

2008 Ford Mustang

2008 TRANSMISSIONS Manual Transaxle/Transmission - TR6060 - Mustang

2008 TRANSMISSIONS

Manual Transaxle/Transmission - TR6060 - Mustang

SPECIFICATIONS

Material

Item	Specification	Fill Capacity
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V	3.46L (3.65 qt)
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B	-
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4	-
Threadlock and Sealer TA-25	WSK-M2G351-A5	-

GENERAL SPECIFICATIONS

Item	Specification
Preload	
Countershaft cluster gear preload	0.0127 mm (0.0005 in) - 0.0889 mm (0.0035 in)
Input/output shaft preload	0.0127 mm (0.0005 in) - 0.0889 mm (0.0035 in)

TORQUE SPECIFICATIONS

Description	Nm	lb-ft	lb-in
Clutch slave cylinder bolts	12	9	-
Drain plug	27	20	-
Extension housing bolts	48	35	-
Filler plug	25	18	-
Gear shaft lever bolt	40	30	-
Gearshift lever upper bolts	35	26	-
Guide plate bolts	22	16	-
Lower gearshift lever bolts	20	15	-
Output shaft speed (OSS) sensor bolt	10	-	89
Rear gearshift lever nuts	20	15	-
Reverse idler shaft bracket bolts	30	22	-
Reverse lockout solenoid bolt	18	13	-
Reversing lamp switch	27	20	-
Shift detent	40	30	-
Shift detent cover bolts	20	15	-
Shift lever guide bolts	27	20	-

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Subframe cross brace bolts	48	35	-
Transmission insulator center bolt	70	52	-
Transmission mount outer bolts	63	46	-
Transmission-to-clutch adapter housing bolts	48	35	-
Transmission-to-engine bolts	45	33	-
Upper gearshift lever bolts	35	26	-

DESCRIPTION AND OPERATION

MANUAL TRANSMISSION

The TR-6060 6-speed manual transmission features:

- six forward speeds and one reverse speed.
- forward gears are synchronized and helical cut.
- a reverse gear operates through a constant-mesh, fully synchronized system.
- a shift interlock system prevents the engagement of more than one gear.
- the countershaft is a one-piece design for added torque capacity.
- two tapered roller bearings on the output shaft.
- two tapered roller bearings on the countershaft cluster.
- a tapered roller bearing on the input shaft.
- a tapered roller bearing on the countershaft extension.
- countershaft cluster endplay controlled by shims located in the transmission clutch housing.
- input/output shaft endplay is controlled by shims located in the transmission clutch housing.
- removable wear pads on the shift forks.
- an aluminum main case, extension housing and clutch housing.

The transmission's function is to move the vehicle from a rest position to motion. This is done by transferring the engine torque, through the transmission, to the vehicle's rear wheels. The transmission input shaft receives power when the clutch is engaged. Torque flows through the input shaft to the drive gear. The torque travels downward to the countershaft drive gear and is delivered along the countershaft to all the countershaft gears. The torque is then transferred upward to the engaged mainshaft gear. The transmission uses a system of mainshaft gears to change the speed and torque relationship between the engine crankshaft and the transmission output shaft.

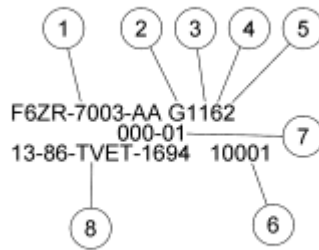
Transmission Identification (ID)

The transmission ID tag is located under the lower bolt that retains the extension housing to the main case.

The 6 speed (TR-6060) transmission is available for the Mustang Shelby GT500 5.4L (4V).

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N0057102

Fig. 1: Transmission ID
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7003	Transmission assembly number
2	-	Build date code - month
3	-	Build date code - day
4	-	Build date code - year
5	-	Shift number
6	-	Serial number
7	-	Service repair code
8	-	Identification (ID) number located on left lower side of transmission case

DIAGNOSTIC TESTS

MANUAL TRANSMISSION

Refer to [MANUAL TRANSAXLE/TRANSMISSION AND CLUTCH - GENERAL INFORMATION](#) article.

GENERAL PROCEDURES

TRANSMISSION DRAINING AND FILLING

Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V
Threadlock and Sealer TA-25	WSK-M2G351-A5

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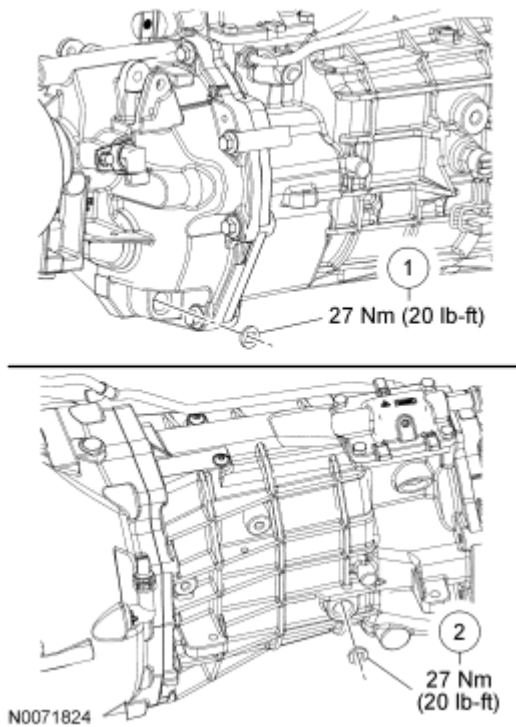


Fig. 2: Exploded View Of Transmission Draining & Filling With Torque Specifications
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7A010	Drain plug
2	7A010	Filler plug

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.

NOTE: Position a suitable drain pan under the transmission.

2. Remove the drain plug and drain the transmission.

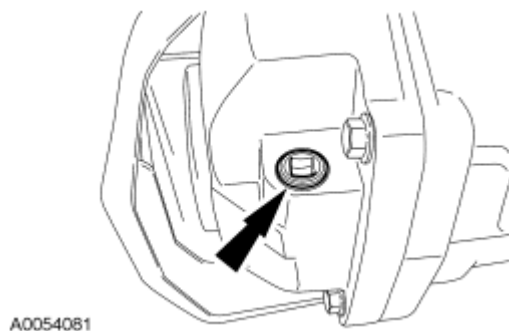


Fig. 3: Locating Drain Plug

Courtesy of FORD MOTOR CO.

3. Clean the drain plug. Apply threadlock and sealer to the plug threads and install the drain plug.
 - Tighten to 27 Nm (20 lb-ft).

NOTE: Before removing, clean the area around the filler plug.

4. Remove the filler plug.

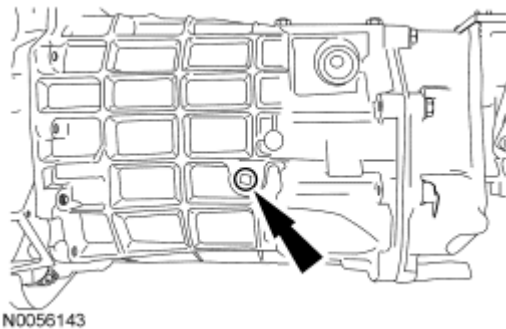


Fig. 4: Locating Filler Plug

Courtesy of FORD MOTOR CO.

5. Using a suitable oil suction gun, fill the transmission to the correct level with the specified fluid.
 - Transmission capacity is 3.46L (3.65 qt).

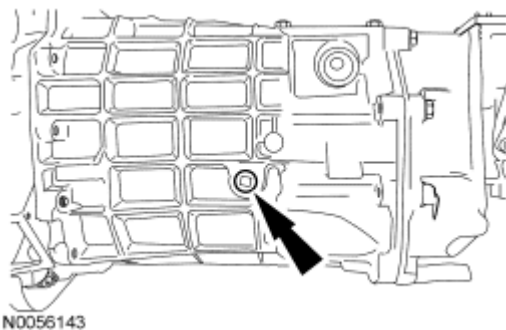


Fig. 5: Locating Filler Plug

Courtesy of FORD MOTOR CO.

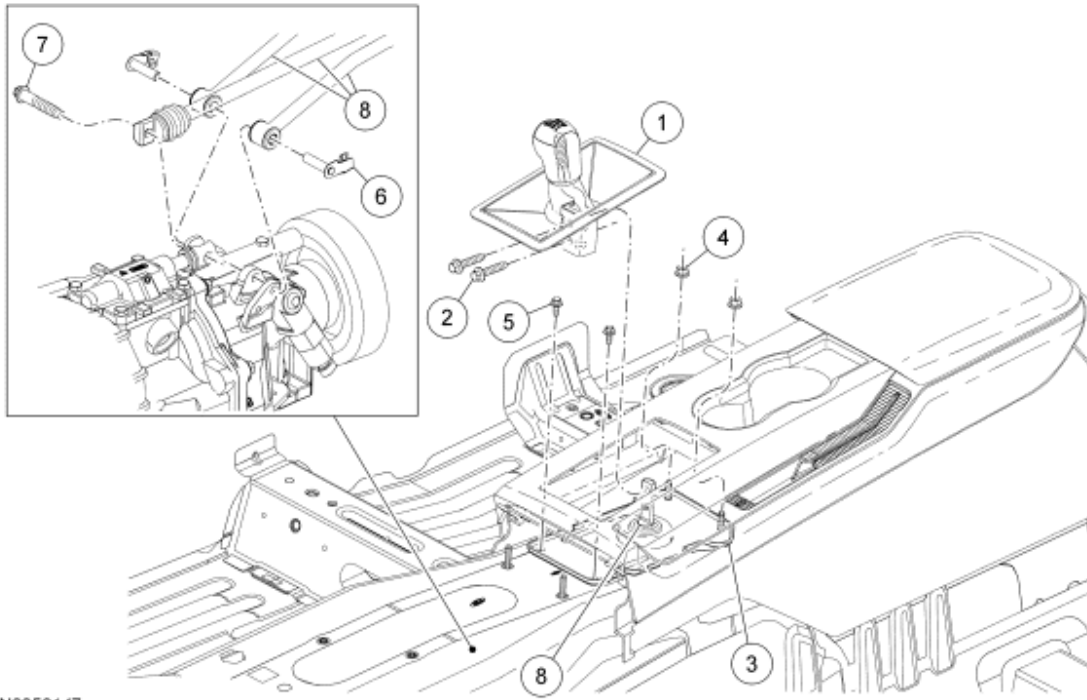
6. Apply threadlock and sealer to the plug threads and install the filler plug.
 - Tighten to 27 Nm (20 lb-ft).

IN-VEHICLE SERVICING

GEARSHIFT LEVER

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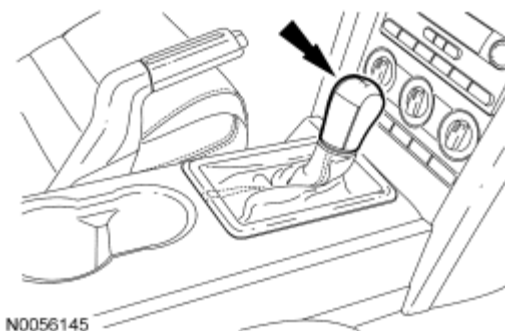


N0056147

Fig. 6: Exploded View Of Gearshift Lever
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7C392	Gearshift lever knob and boot
2	-	Gearshift lever bolt (part of 7C392)
3	7Z206	Gearshift lever shield
4	W702751-S441	Gearshift lever shield nut
5	W505424-S438	Gearshift lever shield bolt
6	7314	Gearshift lever retainer
7	W711489-S439	Gearshift lever bolt
8	7400	Gearshift lever assembly

1. Remove the gearshift lever knob and boot.



N0056145

Fig. 7: Locating Gearshift Lever Knob & Boot
Courtesy of FORD MOTOR CO.

2. Remove the upper gearshift lever bolts and the upper gearshift lever.
 - To install, tighten to 35 Nm (26 lb-ft).
3. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
4. Remove the driveshaft. For additional information, refer to **DRIVESHAFT** article.
5. Remove the 4 subframe cross brace bolts and the subframe cross brace.
 - To install, tighten to 48 Nm (35 lb-ft).

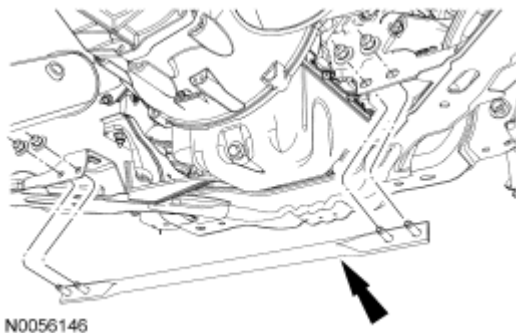


Fig. 8: Locating Subframe Cross Brace & Bolts
Courtesy of FORD MOTOR CO.

6. Using a suitable transmission jack, support the transmission.
7. Remove the 4 rear transmission mount outer bolts.
 - To install, tighten to 63 Nm (46 lb-ft).
8. Lower the transmission.
9. Remove the 2 rear gearshift lever nuts.

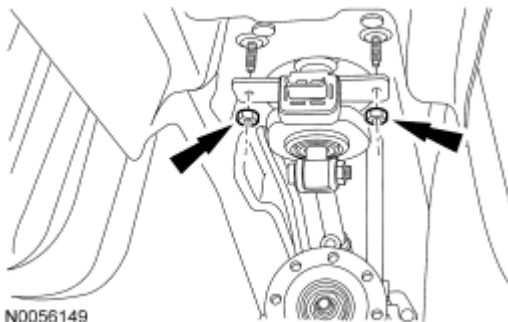
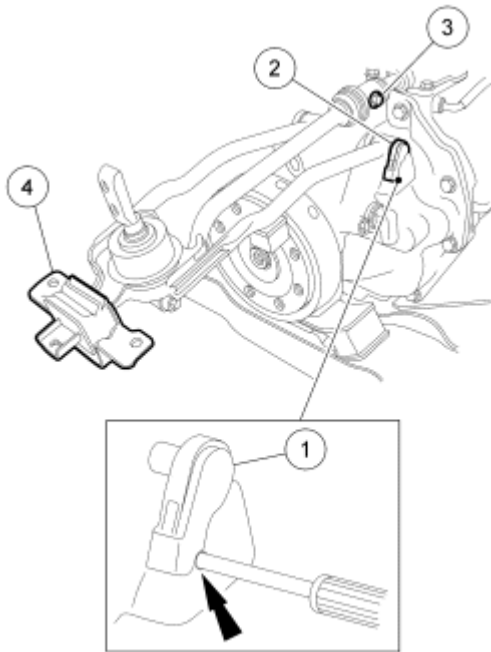


Fig. 9: Locating Rear Gearshift Underbody Nuts
Courtesy of FORD MOTOR CO.

10. Remove the gearshift lever assembly.
 1. Insert a pick into the lower hole to unlock the clip.

2. Rotate the gearshift lever retainers, then remove the retainers.
3. Remove the gearshift lever bolt.
4. Remove the gearshift lever assembly from the vehicle.
5. To install, tighten to 40 Nm (30 lb-ft).



N0059174

Fig. 10: Identifying Gearshift Lever Assembly
Courtesy of FORD MOTOR CO.

11. To install, reverse the removal procedure.
 - Make sure to snap the gearshift lever retainers into the locked position.
 - Carefully position the gearshift lever into the lower shift boot. Make sure the lever is through the boot.



N0056150

Fig. 11: Carefully Position Gearshift Lever Into Lower Shift Boot
Courtesy of FORD MOTOR CO.

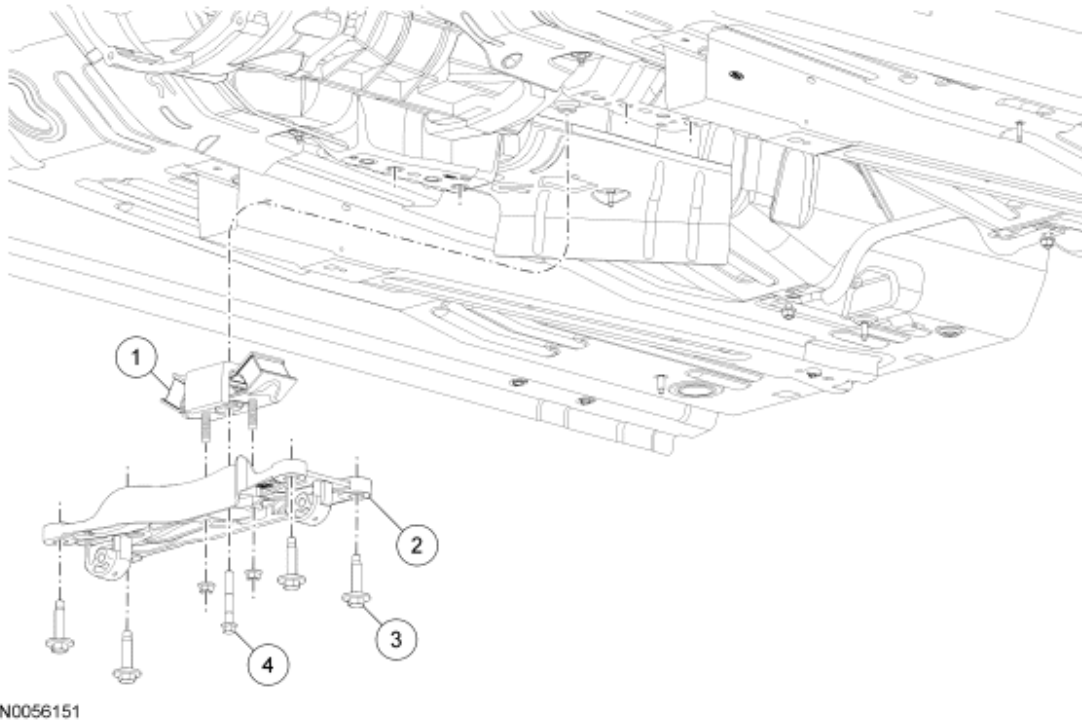
TRANSMISSION REAR SUPPORT INSULATOR

Fig. 12: Exploded View Of Transmission Rear Support Insulator
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	6068	Transmission rear support insulator
2	6068	Transmission mount
3	W505466-S439	Transmission mount outer bolts (4 required)
4	N804518-S439	Transmission rear support insulator center bolt

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Using a suitable transmission jack, support the transmission.
3. Loosen the 2 transmission rear support insulator nuts.

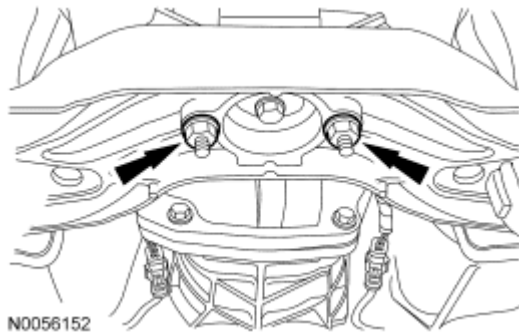


Fig. 13: Locating Transmission Rear Support Insulator Nuts
Courtesy of FORD MOTOR CO.

4. Remove the 4 transmission mount outer bolts.
 - To install, tighten to 63 Nm (46 lb-ft).
5. Remove the transmission rear insulator center bolt. Carefully pry the exhaust brackets from the exhaust insulators on the rear transmission mount. Remove the transmission mount.
 - To install, tighten to 70 Nm (52 lb-ft).
6. Remove the 2 transmission rear support insulator nuts. Separate the transmission rear support insulator from the transmission mount.
7. To install, reverse the removal procedure.

REMOVAL

TRANSMISSION

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** article.
3. Remove the gearshift lever knob and boot.

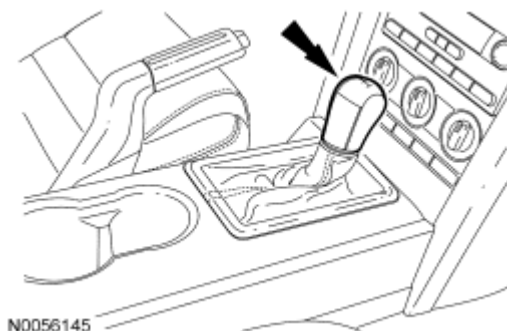


Fig. 14: Locating Gearshift Lever Knob & Boot
Courtesy of FORD MOTOR CO.

4. Remove the upper gearshift lever bolts and the upper gearshift lever.
5. Remove the driveshaft. For additional information, refer to **DRIVESHAFT** article.
6. Remove the catalytic converter assembly (H-pipe). For additional information, refer to **EXHAUST SYSTEM** article.
7. Remove the starter motor. For additional information, refer to **STARTING SYSTEM** article.
8. Remove the 4 subframe cross brace bolts and the subframe cross brace.

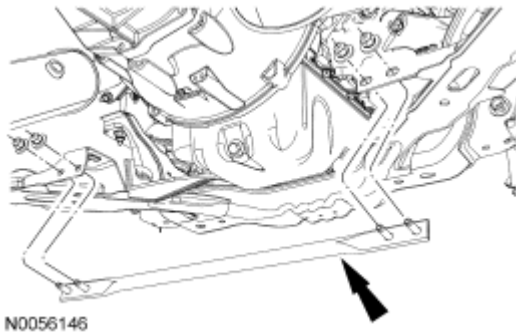


Fig. 15: Locating Subframe Cross Brace & Bolts
Courtesy of FORD MOTOR CO.

9. Disconnect the electrical connectors from the LH side of the transmission. Detach the harness from the transmission and position it aside.
10. Disconnect the electrical connectors from the RH side of the transmission. Detach the harness from the transmission and position it aside.
11. Release the clutch hydraulic tube clip and separate the clutch hydraulic tube from the connector.

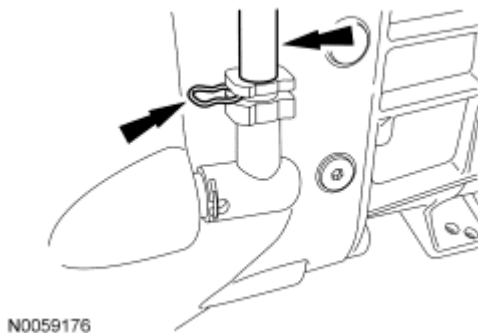


Fig. 16: Locating Clutch Hydraulic Tube Clip
Courtesy of FORD MOTOR CO.

12. If transmission disassembly is necessary, drain the transmission fluid.
13. Using a suitable transmission jack, support the transmission. Securely strap the transmission to the jack.
14. Remove the 4 rear transmission mount outer bolts.

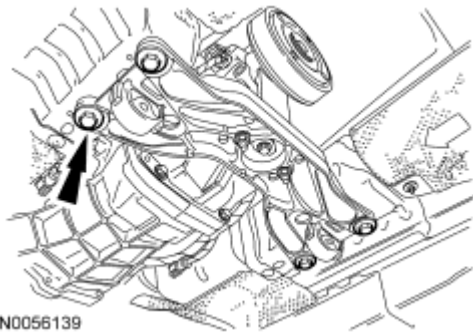


Fig. 17: Locating Rear Transmission Mount Outer Bolts
Courtesy of FORD MOTOR CO.

NOTE: Make sure the block of wood is only on the pan rail.

15. Disconnect the wire harness at the front of the engine oil pan. Using an under hoist stand and a block of wood, raise the engine to pivot the transmission downward. This provides clearance between the input shaft and clutch pressure plate fingers.

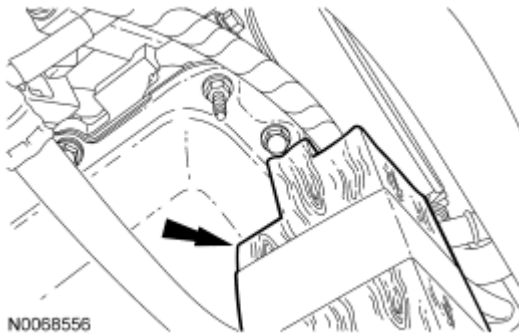


Fig. 18: Locating Transmission Jack Under
Courtesy of FORD MOTOR CO.

16. Lower the transmission.
17. Remove the 2 rear gearshift lever nuts.

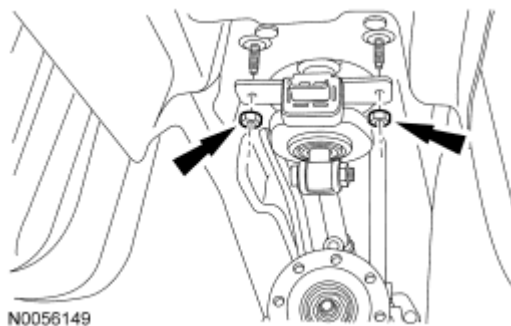
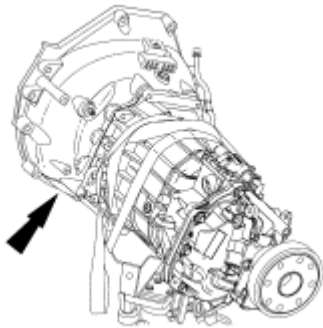


Fig. 19: Locating Rear Gearshift Underbody Nuts
Courtesy of FORD MOTOR CO.

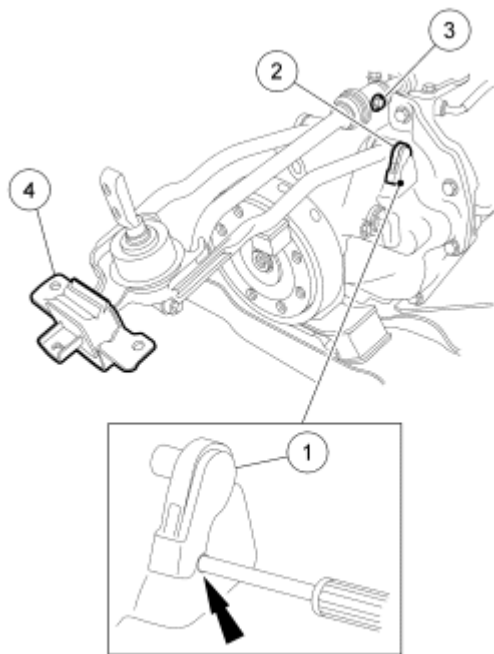
18. Remove the 7 transmission-to-engine bolts.
19. Using the transmission mount, rotate the transmission 45 degrees clockwise. Pull the transmission rearward until the input shaft is clear of the pressure plate, then lower the transmission from the vehicle.



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Fig. 20: Identifying Transmission-To-Engine Bolts
Courtesy of FORD MOTOR CO.

20. If necessary, remove the rear transmission insulator center bolt and the transmission mount.
21. If necessary, remove the gearshift lever assembly.
 1. Insert a pick into the lower hole to unlock the clip.
 2. Rotate the gearshift lever retainers, then remove the retainers.
 3. Remove the gearshift lever bolt.
 4. Remove the gearshift lever assembly.
 5. To install, tighten to 40 Nm (30 lb-ft).



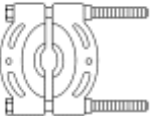
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Fig. 21: Identifying Gearshift Lever Assembly
 Courtesy of FORD MOTOR CO.

DISASSEMBLY

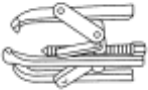
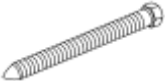
TRANSMISSION

Special Tools

Illustration	Tool Name	Tool Number
 ST1633-A	Holding Fixture, Transmission	307-003 (T57L-500-B)
 ST1895-A	Puller, Bearing	205-D064 (D84L-1123-A)
	2- or 3-Jaw Puller	205-D027 (D80L-1013-A)

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 ST1184-A		
 ST2355-A	Remover, Mainshaft Bearing	308-058 (T77J-7025-H)
 ST2358-A	Remover/Installer, Bearing Tube	308-024 (T75L-7025-B)
 ST1306-A	Remover, Mainshaft Bearing	308-059 (T77J-7025-J)
 ST1304-A	Removal Screw, Bearing Tube	308-092 (T84T-7025-B)
 ST2357-A	Remover, Output Shaft Flange	307-523

DISASSEMBLY

NOTE: During disassembly, if any roll pins, retaining rings or bearings are removed, install new components. Install bearings and bearing cups as a set only.

NOTE: For additional information, refer to the exploded view under the ASSEMBLY.

1. Clean the transmission exterior with solvent and dry with compressed air. During disassembly, clean all components with solvent and dry with compressed air.
2. Remove the 2 clutch slave cylinder bolts and the clutch slave cylinder.

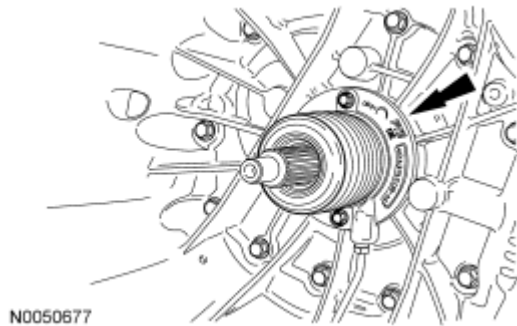


Fig. 22: Locating Clutch Slave Cylinder & Clutch Slave Cylinder Bolts
Courtesy of FORD MOTOR CO.

3. Remove the clutch hydraulic tube clip and the clutch hydraulic tube connector.
4. Attach the transmission to the special tool.

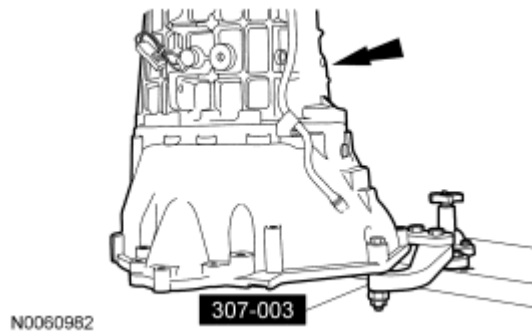


Fig. 23: Locating Clutch Hydraulic Tube Clip
Courtesy of FORD MOTOR CO.

5. Rotate the transmission to a horizontal position.

NOTE: Position a drain pan under the transmission.

6. If the transmission was not drained during removal, remove the drain plug and drain the transmission.

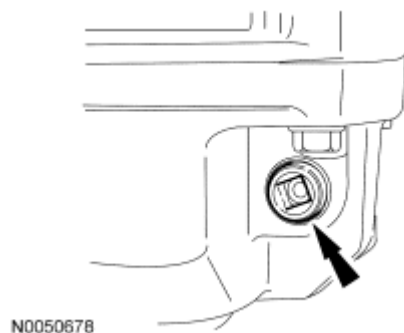


Fig. 24: Locating Drain Plug
Courtesy of FORD MOTOR CO.

7. Remove the output shaft flange nut.

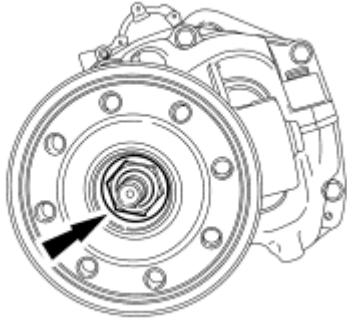


Fig. 25: Identifying Output Shaft Flange & Nuts
Courtesy of FORD MOTOR CO.

8. Using the special tool, remove the output shaft flange.

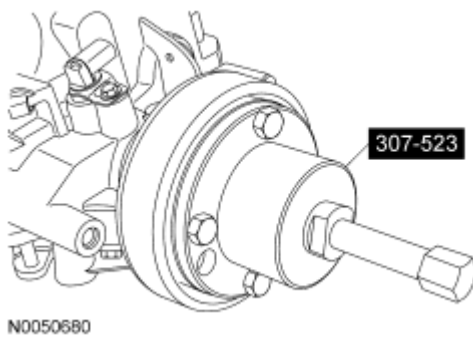


Fig. 26: Removing Output Shaft Flange Using Special Tool
Courtesy of FORD MOTOR CO.

9. Remove the 4 bolts and the shift detent cover.

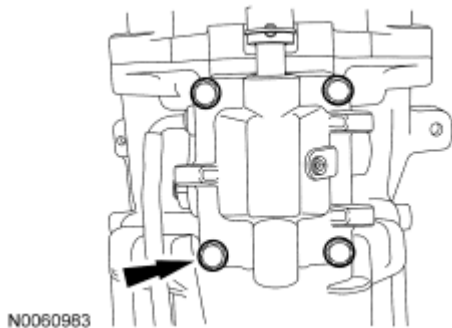


Fig. 27: Locating Shift Detent Cover & Shift Detent Cover Bolts
Courtesy of FORD MOTOR CO.

10. Rotate the transmission to a vertical position.
11. Remove the 8 bolts and carefully separate the extension housing from the transmission.

12. Using the special tool, remove the bearing race and the spacer.

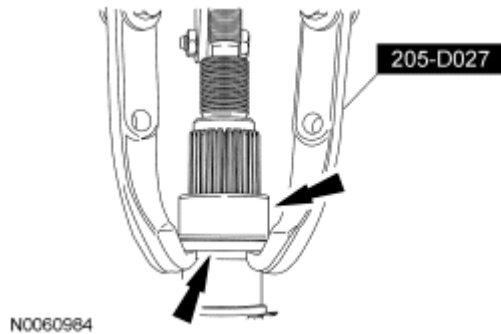


Fig. 28: Locating Bearing Race & Spacer
Courtesy of FORD MOTOR CO.

13. Remove the output shaft speed (OSS) sensor tone wheel snap ring.

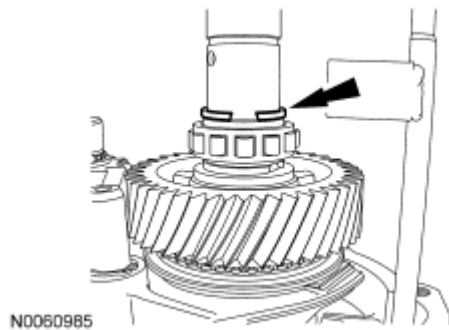


Fig. 29: Locating Output Shaft Speed (OSS) Sensor Tone Wheel Snap Ring
Courtesy of FORD MOTOR CO.

14. Remove the tone wheel and the ball.

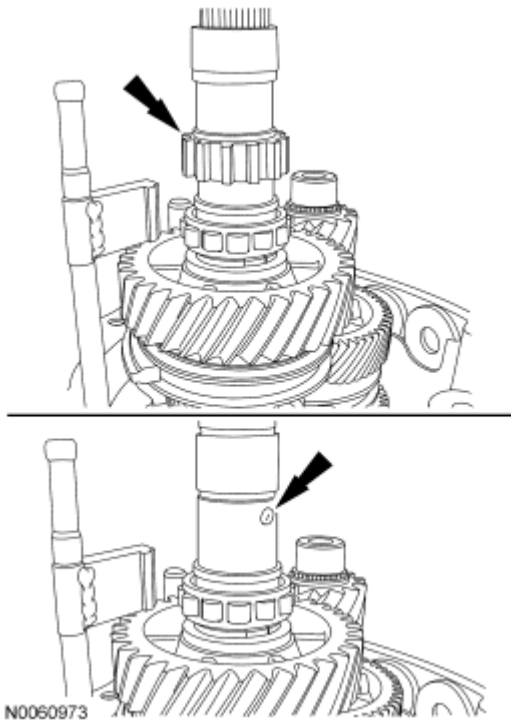


Fig. 30: Locating Tone Wheel & Ball
Courtesy of FORD MOTOR CO.

15. Remove the snap ring, the upper spacer, the rear output shaft roller bearing and the lower spacer.
 - Inspect the rear output shaft roller bearing for wear or damage. Install a new bearing as necessary.

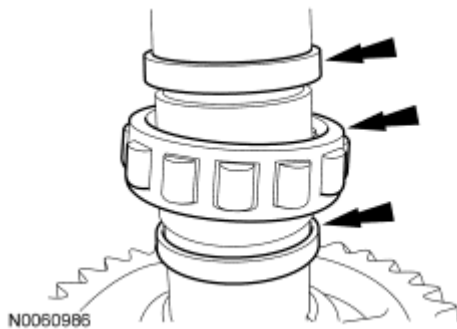


Fig. 31: Inspecting Rear Output Shaft Roller Bearing For Damage
Courtesy of FORD MOTOR CO.

NOTE: Position the gearshift lever in 3rd/4th neutral position.

16. Using a 5/32-inch drift and a hammer, drive the roll pins downward, then remove the reverse shift rail.
 - Discard the roll pins.

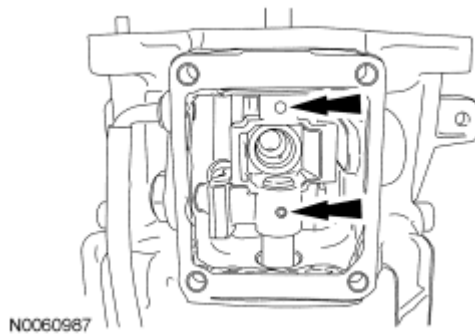


Fig. 32: Driving Roll Pins Downward, Then Removing Reverse Shift Rail Using A 5/32-Inch Drift & A Hammer
Courtesy of FORD MOTOR CO.

17. Remove the following:
 1. The reverse gear snap ring.
 2. The reverse gear thrust washer.
 3. The reverse gear.
 4. Discard the reverse gear snap ring.
 5. Inspect reverse gear for wear or damage. Install a new gear as necessary.

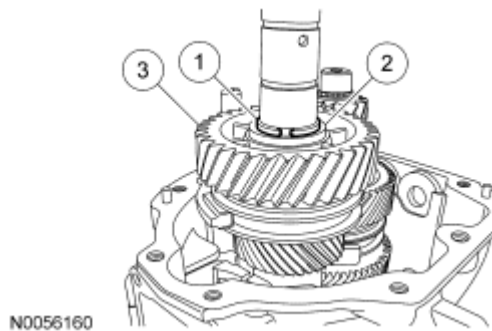


Fig. 33: Inspecting Reverse Gear For Damage
Courtesy of FORD MOTOR CO.

18. Remove the reverse gear needle bearing.
 - Inspect the needle bearing for wear or damage. Install a new bearing as necessary.

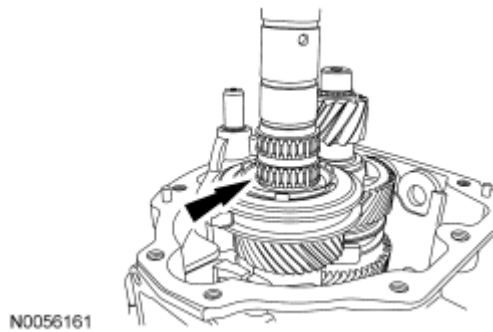


Fig. 34: Locating Reverse Gear Needle Bearing
Courtesy of FORD MOTOR CO.

19. Remove the 3 piece reverse gear synchronizer blocking ring.

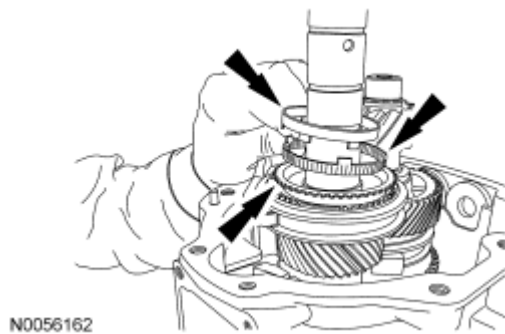


Fig. 35: Locating Reverse Gear Synchronizer Blocking Rings
Courtesy of FORD MOTOR CO.

20. Remove the reverse gear synchronizer snap ring.

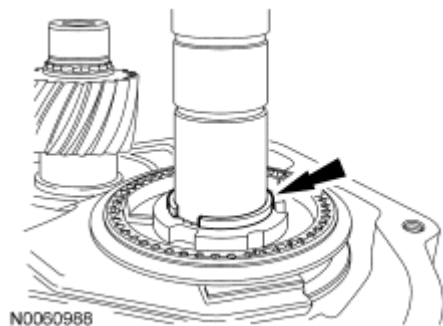


Fig. 36: Locating Reverse Gear Synchronizer Snap Ring
Courtesy of FORD MOTOR CO.

21. Remove the reverse shift fork snap ring.

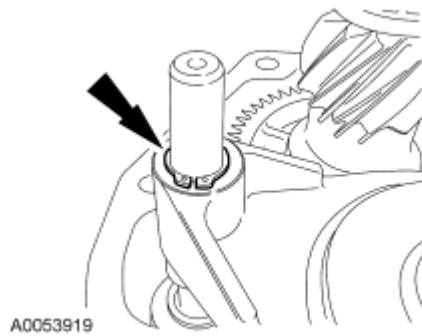


Fig. 37: Locating Reverse Shift Fork Snap Ring
Courtesy of FORD MOTOR CO.

22. Remove the reverse shift fork and the reverse synchronizer.
 - The synchronizer hub is a tight fit on the shaft, and may need to be removed separately. After removing the fork and synchronizer sleeve, carefully pry off the synchronizer hub.

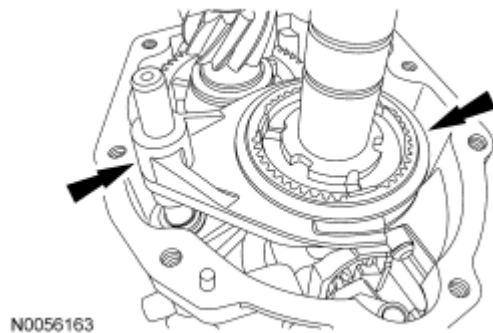
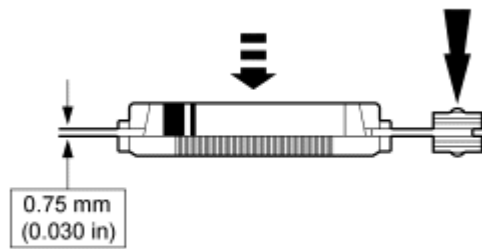


Fig. 38: Locating Reverse Shift Fork, Reverse Synchronizer & Strut Retainer
Courtesy of FORD MOTOR CO.

23. Inspect the synchronizer for the following:
 - Check for worn, nicked or broken teeth. Install a new synchronizer as necessary.
 - Check keys for wear or distortion. Check the springs for distortion. Install a new synchronizer as necessary.
24. Inspect the synchronizer blocking ring for the following:
 - Check for wear or damage. Install a new synchronizer blocking ring as necessary.
 - Check the clearance between the synchronizer blocking ring and the gear.
 - Position the blocking ring onto the gear. Make sure the correct blocking ring is measured with the correct gear and that the blocking ring is fully seated on the gear.
 - Insert a feeler gauge and measure the clearance, while applying pressure and rotating the blocking ring. The measurement should be the same around the entire circumference. If the clearance is less than 0.75 mm (0.030 in), install new blocking ring.



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Fig. 39: Inserting Feeler Gauge & Measuring Clearance
Courtesy of FORD MOTOR CO.

25. Remove the 5th driven gear split ring and retainer.

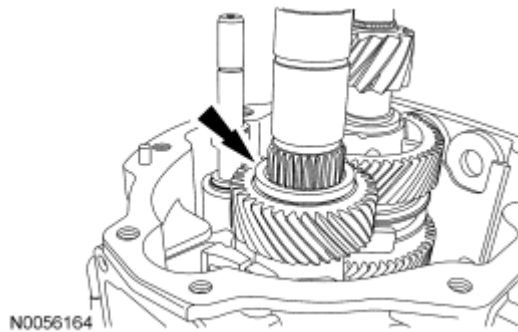


Fig. 40: Locating 5th Driven Gear Split Ring & Retainer
Courtesy of FORD MOTOR CO.

26. Using the special tools, remove the 5th driven gear.

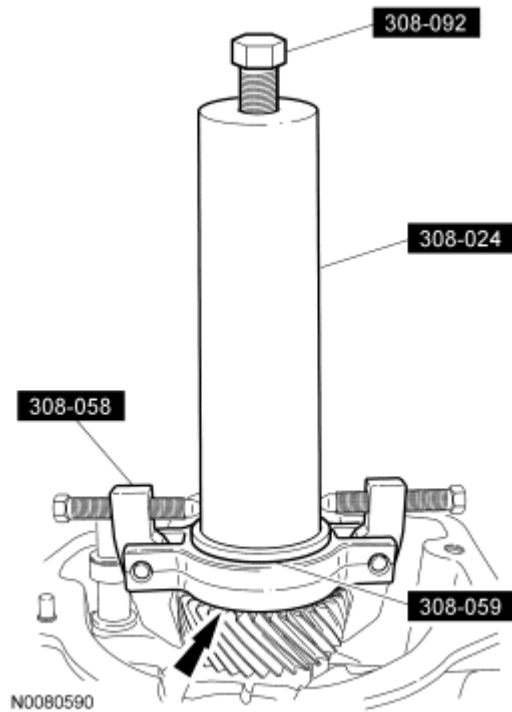


Fig. 41: Removing 5th Driven Gear Using Special Tools
Courtesy of FORD MOTOR CO.

27. Remove the 5th/6th shift fork snap ring.
 - Discard the snap ring.

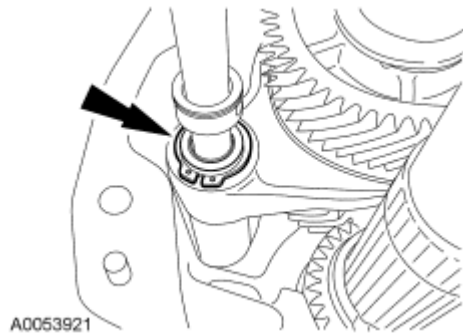


Fig. 42: Locating 5th/6th Gear Shift Fork & 5th/6th Gear Synchronizer
Courtesy of FORD MOTOR CO.

28. Remove the reverse drive gear snap ring.
 - Discard the snap ring.

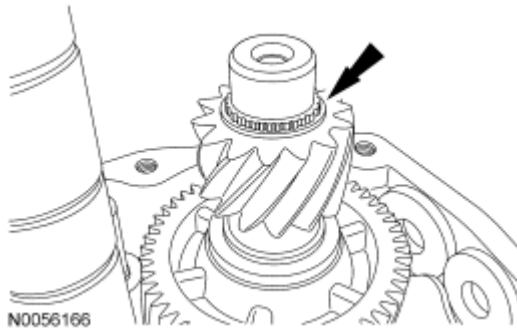


Fig. 43: Locating Reverse Drive Gear Snap Ring
Courtesy of FORD MOTOR CO.

29. Using a suitable puller, remove the reverse drive gear.
- Inspect reverse drive gear for wear or damage. Install a new gear as necessary.

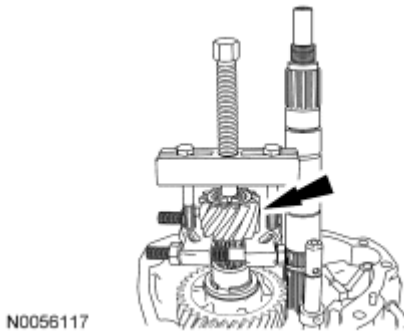


Fig. 44: Removing Reverse Drive Gear Using A Suitable Puller
Courtesy of FORD MOTOR CO.

30. Remove the following:
1. The 5th drive gear snap ring.
 2. The 5th drive gear thrust washer.
 3. The 5th drive gear.
 4. Discard the snap ring.
 5. Inspect the 5th drive gear for wear or damage. Install a new gear as necessary.

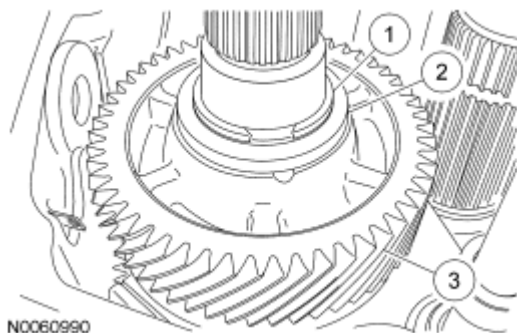


Fig. 45: Inspecting 5th Drive Gear For Damage
Courtesy of FORD MOTOR CO.

31. Remove the 5th/6th drive gear needle bearing and spacer.

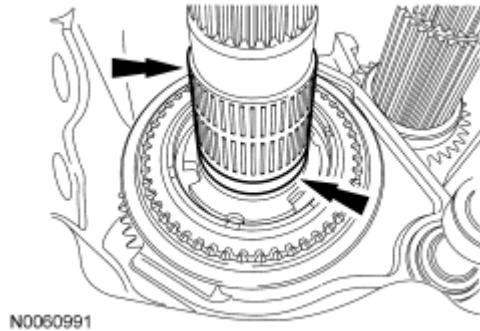


Fig. 46: Locating 5th/6th Drive Gear Needle Bearing & Spacer
Courtesy of FORD MOTOR CO.

32. Remove the 5th/6th gear synchronizer intermediate cone, the 5th/6th gear synchronizer outer cone and the 5th/6th gear synchronizer blocking ring.

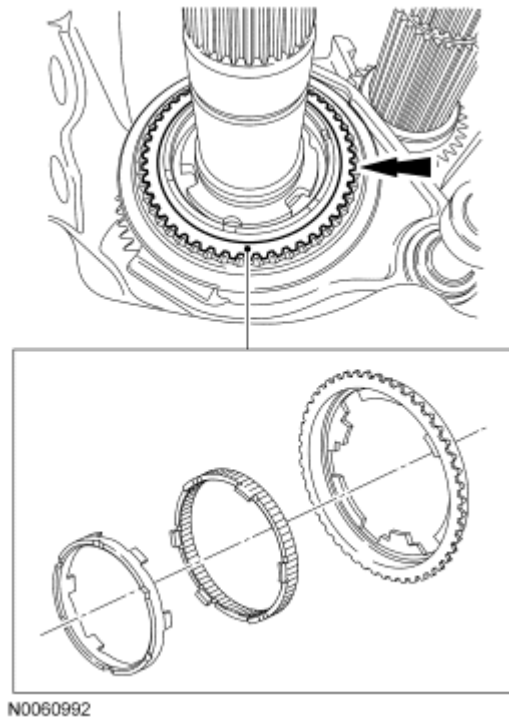


Fig. 47: Locating 5th/6th Gear Synchronizer Intermediate Cone, Outer Cone & Blocking Ring
Courtesy of FORD MOTOR CO.

33. Remove the snap ring.

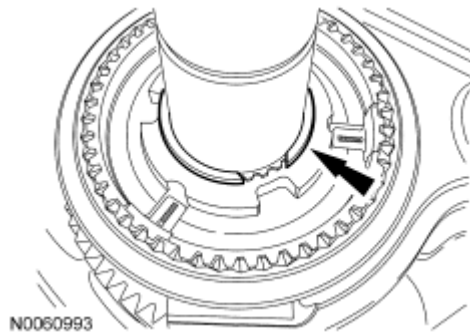


Fig. 48: Locating Snap Ring On Countershaft
Courtesy of FORD MOTOR CO.

34. Remove the 5th/6th gear shift fork and 5th/6th gear synchronizer.
- The synchronizer hub is a tight fit on the shaft, and may need to be removed separately. Using a suitable puller, remove the synchronizer hub.

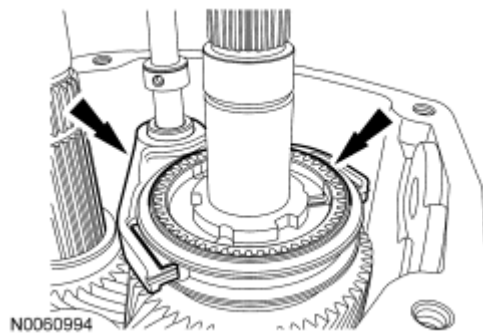


Fig. 49: Locating 5th/6th Gear Shift Fork & 5th/6th Gear Synchronizer
Courtesy of FORD MOTOR CO.

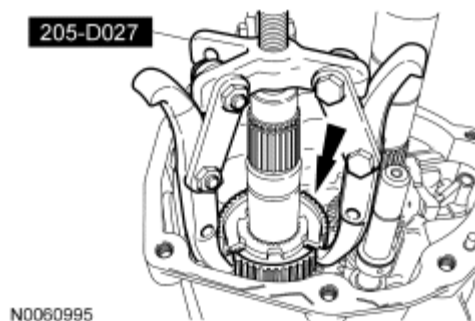


Fig. 50: Identifying Special Tool 205-D027
Courtesy of FORD MOTOR CO.

35. Remove the 5th/6th gear synchronizer intermediate cone, the 5th/6th gear synchronizer outer cone and the 5th/6th gear synchronizer blocking ring.

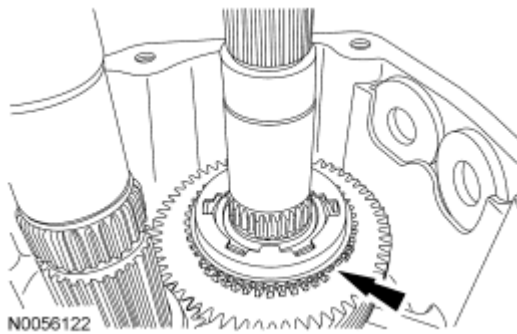


Fig. 51: Locating 5th/6th Gear Synchronizer Intermediate Cone, Outer Cone & Blocking Ring
Courtesy of FORD MOTOR CO.

36. Remove 6th gear.

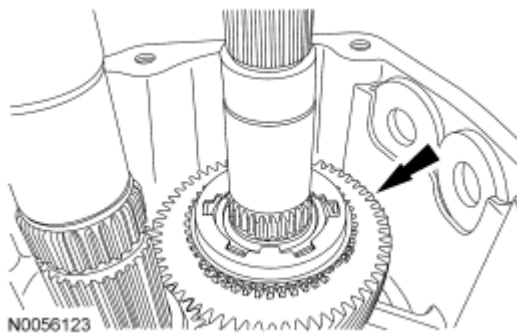


Fig. 52: Locating 6th Gear
Courtesy of FORD MOTOR CO.

37. Remove the 6th gear needle bearing.
38. Remove 9 of the clutch housing-to-transmission case bolts.

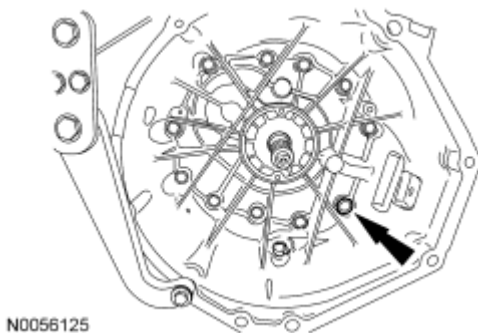


Fig. 53: Locating Clutch Housing-To-Transmission Case Bolts
Courtesy of FORD MOTOR CO.

39. Remove the vent hose.

NOTE: Rotate the transmission to a vertical position.

40. Remove the 2 shift lever guide bolts.

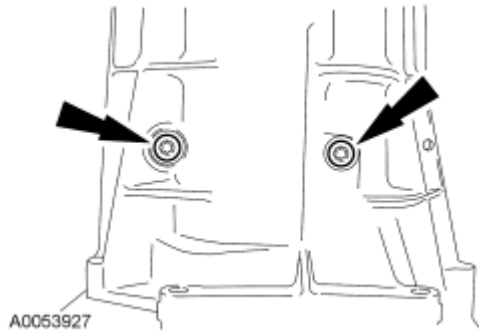


Fig. 54: Locating Shift Lever Guide Bolts
Courtesy of FORD MOTOR CO.

41. Remove the 5th/6th and reverse shift lever detent bolt, spring and detent.

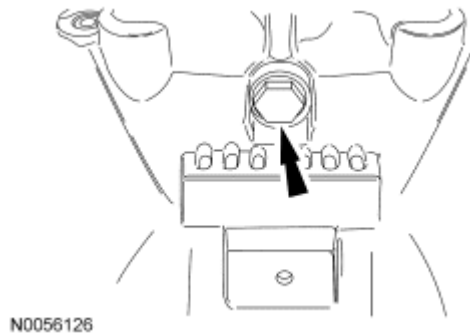


Fig. 55: Locating 5th/6th & Reverse Shift Lever Detent Bolt, Spring And Detent
Courtesy of FORD MOTOR CO.

42. Remove the 2 remaining clutch housing-to-transmission case bolts, then remove the transmission case and the front offset lever.
- Slide the transmission case upward, off the output shaft and shift rails. Hold the offset lever against the guide plate.
43. Remove the 6th gear spacer and thrust washer.

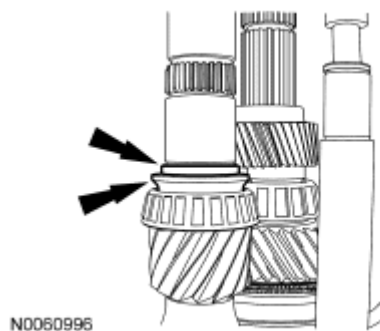


Fig. 56: Locating 6th Gear Spacer & Thrust Washer
Courtesy of FORD MOTOR CO.

44. Rotate the 5th/6th and reverse shift levers from the shift interlock plate, then remove the 5th/6th and reverse shift rail assembly.

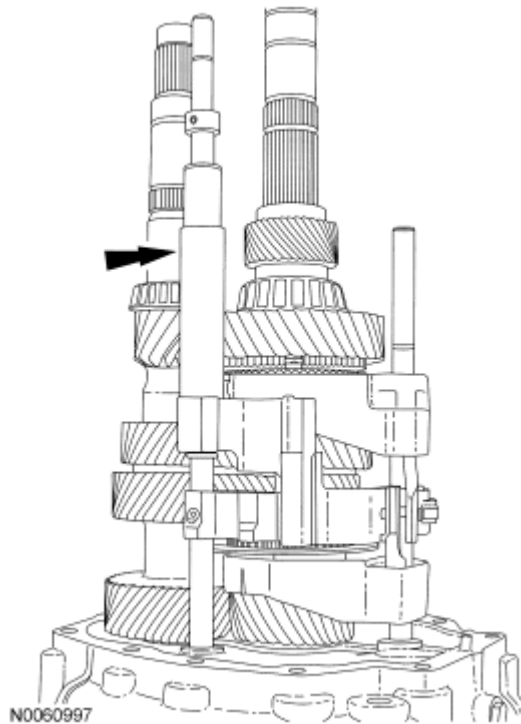


Fig. 57: Locating 5th/6th & Reverse Shift Rail Assembly
Courtesy of FORD MOTOR CO.

45. Lift up the output shaft, then remove the countershaft.
46. Remove the output shaft and shift rail as an assembly. Separate the shift rail assembly from the output shaft on the work bench.

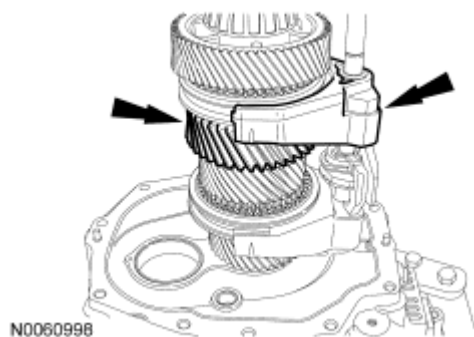


Fig. 58: Locating Output Shaft And Shift Rail
Courtesy of FORD MOTOR CO.

47. Remove the input shaft, the 4th gear synchronizer blocking ring and the double cone (3 rings).

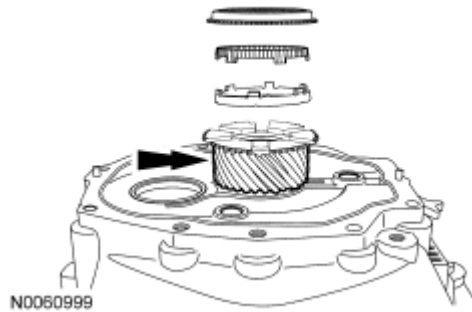


Fig. 59: Locating Input Shaft, 4th Gear Synchronizer Blocking Ring & Double Cone
Courtesy of FORD MOTOR CO.

48. Remove the countershaft bearing cup and the countershaft shim.
- Inspect the cup for wear or damage. Install a new cup and bearing as necessary.
 - Inspect the cup bore for wear, scratches or grooves. Install a new transmission adapter plate as necessary.

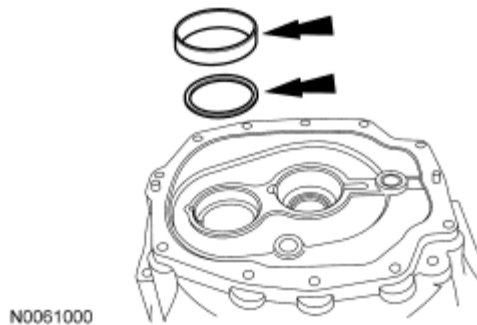


Fig. 60: Locating Input Shaft Bearing Cup
Courtesy of FORD MOTOR CO.

49. Remove the input shaft bearing cup and input shaft shim.
- Inspect the cup for wear or damage. Install a new cup and bearing as necessary.
 - Inspect the cup bore for wear, scratches or grooves. Install a new transmission adapter plate as necessary.

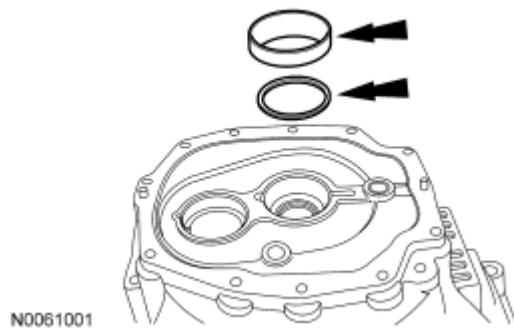


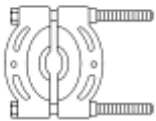
Fig. 61: Locating Countershaft Bearing Cup
Courtesy of FORD MOTOR CO.

50. Remove and discard the input shaft seal.
51. Inspect the clutch housing for cracks. Clean and check the sealing surface for nicks or scratches.
 - If the clutch housing is cracked, install a new housing. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.

DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

INPUT SHAFT AND BEARING

Special Tools

Illustration	Tool Name	Tool Number
 ST1895-A	Puller, Bearing	205-D064 (D84L-1123-A)

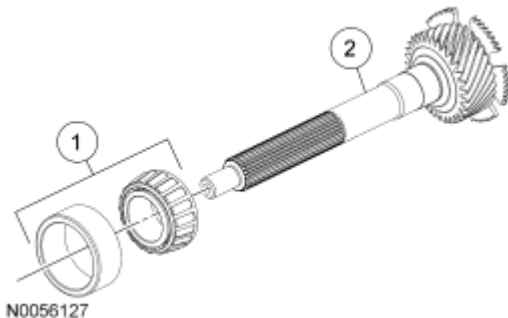


Fig. 62: Exploded View Of Input Shaft & Bearing
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7025	Input shaft bearing

DISASSEMBLY AND ASSEMBLY

NOTE: Any wear or damage on the input shaft can prevent the clutch from operating correctly.

1. Inspect the splines on the input shaft for wear or damage. If worn or damaged, install a new input shaft.
 - Use an emery cloth to remove small scratches.

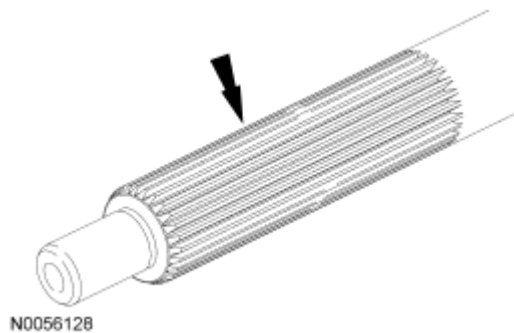


Fig. 63: Inspecting Splines On Input Shaft For Damage
Courtesy of FORD MOTOR CO.

2. Using the special tool and a press, remove the input shaft front bearing.

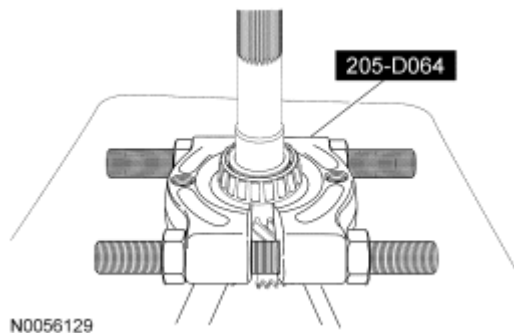


Fig. 64: Removing Input Shaft Front Bearing Using Special Tool & A Press
Courtesy of FORD MOTOR CO.

3. Using the special tools and a press, install a new input shaft bearing.

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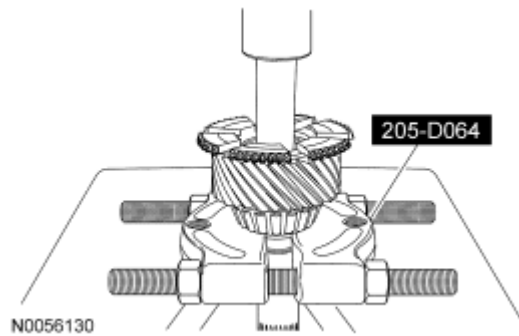
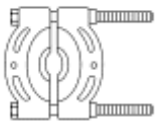


Fig. 65: Installing New Input Shaft Bearing Using Special Tool & A Press
Courtesy of FORD MOTOR CO.

OUTPUT SHAFT

Special Tools

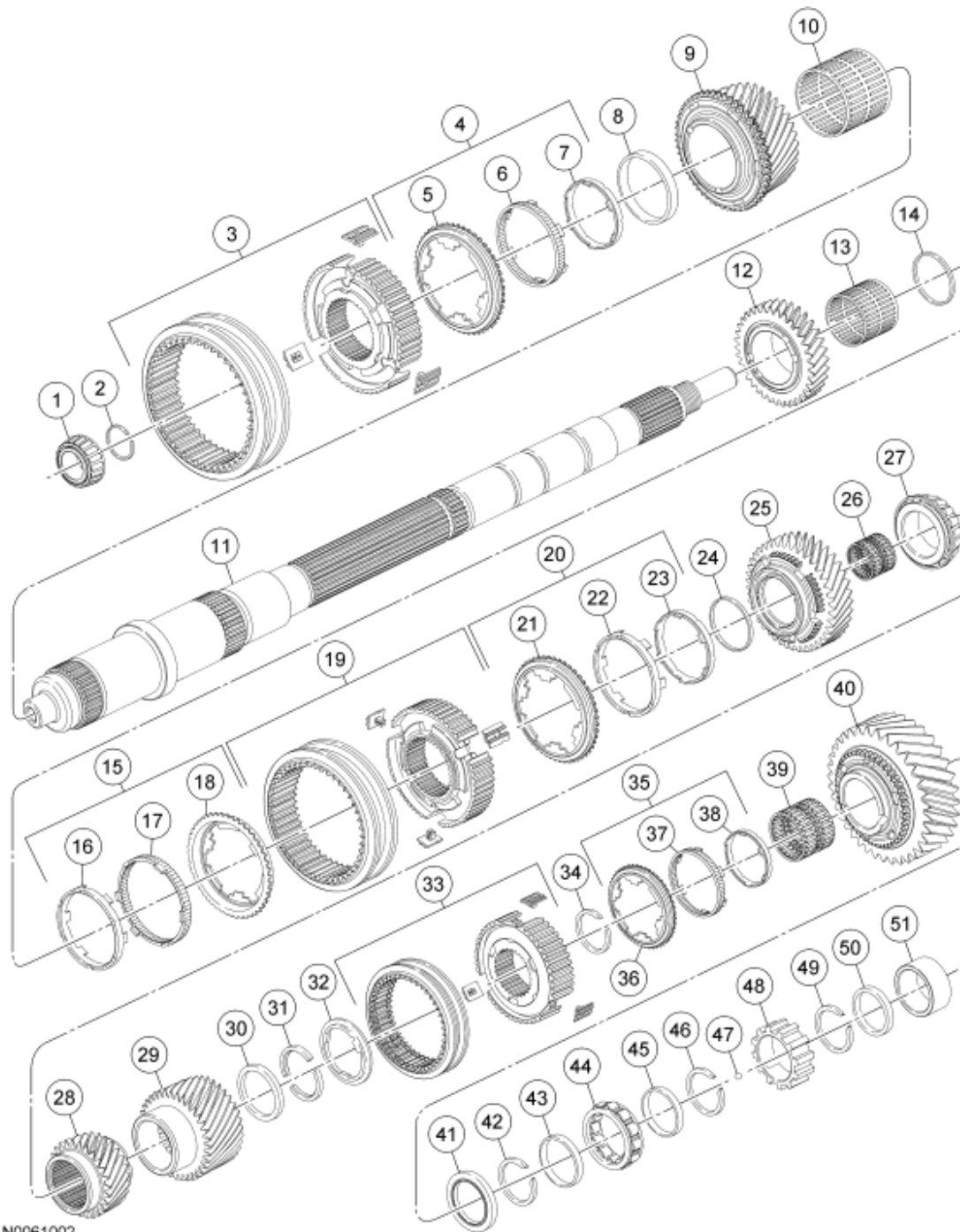
Illustration	Tool Name	Tool Number
 ST1895-A	Puller, Bearing	205-D064 (D84L-1123-A)
 ST2356-A	Adapter for 303-224 (Handle)	205-153 (T80T-4000-W)
 ST2359-A	Installer, Output Shaft Rear Bearing	308-401
 ST2358-A	Remover/Installer, Bearing Tube	308-025 (T75L-7025-C)

Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V

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N0061002

Fig. 66: Exploded View Of Output Shaft
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7025	Output shaft front bearing
2	7A082	Snap ring

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3	7124	3rd/4th synchronizer assembly
4	7107	3rd/4th synchronizer blocking ring assembly
5	-	Synchronizer blocking ring (part of 7107)
6	-	Synchronizer outer cone (part of 7107)
7	-	Synchronizer inner cone (part of 7107)
8	7117	Spacer
9	7B340	3rd gear
10	7025	3rd gear needle bearing
11	7061	Output shaft
12	7102	2nd gear
13	7025	2nd gear needle bearing
14	7117	Spacer
15	7107	2nd gear synchronizer blocking ring assembly
16	-	Synchronizer inner cone (part of 7107)
17	-	Synchronizer outer cone (part of 7107)
18	-	Synchronizer blocking ring (part of 7107)
19	7124	1st/2nd synchronizer assembly
20	7107	1st gear synchronizer blocking ring assembly
21	-	Synchronizer blocking ring (part of 7107)
22	-	Synchronizer outer cone (part of 7107)
23	-	Synchronizer inner cone (part of 7107)
24	-	Split washer
25	7100	1st gear
26	7025	1st gear needle bearing
27	7025	Output shaft rear bearing
28	7L047	6th driven gear
29	7K316	5th driven gear
30	7117	Spacer
31	7050	Retainer
32	7A082	Thrust washer
33	7124	Reverse synchronizer assembly
34	7A082	Snap ring
35	7107	Reverse gear synchronizer blocking ring assembly
36	-	Synchronizer blocking ring (part of 7107)
37	-	Synchronizer outer cone (part of 7107)
38	-	Synchronizer inner cone (part of 7107)
39	7N168	Reverse gear needle bearing

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40	7C238	Reverse gear
41	7A385	Thrust washer
42	7A082	Snap ring
43	-	Spacer
44	7025	Rear output shaft bearing
45	-	Spacer
46	7A082	Snap ring
47	7E172	Check ball
48	7H150	Speedometer rotor
49	7A082	Snap ring
50	-	Spacer
51	-	Output shaft bearing race

DISASSEMBLY

1. Remove the 3rd/4th synchronizer sleeve.

CAUTION: Hand tighten the special tool to prevent gear damage.

CAUTION: Support the output shaft while using the press to prevent damage to the shaft or gears.

2. Using the special tool and a press, remove 1st gear, the output shaft rear bearing and the 5th driven gear.
 - Discard the output shaft bearing.
 - Inspect the gears for wear or damage. Install a new gear as necessary.

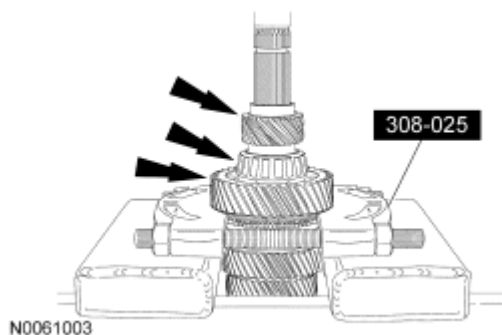


Fig. 67: Locating 1st Gear, Output Shaft Rear Bearing & 5th Driven Gear
Courtesy of FORD MOTOR CO.

3. Remove the 1st gear needle bearing.
 - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.
4. Remove the 1st gear synchronizer inner cone, the outer cone and the blocking ring.

- Inspect all components for wear or damage. Install new components as necessary.

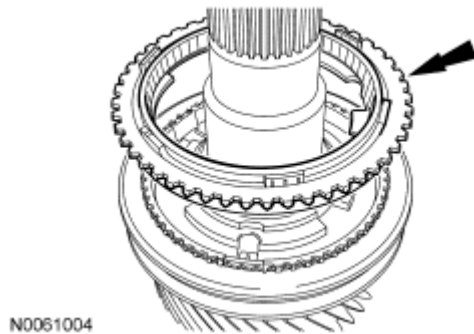


Fig. 68: Locating 1st Gear Synchronizer Inner Cone, Intermediate Cone & 1st Gear Synchronizer Blocking Ring

Courtesy of FORD MOTOR CO.

5. Remove the synchronizer sleeve and the 3 synchronizer keys.

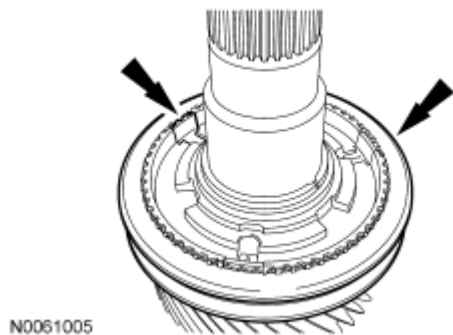


Fig. 69: Locating 1st Gear Synchronizer Sleeve & Synchronizer Keys

Courtesy of FORD MOTOR CO.

6. Remove the split washer.

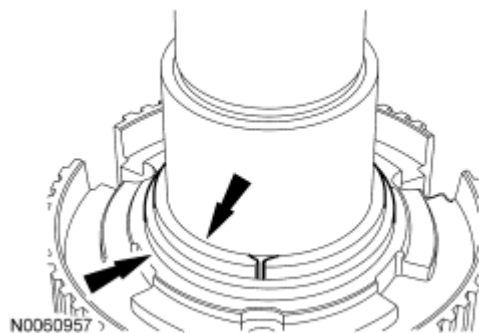
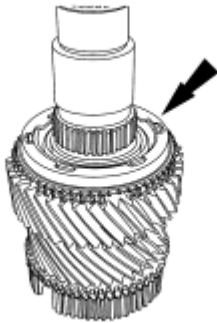


Fig. 70: Installing Split Washer

Courtesy of FORD MOTOR CO.

7. Remove the 1st/2nd gear synchronizer hub.

8. Remove the inner cone, the outer cone, the 2nd gear synchronizer blocking ring and the synchronizer hub.
 - Inspect all synchronizer components for wear or damage. Install new components as necessary.

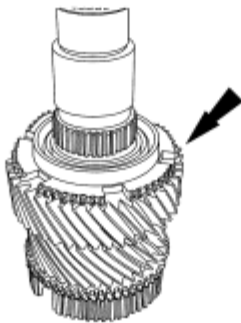


N0061006

Fig. 71: Locating Inner Cone, Outer Cone, 2nd Gear Synchronizer Blocking Ring & Synchronizer Hub

Courtesy of FORD MOTOR CO.

9. Remove 2nd gear.
 - Inspect 2nd gear for wear or damage. Install a new gear as necessary.

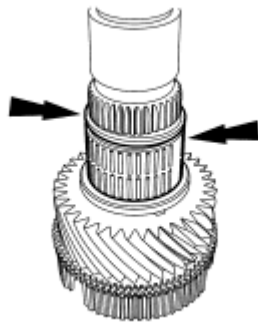


N0060958

Fig. 72: Locating 2nd Gear, Inner Cone, Intermediate Cone & 2nd Gear Synchronizer Blocking Ring

Courtesy of FORD MOTOR CO.

10. Remove the 2nd gear needle bearing and the spacer.
 - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.



N0060959

Fig. 73: Locating 2nd Gear Needle Bearing & Spacer
Courtesy of FORD MOTOR CO.

NOTE: Reposition the output shaft on the press with the input shaft end facing upward.

11. Remove and discard the snap ring, then using the special tool, remove the 3rd/4th gear synchronizer assembly, the 3rd gear synchronizer double cone and the 3rd gear.
 - Inspect the gear for broken or cracked teeth. Install a new gear as necessary.
 - Inspect all synchronizer components for wear or damage. Install new components as necessary.

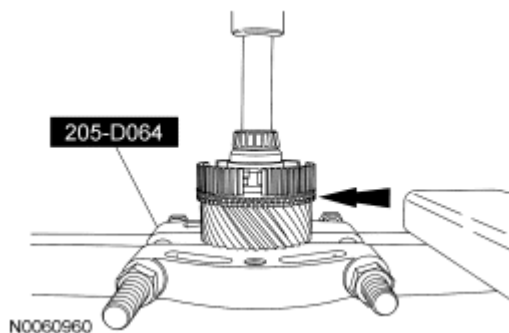


Fig. 74: Locating 3rd/4th Gear Synchronizer Assembly, 3rd Gear Synchronizer Double Cone & 3rd Gear
Courtesy of FORD MOTOR CO.

12. Remove the 3rd gear needle bearing and the spacer.
 - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.

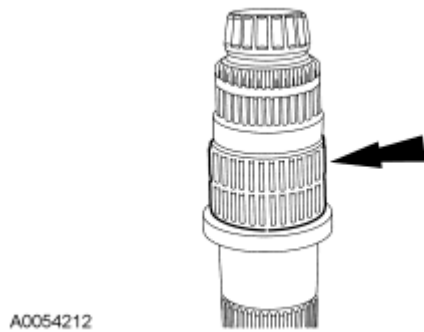


Fig. 75: Locating 3rd Gear Needle Bearing & Space
Courtesy of FORD MOTOR CO.

NOTE: Install the special tool with the flat side facing the bearing.

13. Using the special tool, press the output shaft front bearing from the output shaft. Discard the bearing.

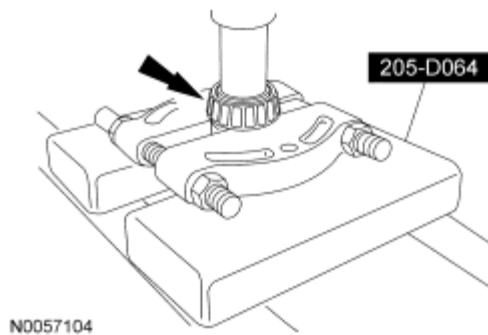


Fig. 76: Pressing Output Shaft Front Bearing From Output Shaft Using Special Tool
Courtesy of FORD MOTOR CO.

14. Inspect the synchronizers.
 - Check for worn, nicked or broken teeth. Install a new synchronizer as necessary.
 - Check keys for wear or damage. Install a new synchronizer as necessary.
15. Inspect the synchronizer blocking rings.
 - Check for wear or damage. Install new synchronizer blocking rings as necessary.
 - Check the clearance between the synchronizer blocking ring and the gear.
 - Position the blocking ring onto the gear. Make sure the correct blocking ring is measured with the correct gear and that the blocking ring is fully seated on the gear.
 - Insert a feeler gauge and measure the clearance, while applying pressure and rotating the blocking ring. The measurement should be the same around the entire circumference. If the clearance is less than 0.38 mm (0.015 in), install new blocking rings.

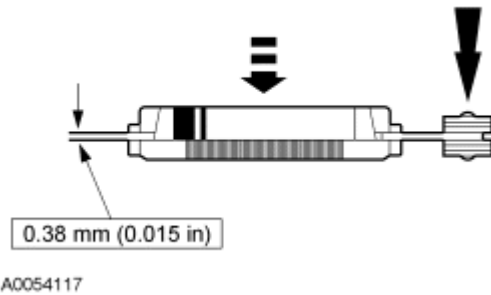


Fig. 77: Measuring Clearance Between Synchronizer Blocking Ring And Gear
Courtesy of FORD MOTOR CO.

16. Inspect the output shaft for scoring or worn or damaged splines. Install a new output shaft as necessary.

ASSEMBLY

1. Lubricate all components with the recommended transmission fluid when reassembling.
2. Using the special tools, press the new output shaft front bearing on the output shaft.

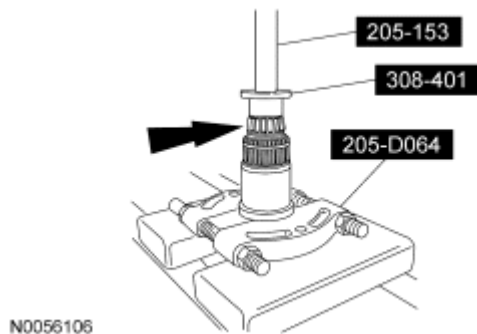


Fig. 78: Pressing New Output Shaft Front Bearing On Output Shaft Using Special Tools
Courtesy of FORD MOTOR CO.

3. Install the 3rd gear bearing and the spacer.
 - Apply petroleum jelly to the bearing.

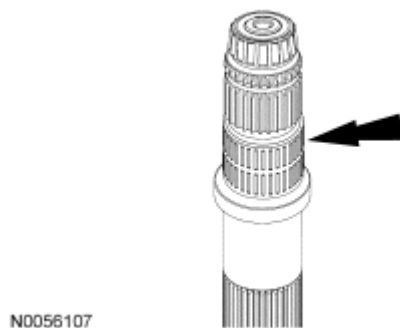


Fig. 79: Locating 3rd Gear Bearing & Spacer

Courtesy of FORD MOTOR CO.

4. Install 3rd gear, the 3rd gear synchronizer double cones and the 3rd/4th gear synchronizer assembly. Position the output shaft with the output end facing upward. Using the special tool, press the 3rd/4th gear synchronizer assembly into place.
 - Install the synchronizer body with the groove facing 3rd gear.
 - Stop press operation before keys engage the blocking ring slots. Lift and rotate the 3rd gear and the blocking ring until the keys are seated in the blocking ring.

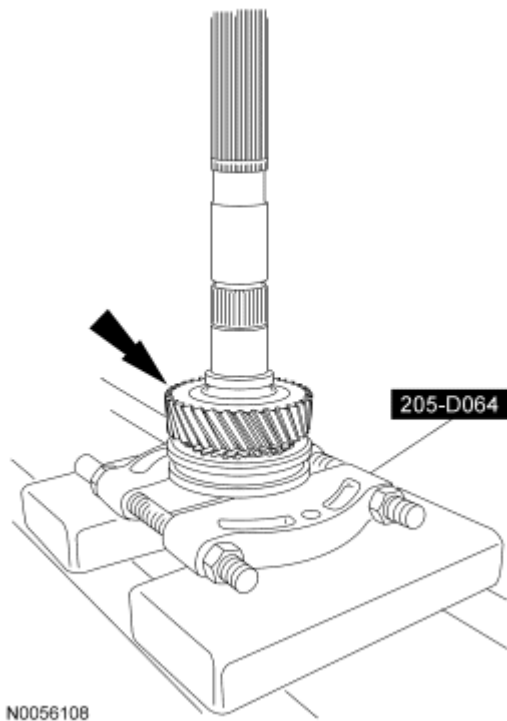


Fig. 80: Locating Synchronizer Body With Groove Facing 3rd Gear
Courtesy of FORD MOTOR CO.

5. Install a new snap ring.
6. Install the 2nd gear needle bearing.
 - Apply petroleum jelly to the bearing.

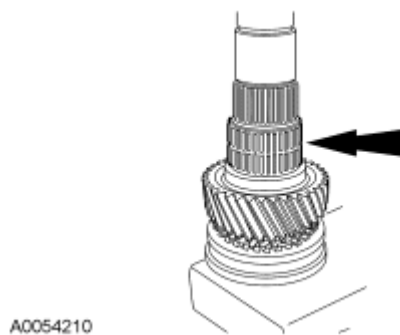
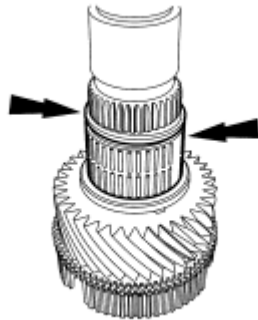


Fig. 81: Installing 2nd Gear Needle Bearing
Courtesy of FORD MOTOR CO.

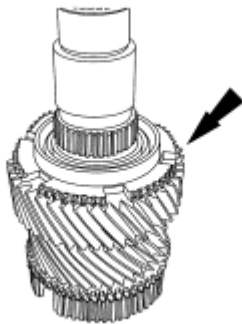
7. Install 2nd gear and the bearing spacer.



N0060959

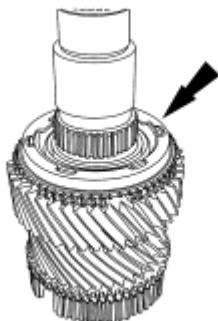
Fig. 82: Locating 2nd Gear Needle Bearing & Spacer
Courtesy of FORD MOTOR CO.

8. Install the 2nd gear, the inner cone, the intermediate cone and the 2nd gear synchronizer blocking ring.
 - Align the blocking ring tabs with the 2nd gear slots.



N0060958

Fig. 83: Locating 2nd Gear, Inner Cone, Intermediate Cone & 2nd Gear Synchronizer Blocking Ring
Courtesy of FORD MOTOR CO.



N0061006

Fig. 84: Locating Inner Cone, Outer Cone, 2nd Gear Synchronizer Blocking Ring & Synchronizer Hub

Courtesy of FORD MOTOR CO.

9. Install the 1st/2nd gear synchronizer hub assembly into place.
 - Install the synchronizer with the groove on the sleeve facing 1st gear.
 - Lift and rotate the 2nd gear and the blocking ring until the keys are seated in the blocking ring.
10. Install the split washer.

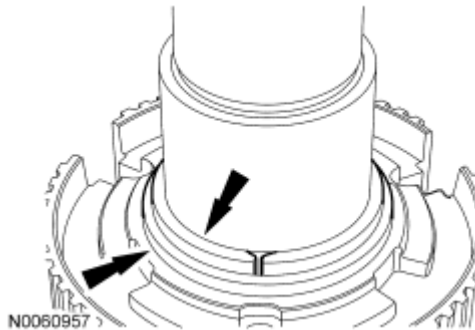


Fig. 85: Installing Split Washer
Courtesy of FORD MOTOR CO.

11. Install the 1st gear synchronizer sleeve and 3 synchronizer keys.

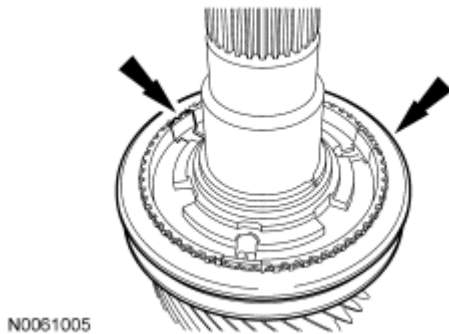


Fig. 86: Locating 1st Gear Synchronizer Sleeve & Synchronizer Keys
Courtesy of FORD MOTOR CO.

12. Install the 1st gear synchronizer inner cone, the intermediate cone and the 1st gear synchronizer blocking ring.

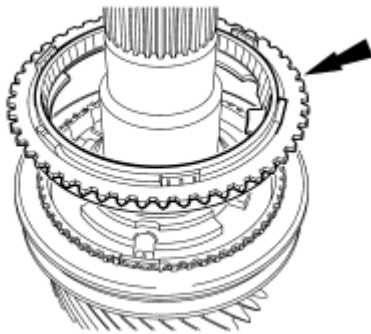


Fig. 87: Locating 1st Gear Synchronizer Inner Cone, Intermediate Cone & 1st Gear Synchronizer Blocking Ring
Courtesy of FORD MOTOR CO.

13. Install the 1st gear needle bearing.
 - Apply petroleum jelly to the bearing.

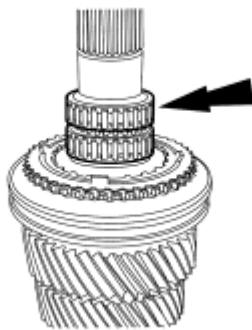


Fig. 88: Locating 1st Gear Needle Bearing
Courtesy of FORD MOTOR CO.

14. Install 1st gear.
 - Rotate the gear to align the gear slots with the intermediate cone tabs.
15. Using the special tool, install a new rear output shaft bearing.

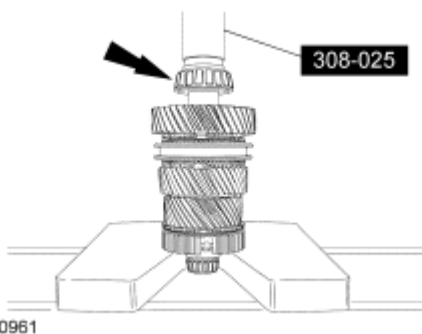


Fig. 89: Installing New Rear Output Shaft Bearing Using Special Tool
Courtesy of FORD MOTOR CO.

16. Using the special tools, install the 5th driven gear.

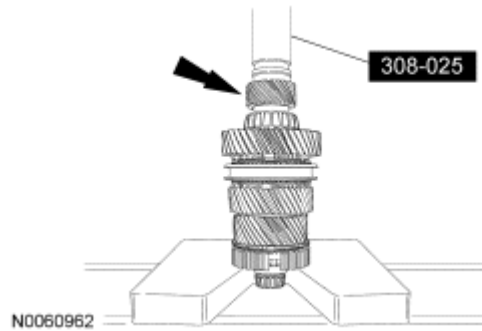
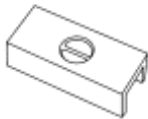
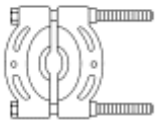
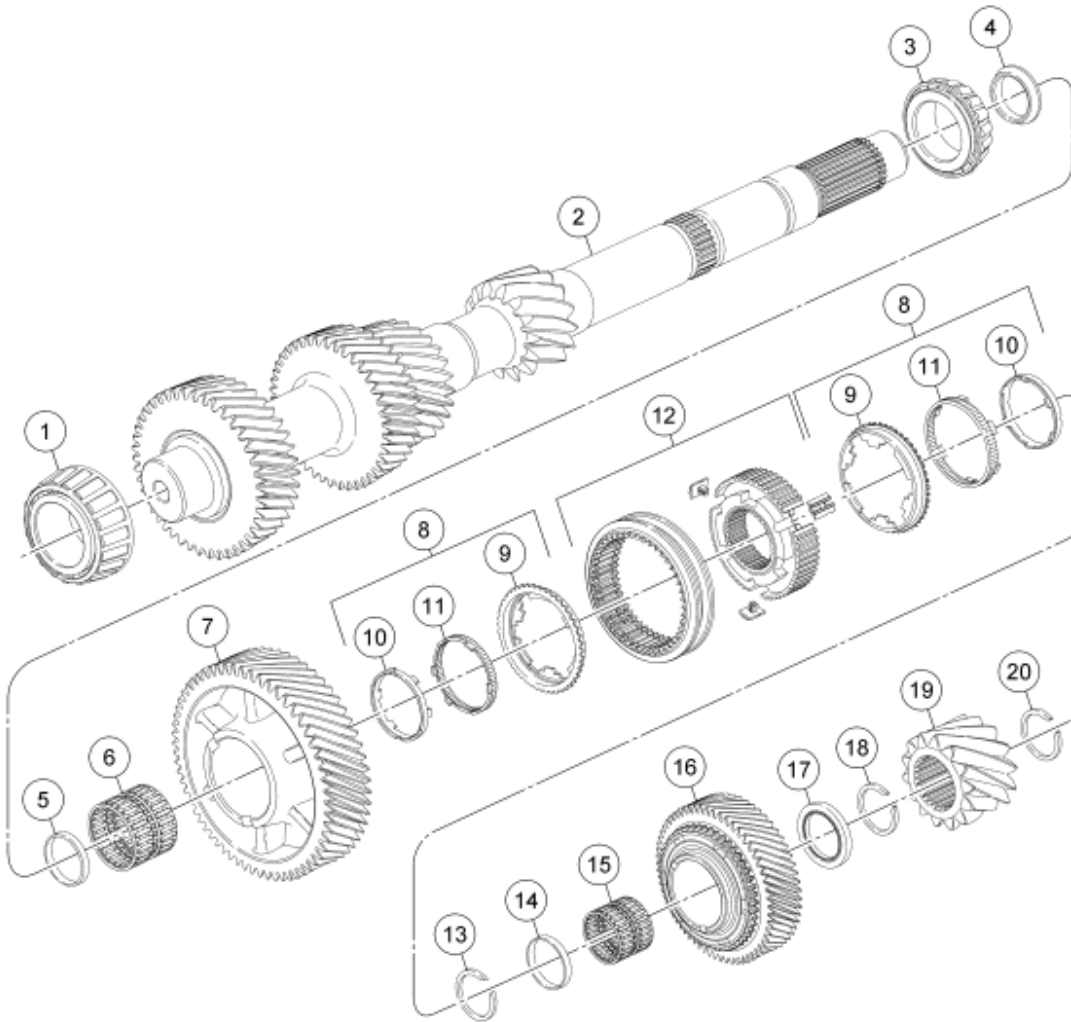


Fig. 90: Installing 5th Driven Gear Using Special Tools
Courtesy of FORD MOTOR CO.

COUNTERSHAFT

Special Tools

Illustration	Tool Name	Tool Number
 ST1254-A	Plate, Bearing Oil Seal	205-090 (T75L-1165-B)
 ST1895-A	Puller, Bearing	205-D064 (D84L-1123-A)
 ST1303-A	Installer, Drive Pinion Bearing Cone	205-004 (T53T-4621-B)
 ST2147-A	Remover/Installer, Bearing Tube	308-025 (T75L-7025-C)



N0072593

Fig. 91: Exploded View Of Countershaft
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7025	Countershaft front bearing
2	7113	Countershaft
3	7025	Countershaft rear bearing
4	-	Thrust washer
5	7117	Spacer
6	7025	6th gear needle bearing
7	7146	6th gear
8	7107	Synchronizer blocking ring assembly
9	-	Synchronizer blocking ring (part of 7107)
10	-	Synchronizer inner cone (part of 7107)

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11	-	Synchronizer outer cone (part of 7107)
12	7124	5th/6th synchronizer assembly
13	7A082	Snap ring
14	7117	Spacer
15	7025	5th gear needle bearing
16	7144	5th gear
17	7117	Spacer
18	7A082	Snap ring
19	-	Reverse driver gear
20	7A082	Snap ring

DISASSEMBLY AND ASSEMBLY

1. Using the special tool and a press, remove the countershaft rear bearing.

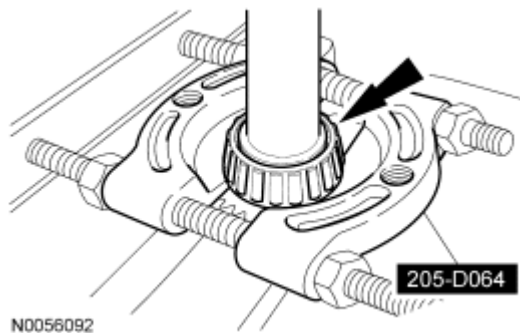


Fig. 92: Locating Countershaft Rear Bearing
Courtesy of FORD MOTOR CO.

2. Using the special tool and a press, remove the countershaft front bearing.

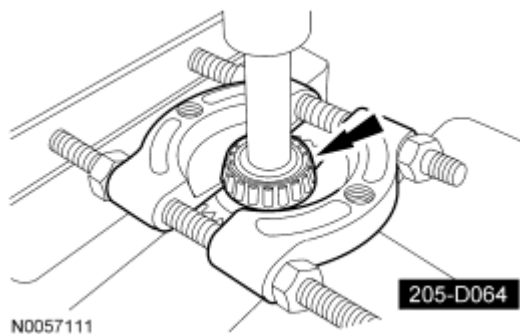
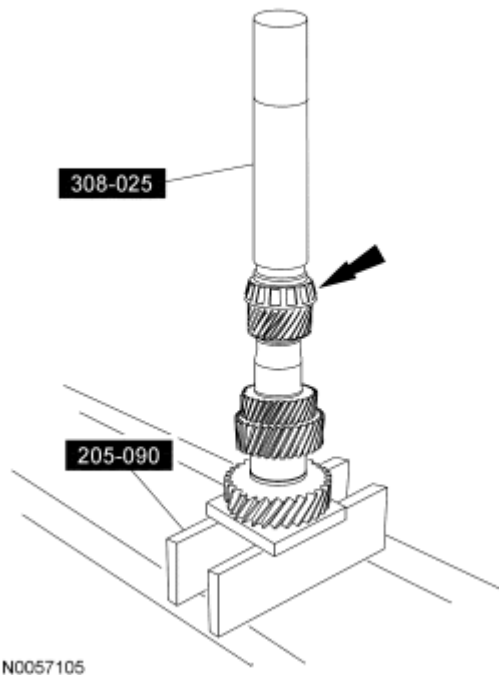


Fig. 93: Locating Countershaft Front Bearing
Courtesy of FORD MOTOR CO.

3. Inspect the countershaft.
 - Check the shaft surface for wear or damage. Install a new shaft as necessary.

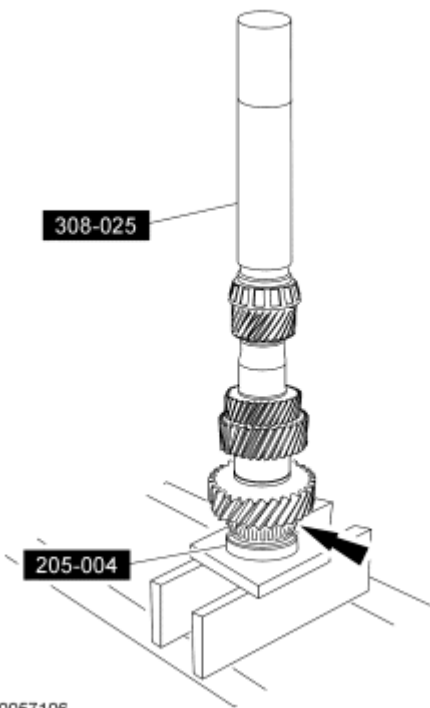
- Check the gear teeth for wear, pitting, scoring, spalling or fractures. Install new components as necessary.
4. Using the special tools, install the countershaft rear bearing.



N0057105

Fig. 94: Locating Countershaft Rear Bearing
Courtesy of FORD MOTOR CO.

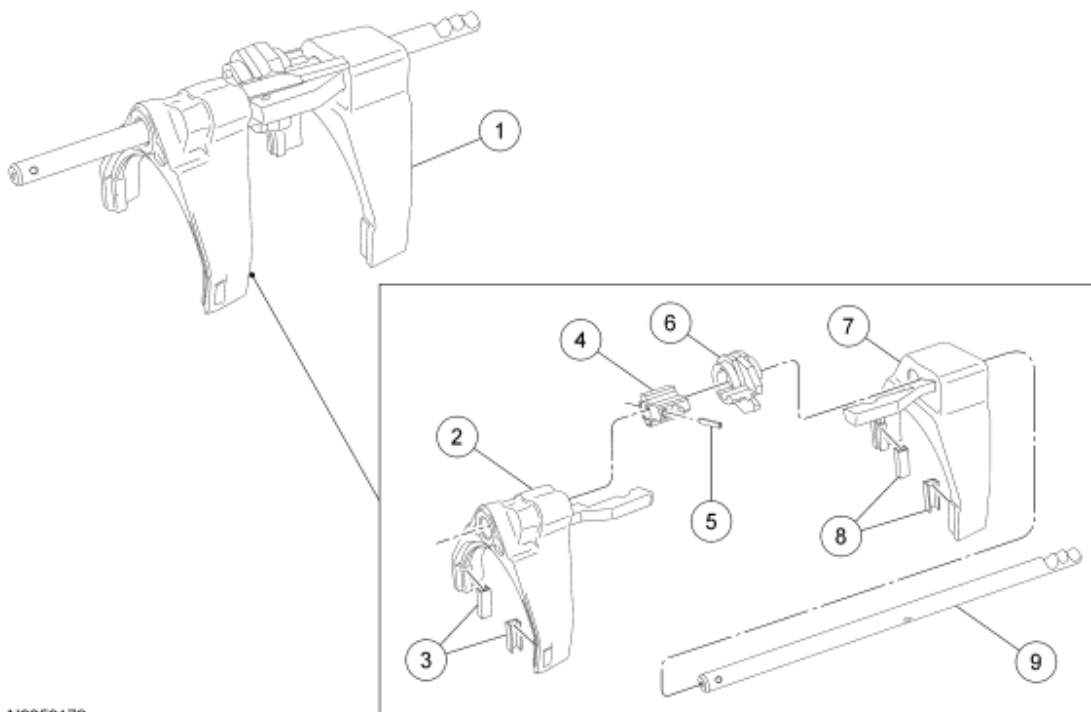
5. Using the special tools, install the countershaft front bearing.



N0057106

Fig. 95: Locating Countershaft Front Bearing
Courtesy of FORD MOTOR CO.

GEARSHIFT RAIL AND FORK



N0059179

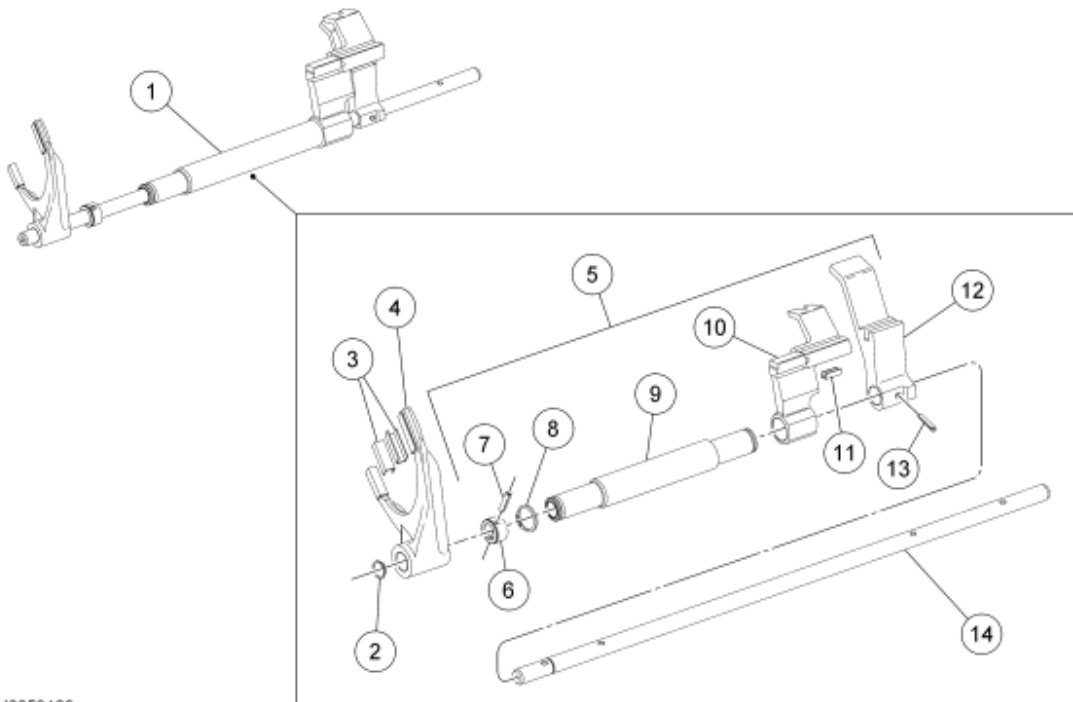
Fig. 96: Exploded View Of 1st/2nd & 3rd/4th Shift Rail Assembly

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Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	-	1st/2nd and 3rd/4th shift rail assembly
2	7230	1st/2nd shift fork and link
3	7L082	1st/2nd shift fork pads
4	7814	Selector pin
5	7A082	Roll pin
6	7K201	Interlock plate
7	7230	3rd/4th shift fork and link
8	7L082	3rd/4th shift fork pads
9	7L267	1st/2nd, 3rd/4th shift rail



N0059180

Fig. 97: Exploded View Of 5th/6th & Reverse Shift Rail Assembly
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	-	5th/6th and reverse shift rail assembly
2	7A082	Snap ring
3	7L082	Reverse shift fork pads
4	7230	Reverse shift fork
5	7241	5th/6th shift rail assembly
6	-	Shift rail collar (part of 7241)

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7	-	Roll pin (part of 7241)
8	-	Snap ring (part of 7241)
9	-	5th/6th inner shift rail lever (part of 7241)
10	-	5th/6th outer shift rail lever (part of 7241)
11	-	5th/6th outer shift lever pad (part of 7241)
12	-	Reverse shift rail lever (part of 7241)
13	-	Roll pin (part of 7241)
14	-	5th/6th shift rail (part of 7241)

DISASSEMBLY AND ASSEMBLY

1. Disassemble the 1st/2nd and 3rd/4th shift rail as follows:
 - Rotate the interlock plate until it is opposite of the shift links.
 - Slide off the 3rd/4th shift fork and shift link.
 - Slide off the 1st/2nd shift fork and shift link.
 - Using a 5/32-inch drift and a hammer, remove and discard the roll pin. Remove the interlock plate.
2. Disassemble the 5th/6th and reverse shift rail as follows:
 - Using a 5/32-inch drift and a hammer, remove and discard the roll pins. Slide the collar and the reverse shift lever from the shift rail.
 - Remove the snap ring.
 - Slide off the 5th/6th shift lever and shift link.
 - Using a press, separate the 5th/6th outer shift rail lever from the inner shift rail lever.
3. Inspect the shift rail components.
 - Check the rails, shift forks, shift levers and shift links for wear or damage. Install new components as necessary.
 - Check the shift fork pads for wear. Install new pads as necessary.
4. To assemble, reverse the disassembly procedure.
 - Install new roll pins.

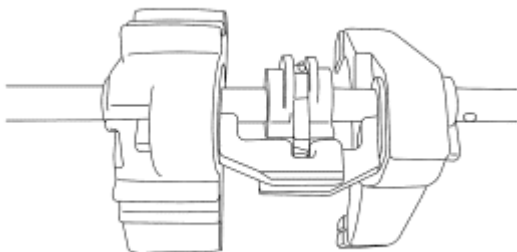
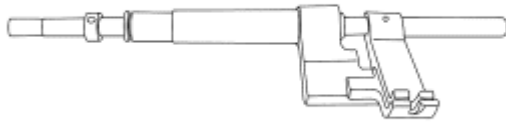


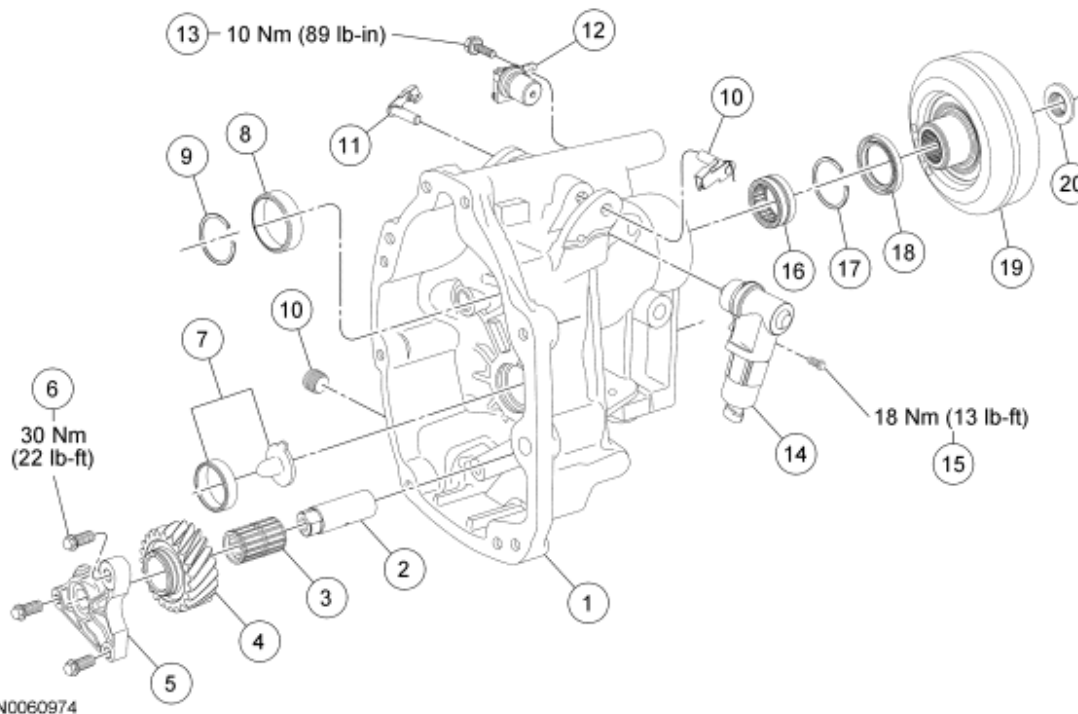
Fig. 98: Identifying 5th/6th Outer Shift Rail Lever
Courtesy of FORD MOTOR CO.



A0054124

Fig. 99: Identifying Inner Shift Rail Lever
Courtesy of FORD MOTOR CO.

EXTENSION HOUSING



N0060974

Fig. 100: Exploded View Of Extension Housing With Torque Specifications
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7A039	Extension housing
2	7140	Reverse idler gear shaft
3	7025	Reverse idler gear needle bearing

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4	7141	Reverse idler gear
5	7723	Reverse idler shaft bracket
6	-	Reverse idler shroud bracket bolt
7	-	Countershaft bearing cup and fluid funnel
8	-	Output shaft bearing cup
9	-	Snap ring
10	7A010	Case plug
11	7314	Shift linkage retainers
12	7H103	Output shaft speed (OSS) sensor
13	7A443	OSS sensor bolt
14	7374	Reverse lockout solenoid
15	-	Reverse lockout solenoid bolt
16	7025	Output shaft bearing
17	7A082	Output shaft bearing snap ring
18	7052	Extension housing seal
19	7089	Output flange
20	7K440	Output flange nut

DISASSEMBLY AND ASSEMBLY

1. Remove the output shaft speed (OSS) bolt and the OSS sensor.
 - To install, tighten to 10 Nm (89 lb-in).

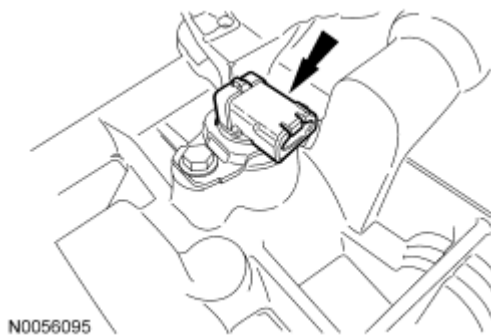
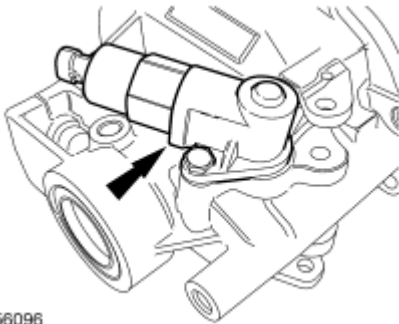


Fig. 101: Locating Output Shaft Speed (OSS) Bolt & OSS Sensor
Courtesy of FORD MOTOR CO.

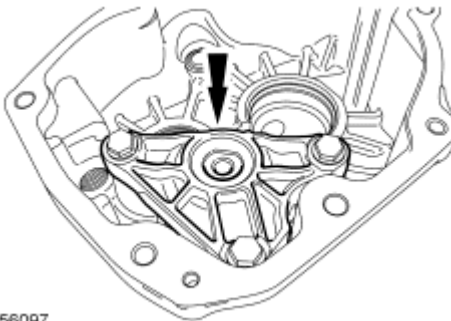
2. Remove the reverse lockout solenoid bolt and the reverse lockout solenoid.
 - To install, tighten to 18 Nm (13 lb-ft).



N0056096

Fig. 102: Locating Reverse Lockout Solenoid Bolt & Reverse Lockout Solenoid
Courtesy of FORD MOTOR CO.

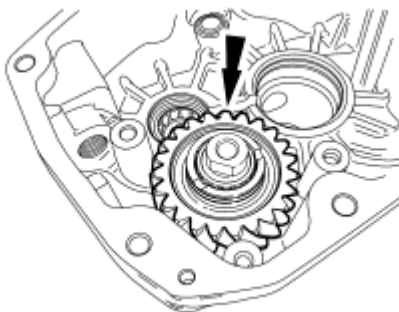
3. Remove the 3 reverse idler shaft bracket bolts and the reverse idler shaft bracket.
 - To install, tighten to 30 Nm (22 lb-ft).



N0056097

Fig. 103: Locating Reverse Idler Shaft Bracket Bolts & Reverse Idler Shaft Bracket
Courtesy of FORD MOTOR CO.

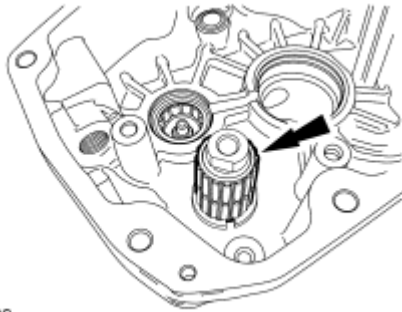
4. Remove the reverse idler gear.



N0056098

Fig. 104: Locating Reverse Idler Gear
Courtesy of FORD MOTOR CO.

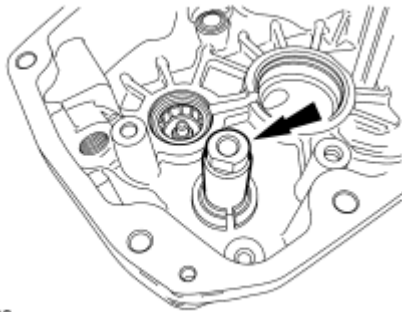
5. Remove the reverse idler gear needle bearing.
 - Inspect the needle bearing for wear or damage. Install a new bearing as necessary.



N0056099

Fig. 105: Locating Reverse Idler Gear Needle Bearing
Courtesy of FORD MOTOR CO.

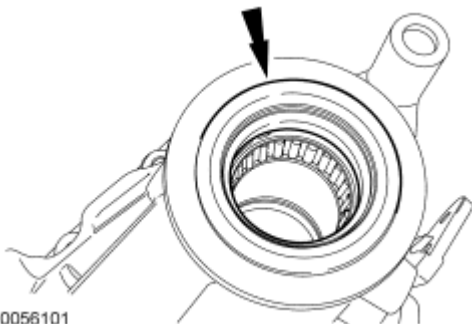
6. Remove the reverse idler gear shaft.



N0056100

Fig. 106: Locating Reverse Idler Gear Shaft
Courtesy of FORD MOTOR CO.

7. If necessary, remove the bearing and fluid funnel assembly.
8. Remove the countershaft bearing cup snap ring and the bearing cup.
9. Remove and discard the extension housing seal.



N0056101

Fig. 107: Locating Countershaft Bearing Cup Snap Ring & Bearing Cup
Courtesy of FORD MOTOR CO.

10. Clean the housing with solvent and dry with compressed air. Clean and check the sealing surface for nicks or scratches. Inspect the housing for cracks.

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- If the housing is cracked, install a new housing. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.
11. Remove the snap ring. Position the extension housing with the seal facing downward. Using a brass drift, remove the output shaft bearing.

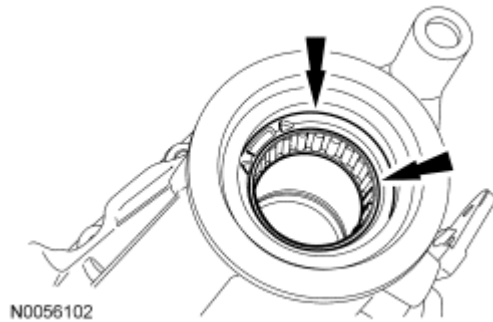


Fig. 108: Identifying Output Shaft Bearing
Courtesy of FORD MOTOR CO.

12. To assemble, reverse the disassembly procedure.

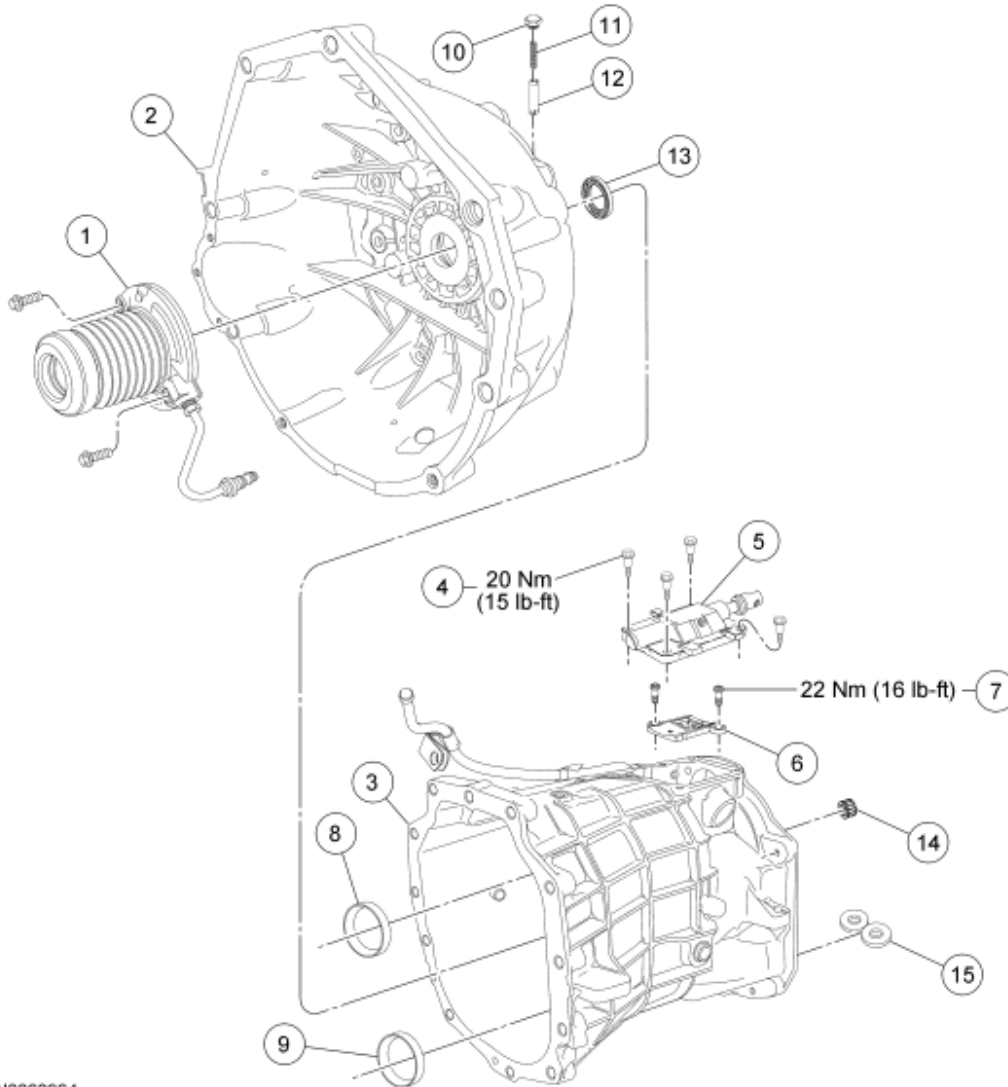
TRANSMISSION CASE

Special Tools

Illustration	Tool Name	Tool Number
 ST2336-A	Handle	205-D055 (D81L-4000-A)
 ST1555-A	Installer, Bearing Cup	204-039 (T77F-1217-B)
 ST1555-A	Installer, Bearing Cup	204-080 (T83P-1104-AH1)
	Installer, Rear Axle Oil Seal	205-155 (T80T-4000-Y)

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N0060964

Fig. 109: Exploded View Of Transmission Case With Torque Specifications
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7A508	Clutch slave cylinder
2	6392	Clutch housing
3	7005	Transmission main case
4	-	Shift cover bolt (4 required)

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5	7C453	Shift cover assembly
6	7F476	Shift guide plate
7	-	Shift guide plate bolt (2 required)
8	-	Output shaft bearing cup
9	-	Countershaft bearing cup
10	-	Shift detent plug
11	7234	Shift detent spring
12	-	Shift detent
13	7052	Input shaft seal
14	7127	Top shift rail bearing
15	-	Magnets

DISASSEMBLY AND ASSEMBLY

1. Remove the shift detent from the transmission main case.



Fig. 110: Locating Shift Detent From Transmission Main Case
Courtesy of FORD MOTOR CO.

2. Remove the shift detent plug and the spring and shift detent from the clutch housing.
3. Remove the 2 guide plate bolts and the guide plate.
 - Inspect the plate for wear or damage. Install a new plate as necessary.
 - To install, tighten to 22 Nm (16 lb-ft).

NOTE: Do not remove the magnets.

4. Clean the case magnets.



Fig. 111: Locating Guide Plate Bolts
Courtesy of FORD MOTOR CO.

5. Remove the reverse lamp switch.
 - To install, tighten to 27 Nm (20 lb-ft).
6. Inspect the countershaft and mainshaft bearing cups for wear or damage. Install new components as necessary.
7. Using the special tools, remove the countershaft bearing cup.

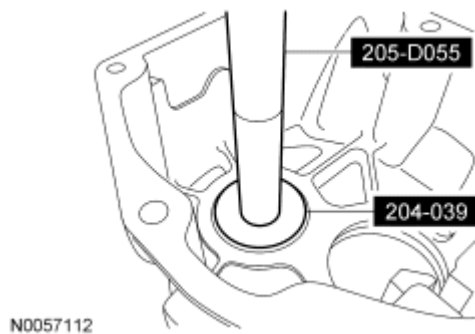


Fig. 112: Locating Reverse Lamp Switch
Courtesy of FORD MOTOR CO.

8. Using the special tools, remove mainshaft bearing cup.
9. Clean the case with solvent and dry with compressed air. Clean and check the sealing surface for nicks or scratches. Inspect the case for cracks.
 - If the case is cracked, install a new case. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.

NOTE: If a new countershaft bearing is being installed, install a new bearing cup. Always install new bearings and cups in a set.

10. Using the special tools, install the countershaft bearing cup.

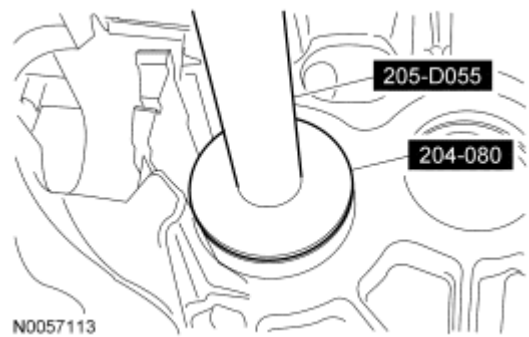


Fig. 113: Removing Mainshaft Bearing Cup Using Special Tools
Courtesy of FORD MOTOR CO.

NOTE: If a new mainshaft bearing is being installed, install a new bearing cup. Always install new bearings and cups in a set.

11. Using the special tools, install the mainshaft bearing cup.

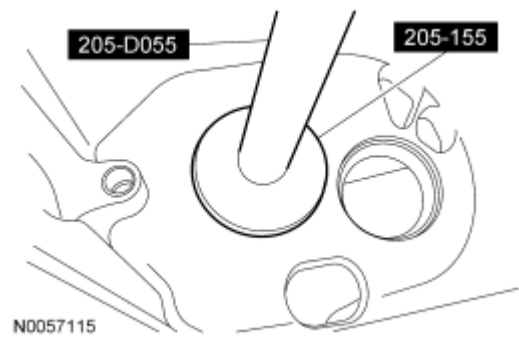


Fig. 114: Installing Mainshaft Bearing Cup Using Special Tools
Courtesy of FORD MOTOR CO.

12. To assemble, reverse the disassembly procedure.

ASSEMBLY

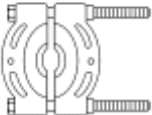
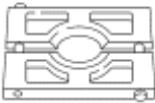
TRANSMISSION

Special Tools

Illustration	Tool Name	Tool Number
 ST1137-A	Dial Indicator Gauge with Holding Fixture	100-002 (TOOL-4201-C) or equivalent

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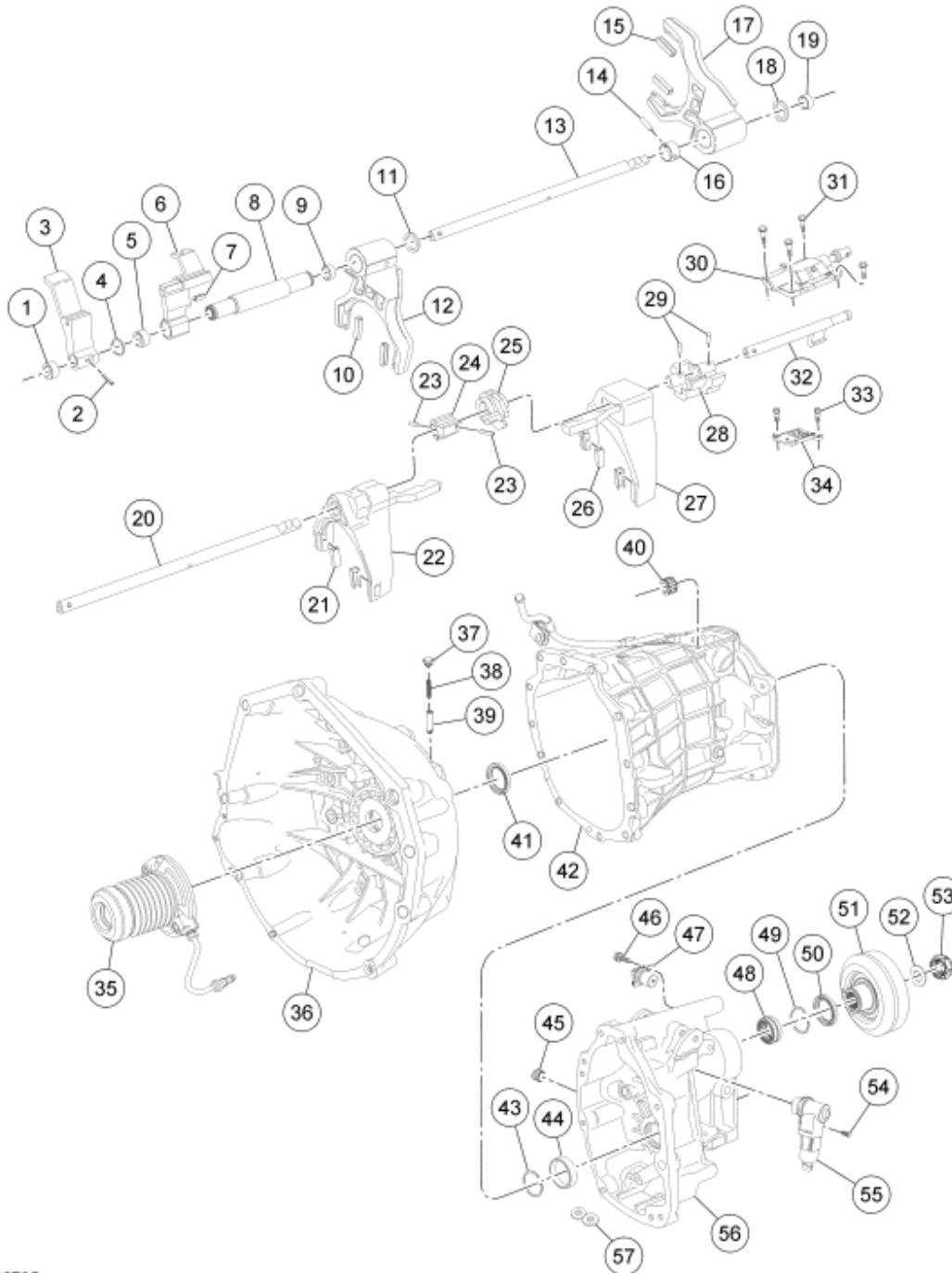
 ST1633-A	Holding Fixture, Transmission	307-003 (T57L-500-B)
 ST2356-A	Adapter for 303-224 (Handle)	205-153 (T80T-4000-W)
 ST2355-A	Installer, Input Shaft Oil Seal	308-220 (T94P-7025-AH)
 ST1895-A	Gauge, Clutch Housing	308-021 (T75L-4201-A)
 ST1303-A	Remover/Installer, Bearing Tube	308-024 (T75L-7025-B)
 ST1310-A	Replacer/Adapter	308-239 (T96P-7025-A)

Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Threadlock and Sealer TA-25	WSK-M2G351-A5

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N0082735

Fig. 115: Disassembled View Of Transmission Case & Shift Components
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7W425	Shift rail bushing
2	7A082	Roll pin

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3	7241	Reverse shift rail lever
4	7A082	Snap ring
5	7W425	Shift rail bushing
6	7241	5th/6th outer shift rail lever
7	7241	5th/6th outer shift lever pad
8	7241	5th/6th inner shift rail lever
9	7W425	Shift rail bushing
10	7L082	3rd/4th shift fork pad
11	7241	Washer
12	7230B	3rd/4th shift fork
13	7241	5th/6th shift rail
14	7A082	Roll pin
15	7L082	Reverse shift fork pad
16	7241	Shift rail collar
17	7230	Reverse shift fork
18	7241	Washer
19	7W425	Shift rail bushing
20	7L267	1st/2nd, 3rd/4th shift rail
21	7L082	5th shift fork pad
22	7230	5th shift fork
23	7A082	Roll pins
24	7814	Selector pin
25	7K201	Interlock plate
26	7L082	1st/2nd shift fork pad
27	7230	1st/2nd shift fork
28	-	Shift gate
29	7A082	Roll pins
30	7C453	Shift cover assembly
31	-	Shift cover bolt (4 required)
32	-	Shift guide rail
33	-	Shift guide plate bolt (2 required)
34	7F476	Shift guide plate
35	7A508	Clutch slave cylinder
36	6392	Clutch housing
37	7234	Shift detent plug
38	7234	Shift detent spring
39	7234	Shift detent
40	7127	Top shift rail bearing
41	7052	Input shaft seal
42	7005	Transmission main case
43	7A082	Snap ring

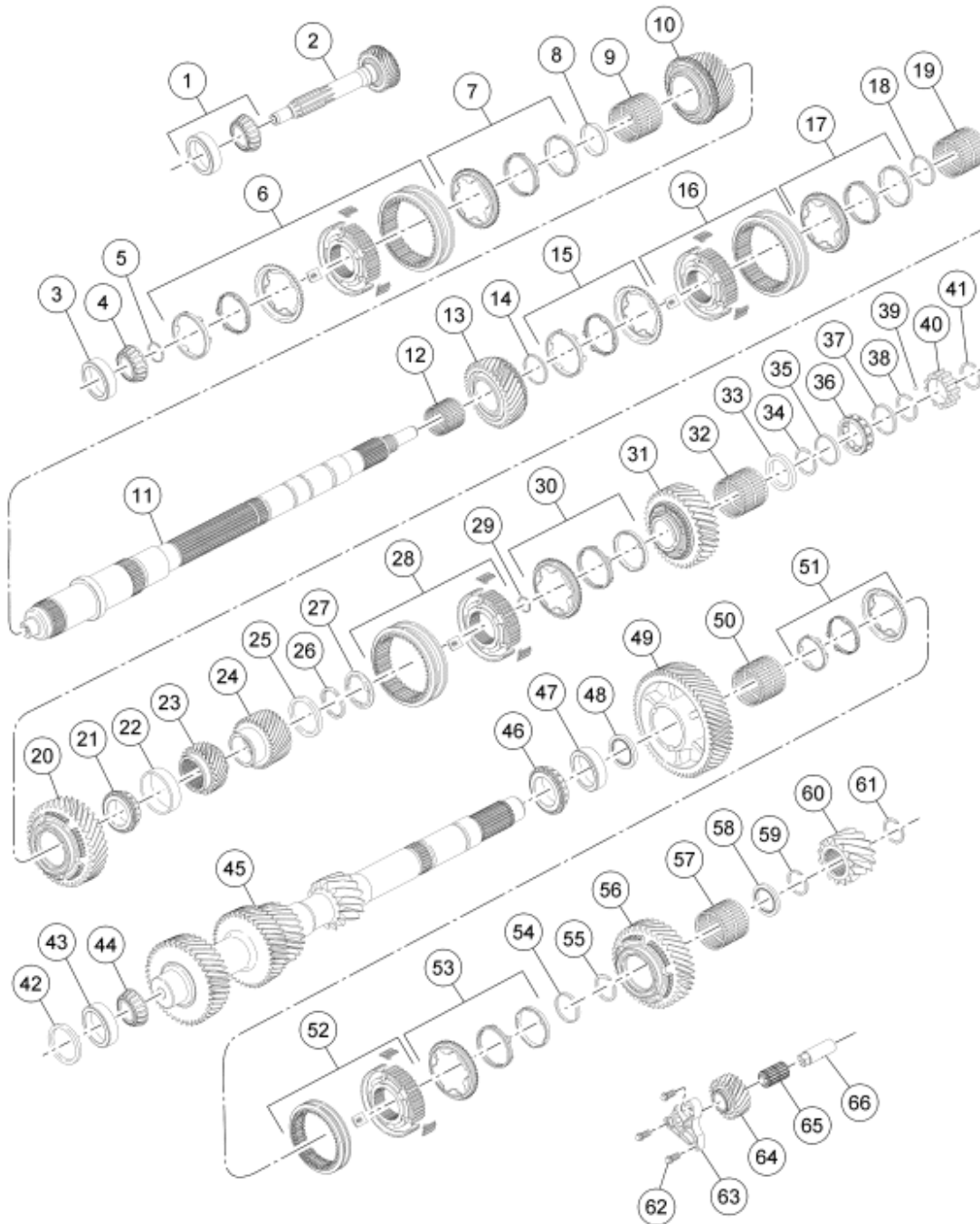
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	7025	Output shaft bearing cup
45	7A010	Case plug
46	7A443	Output shaft speed (OSS) sensor bolt
47	7H103	OSS sensor
48	7025	Output shaft bearing
49	7A082	Output shaft bearing snap ring
50	7052	Extension housing seal
51	7089	Output flange
52	7119	Thrust washer
53	7K440	Output flange nut
54	-	Reverse lockout solenoid bolt
55	7374	Reverse lockout solenoid
56	7A039	Extension housing
57	7L027	Magnet

2008 Ford Mustang

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N0082734

Fig. 116: Disassembled View Of Transmission Gear Assemblies
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7025	Input shaft bearing
2	7017	Input shaft

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3	-	Output shaft bearing race
4	7025	Output shaft front bearing
5	7A082	Snap ring
6	7124	3rd/4th synchronizer assembly
7	7107	3rd/4th synchronizer blocking ring assembly
8	7117	Spacer
9	7025	3rd gear needle bearing
10	7B340	3rd gear
11	7061	Output shaft
12	7025	2nd gear needle bearing
13	7102	2nd gear
14	7117	Spacer
15	7107	2nd gear synchronizer blocking ring assembly
16	7124	1st/2nd synchronizer assembly
17	7117	1st gear synchronizer blocking ring assembly
18	7050	Spacer
19	7025	1st gear needle bearing
20	7100	1st gear
21	7025	Output shaft rear bearing
22	7025	Output shaft bearing race
23	7L047	6th driven gear
24	7K316	5th driven gear
25	7A082	Thrust washer
26	7A082	Split washer
27	-	Synchronizer cone (part of 7107)
28	7124	Reverse synchronizer assembly
29	7A082	Snap ring
30	7107	Reverse gear synchronizer blocking ring assembly
31	7C238	Reverse gear
32	7N168	Reverse gear needle bearing
33	7A385	Thrust washer
34	7A082	Snap ring
35	7A082	Spacer
36	7025	Rear output shaft bearing
37	7A082	Spacer
38	7A082	Snap ring
39	7E172	Check ball

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40	7H150	Speedometer rotor
41	7A082	Snap ring
42	7L172	Shim
43	7025	Countershaft front bearing race
44	7025	Countershaft front bearing
45	7113	Countershaft
46	7025	Countershaft rear bearing
47	7025	Countershaft rear bearing race
48	7025	Thrust washer
49	7146	6th gear
50	7025	6th gear needle bearing
51	7107	Synchronizer blocking ring assembly
52	7124	5th/6th synchronizer assembly
53	7107	Synchronizer blocking ring assembly
54	7117	Spacer
55	7A082	Snap ring
56	7144	5th gear
57	7025	5th gear needle bearing
58	7025	Thrust washer
59	7A082	Snap ring
60	-	Reverse driver gear
61	7A082	Snap ring
62	7C211	Reverse idler shroud bracket bolt
63	7723	Reverse idler shaft bracket
64	7141	Reverse idler gear
65	7025	Reverse idler gear needle bearing
66	7140	Reverse idler gear shaft

1. Lubricate all components with transmission fluid during assembly.
2. Attach the transmission clutch housing to the special tool.

NOTE: If a new front input shaft bearing or front countershaft bearing was installed, install the new bearing cups.

3. Install the input shaft bearing cup and the countershaft bearing cup. Do not install the shims at this time.
4. Install the input shaft.
5. Install the output shaft onto the input shaft.
6. Install the countershaft.
 - Lift the output shaft upward, tilt the countershaft and install.

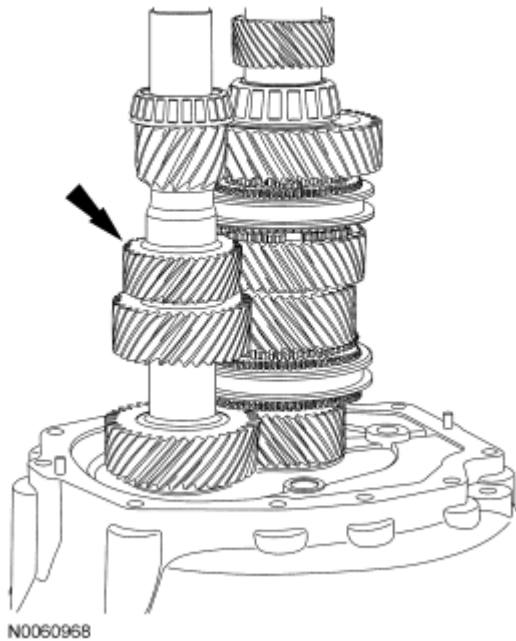


Fig. 117: Locating Countershaft
Courtesy of FORD MOTOR CO.

7. Install the transmission case and tighten the bolts.
 - Tighten to 35 Nm (26 lb-ft).

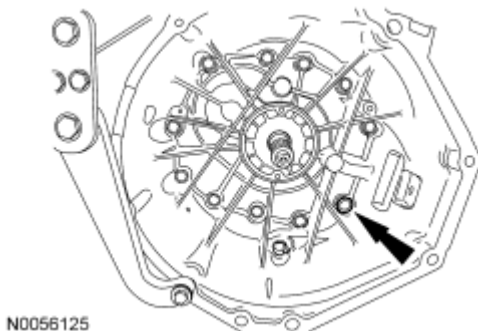


Fig. 118: Locating Clutch Housing-To-Transmission Case Bolts
Courtesy of FORD MOTOR CO.

NOTE: Rotate the input shaft/output shaft to seat the bearings.

8. Using the special tools, measure the input shaft/output shaft end play by applying an upward load on the input shaft. Record the measurement.
 - Input/output shaft preload specification is 0.0127-0.0889 mm (0.0005-0.0035 in).

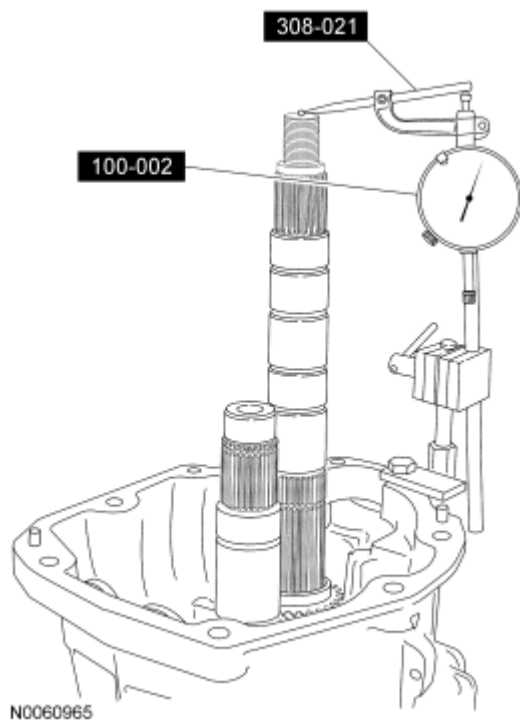


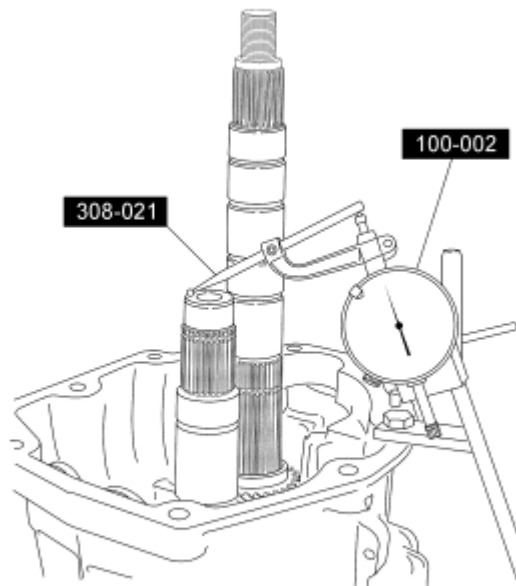
Fig. 119: Measuring Input Shaft/Output Shaft End Play By Applying An Upward Load On Input Shaft Using Special Tools

Courtesy of FORD MOTOR CO.

9. Reposition the special tool on the countershaft.

NOTE: **Rotate the countershaft to seat the bearings.**

10. Using the special tools, measure the countershaft gear end play by pulling upward on the countershaft. Record the measurement.
 - Countershaft preload specification is 0.0127-0.0889 mm (0.0005-0.0035 in).

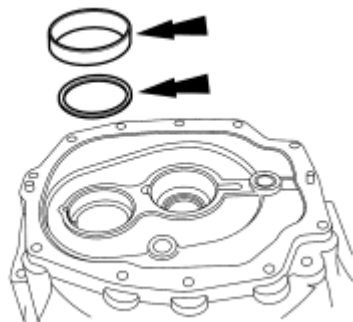


N0060966

Fig. 120: Measuring Countershaft Gear End Play By Pulling Upward On Countershaft Using Special Tools

Courtesy of FORD MOTOR CO.

11. Remove the transmission case.
12. Remove the countershaft.
13. Remove the output shaft.
14. Remove the input shaft.
15. Remove the input shaft bearing cup and the countershaft bearing cup.
16. Using the recorded end play measurements, select and install the appropriate shims to achieve the correct end play. Install the front input shaft bearing cup and the front countershaft bearing cup.
 - Lubricate the bearing cups with petroleum jelly.



N0061000

Fig. 121: Locating Input Shaft Bearing Cup

Courtesy of FORD MOTOR CO.

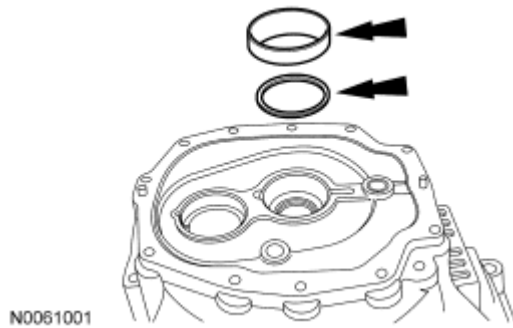


Fig. 122: Locating Countershaft Bearing Cup
Courtesy of FORD MOTOR CO.

17. Using the special tools, install the new input shaft seal.

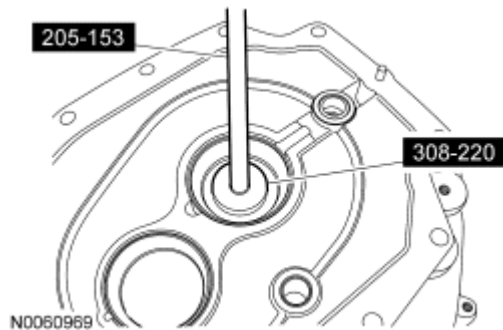


Fig. 123: Installing New Input Shaft Seal
Courtesy of FORD MOTOR CO.

18. Install the input shaft and 4th gear synchronizer blocking ring.

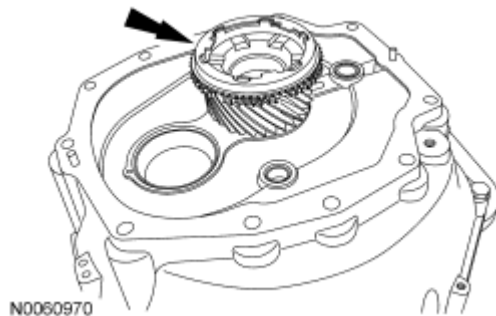


Fig. 124: Installing Input Shaft & 4th Gear Synchronizer Blocking Ring
Courtesy of FORD MOTOR CO.

19. Assemble the shift rail assembly to the output shaft, then install the output shaft and shift rail as an assembly.
- Rotate the output shaft to engage the 4th gear synchronizer blocking ring with the synchronizer keys.

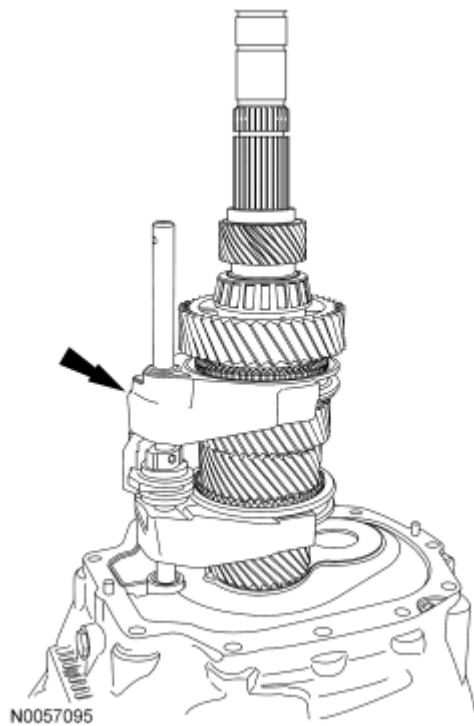


Fig. 125: Rotating Output Shaft To Engage 4th Gear Synchronizer Blocking Ring With Synchronizer Keys
Courtesy of FORD MOTOR CO.

20. Lift up the output shaft, then install the countershaft.

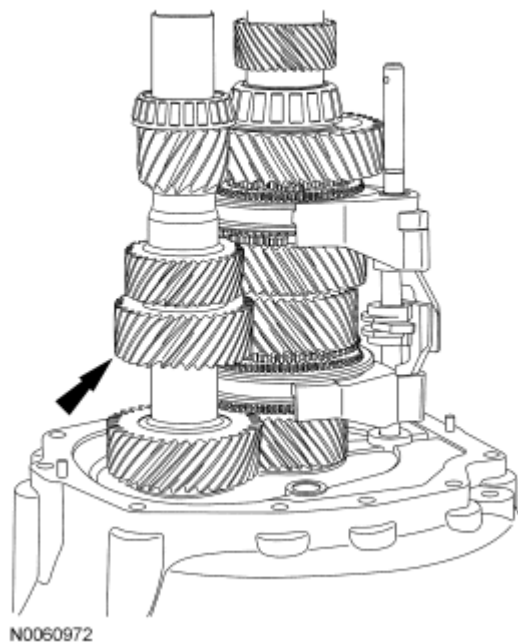


Fig. 126: Locating Countershaft
Courtesy of FORD MOTOR CO.

21. Install the 6th gear spacer and thrust washer.

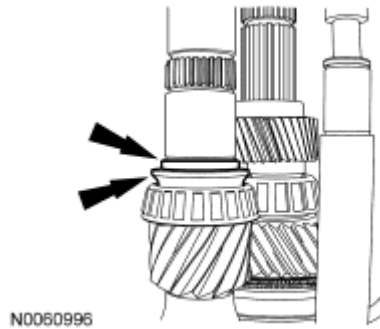


Fig. 127: Locating 6th Gear Spacer & Thrust Washer
Courtesy of FORD MOTOR CO.

22. Install the 5th/6th and reverse shift rail assembly and align the slots of the shift levers with the shift interlock plate.

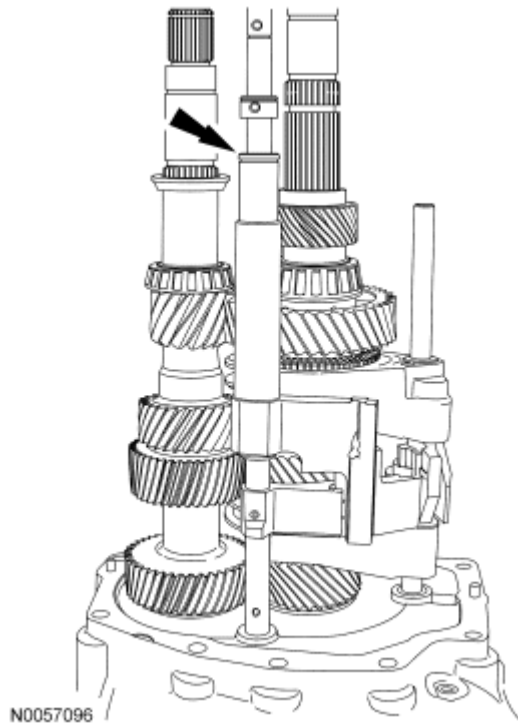
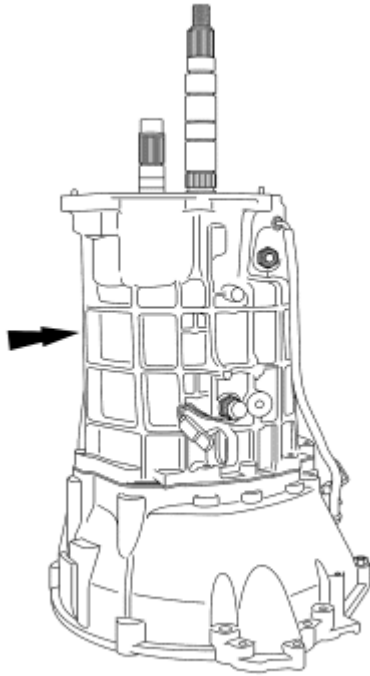


Fig. 128: Locating 5th/6th & Reverse Shift Rail Assembly
Courtesy of FORD MOTOR CO.

23. Clean the mating surfaces of the transmission main case and the transmission clutch housing. Apply a bead of silicone rubber to the sealing surface on the transmission clutch housing. Install the transmission

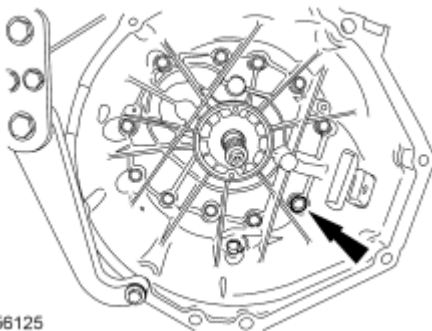
main case and the front offset lever.

- Make sure the transmission is in NEUTRAL to keep the 3rd/4th gear shift rail from engaging. Check for correct alignment of roller with top shift rail.
- Tighten the bolts in a star pattern to 35 Nm (26 lb-ft).



N0060967

Fig. 129: Making Sure Transmission Is In Neutral To Keep 3rd/4th Gear Shift Rail From Engaging
Courtesy of FORD MOTOR CO.



N0056125

Fig. 130: Locating Clutch Housing-To-Transmission Case Bolts
Courtesy of FORD MOTOR CO.

24. Apply threadlock and sealer to the threads of the shift lever guide bolts, then install the bolts.
 - Tighten to 22 Nm (16 lb-ft).
 - Pull up on the 5th/6th shift rail to align the slot of the interlock plate with the guide bolt hole.

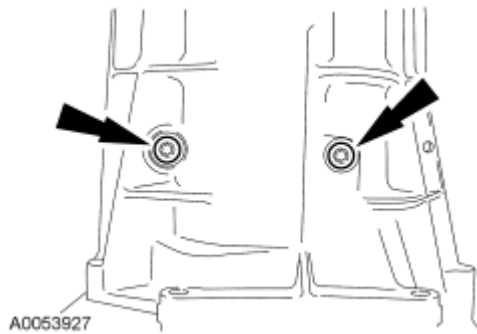


Fig. 131: Locating Shift Lever Guide Bolts
Courtesy of FORD MOTOR CO.

25. Install a new front offset lever roll pin.
 - Install the pin until it is flush with the lever.
26. Apply threadlock and sealer to the threads of the shift detent, then install the shift detent assembly.
 - Tighten to 40 Nm (30 lb-ft).

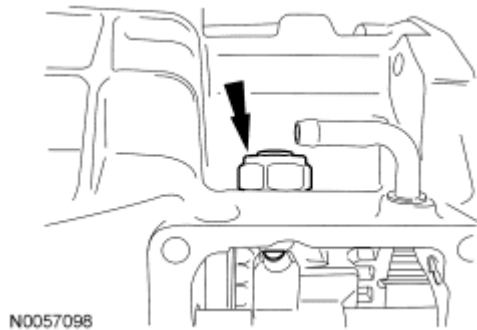


Fig. 132: Locating New Front Offset Lever Roll Pin
Courtesy of FORD MOTOR CO.

27. Install the 5th/6th gear needle bearing.
28. Install 5th/6th gear, then install the 5th/6th gear synchronizer double cone and blocking ring as an assembly.
 - Before installing the blocking ring, index-mark the blocking ring to the synchronizer hub.

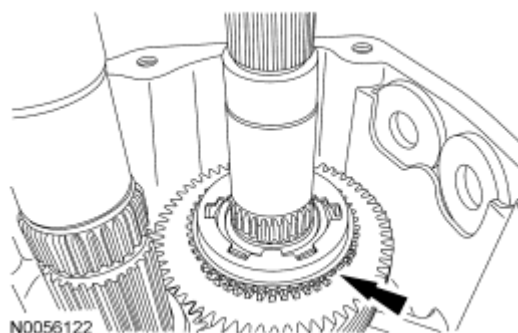


Fig. 133: Locating 5th/6th Gear Synchronizer Intermediate Cone, Outer Cone & Blocking Ring
Courtesy of FORD MOTOR CO.

29. Install the 5th/6th gear shift fork and the 5th/6th gear synchronizer as an assembly.
 - The synchronizer hub has a tight fit on the shaft, and may need to be installed separately.
 - Make sure the synchronizer hub is correctly aligned with the blocking ring.
30. Install the new 5th/6th shift fork snap ring.

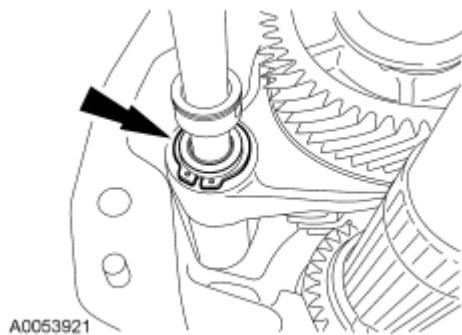


Fig. 134: Locating 5th/6th Gear Shift Fork & 5th/6th Gear Synchronizer
Courtesy of FORD MOTOR CO.

31. Install the snap ring on the countershaft.

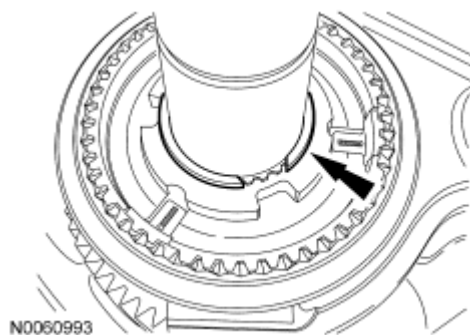


Fig. 135: Locating Snap Ring On Countershaft
Courtesy of FORD MOTOR CO.

32. Install the 5th/6th gear synchronizer double cone and blocking ring as an assembly.

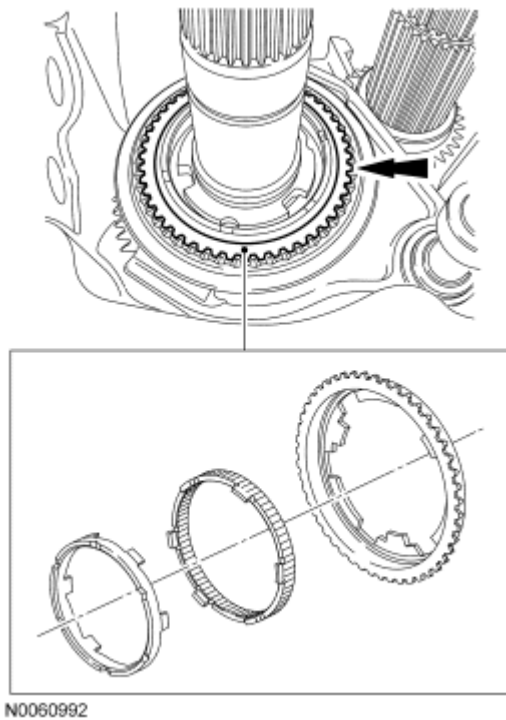


Fig. 136: Locating 5th/6th Gear Synchronizer Intermediate Cone, Outer Cone & Blocking Ring
Courtesy of FORD MOTOR CO.

33. Install the spacer and the 5th drive gear needle bearing.

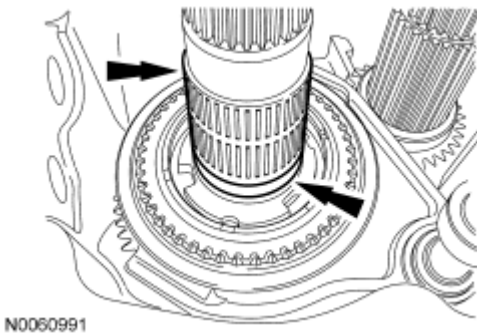


Fig. 137: Locating 5th/6th Drive Gear Needle Bearing & Spacer
Courtesy of FORD MOTOR CO.

34. Install the following components:
- The 5th drive gear.
 - The 5th drive gear thrust washer.
 - A new 5th drive gear snap ring.
35. Using a suitable driver, install the reverse drive gear.
36. Install a new reverse drive gear snap ring.

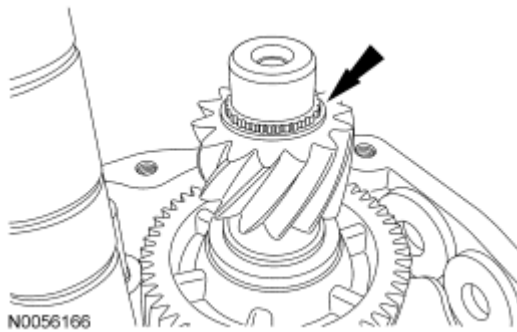


Fig. 138: Locating Reverse Drive Gear Snap Ring
Courtesy of FORD MOTOR CO.

37. Using the special tool, press the 5th driven gear.
 - Align the splines of the 5th driven gear with the drive gear on the countershaft extension.
38. Install the split ring and retainer.

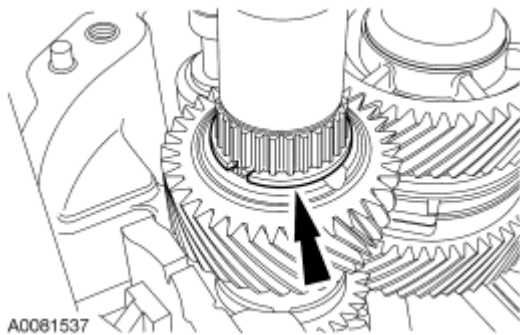


Fig. 139: Pressing 5th Driven Gear Using Special Tool
Courtesy of FORD MOTOR CO.

39. Install the reverse shift fork, the reverse synchronizer and the strut retainer as an assembly.
 - The synchronizer hub has a tight fit on the shaft and may need to be installed separately.

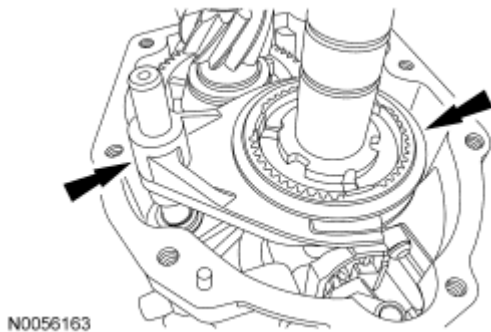


Fig. 140: Locating Reverse Shift Fork, Reverse Synchronizer & Strut Retainer
Courtesy of FORD MOTOR CO.

40. Install the reverse shift fork snap ring.

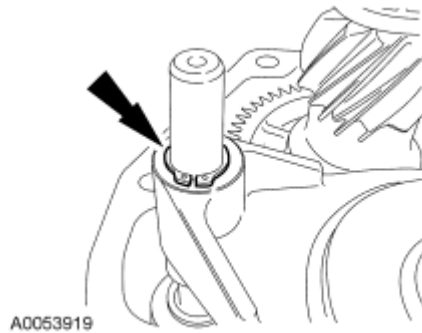


Fig. 141: Locating Reverse Shift Fork Snap Ring
Courtesy of FORD MOTOR CO.

41. Install a new reverse gear synchronizer snap ring.
42. Install the reverse gear synchronizer blocking rings.

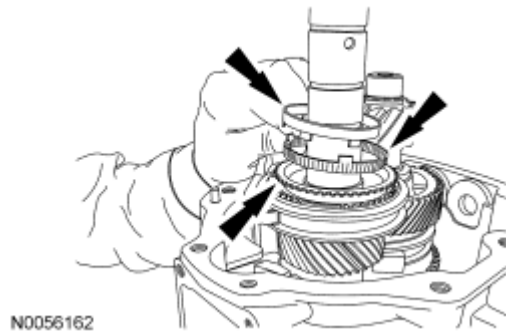


Fig. 142: Locating Reverse Gear Synchronizer Blocking Rings
Courtesy of FORD MOTOR CO.

43. Install the reverse gear needle bearing.

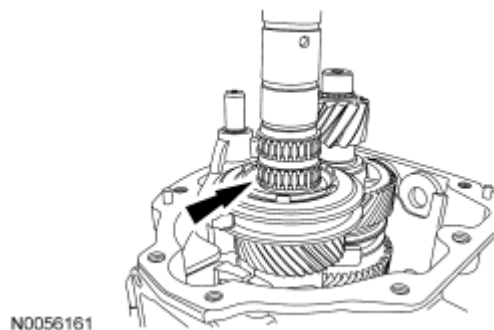


Fig. 143: Locating Reverse Gear Needle Bearing
Courtesy of FORD MOTOR CO.

44. Install reverse gear.

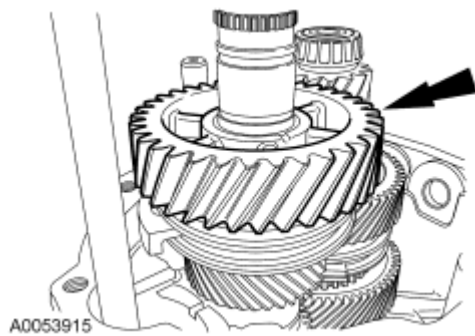


Fig. 144: Locating Reverse Gear
Courtesy of FORD MOTOR CO.

45. Install the reverse gear thrust washer.

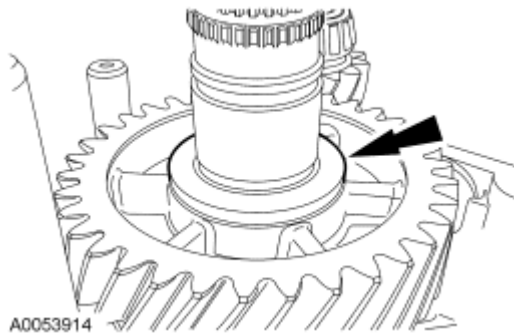


Fig. 145: Locating Reverse Gear Thrust Washer
Courtesy of FORD MOTOR CO.

46. Install a new reverse gear snap ring.

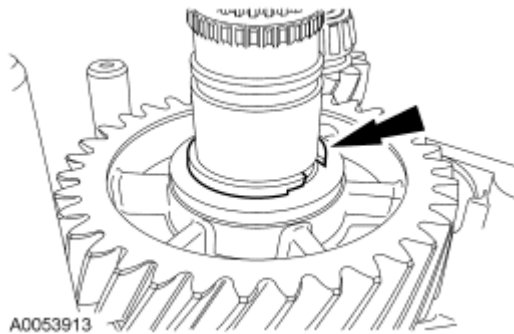


Fig. 146: Locating New Reverse Gear Snap Ring
Courtesy of FORD MOTOR CO.

47. Install the lower spacer, the rear output shaft roller bearing and the upper spacer.

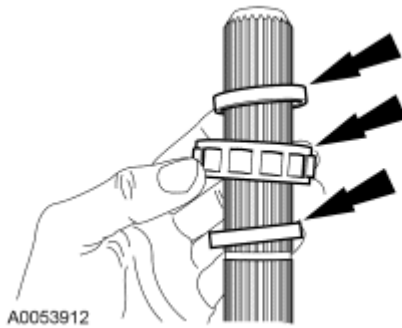


Fig. 147: Locating Lower Spacer, Rear Output Shaft Roller Bearing & Upper Spacer
Courtesy of FORD MOTOR CO.

48. Install the rear output shaft roller bearing snap ring.

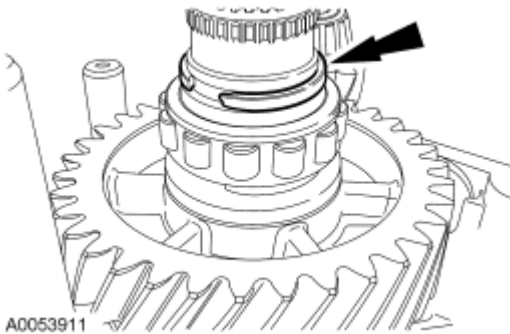


Fig. 148: Locating Rear Output Shaft Roller Bearing Snap Ring
Courtesy of FORD MOTOR CO.

49. Position the check ball on the shaft. Install the output shaft speed (OSS) sensor tone wheel. Install a new OSS sensor tone wheel retaining ring.
50. Install the reverse shift rail, then install a new reverse shift rail roll pin.
- Install the pin until it is flush with the lever.
51. Install the bearing spacer and the race.

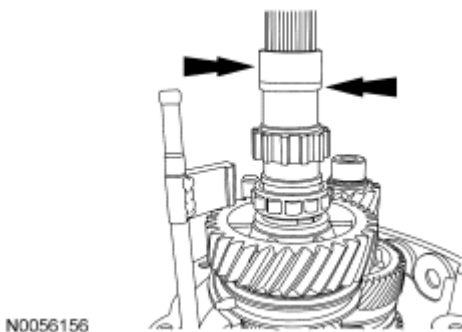


Fig. 149: Installing Bearing Spacer & Race
Courtesy of FORD MOTOR CO.

52. Clean the mating surfaces of the transmission main case and the extension housing. Apply a bead of silicone rubber to the sealing surface on the transmission case. Install the extension housing and tighten the bolts.
 - Tighten to 48 Nm (25 lb-ft).
53. Install the vent hose.
54. Install the shift detent cover and the 4 shift detent cover bolts.
 - Tighten to 20 Nm (15 lb-ft).

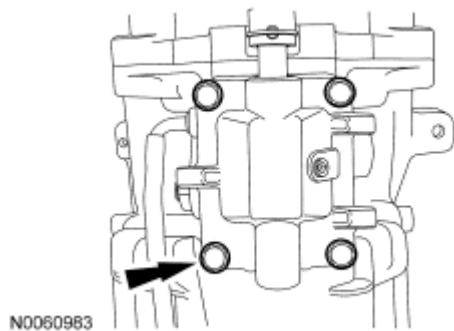


Fig. 150: Locating Shift Detent Cover & Shift Detent Cover Bolts
Courtesy of FORD MOTOR CO.

55. Install the output shaft flange.
56. Install the output shaft flange nut as follows:
 - Using the old flange nut, tighten to 135 Nm (100 lb-ft).
 - Remove the nut and discard.
 - Install a new flange nut and tighten to 142 Nm (105 lb-ft).

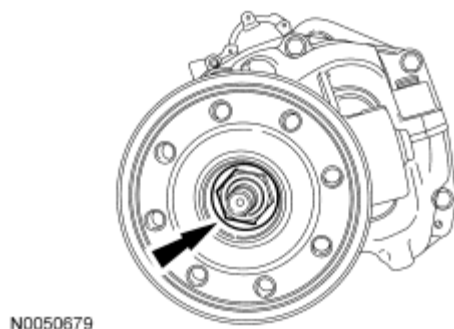


Fig. 151: Identifying Output Shaft Flange & Nuts
Courtesy of FORD MOTOR CO.

57. Apply thread sealer to the plug threads. Install the drain plug.
 - Tighten to 27 Nm (20 lb-ft).

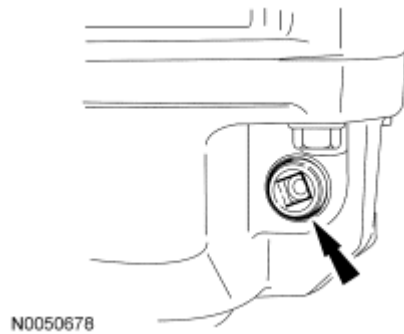


Fig. 152: Locating Drain Plug
Courtesy of FORD MOTOR CO.

58. Install the clutch slave cylinder and the 2 clutch slave cylinder bolts.
- Tighten to 12 Nm (9 lb-ft).

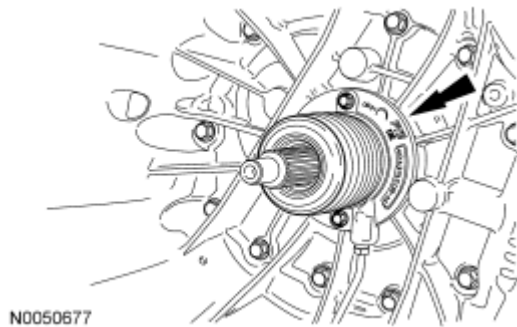


Fig. 153: Locating Clutch Slave Cylinder & Clutch Slave Cylinder Bolts
Courtesy of FORD MOTOR CO.

59. Install the clip and the line connector.

INSTALLATION

TRANSMISSION

Material

Item	Specification
MERCON® V Automatic Transmission Fluid XT-5-QM (or XT-5-QMC) (US); CXT-5-LM12 (Canada)	MERCON® V
Premium Long-Life Grease XG-1-C or XG-1-K (US); CXG-1-C (Canada)	ESA-M1C75-B
Threadlock and Sealer TA-25	WSK-M2G351-A5

INSTALLATION

1. If removed, install the gearshift lever assembly.
 - Tighten to 40 Nm (30 lb-ft).
2. If removed, install the transmission mount and the rear transmission insulator center bolt.
 - Tighten to 70 Nm (52 lb-ft).

NOTE: Before installing the transmission, the input shaft must be cleaned and lightly lubricated with grease.

NOTE: When installing the transmission with the gearshift lever attached, position the gear shifter into neutral position, so that the shifter will not damage the shift boot.

3. Install the transmission at a 45-degree angle. With the input shaft in the pilot bearing, rotate the transmission counterclockwise 45 degrees. Align the dowels and install.
4. Install the 2 rear gearshift lever nuts.
 - Tighten to 20 Nm (15 lb-ft).

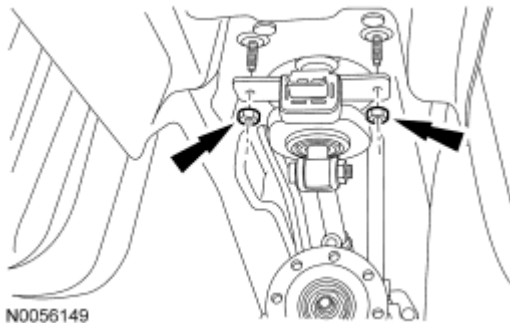


Fig. 154: Locating Rear Gearshift Underbody Nuts
Courtesy of FORD MOTOR CO.

5. Raise the transmission.

NOTE: Insert the clutch hydraulic tube into the clutch slave cylinder and install the clip before tightening the transmission-to-engine bolts.

6. Install the 7 transmission-to-engine bolts.
 - Tighten to 45 Nm (33 lb-ft).
7. Remove the under hoist stand and the block of wood from the oil pan. Attach the wire harness at the front of the engine oil pan.
8. Install the 4 rear transmission mount outer bolts.
 - Tighten to 63 Nm (46 lb-ft).

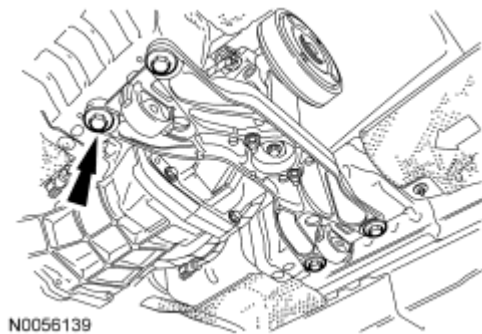


Fig. 155: Locating Rear Transmission Mount Outer Bolts
Courtesy of FORD MOTOR CO.

9. Remove the transmission jack.
10. Connect the electrical connectors to the RH side of the transmission. Attach the harness to the transmission.
11. Connect the electrical connectors to the LH side of the transmission. Attach the harness to the transmission.
12. Install the subframe cross brace and the 4 subframe cross brace bolts.
 - Tighten to 48 Nm (35 lb-ft).

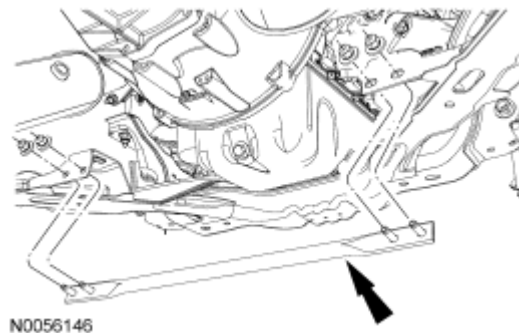


Fig. 156: Locating Subframe Cross Brace & Bolts
Courtesy of FORD MOTOR CO.

NOTE: Clean the starter motor mounting flange and mating surface of the starter motor to make sure of proper ground connection.

13. Install the starter motor. For additional information, refer to **STARTING SYSTEM** article.
14. Install the catalytic converter assembly (H-pipe). For additional information, refer to **EXHAUST SYSTEM** article.

NOTE: Align the index marks on the driveshaft flange and pinion flange, and the driveshaft flange and transmission output shaft flange.

15. Install the driveshaft. For additional information, refer to **DRIVESHAFT** article.

16. Install the upper gearshift lever and upper gearshift lever bolts.
 - Tighten to 35 Nm (26 lb-ft).
17. Install the gearshift lever knob and boot.

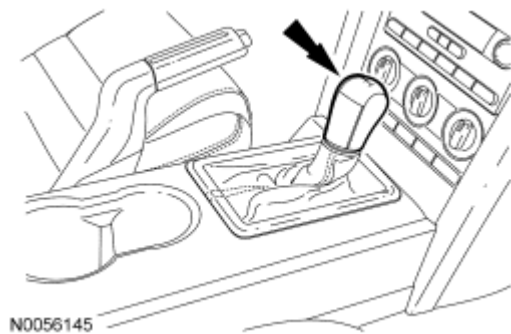


Fig. 157: Locating Gearshift Lever Knob & Boot
Courtesy of FORD MOTOR CO.

18. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** article.
19. Check, and as necessary, fill the transmission with transmission fluid. The total fill capacity is 3.46L (3.65 qt). Apply threadlock and sealer to the filler plug threads and install the filler plug.
 - - Tighten to 25 N.m (18 lb-ft).
20. Fill the brake and clutch reservoir. Bleed the clutch hydraulic system. For additional information, refer to **MANUAL TRANSAXLE/TRANSMISSION AND CLUTCH - GENERAL INFORMATION** article.