FORD EXPLORER 1991-2001
A4LD - 4R55E - 4R70W - 5R55E
AUTOMECANICO.COM
ESPECIFICACIONES
TRANSMISION
AUTOMATICA
### Automatic transmission

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#### Specifications

**General**

Transmission type:
- 1991 through 1994 models: A4LD
- 1996 and later V8 models: 4R70W
- 1997 and later V6 models: 5R55E
- See Chapter 1

Fluid type and capacity:
- 7 to 10 quarts

**Torque Specifications**

1995 and earlier models:
- Transmission-to-engine bolts: 29 to 38 ft-lbs
- Torque converter-to-driveplate nuts: 20 to 34 ft-lbs
- Neutral start switch: 84 to 120 in-lbs

1996 and later models:
- Transmission-to-engine bolts:
  - V6 models: 30 to 41 ft-lbs
  - V8 models: 30 to 41 ft-lbs
  - 1996 models: 30 to 41 ft-lbs
  - 1997 and later models: 30 to 41 ft-lbs
- Torque converter-to-driveplate nuts:
  - V6 models: 22 to 30 ft-lbs
  - V8 models: 20 to 34 ft-lbs
- Transmission range sensor mounting bolts:
  - V6 models: 71 to 97 in-lbs
  - V8 models: 62 to 89 in-lbs
- Extension housing bolts:
  - V6 models: 27 to 39 ft-lbs
  - V8 models: 18 to 22 ft-lbs
- VSS sensor mounting bolt:
  - V6 models: 63 to 89 in-lbs
  - V8 models: 98 to 115 in-lbs

### 1 General information

All vehicles covered in this manual come equipped with a five-speed manual transmission or an automatic transmission. All information on the automatic transmissions is included in this Part of Chapter 7. Information on the manual transmission can be found in Part A of this Chapter.

Due to the complexity of the automatic transmissions covered in this manual and the need for specialized equipment to perform most service operations, this Chapter contains only general diagnosis, routine maintenance, adjustment and removal and installation procedures.

Models up through 1994 used an A4LD 4-speed automatic transmission. The 1995 and 1996 V6 models used the 4-speed, electronically-controlled 4R55E transmission, while the V8 models (1996 and later) used a 4R70W 4-speed automatic transmission. Models after 1996 equipped with V6 engines use a 5R55E five-speed electronic transmission.

If the transmission requires major repair work, it should be taken to a dealer service department or an automotive or transmission repair shop for troubleshooting with an electronic scan tool. You can, however, remove and install the transmission yourself and save that labor expense, even if the repair work is done by a transmission shop.
2 Diagnosis - general

Note: Automatic transmission malfunctions may be caused by five general conditions: poor engine performance, improper adjustments, hydraulic malfunctions, mechanical malfunctions or malfunctions in the computer or its signal network. Diagnosis of these problems should always begin with a check of the easily repaired items: fluid level and condition (see Chapter 1) and shift linkage adjustment. Next, perform a road test to determine if the problem has been corrected or if more diagnosis is necessary. If the problem persists after the preliminary tests and corrections are completed, additional diagnosis should be done by a dealer service department or transmission repair shop using a scan tool to diagnose the electronics of the transmission. Refer to the Troubleshooting section at the front of this manual for information on symptoms of transmission problems.

Preliminary checks
1. Drive the vehicle to warm the transmission to normal operating temperature.
2. Check the fluid level as described in Chapter 1:
   a. If the fluid level is unusually low, add enough fluid to bring the level within the designated area of the dipstick, then check for external leaks (see below).
   b. If the fluid level is abnormally high, drain off the excess, then check the drained fluid for contamination by coolant. The presence of engine coolant in the automatic transmission fluid indicates a failure has occurred in the internal radiator walls that separate the coolant from the transmission fluid (see Chapter 3).
   c. If the fluid is foaming, drain it and refill the transmission, then check for coolant in the fluid or a high fluid level.
3. Check the engine idle speed. Note: If the engine is malfunctioning, do not proceed with the preliminary checks until it has been repaired and runs normally.
4. Inspect the shift linkage (see Section 3). Make sure that it's properly adjusted and that the linkage operates smoothly.

Fluid leak diagnosis
5. Most fluid leaks are easy to locate visually. Repair usually consists of replacing a seal or gasket. If a leak is difficult to find, the following procedure may help.
6. Identify the fluid. Make sure it's transmission fluid and not engine oil or brake fluid (automatic transmission fluid is a deep red color when new and may turn light brown after the vehicle has been driven some distance).
7. Try to pinpoint the source of the leak. Drive the vehicle several miles, then park it over a large sheet of cardboard. After a minute or two, you should be able to locate the leak by determining the source of the fluid dripping onto the cardboard.
8. Make a careful visual inspection of the suspected component and the area immediately around it. Pay particular attention to gasket mating surfaces. A mirror is often helpful for finding leaks in areas that are hard to see.
9. If the leak still cannot be found, clean the suspected area thoroughly with a degreaser or solvent, then dry it.
10. Drive the vehicle for several miles at normal operating temperature and varying speeds. After driving the vehicle, visually inspect the suspected component again.
11. Once the leak has been located, the cause must be determined before it can be properly repaired. If a gasket is replaced but the sealing flange is bent, the new gasket will not stop the leak. The bent flange must be straightened.
12. Before attempting to repair a leak, check to make sure that the following conditions are corrected or they may cause another leak. Note: Some of the following conditions cannot be fixed without highly specialized tools and expertise. Such problems must be referred to a transmission repair shop or a dealer service department equipped with an electronic scan tool.

Gasket leaks
13. Check the pan periodically. Make sure the bolts are tight, no bolts are missing, the gasket is in good condition and the pan is flat (dents in the pan may indicate damage to the valve body inside).
14. If the pan gasket is leaking, the fluid level or the fluid pressure may be too high, the vent may be plugged, the pan bolts may be too tight, the pan sealing flange may be warped, the sealing surface of the transmission housing may be damaged, the gasket may be damaged or the transmission casting may be cracked or porous. If sealant instead of gasket material has been used to form a seal between the pan and the transmission housing, it may be the wrong sealant.

Seal leaks
15. If a transmission seal is leaking, the fluid level or pressure may be too high, the vent may be plugged, the seal bore may be damaged, the seal itself may be damaged or improperly installed, the surface of the shaft protruding through the seal may be damaged or a loose bearing may be causing excessive shaft movement.
16. Make sure the dipstick tube seal is in good condition and the tube is properly seated. Periodically check the area around the speedometer gear or sensor for leakage. If transmission fluid is evident, check the O-ring for damage.

Case leaks
17. If the case itself appears to be leaking, the casting is porous and will have to be repaired or replaced.
18. Make sure the oil cooler hose fittings are tight and in good condition.

3.3 Pry the cable end from the ball-stud on the lever (A), then use a screwdriver to pull up the locking tab (B) at the cable bracket.

Fluid comes out vent pipe or fill tube
19. If this condition occurs, the transmission is overfilled, there is coolant in the fluid, the case is porous, the dipstick is incorrect, the vent is plugged or the drain back holes are plugged.

3 Shift cable - adjustment

Refer to illustration 3.3
1. Raise the vehicle and support it securely on jackstands. Caution: If the vehicle is equipped with Automatic Ride Control (ARC), make sure the air suspension switch is turned to the OFF position before the vehicle is raised to prevent damage to the system components (see Chapter 10).
2. Have an assistant position the column shift selector lever in the Drive/Overdrive position and hold in place during adjustment. If working by yourself, hang a three-pound weight on the gear selector lever.
3. Working under the vehicle, pull down on the lock tab on the shift cable and remove the fitting from the manual shift lever ballstud with a screwdriver (see illustration).
4. Position the transmission manual shift lever in the Drive/Overdrive position by moving the bellcrank lever all the way to the rear (counterclockwise), then forward three detents (clockwise).
5. Connect the cable end fitting to the manual lever ball stud.
6. Push the lock tab all the way down to lock the cable in the correctly adjusted position.
7. If used, remove the weight from the gear selector lever.
8. After adjustment, check for Park engagement. The control lever must move to the right when engaged in Park. Check the control lever in all detent positions with the engine running to ensure correct detent/transmission action and readjust as necessary.
54 Remove the upper steering column shroud by pulling its tab out of the slot (arrow).

5.5 Use a punch (A) to drive out the shift lever pin (B) to remove the shift lever.

6.4 Disconnect the shift indicator cable (A) at the shift lever - (B) is the thumbwheel adjuster.

3 Remove the ignition lock cylinder (see Chapter 12).
4 The shift indicator cable attaches to the shift control lever on the top side of the steering column (see illustration).
5 Follow the cable routing from there to the instrument panel, removing any retaining clips along the way, and disconnect the upper end from the shift indicator in the instrument panel (see illustration).
6 Replacement is the reverse of the removal process.

Adjustment
7 Position the shift lever in the Overdrive position, which is two clicks counterclockwise from the most clockwise position. Observe the indicator, which has a “flag” around the indicated position (with standard instrument panels) or a pointer (electronic instrument panel).
8 Apply several pounds of pressure downward (clockwise) on the shifter. If the flag or pointer isn’t correctly centered on the Overdrive symbol, adjust the thumbwheel on the shift indicator cable until it is centered (see illustration 6.4).

5 Shift lever assembly - removal and installation

Refer to illustrations 5.4 and 5.5

Warning: On models equipped with airbags, disconnect the negative battery cable, then the positive battery cable and wait two minutes before working in the vicinity of the impact sensors, steering column or instrument panel to avoid the possibility of accidental deployment of the airbag, which could cause personal injury (see Chapter 12).

1 Disconnect the negative cable (and positive cable, if equipped with airbags) from the battery.
2 Remove the driver’s side knee bolster and upper and lower steering column covers (see Chapter 11).
3 Disconnect the electrical connector from the transmission control switch, if equipped (see Section 9).
4 Remove the boot by prying up one end and pulling the bottom out of a slot in the column (see illustration).
5 Drive the retaining pin from the shift lever base with a small punch and hammer (see illustration). Remove the shift lever and the clip. Note: If the shift lever is to be removed from the vehicle, not just from the column, refer to Section 6 and disconnect the shift indicator cable.
6 Installation is the reverse of removal. Caution: Replace the shift lever pin with a new one any time the shift lever is removed.

6 Shift indicator cable - replacement and adjustment

Warning: On models equipped with airbags, disconnect the negative battery cable, then the positive battery cable and wait two minutes before working in the vicinity of the impact sensors, steering column or instrument panel to avoid the possibility of accidental deployment of the airbag, which could cause personal injury (see Chapter 12).

Replacement
Refer to illustrations 6.4 and 6.5

1 Disconnect the negative battery cable (and positive cable, if equipped with airbags).
2 Refer to Chapter 11 and remove the driver’s side lower instrument panel cover and the upper and lower steering column covers.

6.5 Upper end of shift indicator cable (arrow)
After adjustment, try the shift lever in all positions to make sure the indicator matches all the shift lever detents.

7 Neutral-start switch (1994 and earlier models) - removal, installation and adjustment

1. Disconnect the negative cable from the battery.
2. Disconnect the electrical connector from the switch on the transmission housing.
3. Carefully remove the switch. Caution: It is easy to crush or puncture the walls of the switch. A special socket, designed to remove the switch without damaging it, may be available at your local auto parts store.
4. Install the switch and tighten to the torque listed in this Chapter's Specifications. If available, use the same special tool used for removal to avoid damaging the switch.
5. Install the electrical connector.
6. Connect the negative cable to the battery.
7. Check that the engine will start only when the shift selector is in the Neutral or Park positions.

8 Brake/transmission shift interlock system (1995 and later models) - description, check and solenoid replacement

Warning: On models equipped with airbags, disconnect the negative battery cable, then the positive battery cable and wait two minutes before working in the vicinity of the impact sensors, steering column or instrument panel to avoid the possibility of accidental deployment of the airbag, which could cause personal injury (see Chapter 12).

Description
1. The brake transmission interlock system prevents the shift lever from being moved out of Park unless the brake pedal is depressed simultaneously. When the car is started, a solenoid is energized, locking the shift lever in Park; when the brake pedal is depressed, the solenoid is deenergized, unlocking the shift lever so that it can be moved out of Park.

Note: Before making the following checks, refer to Chapter 9 and verify that the brake light switch is functioning properly, because it is part of the interlock circuit. Also check the 15-amp fuse in position 13 in the fuse panel below the instrument panel (see Chapter 12). This fuse serves the interlock solenoid.

Check
Refer to illustration 8.2
2. Remove the driver's side lower instrument panel cover and upper and lower steering column covers (see Chapter 11). Using a flashlight, locate the brake transmission shift interlock solenoid (see illustration). Verify that the brake/transmission shift interlock solenoid operates as follows:
   a. When the ignition key is in the Lock position, the solenoid plunger should be in and you should not be able to move the shift lever, even with the brake pedal applied.
   b. With the ignition key turned to the Off position, the solenoid plunger should be out and you should be able to move the shift lever to any gear position without applying the brake pedal.
   c. When the ignition key is turned to the Run position, the solenoid should go back into the solenoid and you should not be able to move the shift lever; except with the brake pedal applied, the solenoid plunger should be released and you should be able to move the shift lever out of Park into any gear.
   d. Place the key in the Lock position, then turn the key to the Acc (accessory) position. The solenoid plunger should go in a little further than it does when the key is turned to Lock, and you should not be able to move the shift lever (even with the brake applied).

4. If the solenoid doesn't operate as described above, unplug the electrical connector from the solenoid, apply battery voltage to the solenoid and verify that it clicks on, then open the circuit and verify that the solenoid clicks off. If the solenoid doesn't operate as described, replace it.
5. Check for battery voltage (10 or more volts) at the connector at the terminal for the wire from the fuse panel (gray/yellow).
6. Step on the brake pedal and check for voltage at the wire from the brake light switch (light green). There should be battery voltage when the pedal is depressed, but less than one volt with the pedal released.
7. Using an ohmmeter, check the resistance at the black wire on the solenoid connector. If the resistance is greater than 50 ohms, there is a problem in the ground circuit.

Solenoid replacement
7. Disable the airbag system (see Chapter 12). Remove the driver's side lower instrument panel cover and upper and lower steering column covers (see Chapter 11).
8. Lower the steering column and support it (see Chapter 10).
9. Unplug the electrical connector from the solenoid, and remove the solenoid mounting screws (see illustration 8.2). Remove the solenoid.
10. Installation is the reverse of the removal procedure.

9 Transmission control switch (1996 and later models) - check and replacement

Refer to illustrations 9.3a and 9.3b
1. The Transmission Control Switch located on the shift lever allows the driver to turn the Overdrive capability On or Off. In normal driving the Overdrive is always turned On.
2. Check the 10-amp fuse (designated "V")
in the engine compartment fuse panel.
3 Pry off the cover on the end of the shift lever and pull out the transmission control switch (see illustrations).
4 Using a voltmeter, check for battery voltage at one of the pin sockets in the end of the shift lever, with the ignition key On (engine not running).
5 Using an ohmmeter, check for continuity across the pins when the switch is depressed. If continuity is not indicated, replace the transmission control switch.
6 Press the new switch into the lever, making sure the pins are aligned with the sockets. Press the cover back on.

**10 Transmission range sensor (1995 and later models) - check and replacement**

**Check**
Refer to illustration 10.4
1 With the ignition key Off, remove the electrical connector from the transmission range sensor. **Caution:** Disconnect the connector by hand; do not use a tool to pry it off.
2 Use a small mirror to examine the connector socket on the sensor for loose, corroded or bent pins.
3 Major testing of the transmission range sensor and harness requires a scan tool, normally used by a dealer service department. However, you can check for basic continuity between some of the terminals on the sensor with an ohmmeter or continuity tester.
4 Check for continuity between the indicated terminals at the sensor, with the connector disconnected (see illustration).
   a) There should be continuity between terminals 1 and 4 in Park or Neutral.
   b) There should be continuity between terminals 5 and 8 in Neutral.
   c) There should be continuity between terminals 2 and 3 in Reverse.
5 If one or more of these tests fail, replace the transmission range sensor.
6 Further testing should be performed with a scan tool.

**Replacement**
Refer to illustration 10.13
7 Disconnect the negative cable from the battery.
8 Shift the transmission into Neutral.
9 Raise and support the front of the vehicle securely on jackstands. **Caution:** If the vehicle is equipped with Automatic Ride Control (ARC), make sure the air suspension switch is turned to the OFF position before the vehicle is raised to prevent damage to the system components (see Chapter 10).
10 Refer to Section 4 and remove the shift cable from the shift lever and the cable bracket.
11 Make a mark or scribe mark on the transmission shift lever, relative to its position on the splined shaft from the transmission when in Neutral, then remove the nut and take off the shift lever.
12 Disconnect the electrical connector from the transmission range sensor.
13 Remove the bolts and detach the sensor (see illustration).
14 Before installing the sensor, make sure the transmission is in the Neutral position. Align the flats on the switch with the flats in the shaft and position the sensor onto the shaft.
15 Install the bolts finger-tight. Precise adjustment of the sensor requires a special tool. If the tool is not available, adjust the sensor as follows:
   a) Connect the electrical sensor to the sensor, connect the negative battery cable and turn the ignition key On (engine not running).
   b) Shift the transmission into Reverse.
   c) Rotate the sensor until the back-up lights come on and tighten the mounting bolts.
16 The remainder of installation is the reverse of removal. **Note:** Use a new nut when installing the shift lever.
17 Apply the parking brake and verify that the engine will start only in Neutral or Park.
12.6 Mark one of the torque converter studs with white paint and make a corresponding mark on the driveplate so the torque converter and driveplate can be reassembled in the same relative positions.

12.10 Disconnect the shift cable from the manual shift lever (A) and the kickdown cable from the transmission downshift lever (B) (early model shown)

12.11 Vacuum diaphragm (1994 and earlier models) - removal and installation

1. Raise the vehicle and support it securely on jackstands.
2. Carefully pry the heat shield from the transmission pan, then slide it forward to gain access to the vacuum diaphragm.
3. Disconnect the hose from the vacuum diaphragm.
4. Remove the bolt and the retaining clamp and pull the diaphragm out of the transmission case.
5. Remove the control rod from the transmission case.
6. Installation is the reverse of the removal procedure, but be sure to install a new O-ring on the vacuum diaphragm and tighten the clamp bolt securely.

12.12 Automatic transmission - removal and installation

**Removal**

Refer to illustrations 12.6, 12.10, 12.11 and 12.16

1. Disconnect the negative cable from the battery.
2. Raise the vehicle and support it securely on jackstands. **Caution:** If the vehicle is equipped with Automatic Ride Control (ARC), make sure the air suspension switch is turned to the OFF position before the vehicle is raised to prevent damage to the system components (see Chapter 10).
3. Drain the transmission fluid (see Chapter 1), then reinstall the pan.
4. On 4WD models, remove the transfer case (see Chapter 7 Part C).
5. Unbolt the starter and tie it up out of the way (see Chapter 5). The starter mounting hole provides access to the torque converter nuts. On 5.0L V8 models, remove the two bolts and the converter housing cover.
6. Mark the torque converter and one of the studs with white paint so they can be installed in the same position (see illustration).
7. Remove the four torque converter-to-driveplate nuts. Turn the crankshaft to access to each nut. Turn the crankshaft in a clockwise direction only (as viewed from the front).
8. On 2WD models, remove the driveshaft (see Chapter 8). Plug the end of the extension housing to prevent the entry of dirt and to catch any residual transmission fluid.
9. On early 2WD models, remove the speedometer cable retaining bracket and disconnect the speedometer cable from the transmission (see Chapter 7A). On later models, disconnect the electrical connector from...

12.11 Disconnect the electrical connectors from the various components on the transmission (arrows)

12.13a Remove the transmission mount nuts at the crossmember (A), and the bolts at the transmission (B)
10 Disconnect the shift cable from the transmission shift lever and the kickdown cable from the transmission kickdown lever on early models (see illustration).

11 Disconnect the electrical connectors for the neutral safety switch, torque converter lockup solenoid, transmission range sensor, etc. and secure the transmission electrical harness aside (see illustration).

12 Place a transmission jack beneath the transmission and apply jack pressure to slightly raise the transmission. Use safety chains to help steady the transmission on the jack.

13 Remove the transmission mount and crossmember (see illustrations). Refer to Chapter 7B for crossmember mounting details on early models.

14 Support the engine with a jack. Use a block of wood under the oil pan to spread the load.

15 Slightly lower the engine and transmission.

16 Disconnect the transmission oil cooler lines from the transmission and plug them to prevent the entry of dirt (see illustration). Use a flare nut wrench to avoid rounding off the nuts.

17 Remove the lower transmission-to-engine bolts.

18 Remove the transmission fluid dipstick tube from the transmission. Note: On some models, the upper end of the dipstick tube is bolted to the back of one of the cylinder heads. Be sure to remove this bolt before separating the transmission from the engine.

19 Make sure the transmission is securely mounted on the transmission jack. Using a long extension and universal-joint socket, remove the two upper transmission-to-engine bolts.

20 Carefully move the transmission to the rear to disengage it from the engine block dowel pins and make sure the torque converter is detached from the driveplate. Secure the torque converter to the transmission so it won't fall out during removal.

**Installation**

21 Installation is the reverse of the removal steps with the following additions:

a) Install the converter to the transmission, making sure the converter hub is fully engaged in the pump gear.

b) Rotate the converter to align the bolt drive lugs and the drain plug with the holes in the driveplate.

c) With the transmission secured to the jack, raise it into position. Be sure to keep it level so the torque converter does not slide forward and disengage from the pump gear.

d) Turn the torque converter to line up the studs with the holes in the driveplate. The white paint mark on the torque converter and the stud made in Step 5 must line up.

e) Move the transmission forward carefully until the dowel pins and the torque converter are engaged.

f) When installing the driveplate-to-converter nuts, position the driveplate so the pilot hole is in the six o'clock position. First install one nut through the pilot hole and tighten it, then install the remaining nuts. Tighten the nuts to the torque listed in this Chapter's Specifications.

g) Adjust the shift cable (see Section 3).

h) Lower the vehicle.

i) Fill the transmission with the specified fluid (see Chapter 1), run the engine and check for fluid leaks.