

# TRANSMISSION SERVICING - A/T

## TRANSMISSION SERVICING Ford Motor Co. Automatic Transmission Servicing

### LUBRICATION

#### SERVICE INTERVALS

##### Transmission

Vehicles used in normal service do not require regularly scheduled maintenance. Fluid level should be checked whenever underhood maintenance is performed or if leakage is detected. Clutch bands on A4LD and C-6 should be adjusted when quality of shifts deteriorates or otherwise indicates improper band adjustment. On vehicles used for fleet service or those operated under severe conditions (such as police, taxi or towing), regular transmission fluid changes are required every 30,000 miles or when fluid appears discolored.

##### Transfer Case

Under normal driving conditions, replace transfer case fluid every 60,000 miles. Under severe driving conditions, perform this service more frequently.

#### CHECKING FLUID LEVEL

**NOTE:** To check fluid level on vehicles equipped with 4WD applications, the 4WD shift selector must be in any position other than Neutral.

#### TRANSMISSION

##### Transmission

1. Check fluid level with vehicle parked on level surface, engine and transmission at normal operating temperatures and engine idling. Apply parking brake and move transmission selector lever through all ranges, ending in "P".
2. Fluid level should be between the ADD and DON'T ADD marks on dipstick (in crosshatched area). Add fluid through filler tube as needed. **DO NOT** overfill.

**CAUTION:** Vehicle should **NOT** be driven if fluid level is below the bottom hole on the dipstick and outside temperatures are above 50°F (10°C).

##### Transfer Case

Remove fill plug. If fluid drains out or is level with opening, reinstall drain plug. If not, fill until fluid is level with fill plug opening.

#### RECOMMENDED FLUID

It is important that the proper lubricant be used. Motorcraft Mercon automatic transmission fluid XT-2-QDX or DDX E4AZ-19582 should be used in both transmissions and transfer cases.

## FLUID CAPACITY

**NOTE:** Fluid capacities listed are approximate. Always determine correct fluid level by mark on dipstick rather than by amount of fluid added.

### TRANSMISSION REFILL CAPACITIES <sup>(1)</sup>

Application	Capacity
AOD Transmission	12.3 qts. (11.6L)
A4LD Transmission	
2WD	9.5 qts. (9.0L)
4WD	8.5 qts. (8.0L)
C-6 Transmission	
2WD Models	12.0 qts. (11.4L)
4WD Models	13.5 qts. (12.7L)
E4OD Transmission	
2WD Models	15.5 qts. (16.4L)
4WD Models	16.0 qts. (16.9L)
(1) Includes torque converter, cooler and lines.	

### TRANSFER CASE REFILL CAPACITIES

Application	Capacity
Borg-Warner 1345	3.3 qts. (3.0L)
Borg-Warner 1350	1.5 qts. (1.4L)
Borg-Warner 1354	1.3 qts. (1.2L)
Borg-Warner 1356	2.0 qts. (1.9L)
Borg-Warner 1359	1.5 qts. (1.4L)
Spicer TC-28	N/A

### DRAINING & REFILLING TRANSMISSION

1. Raise vehicle on hoist or jackstands. Loosen oil pan bolts and tap pan to break gasket seal. Allow fluid to drain. Remove oil pan bolts and oil pan. Discard used filter and gasket. Install new filter and gasket. On all transmissions, clean pan and mounting surface. Install new gasket.
2. On all transmissions, add 3 quarts of transmission fluid. Check fluid level as previously described. When filling a dry transmission and converter, refer to TRANSMISSION REFILL CAPACITIES table. Recheck fluid level when transmission is at normal operating temperature. **DO NOT** overfill.

### DRAINING & REFILLING TRANSFER CASE

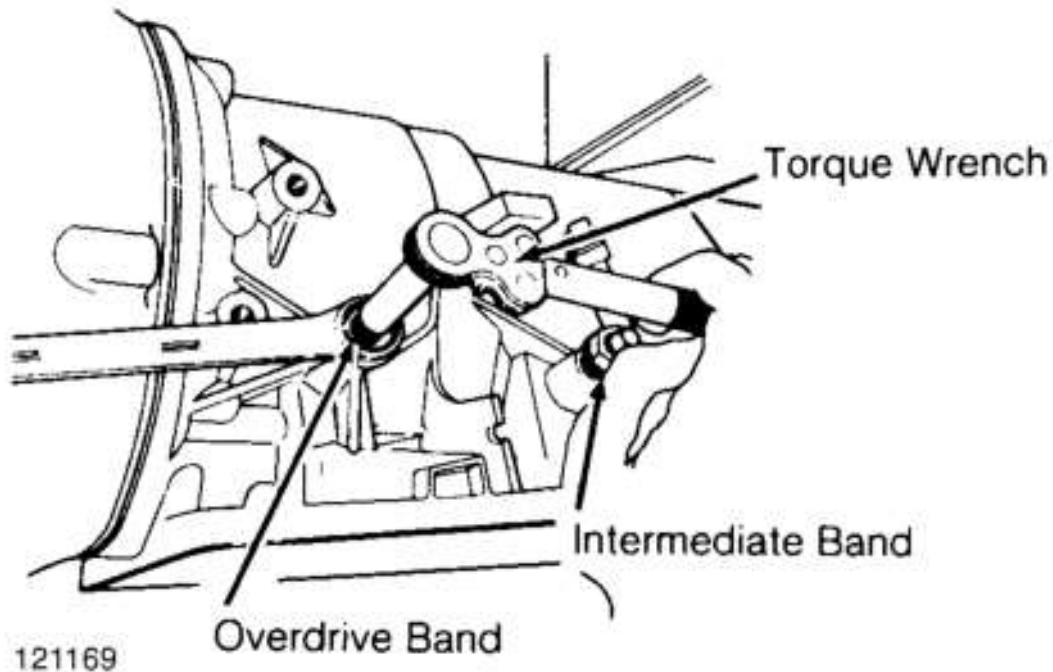
Remove drain plug from transfer case. Remove fill plug for easier draining. With fluid fully drained, reinstall drain plug. Fill transfer case to fill plug opening with Mercon ATF. Install fill plug.

## ADJUSTMENTS

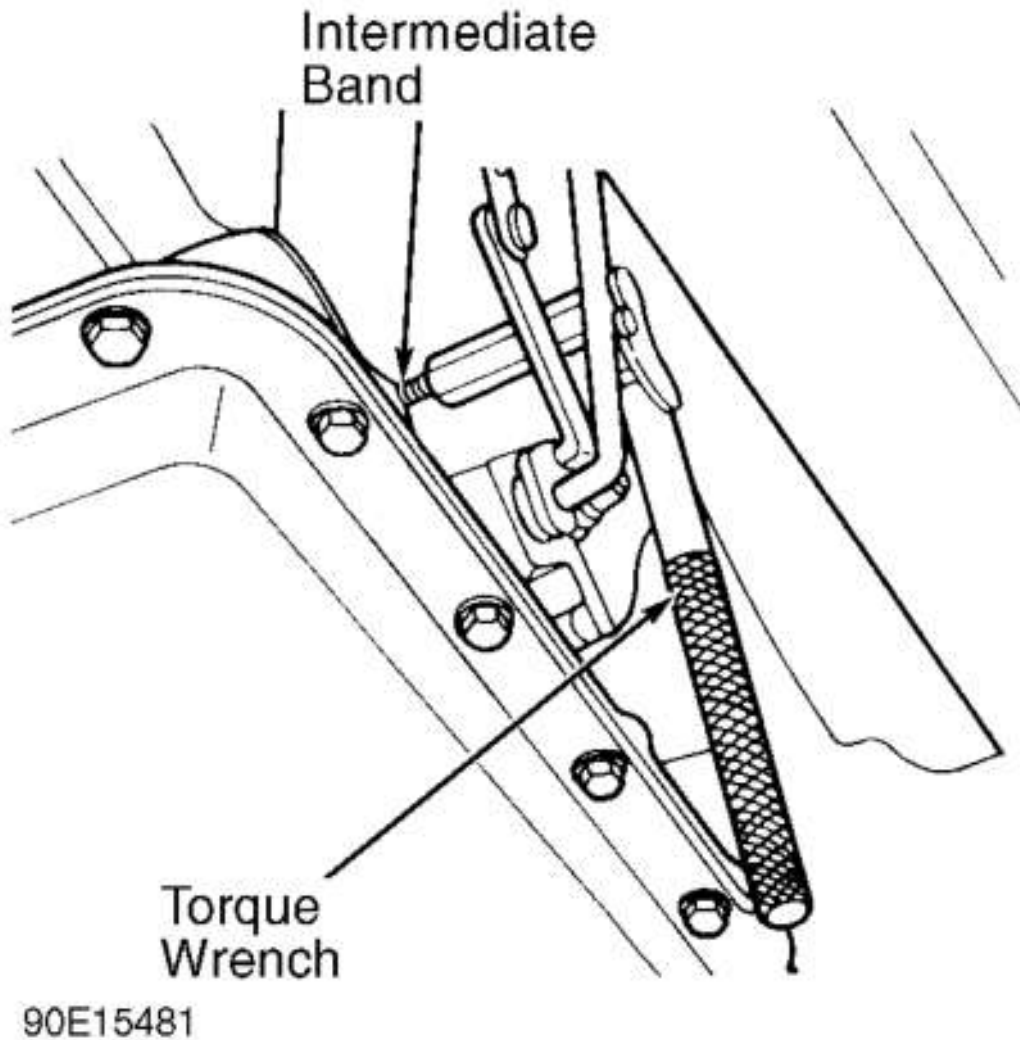
### INTERMEDIATE (FRONT) & OVERDRIVE BAND

## A4LD & C-6

1. Clean dirt from band adjusting screw area. Remove and discard band adjusting screw lock nut. Install new lock nut. Tighten adjusting screw to 120 INCH lbs. (14 N.m). See **Fig. 1** for A4LD transmissions. See **Fig. 2** for C-6 transmissions.



**Fig. 1: Adjusting A4LD Intermediate or Overdrive Band**  
Courtesy of FORD MOTOR CO.



**Fig. 2: Adjusting C-6 Intermediate Band**  
 Courtesy of FORD MOTOR CO.

2. Back off adjusting screw exact number of turns. See **INTERMEDIATE & OVERDRIVE BAND ADJUSTMENT** table. Hold adjusting screw in position and tighten new lock nut to 35-40 ft. lbs. (48-54 N.m).

**INTERMEDIATE & OVERDRIVE BAND ADJUSTMENT**

<b>Application</b>	<b>Back Off Screw</b>
A4LD Intermediate	2 Turns
A4LD Overdrive 4.0L	3 1/2 Turns
A4LD Overdrive (Except 4.0L)	2 Turns
C-6 Intermediate	1 1/2 Turns

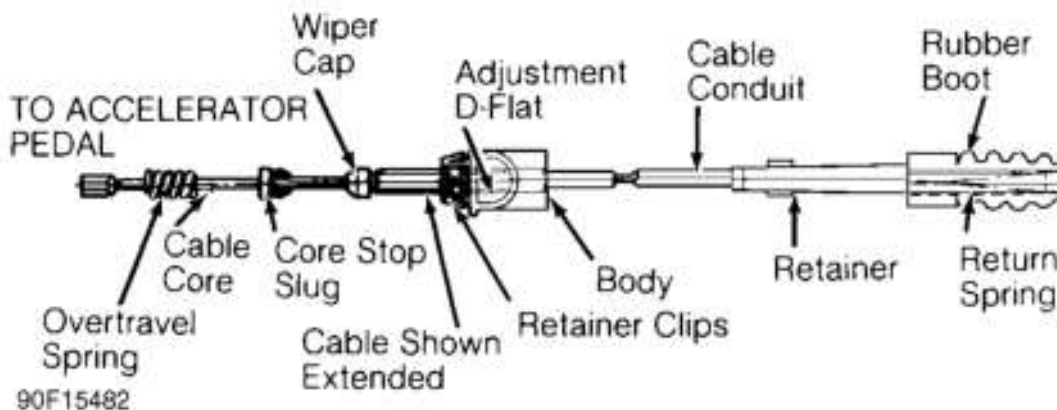
**KICKDOWN CONTROL CABLE ADJUSTMENT**

**NOTE:** Kickdown control cable self-adjusts .5-1.5" (13-38 mm) after installation by depressing accelerator pedal to floor. No adjustment is required, but cable must be manually locked in adjusted position. Cable must be adjusted whenever it is removed or replaced.

### Initial Adjustment A4LD

If cable has been replaced or removed adjust kickdown cable. From under the hood, depress the D-flat while pulling the cable conduit out from cable body. See Fig. 3. Adjust cable by depressing accelerator pedal to floor.

**NOTE:** If transmission kickdown is difficult to achieve at wide open throttle, check to ensure that aftermarket floormats have not been installed or mispositioned behind accelerator pedal thus restricting full pedal movement.



**Fig. 3: A4LD Kickdown Cable**  
Courtesy of FORD MOTOR CO.

## THROTTLE VALVE (T.V.) CONTROL CABLE SYSTEM

### AOD Only

1. T.V. control cable is set and locked to its proper length during initial assembly by pushing in locking tab at throttle body end of cable assembly. When tab is unlocked, cable is released for adjustment. Under normal circumstances, it should not be necessary to alter or readjust initial setting of T.V. control cable.
2. Set parking brake and put selector in "N". **DO NOT** put selector in "P". On F150-F250 and Bronco vehicles equipped with a 5.0L engine, remove cable linkage protective cover. On all vehicles, ensure throttle lever is resting against idle stop. **DO NOT** adjust idle stop.
3. Verify cable routing is free of sharp bends or pressure points and cable operates freely. Unlock locking tab at throttle body end by pushing up from below and prying up rest of way to free cable.
4. Install a retention spring with about 10 lbs. (4.5 kg) force to hold T.V. control lever to hold it in idle position (to rear of travel). Attach spring(s) to transmission T.V. lever and hook rear of spring to transmission case. If necessary, use 2 V8 throttle return springs to hold T.V. lever back.

5. With T.V. cable locking tab unlocked and retention spring in place, rotate transmission outer T.V. lever 10-30 degrees and return slowly. Push down locking tab until flush. Remove retention spring(s) from transmission lever.

## **VACUUM REGULATOR VALVE (VRV)**

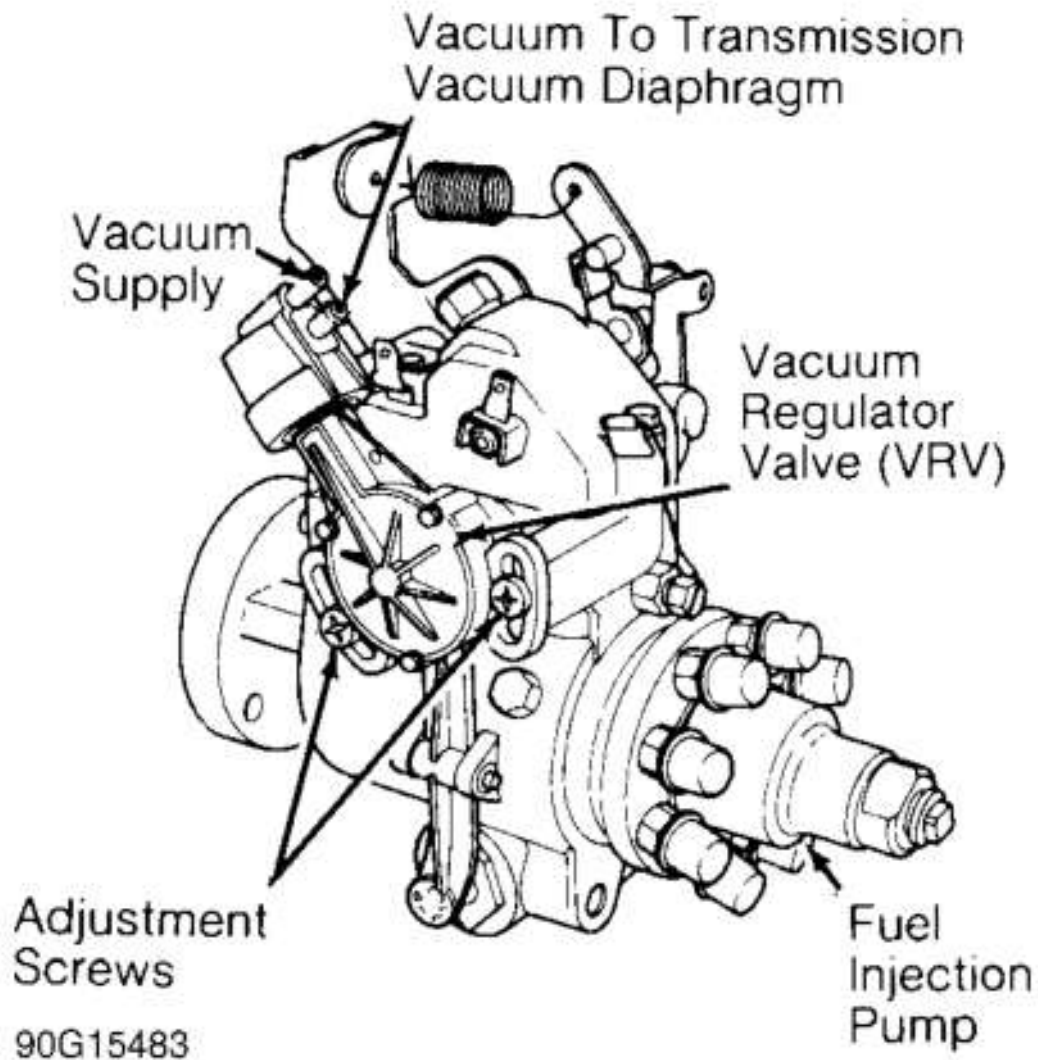
All models equipped with the 7.3L V8 diesel engine and automatic transmission include a VRV. Mounted on the left side of the fuel injection pump, it provides a vacuum signal to the transmission to control shift points. Signal strength is determined by the VRV.

### **Checking VRV Operation**

1. With engine turned off, disconnect the 2-port vacuum connector from VRV. Remove throttle cable from injection pump throttle lever (on right side of pump). Disconnect throttle return spring.
2. Attach one end of return spring over throttle lever ball stud. Install other end of spring over throttle cable support bracket. Insert .515" (13 mm) Gauge Block (T83T-7B200-AH) between pump boss and wide-open throttle stop screw.
3. Spring will hold throttle lever against gauge block during vacuum check and VRV adjustment. Attach vacuum pump to VAC (upper) port of VRV. Attach vacuum gauge to TRANS (lower) port. Apply and maintain 20 in. Hg vacuum. Vacuum gauge should indicate 6-8 in. Hg vacuum. If not, VRV requires adjustment.

### **Adjusting VRV**

1. Loosen 2 screws attaching VRV to fuel injection pump. See **Fig. 4**. With vacuum pump, gauge, gauge block and return spring in position (as during checking procedure), maintain 20 in. Hg vacuum with pump. Rotate VRV until vacuum gauge reads 6.5-7.5 in. Hg vacuum. Tighten mounting screws.



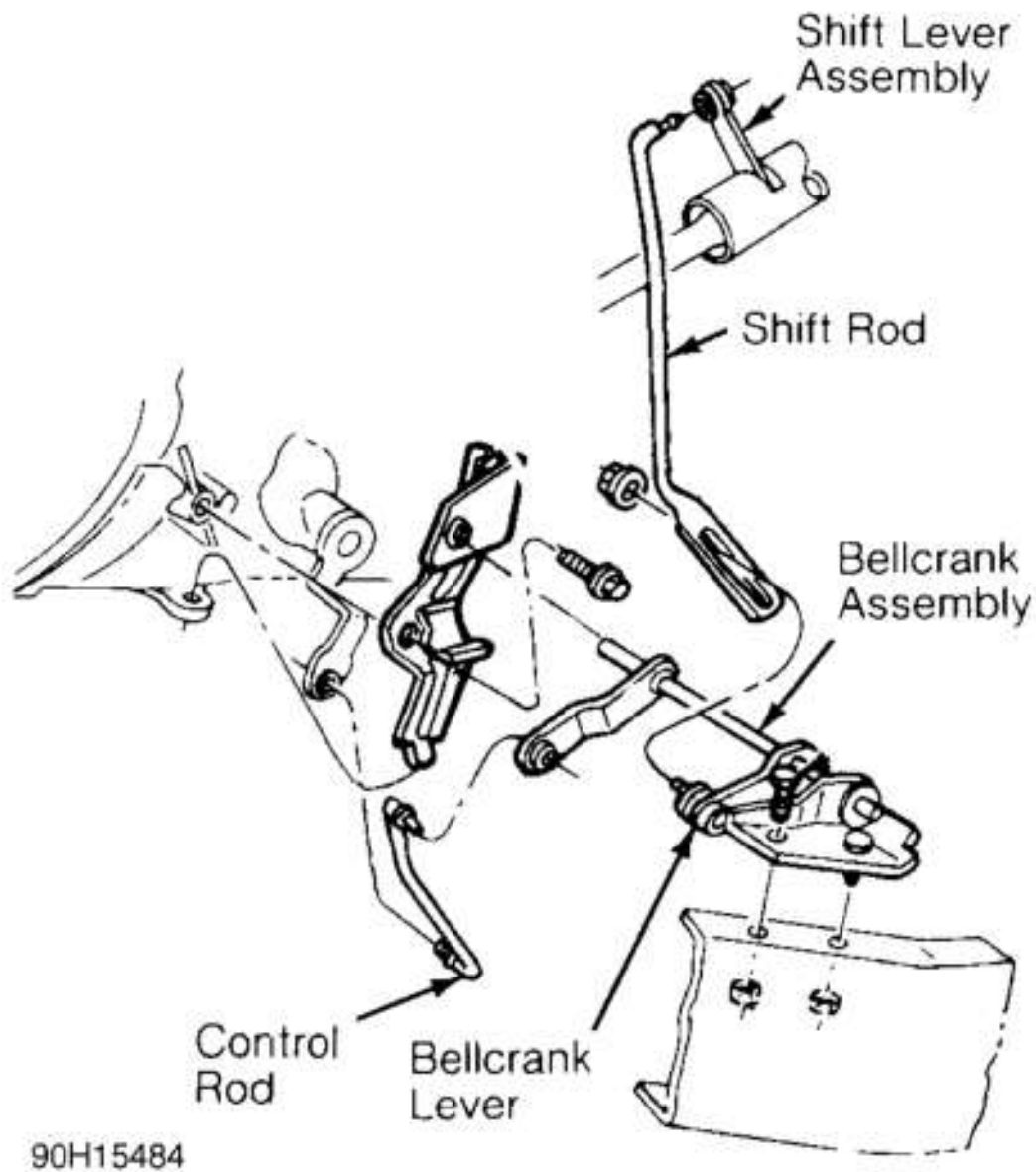
**Fig. 4: Vacuum Regulator Valve (VRV)**  
 Courtesy of FORD MOTOR CO.

2. If correct vacuum reading cannot be obtained by adjusting VRV, it must be replaced. If correct reading is obtained, remove gauge block, and connect throttle return spring. Ensure pump lever returns to idle position. Apply 20 in. Hg vacuum with vacuum pump.
3. While maintaining vacuum, cycle throttle lever from idle to wide open throttle 5 times. Vacuum gauge must indicate a minimum of 13 in. of vacuum at idle position. If vacuum gauge reads less than 13 in. Hg, replace VRV. Remove vacuum pump and gauge and re-connect vacuum connector to VRV. Connect throttle cable.

## GEARSHIFT LINKAGE

All Except Aerostar, Bronco II & Ranger

1. On vehicles equipped with C-6 transmissions, move selector lever rearward against stop in "D" position. On models equipped with AOD or E4OD transmissions, move selector lever rearward against stop in "D" Overdrive position. Hold shift lever against stop by hanging an 8 lb. (3.6 kg) weight from selector lever.
2. Loosen bellcrank lever-to-shift rod retaining nut. See **Fig. 5**. Move transmission manual lever to "D" position for C-6 or "D" Overdrive for AOD and E4OD models, by moving lever all the way rearward, then forward 2 detents.



**Fig. 5: Exploded View of Typical Shift Linkage**  
Courtesy of FORD MOTOR CO.

3. With selector lever and transmission manual lever in the "D" or "D" Overdrive position, tighten



retaining nut to 12-18 ft. lbs. (17-24 N.m). Remove 8 lb. (3.6 kg) weight from steering column selector lever knob. Check for normal operation in all selected positions.

### **Aerostar**

1. From inside vehicle, place gearshift lever in "D" Overdrive position. From under vehicle, loosen adjustment screw on shift cable and remove end fitting from manual lever ball stud.
2. Position manual lever in "D" Overdrive position by moving lever all the way rearward (counterclockwise), then moving it 3 detents forward (clockwise). Connect cable end fitting to manual lever.
3. Tighten adjusting screw to 45-60 INCH lbs. (5-7 N.m). After adjustment of shift linkage, check for "P" position engagement. Control lever must move to right when engaged in "P" detent.
4. Check control lever corresponds in all detent positions with engine running to ensure correct detent/transmission action.

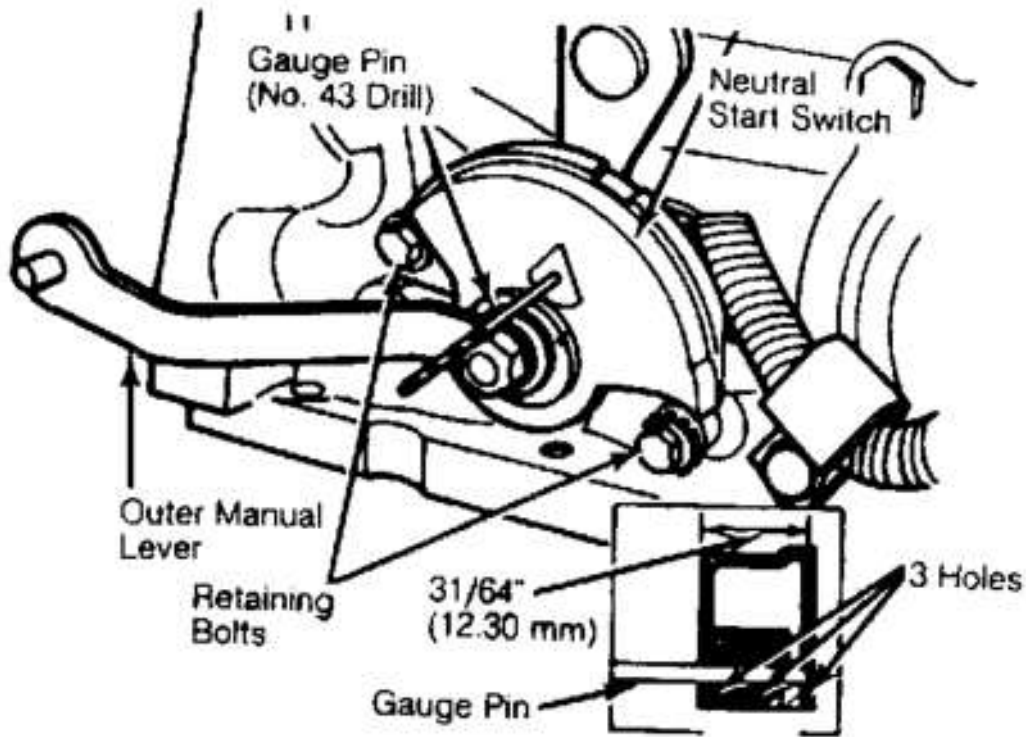
### **Bronco II & Ranger**

1. With engine off and parking brake applied, place shift lever in "D" Overdrive position. Hang an 8 lb. (3.6 kg) on the selector lever. From below the vehicle, pull down lock tab on shift cable and remove fitting from manual lever ball stud.
2. Position manual lever in the "D" Overdrive position by moving the lever all the way rearward (counterclockwise) and then moving it 3 detents forward (clockwise). Connect cable end fitting to the manual lever.
3. Push up on the lock tab to lock cable in the correctly adjusted position. Remove 8 lb. (3.6 kg) weight from column shift selector. Move lever through all positions making sure transmission is at full detent in each position.

### **NEUTRAL SAFETY SWITCH**

**NOTE:**        **AOD and A4LD switches are not adjustable. Use Neutral Start Switch Socket (T74P-77247-A) to replace switch. If any other socket is used, damage to switch may occur.**

1. With transmission shift linkage properly adjusted, loosen the 2 switch attaching bolts. See **Fig. 6**. Place transmission manual lever in neutral position. Rotate switch and insert a gauge pin (No. 43 drill bit) into gauge pin hole of switch.



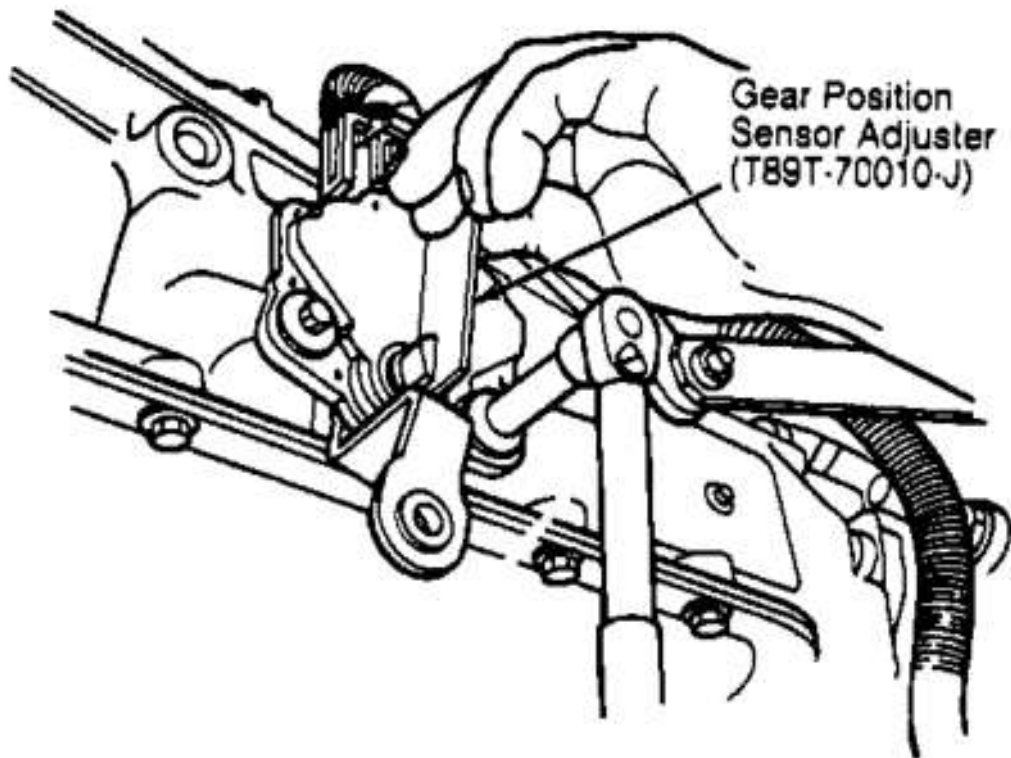
**Fig. 6: Neutral Safety Switch (Note Location of No. 43 Drill Bit)**  
 Courtesy of FORD MOTOR CO.

2. Gauge pin must be inserted completely through all 3 holes of switch. Tighten switch attaching bolts and remove gauge pin. Check operation of switch. Engine should start in "N" or "P" positions, only.

## **MANUAL LEVER POSITION SENSOR**

### **E40D Only**

Remove shift linkage from transmission. Loosen manual lever position attaching bolts. Using Gear Position Sensor Adjuster (T89T-70010-J), align manual lever position sensor for NEUTRAL gear. See [Fig. 7](#). Tighten bolts to 53-70 INCH lbs. (6-8 N.m)



**Fig. 7: E4OD Manual Lever Position Sensor**  
 Courtesy of FORD MOTOR CO.

### FUEL INJECTION PUMP LEVER (FIPL) SENSOR

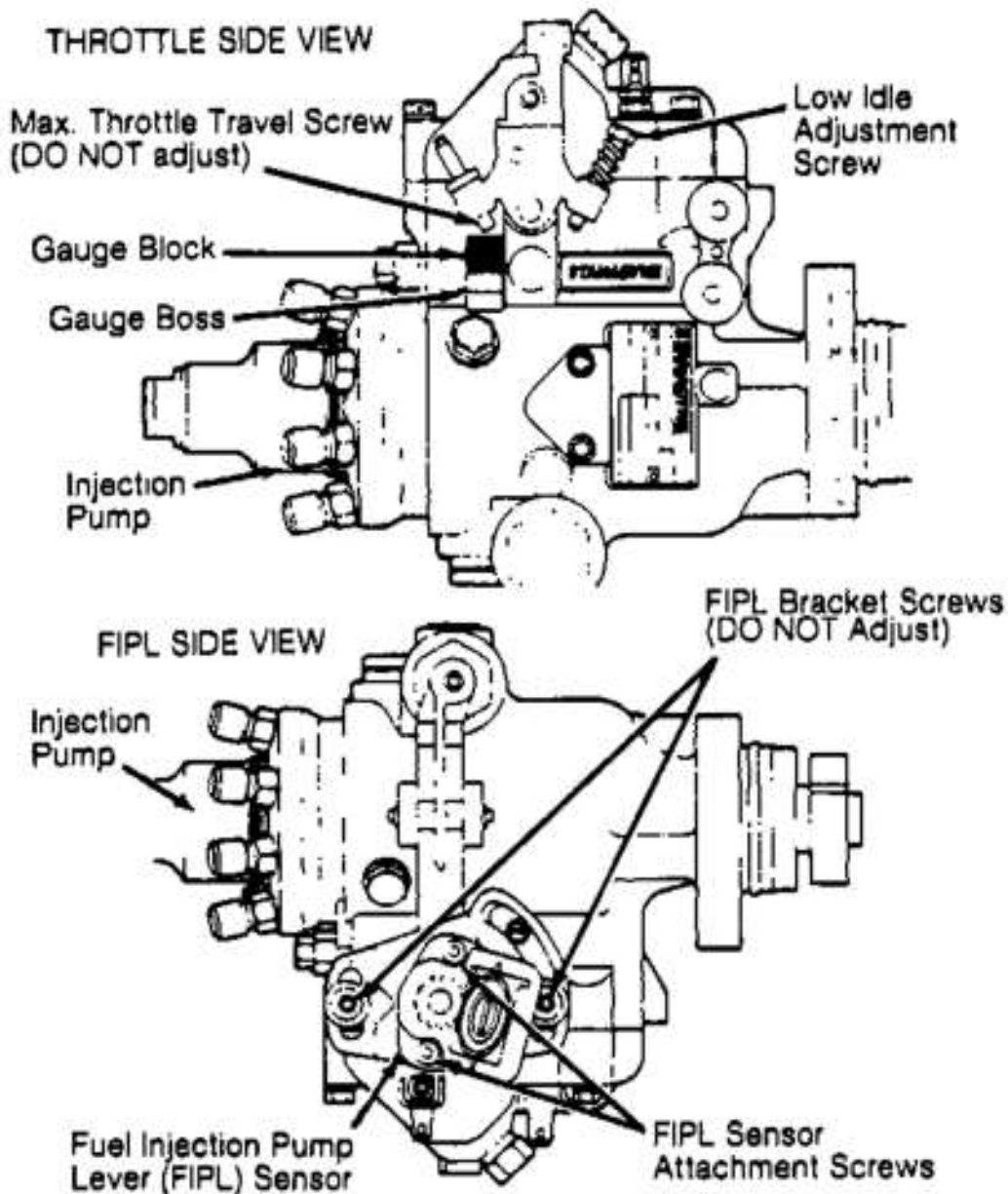
**NOTE:** Checking and adjustment of FIPL requires a Star Tester.

#### Checking FIPL Operation

1. Perform Key-On-Engine-Off (KOEO) Self-Test. Throttle must be held to floor (WOT) during Self-Test, until codes have been displayed. After last service code has been displayed, press Overdrive Cancel Switch (OCS). This will initiate FIPL sensor adjustment mode.

**NOTE:** Star Tester remains in adjustment mode for 10 minutes. Steps 1) and 3) must be accomplished in this time frame. If time limit is exceeded, procedure must be repeated starting at Step 1).

2. Remove throttle cable from throttle lever on right side of fuel injection pump. Place a .515" (13.08 mm) block Gauge Block (T83T-7B200-AH) between gauge boss and maximum throttle travel screw. See **Fig. 8**. Hold throttle lever open against gauge block.



**Fig. 8: Fuel Injection Pump (FIPL) Sensor**  
 Courtesy of FORD MOTOR CO.

3. A steady tone indicated FIPL sensor is properly adjusted. If setting is too low the Star Tester will emit a slow beep (1 per second). If setting is too high the Star Tester will emit a fast beep (4 per second).

#### **Adjusting FIPL**

1. After checking FIPL sensor operation, loosen 2 screws that attach FIPL sensor to mounting bracket. Rotate FIPL sensor until a steady tone is heard from Star Tester. A constant tone will indicate that the sensor is within range. See **Fig. 8**.

**CAUTION: FIPL sensor bracket is permanently attached to injection pump with tamperproof screws. Movement of bracket is NOT intended as a means of adjustment.**

2. If FIPL sensor cannot be adjusted to obtain a steady tone, replace sensor and repeat the adjustment procedure. Remove gauge block. Attach throttle cable. Start engine and check throttle and transmission shift operation.

**CAUTION: DO NOT turn maximum throttle travel screw. This screw has been preset and should not be adjusted.**