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2002 AUTOMATIC TRANSMISSIONS

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APPLICATION

TRANSMISSION APPLICATION

Application	Transmission Model
Explorer & Mountaineer	
4.0L & 4.6L	5R55W/S

TRANSFER CASE APPLICATION

Application	Transfer Case Model
Ford Explorer	Borg-Warner 44-05
Mercury Mountaineer	Borg-Warner 44-03

IDENTIFICATION

TRANSMISSION

NOTE: Refer to illustrations for transmission identification. See Fig. 1 and Fig. 2.



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Fig. 1: Identifying Transmission Assembly (2WD Shown; 4WD Similar)

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Courtesy of FORD MOTOR CO.



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Fig. 2: Identifying Service Identification Tag Courtesy of FORD MOTOR CO.

OIL PAN GASKET

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G00031941

Fig. 3: Identifying Oil Pan Gasket (5R55W)

LUBRICATION

SERVICE INTERVALS

Transmission

Under normal service, change fluid and filter at 150,000-mile intervals. Change transmission fluid and filter at 30,000-mile intervals when used under the following conditions:

- In hot weather with temperatures greater than 90°F (32°C), carrying heavy loads and/or in hilly terrain.
- Towing a trailer or using a car top carrier.
- In police, taxi or door-to-door delivery service.
- Extreme dusty conditions or off-road use.

Transfer Case

Under normal driving conditions, replace transfer case fluid every 150,000 miles. Under severe driving conditions, replace transfer case fluid every 60,000 miles.

CHECKING FLUID LEVEL

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Transmission

- 1. Using a scan tool, monitor the Transmission Fluid Temperature (TFT) using PID: TFT. Start the vehicle. Engine idle speed should be approximately 650 RPM.
- 2. Run engine until the recommended TFT is between 81-120°F (27-49°C). The fluid level can be checked above 122°F (50°C) using this procedure.
- 3. Move the gearshift lever slowly, stopping in each gear. Place gearshift lever in the Park position. Raise and support the vehicle. Set vehicle as close to level as possible.
- If needed, the Drive Pinion Angle Gauge (205-025), can be used to assist in leveling the vehicle. See <u>Fig.</u>
 <u>4</u>. Place a drain pan under the transmission.

NOTE: It will be necessary to hold the drain plug (larger plug) with a wrench when removing the fluid level indicator plug.

- 5. With the transmission in the Park position and the engine running, use a 3/16" Allen key to remove the fluid level indicator plug. See <u>Fig. 5</u>. Allow the fluid to drain. Wait approximately one minute.
- 6. When the fluid comes out as a thin stream or a drip, it is at the correct level. If no fluid comes out of the hole, fluid will need to be added. Continue with this procedure. Install the Fluid Fill Tool (307-437), into the transmission fluid pan. See **Fig. 6**.
- Using the Oil Suction Gun (303-D104), extract approximately one pint of clean ATF from a suitable container. Using the oil suction gun and fluid fill tool, fill the transmission with clean ATF. See <u>Fig. 7</u>. Remove the oil suction gun.
- 8. Allow fluid to drain. Wait approximately one minute. When fluid comes out as a thin stream or drip, the fluid is at correct level. If no fluid drains from the plug, continue adding clean ATF in 1/2-pint increments until fluid starts to drain from the plug.
- Remove the fluid fill tool from the pan. Reinstall the fluid level indicator plug and tighten to specification. See <u>TORQUE SPECIFICATIONS</u>. Lower the vehicle. Remove scan tool. Check the operation of the transmission and inspect for leaks.

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Fig. 4: Identifying Drive Pinion Angle Gauge Courtesy of FORD MOTOR CO.

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Fig. 5: Identifying Fluid Level Indicator Plug Courtesy of FORD MOTOR CO.



Fig. 6: Identifying Fluid Fill Tool

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Courtesy of FORD MOTOR CO.



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Fig. 7: Viewing Transmission Fluid Fill Procedure Courtesy of FORD MOTOR CO.

Transfer Case

Remove transfer case fluid fill plug. See <u>Fig. 8</u>. Check fluid level at transfer case fill plug hole. Fluid should be level with bottom of fill plug hole. See <u>Fig. 9</u>. Fill the transfer case to the proper level with appropriate fluid. See <u>RECOMMENDED FLUIDS</u> and <u>FLUID CAPACITIES</u>.

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Fig. 8: Identifying Fluid Fill & Drain Plugs Courtesy of FORD MOTOR CO.

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Fig. 9: Viewing Transfer Case Fluid Levels Courtesy of FORD MOTOR CO.

RECOMMENDED FLUIDS

Transmission

TRANSMISSION FLUID APPLICATION

(1) Fluid Type

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5R55W/S

Mercon(R) V (XT-5-QM Or XT-5-DM)

(1) The use of any type of transmission fluid other than specified could result in transmission damage.

Transfer Case

TRANSFER CASE FLUID APPLICATION

Application	Fluid Type
44-03 & 44-05	Mercon ATF (XT-2-QDX)

FLUID CAPACITIES

NOTE: Capacities given are approximate. Correct fluid level should be determined by fluid level check procedure, rather than amount of fluid added. See <u>CHECKING</u> <u>FLUID LEVEL</u>.

Transmission

TRANSMISSION FLUID CAPACITIES

Application	Qts. (L)
5R55W/S	12.6 (12.0)

Transfer Case

TRANSFER CASE FLUID CAPACITIES

Application	Pts. (L)
AWD	2.6 (1.25)
4WD	3.0 (1.4)

DRAINING & REFILLING

Transmission

1. Raise and support the vehicle. Place a drain pan under the transmission fluid pan. Remove the drain plug and drain the fluid. Remove the 16 transmission fluid pan bolts, fluid pan, and gasket.

NOTE: Transmission oil pan gasket is reusable. Clean and inspect gasket for damage, and replace as necessary.

Remove bolts and discard the transmission fluid filter. See <u>Fig. 10</u>. Clean and inspect the transmission fluid pan and magnet. Remove the converter housing access plug and remove the converter drain plug. See <u>Fig. 11</u>. Allow the fluid to drain.

NOTE: A new converter drain plug must be used to prevent leakage.

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 After fluid has drained, install a new converter drain plug and tighten to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Install the converter housing access plug. Make sure that the fluid filter seals are correctly seated on the filter and lubricated with ATF.

CAUTION: Lubricate the fluid filter seals with clean ATF or they may be damaged.

- 4. Install the transmission fluid filter. Install the fluid pan magnet in the transmission fluid pan. Install the fluid pan gasket on the pan. Install the transmission fluid pan and gasket then loosely install the bolts.
- 5. Tighten the bolts in a crisscross sequence and tighten to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Install the fluid drain plug and tighten to specification.
- 6. Use a 3/16" Allen key to remove the fluid level indicator plug. It will be necessary to hold the drain plug (larger plug) with a wrench when removing the fluid level indicator plug. Install the Fluid Fill Tool (307-437), into the pan.

NOTE: When using pressurized fill equipment, reduce the pressure to one psi. Using a higher pressure can result in fluid coming out of the vent. Fluid will then appear as a leak coming from the torque converter area.

- 7. Using the Oil Suction Gun (303-D104), extract approximately one pint of clean ATF from a suitable container. Using the fluid fill tool and oil suction gun, fill the transmission with clean ATF. Remove the oil suction gun and allow the fluid to drain.
- 8. Wait approximately one minute. If fluid comes out as a thin stream or drip, the fluid is at the correct level. If no fluid drains from the plug, add fluid in 1/2-pint increments until the fluid starts to drain from the plug.
- Remove the fluid fill tool from the pan. Reinstall the small (center) fluid level indicating plug using a 3/16" Allen key. Check fluid level. See <u>CHECKING FLUID LEVEL</u>.

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Fig. 10: Identifying Transmission Fluid Filter Bolts Courtesy of FORD MOTOR CO.



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Fig. 11: Identifying Torque Converter Drain Plug Courtesy of FORD MOTOR CO.

Transfer Case

CAUTION: Transfer case failure can result if the correct fill procedure is not followed.

- 1. Remove the drain plug and drain the fluid. See <u>Fig. 8</u>. Clean and install the drain plug after fluid is drained. Clean the area around the fill plug.
- 2. Remove the fill plug, and fill the transfer case to the proper level with appropriate fluid. See <u>RECOMMENDED FLUIDS</u> and <u>FLUID CAPACITIES</u>.
- 3. The fluid must be just below the fill plug hole. See <u>Fig. 9</u>. Being able to reach the fluid with a finger does not mean the fluid is at the correct level. Ensure the fluid is level with the filler opening for the correct fluid level. Install the fill plug and tighten to specification. See <u>TORQUE SPECIFICATIONS</u>.

BACKFLUSHING AND CLEANING TRANSMISSION FLUID COOLER

- CAUTION: Whenever a transmission has been disassembled to install new parts or a new or remanufactured transmission has been installed, a new transmission fluid cooler, either in-tank, auxiliary or oil to air (OTA), if equipped will need to be installed. Using a suitable torque converter/fluid cooler cleaner, clean and backflush the transmission fluid cooler tubes.
- CAUTION: Use only clean automatic transmission fluid specified for this transmission. Do not use supplemental fluid additives, treatments or cleaning agent. The use of these materials may affect transmission operation and result in internal damage to the transmission. When internal wear or damage has occurred in the transmission, metal particles, clutch plate material or band material may have been carried into the transmission fluid cooler. These contaminants are a major cause of recurring transmission concerns and must be removed from the system before the transmission is put back in use.

NOTE: NOTE: Do not use any solvents while carrying out this procedure. Only use clean automatic transmission fluid.

- 1. Conduct backflushing with a suitable torque converter/transmission fluid cooler cleaner. Test the equipment to make sure that a vigorous fluid flow is present before proceeding. Install a new system filter if flow is weak or contaminated.
- 2. Remove and discard the in-line transmission fluid filter, if equipped.
- 3. To aid in attaching the cleaner to the transmission steel cooler lines, connect 2 additional rubber hoses to the transmission end of the steel transmission cooler lines as described.
 - Connect the cleaner tank pressure line to the steel transmission cooler return line (longest line).

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- Connect a tank return hose to the steel transmission cooler pressure line (shorter line). Place the outlet end of this hose in the solvent tank reservoir.
- 4. Turn on the pump and allow the transmission fluid to circulate a minimum of 5 minutes (cycling switch on and off will help dislodge contaminants in the cooler system).
- 5. Switch off the pump and disconnect the pressure hose from the transmission cooler return line.
- 6. Use compressed air to blow out the cooler(s) and lines (blow air into the transmission cooler return line) until all the fluid is removed.
- 7. Remove the rubber return hose from the remaining steel cooler line.

ON-VEHICLE REPAIRS

Various components may be serviced without transmission removal, depending on application. For servicing of these components, see appropriate component under <u>ADJUSTMENTS</u> and/or <u>REMOVAL &</u> <u>INSTALLATION</u>. For additional information on testing electrical components, see appropriate DIAGNOSIS article.

ADJUSTMENTS

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

SHIFT CABLE

- 1. Place gearshift lever in "OD" position. Hang a 3 lb. (1.4 kg) weight from gearshift lever. Raise and support vehicle. Using a screwdriver, pry shift cable from manual control lever on transmission. Pull shift cable adjustment lock tab outward to unlock. See **Fig. 12**. Ensure adjuster body moves freely.
- Ensure manual control lever in "OD" position. "OD" position is obtained by rotating manual control lever clockwise until travel stops, and then turn manual control lever counterclockwise 3 detents. See <u>Fig. 13</u>. Connect shift cable (1), to manual control lever. Push in lock tab (2), to lock adjustment sleeve in position. See <u>Fig. 14</u>. Lower vehicle.
- 3. Remove 3 lb. (1.4 kg) weight from gearshift lever. Check for park gear engagement. Start engine and ensure indicated gear positions match transmission response. Verify vehicle only starts in Park and Neutral, and back-up lights operate. If operation is not okay, check transmission range sensor adjustment. See <u>TRANSMISSION RANGE SENSOR</u>.

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Fig. 12: Unlocking Shift Cable Adjustment Lock Courtesy of FORD MOTOR CO.

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Fig. 13: Positioning Of Manual Control Lever Courtesy of FORD MOTOR CO.

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Fig. 14: Locking Shift Cable Adjustment Lock Courtesy of FORD MOTOR CO.

SHIFT INDICATOR

- Remove the screws and the lower steering column opening finish panel. Remove the 3 screws and the lower steering column shroud. See <u>Fig. 15</u>. Remove the screw retaining the upper steering column shroud to the steering column. See <u>Fig. 16</u>.
- 2. Remove the upper steering column shroud. See <u>Fig. 17</u>. Rotate the gearshift lever clockwise until it bottoms out (1st gear), then rotate it counterclockwise 3 detents ("OD" position). Hang a 3 lb. (1.4 kg) weight on the gearshift lever.
- 3. Rotate the thumbwheel to center the gearshift lever indicator in the middle of the "OD" position. See <u>Fig.</u> <u>18</u>. Remove the 3 lb. (1.4 kg) weight. Rotate the gearshift lever into each detent to verify that the gearshift lever indicator matches the selected range.
- 4. Readjust, if necessary. Install the upper steering column shroud. See <u>Fig. 17</u>. Install the screw retaining the upper steering column shroud to the steering column. See <u>Fig. 16</u>. Position the lower steering column shroud and install the 3 screws. Position the lower steering column opening finish panel and install the screws.

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Fig. 15: Removing & Installing Lower Steering Column Shroud Courtesy of FORD MOTOR CO.

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Fig. 16: Locating Upper Steering Column Shroud Retaining Screw Courtesy of FORD MOTOR CO.

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<u>Fig. 17: Removing & Installing Upper Steering Column Shroud</u> Courtesy of FORD MOTOR CO.

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Fig. 18: Identifying Gearshift Indicator Thumbwheel Adjuster Courtesy of FORD MOTOR CO.

TRANSMISSION RANGE SENSOR

- 1. Raise and support the vehicle. Remove the shift cable from the manual control lever. Remove the outer manual control lever. Using the Transmission Range Sensor Alignment Gauge (307-351), align the digital Transmission Range (TR) sensor. See **Fig. 19**.
- Tighten the TR sensor bolts in an alternating sequence to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Install the outer manual lever. Tighten manual control lever nut to specification. See <u>TORQUE SPECIFICATIONS</u>. Ensure manual control lever is in the Neutral position.
- 3. Install the shift cable to the manual control lever. Verify that the shift cable is adjusted correctly. See <u>SHIFT CABLE</u>. Lower the vehicle.

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Fig. 19: Adjusting Transmission Range Sensor Courtesy of FORD MOTOR CO.

REMOVAL & INSTALLATION

- WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.
- CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

EXTENSION HOUSING

NOTE: For removal and installation of extension housing on 4WD models, see appropriate REMOVAL & INSTALLATION article.

Removal

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- 1. Raise and support the vehicle. Remove the drive shaft. See appropriate DRIVE SHAFTS & UNIVERSAL JOINTS article in DRIVELINE/AXLES.
- 2. Support the transmission with a suitable jack. Remove the transmission mount nuts from crossmember.
- 3. Remove the bolts from the transmission mount. Raise the transmission and remove the transmission mount. See **Fig. 20**.
- 4. Remove the extension housing bolts then remove extension housing. See <u>Fig. 21</u>. Ensure the parking pawl, parking pawl return spring and parking pawl shaft do not fall out during removal of the extension housing. Remove and discard the extension housing gasket.



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Fig. 20: Removing & Installing Transmission Mount Courtesy of FORD MOTOR CO.

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Fig. 21: Removing & Installing Transmission Extension Housing Courtesy of FORD MOTOR CO.

Installation

- 1. Clean the extension housing and install new extension housing gasket. Ensure that the park pawl is installed correctly.
- Ensure the parking lever actuating rod is correctly seated into the case parking rod guide cup. Install the extension housing and bolts. See <u>Fig. 21</u>. Tighten extension housing bolts to specification. See <u>TORQUE SPECIFICATIONS</u>.
- 3. Install the transmission mount and lower the transmission onto the transmission crossmember. Install the transmission mount bolts and tighten to specification. See **<u>TORQUE SPECIFICATIONS</u>**.
- 4. Install the transmission crossmember nuts. See <u>**TORQUE SPECIFICATIONS</u>**. Install the driveshaft. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation.</u>

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See LUBRICATION .

EXTENSION HOUSING SEAL

NOTE: For removal and installation of extension housing seal on 4WD models, see appropriate REMOVAL & INSTALLATION article.

Removal & Installation

Raise and support the vehicle. Remove the drive shaft. See appropriate DRIVE SHAFTS & UNIVERSAL JOINTS article in DRIVELINE/AXLES. Using the Slide Hammer (100-001) and Seal Remover (307-309), remove the extension housing seal. See **Fig. 22**. Ensure the extension housing seal is correctly installed onto the special tool and the garter spring is in the correct position. Using the Seal Installer (308-002), install the extension housing seal. See **Fig. 23**. Install the driveshaft. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation. See **LUBRICATION**.



Fig. 22: Removing Extension Housing Seal Courtesy of FORD MOTOR CO.

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Fig. 23: Installing Extension Housing Seal Courtesy of FORD MOTOR CO.

INTERMEDIATE, OUTPUT & TURBINE SHAFT SPEED SENSORS

Removal

Raise and support the vehicle. On 4WD models, disconnect the front drive shaft from the transfer case. See <u>Fig.</u> <u>24</u>. Disconnect the front drive shaft from the front differential. See <u>Fig. 25</u>. Remove the front drive shaft from the vehicle. On all models, remove the shift cable and bracket. See <u>SHIFT CABLE</u>. Disconnect appropriate speed sensor harness connector. Remove the appropriate sensor screw (1). See <u>Fig. 26</u> or <u>Fig. 27</u>. Remove the appropriate sensor (2), from the transmission. Inspect the sensor "O" ring for damage. If damaged, install a new "O" ring.

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Fig. 24: Viewing Front Drive Shaft At Transfer Case Courtesy of FORD MOTOR CO.

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Fig. 25: Viewing Front Drive Shaft At Front Differential Courtesy of FORD MOTOR CO.

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Fig. 26: Locating Intermediate & Output Shaft Speed Sensors Courtesy of FORD MOTOR CO.

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Fig. 27: Locating Turbine Shaft Speed Sensor Courtesy of FORD MOTOR CO.

Installation

 On all models, inspect and lubricate "O" ring with petroleum jelly. Install the sensor into the transmission. Tighten appropriate sensor screw to specification. See <u>TORQUE SPECIFICATIONS</u>. Connect appropriate sensor harness connector. Install the shift cable and bracket. See <u>SHIFT CABLE</u>. On 4WD models, install the front drive shaft in the vehicle. Install the front drive shaft to the transfer case and tighten bolts to specification. Install the front drive shaft to the front differential. Tighten front drive shaft bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. On all models, lower the vehicle.

PARKING PAWL ACTUATING ROD

NOTE: On models equipped with 4WD, see appropriate article in TRANSFER CASES.

Removal

 Raise and support vehicle. Remove inspection plug from bottom of bellhousing. Drain fluid from torque converter and transmission. See <u>DRAINING & REFILLING</u> under LUBRICATION. Remove exhaust hanger bracket insulators. Remove 2 nuts retaining exhaust pipe clamps. Remove 2 bolts from cross brace and remove cross brace and mufflers. Remove drive shaft assembly.

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- Support transmission with transmission jack. Remove shift cable and bracket and move to side of transmission. See <u>SHIFT CABLE</u>. Remove transmission crossmember bolts and crossmember-totransmission mount bolts. Disconnect shift cable from crossmember clip. Remove digital Transmission Range (TR) sensor harness connector. See <u>Fig. 28</u>.
- Remove transmission oil pan and filter. See <u>DRAINING & REFILLING</u> under LUBRICATION. Remove manual valve detent spring, manual lever shaft nut and manual shaft retaining pin. See <u>Fig. 29</u> - <u>Fig. 31</u>.
- 4. Remove manual lever shaft out of case. See <u>Fig. 32</u>. Disconnect manual valve inner lever from parking pawl actuating rod. See <u>Fig. 33</u>. Remove extension housing bolts. Remove extension housing and discard extension housing gasket. Remove parking pawl actuating rod from rear of transmission case.



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Fig. 28: Identifying Transmission Range Sensor Harness Connector Courtesy of FORD MOTOR CO.

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Fig. 29: Identifying Manual Valve Detent Spring Courtesy of FORD MOTOR CO.

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Fig. 30: Identifying Manual Lever Shaft Nut Courtesy of FORD MOTOR CO.

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Fig. 31: Identifying Manual Shaft Retaining Pin Courtesy of FORD MOTOR CO.

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Fig. 32: Removing & Installing Manual Control Lever Shaft Courtesy of FORD MOTOR CO.

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Fig. 33: Identifying Parking Pawl Actuating Rod Courtesy of FORD MOTOR CO.

Installation

- 1. To install, reverse removal procedure. Ensure flats on manual valve inner lever aligns with flats on the manual lever shaft. See **Fig. 32**. Install extension housing using a NEW extension housing gasket. Ensure parking pawl lever and parking gear components are installed correctly. If fluid pan gasket is not damaged, it may be reused.
- Install NEW output shaft flange collared nut. See <u>Fig. 30</u>. Tighten bolts and nuts to specification. See <u>TORQUE SPECIFICATIONS</u>. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation. See <u>LUBRICATION</u>.

REVERSE SERVO

Removal

- 1. Raise and support vehicle. Remove inspection plug from bottom of bellhousing. Drain transmission fluid from pan and torque converter. See **DRAINING & REFILLING** under LUBRICATION.
- Remove 2 bolts retaining shift cable bracket to side of transmission. Remove 16 oil pan bolts and remove oil pan. Remove 2 bolts retaining transmission fluid filter and remove transmission fluid filter. Remove 4 bolts retaining low-reverse servo cover to transmission case. See <u>Fig. 34</u>. Remove low-reverse servo cover, piston, spring and plate.

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<u>Fig. 34: Locating Reverse Servo</u> Courtesy of FORD MOTOR CO.

Installation

Install low-reverse servo cover, piston, spring and plate. Tighten 4 low-reverse servo cover-to-transmission case bolts in sequence. See <u>Fig. 35</u>. Tighten bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. Install transmission fluid filter and pan. See <u>DRAINING & REFILLING</u> under LUBRICATION. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation. See <u>LUBRICATION</u>.

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Fig. 35: Identifying Low-Reverse Servo Cover Bolt Tightening Sequence Courtesy of FORD MOTOR CO.

SHIFT CABLE

Removal

- 1. Position the gearshift lever in Neutral position. Disconnect the negative battery cable. Wait at least one minute before proceeding with the procedure to allow the backup power supply to deplete its energy.
- Remove the screws and the lower steering column opening finish panel. Remove the 3 screws and the lower steering column shroud. See <u>Fig. 15</u>. Remove the 4 screws and position the wire shield aside. See <u>Fig. 36</u>.
- 3. Disconnect the shift cable from the transmission selector lever arm and support. Disconnect the shift cable from the bracket. Do not bend or damage the bracket.
- 4. Using a suitable tool, squeeze the 2 shift cable retainer lock tabs above the bracket, and disconnect the retainer from the bracket. See **Fig. 37**. Push the rubber grommet through the bulkhead. Raise and support the vehicle.
- 5. Remove the shift cable from the vehicle. Disconnect the shift cable from the digital Transmission Range (TR) sensor. Disconnect the shift cable from the shift cable bracket. Remove the shift cable from the vehicle. Remove the bolts and the shift cable bracket. Lower the vehicle.

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<u>Fig. 36: Identifying Wire Shield</u> Courtesy of FORD MOTOR CO.

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Fig. 37: Identifying Retainer Lock Tabs Courtesy of FORD MOTOR CO.

Installation

- 1. Install the new shift cable retainers in either direction on the shift cable. See **Fig. 38**. Verify that the washer is installed on the shift cable retainer with the shiny side facing upward. See **Fig. 39**. From inside the vehicle, feed the shift cable through the opening in the bulkhead.
- 2. Do not seat the rubber grommet in the bulkhead opening at this time. Raise and support the vehicle. Pull the shift cable downward from between the engine and the bulkhead, and position it aside. Lower the vehicle.
- 3. Do not bend or damage the bracket. Connect the shift cable retainer to the bracket. The retainer clip on the shift cable will only slide into the bracket in one direction. Connect the shift cable to the bracket.
- 4. Connect the shift cable (2), to the manual selector lever (1), and support. See **Fig. 14**. Position the wire shield and install the 4 screws. Seat the rubber grommet in the bulkhead opening.
- 5. Position the lower steering column shroud and install the 3 screws. Position the lower steering column opening finish panel and install the screws. Position the shift cable bracket and install the bolts. Adjust shift cable. See <u>SHIFT CABLE</u> under ADJUSTMENTS. Lower the vehicle.
- 6. Connect the negative battery cable. Verify that the engine will start in Park and Neutral positions and that the reverse lights illuminate when gearshift lever is in Reverse position. If not, readjust the shift cable.

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See **<u>SHIFT CABLE</u>** under ADJUSTMENTS.

7. Check that the digital Transmission Range (TR) sensor adjustment is correct. Adjust the TR sensor if necessary. See <u>TRANSMISSION RANGE SENSOR</u> under ADJUSTMENTS.



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Fig. 38: Identifying Shift Cable Retainer Positions Courtesy of FORD MOTOR CO.

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Fig. 39: Identifying Shift Cable Retainer Washer Placement Courtesy of FORD MOTOR CO.

SOLENOID BODY

Removal

- Disconnect negative battery cable. Raise and support vehicle. Remove inspection plug from bottom of bellhousing. Drain transmission fluid from transmission pan and torque converter. See <u>DRAINING &</u> <u>REFILLING</u> under LUBRICATION. Clean area around transmission case at solenoid body harness connector.
- Loosen bolt and disconnect solenoid body harness connector. See <u>Fig. 40</u>. Remove 2 bolts retaining shift cable bracket to side of transmission. Disconnect 2-pin harness connector from reverse pressure switch. Remove 8 Torx head bolts retaining solenoid body to transmission case and remove solenoid body. See <u>Fig. 41</u>.

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Fig. 40: Locating Solenoid Body Harness Connector Courtesy of FORD MOTOR CO.

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Fig. 41: Solenoid Body Bolt Tightening Sequence Courtesy of FORD MOTOR CO.

Installation

CAUTION: Damage will occur to the solenoid body assembly if the bolts are tightened more than specification.

- 1. To install, reverse removal procedure. Install 2 NEW "O" rings onto solenoid valve body connector. See **Fig. 42**. Ensure solenoid body harness connector is fully seated before tightening connector bolt.
- 2. Tighten solenoid body bolts in sequence and to specification. See <u>Fig. 41</u>. See <u>TORQUE</u> <u>SPECIFICATIONS</u>.
- 3. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation. See <u>LUBRICATION</u>.

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Fig. 42: Installing "O" Rings Onto Solenoid Valve Body Courtesy of FORD MOTOR CO.

TRANSMISSION RANGE SENSOR

Removal

- 1. Raise and support the vehicle. Move the rubber boot back to gain access to the connector. See <u>Fig. 28</u>. Disconnect the digital Transmission Range (TR) sensor harness connector.
- 2. Remove the shift cable from the manual control lever. Remove the outer manual control lever. Remove the digital TR sensor.

Installation

CAUTION: Tightening one screw before tightening the other may cause the sensor to bind or become damaged. Tighten the TR sensor bolts in an alternating sequence.

- 1. Digital TR sensor must fit flush against the boss on the case to prevent damage to the sensor. Install the digital TR sensor and loosely install the screws.
- Ensure manual control lever is in the Neutral position and adjust TR sensor. See <u>TRANSMISSION</u> <u>RANGE SENSOR</u> under ADJUSTMENTS. Tighten the TR sensor bolts to specification. See <u>TORQUE</u> <u>SPECIFICATIONS</u>. Install the outer manual lever.
- 3. Install the shift cable to the manual control lever. Reconnect the digital TR sensor connector. Move the rubber boot back over the connector. Verify that the shift cable is adjusted correctly. See <u>SHIFT</u>

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<u>**CABLE**</u> . Lower the vehicle.

VALVE BODY

Removal

- 1. Disconnect negative battery cable. Raise and support vehicle. Drain transmission fluid, remove inspection plug from bottom of bellhousing and drain transmission fluid from torque converter. See <u>DRAINING &</u> <u>REFILLING</u> under LUBRICATION. Clean area around transmission case at transmission connector.
- Loosen bolt and disconnect transmission connector. See <u>Fig. 40</u>. Remove 2 bolts retaining shift cable bracket to side of transmission. Disconnect Transmission Range (TR) sensor harness connector. Remove TR sensor. See <u>TRANSMISSION RANGE SENSOR</u>.
- 3. Remove 16 oil pan bolts and remove transmission fluid pan. See <u>DRAINING & REFILLING</u> under LUBRICATION. Remove 2 bolts retaining transmission fluid filter and remove filter.
- 4. Remove solenoid body. See <u>SOLENOID BODY</u>. Remove reverse servo. See <u>REVERSE SERVO</u>. Remove manual valve detent spring and bolt. See <u>Fig. 29</u>.
- 5. Remove bolts retaining valve body to transmission case. See <u>Fig. 43</u>. Remove valve body, separator plate and gasket. Remove intermediate clutch spring and inlet tube seal assembly.



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Fig. 43: Identifying Valve Body Bolt Torque Sequence Courtesy of FORD MOTOR CO.

Installation

- Install 2 valve body Alignment Pins (T95L-70010-C), into transmission case. See <u>Fig. 44</u>. Install valve body bolts finger tight. Remove alignment pins and install 2 valve body bolts finger tight. Install solenoid body. See <u>SOLENOID BODY</u>.
- 2. Install manual detent lever spring. Tighten manual lever detent spring bolt to specification. See <u>TORQUE SPECIFICATIONS</u>. Install reverse servo assembly. See <u>REVERSE SERVO</u>.
- 3. Install solenoid body bolts and tighten in sequence and to specification. See <u>Fig. 41</u>. Rotate the manual selector lever through all gear ranges. Then place the manual selector lever in Neutral position.
- 4. Install TR sensor. See <u>TRANSMISSION RANGE SENSOR</u>. Check adjustment of TR sensor after installation. Tighten TR sensor bolts to specification. See <u>TORQUE SPECIFICATIONS</u>.
- Connect shift cable to manual selector lever. Install transmission fluid filter and pan. See <u>DRAINING &</u> <u>REFILLING</u> under LUBRICATION. Install solenoid body harness connector and position into transmission case. Fill the transmission with appropriate fluid to proper level and check for correct transmission operation. See <u>LUBRICATION</u>.



Fig. 44: Installing Valve Body Alignment Pins Courtesy of FORD MOTOR CO.

TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Extension Housing Bolts	29 (39)
Front Drive Shaft Bolts (AWD & 4WD)	
At Front Differential	13 (18)
At Transfer Case	22 (30)
Manual Control Lever Nut	35 (48)
Transmission Drain Plug	19 (26)
Transfer Case Drain & Fill Plugs	
AWD	17 (23)
4WD	11 (15)
Transmission Crossmember Bolts	66 (90)
Transmission Mount Bolts	66 (90)
	INCH Lbs. (N.m)
Intermediate Shaft Speed Sensor	89 (10)
Oil Pan Bolts	97 (11)
Solenoid Body Bolts	71 (8)
Torque Converter Drain Plug	89 (10)
Transmission Range Sensor	89 (10)