

# New Process Gear 208 Transfer Case

**PART**  
**16-82**

APPLIES TO BRONCO, F-150 — F-250

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## DESCRIPTION

The New Process 208 is a part-time transfer case. The case itself is a two piece aluminum housing. On the front case half, (Fig. 1) the front output shaft, front input shaft, four-wheel drive indicator switch, and shift lever

assembly are located. On the rear case half, (Fig. 2) the rear output shaft, bearing retainer, and drain and fill plugs are located.

## DIAGNOSIS AND TESTING

For diagnosis and testing procedures, refer to Part 16-10, General Manual Transmission Service.

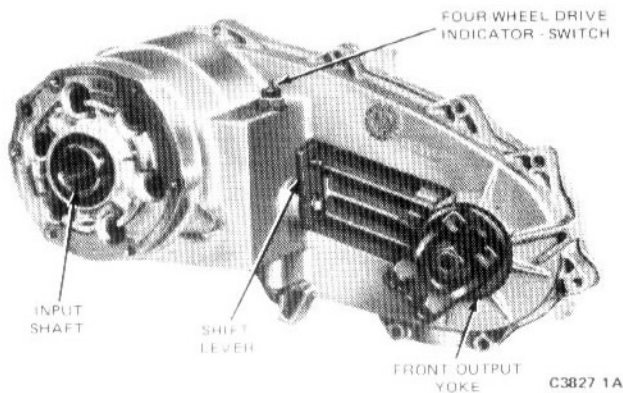


FIG. 1 NPG 208 Front Case Half

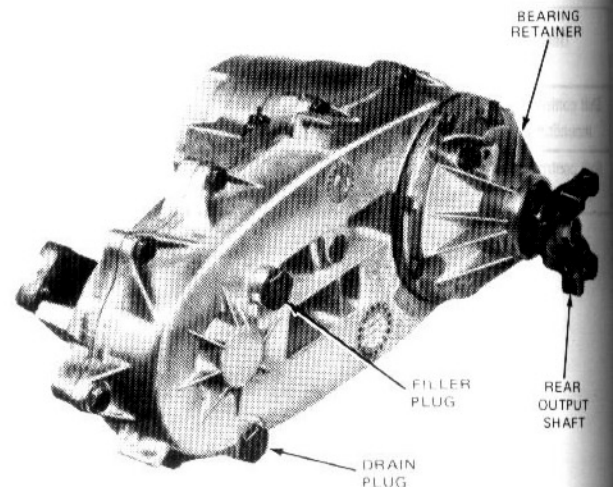


FIG. 2 NPG 208 Rear Case Half

## ADJUSTMENTS

### Fluid Level Check

Remove fill plug from rear case half. Fluid level should be just below the fill plug. If fluid is below the

level, fill with automatic transmission fluid meeting Ford specification ESP-M2C138-CJ, or Dexron II Series D or equivalent to correct level.

## REMOVAL AND INSTALLATION

Refer to Fig. 3.

### Removal

1. Raise vehicle on a hoist.
2. Place a drain pan under transfer case, remove drain plug and drain fluid from transfer case.
3. Disconnect four wheel drive indicator switch wire connector at transfer case.
4. Disconnect speedometer driven gear from transfer case rear bearing retainer.
5. Remove nut retaining transmission shift lever assembly to transfer case.
6. If so equipped, remove skid plate from frame.
7. Remove heat shield from frame.

**CAUTION: Catalytic converter is located beside the heat shield. Be careful when working around catalytic converter because of the extremely high temperatures generated by the converter.**

8. Support transfer case with transmission jack.
9. Disconnect front driveshaft from front output shaft yoke.
10. Disconnect rear driveshaft from rear output shaft yoke.
11. Remove the bolts retaining transfer case to transmission adapter. Remove gasket between transfer case and adapter.
12. Lower transfer case from vehicle.

### Installation

1. Place a new gasket between transfer case and adapter.
2. Raise transfer case with transmission jack so transmission output shaft aligns with splined transfer case input shaft. Install bolts retaining transfer case to adapter. Tighten bolts to specification.
3. Connect rear driveshaft to rear output shaft yoke. Tighten nut to specifications.
4. Connect front driveshaft to front output yoke. Tighten nut to specifications.
5. Remove transmission jack from transfer case.
6. Position heat shield to frame crossmember and mounting lug on transfer case. Install and tighten bolts and screw to 15-21 N·m (11-16 ft-lbs).
7. Install skid plate to frame. Tighten nuts and bolts to specification.
8. Install shift lever to transfer case. Install retaining nut.
9. Connect speedometer driven gear to transfer case.
10. Connect four-wheel drive indicator switch wire connector at transfer case.
11. Install drain plug. Remove filler plug and install 2.8 liters (six pints) of automatic transmission fluid meeting Ford specification ESP-M2C138-CJ or Dexron II, Series D or equivalent. Install filler plug.
12. Lower vehicle.

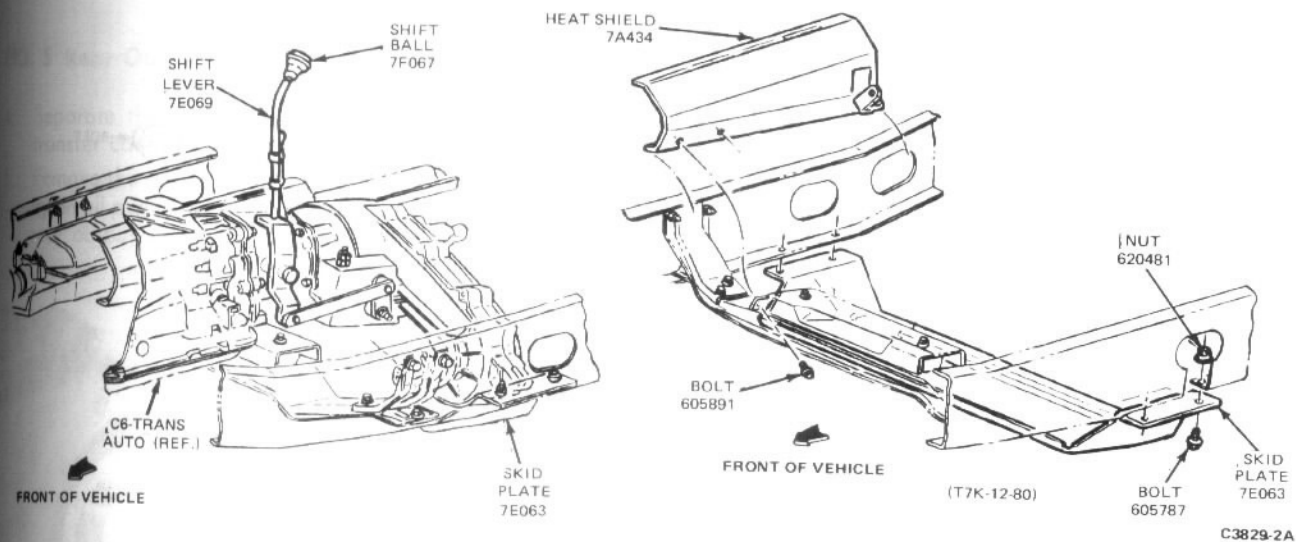


FIG. 3 Transfer Case Installation

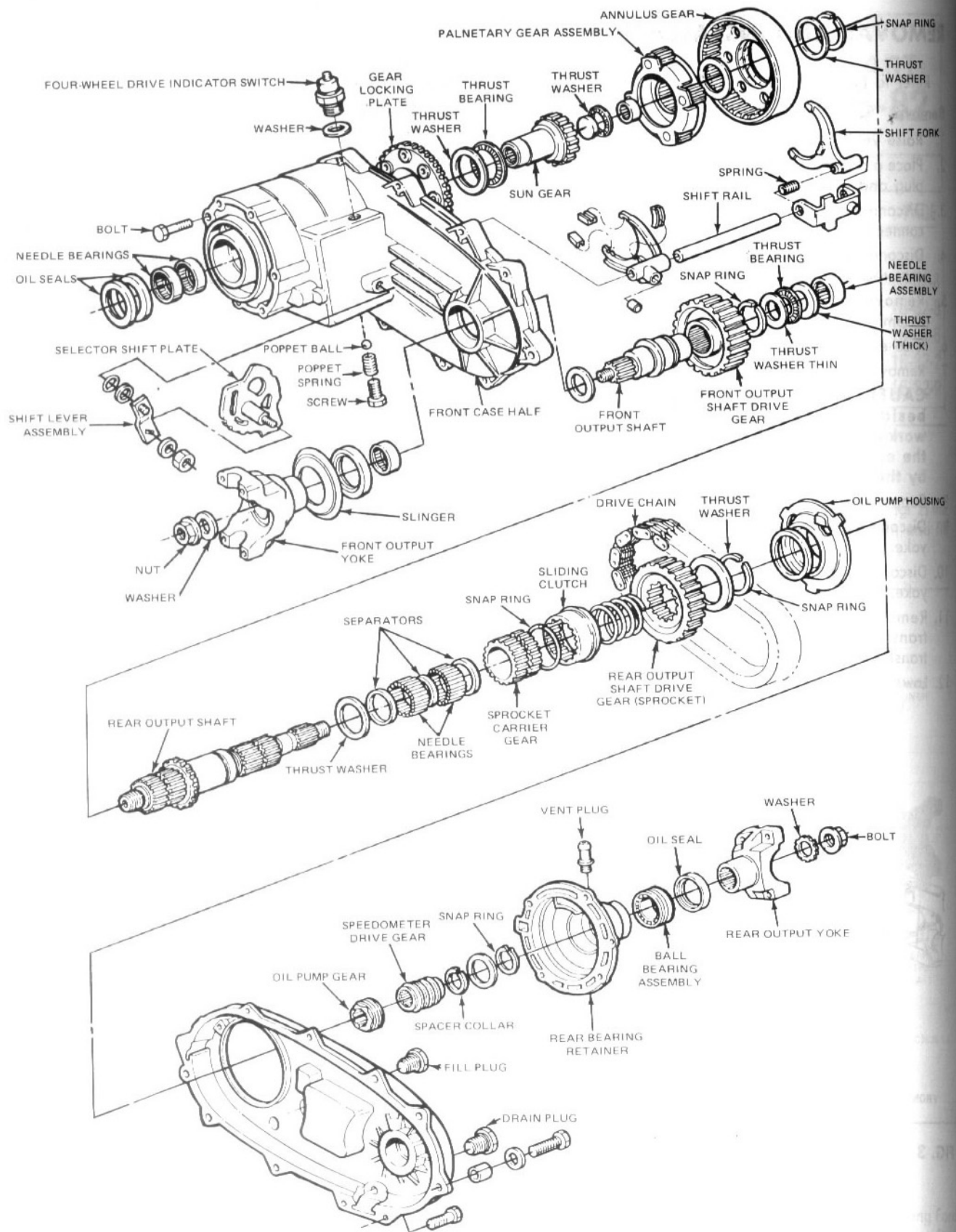


FIG. 4 NPG 208 Transfer Case—Exploded View

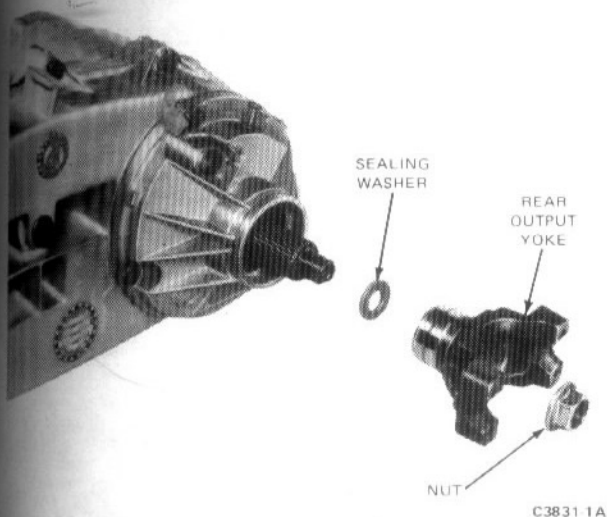
## DISASSEMBLY AND ASSEMBLY

### NEW PROCESS GEAR 208 TRANSFER CASE

Refer to Fig. 4.

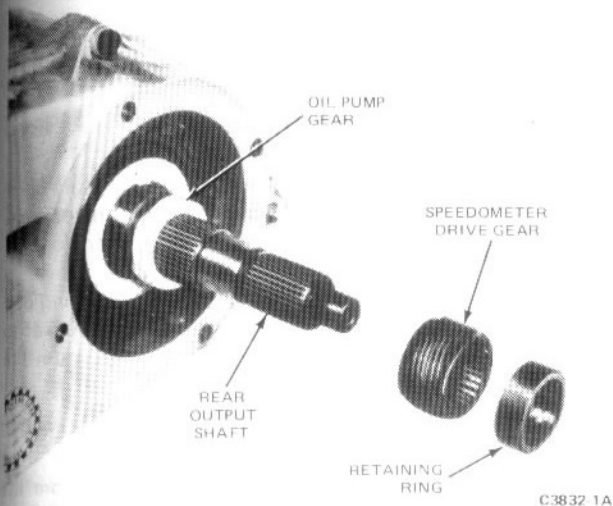
#### Disassembly

1. Remove the transfer case from the vehicle as described in this part.
2. Position transfer case on work bench or suitable work table. If lubricant was not drained from transfer case during removal, drain fluid. Remove drain plug from the rear case half and drain fluid into a suitable container.
3. From both output yokes (front and rear), remove the attaching nuts, and remove yokes and sealing washers (Fig. 5).



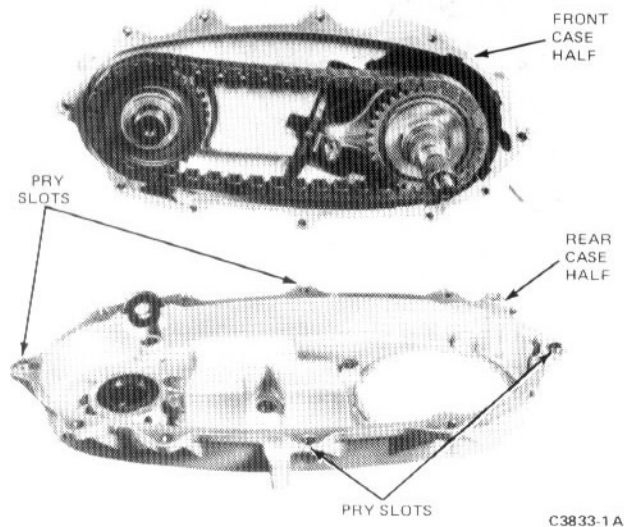
**FIG. 5 Rear Output Yolk**

4. Separate the rear bearing retainer from the rear transfer case half by removing the four bolts.
5. Remove the retaining ring, speedometer drive gear, nylon oil pump housing, and oil pump gear from the rear output shaft (Fig. 6).



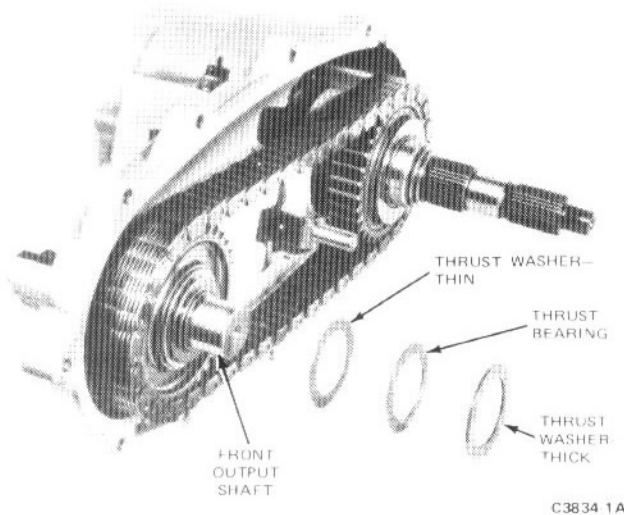
**FIG. 6 Speedometer and Oil Pump Assemblies**

6. Separate the transfer case by removing the eleven bolts. The case halves may be separated by inserting a flat blade screwdriver in the pry slots on the case housing (Fig. 7). With the case halves separated, remove the magnetic chip collector from the bottom of the rear transfer case half.



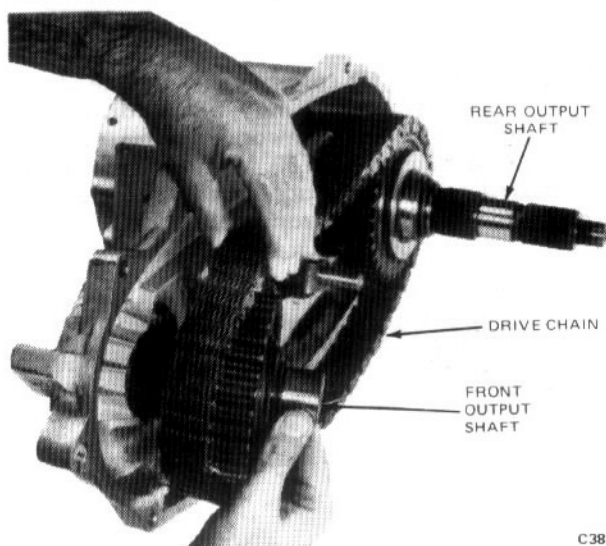
**FIG. 7 Case Halves Assemblies**

7. Slide the thick thrust washer, thrust bearing and thin thrust washer off the front output shaft assembly (Fig. 8).



**FIG. 8 Removing Front Output Shaft Washers Assemblies**

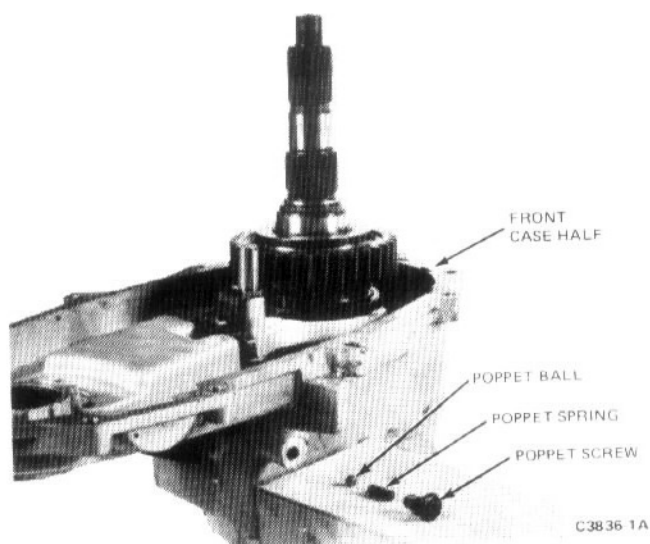
8. Remove the drive chain by pushing the front input shaft inward, and by angling the gear slightly adequate clearance is obtained to remove the drive chain (Fig. 9).
9. Remove the output shaft from the front case half assembly and slide the thick thrust washer, thrust bearing, and thin thrust washer off the output side of the front output shaft.



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**FIG. 9 Removing Drive Chain**

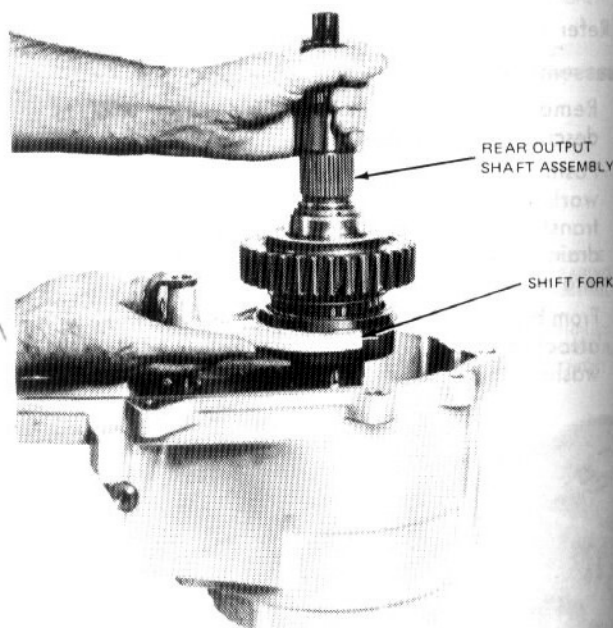
10. From the bottom of the front case half, remove the screw, poppet spring and check ball from the case (Fig. 10).



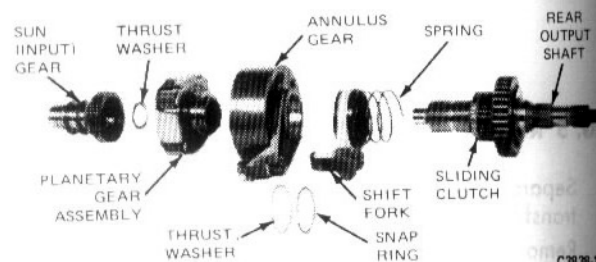
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**FIG. 10 Removing Poppet Assembly**

11. From the top of the front case half, remove the four-wheel-drive indicator switch and washer.
12. Position the front case half as shown in Fig. 11 and lift out the rear output shaft, sliding clutch, clutch shift fork and clutch shift spring from the case (Fig. 12).
13. Place a shop towel and vise grip pliers on the shift rail. Remove the shift rail by prying up on the vise grips with a pry bar as shown in Fig. 13.
14. Remove the snap ring and thrust washer from the planetary gear set assembly in the front case half (Fig. 14).
15. Remove the annulus gear assembly and shift fork from the case (Fig. 15).
16. Lift the planetary gear assembly and thrust washer from the front case half (Fig. 16).



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**FIG. 11 Removing Rear Output Shaft Assembly**

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**FIG. 12 Rear Output Shaft, Input shaft and Gear Transfer Components**

17. Lift out the thrust bearing, sun (input) gear, another thrust bearing and thrust washer (Fig. 17).
18. From the front case half remove the six bolts and remove the gear locking plate.
19. Remove the nut retaining the external shift lever and washer. Press the shift control shaft inward and remove the shift selector plate and washer from the case (Fig. 18).
20. On the rear output shaft, remove the snap ring and thrust washer retaining the chain drive sprocket to the output shaft, and slide the sprocket from the drive gear (Fig. 19).
21. Remove the retaining ring from the sprocket carrier gear.
22. Carefully slide the sprocket carrier gear from the rear output shaft. Remove the two rows of sixty loose needle bearing (120 together). Remove the





**FIG. 13 Removing Shift Rail**

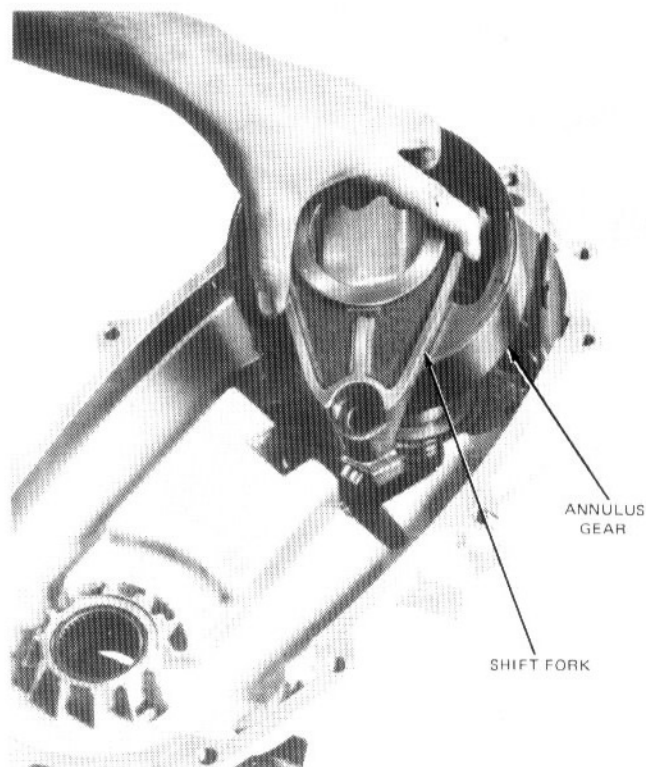


**FIG. 14 Removing Planetary Gear Set Snap Ring**

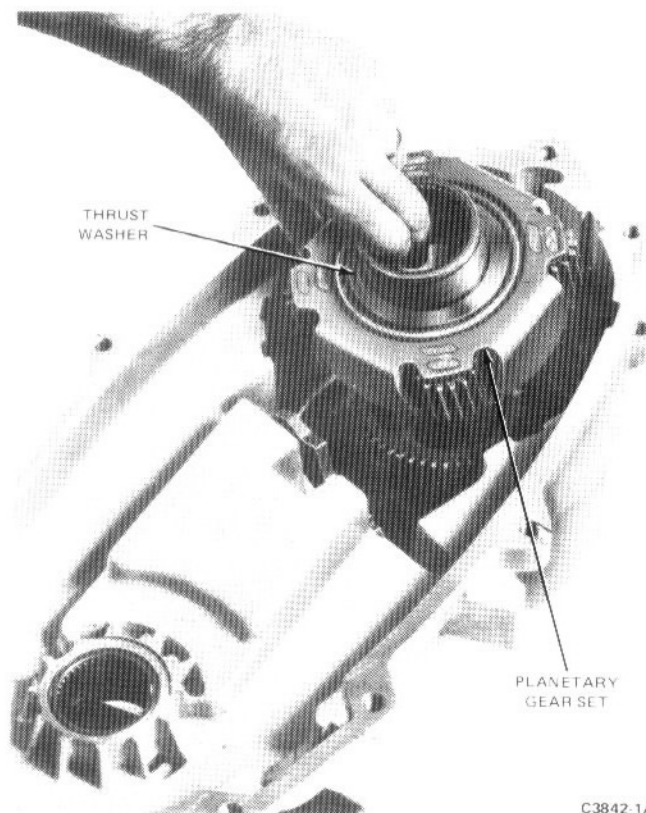
three separator rings and thrust washer from the output shaft.

#### Assembly

1. Start transfer case assembly by sliding the thrust washer against the gear on the rear output shaft.
2. Place the three space rings in position on the rear output shaft. Liberally coat the output shaft with petroleum jelly and install 120 needle bearings (two rows of sixty needle bearings) in position on the rear output shaft.
3. Carefully slide the sprocket carrier gear over the needle bearings. Be careful not to dislodge any bearings from their position on the output shaft.
4. Install the retaining ring on the sprocket carrier gear.
5. Slide the chain drive sprocket onto the sprocket carrier gear.
6. Install thrust washer and snap ring on rear output shaft.
7. Install the shift selector plate and washer through



**FIG. 15 Removing Annulus Gear and Shift Fork**



**FIG. 16 Removing Planetary Gear Set**

the front case half. Place shift lever assembly on shift control shaft and attach nut. Tighten to 19-27 N·m (14-20 ft.lb.).

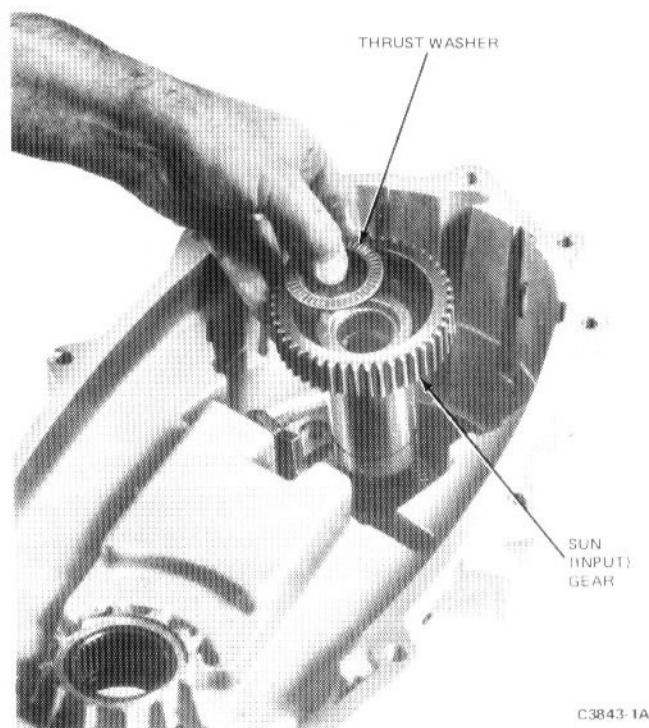


FIG. 17 Removing Sun Gear

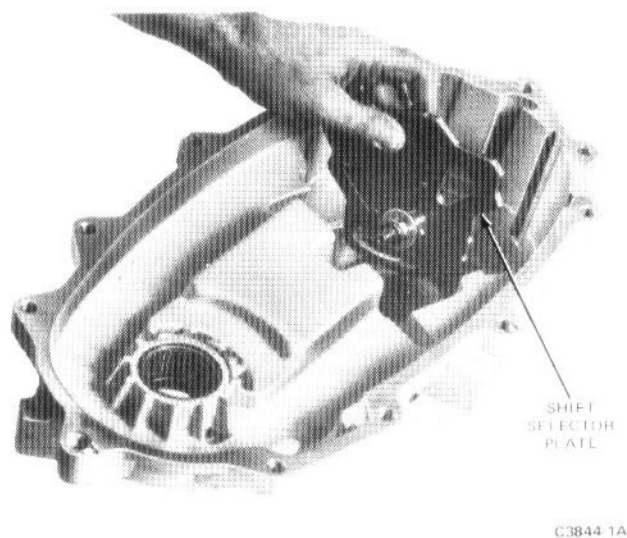


FIG. 18 Removing Shift Selector Plate

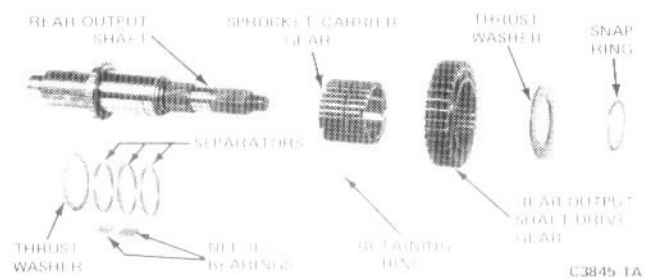


FIG. 19 Rear Output Shaft Assembly

8. Position the locking plate in the front case half and install six bolts. Tighten to 34-47 N·m (25-35 ft. lb.).
9. Place the thrust bearing and washer over the input shaft of the sun (input) gear. Insert the input shaft through the front case half from the inside and insert the thrust bearing.
10. Install the planetary gear assembly so the fixed plate and planetary gears engage the sun (input) gear.
11. Slide the annulus gear and clutch assembly with the shift fork assembly engaged, over the hub of the planetary gear assembly. The shift fork pin must engage the slot in the shift selector plate. Install the thrust washer and snap ring.
12. Position the shift rail through the shift fork hub in the front case half. Tap lightly with a soft hammer to seat rail in hole.
13. Position the sliding clutch shift fork on the shift rail and place the sliding clutch and clutch shift spring into the front case half.
14. Slide the rear output shaft into the case.
15. On the output side of the front output shaft, assemble the thin thrust washer, thrust bearing, and thick thrust washer and partially insert the front output shaft into the case.
16. Place the drive chain on the rear output shaft drive gear. Insert the rear output shaft into the front case half and engage the drive chain on the front output shaft drive gear. Push the front output shaft into position in the case.
17. Assemble the thin thrust washer, thrust bearing and thick thrust washer on the inside of the front output shaft drive gear.
18. Position the magnetic chip collector into the slot in the case half.
19. Apply a bead of RTV sealant or equivalent completely around the face of the front case half. Carefully reassemble the case halves making sure the shift rail and forward output shaft are properly retained.
20. Install the bolts in the case and tighten the bolts alternately to 28-33 N·m (20-25 ft. lb.).
21. Slide the oil pump gear over the output shaft and slide the spacer collar into position.
22. Engage the speedometer drive gear onto the rear output shaft and slide the retaining ring into position.
23. Use petroleum jelly to hold the nylon oil pump housing in position to the rear bearing retainer. Apply a bead of RTV sealant or equivalent around the mounting surface of the retainer and carefully position the retainer assembly over the output shaft and onto the rear case half. The retainer must be installed so the vent plug is vertical when the transfer case is installed.
24. Install the four bolts in the retainer assembly and tighten alternately to 28-33 N·m (20-25 ft. lb.).
25. Place a new washer under each yoke and install yokes on respective output shafts. Remember to place the oil slinger under the front output yoke. Install and tighten nut to 123-176 N·m (90-130 ft. lb.).

26. Install poppet ball, spring and screw in front case half. Tighten screw to 28-33 N·m (20-25 ft. lb.).
27. Install the four wheel drive indicator switch and tighten to 21-27 N·m (15-20 ft. lb.).
28. Remove fill plug and install 2.8 litres (6 pints) of transmission fluid meeting Ford specification ESP-M2C138-CJ, or Dexron II, Series D or equivalent. Install fill plug and tighten to 21-27 N·m (15-20 ft. lb.).

## SUB-ASSEMBLIES

### FRONT OUTPUT SHAFT

Refer to Fig. 20.

#### Disassembly

1. Remove snap ring holding drive gear to front output shaft.
2. Slide drive gear from shaft.

#### Assembly

1. Slide drive gear on front output shaft.
2. Install snap ring.

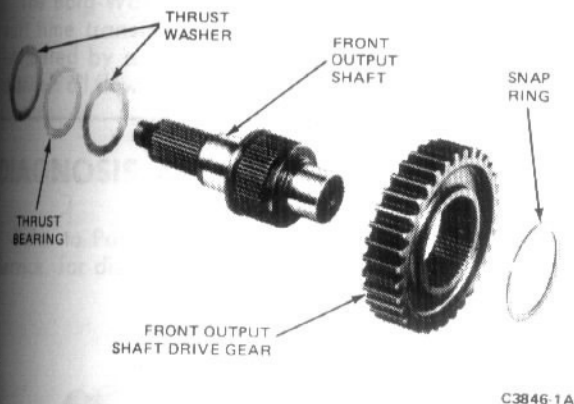


FIG. 20 Front Output Shaft Assembly

### REAR BEARING RETAINER

#### Disassembly

1. Use special Tool 1175-AC and remove the rear output shaft oil seal from the retainer.
- CAUTION: Do not nick aluminum case.**
2. From inside the case, remove the ball bearing retainer snap ring.
3. Support the inner face of the output shaft bore. Install special tool and press the ball bearing assembly from the bore.
- CAUTION: The ball bearing assembly can only be removed by pressing it inward. A lip in the output shaft bore prevents its removal out the end.**

#### Assembly

1. Inspect the bearing and replace if necessary.
2. Using special tool T80T-4000-Z and T80T-4000-R, press the ball bearing assembly into its seat from

inside the case. The ball bearings should be visible from inside the case.

3. Insert the ball bearing retainer snap ring.
4. Turn case over, and with special tool press the oil seal into the bore.

### REAR CASE HALF

#### Disassembly

1. Remove drain and fill plugs.
2. Install puller special tool to the needle bearing assembly and attach slide hammer T50T-100-A. Pull the bearing from the bore.

#### Assembly

1. Using special tool T80T-4000-R, press the needle bearing into the bore in the rear case half.
2. Install fill and drain plugs.

### FRONT CASE HALF

#### Disassembly

1. Using special Tool 1175-AC, remove the first oil seal from the front input shaft bore.
- Caution: Be careful not to nick aluminum case.**
2. Using special Tool 1175-AC, remove second oil seal from input shaft bore.
- CAUTION: Be careful not to nick the aluminum case.**
3. Using special tool D80L-100-U and D80L-100-H, remove the first needle bearing from the front input shaft bore.
4. Using special tool D80L-100-W and D80L-100-H, remove the second needle bearing from the input shaft bore.
5. Remove the 'o' ring retainer and 'o' ring from the shift control shaft bore.
6. Using special Tool 1175-AC, remove the oil seal from the front output shaft bore.
7. Using special tool D80L-100-U and D80L-100-H, remove the needle bearing from the front output shaft bore.

#### Assembly

1. Using special tool T80T-4000-R and T80T-4000-Z, press the needle bearing into the front output shaft bore.
2. Press the oil seal into the front output shaft bore.
3. Install a new shift control 'o' ring seal and retainer into the case bore.
4. Using special tool T80T-4000-Z and T80T-4000-R, press the inner needle bearing in the input shaft bore.
5. Press the outer needle bearing in the input shaft bore.
6. Press the inner oil seal in the input shaft bore.
7. Press the outer oil seal in the input shaft bore.