
9. Remove the gearshift lever shaft.



G03854797

Fig. 105: Removing Gearshift Lever Shaft
Courtesy of FORD MOTOR CO.

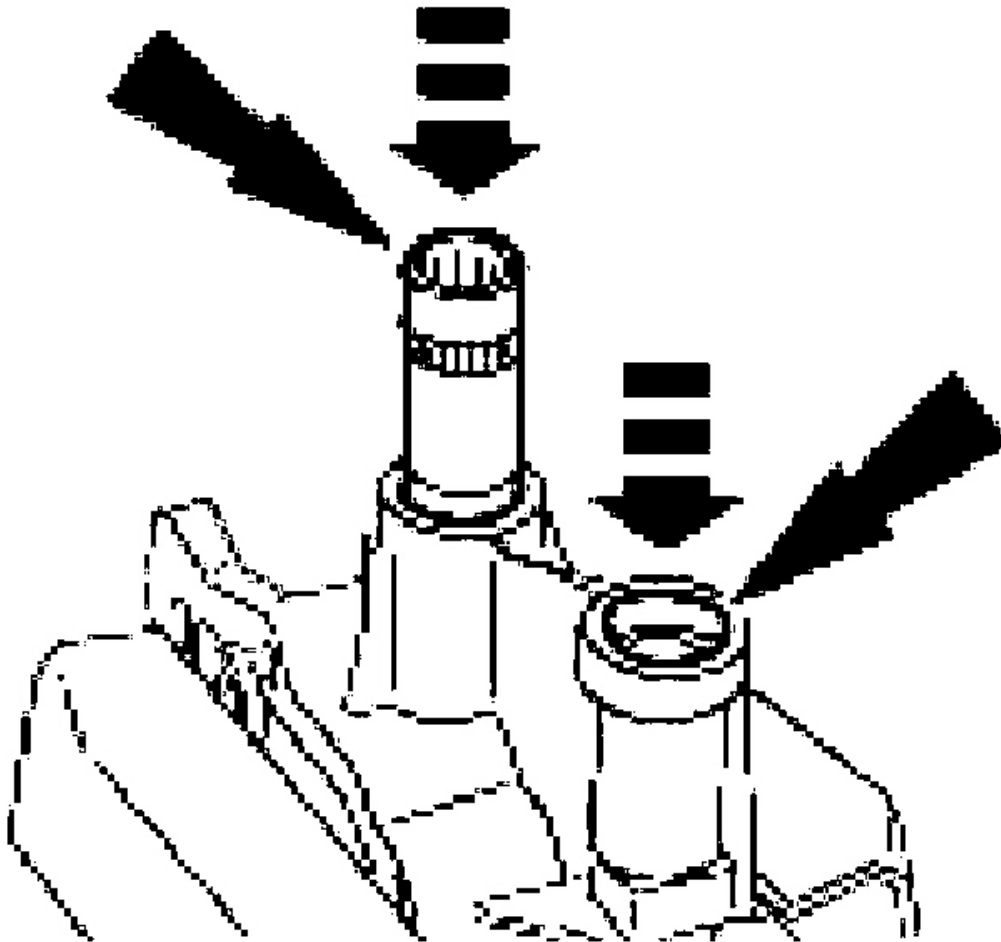
10. Remove the oil seals.



G03854798

Fig. 106: Removing Oil Seals
Courtesy of FORD MOTOR CO.

11. Drive both the needle roller bearings of the gearshift lever shaft inwards using a suitable socket and remove them.

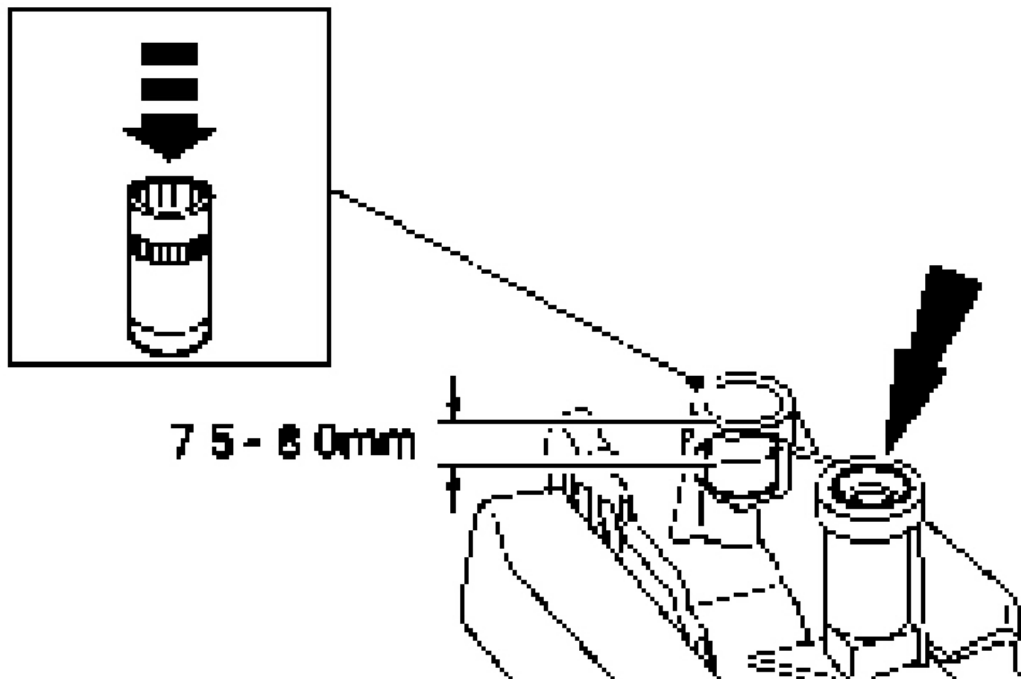


G03854799

Fig. 107: Removing Needle Roller Bearings
Courtesy of FORD MOTOR CO.

Assembly

1. Drive in the upper needle roller bearing of the gearshift lever shaft using a suitable socket.



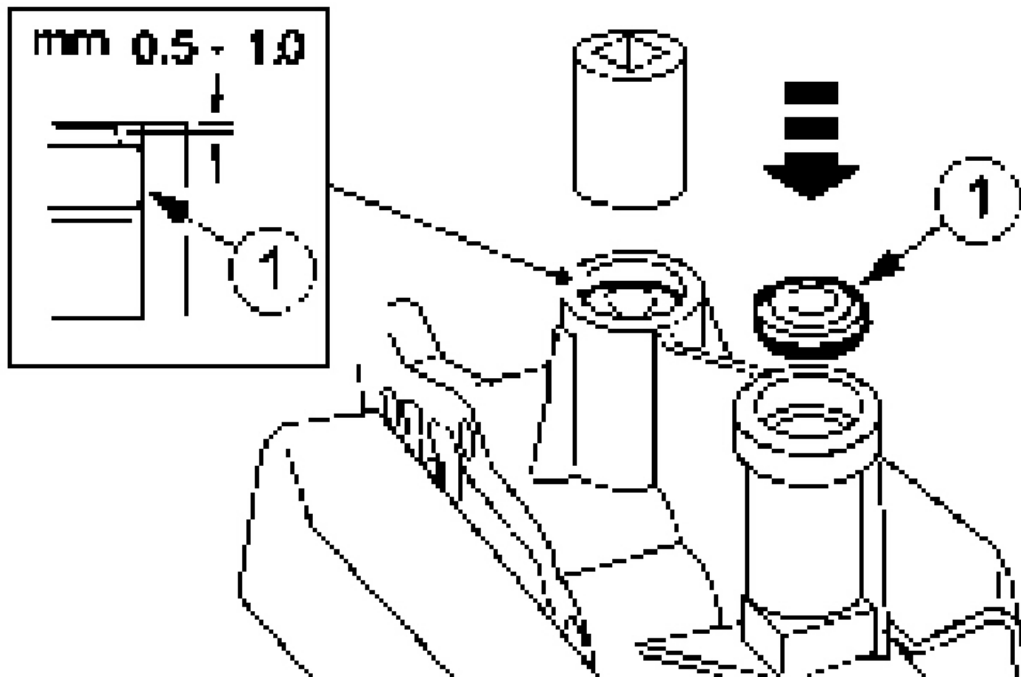
G03854800

Fig. 108: Driving In Upper Needle Roller Bearing Of Gearshift Lever Shaft
Courtesy of FORD MOTOR CO.

2. Install the oil seals.
 - Coat the oil seal with sealer.
 - 2. Drive in the oil seal as far as the stop using a suitable socket.

NOTE: Installation depth.

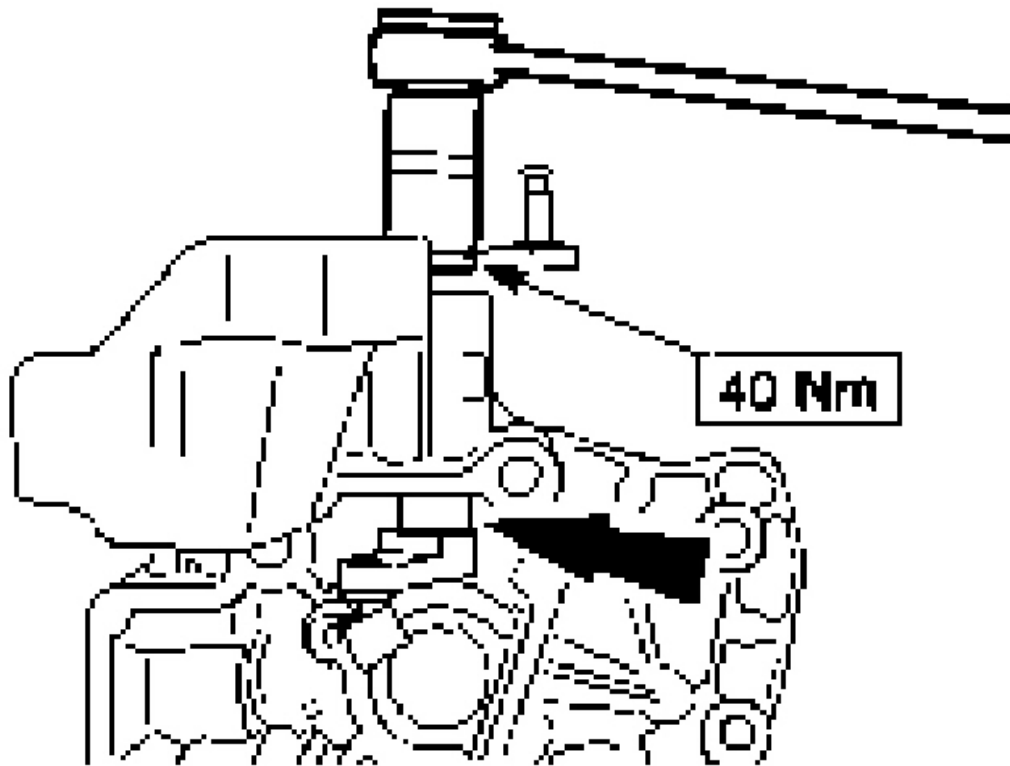
Install the oil seal.



G03854801

Fig. 109: Installing Oil Seals
Courtesy of FORD MOTOR CO.

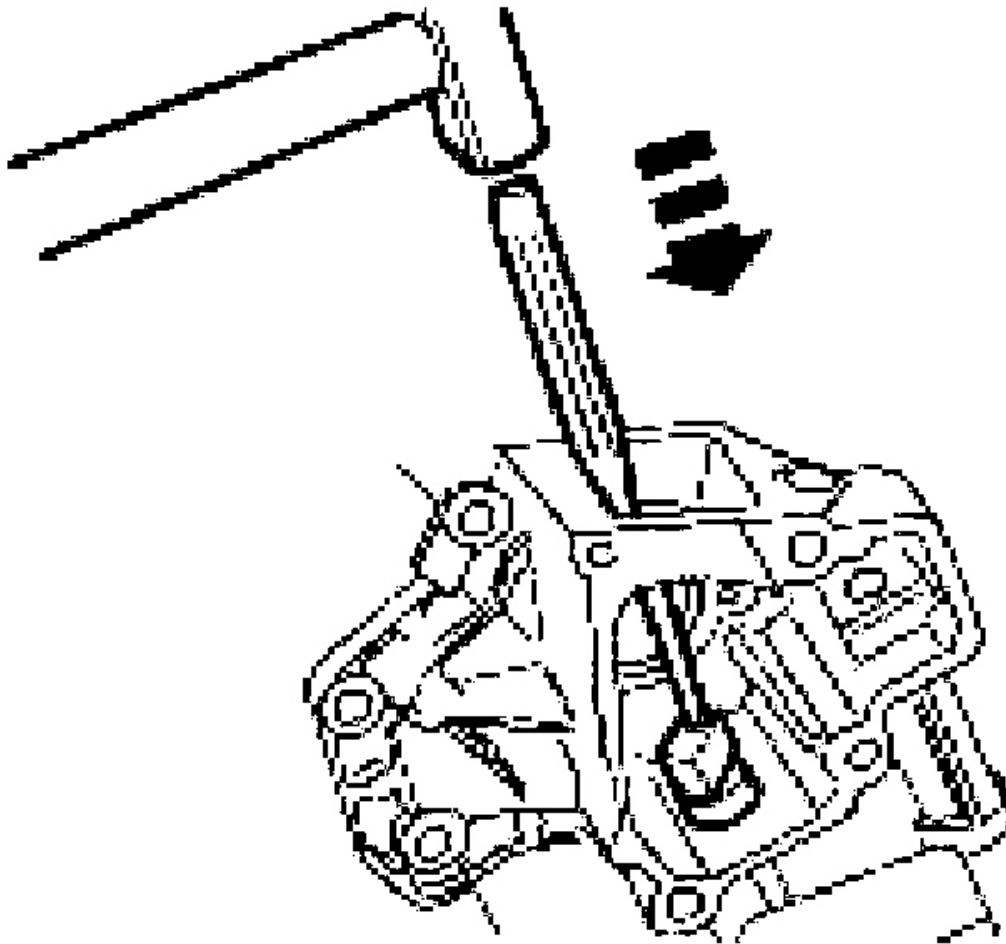
3. Install the lower needle roller bearing of the gearshift lever shaft together with the gearshift lever shaft.



G03854802

Fig. 110: Installing Lower Needle Roller Bearing Of Gearshift Lever Shaft Together With Gearshift Lever Shaft
Courtesy of FORD MOTOR CO.

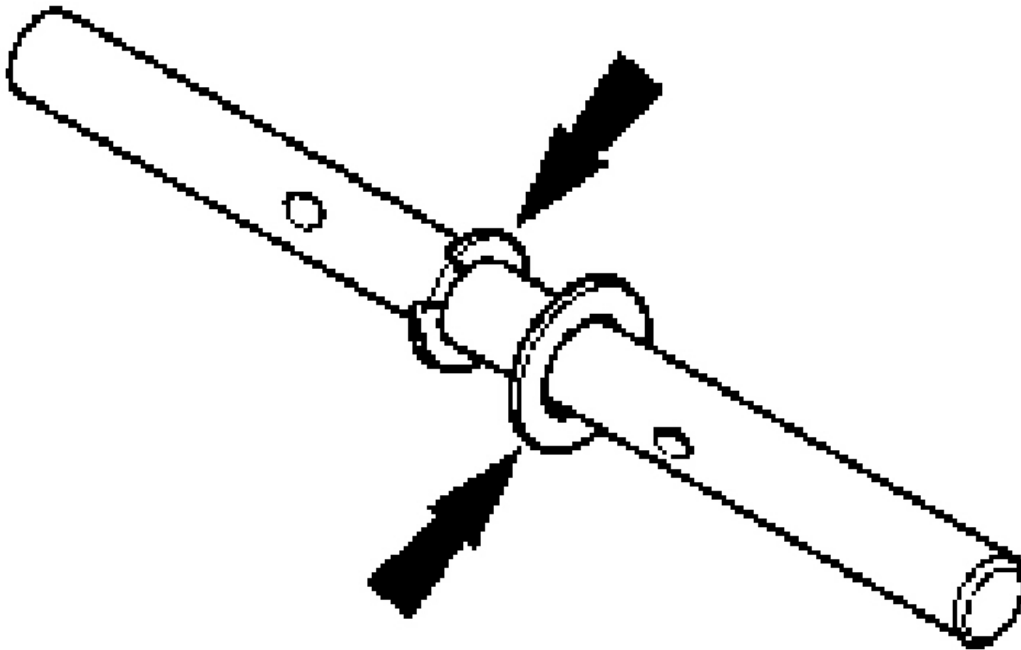
4. Set the end float on the gearshift lever shaft to 0.3 +/- 0.1 mm by tapping lightly.



G03854803

Fig. 111: Setting End Float On Gearshift Lever Shaft
Courtesy of FORD MOTOR CO.

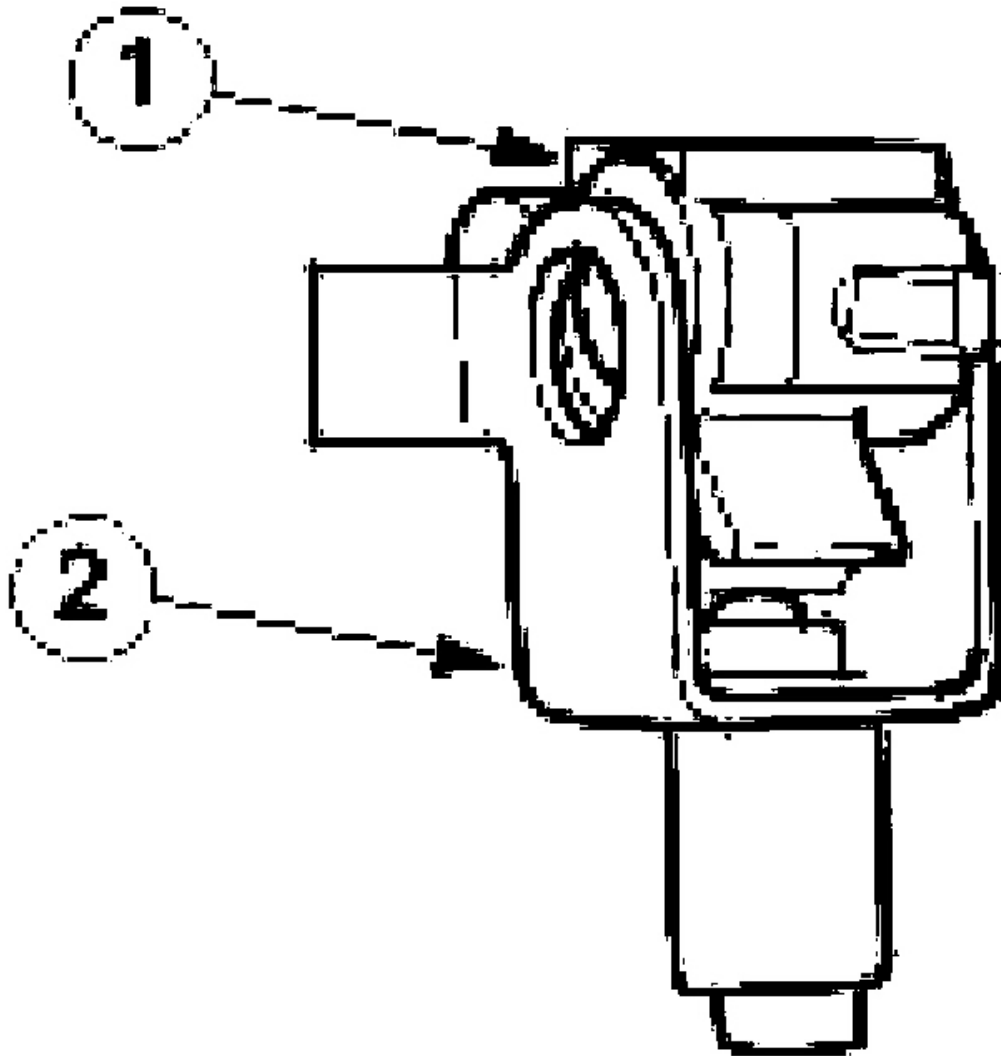
5. Slide the snap-ring and washer onto the selector shaft.



G03854804

Fig. 112: Installing Snap-Ring And Washer Onto Selector Shaft
Courtesy of FORD MOTOR CO.

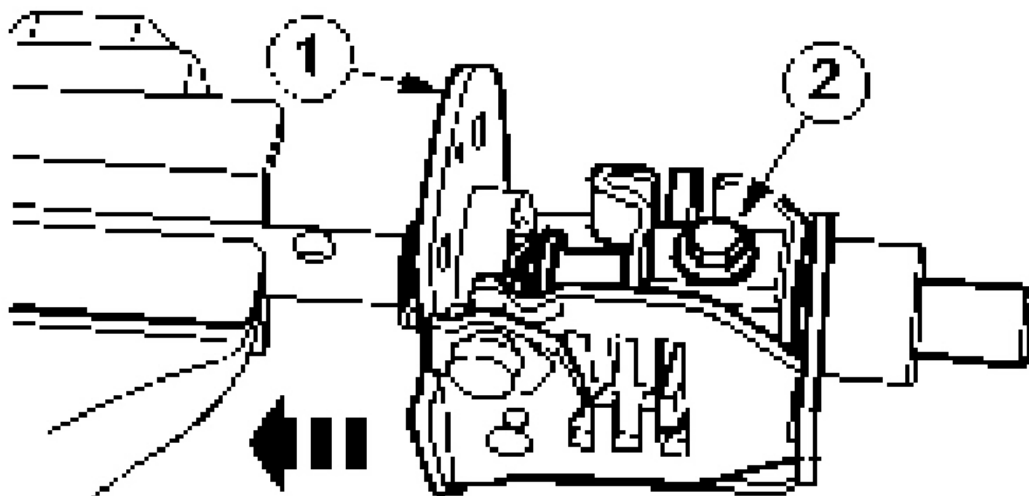
6. Assemble the selector finger and bracket, insert it in the selector gate.
 1. Selector finger
 2. Selector finger bracket



G03854805

Fig. 113: Assembling Selector Finger And Bracket
Courtesy of FORD MOTOR CO.

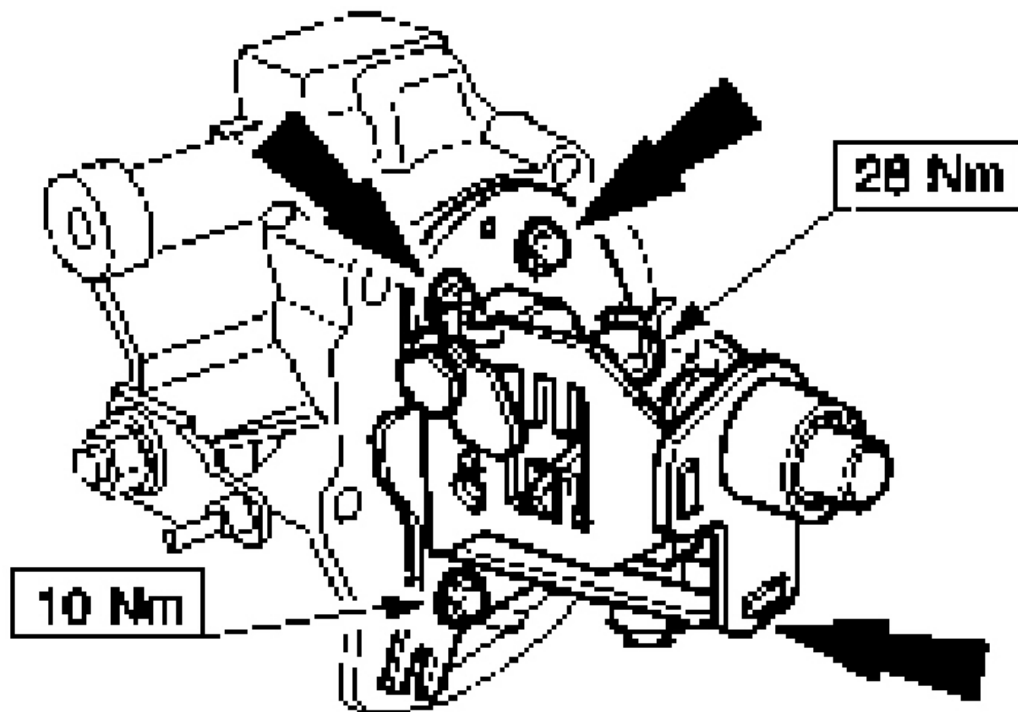
NOTE: Install a new bolt and tighten it lightly.



G03854806

Fig. 114: Installing Selector Shaft And Bolt
Courtesy of FORD MOTOR CO.

7. Install the selector shaft and bolt.
 1. Push the selector gate to the selector shaft.
 2. Install the bolt and tighten it lightly.
8. Install the selector gate and selector shaft to the selector mechanism housing and tighten the bolt.
 - Check the selector shaft freeplay.

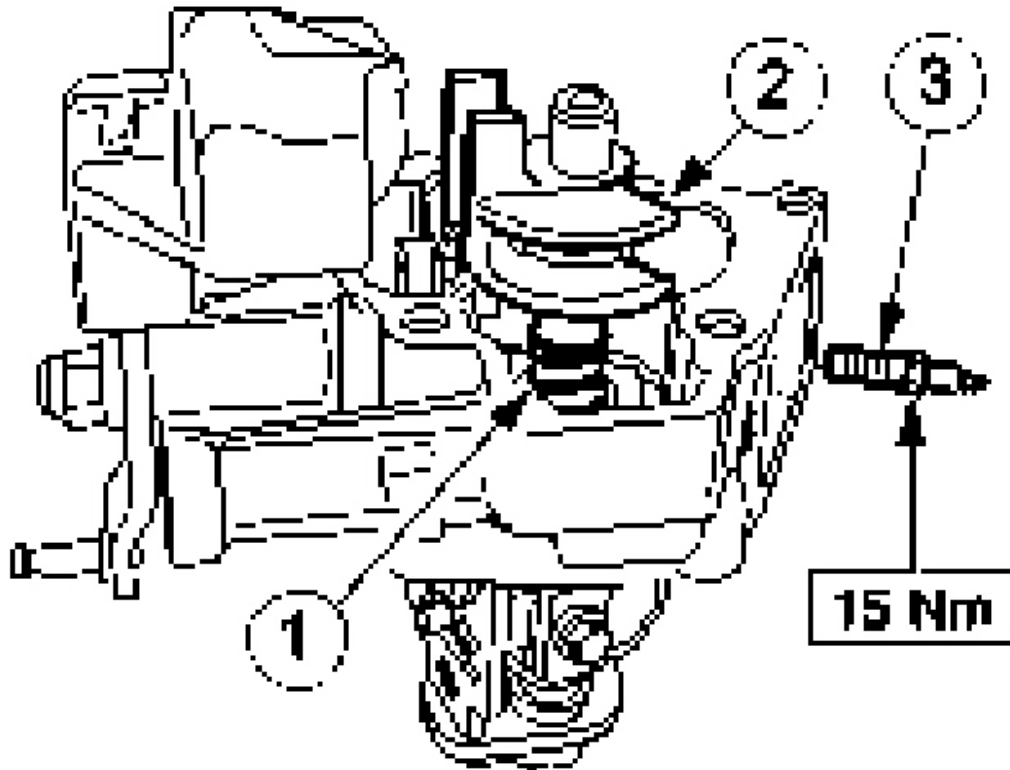


G03854807

Fig. 115: Installing Selector Gate And Selector Shaft To Selector Mechanism Housing

Courtesy of FORD MOTOR CO.

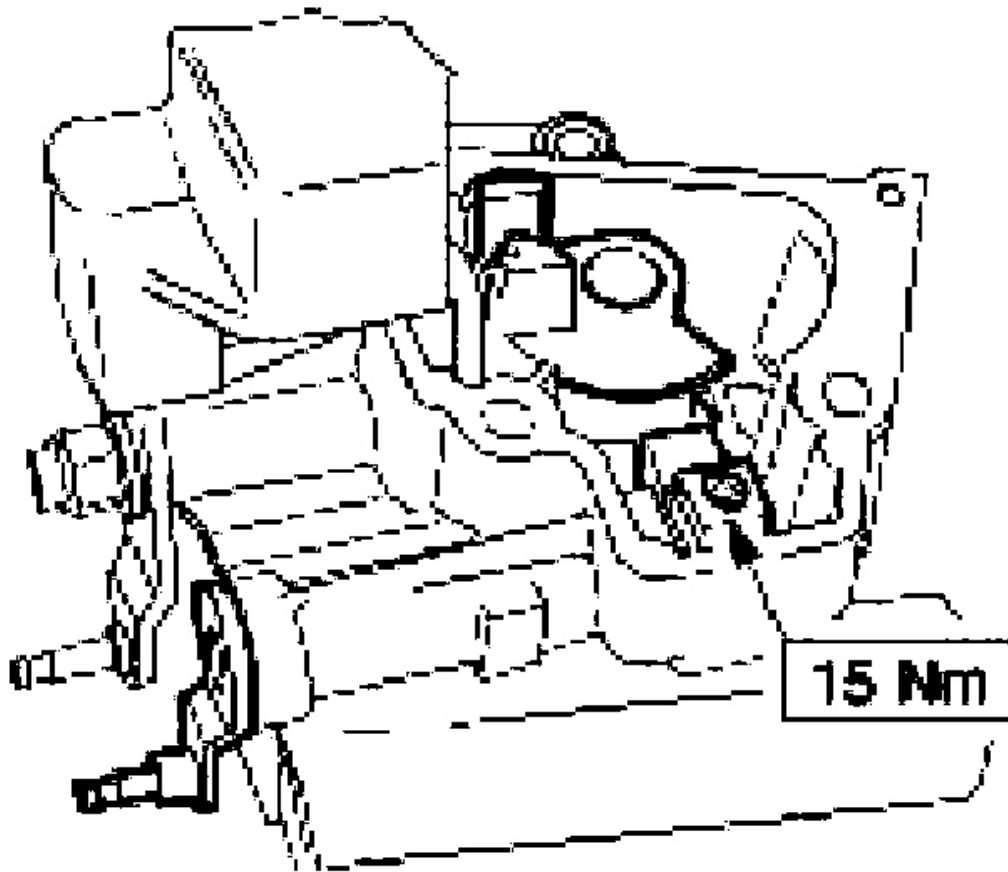
NOTE: Install a new reversing light actuating pin.



G03854808

Fig. 116: Installing Selector Block And Spring
Courtesy of FORD MOTOR CO.

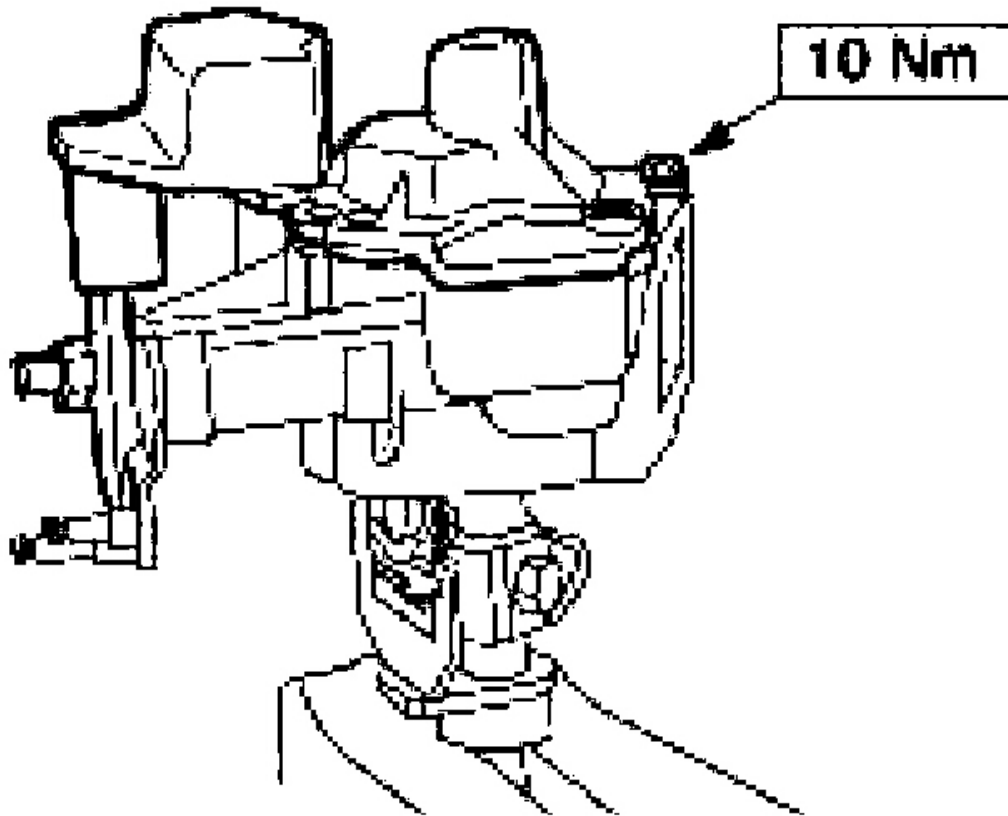
9. Install the selector block and the spring.
 - Install a new reversing light actuating pin.
10. Install the selector lever shaft and the ball bearing.



G03854809

Fig. 117: Installing Selector Lever Shaft And Ball Bearing
Courtesy of FORD MOTOR CO.

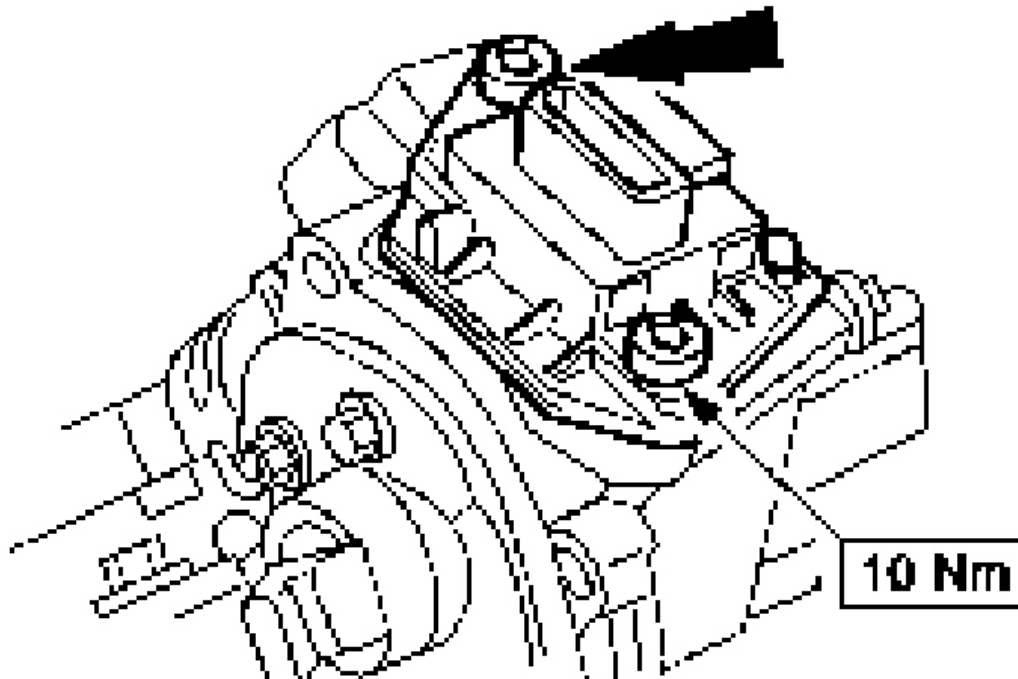
11. Install the cover of the inner gearshift mechanism using sealer.



G03854810

Fig. 118: Installing Cover Of Inner Gearshift Mechanism Using Sealer
Courtesy of FORD MOTOR CO.

12. Install the reversing light switch.



G03854811

Fig. 119: Installing Reversing Light Switch
Courtesy of FORD MOTOR CO.

INPUT SHAFT

Special Tool(s)



Remover, Bearing/Gear
205-D064 (D84L-1123-A)

G03854812

Fig. 120: Special Tools Specifications (Input Shaft)
Courtesy of FORD MOTOR CO.

Material

MATERIAL SPECIFICATIONS

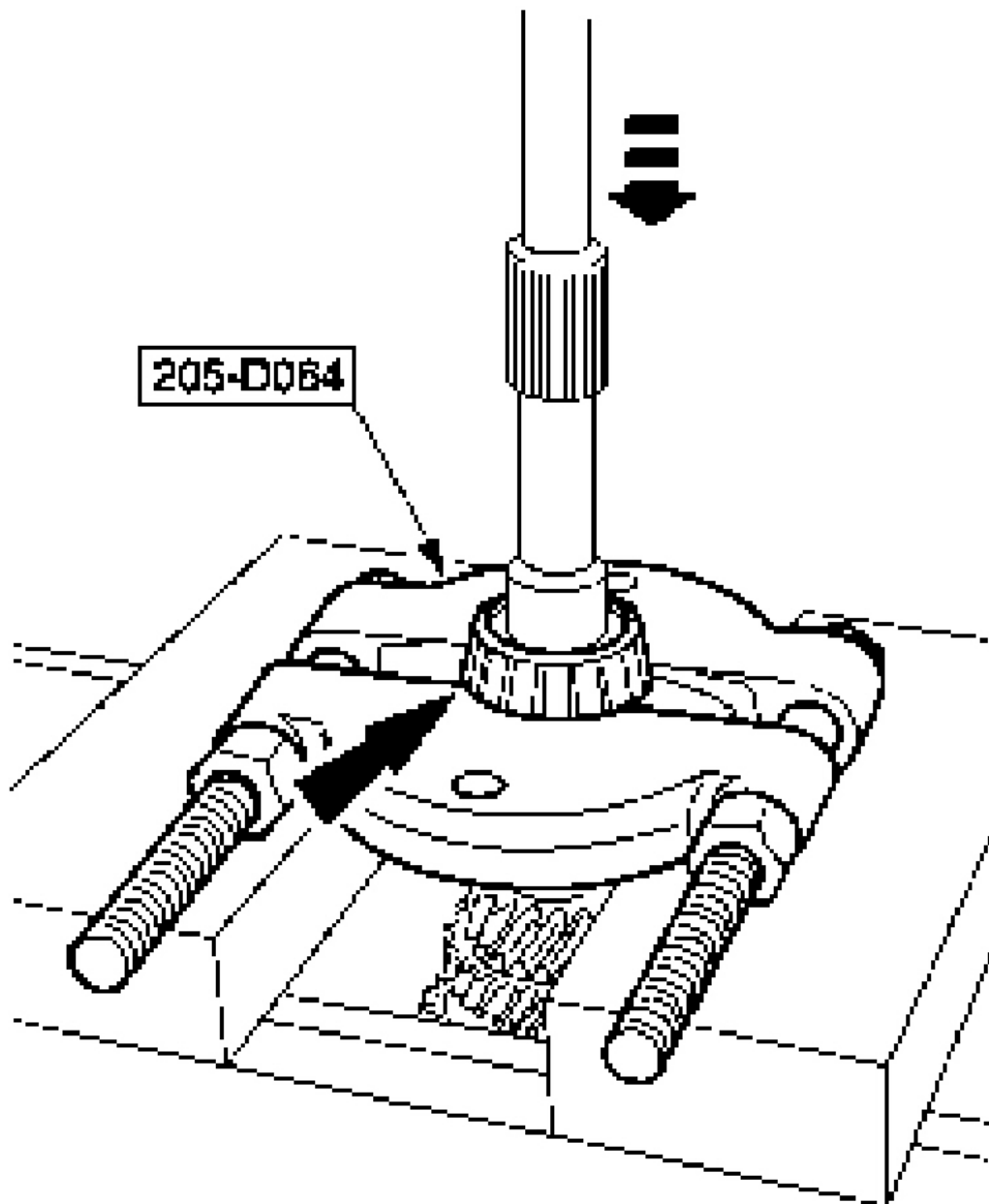
Manual transmission fluid	WSD-M2C200-C
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Disassembly

CAUTION: The inner synchronizer ring and the synchronizer cone must be handled very carefully.

1. General note
- If there any new installation of bearings, shafts or the transaxle housings is necessary, the transaxle must be shimmed.

CAUTION: The roller bearing is damaged when it is pressed off using the special tool and cannot be reused.

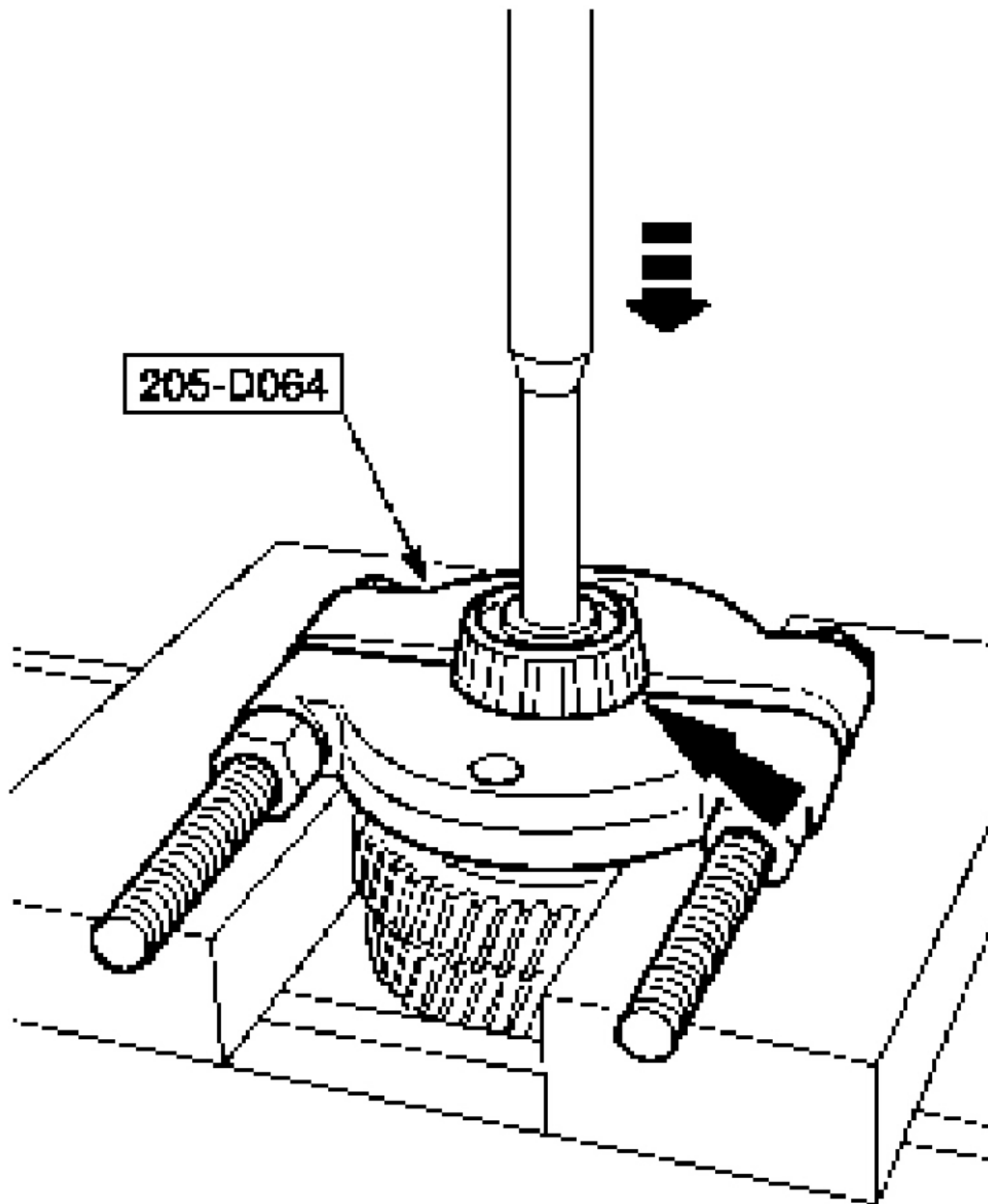


G03854813

Fig. 121: Removing Clutch Housing Roller Bearing
Courtesy of FORD MOTOR CO.

2. Using the special tool, remove the clutch housing roller bearing.

CAUTION: The roller bearing is damaged when it is pressed off using the special tool and cannot be reused.



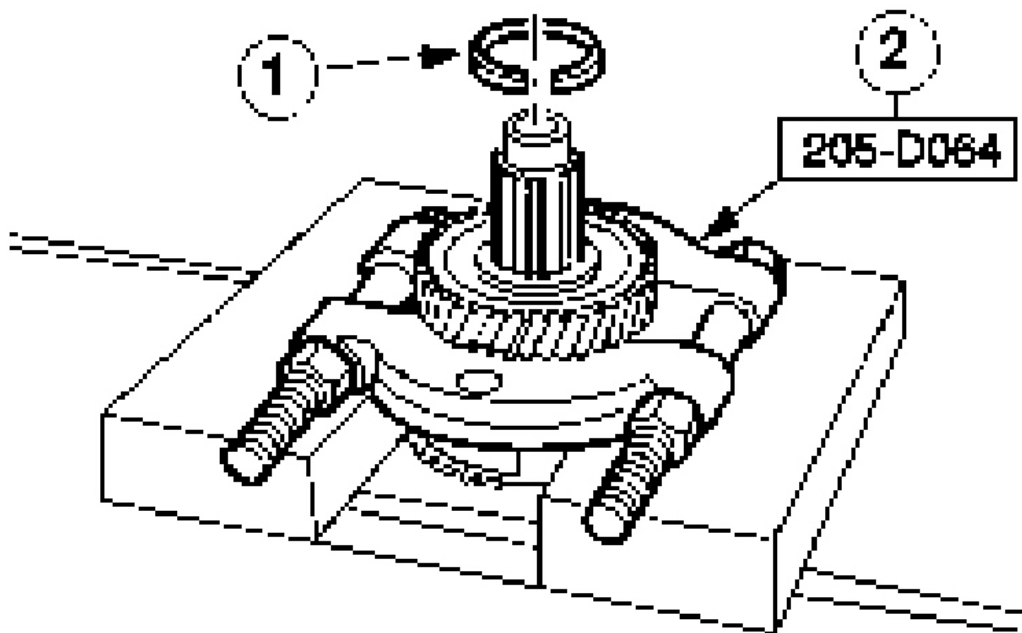
G03854814

Fig. 122: Removing Transaxle Housing Roller Bearing

Courtesy of FORD MOTOR CO.

3. Using the special tool, remove the transaxle housing roller bearing.

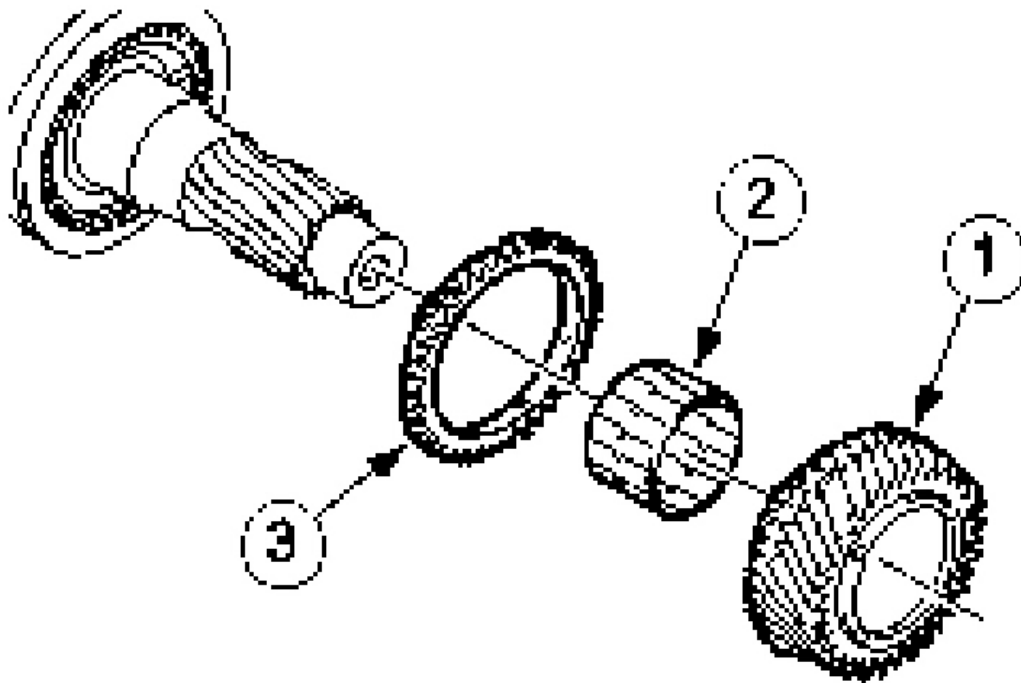
CAUTION: Components maybe damaged when pressed off using the special tool or an equivalent tool.



G03854815

Fig. 123: Pressing Off Fifth Gear Wheel
Courtesy of FORD MOTOR CO.

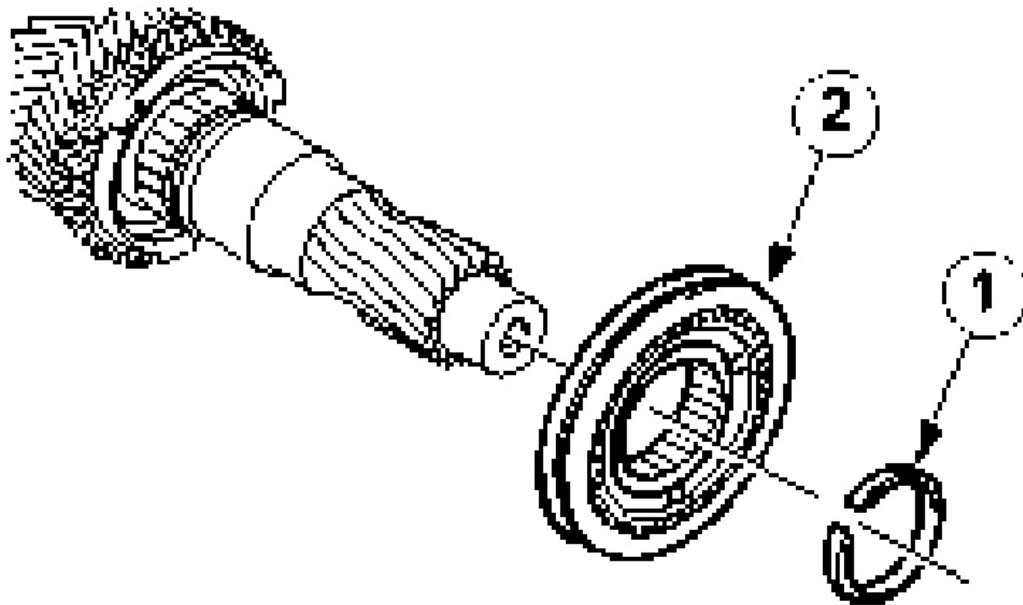
4. Using the special tool, press off the fifth gear wheel.
 1. Discard the snap ring.
 2. Press off the fifth gear wheel.
5. Remove the fourth gear wheel.
 1. Remove the fourth gear wheel.
 2. Remove the needle roller bearing.
 3. Remove the synchronizer ring.



G03854816

Fig. 124: Removing Fourth Gear Wheel
Courtesy of FORD MOTOR CO.

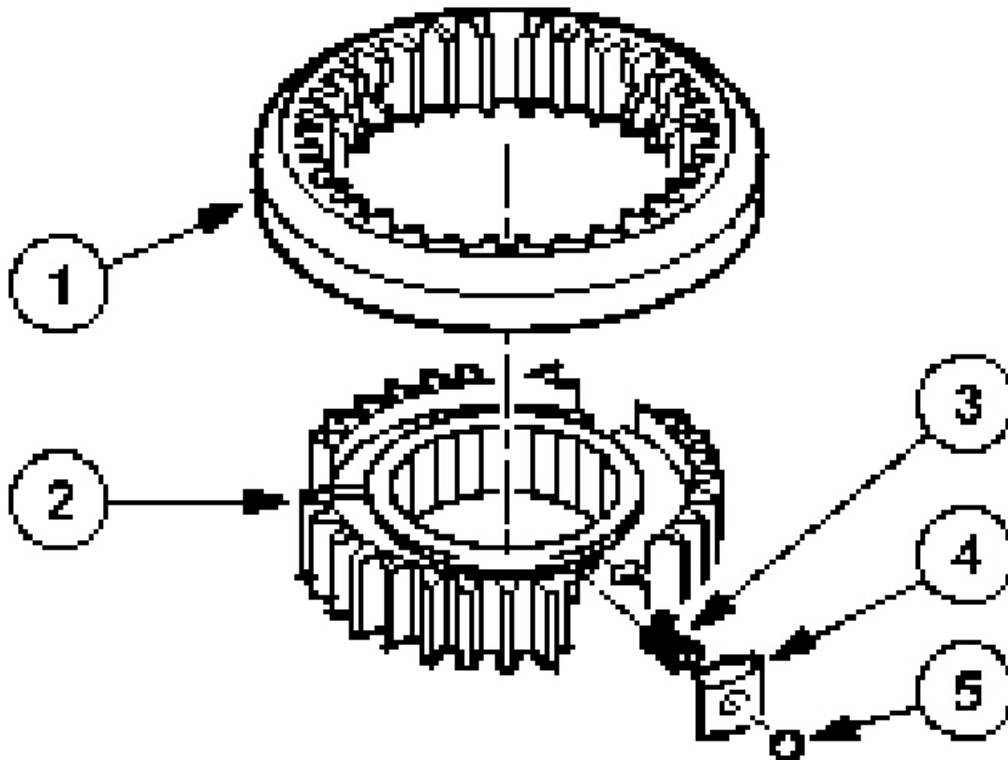
6. Remove the third and fourth gear synchronizer assembly.
 1. Discard the snap ring.
 2. Remove the synchronizer assembly.



G03854817

Fig. 125: Removing Third And Fourth Gear Synchronizer Assembly
Courtesy of FORD MOTOR CO.

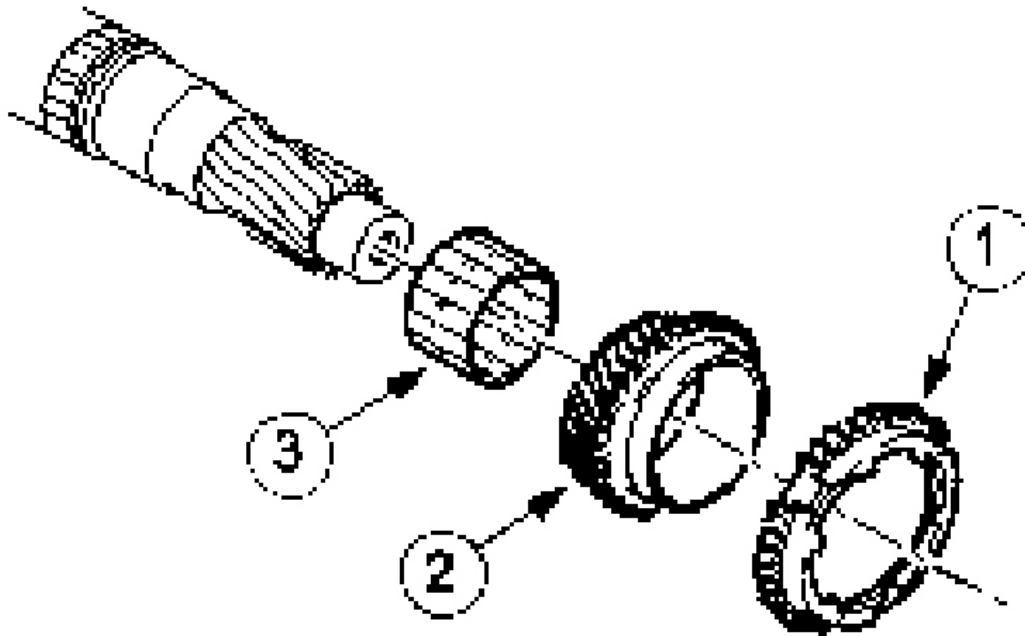
NOTE: Take care when pulling the selector ring off the gear synchronizer hub. The detent balls are spring-loaded.



G03854818

Fig. 126: Disassembling Third And Fourth Gear Synchronizer
Courtesy of FORD MOTOR CO.

7. Disassemble the third and fourth gear synchronizer.
 1. Remove the selector ring.
 2. Remove the gear synchronizer hub.
 3. Remove the compression springs.
 4. Remove the blocker bars.
 5. Remove the detent balls.
8. Remove the third gear wheel.
 1. Remove the synchronizer ring.
 2. Remove the gear wheel.
 3. Remove the needle roller bearing.



G03854819

Fig. 127: Removing Third Gear Wheel
Courtesy of FORD MOTOR CO.

Assembly

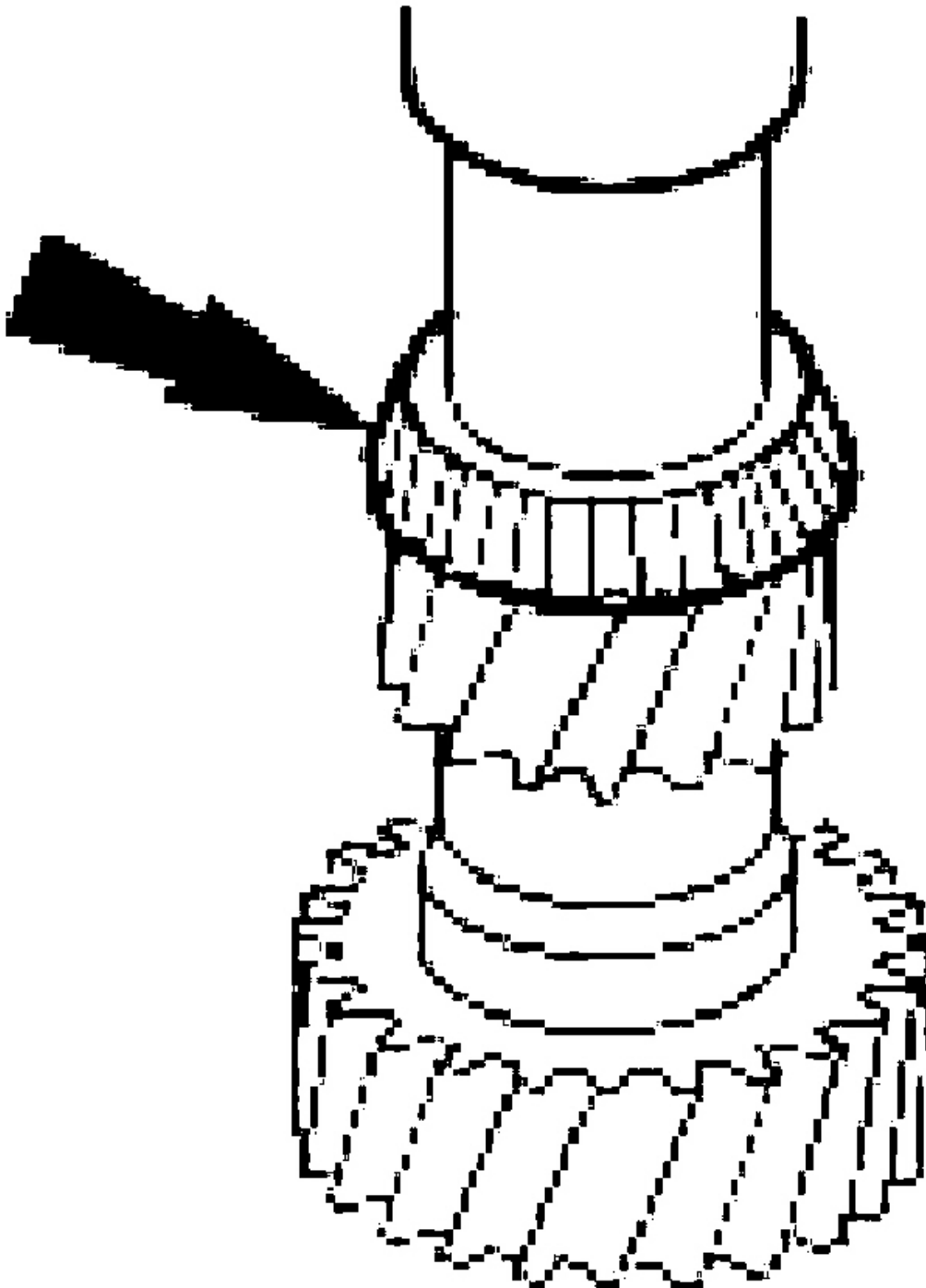
NOTE: Do not oil taper roller bearings which are to be used again. New taper roller bearings can be installed without any treatment.

NOTE: Using a suitable press, install the gear wheels.

1. Carefully clean and check all sliding parts and lubricate them with clean manual transmission fluid before assembly.
2. Using a length of suitable tube, install the clutch housing roller bearing.

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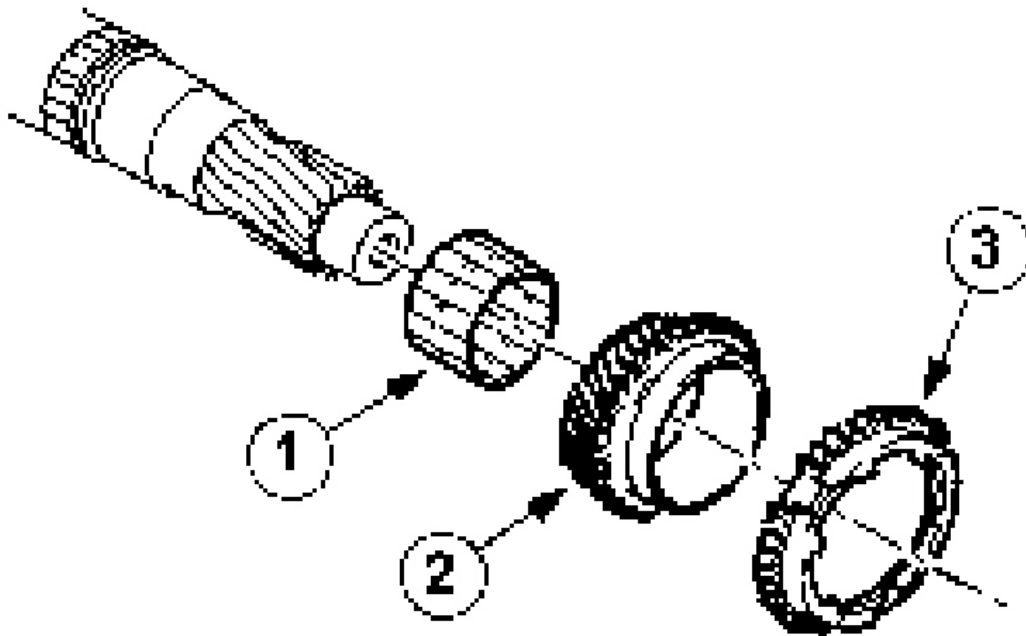
2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus



G03854820

Fig. 128: Installing Clutch Housing Roller Bearing
Courtesy of FORD MOTOR CO.

NOTE: Do not oil taper roller bearings which are to be used again. New taper roller bearings can be installed without any treatment.

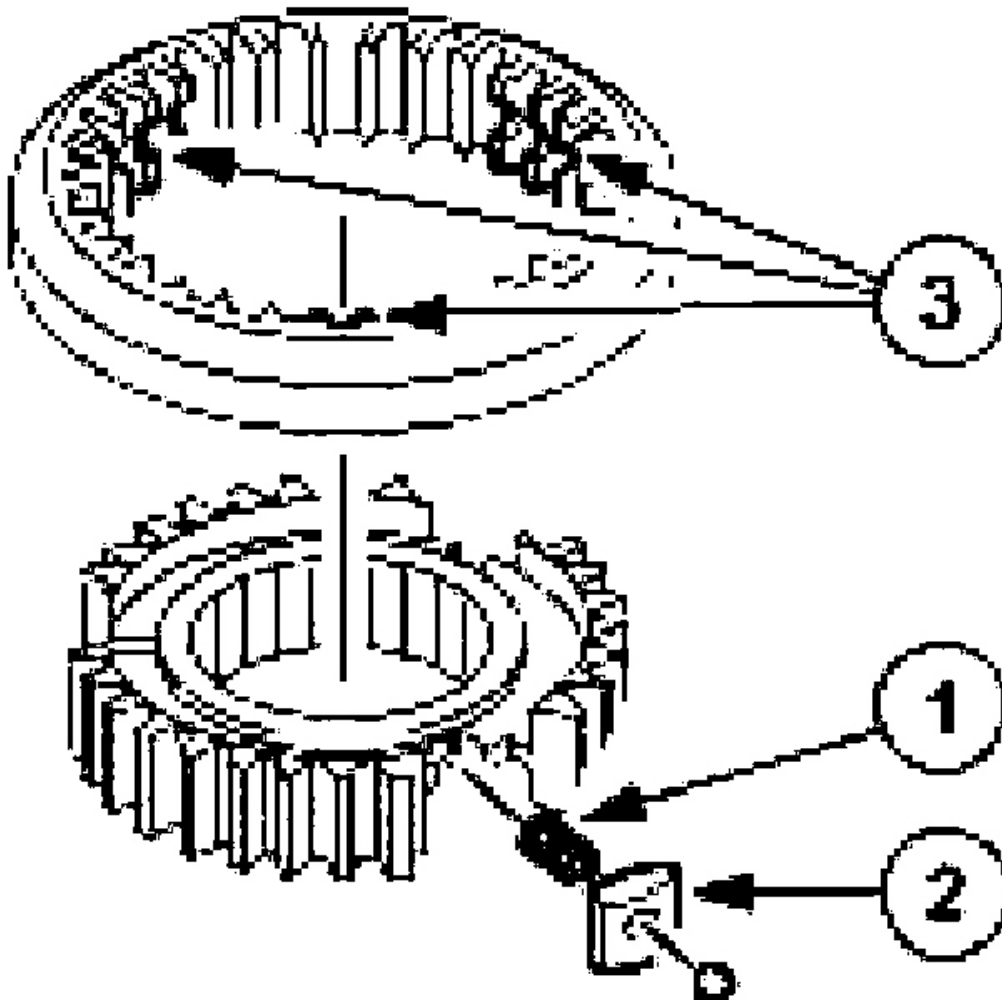


G03854821

Fig. 129: Installing Third Gear Wheel
Courtesy of FORD MOTOR CO.

3. Install the third gear wheel.
 1. Install the needle roller bearing.
 2. Install the gear wheel.
 3. Install the synchronizer ring.
4. Assemble the third and fourth gear synchronizer.
 1. Install the compression springs.
 2. Install the synchronizer bar and detent balls by pressing against the spring pressure.

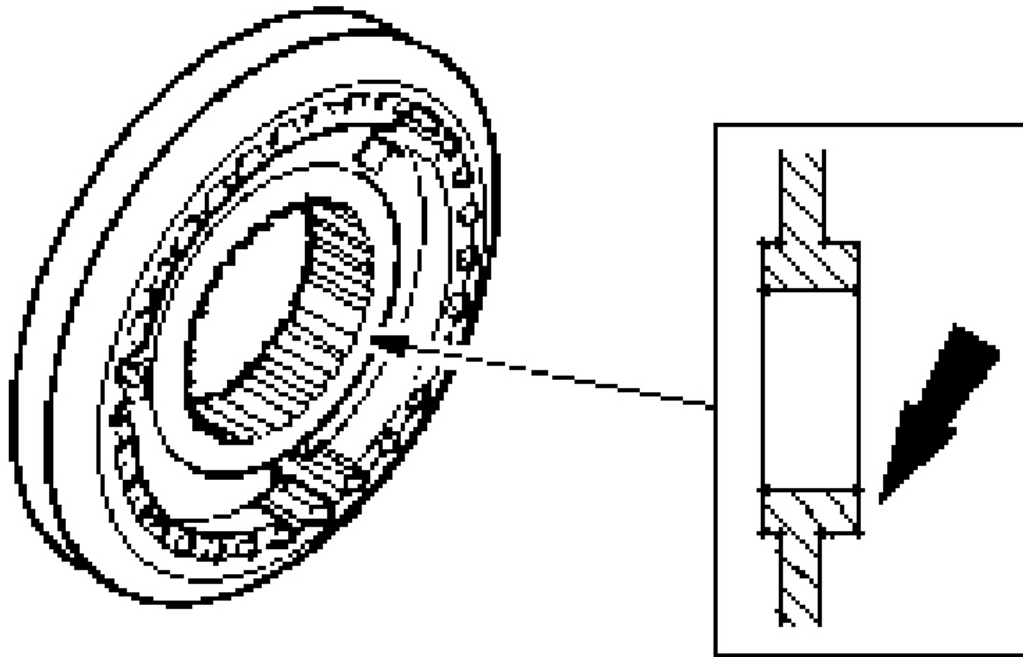
3. Install the selector ring the right way round and slide it on.



G03854822

Fig. 130: Assembling Third And Fourth Gear Synchronizer
Courtesy of FORD MOTOR CO.

NOTE: Install the synchronizer hub with the large collar facing outwards and the annular groove facing the small collar.



G03854823

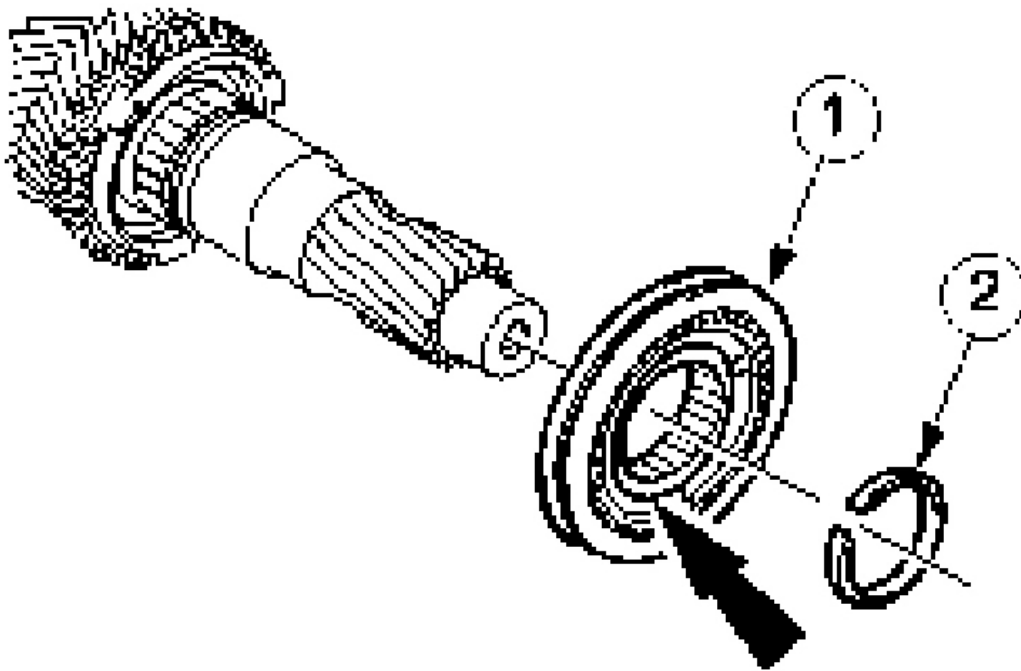
Fig. 131: Identifying Installation Position Of Synchronizer Assembly
Courtesy of FORD MOTOR CO.

5. Installation position of the synchronizer assembly shown.

NOTE: Install the synchronizer hub with the large collar facing outwards.

NOTE: Install a new snap ring.

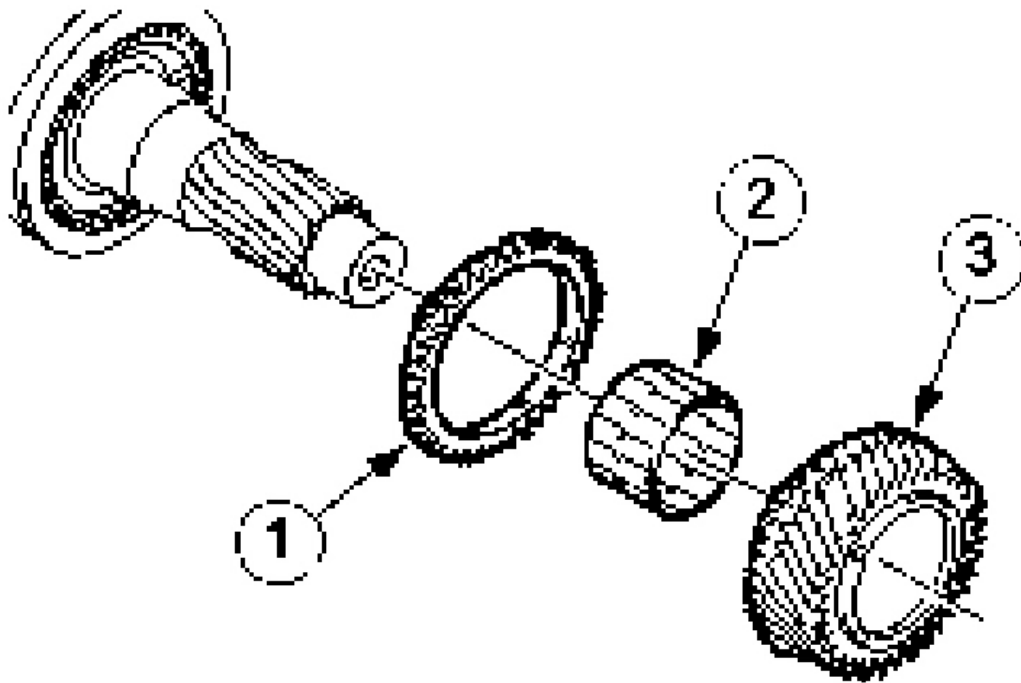
NOTE: The snap ring thickness is 2.5 mm.



G03854824

Fig. 132: Installing Snap Ring
Courtesy of FORD MOTOR CO.

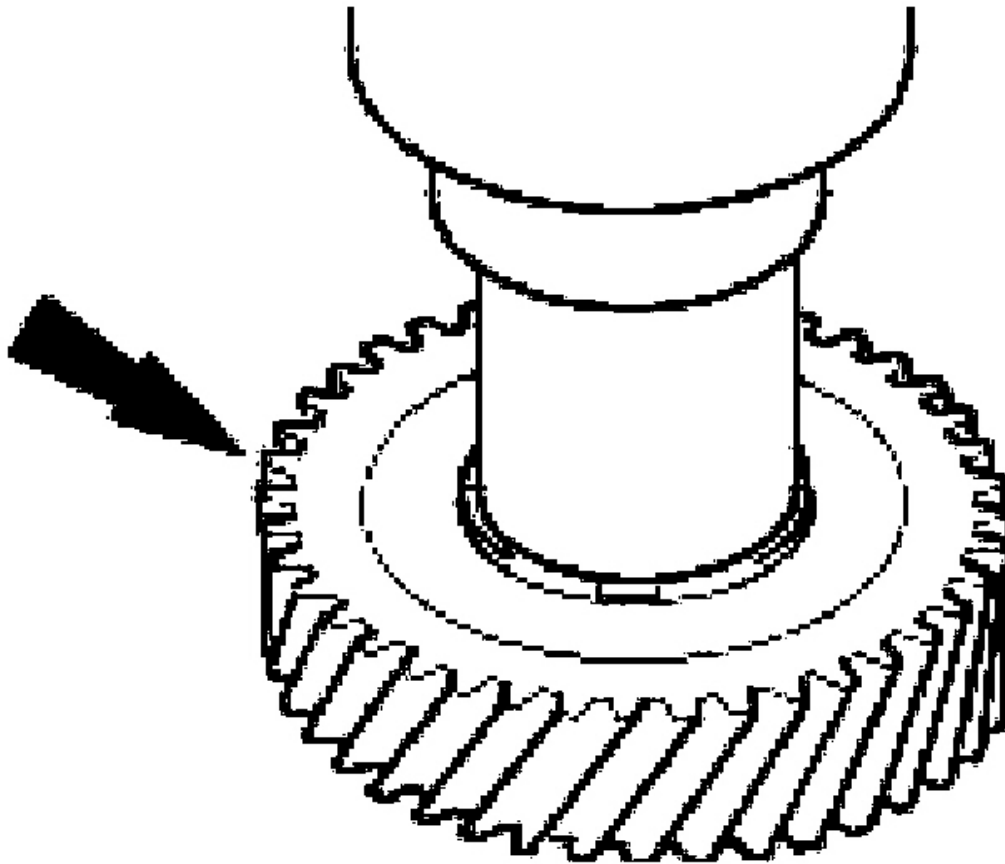
6. Install the complete third and fourth gear synchronizer assembly.
 1. Install the synchronizer assembly.
 2. Install the snap ring.
7. Install the fourth gear wheel.
 1. Install the synchronizer ring.
 2. Install the needle roller bearing.
 3. Install the gear wheel.



G03854825

Fig. 133: Installing Fourth Gear Wheel
Courtesy of FORD MOTOR CO.

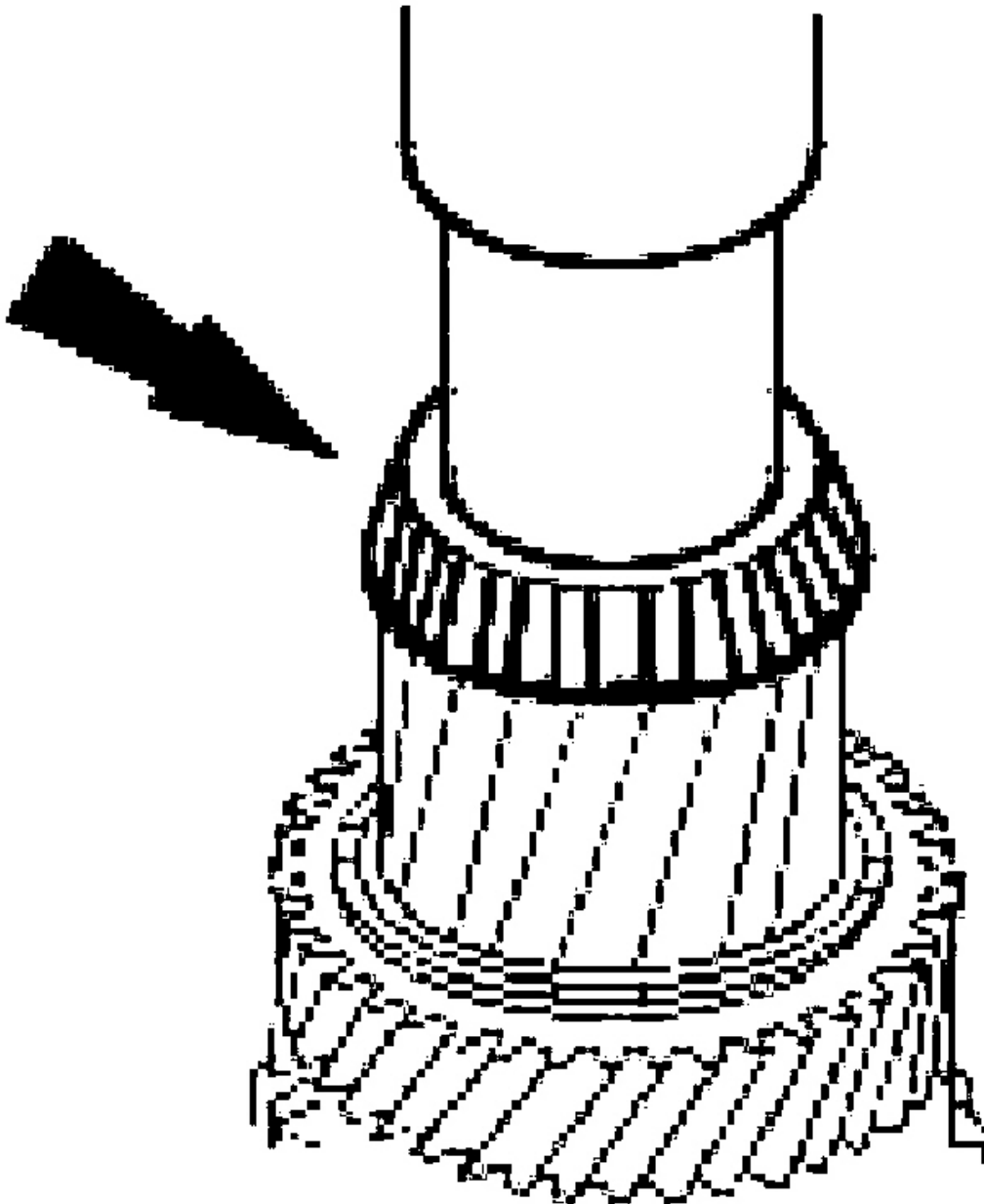
NOTE: Install a new snap ring.



G03854826

Fig. 134: Pressing On Fifth Gear Wheel
Courtesy of FORD MOTOR CO.

8. Press on the fifth gear wheel.
 - Using a length of suitable tube, press on the fifth gear wheel.
 - Install the snap ring.
9. Using a length of suitable tube, install the transaxle housing roller bearing.



G03854827

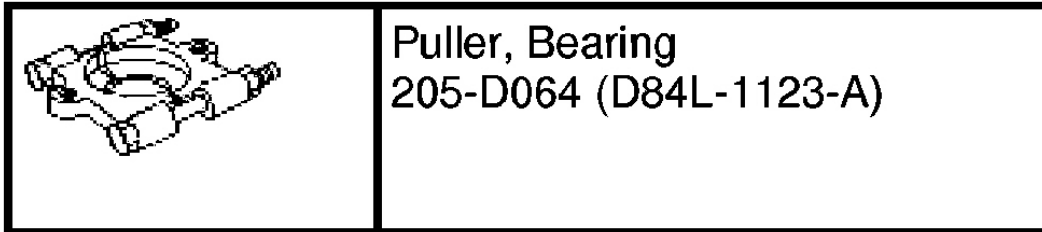
Fig. 135: Installing Transaxle Housing Roller Bearing
Courtesy of FORD MOTOR CO.

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OUTPUT SHAFT

Special Tool(s)



G03854828

Fig. 136: Output Shaft Special Tools Specifications
Courtesy of FORD MOTOR CO.

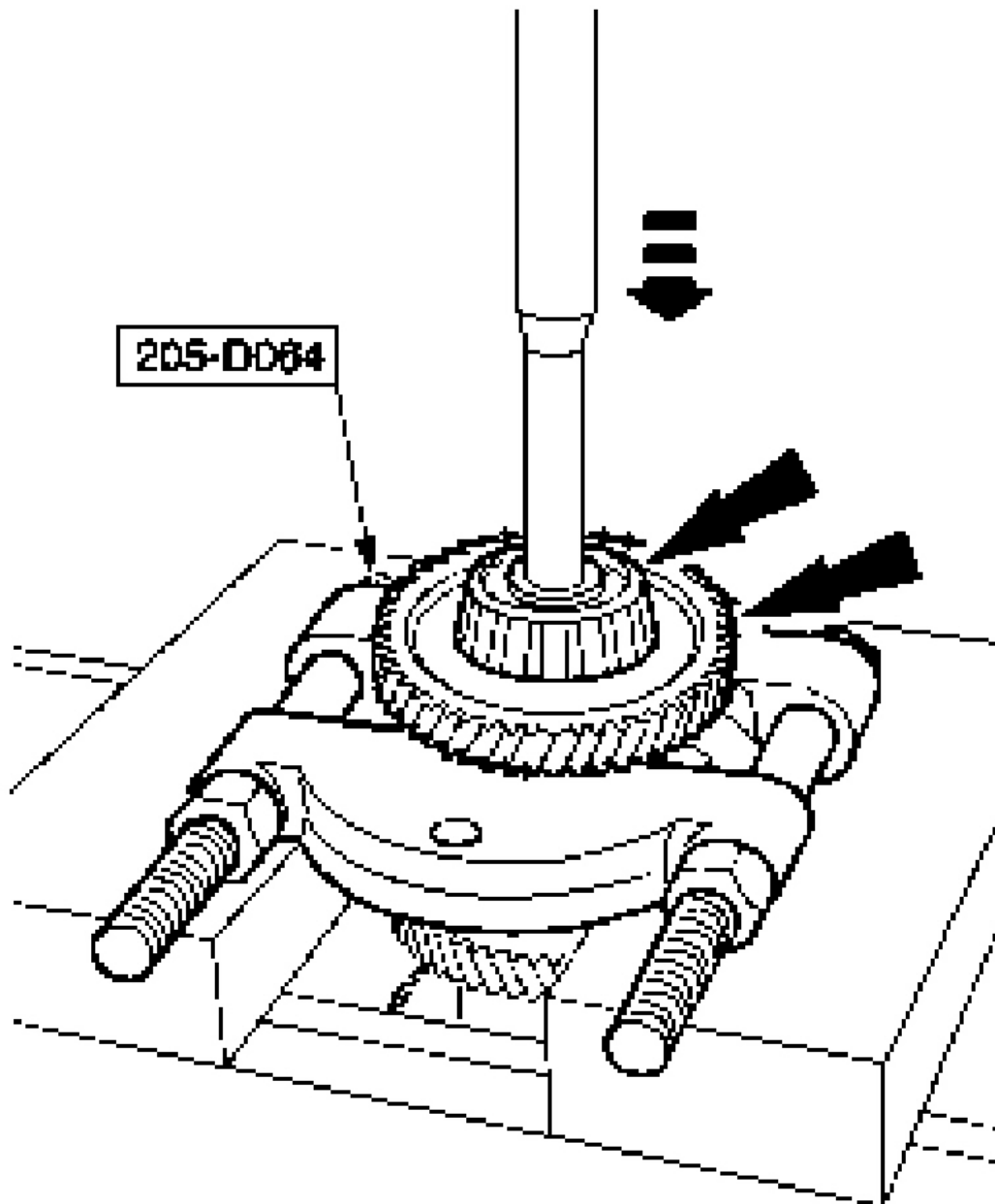
Material

MATERIAL SPECIFICATIONS

Transmission Fluid	WSD-M2C200-C
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Disassembly

1. Using the special tool, remove the transaxle housing roller bearing.

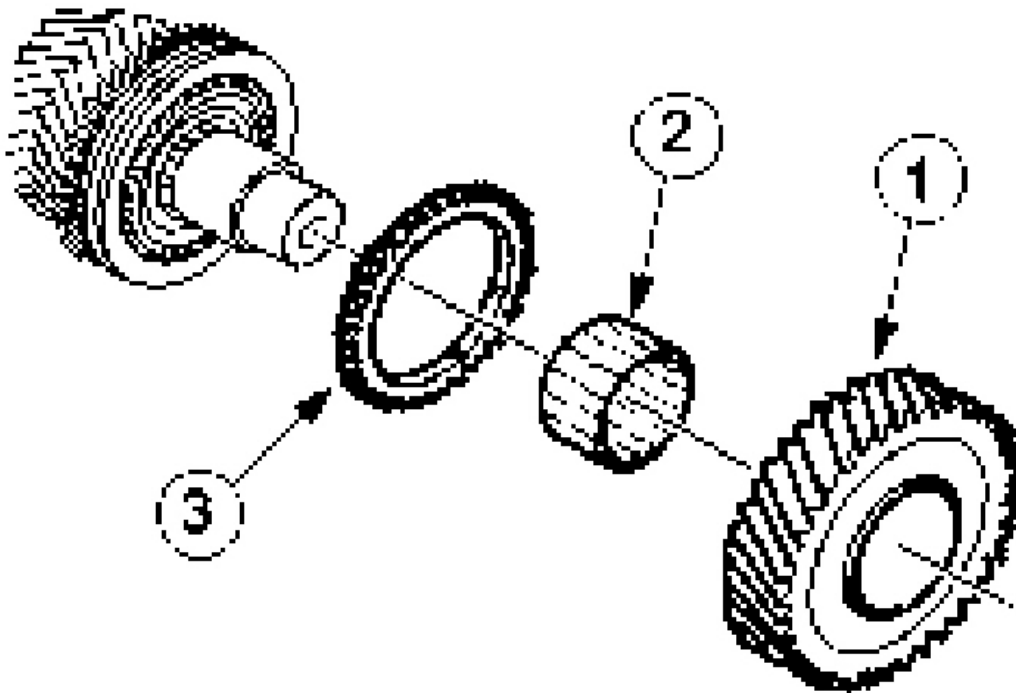


G03854829

Fig. 137: Removing Transaxle Housing Roller Bearing
Courtesy of FORD MOTOR CO.

2. Remove the reverse gear wheel.

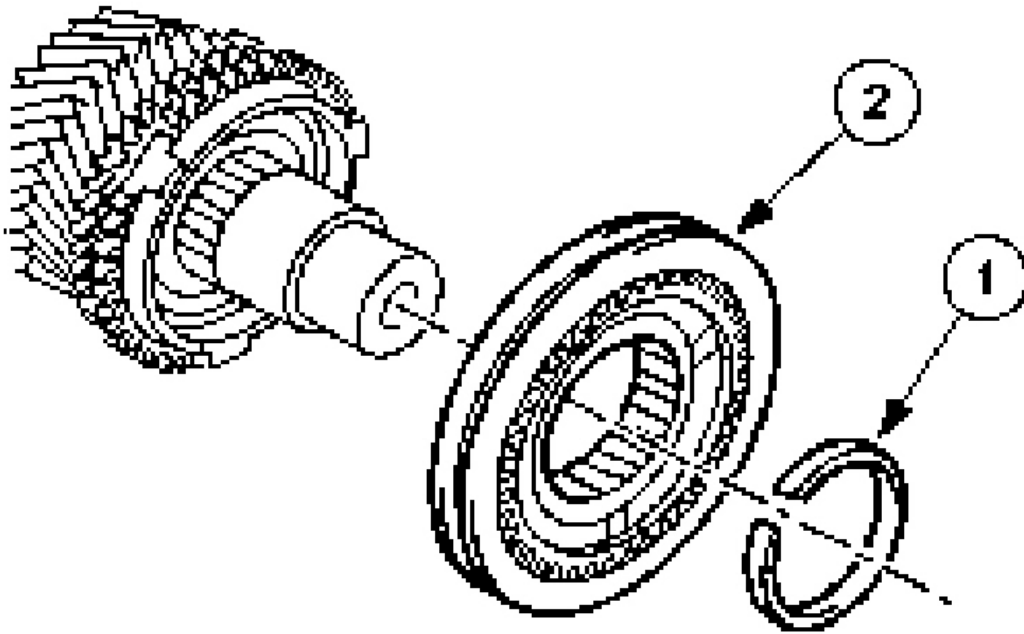
1. Remove the reverse gear wheel.
2. Remove the needle roller bearing.
3. Remove the synchronizer ring.



G03854830

Fig. 138: Removing Reverse Gear Wheel
Courtesy of FORD MOTOR CO.

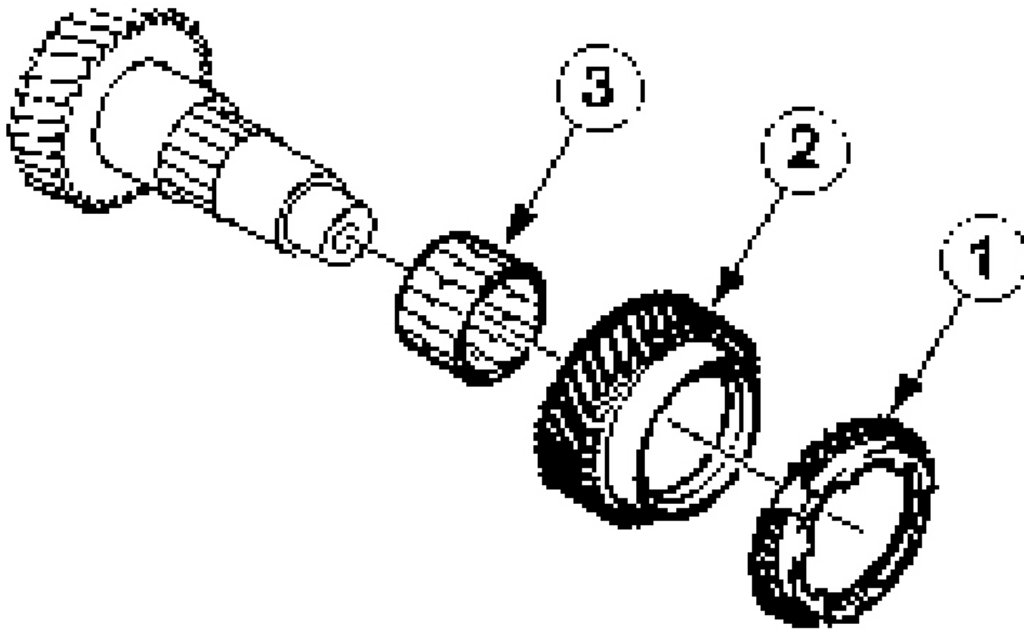
NOTE: If the gear changes are difficult, carefully remove the synchronizer hub assembly and the fifth gearwheel.



G03854831

Fig. 139: Removing Fifth Gear And Reverse Gear Synchronizer Hub Assembly
Courtesy of FORD MOTOR CO.

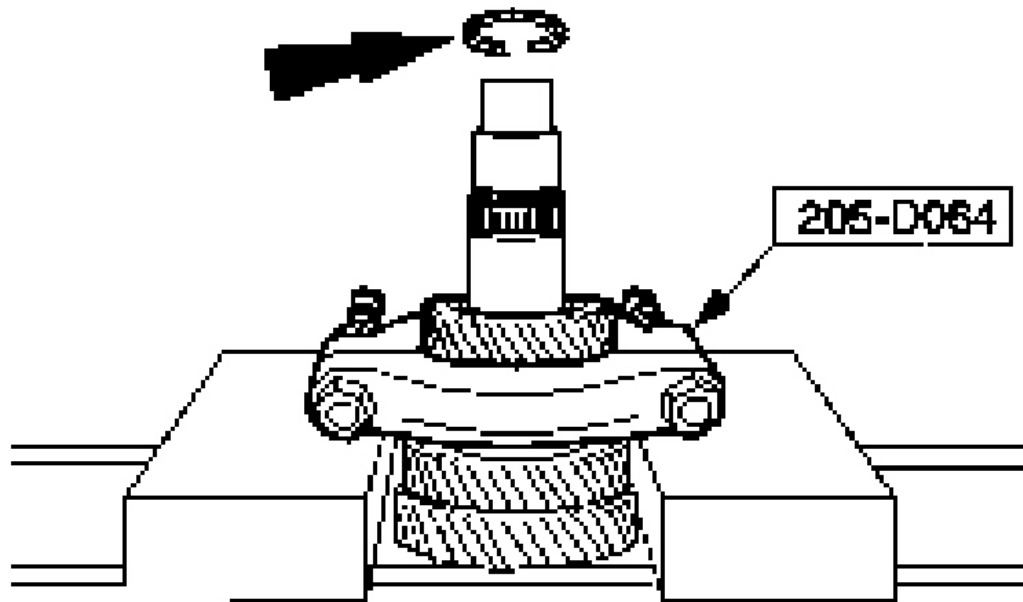
3. Remove the fifth gear and the reverse gear synchronizer hub assembly.
 1. Remove the snap ring.
 2. Remove the synchronizer hub assembly.
4. Remove the fifth gear wheel.
 1. Remove the synchronizer ring.
 2. Remove the fifth gear wheel.
 3. Remove the needle roller bearing.



G03854832

Fig. 140: Removing Fifth Gear Wheel
Courtesy of FORD MOTOR CO.

NOTE: Use the special tool with the flat side upwards.



G03854833

Fig. 141: Removing Fourth Gear Wheel
Courtesy of FORD MOTOR CO.

5. Using the special tool, remove the fourth gear wheel.
 - Remove the snap ring.

NOTE: Use the special tool with the flat side upwards.

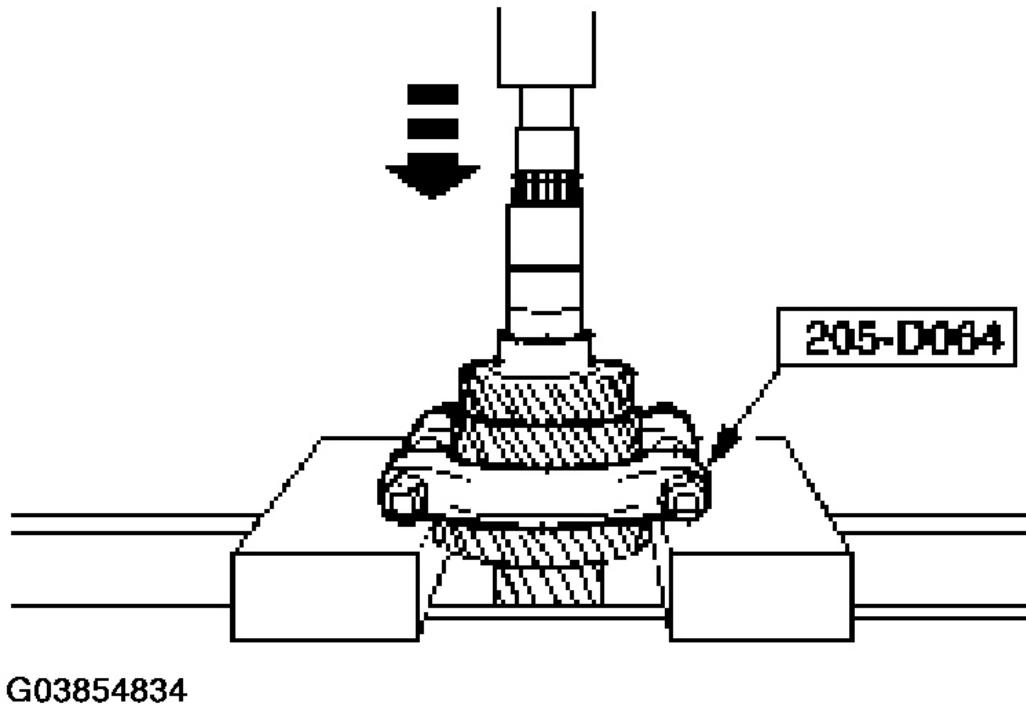
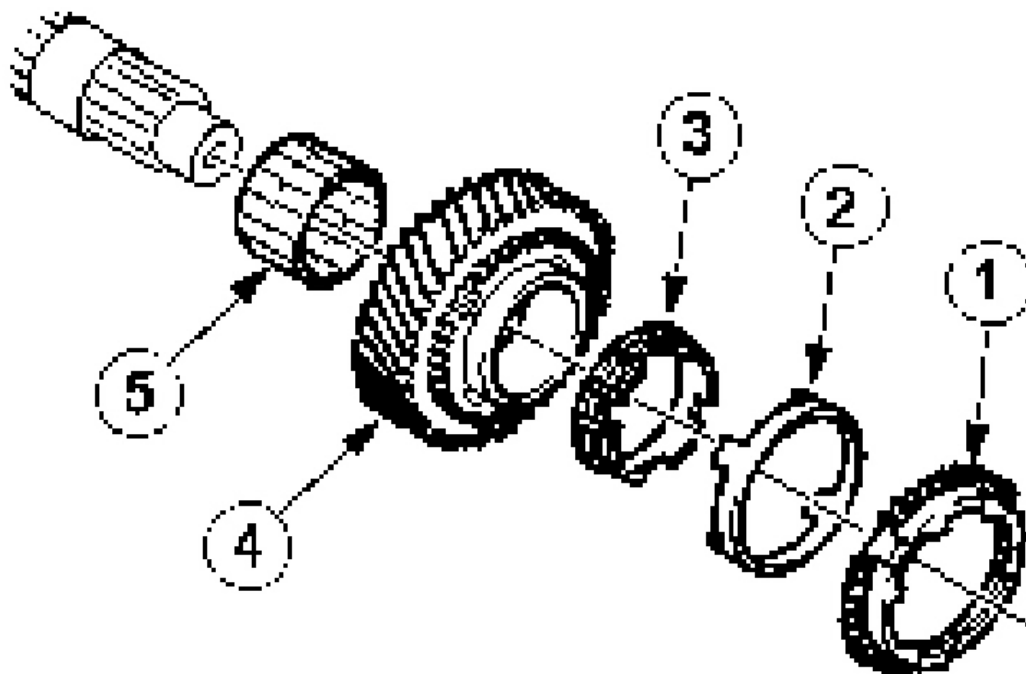


Fig. 142: Removing Second And Third Gear Wheel
Courtesy of FORD MOTOR CO.

6. Using the special tool, remove the second and the third gear wheel.

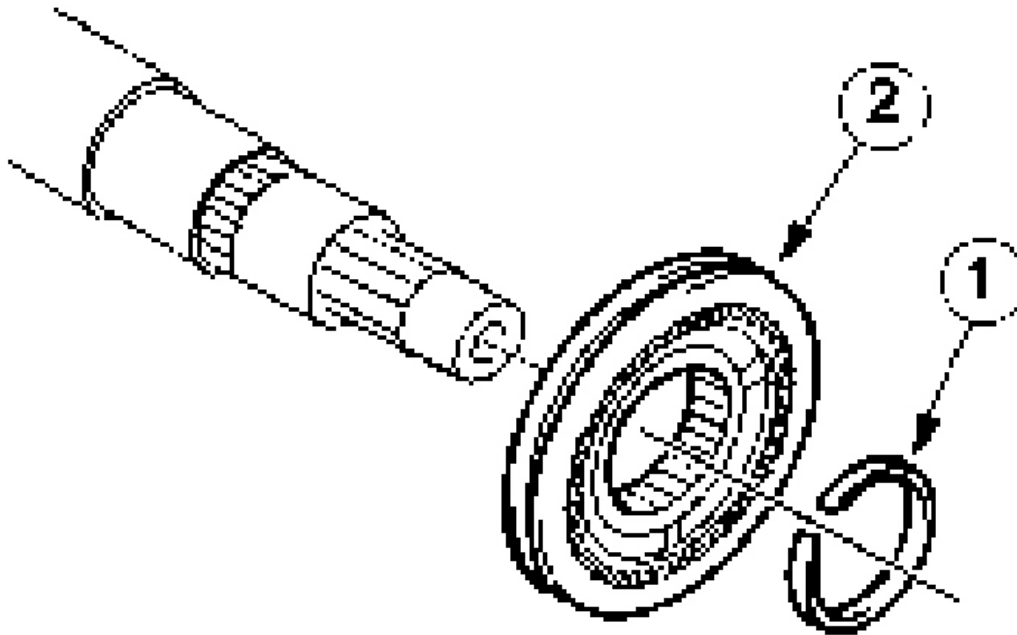
CAUTION: Be extremely careful when handling the inner synchronizer ring and synchronizer cone.



G03854835

Fig. 143: Removing Second Gear Wheel
Courtesy of FORD MOTOR CO.

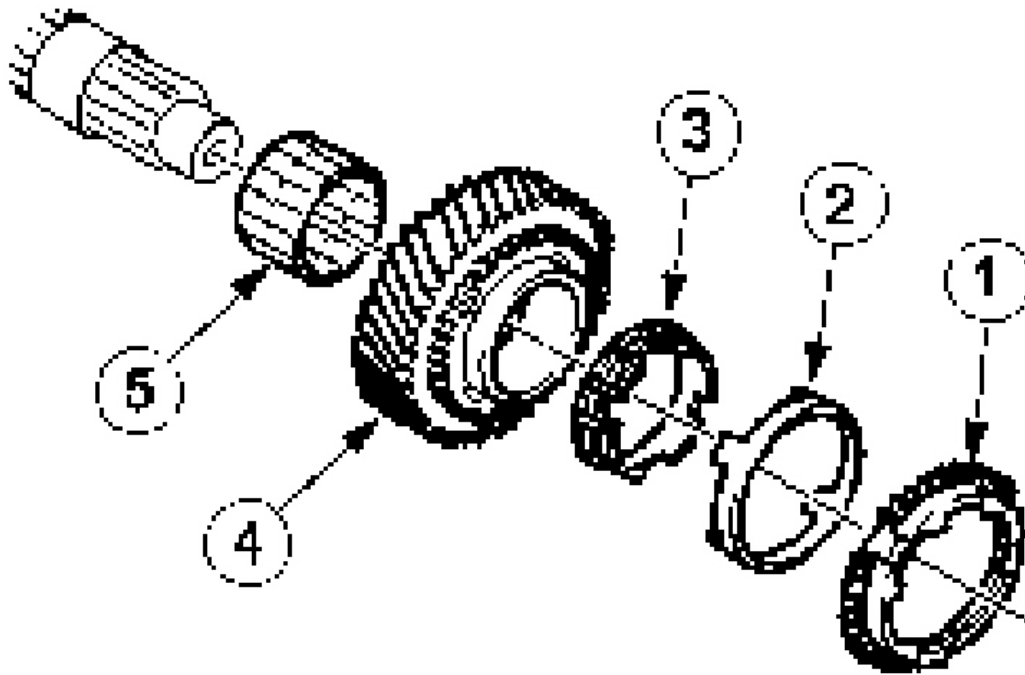
7. Remove the second gear wheel.
 1. Remove the outer synchronizer ring.
 2. Remove the synchronizer cone.
 3. Remove the inner synchronizer ring.
 4. Remove the second gear wheel.
 5. Remove the needle roller bearing.
8. Remove the first and the second gear synchronizer hub assembly.
 1. Remove the snap ring.
 2. Remove the synchronizer hub assembly.



G03854836

Fig. 144: Removing First And Second Gear Synchronizer Hub Assembly
Courtesy of FORD MOTOR CO.

CAUTION: Be extremely careful when handling the inner synchronizer ring and synchronizer cone.

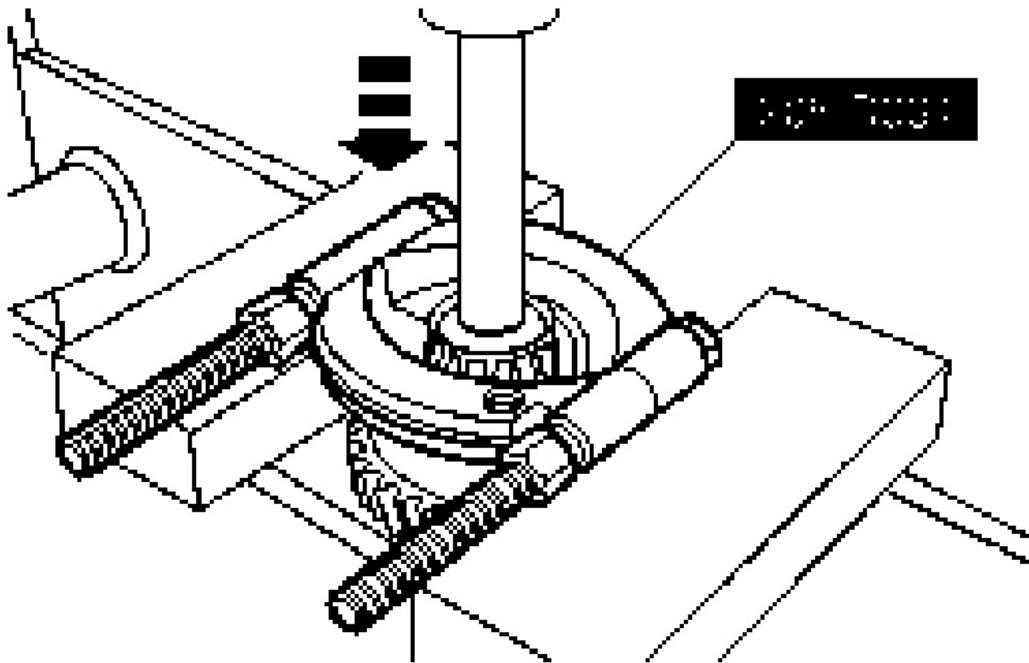


G03854837

Fig. 145: Removing First Gear Wheel
Courtesy of FORD MOTOR CO.

9. Remove the first gear wheel.
 1. Remove the outer synchronizer ring.
 2. Remove the synchronizer cone.
 3. Remove the inner synchronizer ring.
 4. Remove the first gear wheel.
 5. Remove the needle roller bearing.

NOTE: Only remove if a new bearing is to be installed.



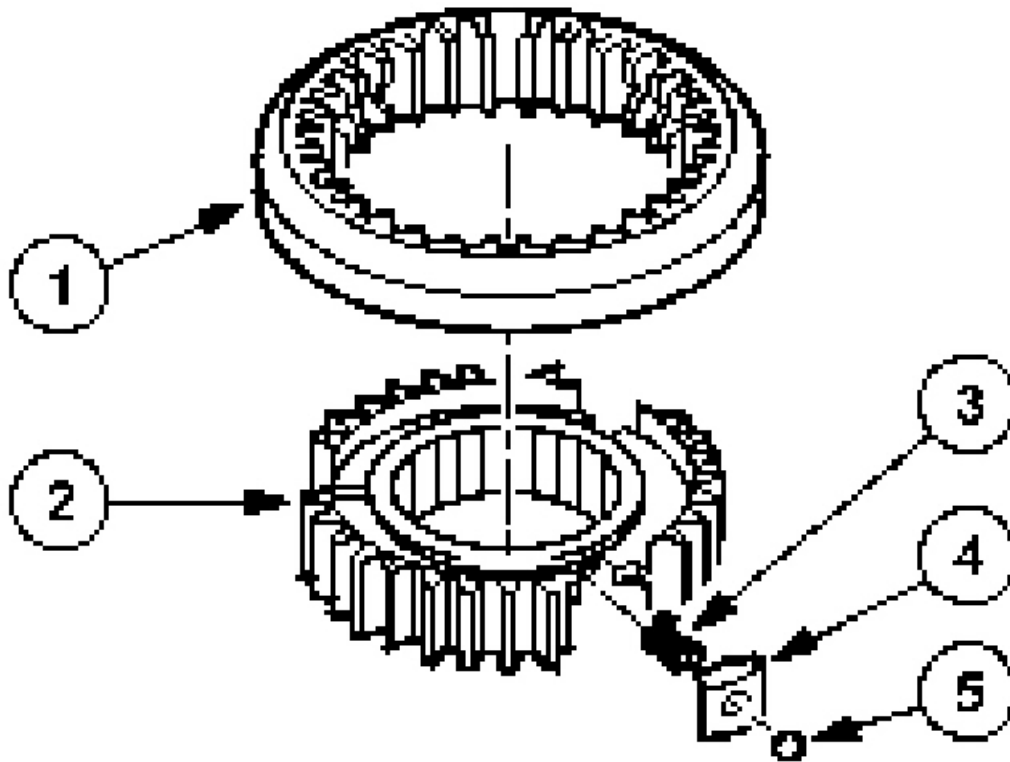
G03854838

Fig. 146: Removing Clutch Housing Roller Bearing
Courtesy of FORD MOTOR CO.

10. Using the special tool, remove the clutch housing roller bearing.

CAUTION: Take care when removing the selector ring from the synchronizer hub assembly. The detent balls are spring-loaded.

NOTE: Mark the installed position of the selector ring.



G03854839

Fig. 147: Disassembling Synchronizer Hub Assembly
Courtesy of FORD MOTOR CO.

11. Disassemble the synchronizer hub assembly.
 1. Remove the shift ring.
 2. Remove the synchronizer hub.
 3. Remove the compression springs.
 4. Remove the blocker bars.
 5. Remove the detent balls.

Assembly

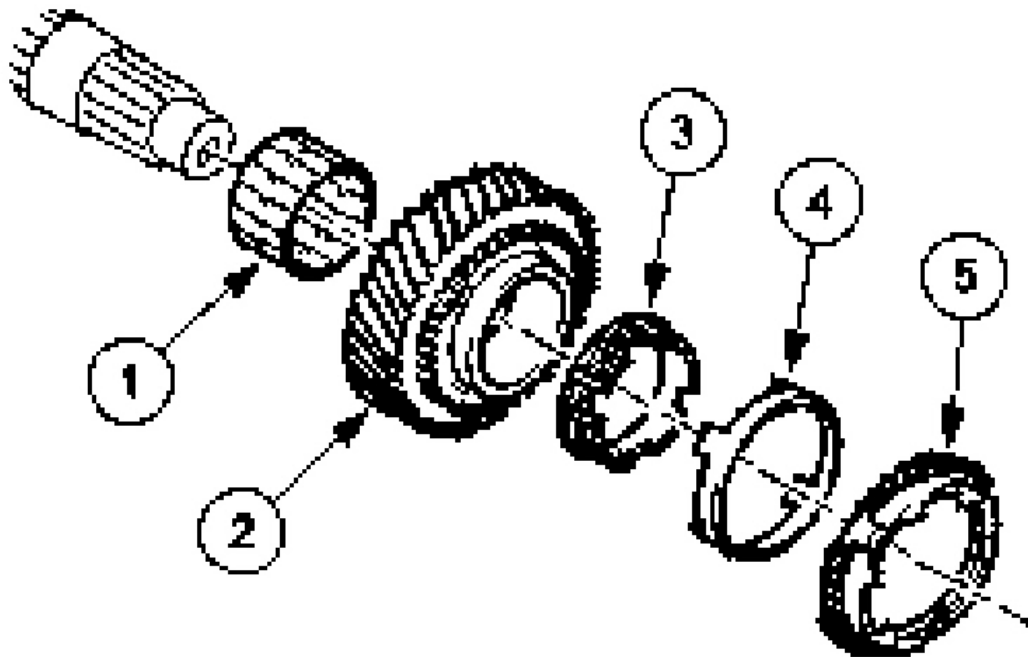
CAUTION: Handle the inner synchronizer ring and the synchronizer cone with extreme care. Before installation lay the

synchronizer rings in transmission fluid.

NOTE: Do not lubricate the roller bearings.

1. Clean and check all parts thoroughly before assembling them and lubricate all sliding parts with transmission fluid.

CAUTION: Handle the inner synchronizer ring and synchronizer cone very carefully.



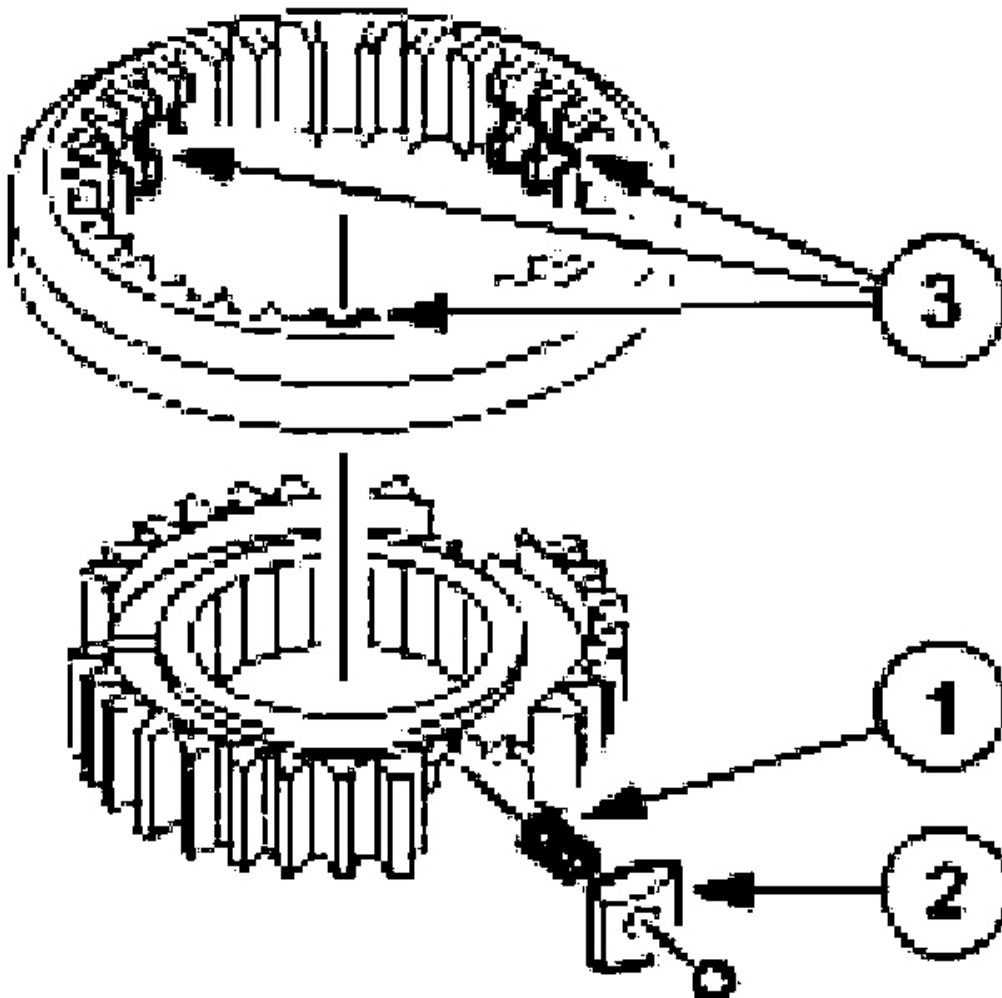
G03854840

Fig. 148: Installing First Gear Wheel
Courtesy of FORD MOTOR CO.

2. Install the first gear wheel.
 1. Install the needle roller bearing.
 2. Install the first gear wheel.
 3. Install the inner synchronizer ring.

4. Install the synchronizer cone.
5. Install the outer synchronizer ring.

NOTE: **Observe the markings.**

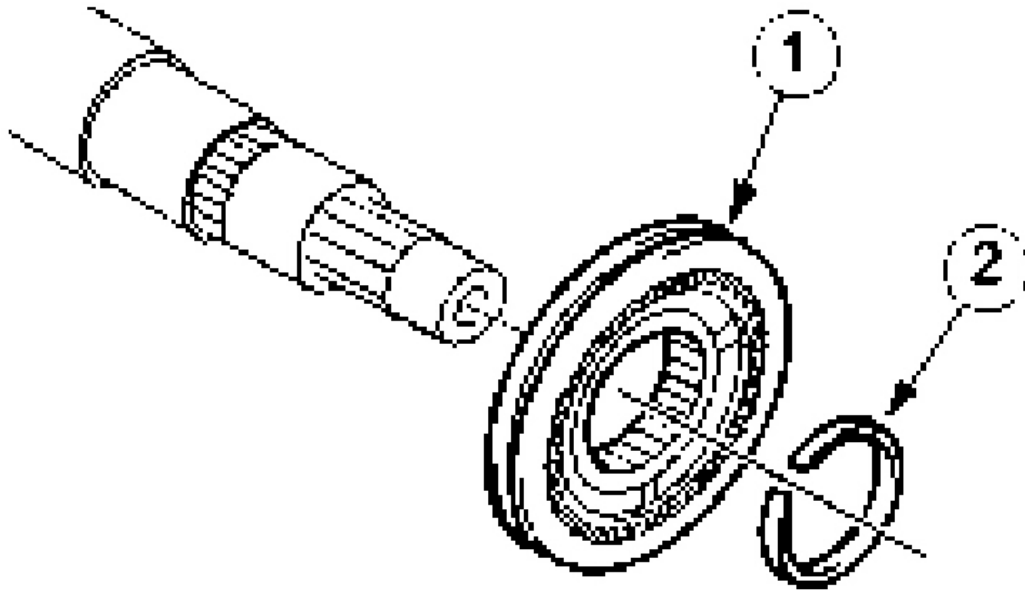


G03854841

Fig. 149: Assembling Synchronizer Hub Assembly
Courtesy of FORD MOTOR CO.

3. Assemble the synchronizer hub assembly.
 1. Install the compression springs.
 2. Install the blocker bar and the detent balls in the gear synchronizer hub against the force of the spring.
 3. Install the spring ring the correct way round and push it on.

NOTE: **Install the synchronizer hub assembly with the larger collar facing outwards (towards the second gear wheel).**

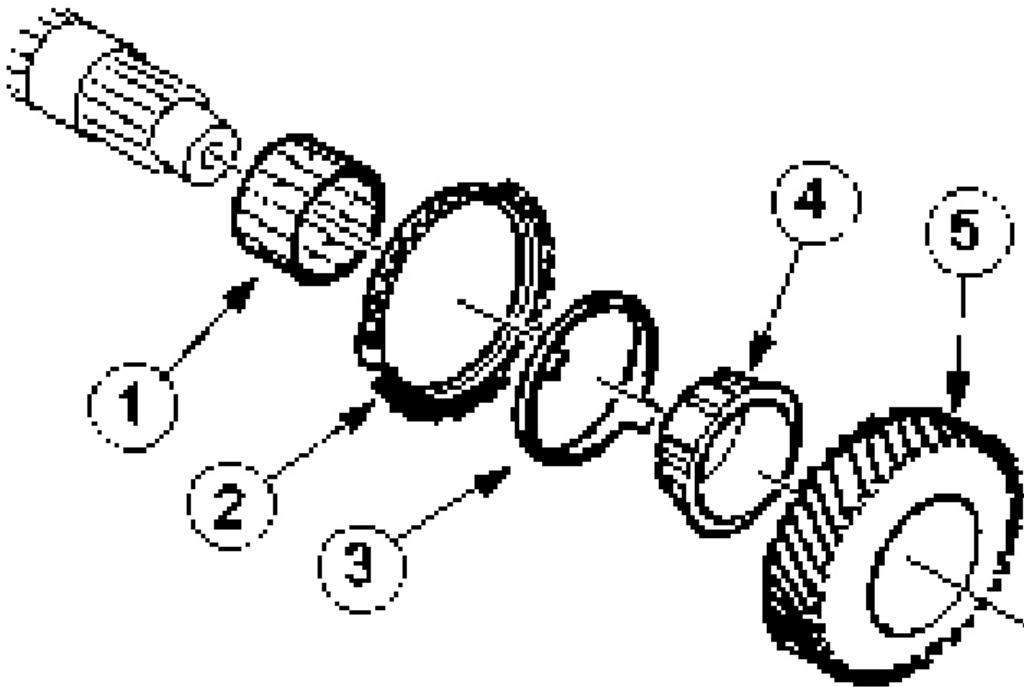


G03854842

Fig. 150: Installing First And Second Gear Synchronizer Hub Assembly
Courtesy of FORD MOTOR CO.

4. Install the first and the second gear synchronizer hub assembly.
 1. Install the synchronizer hub assembly.
 2. Install the snap ring.
5. Install the second gear wheel.
 1. Install the needle roller bearing.

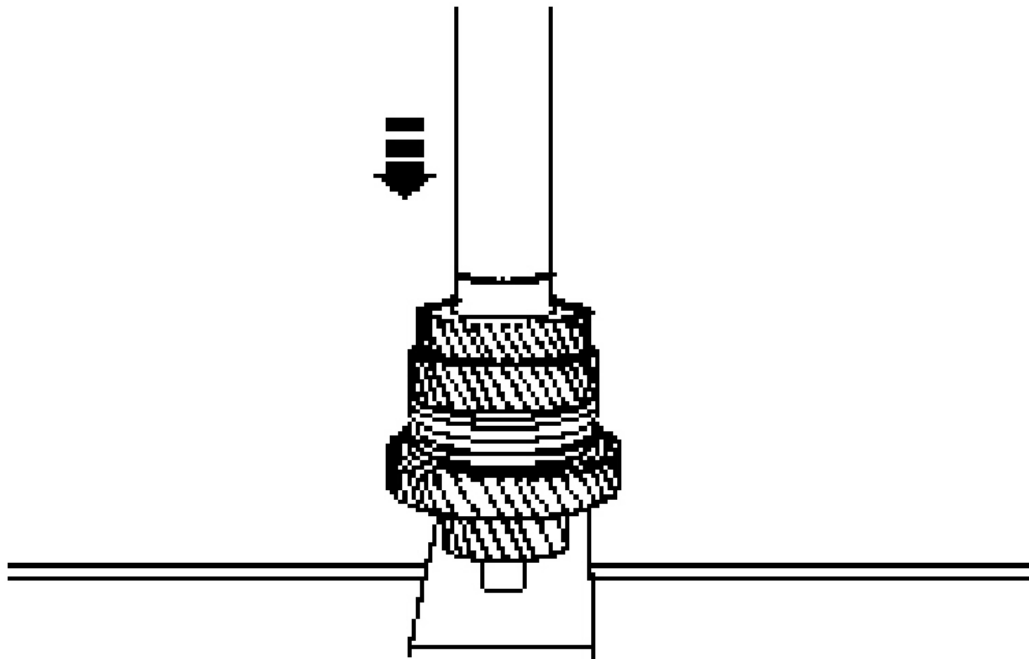
2. Install the outer synchronizer ring.
3. Install the synchronizer cone.
4. Install the inner synchronizer ring.
5. Install the second gear wheel.



G03854843

Fig. 151: Installing Second Gear Wheel
Courtesy of FORD MOTOR CO.

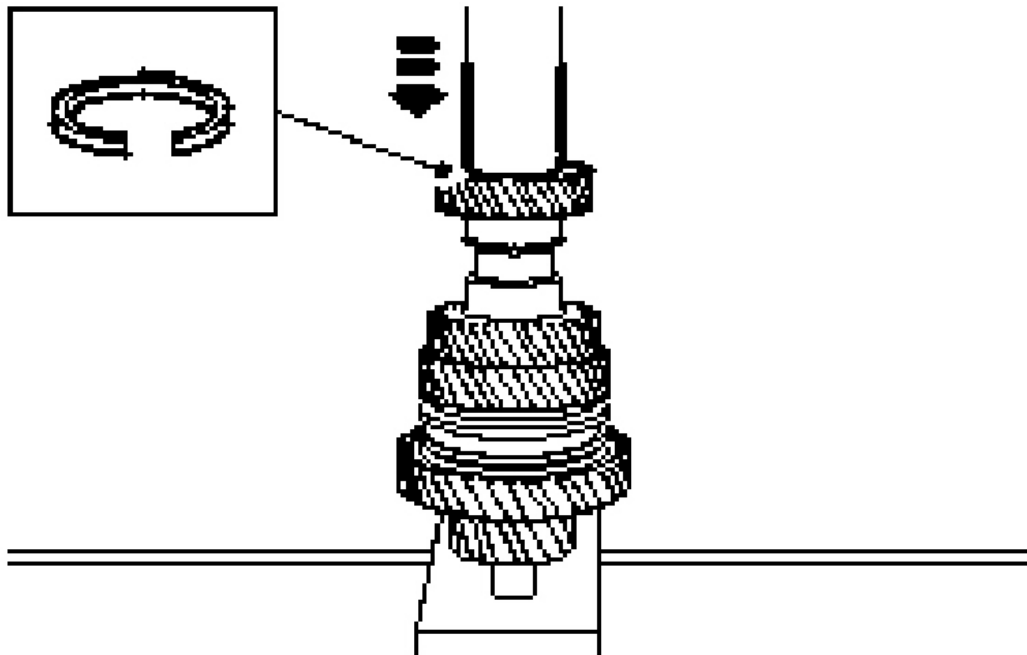
6. Using a length of suitable tube, install the third gear wheel.



G03854844

Fig. 152: Installing Third Gear Wheel
Courtesy of FORD MOTOR CO.

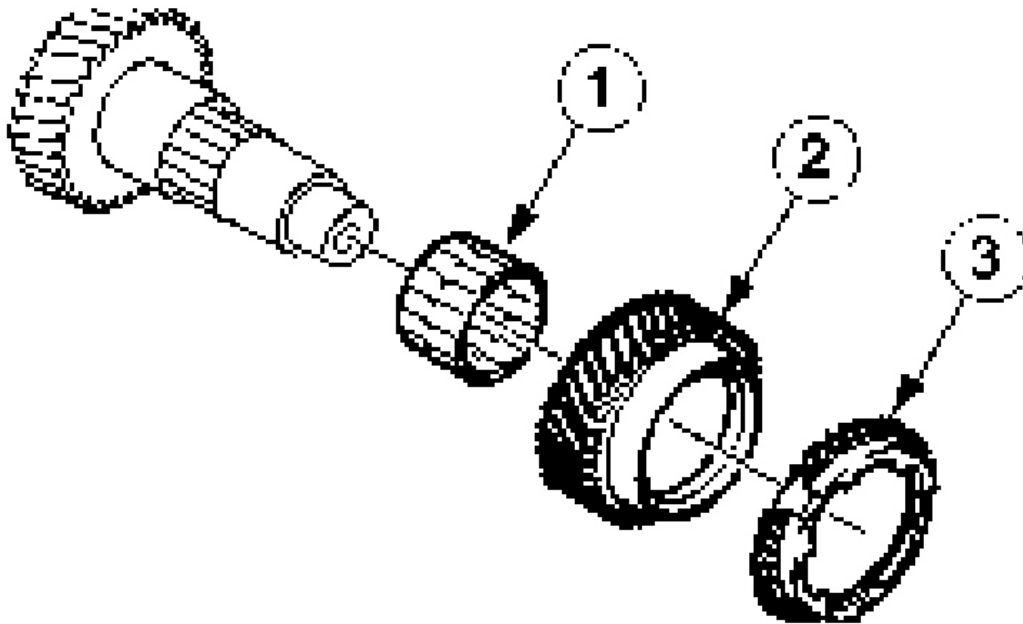
NOTE: Install a new circlip.



G03854845

Fig. 153: Installing Fourth Gear Wheel
Courtesy of FORD MOTOR CO.

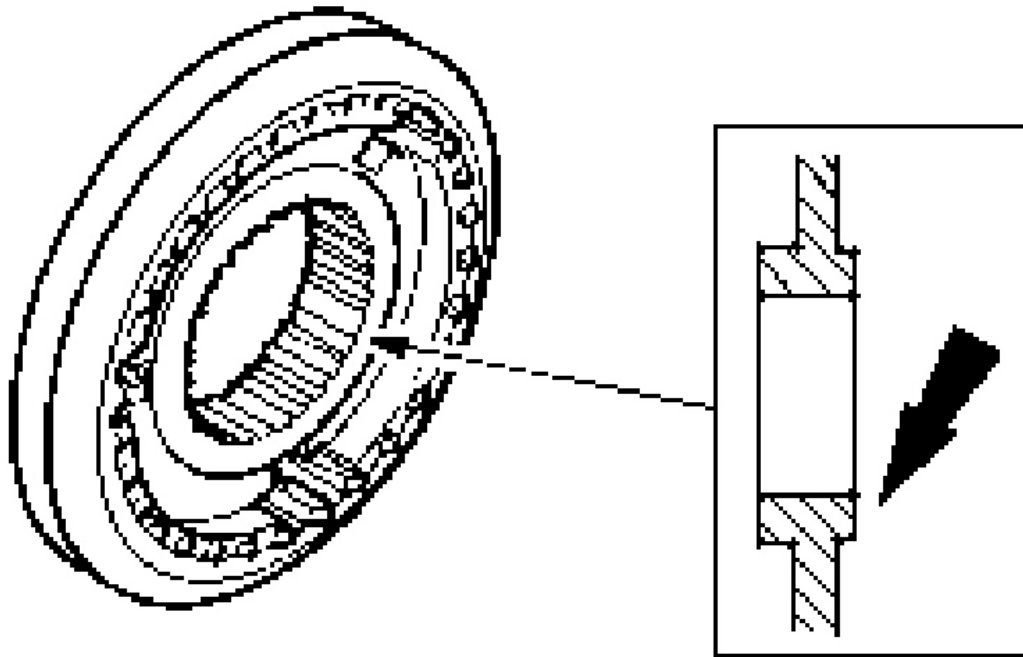
7. Using a length of suitable tube, install the fourth gear wheel.
8. Install the fifth gear wheel.
 1. Install the needle roller bearing.
 2. Install the fifth gear wheel.
 3. Install the synchronizer ring.



G03854846

Fig. 154: Installing Fifth Gear Wheel
Courtesy of FORD MOTOR CO.

NOTE: Install the synchronizer hub assembly with the small collar and the ring groove facing outwards.



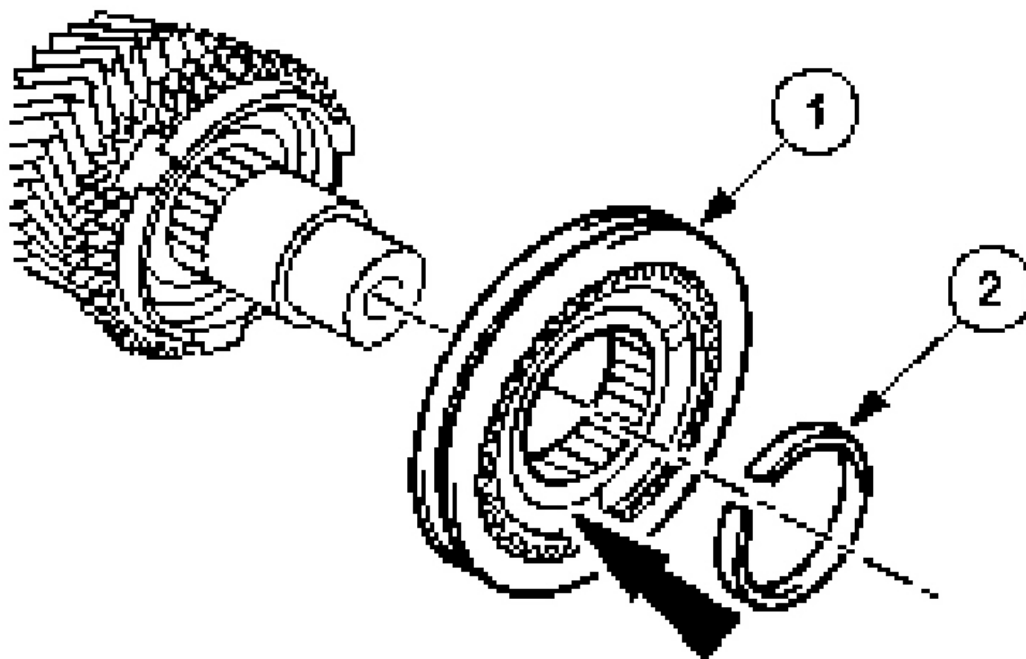
G03854847

Fig. 155: Identifying Reverse And Fifth Gear Synchronizer Hub Assembly Installation Position

Courtesy of FORD MOTOR CO.

9. Reverse and fifth gear synchronizer hub assembly installation position.

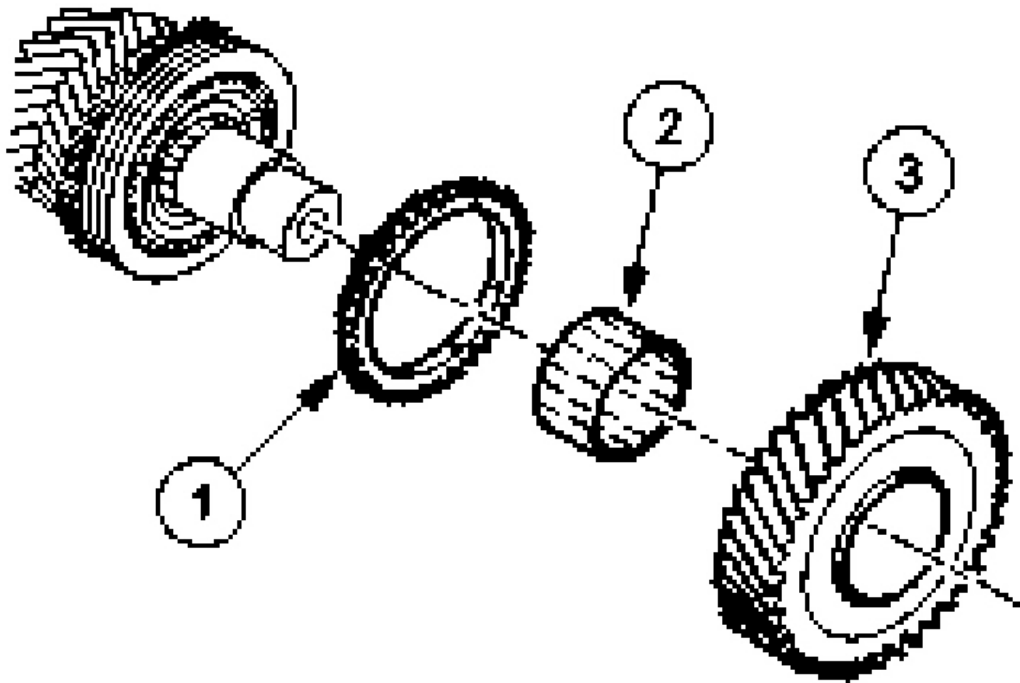
NOTE: **Install the synchronizer hub assembly with the small collar and the ring groove facing outwards.**



G03854848

Fig. 156: Installing Fifth And Reverse Gear Synchronizer Assembly
Courtesy of FORD MOTOR CO.

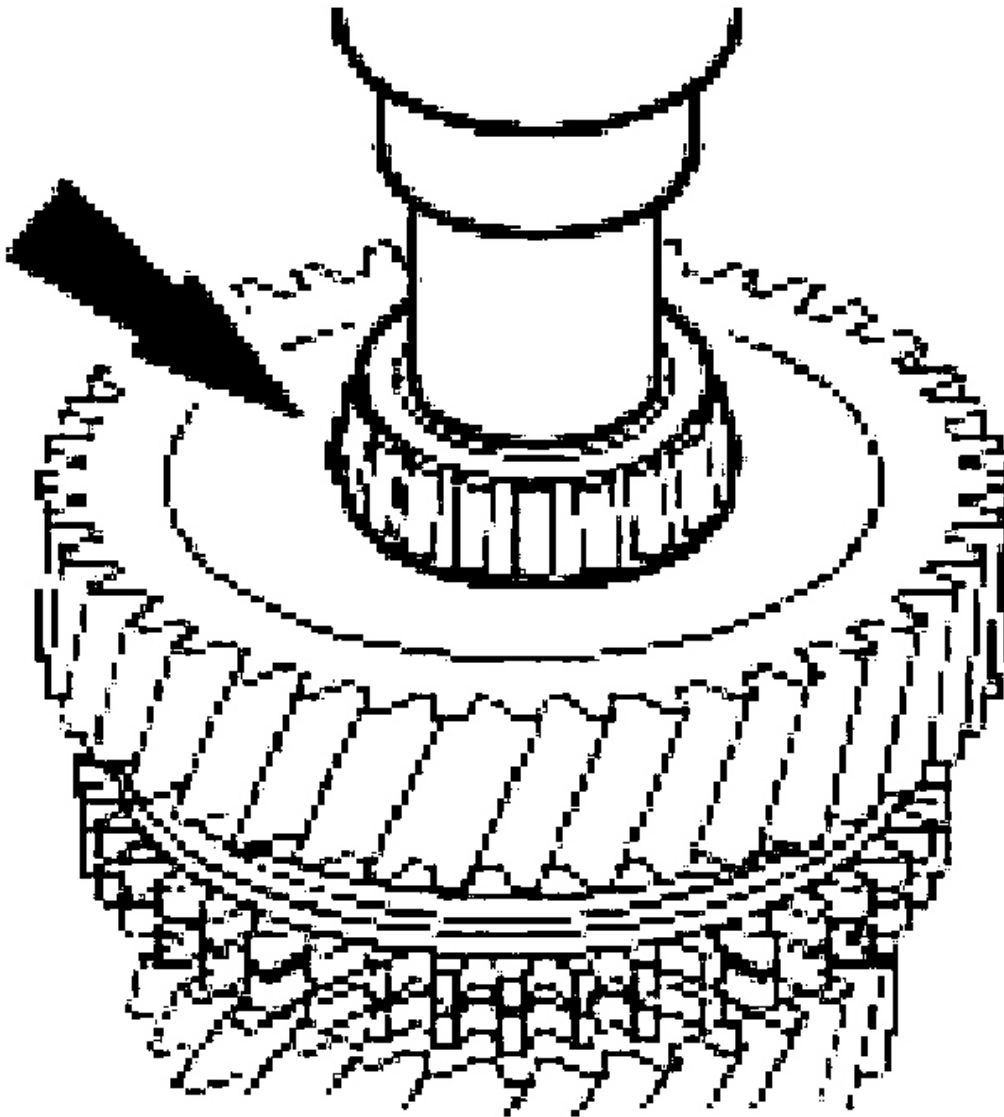
10. Install the fifth and the reverse gear synchronizer assembly.
 1. Install the synchronizer hub assembly.
 2. Install a new snap ring.
11. Install the reverse gear wheel.
 1. Install the synchronizer ring.
 2. Install the needle roller bearing.
 3. Install the reverse gear wheel.



G03854849

Fig. 157: Installing Reverse Gear Wheel
Courtesy of FORD MOTOR CO.

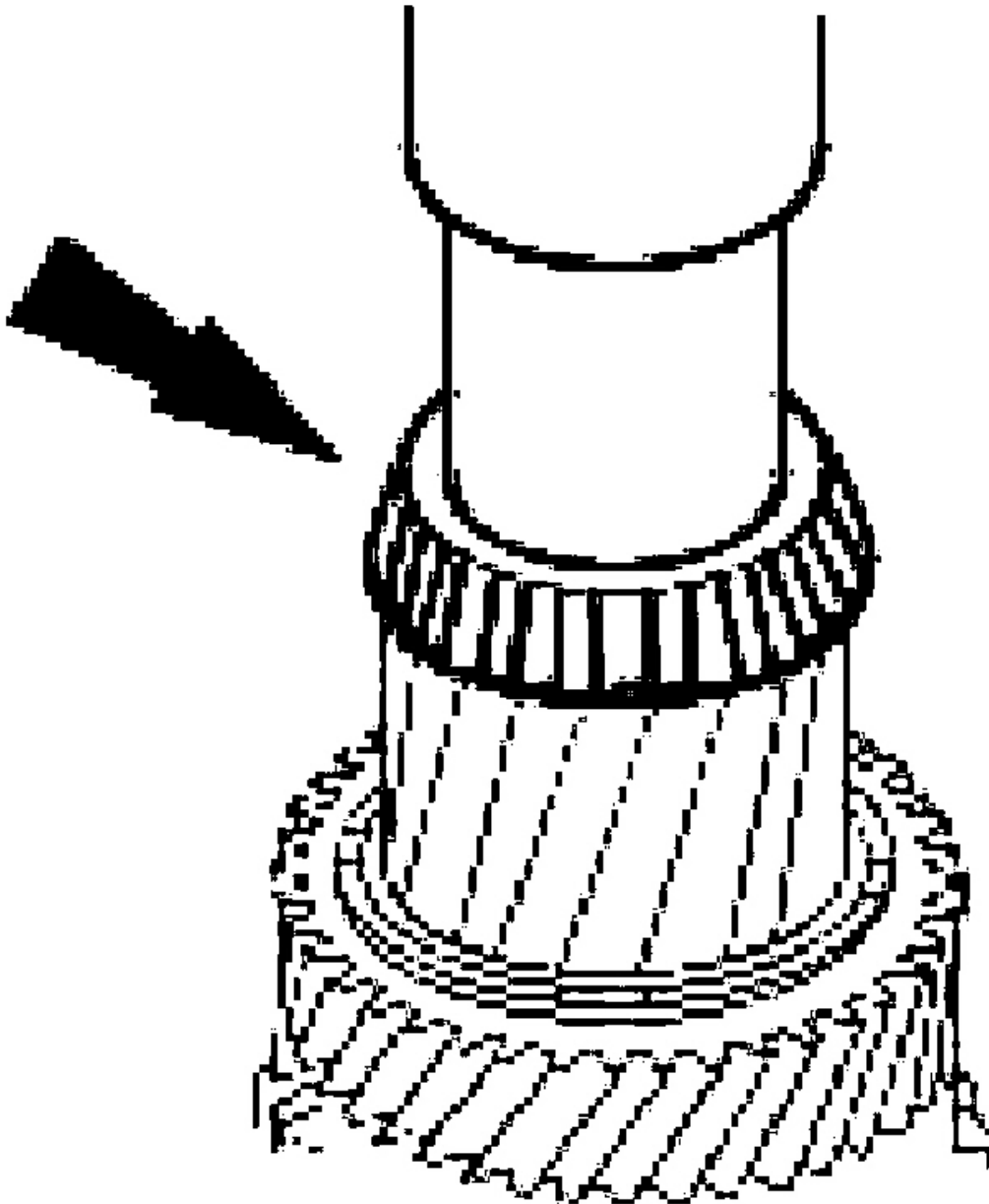
12. Using a length of suitable tube, install the transaxle housing roller bearing.



G03854850

Fig. 158: Installing Transaxle Housing Roller Bearing
Courtesy of FORD MOTOR CO.




13. Using a length of suitable tube, install a new clutch housing roller bearing.



G03854851

Fig. 159: Installing Clutch Housing Roller Bearing
Courtesy of FORD MOTOR CO.

DIFFERENTIAL**Special Tool(s)**

	Installer, Differential Bearing Cup 308-225 (T94P-7025-GH)
	Adaptor for 303-224 (Handle) 205-153 (T80T-4000-W)
	Puller, Drive Pinion/Differential Carrier 205-D036 (D81L-4220-A)

G03854852

Fig. 160: Differential Special Tools Specifications
Courtesy of FORD MOTOR CO.

Material**MATERIAL SPECIFICATIONS**

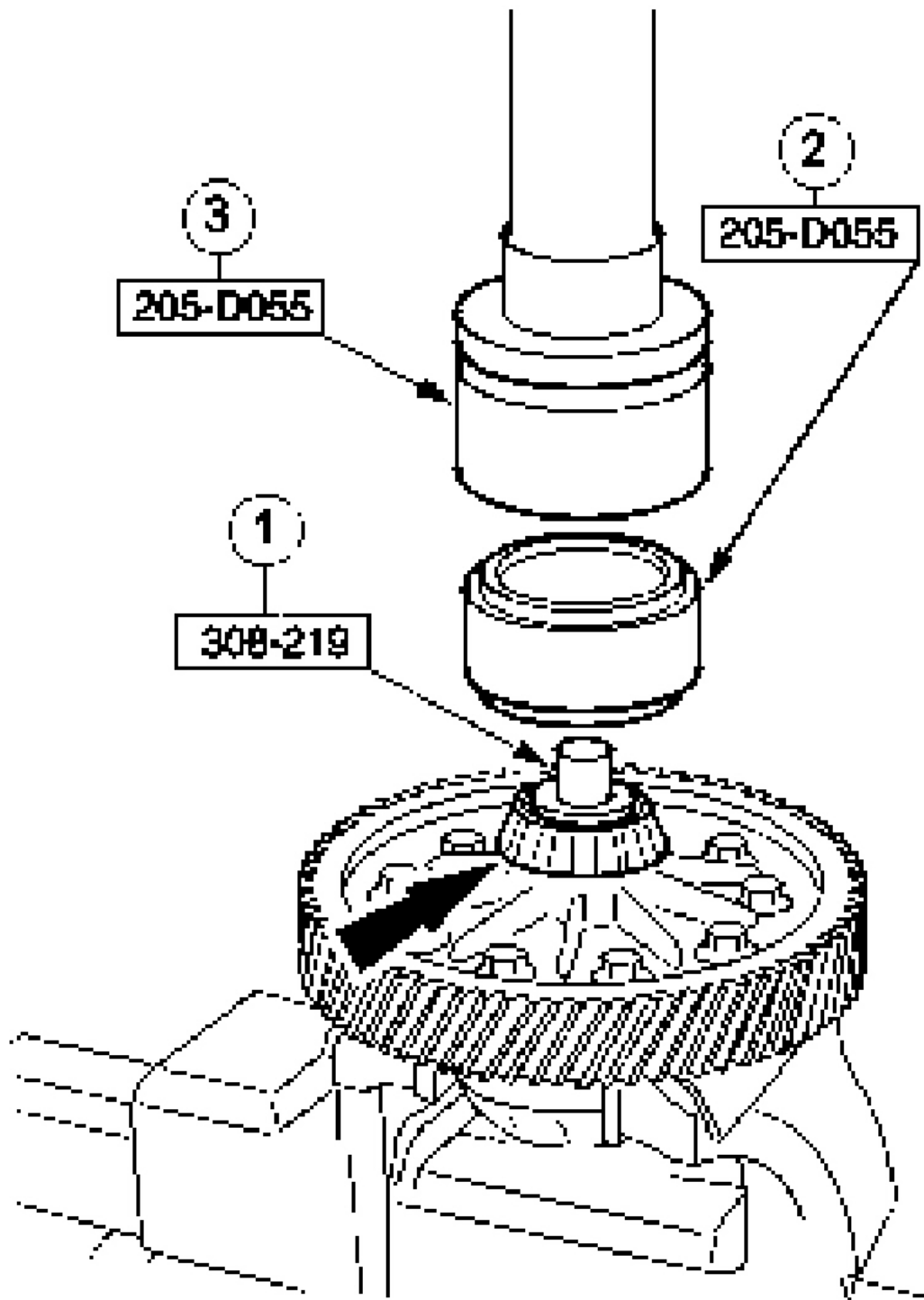
Manual transmission fluid	ESD-M2C186-A
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Disassembly

1. Install the special tools.
 1. Install the thrust element.
 2. Install the tapered insert
 3. Install the basic tool.

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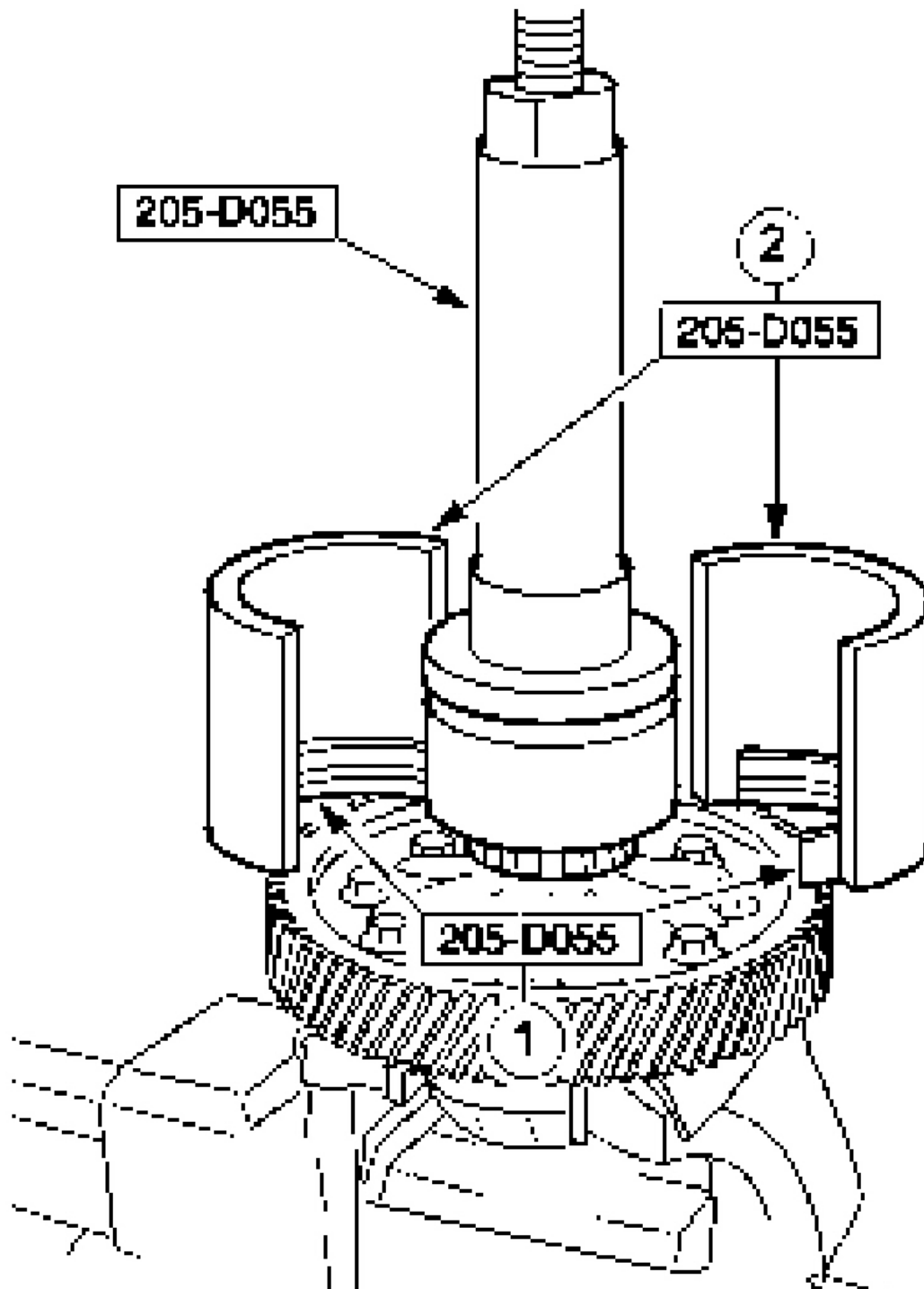
G03854853

Fig. 161: Installing Special Tools
Courtesy of FORD MOTOR CO.

2. Install the special tools.
 - Install the half shells of the insert.
 - Install the half shells to the basic tool.

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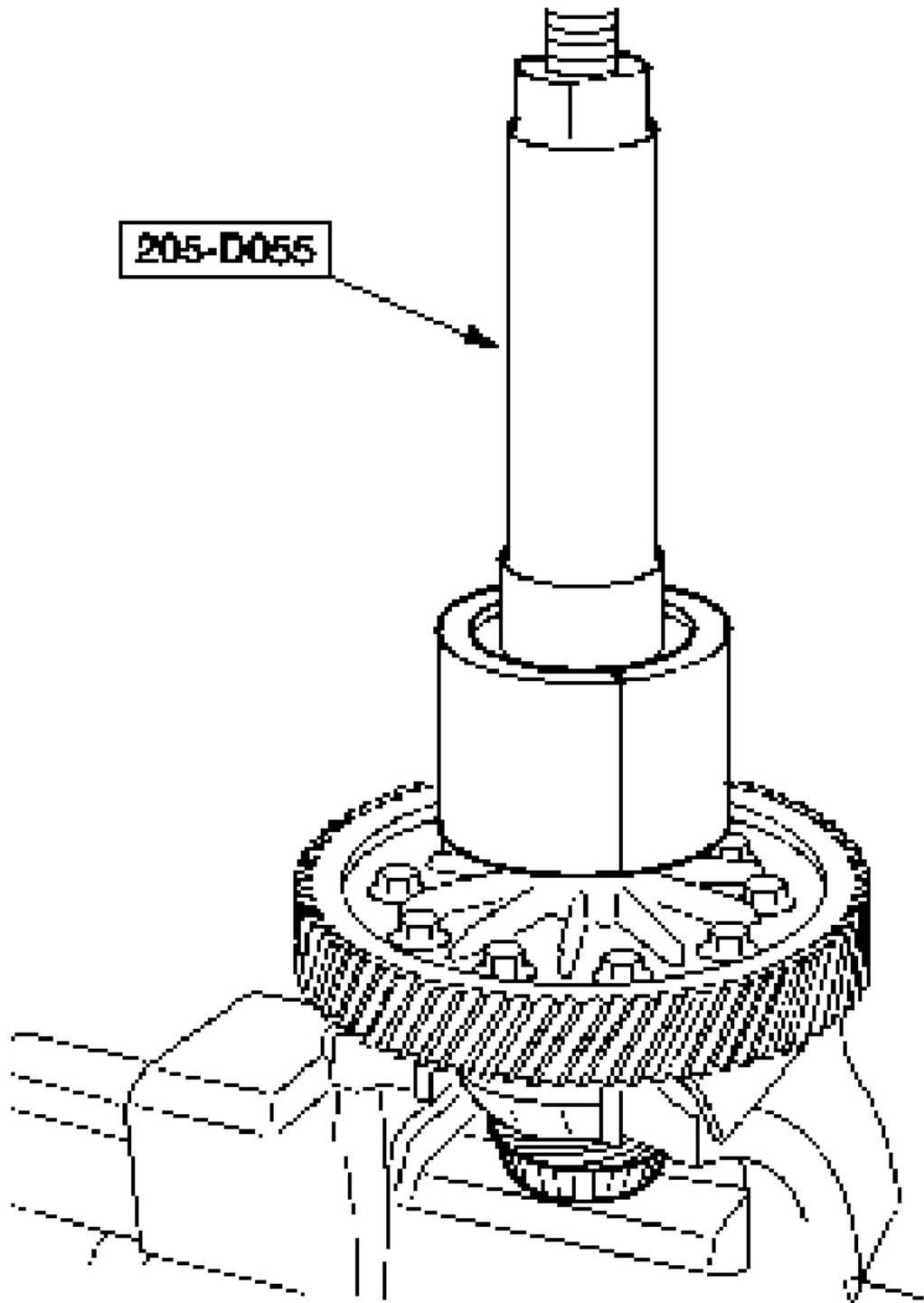
G03854854

Fig. 162: Installing Special Tools
Courtesy of FORD MOTOR CO.

3. Using the special tools, preload the bearing and remove it.

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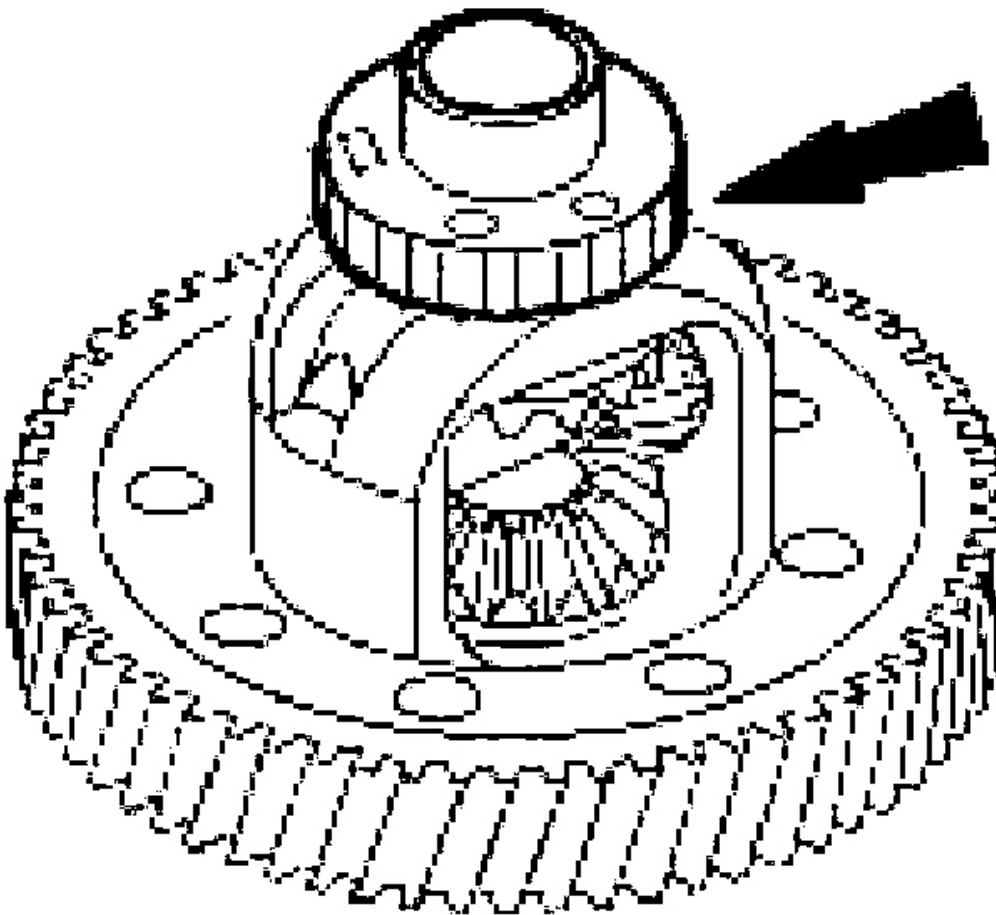
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G03854855

Fig. 163: Removing Bearing
Courtesy of FORD MOTOR CO.

4. Repeat sub-operations to for the other taper roller bearing.
5. Remove the trigger wheel.

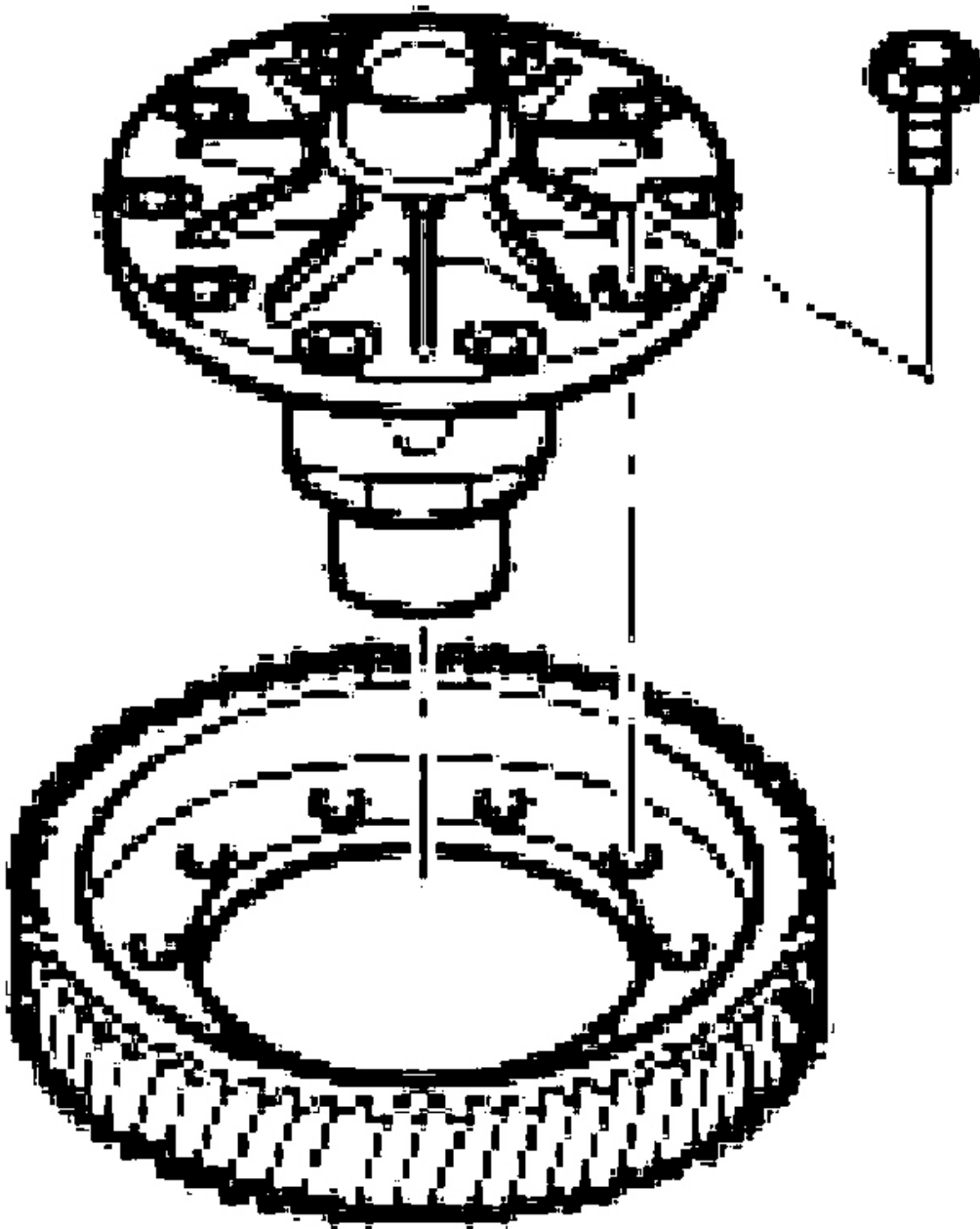


G03854856

Fig. 164: Removing Trigger Wheel
Courtesy of FORD MOTOR CO.

6. Remove the gear.
 - Unscrew the bolts.

- Remove the gear by tapping lightly on it.



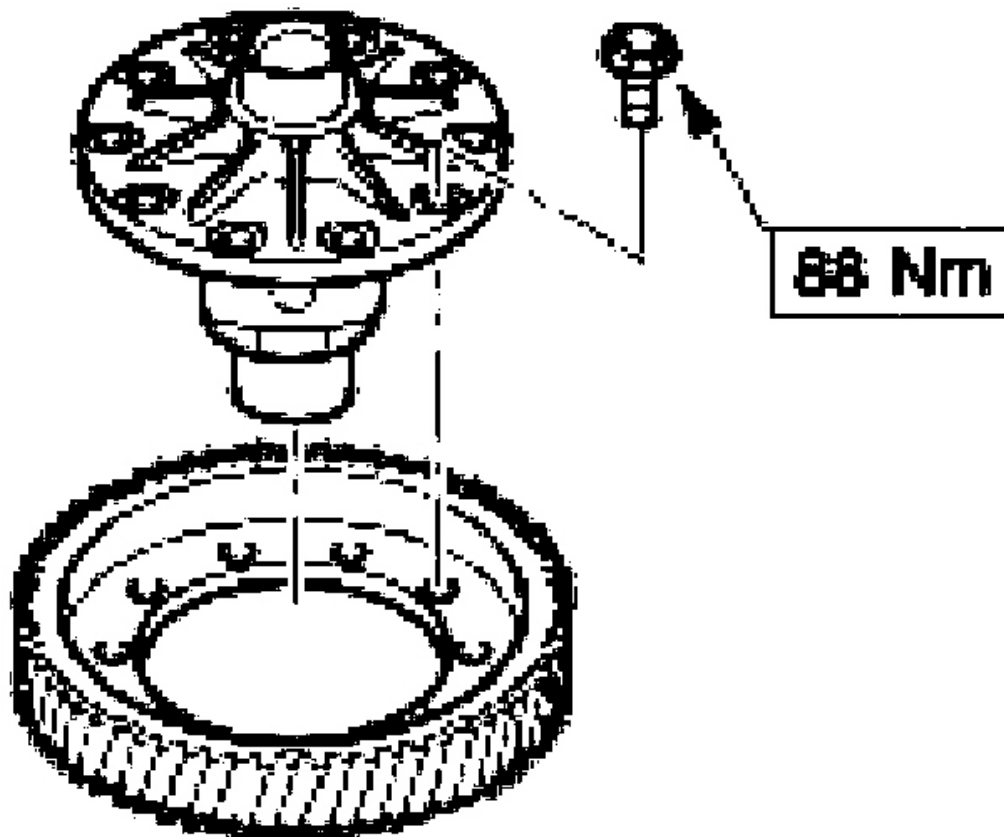
G03854857

Fig. 165: Removing Gear
Courtesy of FORD MOTOR CO.

Assembly

NOTE: **Do not oil taper roller bearings which are to be used again. New taper roller bearings can be installed without any treatment.**

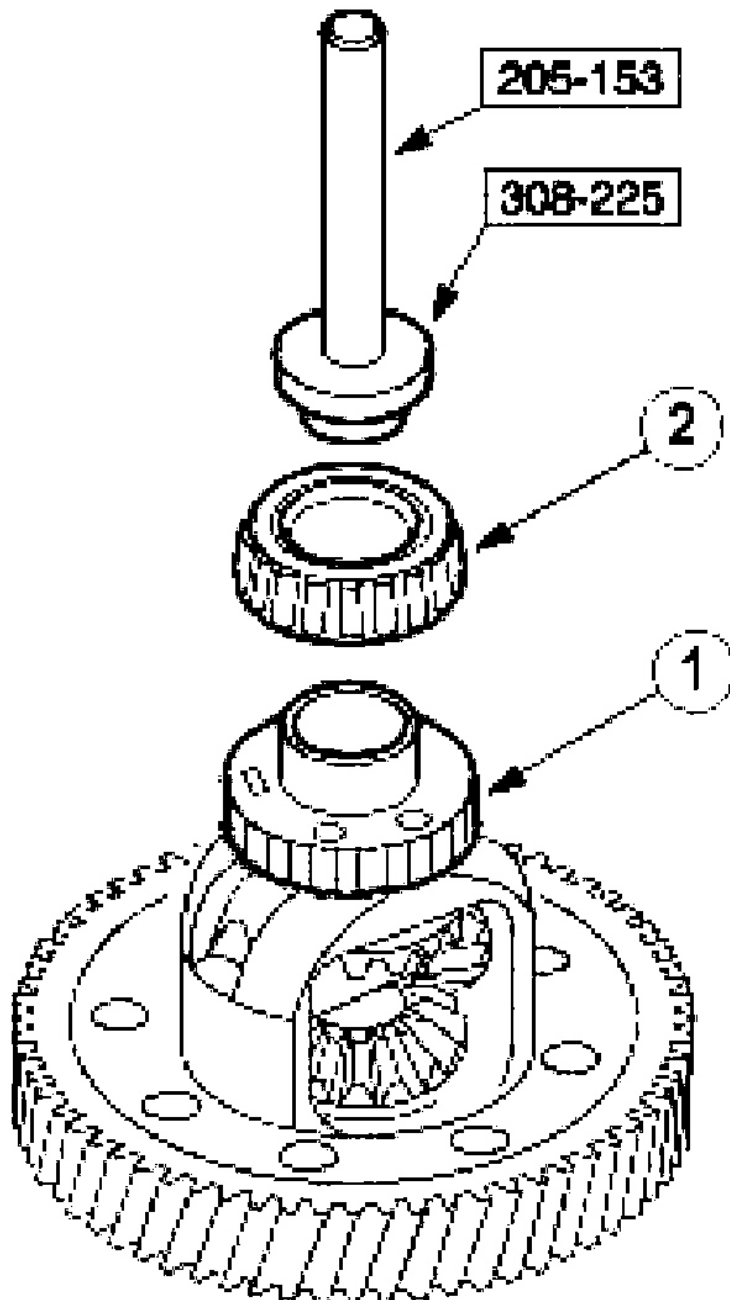
1. Carefully clean and check all parts and lubricate them with Manual transmission fluid.
2. Install the gear to the differential.
 - Tighten the bolts, working diagonally.



G03854858

Fig. 166: Installing Gear To Differential
Courtesy of FORD MOTOR CO.

NOTE: The trigger wheel must engage in the housing recess.



G03854859

Fig. 167: Installing Bearings
Courtesy of FORD MOTOR CO.

3. Install the bearings.

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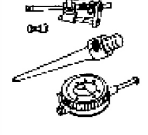
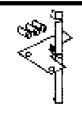
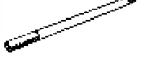
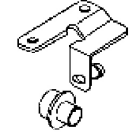
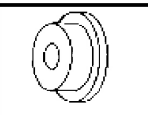



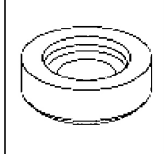

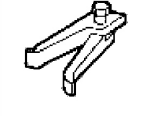



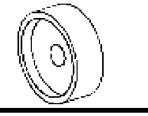
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1. Install the trigger wheel.
2. Using the special tools, install the bearings.

ASSEMBLY

TRANSAXLE

Special Tool(s)

	Dial Indicator Gauge with Holding Fixture 100-002 (TOOL-4201-C)		Holding Fixture, Dial Indicator Gauge (Output Shaft End Play) 308-216 (T94P-4451-AH)
	Adaptor for 303-224 (Handle) 205-153 (T80T-4000-W)		Set, Shim Selection 308-S217 (T94P-4451-BH)
	Installer, Drive Pinion Bearing 205-267 (T87P-4616-A)		Installer, Shaft Bearing Cup 308-221 (T94P-7025-BH)
	Compressor, Valve Spring 303-350 (T89P-6565-A)		Installer, Differential Oil Seal 308-222 (T94P-7025-CH)
	Installer, Crankshaft Front Oil Seal 303-420 (T92P-6701-BH)		Socket, Input Shaft 308-224 (T94P-7025-EH)
	Remover, Stator Case Bearing 307-163 (T86P-70043-A)		Installer, Differential Bearing Cup 308-225 (T94P-7025-GH)
	Remover, Pilot Bearing 308-001 (T58L-101-B)		
	Adaptor for 308-046 308-046-01 (T87P-7005-B)		
	Installer, Transfer Case Output Oil Seal 308-121 (T87P-7065-B)		

G03854860

Fig. 168: Special Tools Specifications (Transaxle)

2002 Ford Focus LX

2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

Courtesy of FORD MOTOR CO.

Material

MATERIAL SPECIFICATIONS

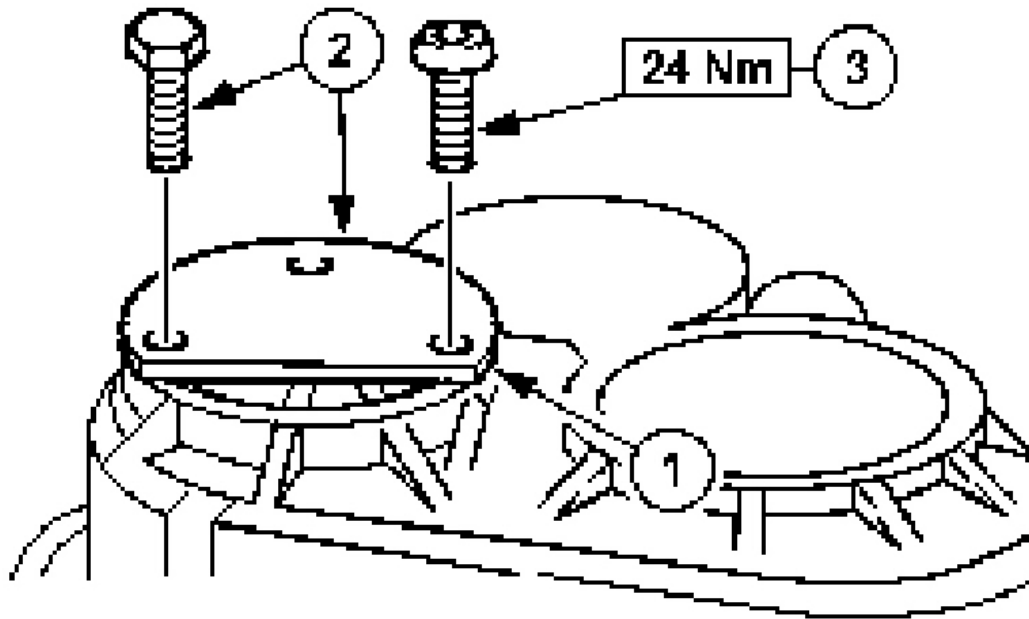
Manual transmission fluid	ESD-M2C186-A
Sealer	WSK-M2G348-A5
Temperature reduction spray	
High-temperature grease	ESDM-1C220-A

Assembly

CAUTION: Bearing races require a heating and cooling procedure and special tools for installation. This procedure must be followed to provide accurate preload measurements.

1. Clean and check all parts carefully before assembly.
 - All sliding parts should be lubricated with manual transmission fluid.

NOTE: Heat the transaxle housing to approximately 80 °C.

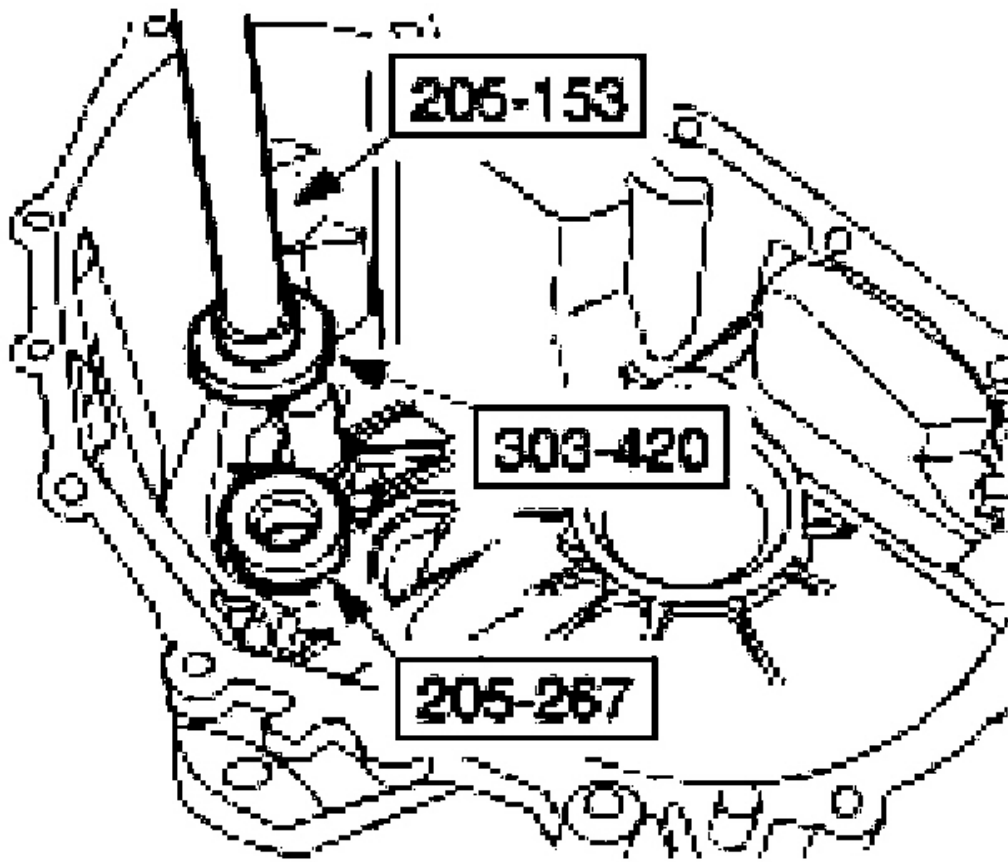


G03854861

Fig. 169: Installing Reverse Gear Idler Shaft
Courtesy of FORD MOTOR CO.

2. Install the reverse gear idler shaft.
 1. Apply Sealer to the reverse gear idler shaft plate mating face.
 2. Align the reverse gear idler shaft plate using the longer locating bolt and drive it in.
 3. Remove the locating bolt and install the original bolts.

CAUTION: The press pressure must not exceed 15 kN.



G03854862

Fig. 170: Installing Bearing Cups On Transaxle Housing Side
Courtesy of FORD MOTOR CO.

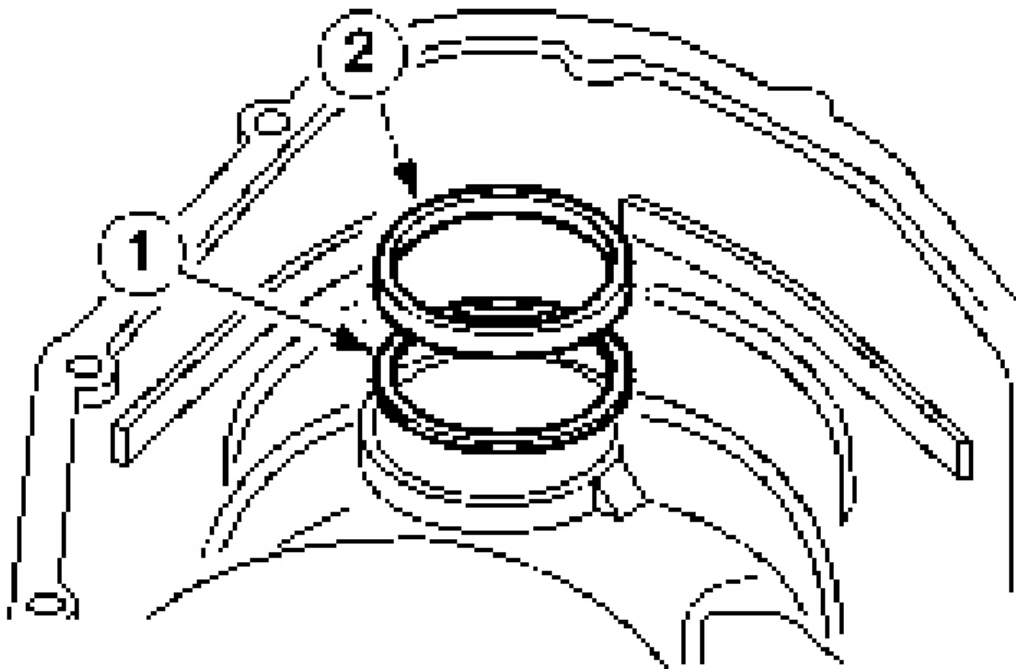
3. Using the special tools, install the bearing cups on the transaxle housing side.
 - Heat the housing area to approximately 80°C.
 - Cool the bearing cups and install them.
 - Install the bearing cups of the:
 - Input shaft using 205-153, 303-420 and 205-267
 - Output shaft using 205-153 and 308-046-01
 - Differential using 205-153 and 308-121

CAUTION: Press the bearing races down again. The press pressure must not exceed 15 kN.

4. Measuring shim to be installed:

- Input shaft: 1.00 mm.
- Output shaft: 1.00 mm.
- Differential: 1.10 mm.

CAUTION: The press pressure must not exceed 15 kN.



G03854863

Fig. 171: Installing Bearing Cups
Courtesy of FORD MOTOR CO.

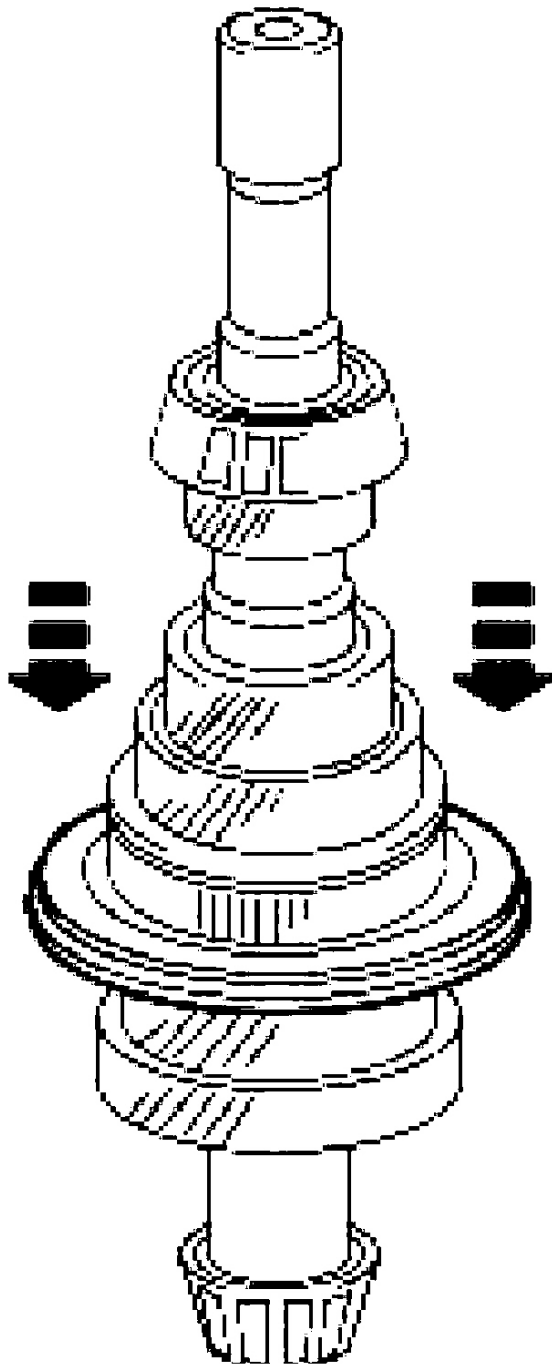
5. Install the measuring shims and the bearing cups in the housing section at the clutch end.
- Heat the housing area to approximately 80°C.

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- Cool the bearing cups.
- 3. Install the measuring shims.
- 4. Install the bearing cups.
- Install the bearing cups of the:
- Input shaft using 205-153 and 308-221.
- Output shaft using 205-153 and 308-046-01.
- Differential using 205-153 and 308-121.

NOTE: **Do not oil taper roller bearings which are to be used again.
New taper roller bearings can be installed without any
treatment.**

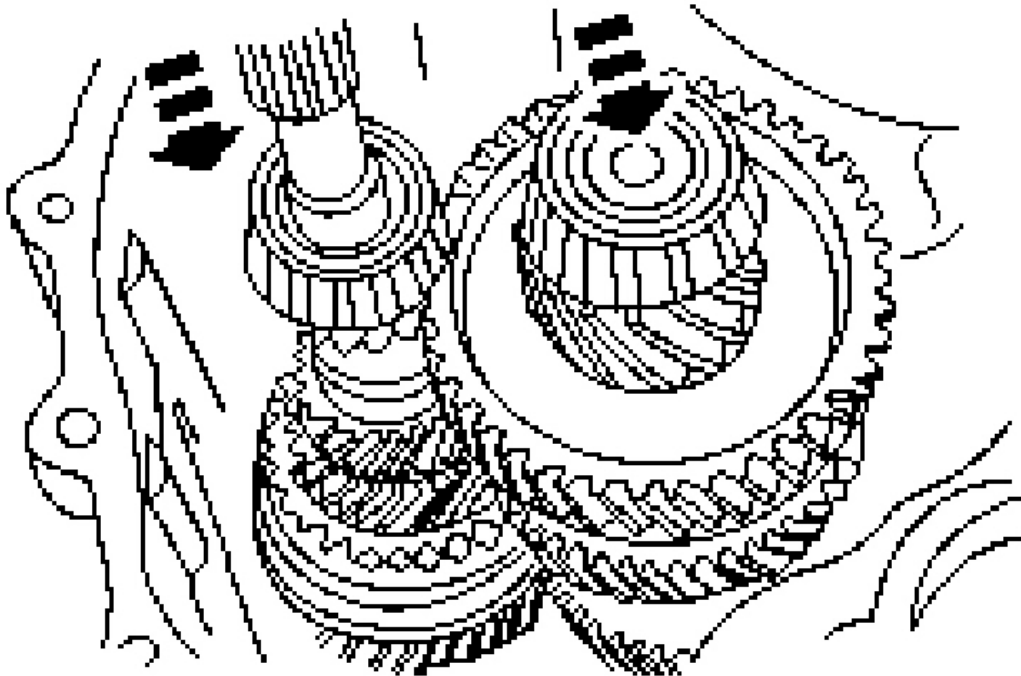


G03854864

Fig. 172: Engaging Fourth Gear Synchronizer On Input Shaft
Courtesy of FORD MOTOR CO.

6. Engage the fourth gear synchronizer on the input shaft.

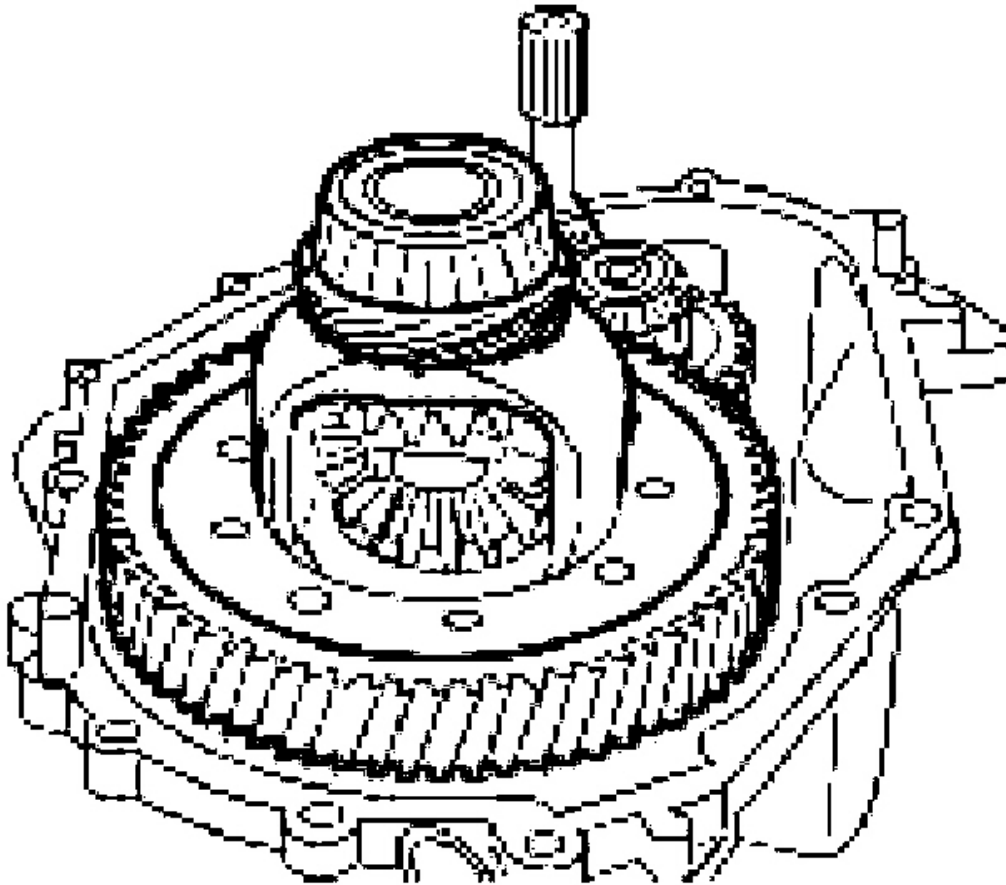
7. Assemble the input and output shafts together and put them in the transaxle case as an assembly.



G03854865

Fig. 173: Assembling Input And Output Shafts Together
Courtesy of FORD MOTOR CO.

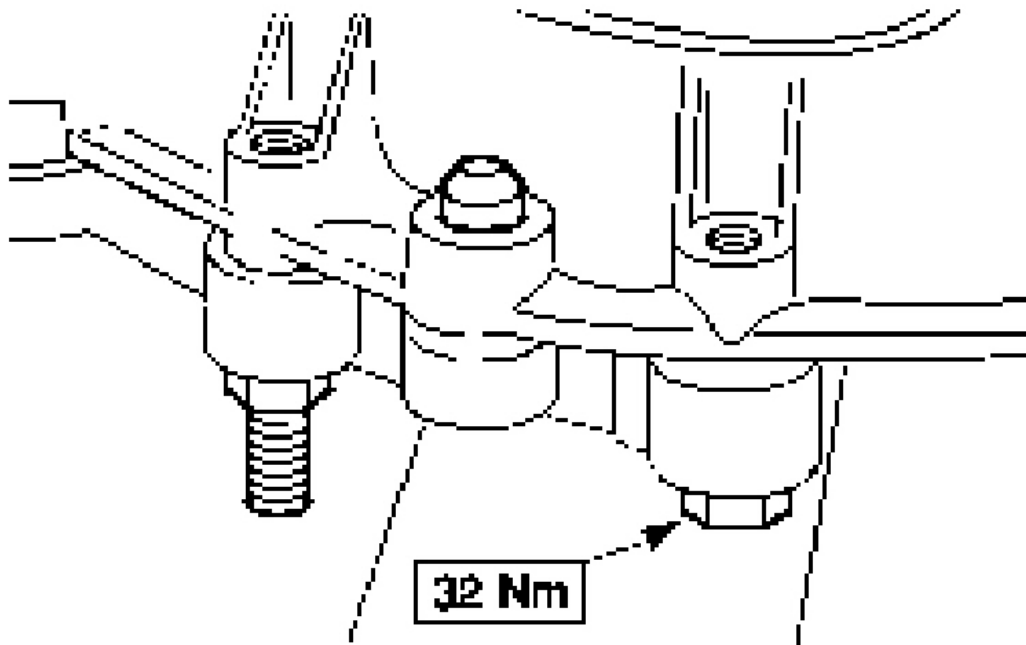
NOTE: Do not oil taper roller bearings which are to be used again.
New taper roller bearings can be installed without any treatment.



G03854866

Fig. 174: Installing Differential Assembly
Courtesy of FORD MOTOR CO.

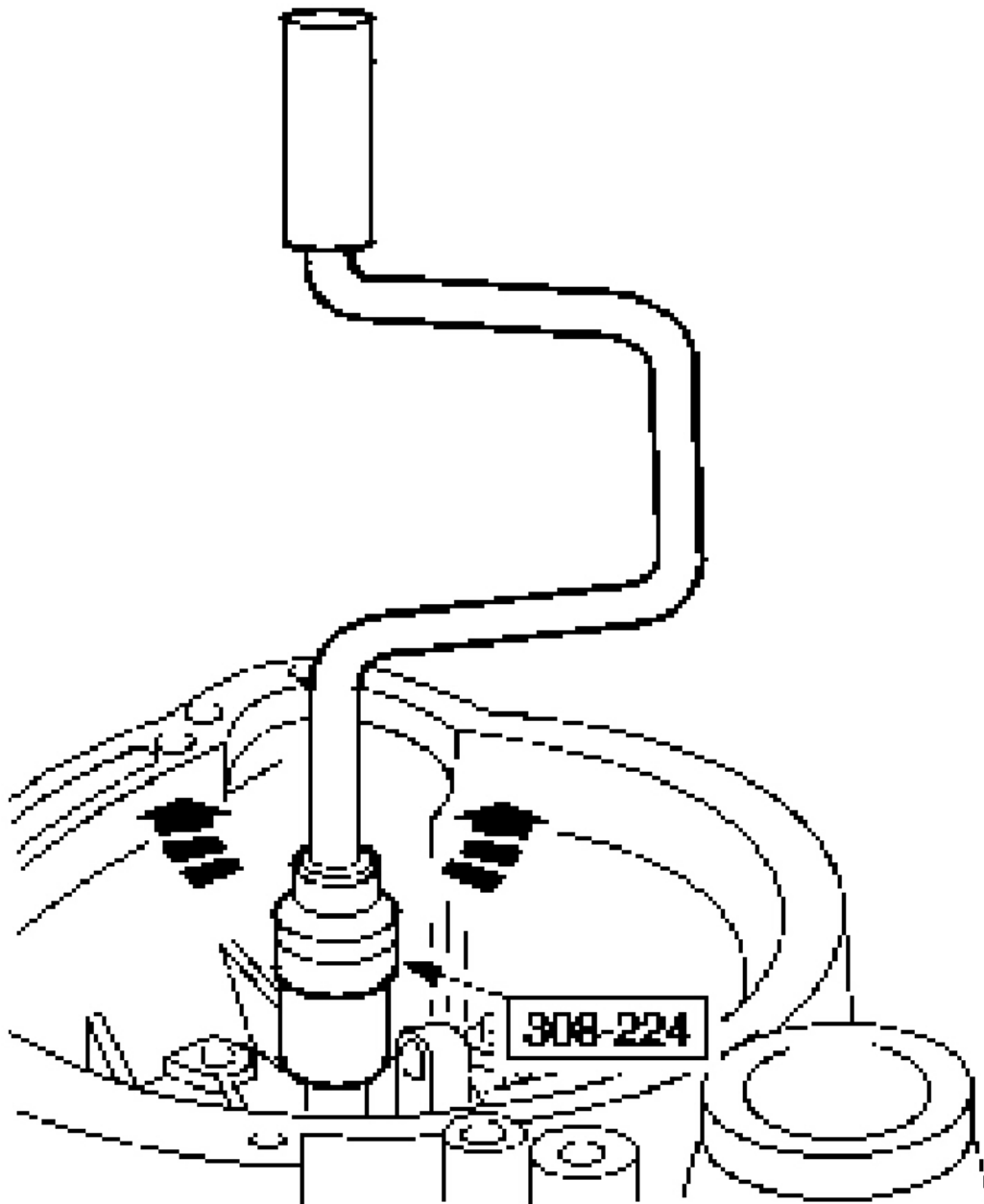
8. Install the differential assembly.
9. Position the housing and tighten the sixteen flange bolts uniformly.



G03854867

Fig. 175: Positioning Housing
Courtesy of FORD MOTOR CO.

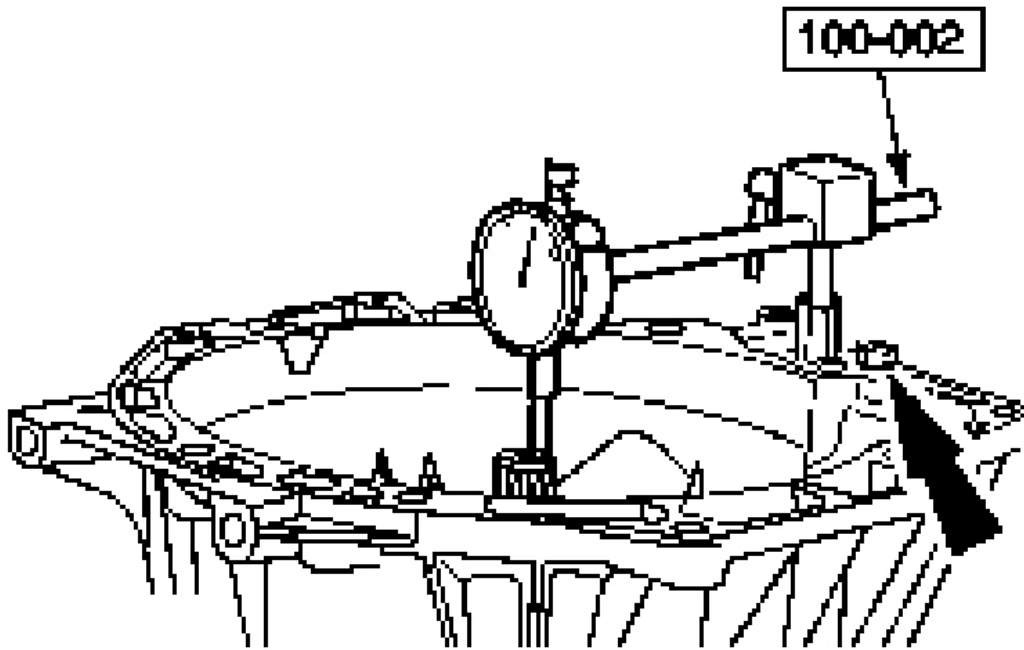
10. Using the special tool, prepare the input shaft for measuring.
 - Turn the input shaft back and forth to settle the bearings using the special tool.



G03854868

Fig. 176: Turning Input Shaft Back And Forth
Courtesy of FORD MOTOR CO.

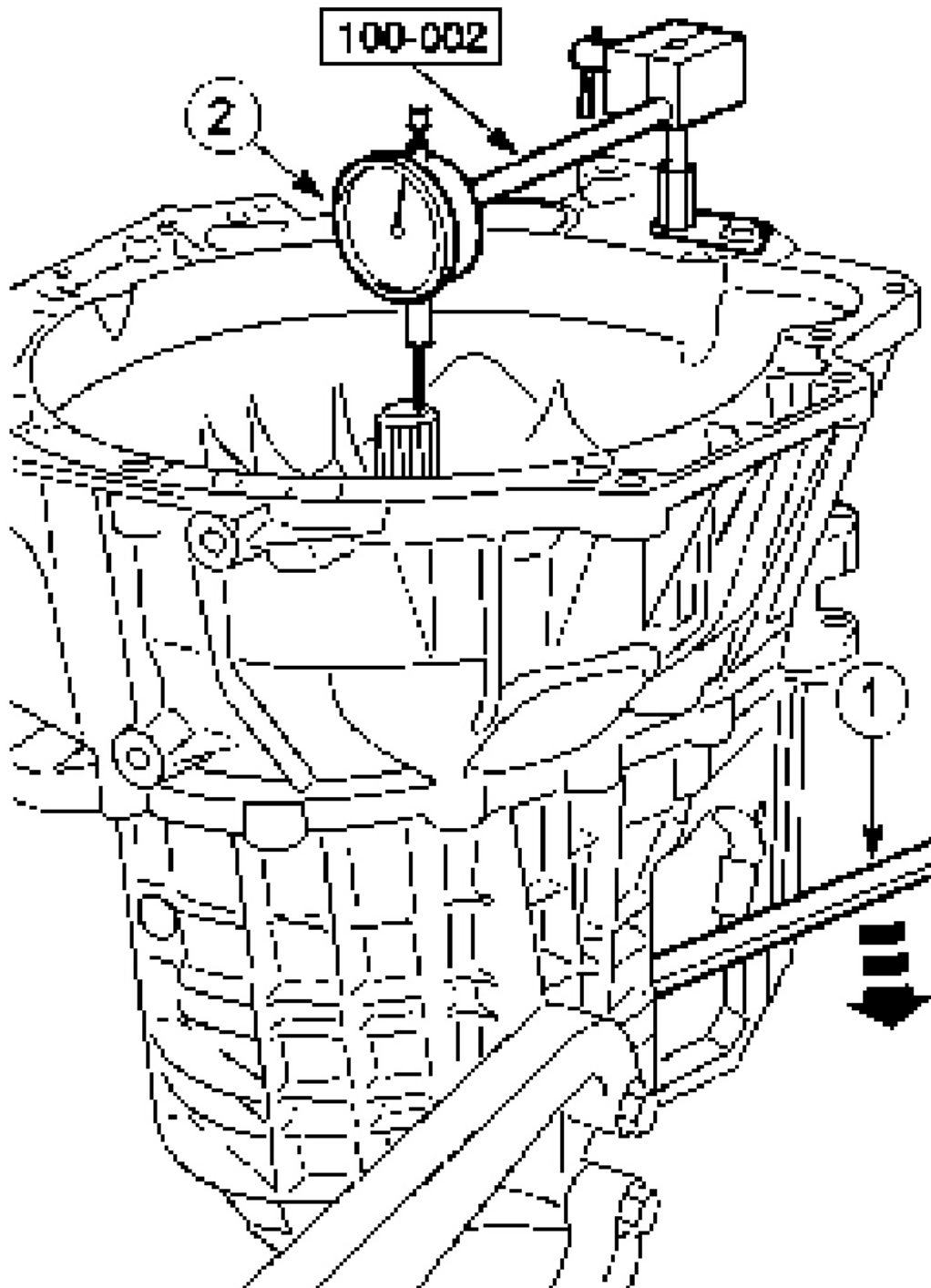
11. Install the special tool on the transaxle housing and set it to zero.



G03854869

Fig. 177: Installing Special Tool On Transaxle Housing
Courtesy of FORD MOTOR CO.

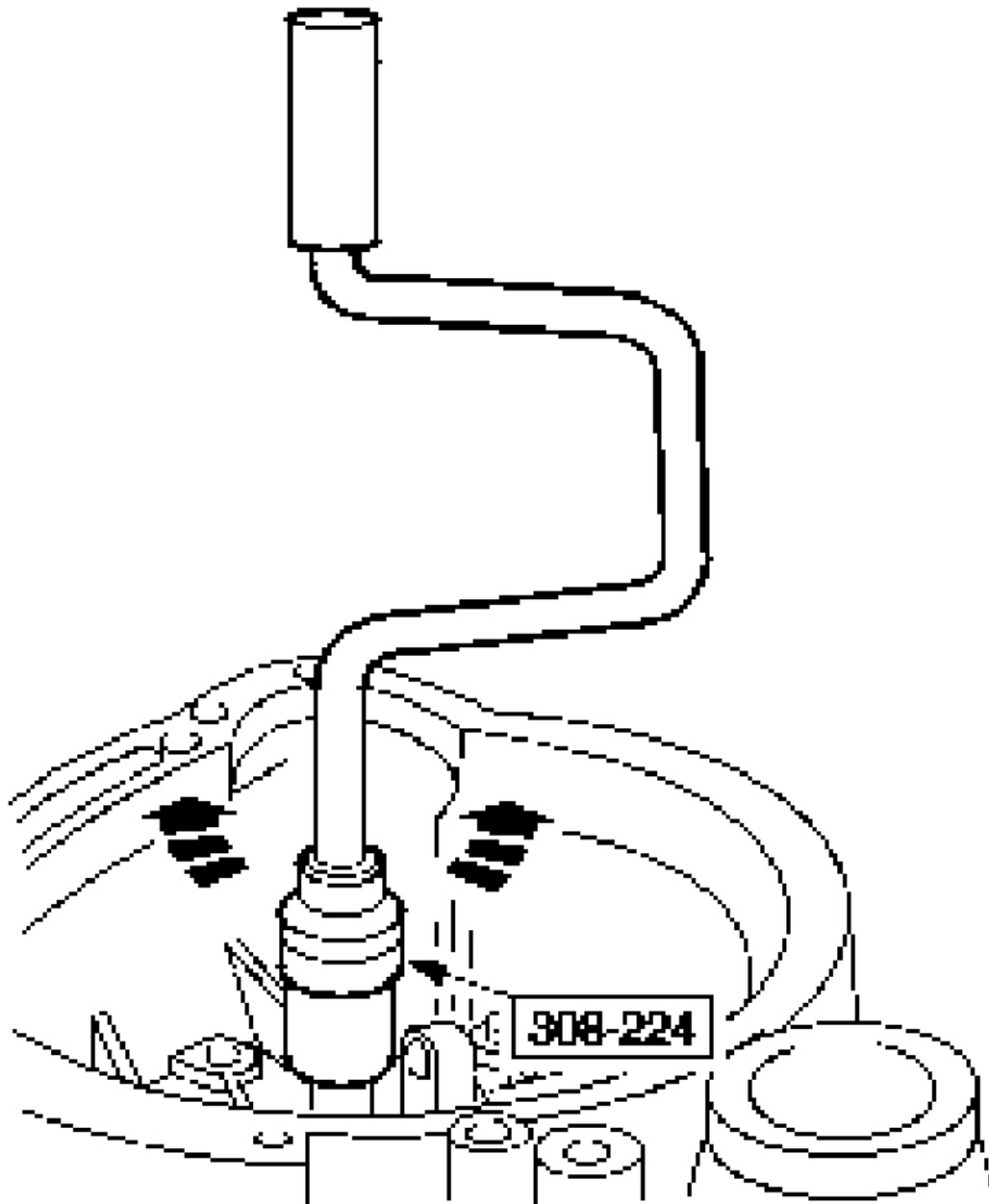
NOTE: Carry out the Measurement including the preparation three times and calculate the average measurement.



G03854870

Fig. 178: Measuring Input Shaft End Float
Courtesy of FORD MOTOR CO.

12. Measure the input shaft end float.
 1. Lift the input shaft with a lever.
 2. Note the resulting measurement.
 - Example: $0.22 \text{ mm} + 0.23 \text{ mm} + 0.21 \text{ mm}$ divided by three = 0.22 mm .
13. Using the special tools, prepare the output shaft for measuring.
 - Turn the input shaft back and forth to settle the bearings using the special tool.

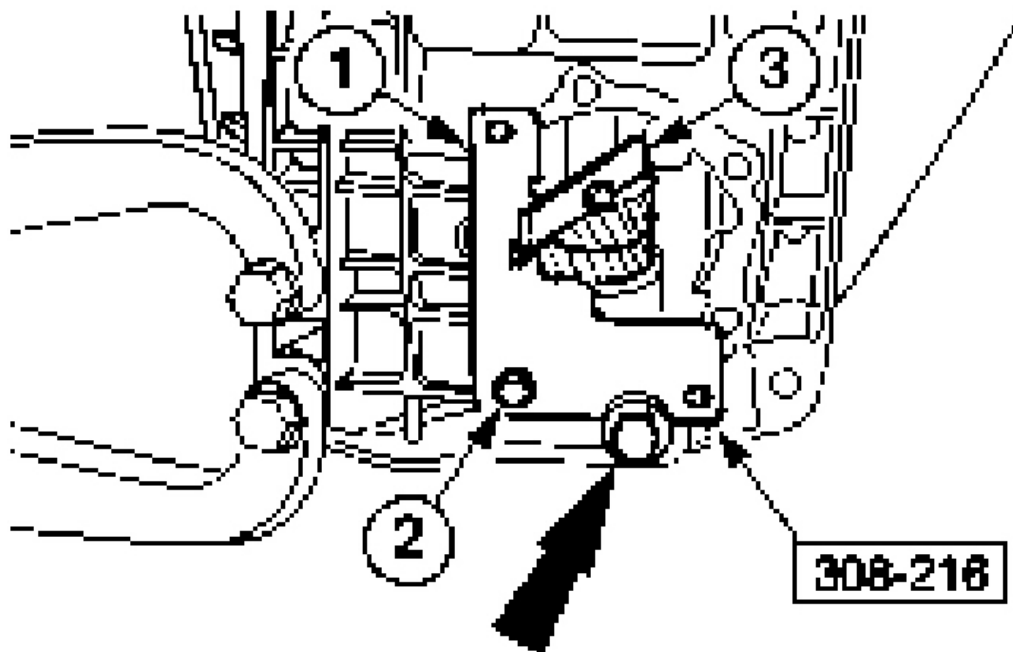


G03854871

Fig. 179: Turning Input Shaft Back And Forth
Courtesy of FORD MOTOR CO.

14. Install the special tool.

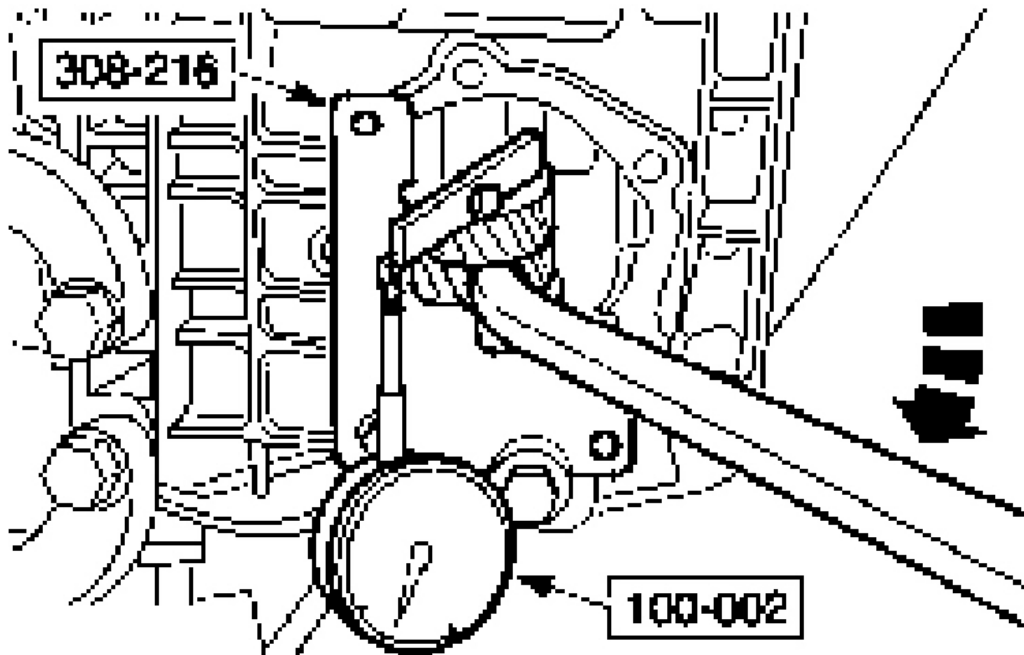
1. Position the special tool.
2. Install the bolts.
3. Position the special tool on the fourth gear.



G03854872

Fig. 180: Positioning Special Tool On Fourth Gear
Courtesy of FORD MOTOR CO.

NOTE: Carry out the Measurement including the preparation three times and calculate the average measurement.



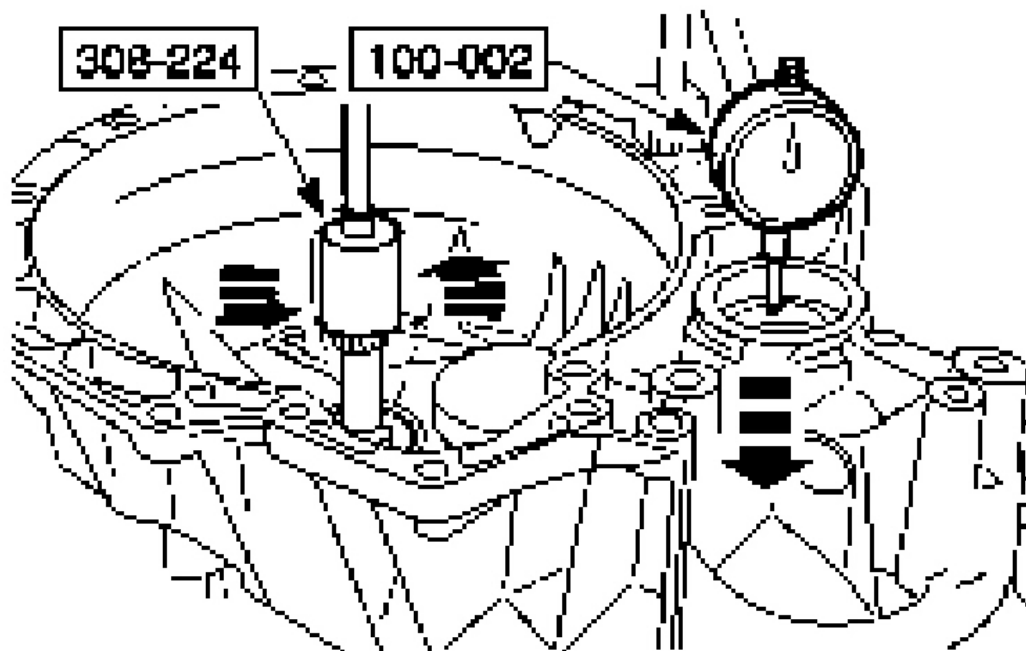
G03854873

Fig. 181: Measuring Output Shaft End Float
Courtesy of FORD MOTOR CO.

15. Measure the output shaft end float

- Lift the output shaft with a lever and note the resulting measurement, e.g. 0.32 mm.
- Example: $0.32 \text{ mm} + 0.34 \text{ mm} + 0.33 \text{ mm}$ divided by three = 0.33 mm.

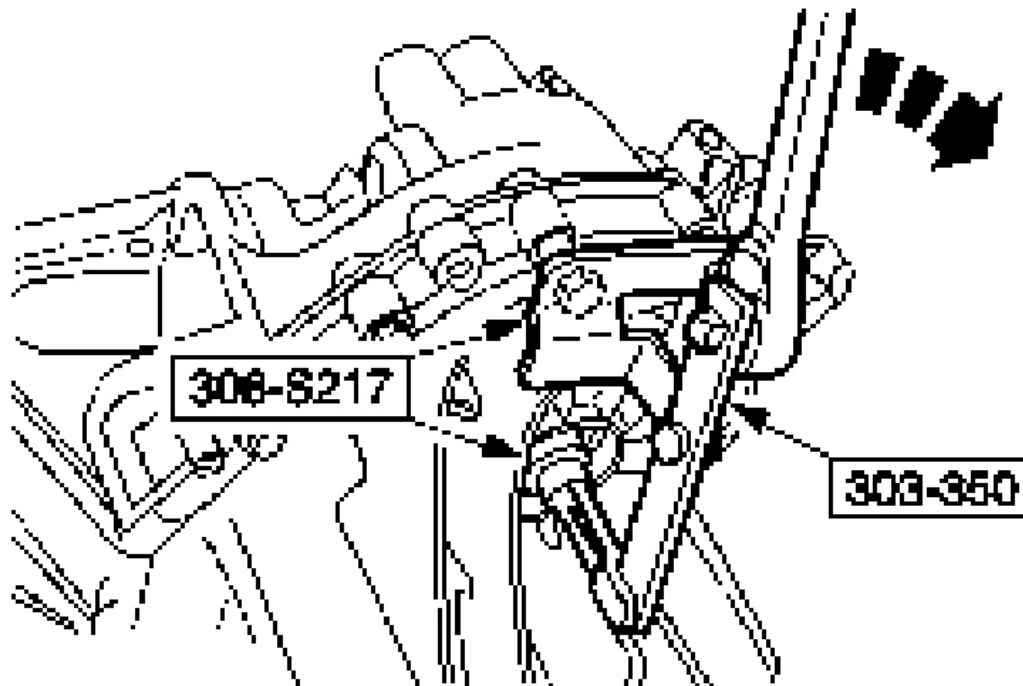
NOTE: Carry out the Measurement including the preparation three times and calculate the average measurement.



G03854874

Fig. 182: Turning Output Shaft Back And Forth
Courtesy of FORD MOTOR CO.

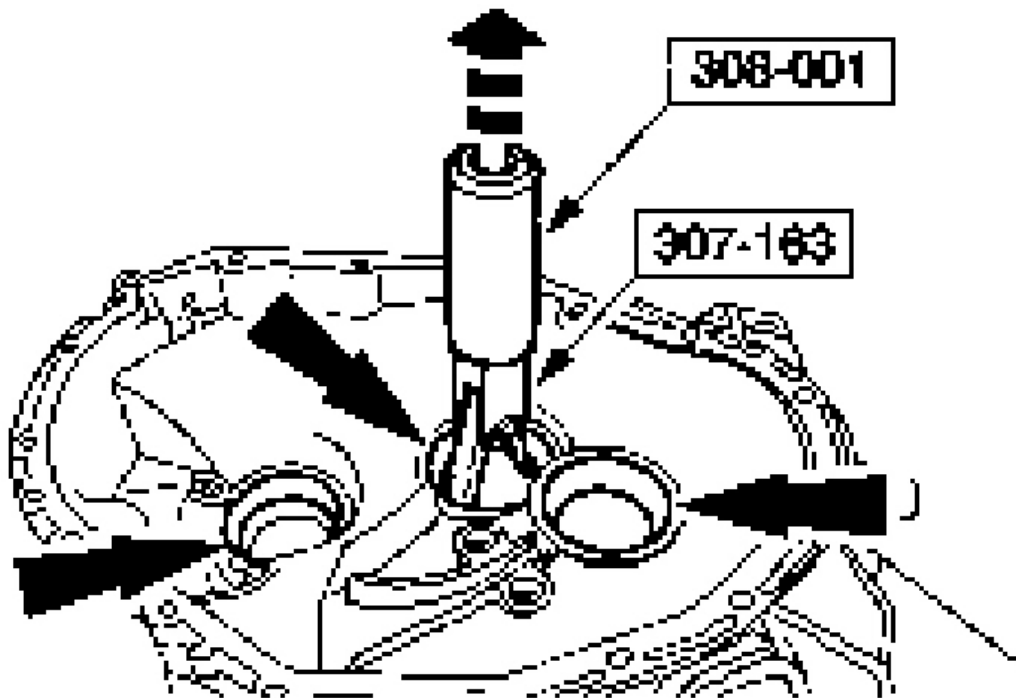
16. Using the special tools, prepare the differential for measuring.
 - Using the special tools, turn the output shaft back and forth and at the same time press down.
 - Set up the special tool and set it to zero.
17. Using the special tools, measure the differential end float.
 - Note the resulting measurement.



G03854875

Fig. 183: Measuring Differential End Float
Courtesy of FORD MOTOR CO.

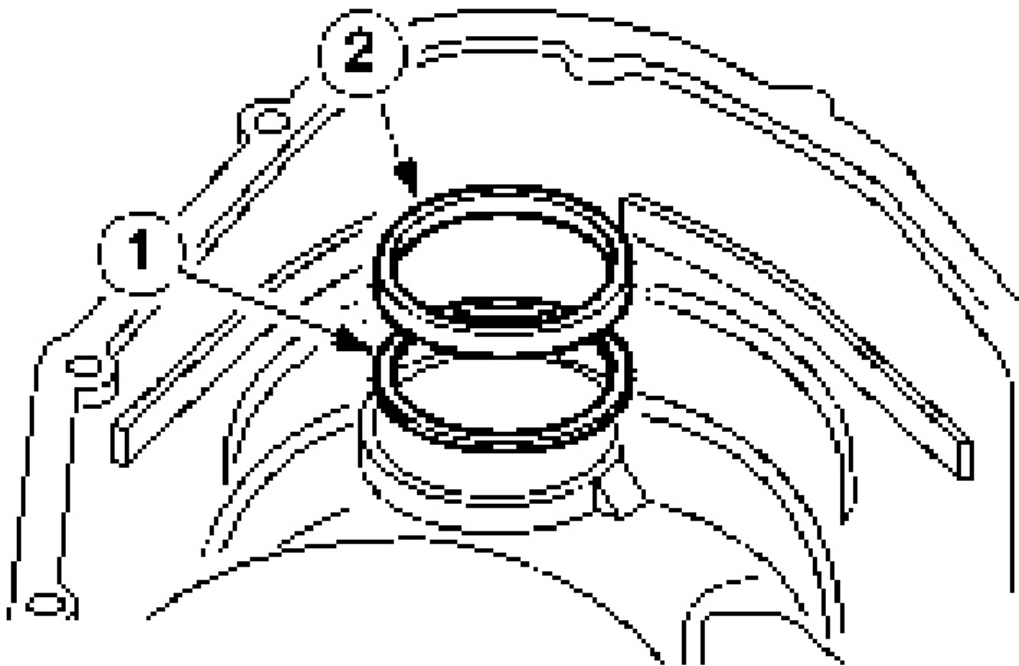
18. Select the correct shim(s) for the differential, input shaft and output shaft. Refer to **SPECIFICATIONS**.
19. Using the special tools, remove the bearing outer races and shim of the differential, the input shaft and the output shaft again.
 - Locate the special tool in the housing recesses.



G03854876

Fig. 184: Removing Bearing Outer Races And Shim Of Differential
Courtesy of FORD MOTOR CO.

CAUTION: The press pressure must not exceed 15 kN.



G03854877

Fig. 185: Installing Selected Shims And Bearing Cups In Housing Section At Clutch End

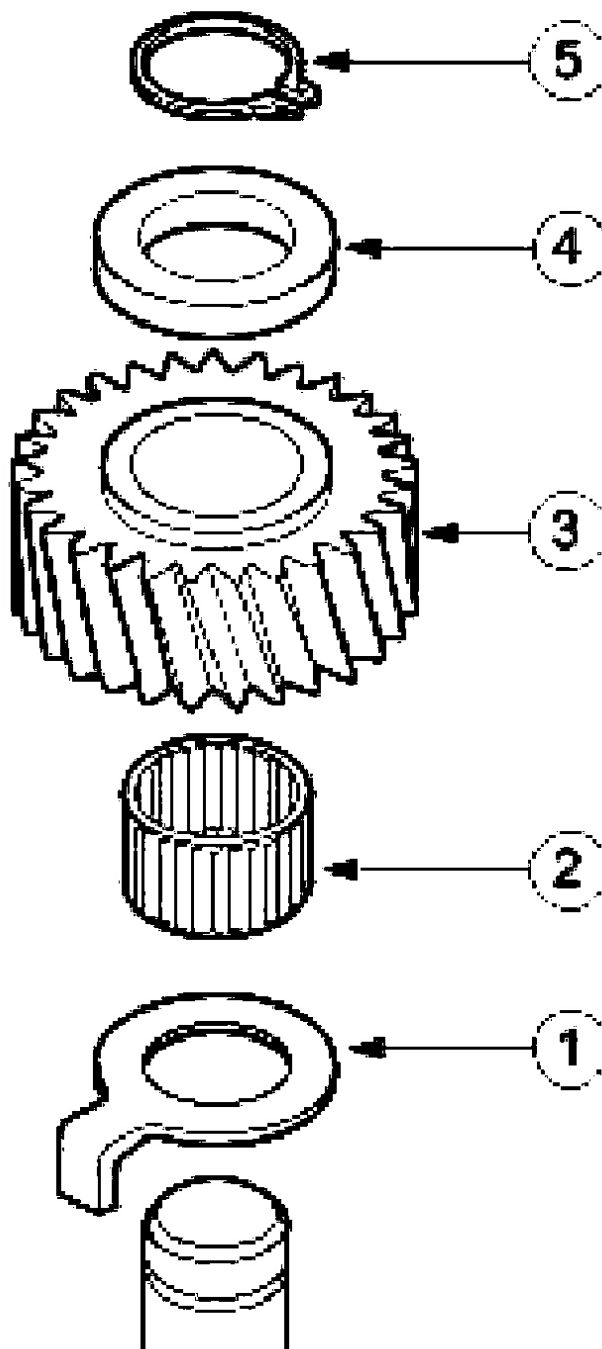
Courtesy of FORD MOTOR CO.

20. Install the selected shims and the bearing cups in the housing section at the clutch end.
 - Heat the housing area to approximately 80°C.
 - Cool the bearing cups.
 - 3. Install the selected shims.
 - 4. Install the bearing cups.
 - Install the bearing cups of the:
 - Input shaft using 205-153 and 308-221.
 - Output shaft using 205-153 and 308-046-01.
 - Differential using 205-153 and 308-121.
21. Install the reverse idler gear.
 1. Lower thrust washer.

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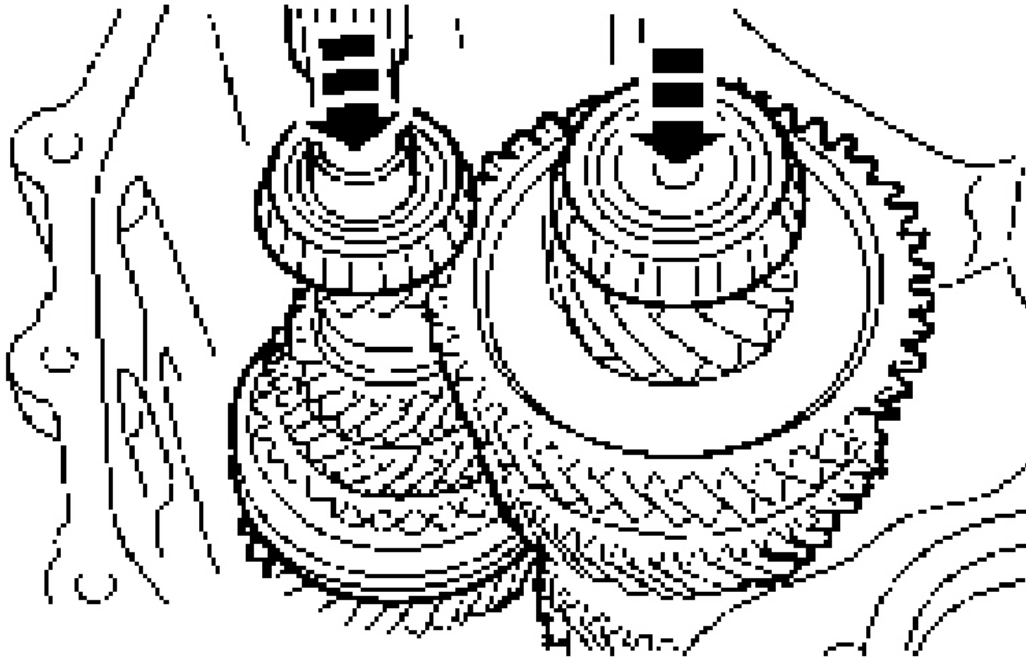
2. Needle roller bearing.
3. Reverse idler gear (smaller collar facing downwards).
4. Upper thrust washer.
5. Snap-ring.



G03854878

Fig. 186: Installing Reverse Idler Gear
Courtesy of FORD MOTOR CO.

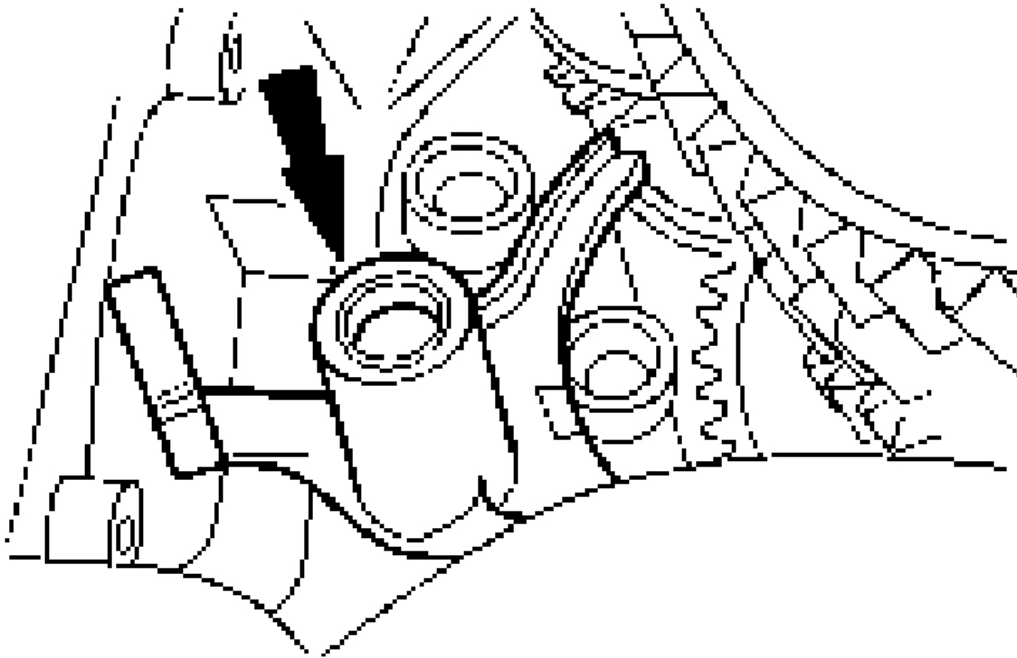
22. Install the input shaft and the output shaft.



G03854879

Fig. 187: Installing Input Shaft And Output Shaft
Courtesy of FORD MOTOR CO.

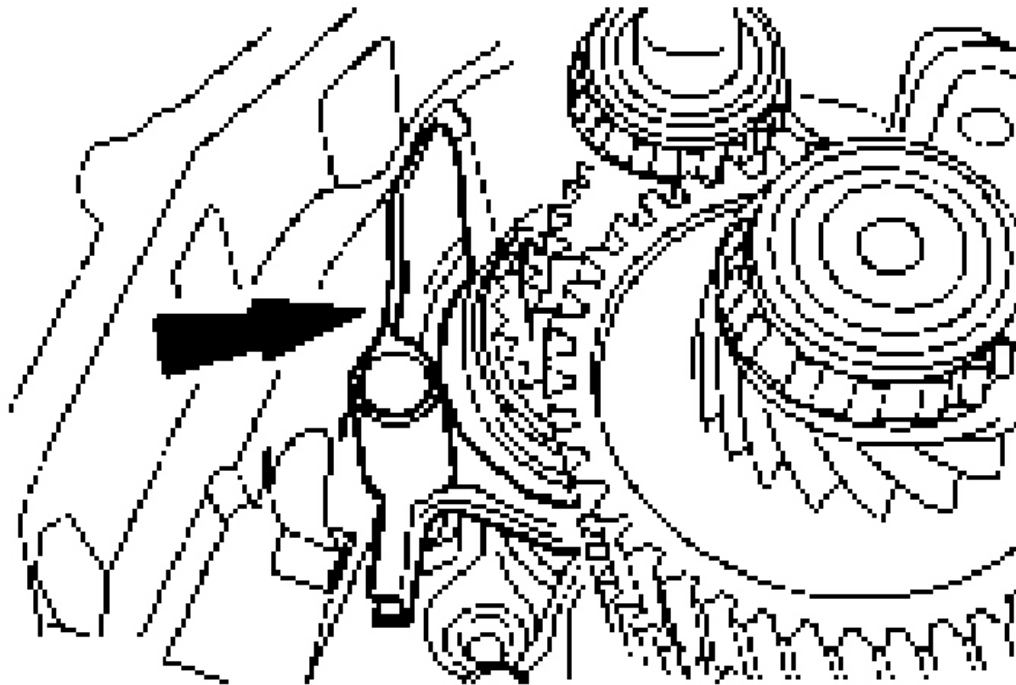
NOTE: **Make sure the fourth gear selector ring is in the neutral position.**



G03854880

Fig. 188: Installing Fifth/Reverse Gear Selector Fork
Courtesy of FORD MOTOR CO.

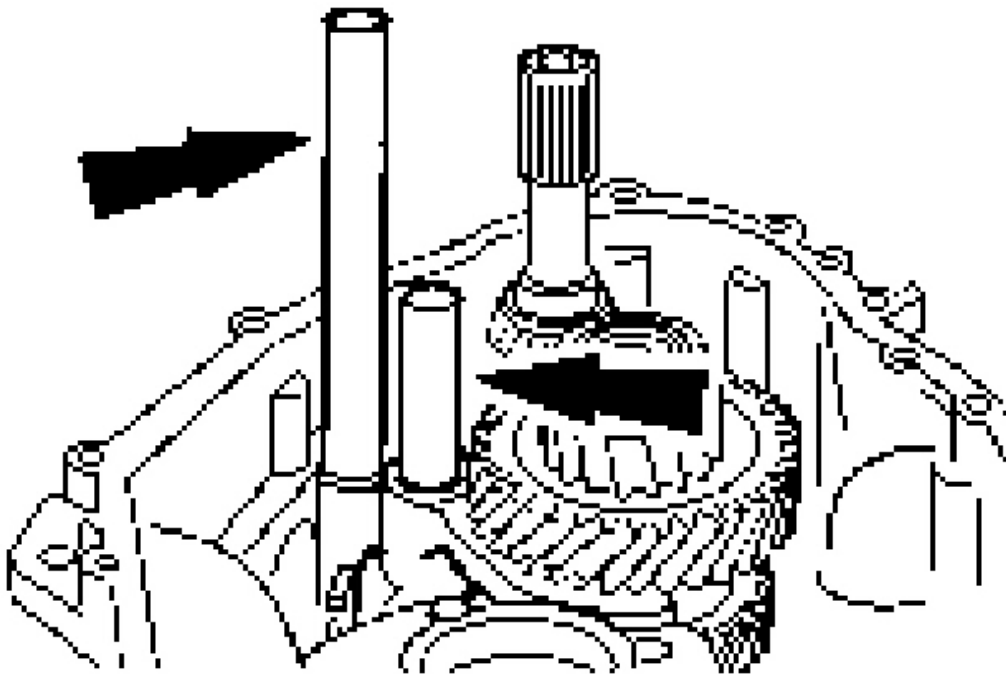
23. Install the fifth/reverse gear selector fork and position it to the side.
24. Install the third/fourth gear selector fork.



G03854881

Fig. 189: Installing Third/Fourth Gear Selector Fork
Courtesy of FORD MOTOR CO.

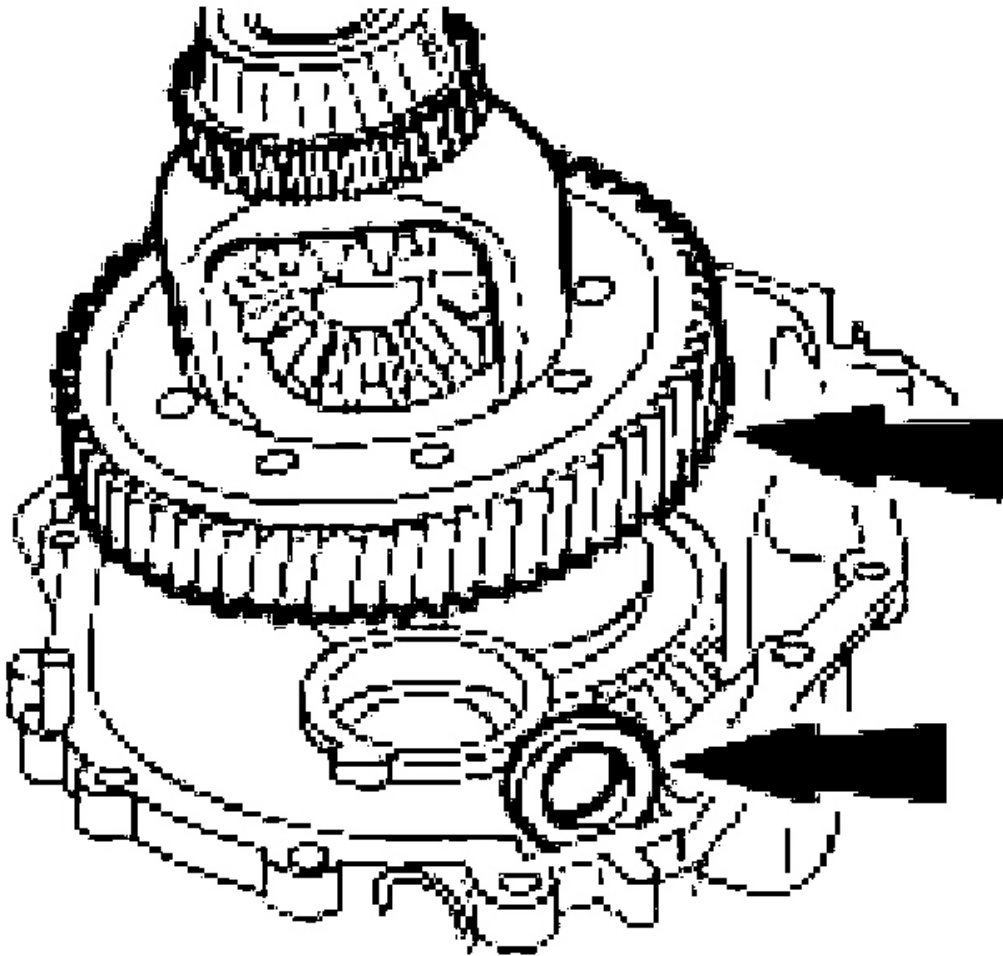
NOTE: When installed correctly, the selector rods are the same height.



G03854882

Fig. 190: Installing First/Second Gear Selector Fork And Rods
Courtesy of FORD MOTOR CO.

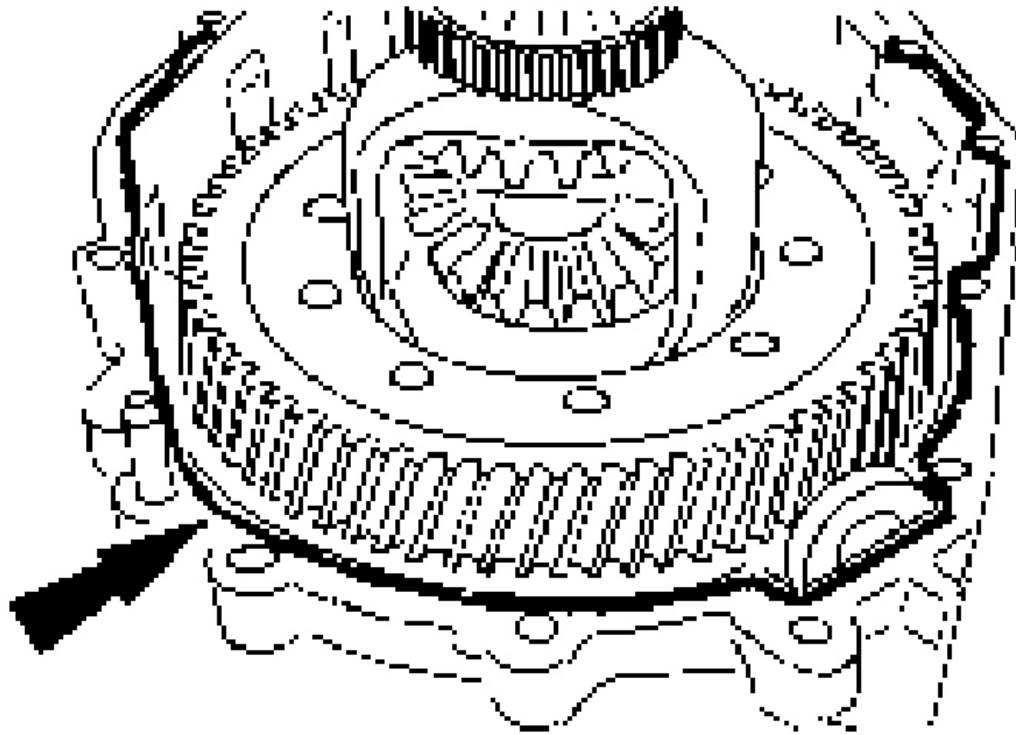
25. Install the first/second gear selector fork and rods.
26. Install the differential assembly and the magnetic disk.



G03854883

Fig. 191: Installing Differential Assembly And Magnetic Disk
Courtesy of FORD MOTOR CO.

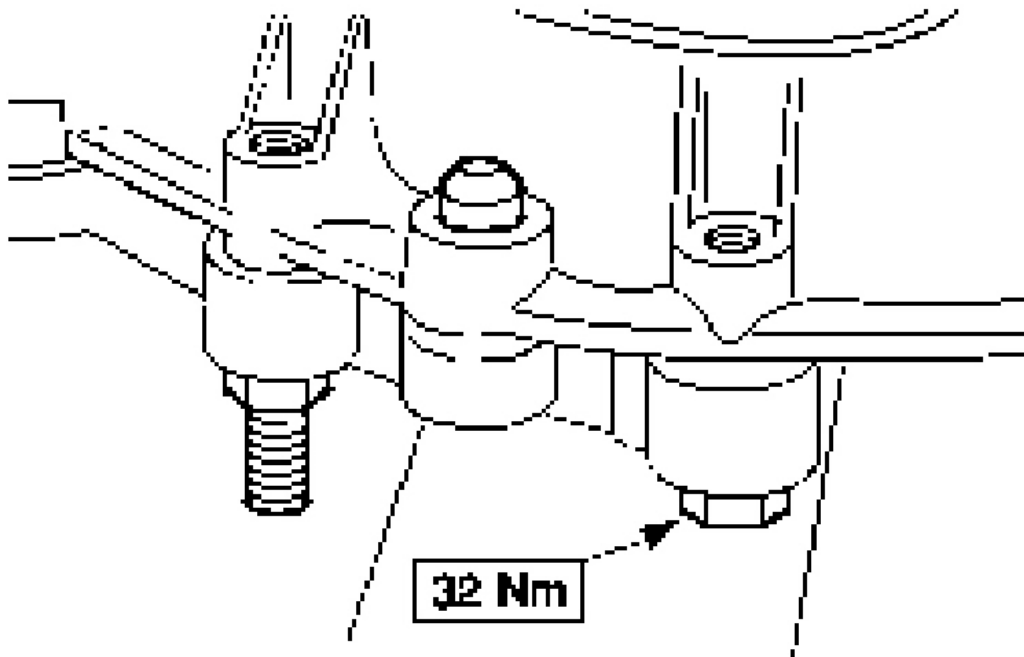
27. Treat the mating face with sealer.
 - The mating face must be dry. Sealer must be applied in an even coating to the inside of the mating face. (The even bead of sealer should have a diameter of 2 mm).



G03854884

Fig. 192: Treating Mating Face With Sealer
Courtesy of FORD MOTOR CO.

NOTE: The transaxle housing must not be turned over to tighten the bolts.

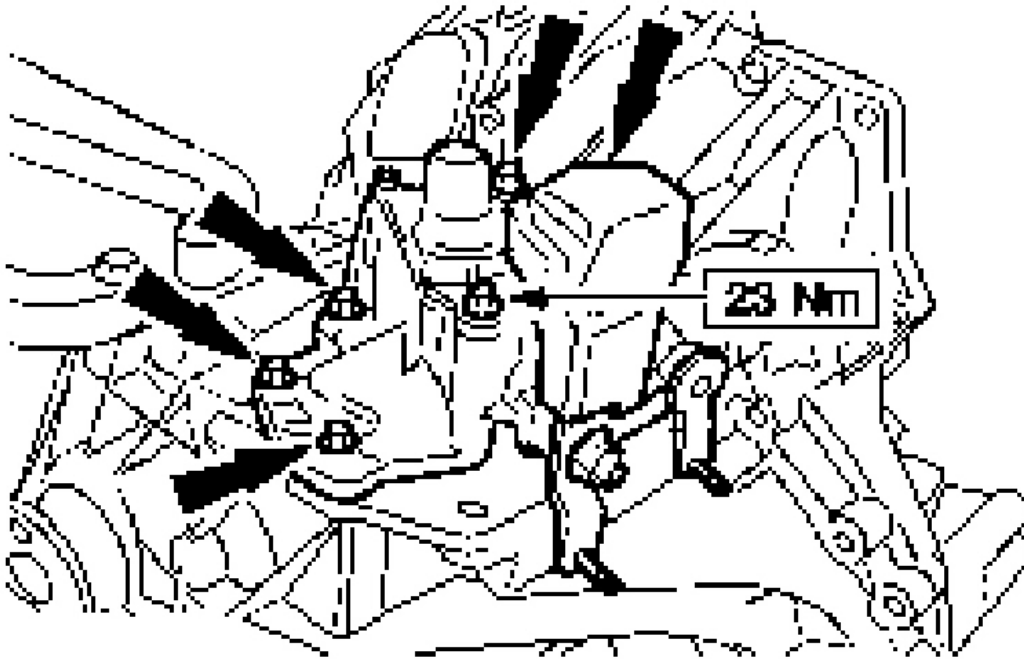


G03854885

Fig. 193: Identifying Tightening Torque Of Housing (Clutch End) Flange Bolt
Courtesy of FORD MOTOR CO.

28. Install the housing (clutch end).
- Tighten the 16 flange bolts within 15 minutes, working diagonally.

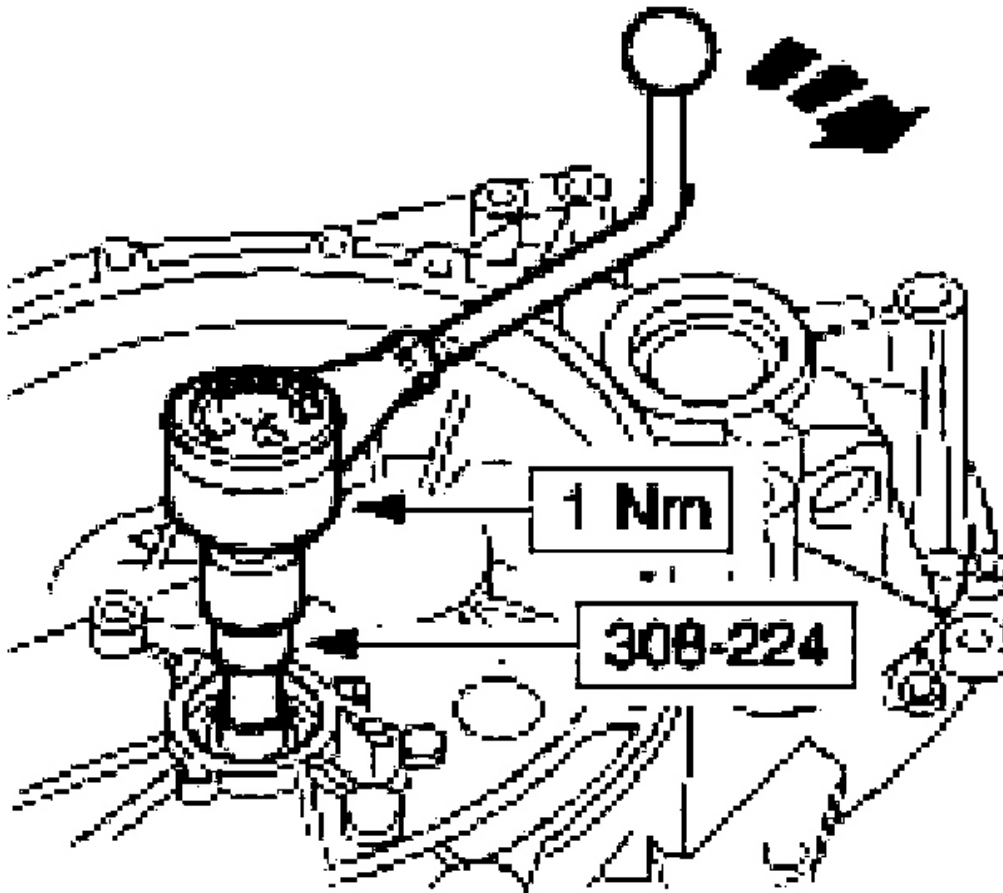
NOTE: **Make sure the transaxle is in neutral (the gearshift lever and selector lever must be vertical).**



G03854886

Fig. 194: Positioning Selector Mechanism
Courtesy of FORD MOTOR CO.

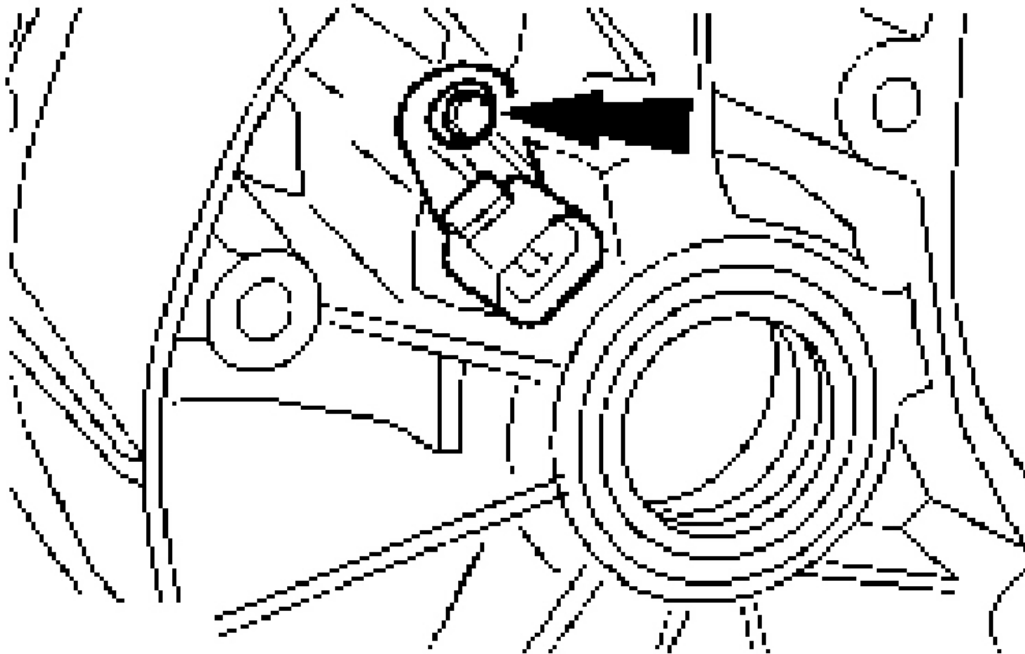
29. Position the selector mechanism and install the bolts.
 - Coat the mating face with sealer.
30. Using the special tool, measure the turning torque.
 - Engage fourth gear.
 - Measure the turning torque.
 - If the turning torque is too high, all the measurements (to establish the required shim thickness) must be repeated.



G03854887

Fig. 195: Measuring Turning Torque Of Fourth Gear
Courtesy of FORD MOTOR CO.

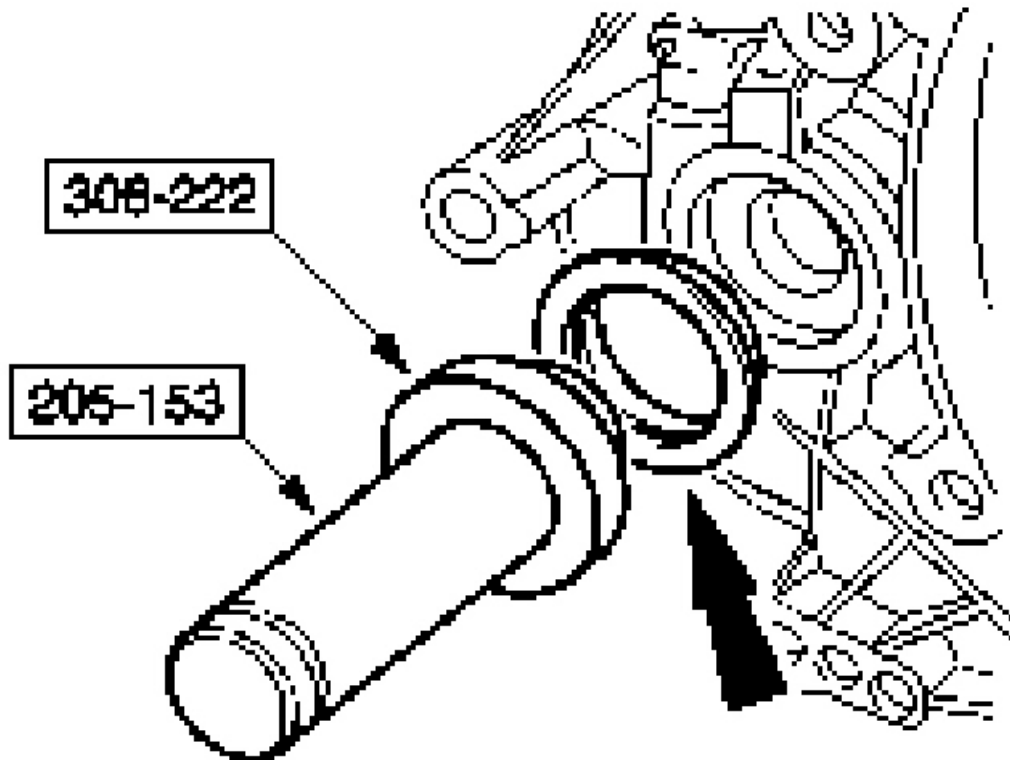
31. Install the vehicle speed sensor (VSS).



G03854888

Fig. 196: Installing Vehicle Speed Sensor (VSS)
Courtesy of FORD MOTOR CO.

32. Using the special tools, install the differential oil seals.



G03854889

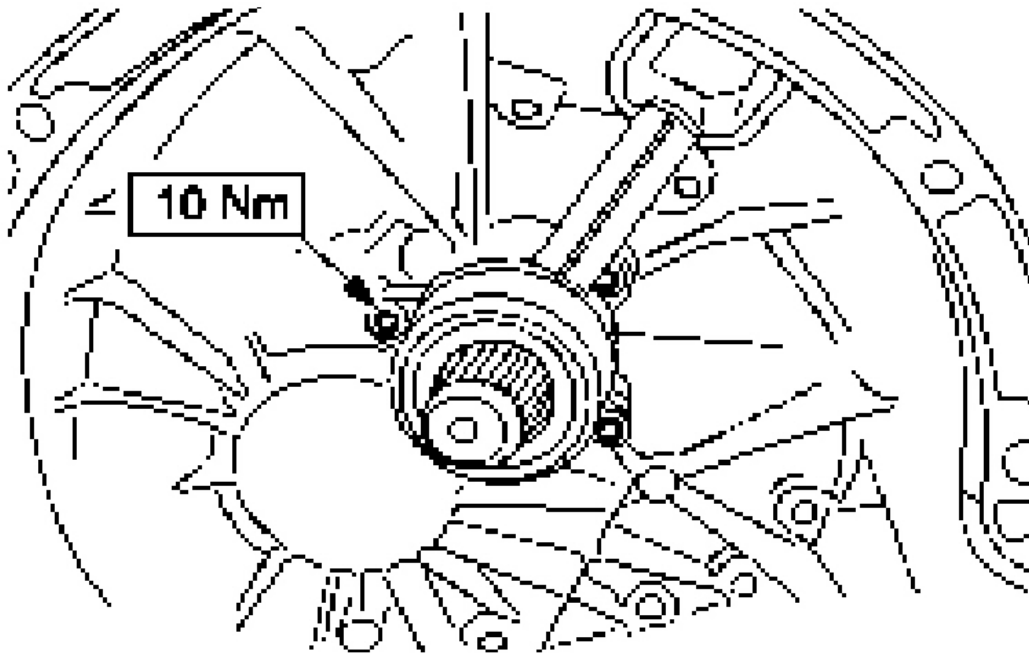
Fig. 197: Installing Differential Oil Seals
Courtesy of FORD MOTOR CO.

CAUTION: If brake fluid is spilt on the paintwork, the affected area must be immediately washed down with cold water.

CAUTION: Using suitable adhesive tape, cover the input shaft splines to prevent damage to the input shaft oil seal.

CAUTION: Do not apply grease on any area of the clutch slave cylinder.

NOTE: Install a new clutch slave cylinder.



G03854890

Fig. 198: Installing Slave Cylinder With Seal
Courtesy of FORD MOTOR CO.

33. Coat the slave cylinder with sealer and install it together with a new seal.
34. Remove the adhesive tape from the input shaft splines.
35. Coat the input shaft splines with a thin layer of high-temperature grease.

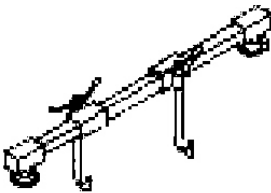
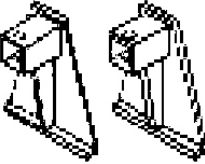
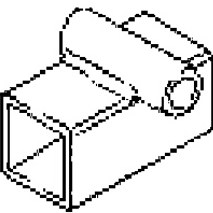
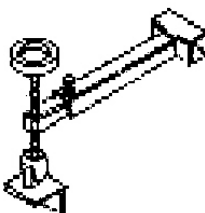
INSTALLATION

TRANSAXLE

Special Tool(s)

2002 Ford Focus LX

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	Support Bar, Engine 303-290A
	Adapter for 303-290A 303-290-01
	Adapter for 303-290A 303-290-02
	Adapter for 303-290A 303-290-03A

G03854891

Fig. 199: Special Tools Specifications (Transaxle)
Courtesy of FORD MOTOR CO.

General Equipment

GENERAL EQUIPMENT

Retaining strap

Transmission jack

2002 Ford Focus LX

2002 TRANSMISSION Manual Transmission/Transaxle - Vehicles With MTX75/Manual Transaxle - Focus

Material

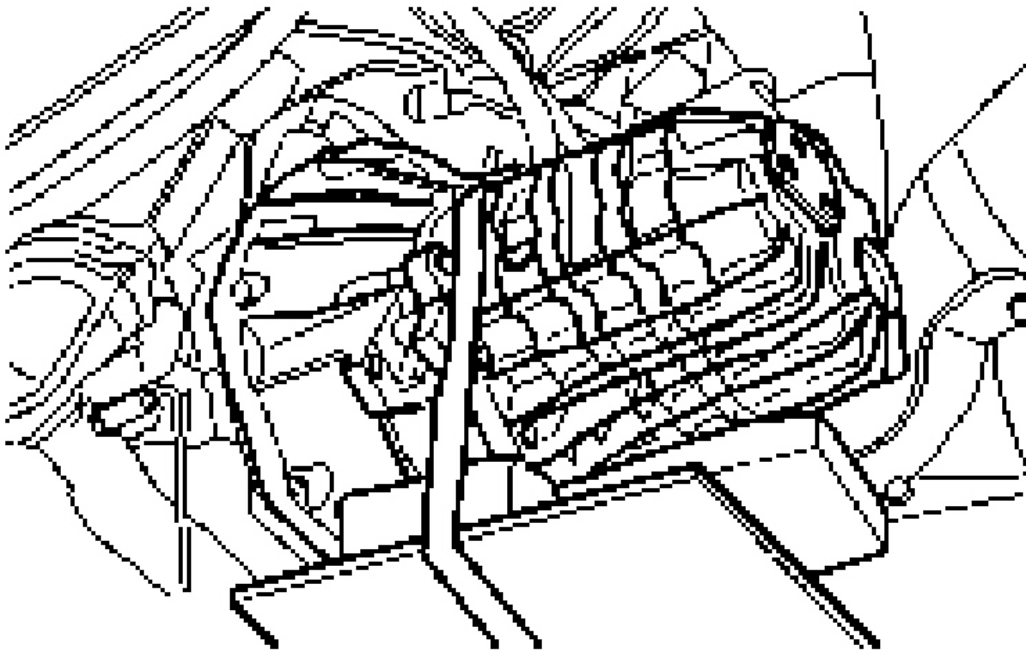
MATERIAL SPECIFICATIONS

Manual transmission fluid	WSD-M2C200-C
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Installation

1. General note.
 - Only use new self-locking nuts.
2. Raise and support the vehicle.

CAUTION: Make sure that the two locating tubes are installed.

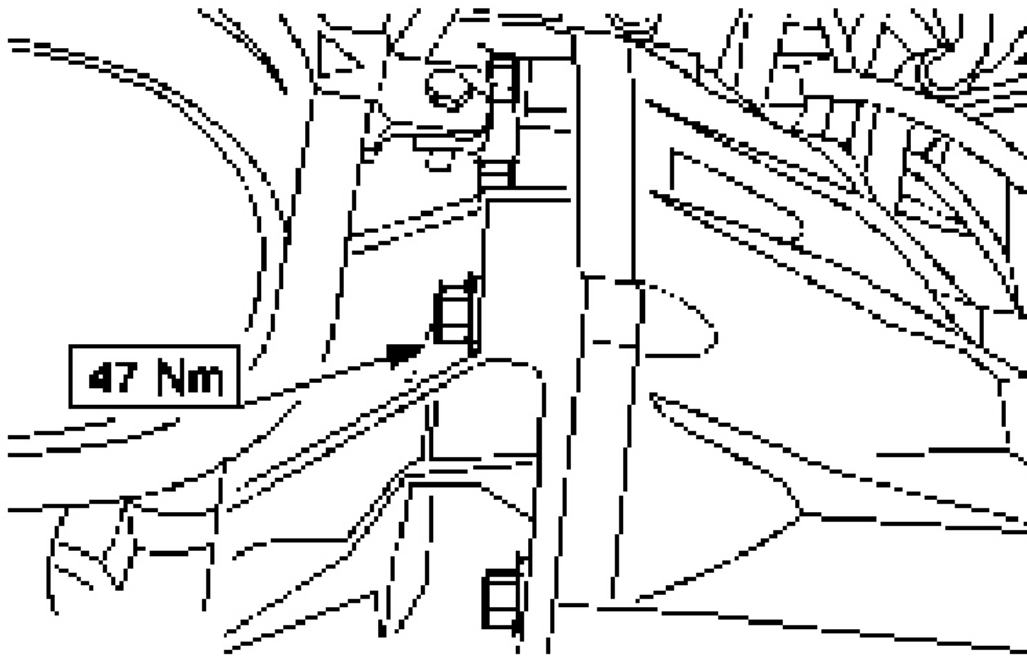


G03854892

Fig. 200: Securing Transaxle On Transmission Jack
Courtesy of FORD MOTOR CO.

3. Using a retaining strap and wooden blocks, secure the transaxle on a transmission jack.

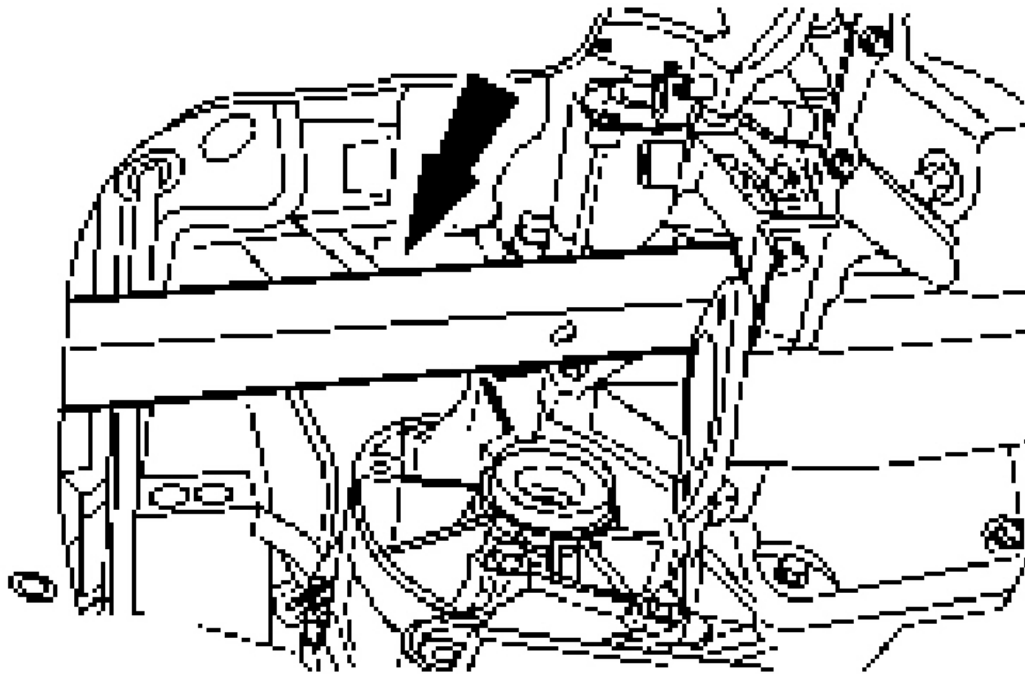
4. Install the transaxle right-hand flange bolts.



G03854893

Fig. 201: Identifying Tightening Torque Of Transaxle Right-Hand Flange Bolts
Courtesy of FORD MOTOR CO.

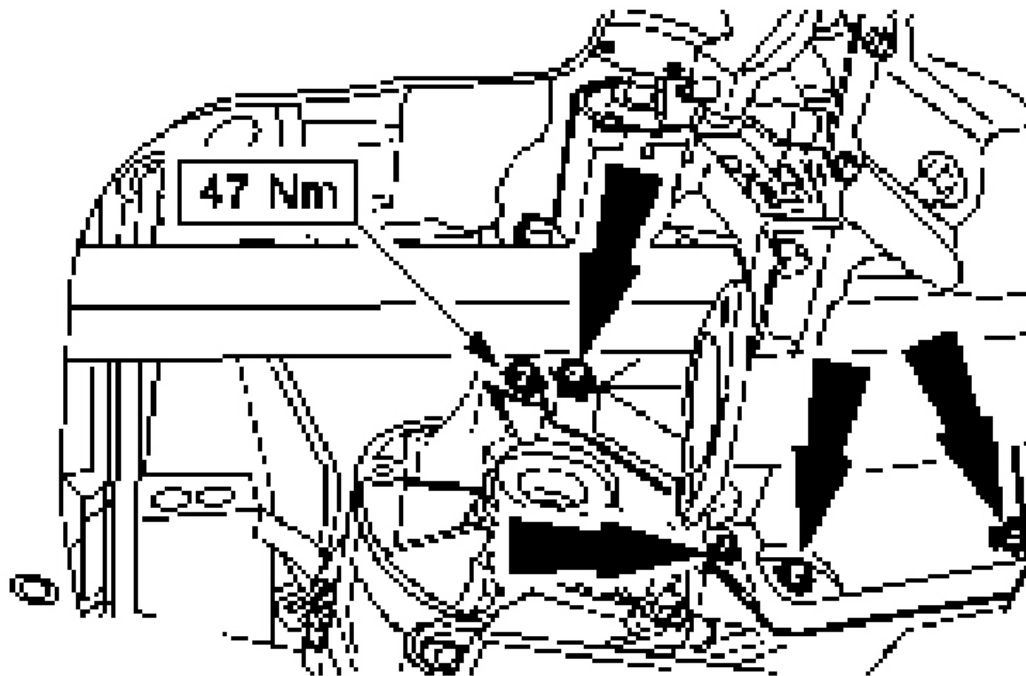
5. Push the engine forwards and install an approximately 350 mm long wooden block between the engine and the crossmember.
 - Move the transaxle into position.



G03854894

Fig. 202: Installing Wooden Block Between Engine And Crossmember
Courtesy of FORD MOTOR CO.

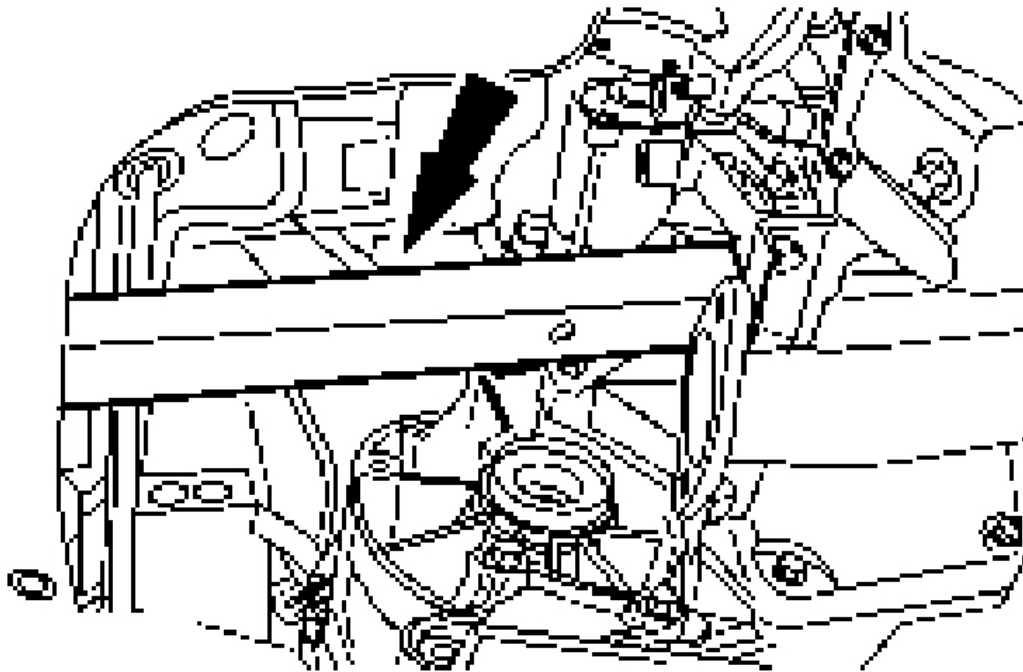
6. Install the transaxle lower flange bolts.



G03854895

Fig. 203: Identifying Tightening Torque Of Transaxle Lower Flange Bolts
Courtesy of FORD MOTOR CO.

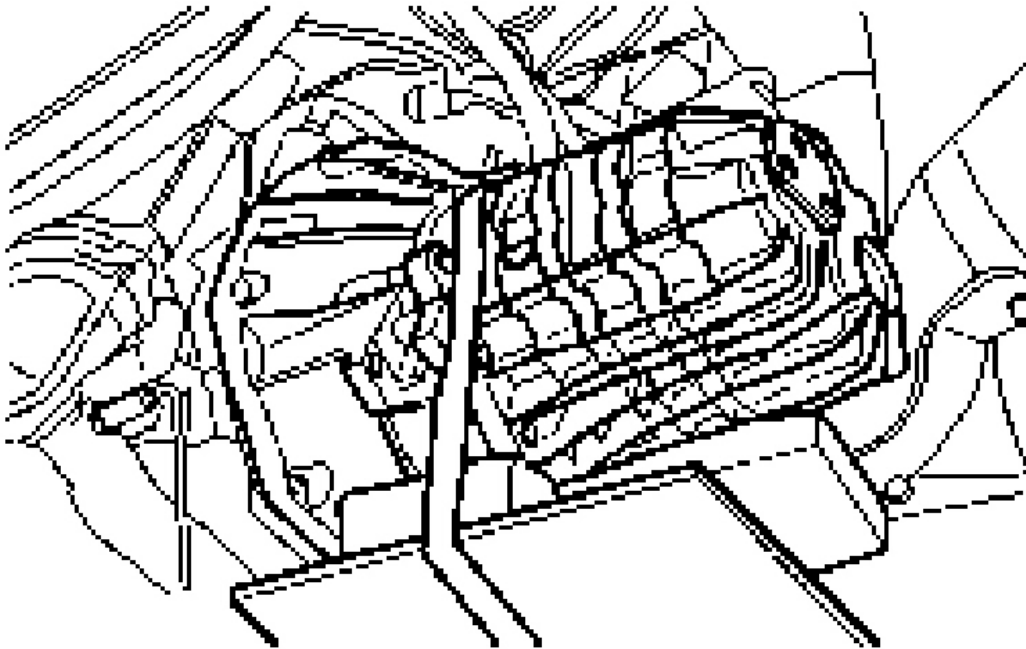
7. Remove the retaining strap from the transaxle.
8. Remove the wooden block.



G03854896

Fig. 204: Removing Wooden Block
Courtesy of FORD MOTOR CO.

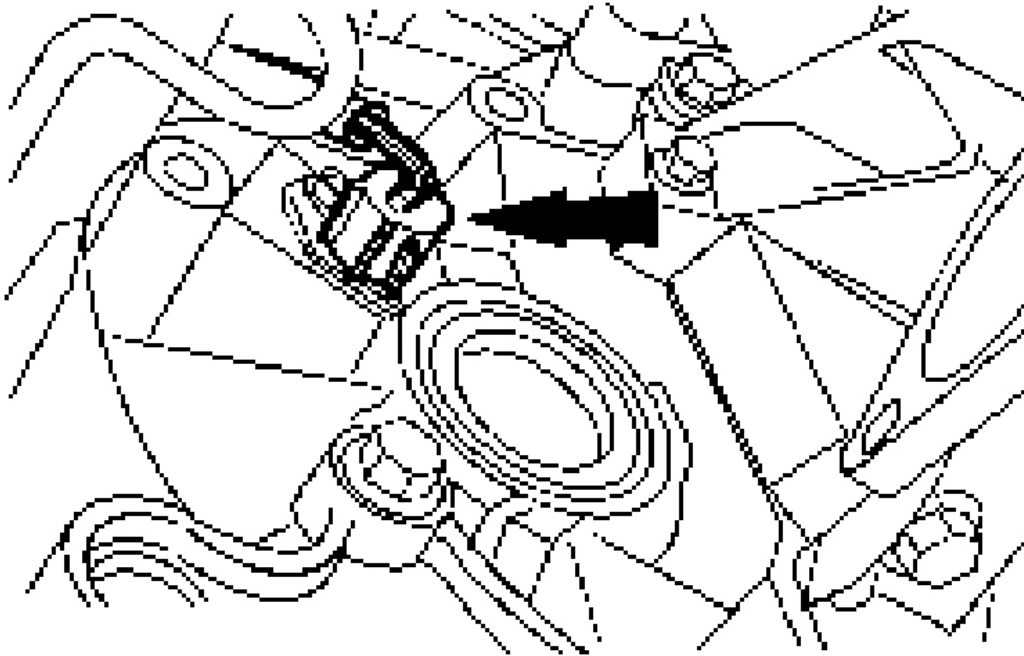
9. Remove the transmission jack.



G03854897

Fig. 205: Removing Transmission Jack
Courtesy of FORD MOTOR CO.

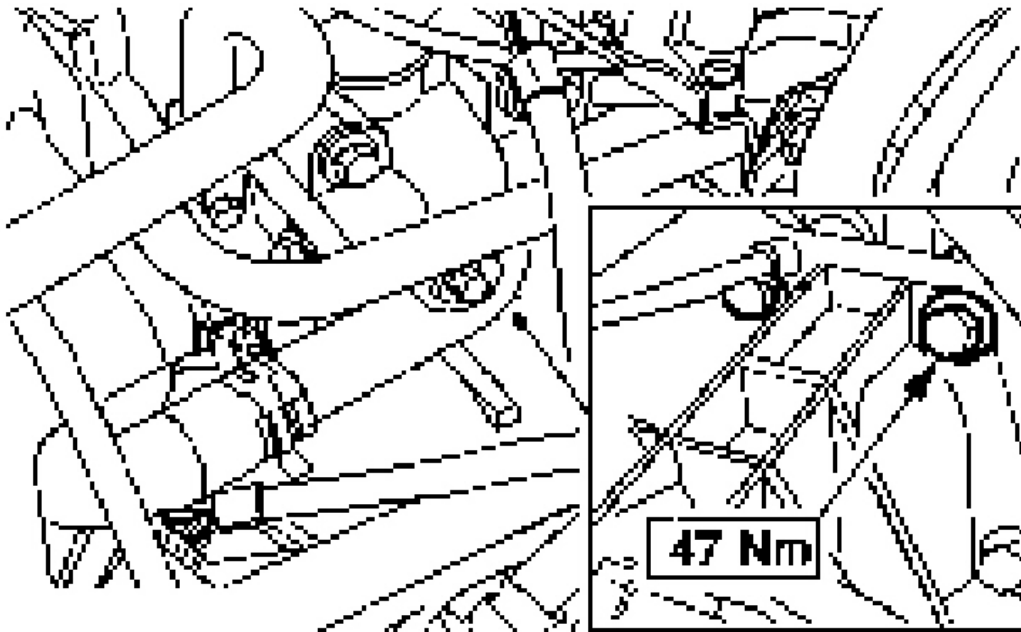
10. Connect the vehicle speed sensor (VSS) electrical connector.



G03854898

Fig. 206: Connecting Vehicle Speed Sensor (VSS) Electrical Connector
Courtesy of FORD MOTOR CO.

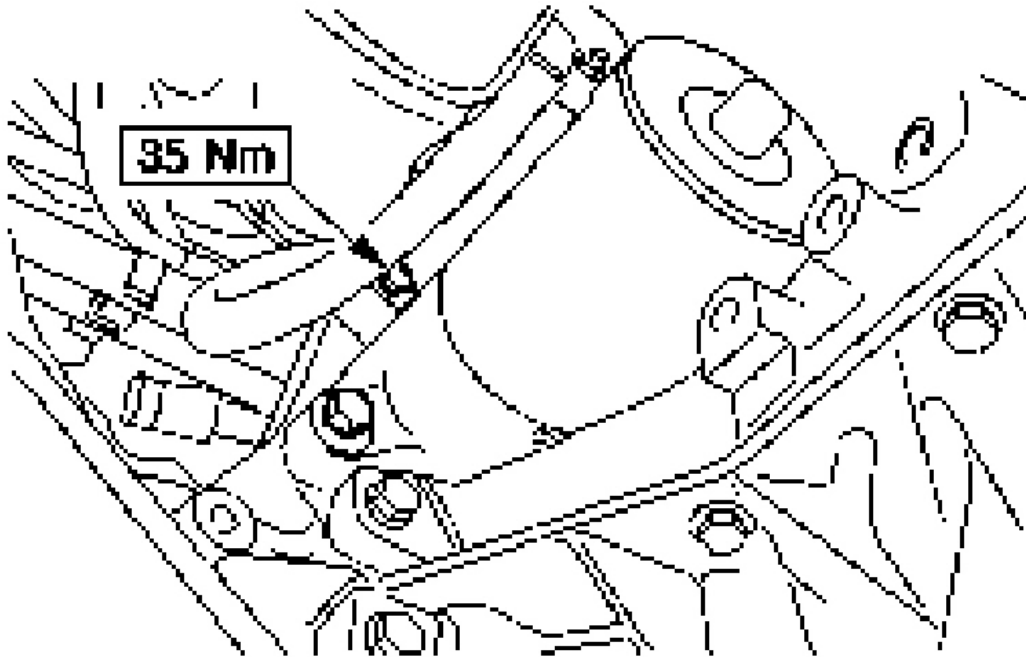
11. Lower the vehicle.
12. Install the two transaxle upper flange bolts.



G03854899

Fig. 207: Identifying Tightening Torque Of Transaxle Upper Flange Bolts
Courtesy of FORD MOTOR CO.

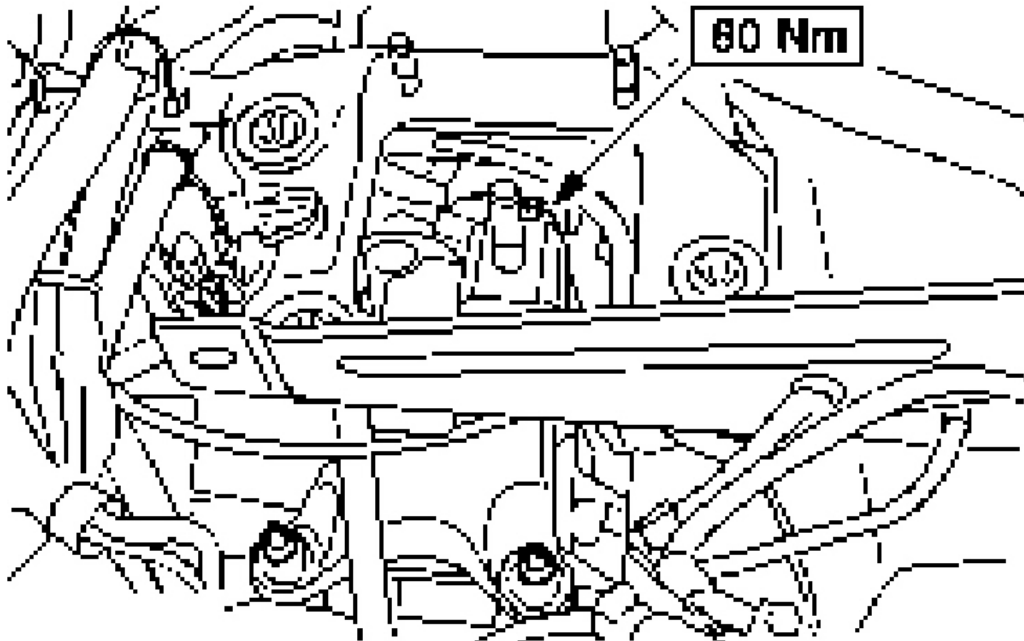
13. Attach the starter motor to the transaxle.



G03854900

Fig. 208: Identifying Tightening Torque Of Starter Motor Bolt
Courtesy of FORD MOTOR CO.

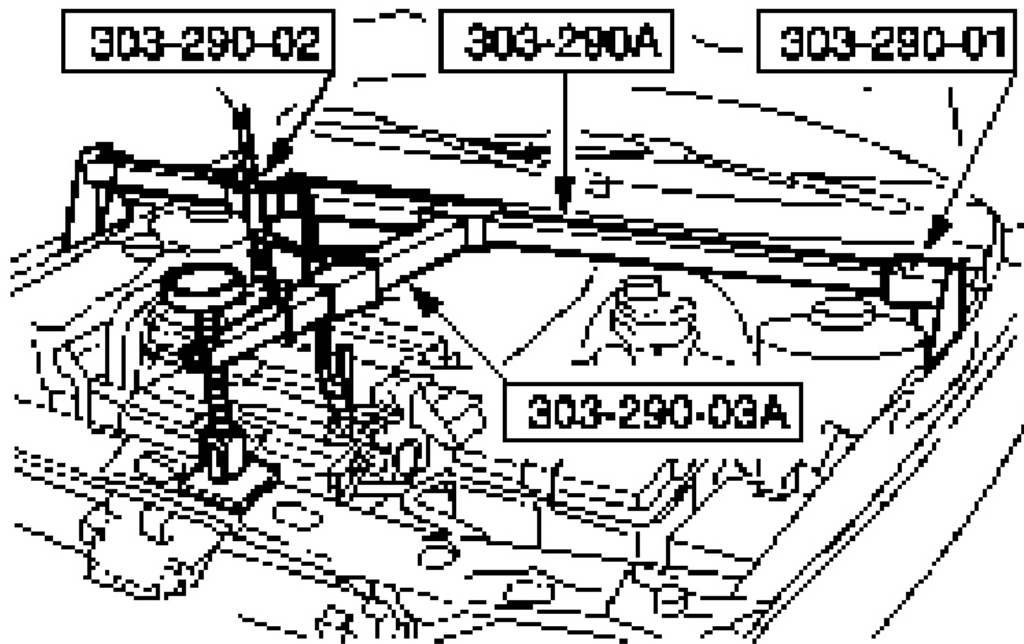
14. Install the engine rear mount bracket.



G03854901

Fig. 209: Identifying Tightening Torque Of Engine Rear Mount Bracket Bolts
Courtesy of FORD MOTOR CO.

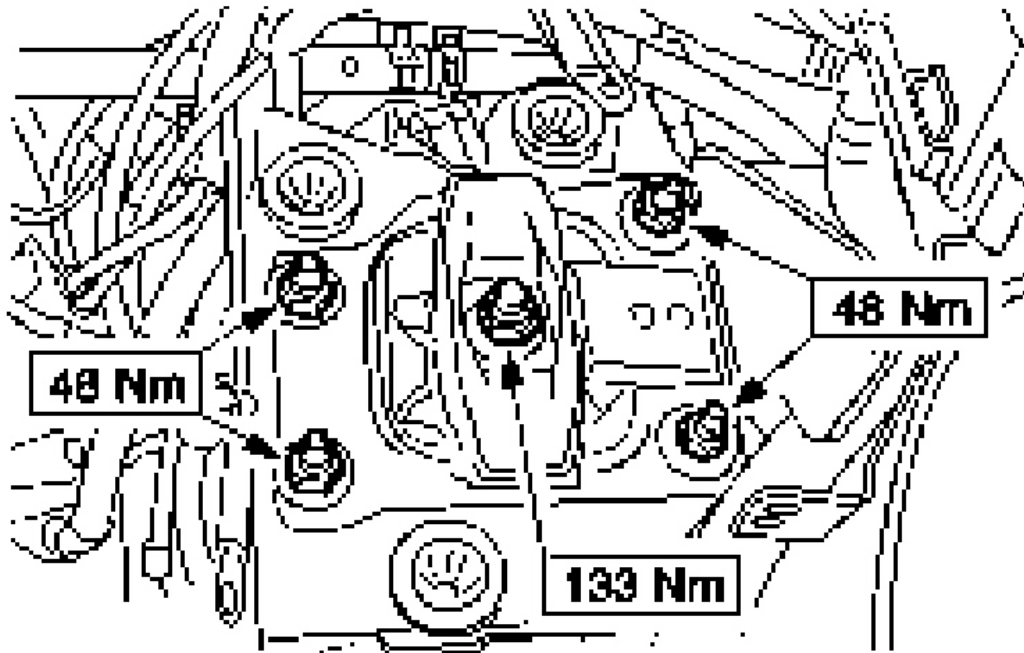
15. Using the special tools, raise the engine and transaxle assembly slightly.



G03854902

Fig. 210: Raising Engine And Transaxle Assembly
Courtesy of FORD MOTOR CO.

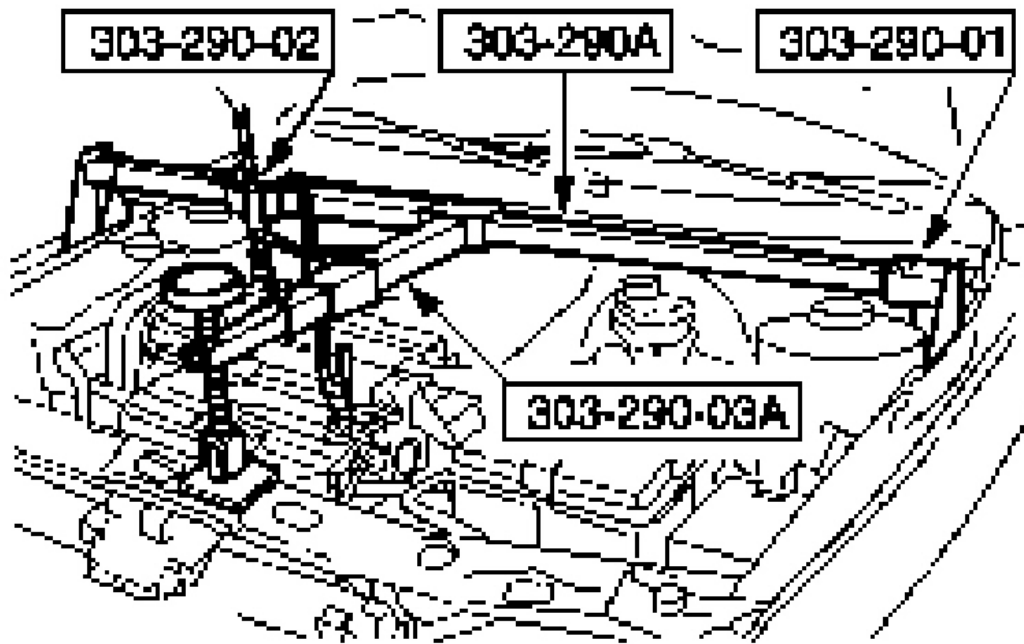
16. Install the engine rear mount.



G03854903

Fig. 211: Identifying Tightening Torque Of Engine Rear Mount
Courtesy of FORD MOTOR CO.

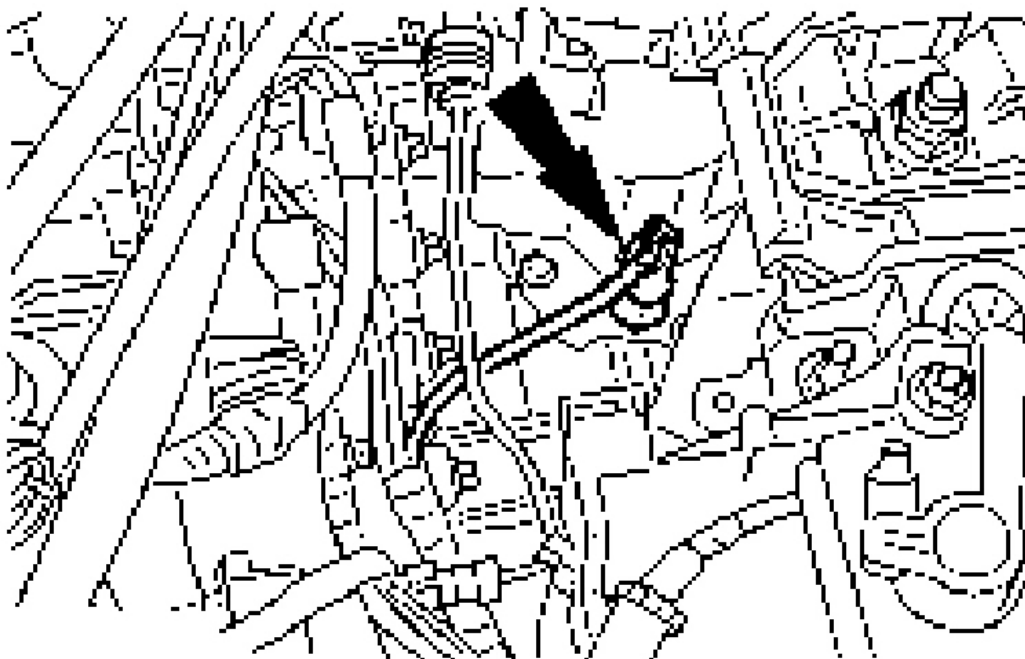
17. Remove the special tools (illustration shows battery installed)



G03854904

Fig. 212: Removing Special Tools
Courtesy of FORD MOTOR CO.

18. Connect the reversing lamp switch electrical connector.

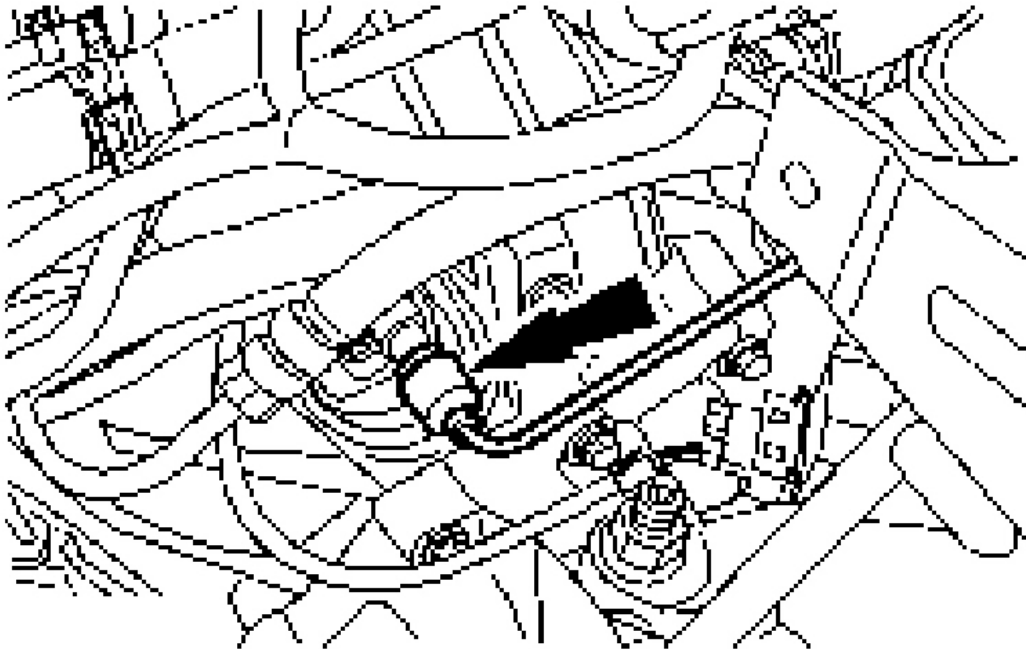


G03854905

Fig. 213: Connecting Reversing Lamp Switch Electrical Connector
Courtesy of FORD MOTOR CO.

WARNING: Escaping brake fluid. Do not allow brake fluid to come into contact with the skin or the eyes. If brake fluid does come into contact with the skin or the eyes, rinse the affected areas with water immediately. Failure to follow these instructions may result in personal injury.

CAUTION: If brake fluid is spilt on the paintwork, the affected area must be immediately washed down with cold water.



G03854906

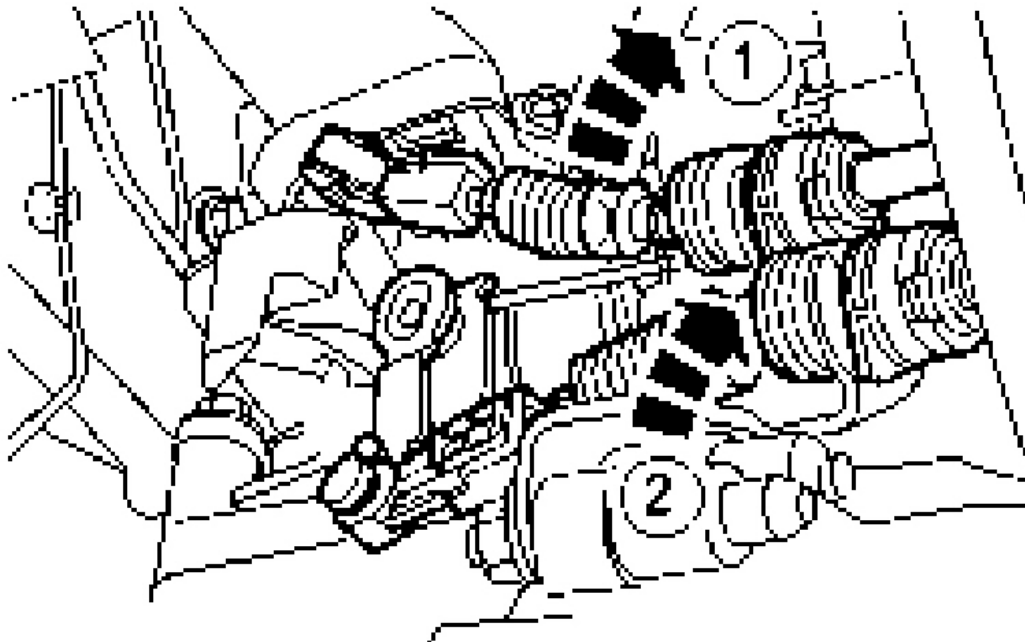
Fig. 214: Connecting Clutch Slave Cylinder Supply Line
Courtesy of FORD MOTOR CO.

19. Connect the clutch slave cylinder supply line.

- Insert the clip.

NOTE: The gearshift cable is colored white.

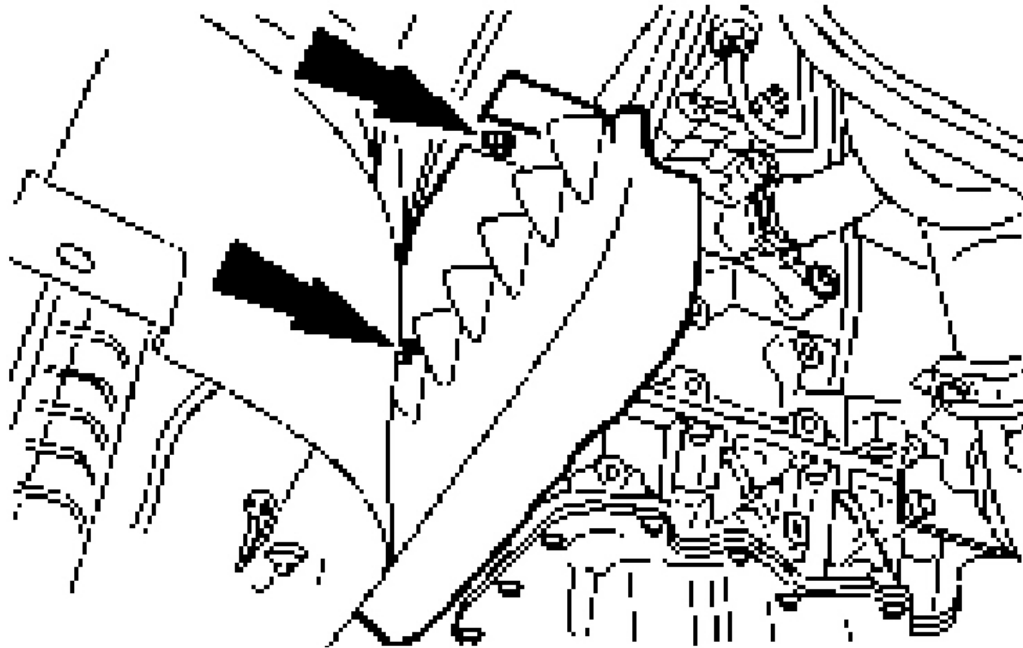
NOTE: The selector cable is colored black.



G03854907

Fig. 215: Attaching Gearshift Cables To Bracket
Courtesy of FORD MOTOR CO.

20. Attach the gearshift cables to the bracket.
 1. Attach the shifter cable to the bracket, turning the abutment sleeves counterclockwise.
 2. Attach the selector cable to the bracket, turning the abutment sleeves counterclockwise.
21. Raise and support the vehicle.
22. Install the drive belt cover.

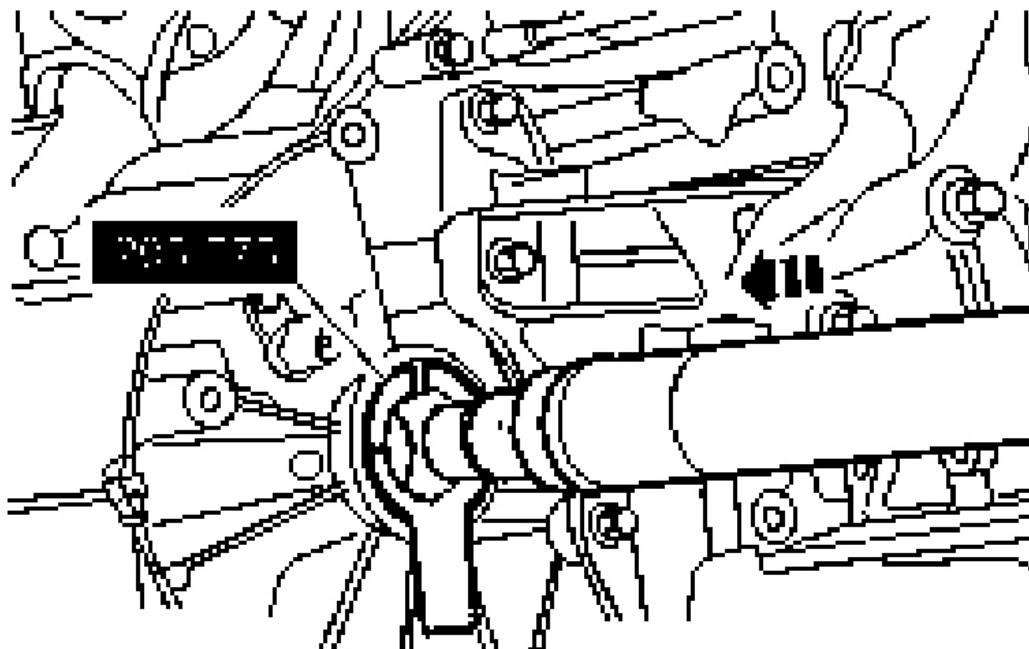


G03854908

Fig. 216: Installing Drive Belt Cover
Courtesy of FORD MOTOR CO.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.

CAUTION: Do not damage the halfshaft seal.



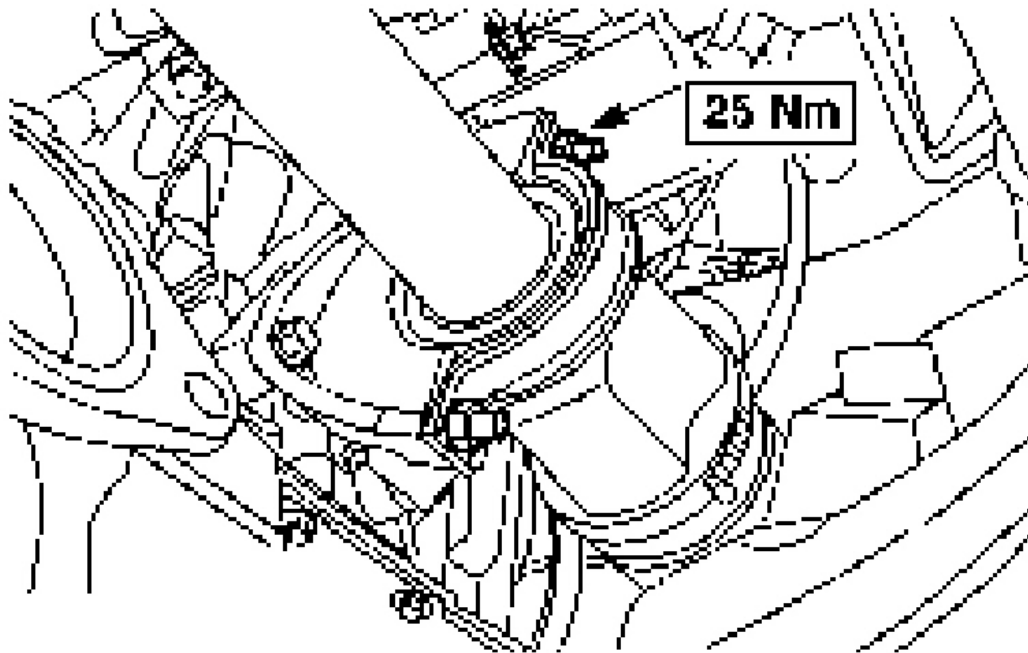
G03854909

Fig. 217: Attaching Halfshaft Together With Intermediate Shaft To Transaxle
Courtesy of FORD MOTOR CO.

23. Attach the halfshaft together with the intermediate shaft to the transaxle.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.

NOTE: Install a new center bearing cap and locknuts.



G03854910

Fig. 218: Installing Intermediate Shaft Center Bearing Cap
Courtesy of FORD MOTOR CO.

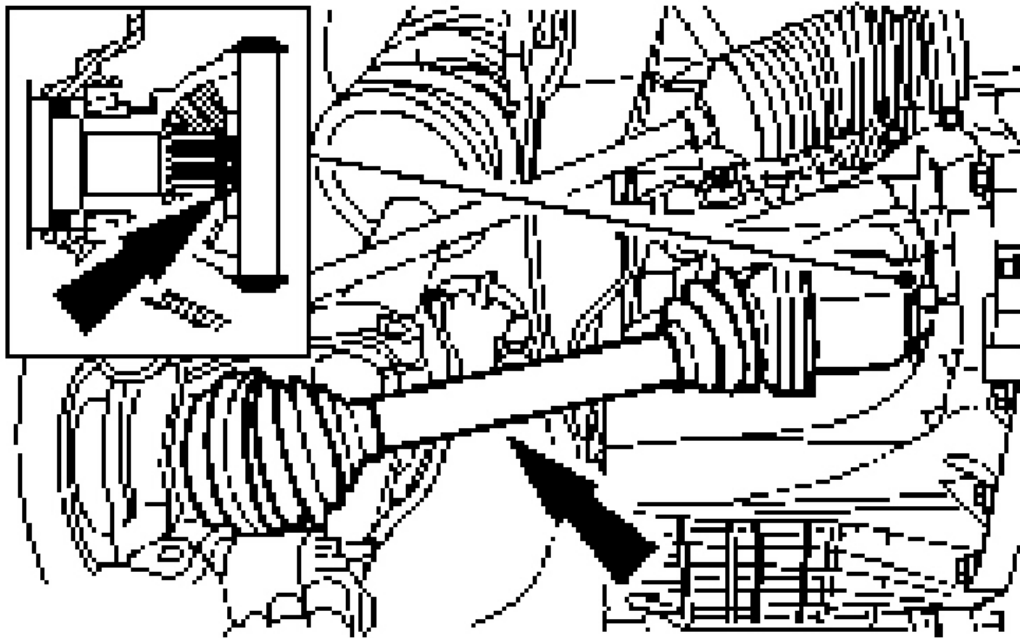
24. Install the intermediate shaft center bearing cap.

CAUTION: Support the halfshaft. The inner joint must not be bent more than 18 degrees. The outer joint must not be bent more than 45 degrees.

CAUTION: Do not damage the halfshaft seal.

CAUTION: Make sure the snap ring is correctly seated.

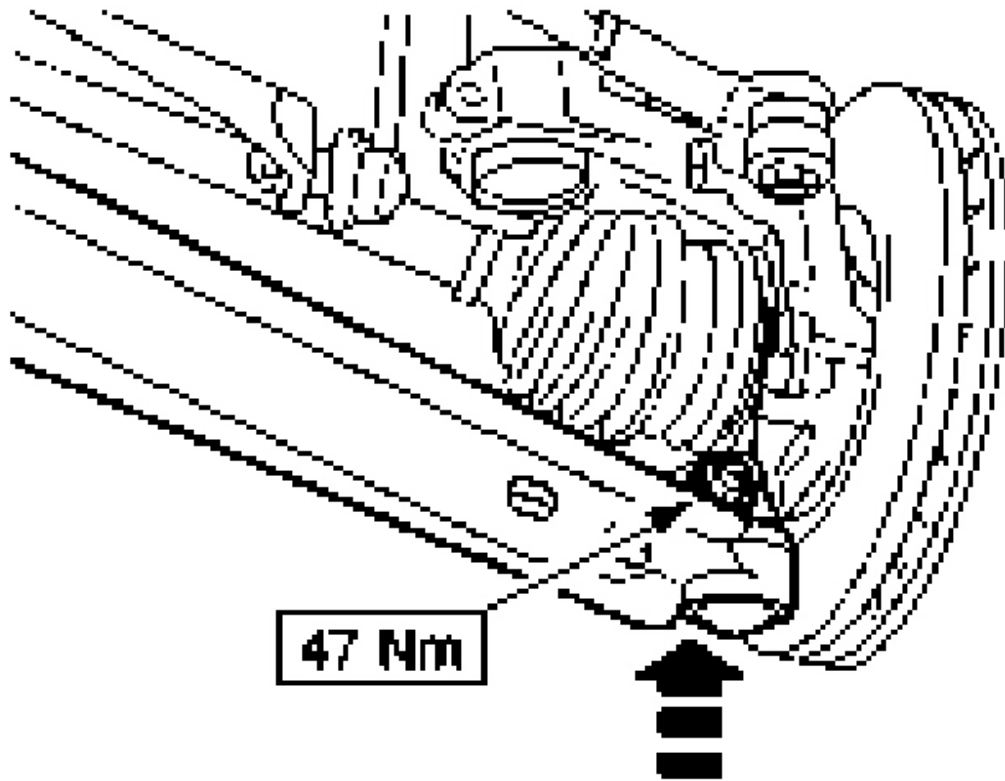
NOTE: Install a new snap ring.



G03854911

Fig. 219: Attaching Left-Hand Halfshaft To Transaxle
Courtesy of FORD MOTOR CO.

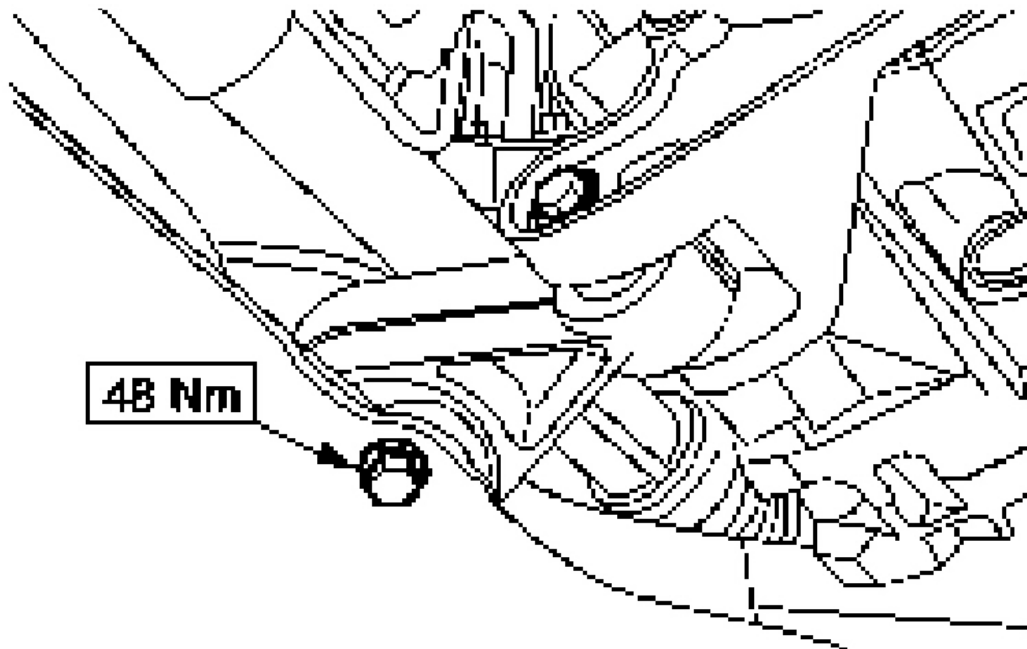
25. Attach the left-hand halfshaft to the transaxle.
26. Install the lower arm ball joints on both sides.
 - Install the heat shield.



G03854912

Fig. 220: Identifying Tightening Torque Of Lower Arm Ball Joints
Courtesy of FORD MOTOR CO.

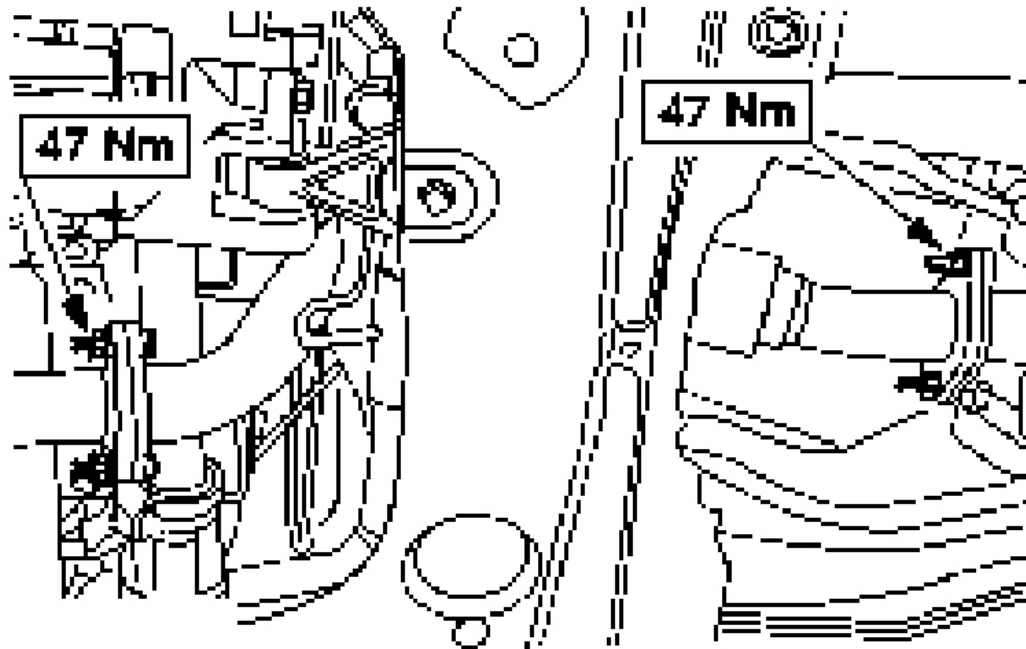
27. Install the engine roll restrictor.



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Fig. 221: Installing Engine Roll Restrictor
Courtesy of FORD MOTOR CO.

28. Install the flexible exhaust pipe.

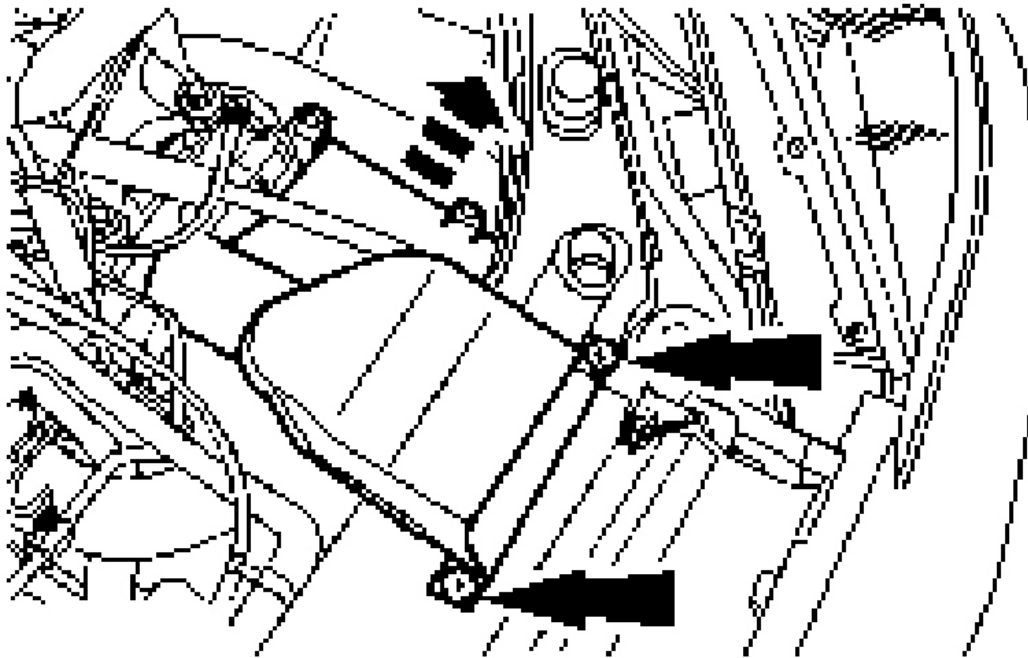


G03854914

Fig. 222: Installing Flexible Exhaust Pipe
Courtesy of FORD MOTOR CO.

29. Install the front wheels and tires.
30. Lower the vehicle.

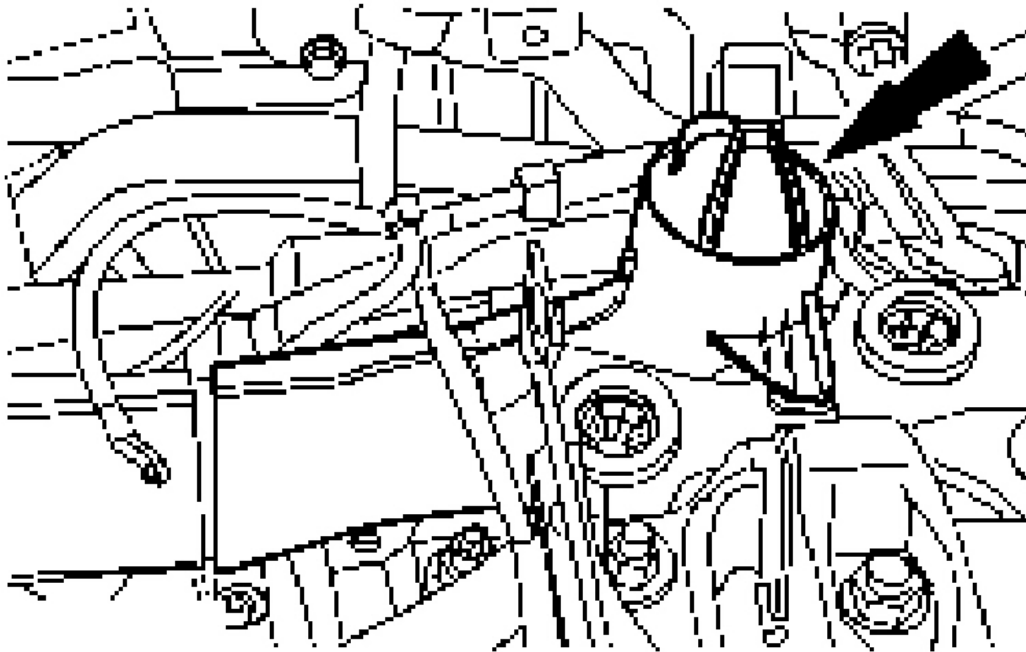
NOTE: The resonator is a push fit into the bracket.



G03854915

Fig. 223: Installing Air Cleaner Intake And Resonator
Courtesy of FORD MOTOR CO.

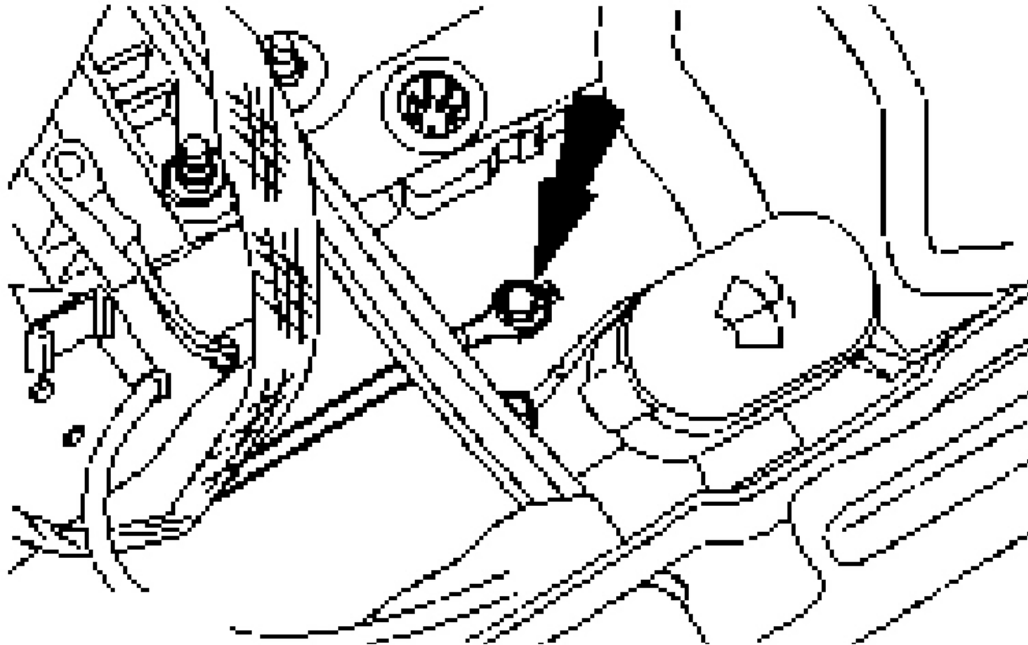
31. Install the air cleaner intake and resonator.
32. Install the intake tube.



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Fig. 224: Installing Intake Tube
Courtesy of FORD MOTOR CO.

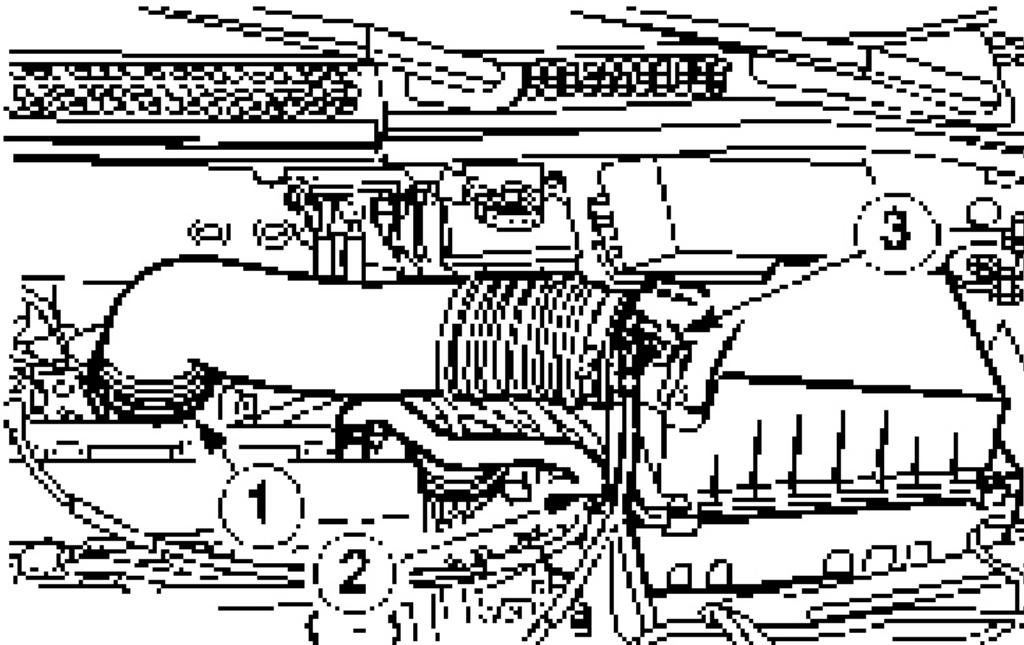
33. Connect the ground cable.



G03854917

Fig. 225: Connecting Ground Cable
Courtesy of FORD MOTOR CO.

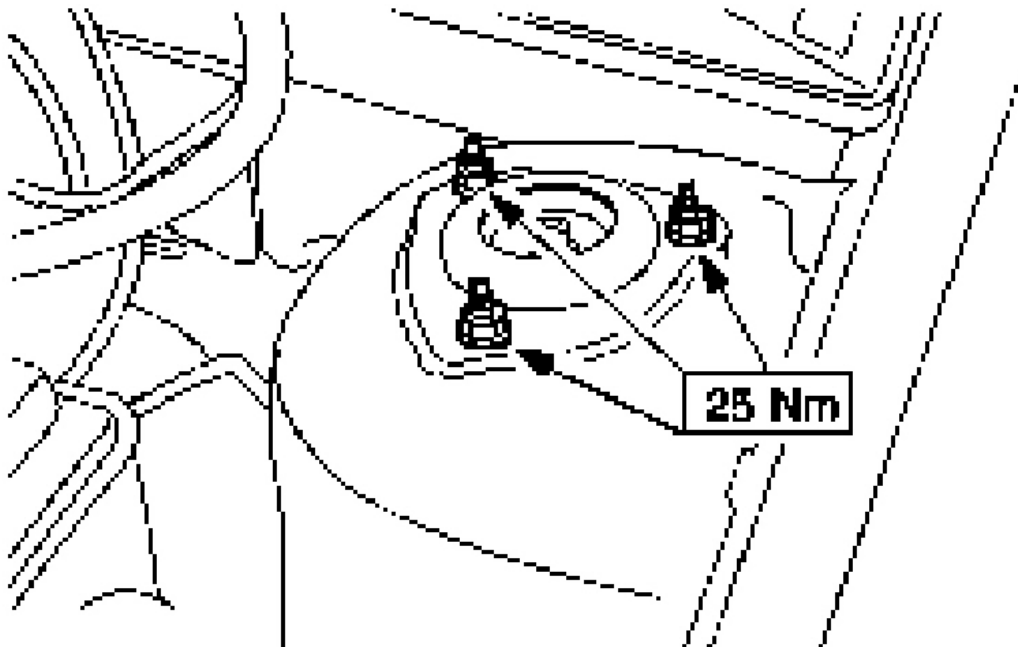
34. Install the air cleaner housing.
 1. Connect the intake hose.
 2. Install the crankcase ventilation hose.
 3. Install the mass air flow sensor (MAF sensor) connector.



G03854918

Fig. 226: Installing Air Cleaner Housing
Courtesy of FORD MOTOR CO.

35. Tighten the strut and spring assembly top mount nuts by five turns on both sides.

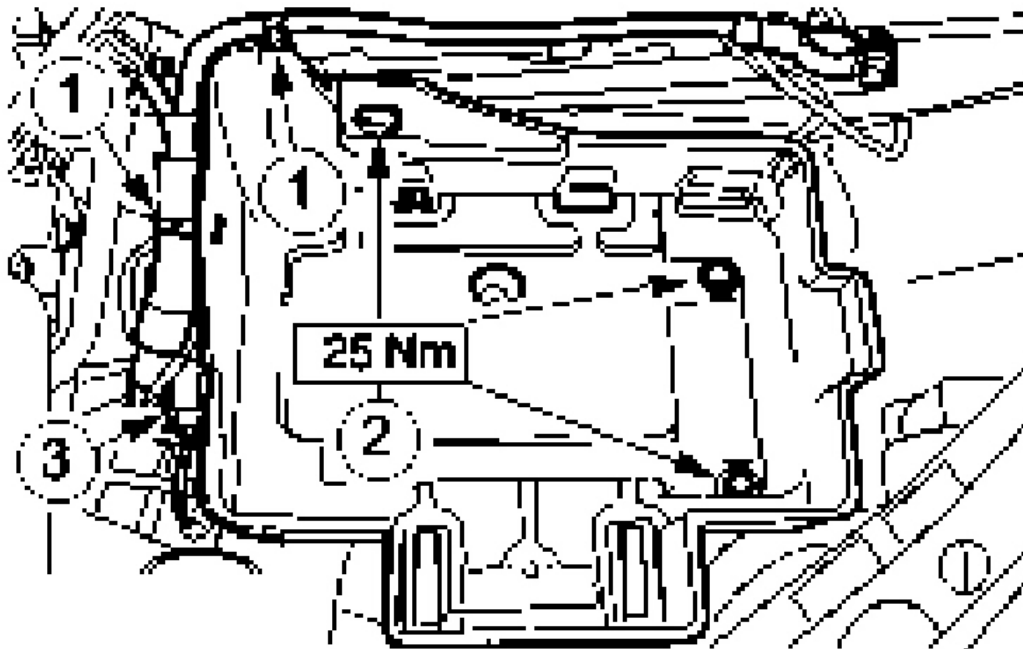


G03854919

Fig. 227: Identifying Tightening Torque Of Strut And Spring Assembly Top Mount Nuts

Courtesy of FORD MOTOR CO.

36. Install the battery tray.
 1. Attach the wiring harness.
 2. Tighten the bolts.
 3. Fasten the connector and clip it in.



G03854920

Fig. 228: Identifying Tightening Torque Of Battery Tray Bolts
Courtesy of FORD MOTOR CO.

37. Install the battery.
38. Adjust the gearshift cables. Refer to **MANUAL TRANSMISSION/TRANSAXLE AND CLUTCH - GENERAL INFORMATION** .
39. Bleed the hydraulic clutch system. Refer to **MANUAL TRANSMISSION/TRANSAXLE AND CLUTCH - GENERAL INFORMATION** .
40. Fill up the transaxle with manual transmission fluid.

NOTE: When the battery has been disconnected and reconnected, some abnormal drive symptoms may occur while the vehicle relearns its adaptive strategy. The vehicle may need to be driven 16 km (10 miles) or more to relearn the strategy.

41. Finishing operations:
 - Connect the battery ground cable.

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- Carry out a road test to enable the powertrain control module (PCM) to collect data.
- Check the routing of the vacuum hoses and wiring and secure them with cable ties.
- Check the engine and cooling system for leaks (visual inspection).