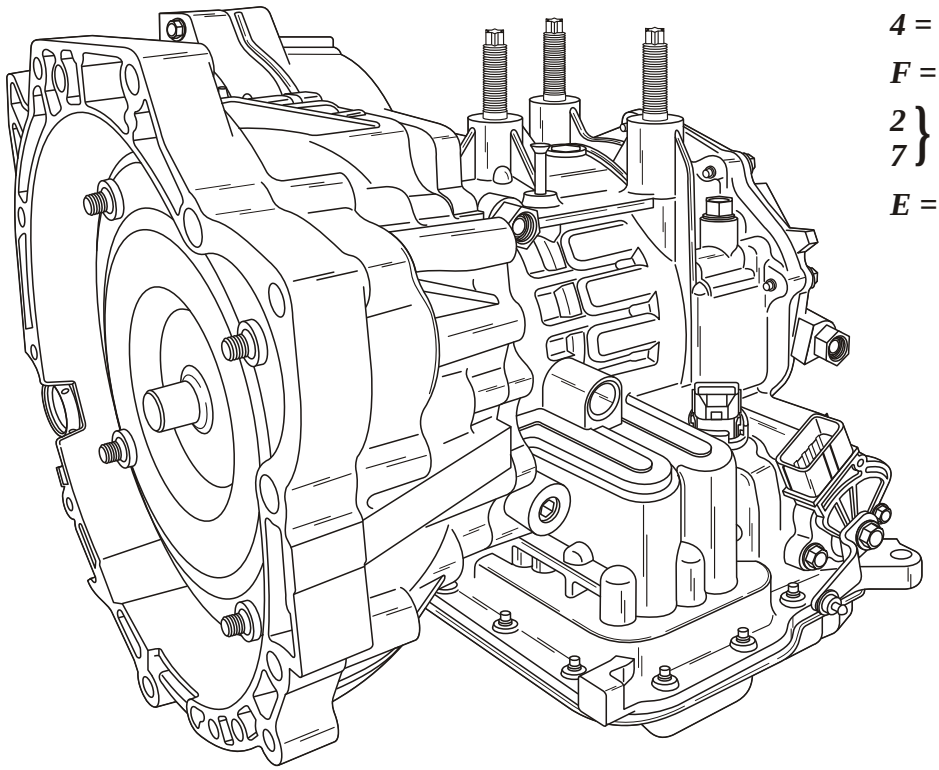
**FORD 4F27E**



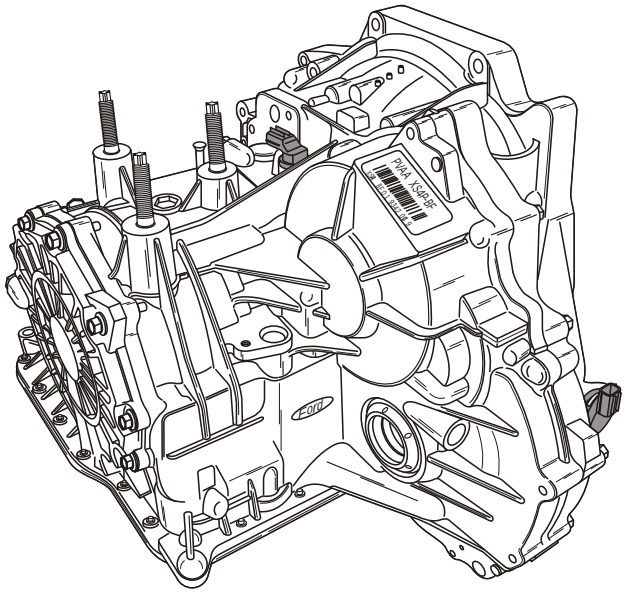
*4 = 4 Forward Speeds*

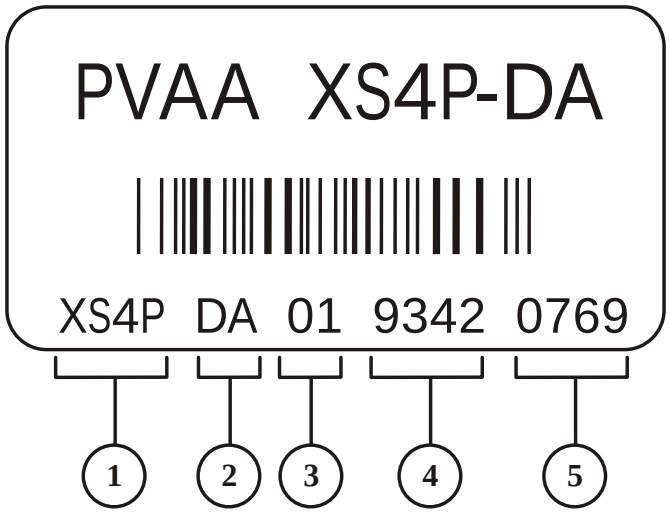
*F = Front Wheel Drive*

*2, 7 } = Relative Torque Capacity*

*E = Electronic Controlled*

**I.D. TAG INFORMATION FOUND ON RIGHT SIDE OF TRANSMISSION CASE**



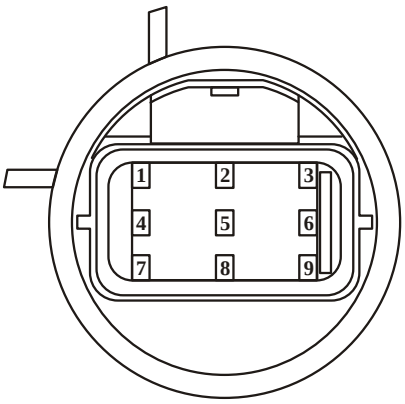



*1. Part Number, Basic = 7000 (Example XS4Z-7000-DA)*
*2. Transmission Model Code*
*3. Engineering Level*
*4. Build Date (Year and Julian Date)*
*5. Serial Number*

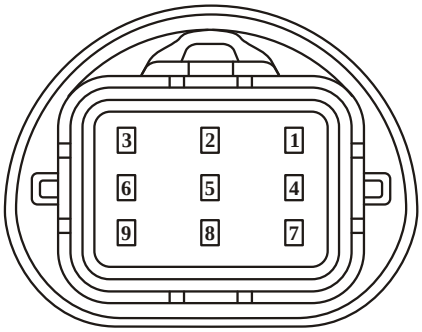
| | Year | Julian Date |
|---|---|---|
| BD- | 9 | 342 |
| Build Date | 9=1999<br>0=2000<br>1=2001<br>2=2002<br>3=2003<br>4=2004 | |

Figure 1

**SOLENOID AND TRANSAXLE FLUID TEMP RESISTANCE CHART**




*Transaxle Case Connector (Face View)*




*Vehicle Harness Connector (Face View)*

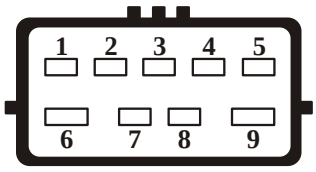
| INTERNAL TRANSAXLE COMPONENTS RESISTANCE CHART | | |
|---|---|---|
| *Terminals* | *Transaxle Component* | *Ohms Resistance At 20°C (70°F)* |
| *6 and Gnd.* | *Shift Solenoid "A" (On-Off)* | *10.9 - 26.2* |
| *8 and Gnd.* | *Shift Solenoid "B" (On-Off)* | *10.9 - 26.2* |
| *3 and Gnd.* | *Shift Solenoid "C" (PWM)* | *1.0 - 4.2* |
| *9 and Gnd.* | *Shift Solenoid "D" (PWM)* | *1.0 - 4.2* |
| *1 and Gnd.* | *Shift Solenoid "E" (PWM)* | *1.0 - 4.2* |
| *2 and 7* | *EPC Solenoid (PWM)* | *2.4 - 7.3* |

***NOTE: Gnd. = Ground Ohm Meter to the Case***

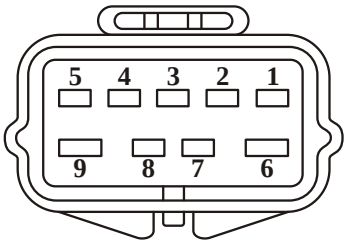
| *Transaxle Temperature Sensor Resistance Chart Terminals 4 and 5* |
|---|
| *0°C (32°F) = 83.2k - 107k Ohms* |
| *20°C (70°F) = 33.5k - 41.2k Ohms* |
| *40°C (104°F) = 14.6k - 17.6k Ohms* |
| *60°C (140°F) = 7.08k - 8.01k Ohms* |
| *80°C (176°F) = 3.61k - 4.06k Ohms* |
| *100°C (212°F) = 1.96k - 2.20k Ohms* |
| *120°C (248°F) = 1.13k - 1.25k Ohms* |
| *130°C (266°F) = 0.87k - 0.96k Ohms* |

Figure 5

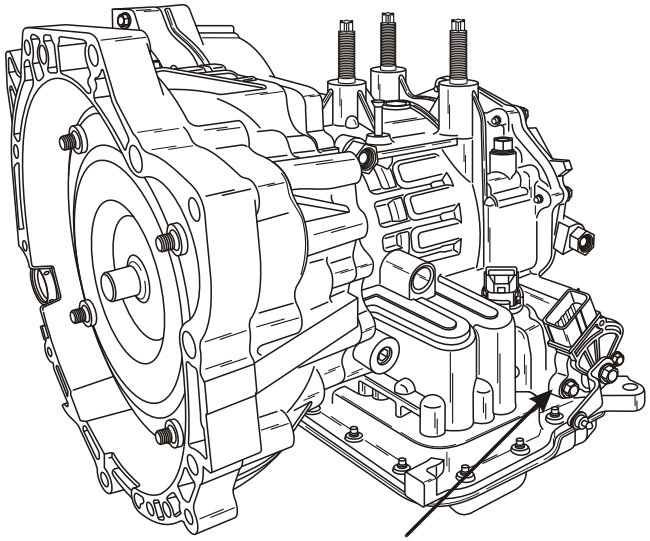
## TRANSAXLE RANGE SENSOR WIRE SCHEMATIC



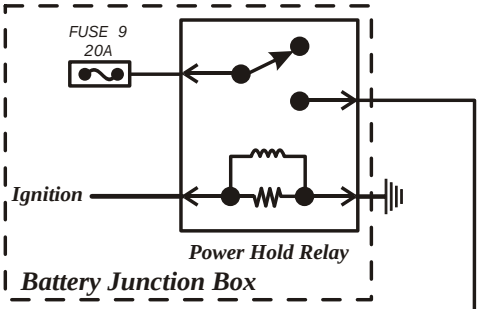

*Transaxle Range Sensor Connector (Face View)*



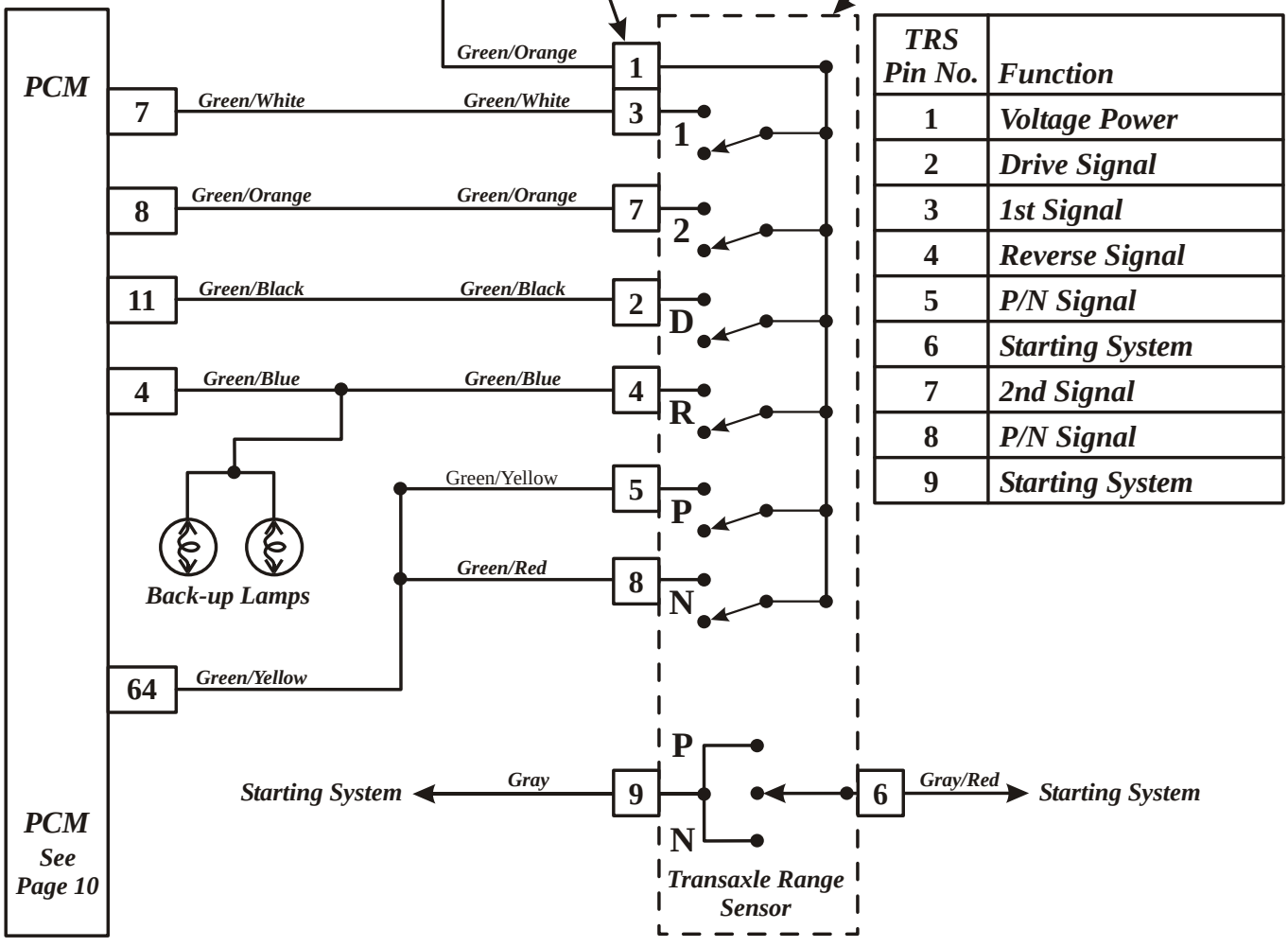

*Vehicle Harness Connector (Face View)*



*Transaxle Range Sensor*




*Transaxle Range Sensor Connector*




| TRS Pin No. | Function |
|---|---|
| 1 | Voltage Power |
| 2 | Drive Signal |
| 3 | 1st Signal |
| 4 | Reverse Signal |
| 5 | P/N Signal |
| 6 | Starting System |
| 7 | 2nd Signal |
| 8 | P/N Signal |
| 9 | Starting System |

Figure 10

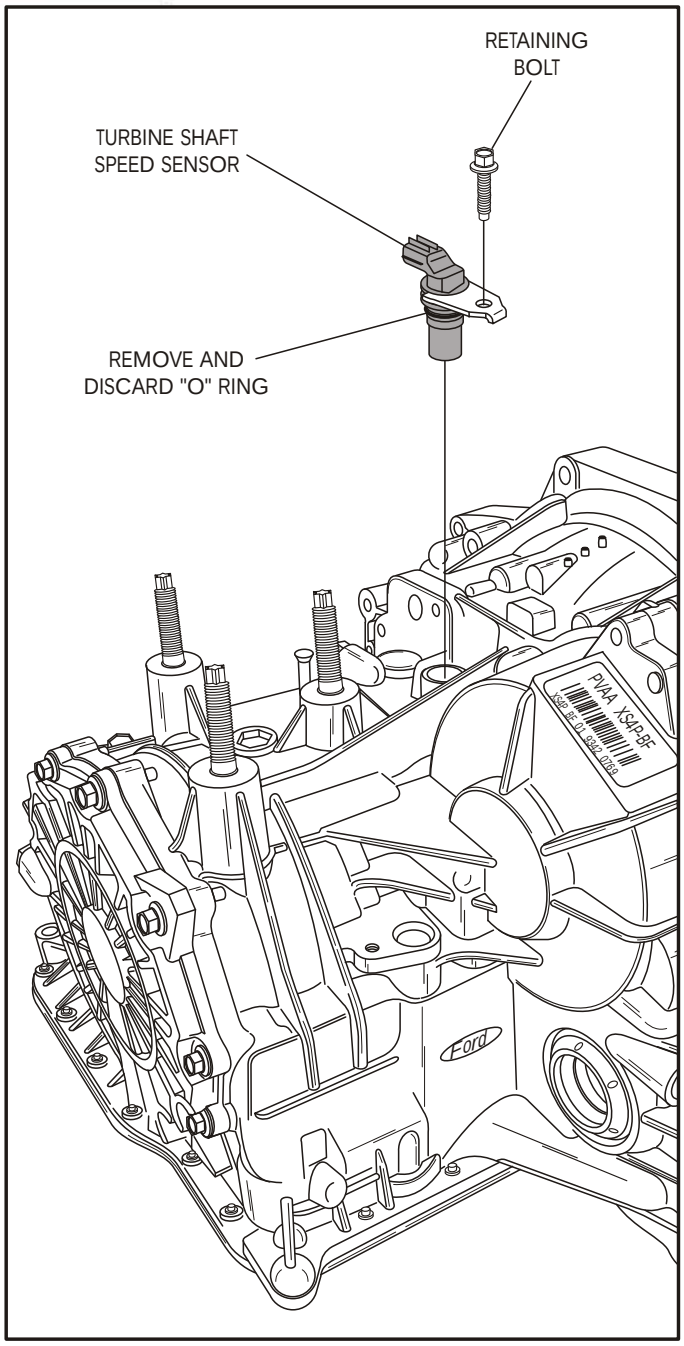



Figure 16

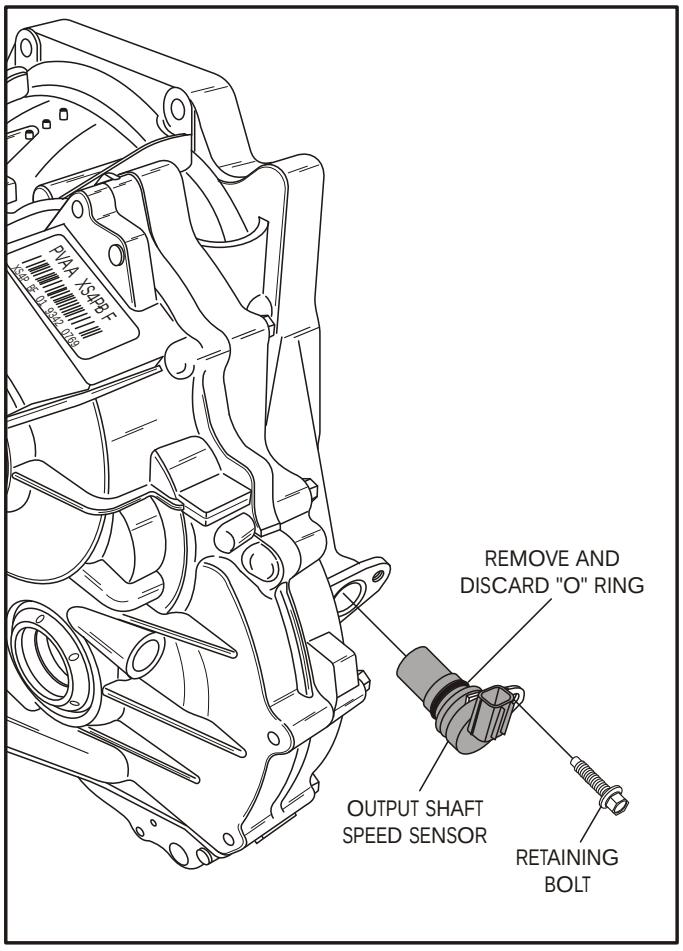



Figure 17

*EXTERNAL COMPONENTS (Con't'd)*

3. Remove the turbine shaft speed sensor from the case, as shown in Figure 16.
4. Remove the output speed sensor from the case, as shown in Figure 17.
5. Install the converter handles 307-091 onto the converter, as shown in Figure 18, that allows you to rotate the converter as you remove it.

**Continued on Page 19.**

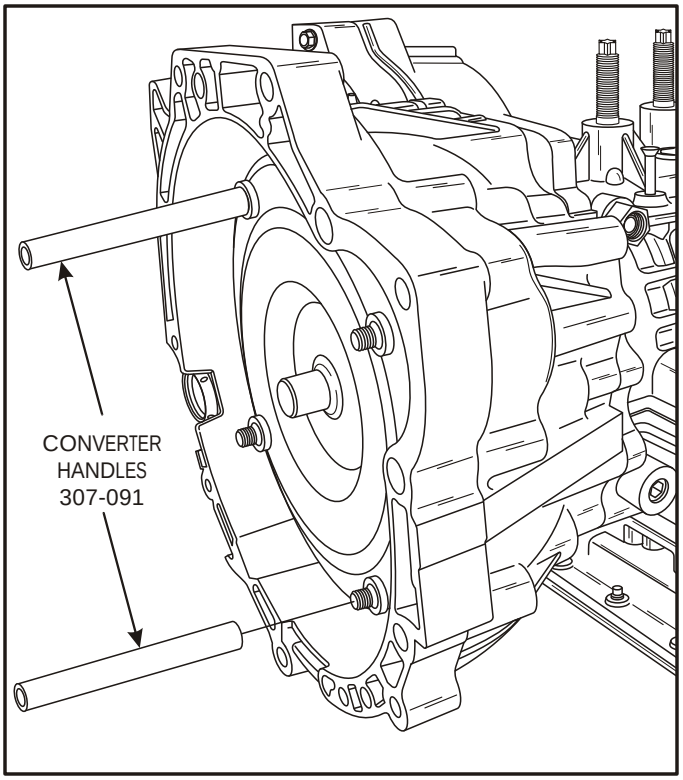



Figure 18

*INTERNAL COMPONENTS (CONT'D)*

18. Remove the planetary gearset from transaxle by lifting straight up, as shown in Figure 30.
19. Set the planetary gearset aside for component rebuild section.
20. Remove the low/reverse clutch backing plate snap ring, as shown in Figure 31.
21. Remove the low/reverse clutch backing plate, as shown in Figure 31.
22. Remove the low/reverse clutch plates, as shown in Figure 31.
    ***Note: This clutch pack consists of five steel plates and five friction plates.***
23. Remove the low/reverse clutch cushion "cone" plate, as shown in Figure 31.

**Continued on Page 24**

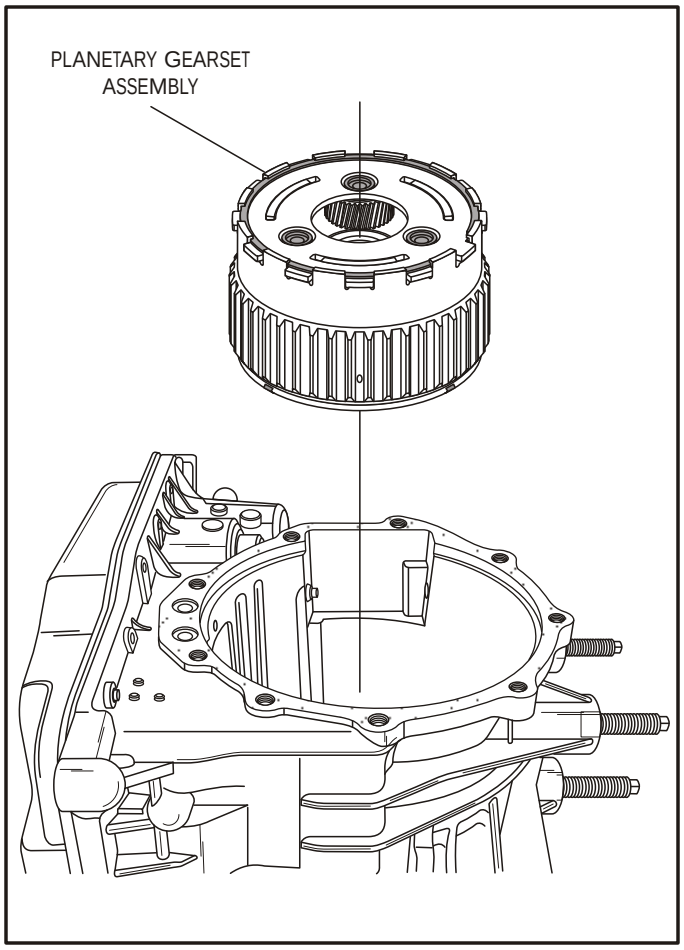
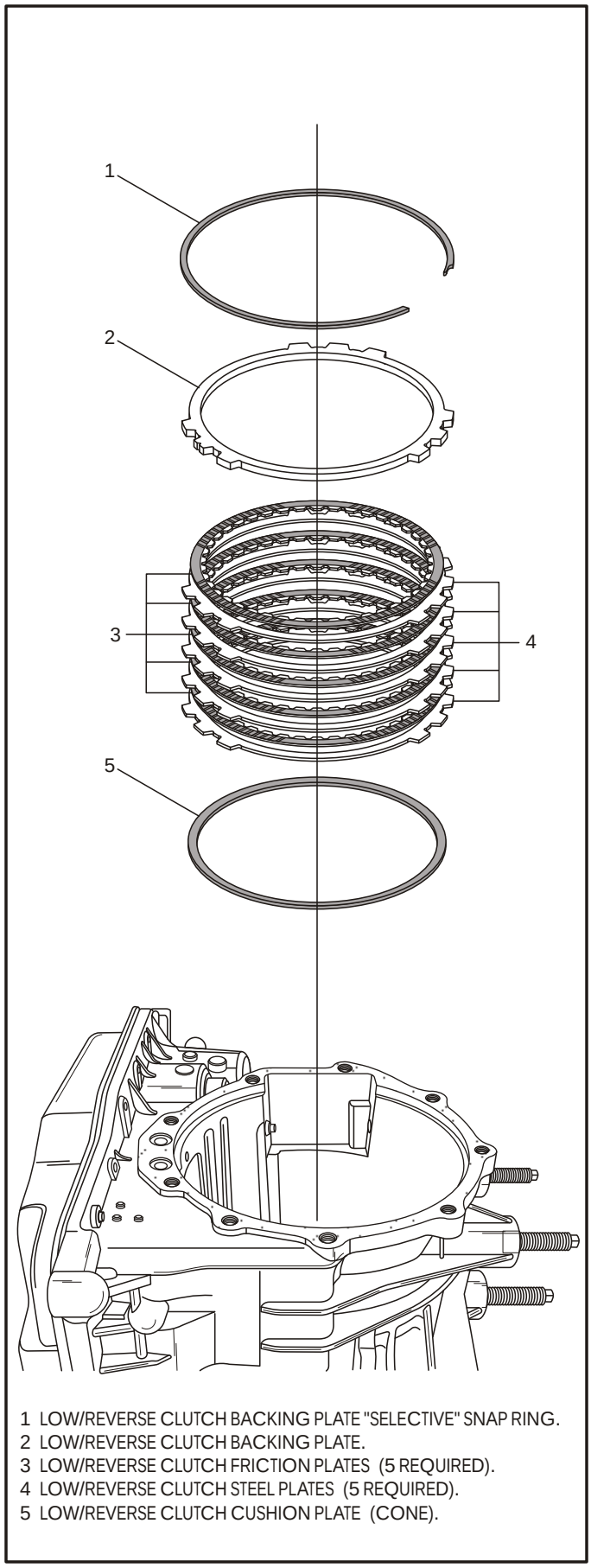



Figure 30




1 LOW/REVERSE CLUTCH BACKING PLATE "SELECTIVE" SNAP RING.
2 LOW/REVERSE CLUTCH BACKING PLATE.
3 LOW/REVERSE CLUTCH FRICTION PLATES (5 REQUIRED).
4 LOW/REVERSE CLUTCH STEEL PLATES (5 REQUIRED).
5 LOW/REVERSE CLUTCH CUSHION PLATE (CONE).

Figure 31

*INTERNAL COMPONENTS (CONT'D)*

57. This now leaves nothing in the case except the final drive input gear, as shown in Figure 53.
***Note: This gear involves an exceptional amount of set-up time if it is removed, as it involves a "Crush" sleeve (See Figure 53). Our recommendation is "Not" to remove it, if there is no problem with the bearings. "If there are problems with the bearings", refer to the complete bearing and shim set-up in the Component Rebuild section.***

*Transaxle Disassembly Complete*

*COMPONENT REBUILD SECTION*

*OIL PUMP ASSEMBLY*

1. Disassemble the oil pump assembly using Figure 55 as a guide.
2. Remove and discard the two stator shaft seal rings, as shown in Figure 55.
3. Clean all oil pump parts thoroughly and dry with compressed air.
4. Inspect all oil pump parts thoroughly for any wear and/or damage. Replace as necessary.
5. Place oil pump body on a flat work surface, as shown in Figure 54, and replace bushing using the proper bushing driver, as necessary.

**Continued on Page 33**

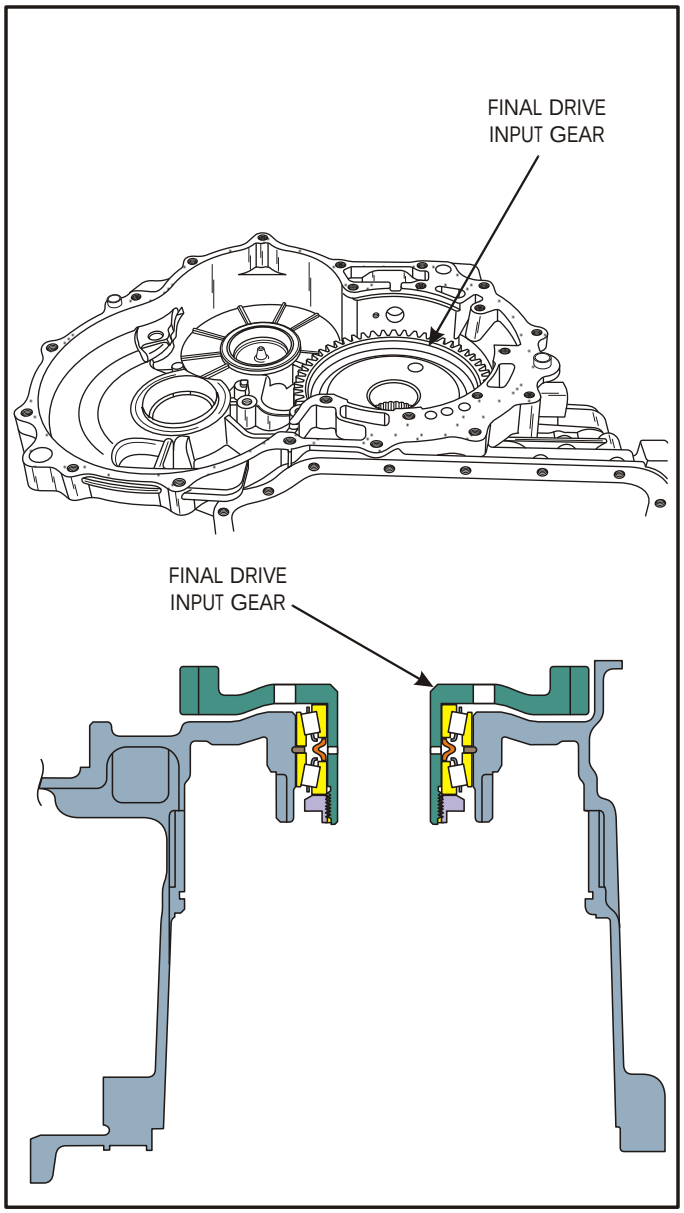



Figure 53

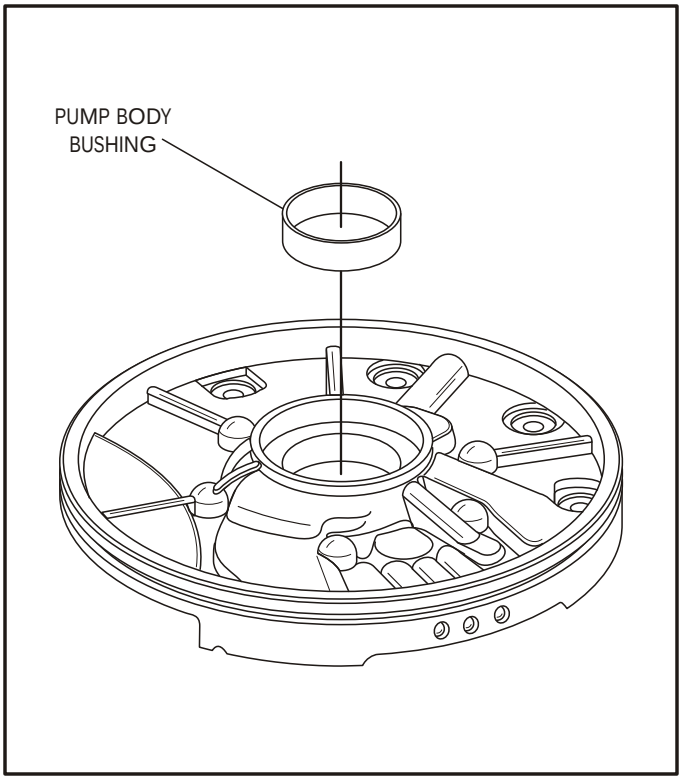
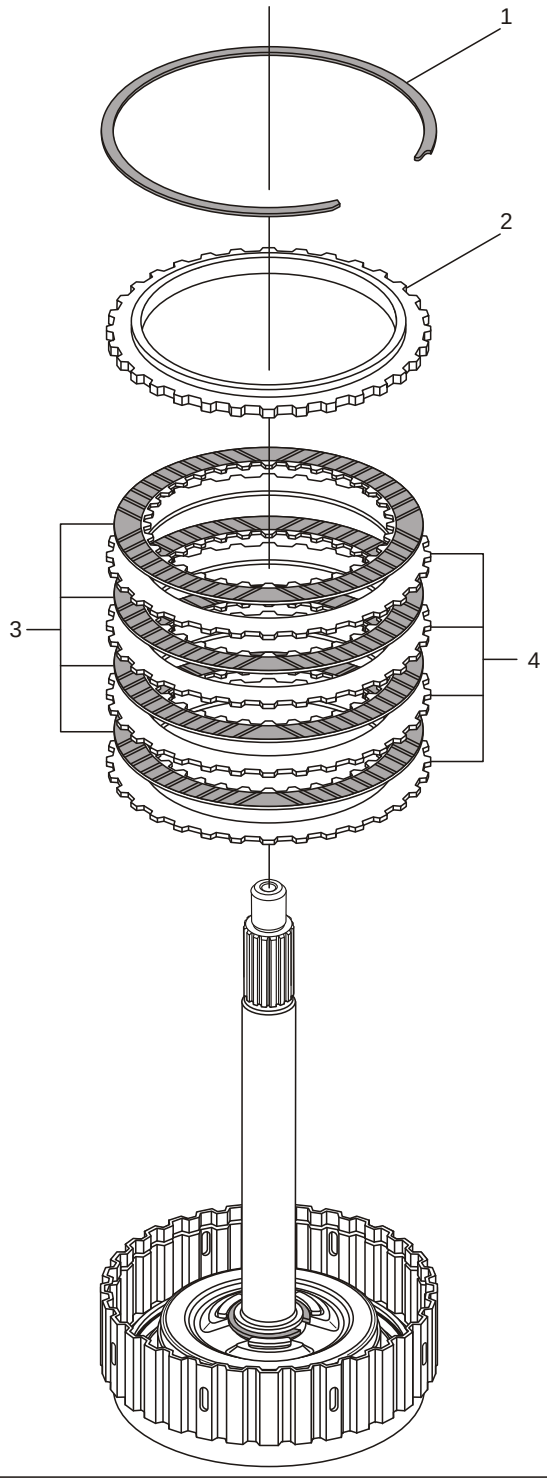



Figure 54




1. FORWARD CLUTCH BACKING PLATE SNAP RING *(SELECTIVE).*
2. FORWARD CLUTCH BACKING PLATE.
3. FORWARD CLUTCH FRICTION PLATES (4 REQUIRED).
4. FORWARD CLUTCH STEEL PLATES (4 REQUIRED).

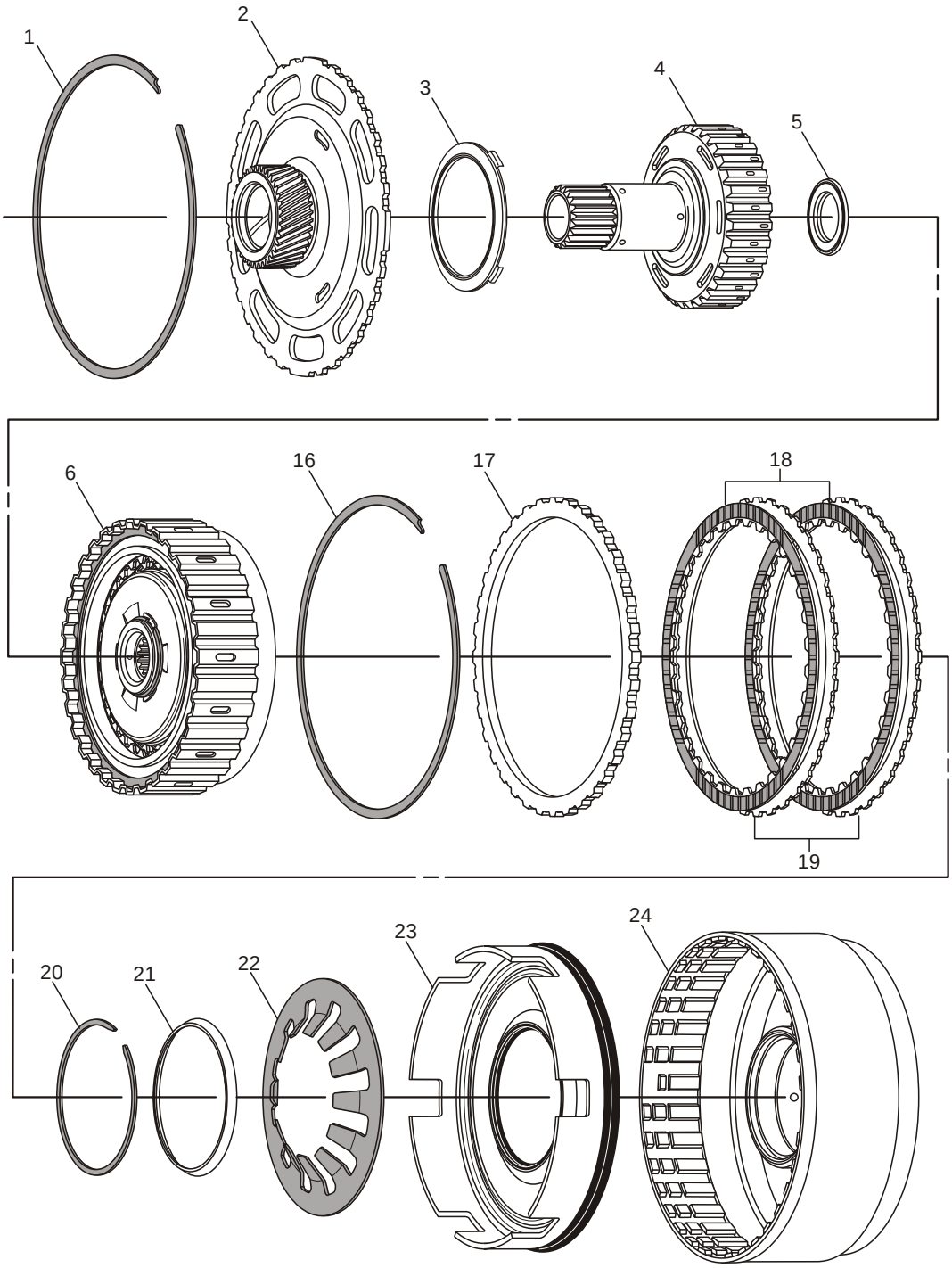
Figure 67

*COMPONENT REBUILD SECTION*
*FORWARD CLUTCH HOUSING ASSEMBLY (cont'd)*

9. Soak the new forward clutch friction plates in clean Mercon® V trans fluid for 15 minutes.
10. Install the forward clutch plates beginning with a steel plate and alternating with a lined plate, until you have installed 4 of each, as shown in Figure 67.
11. Install the forward clutch backing plate into the housing, as shown in Figure 67.
12. Install the selective forward clutch backing plate snap ring, as shown in Figure 67.
13. Tap the turbine shaft gently on the work bench to seat the snap ring against top of ring groove.

**Continued on Page 39**

*REVERSE CLUTCH HOUSING EXPLODED VIEW*



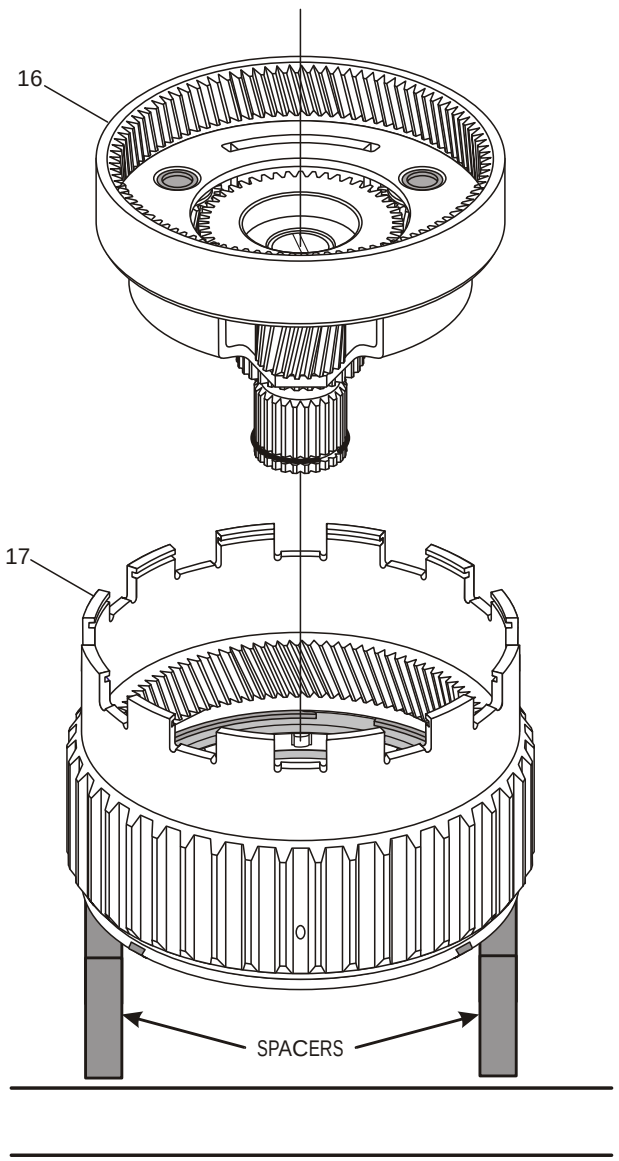

1 REAR SUN GEAR ASSEMBLY RETAINING SNAP RING.
2 REAR SUN GEAR ASSEMBLY.
3 REAR SUN GEAR TO DIRECT HUB, NO. 3, THRUST BEARING.
4 DIRECT CLUTCH HUB.
5 DIRECT HUB TO DIRECT HOUSING, NO. 2, THRUST BEARING.
6 DIRECT CLUTCH HOUSING ASSEMBLY, COMPLETE.
16 REVERSE CLUTCH BACKING PLATE "SELECTIVE" SNAP RING.
17 REVERSE CLUTCH BACKING PLATE.
18 REVERSE CLUTCH FRICTION PLATES (2 REQUIRED).
19 REVERSE CLUTCH STEEL PLATES (2 REQUIRED).
20 REVERSE CLUTCH PISTON BELLVILLE RETAINER SNAP RING.
21 REVERSE CLUTCH PISTON BELLVILLE SPRING RETAINER.
22 REVERSE CLUTCH PISTON BELLVILLE RETURN SPRING.
23 REVERSE CLUTCH PISTON.
24 REVERSE CLUTCH HOUSING ASSEMBLY.

Figure 81

*COMPONENT REBUILD SECTION*

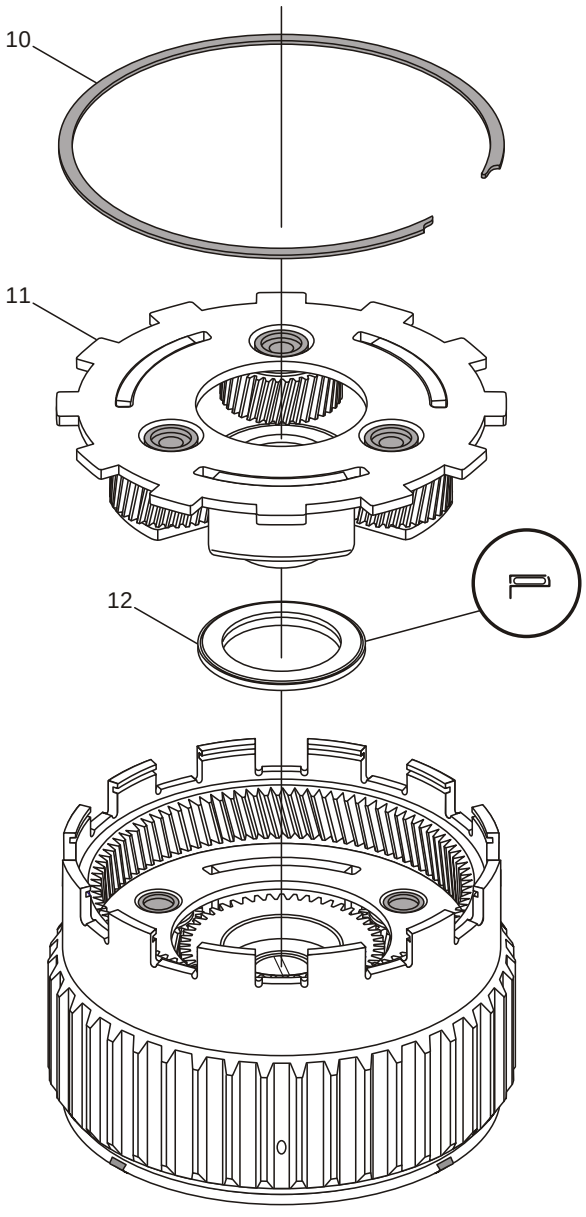
*PLANETARY ASSEMBLIES (CONT'D)*

12. Place the pre-assembled ring gear and hub assembly on flat work surface with some type of spacers below ring gear to allow the shaft of the sun gear to protrude through ring gear. Refer to Figure 96.
13. Install the pre-assembled front planet and sun gear assembly into front ring gear by rotating into position, as shown in Figure 96, until fully seated
14. Install the number five, rear planetary carrier thrust bearing, onto the front sun gear in the direction shown in Figure 97, with the inside lip facing down.
15. Install the rear planetary carrier by rotating into position, as shown in Figure 97.
16. Install the rear planetary carrier retaining snap ring, as shown in Figure 97.
17. Set completed planetary gear assembly aside for the final assembly process (See Figure 98).




16 FRONT PLANETARY CARRIER/REAR RING GEAR ASSEMBLY.
17 FRONT PLANETARY CARRIER RING GEAR AND HUB ASSEMBLY.

Figure 96




10 REAR PLANETARY CARRIER RETAINING SNAP RING.
11 REAR PLANETARY CARRIER ASSEMBLY.
12 REAR PLANETARY/SUN GEAR THRUST BEARING (NUMBER 5).

Figure 97

*COMPONENT REBUILD SECTION*

*BEARING REPLACEMENT AND SET-UP*

1. Rotate transaxle case in the fixture, as shown in Figure 110.
2. Secure the final drive input gear assembly, by installing the final drive input gear holding tool 307-413, as shown in Figure 110.
   ***Note: The transaxle will be rotated several times to remove the bearing retainer nut. To prevent the final drive input gear from falling out, it "Must" be secured.***
3. Lock the final drive input gear into position using the pins on the tool that go into holes in the input gear (See Figure 110).
4. Rotate the transaxle 180 degrees so that end cover side is facing up (See Figure 111).
   ***Note: The two staked areas on the nut must be pushed away from the flats on the final drive input gear before the bearing retainer nut can be removed.***
5. Install the final drive input nut socket 307-414 and wrenching plate, as shown in Figure 111.
6. Loosen the retainer nut with the tools.
7. Remove the special tools and remove the final drive input gear retaining nut, as shown in Figure 112.

**Continued on Page 62**

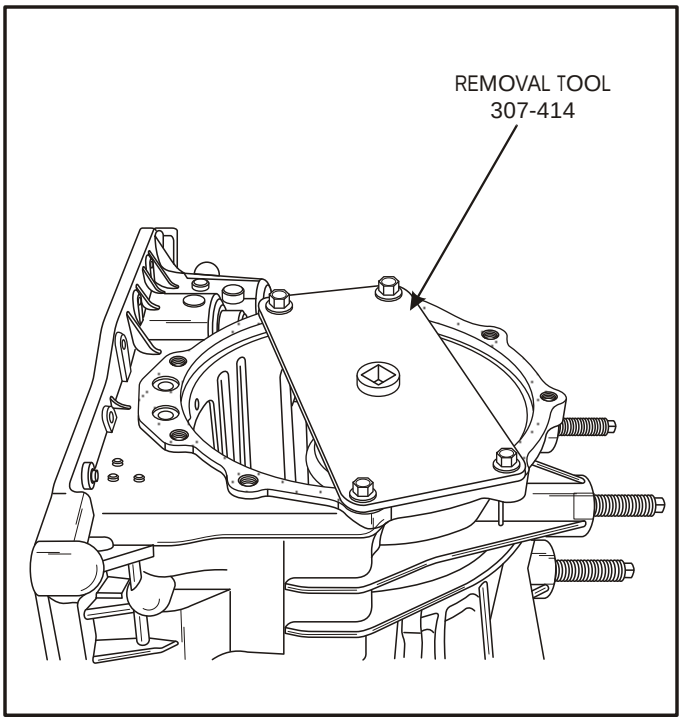



Figure 111

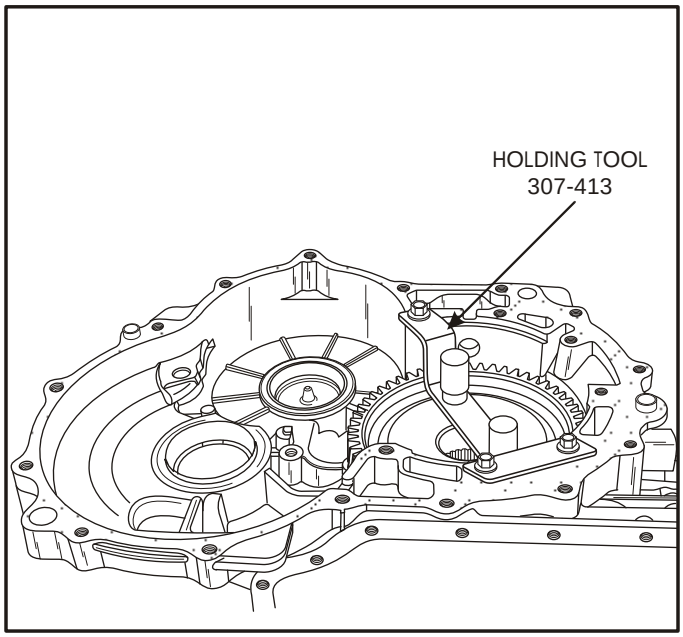



Figure 110

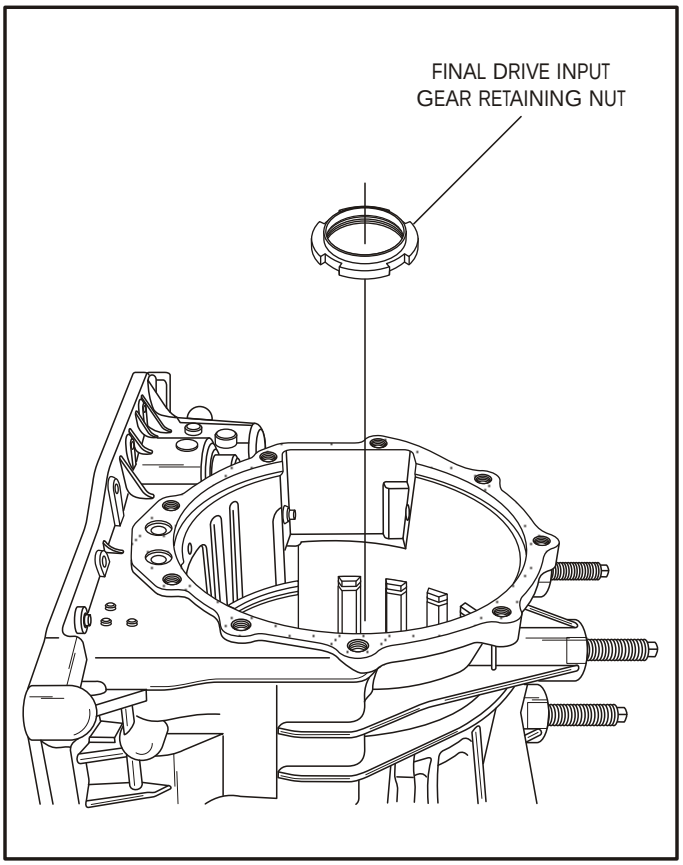



Figure 112

*COMPONENT REBUILD SECTION*
*BEARING REPLACEMENT AND SET-UP (CONT'D)*

43. Remove and replace the two differential case bearing cones, as shown in Figure 131, using the proper adapters and a hydraulic press.
44. Install completed transfer shaft assembly into transaxle case, as shown in Figure 132.

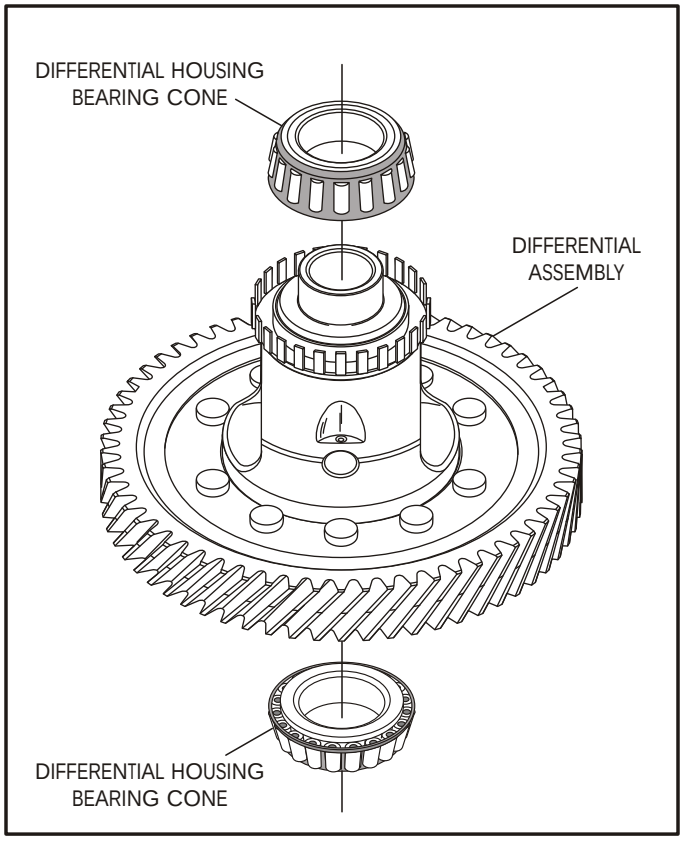



Figure 131

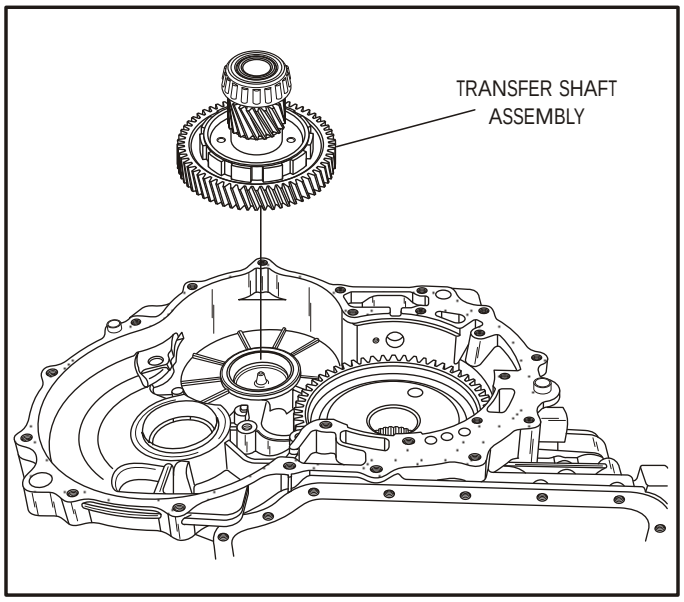



Figure 132

45. Install parking pawl spring into the case and over the case casting dowel (See Figure 133).
46. Install the parking pawl abutment, as shown in Figure 133.
47. Install the parking pawl into case and install the pivot pin, as shown in Figure 133.
48. Install the park pawl spring into hole in parking pawl using a pair of pliers (See Figure 133).
49. Install the parking pawl cover, as shown in Figure 134, install retaining bolts and torque to 13 N•m (10 ft.lb.)

**Continued on Page 69**

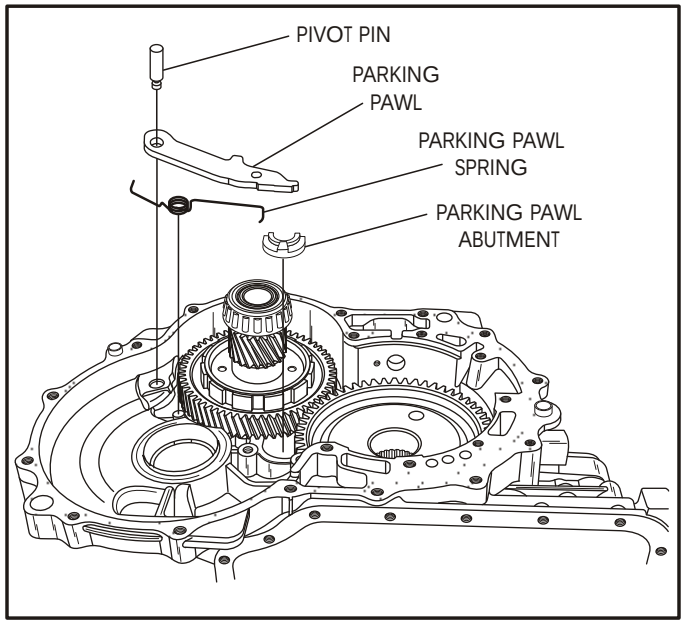



Figure 133

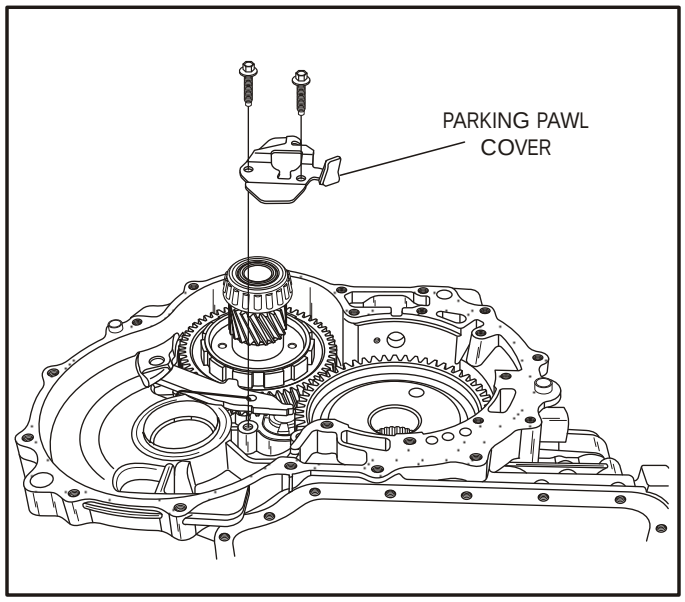



Figure 134

*DIFFERENTIAL BEARING SHIM - SELECTION CHART*

| Tool Reading | Part Number | Shim Thickness |
|---|---|---|
| OVER 0.28 – 0.33 mm | XS4P-7F119-AB | 0.48 – 0.52 mm (0.0188 – 0.0204 in) |
| OVER 0.33 – 0.38 mm | XS4P-7F119-BB | 0.53 – 0.57 mm (0.0208 – 0.0224 in) |
| OVER 0.38 – 0.43 mm | XS4P-7F119-CB | 0.58 – 0.62 mm (0.0228 – 0.0244 in) |
| OVER 0.43 – 0.48 mm | XS4P-7F119-DB | 0.63 – 0.67 mm (0.0248 – 0.0263 in) |
| OVER 0.48 – 0.53 mm | XS4P-7F119-EB | 0.68 – 0.72 mm (0.0267 – 0.0283 in) |
| OVER 0.53 – 0.58 mm | XS4P-7F119-FB | 0.73 – 0.77 mm (0.0287 – 0.0303 in) |
| OVER 0.58 – 0.63 mm | XS4P-7F119-GB | 0.78 – 0.82 mm (0.0307 – 0.0322 in) |
| OVER 0.63 – 0.68 mm | XS4P-7F119-HB | 0.83 – 0.87 mm (0.0326 – 0.0342 in) |
| OVER 0.68 – 0.73 mm | XS4P-7F119-JB | 0.88 – 0.92 mm (0.0346 – 0.0362 in) |
| OVER 0.73 – 0.78 mm | XS4P-7F119-KB | 0.93 – 0.97 mm (0.0366 – 0.0381 in) |
| OVER 0.78 – 0.83 mm | XS4P-7F119-LB | 0.98 – 1.02 mm (0.0385 – 0.0401 in) |
| OVER 0.83 – 0.88 mm | XS4P-7F119-MB | 1.03 – 1.07 mm (0.0405 – 0.0421 in) |
| OVER 0.88 – 0.93 mm | XS4P-7F119-NB | 1.08 – 1.12 mm (0.0425 – 0.0440 in) |
| OVER 0.93 – 0.98 mm | XS4P-7F119-PB | 1.13 – 1.17 mm (0.0444 – 0.0460 in) |
| OVER 0.98 – 1.03 mm | XS4P-7F119-RB | 1.18 – 1.22 mm (0.0464 – 0.0480 in) |
| OVER 1.03 – 1.08 mm | XS4P-7F119-SB | 1.23 – 1.27 mm (0.0484 – 0.0500 in) |
| OVER 1.08 – 1.13 mm | XS4P-7F119-TB | 1.28 – 1.32 mm (0.0503 – 0.0519 in) |
| OVER 1.13 – 1.18 mm | XS4P-7F119-UB | 1.33 – 1.37 mm (0.0523 – 0.0539 in) |
| OVER 1.18 – 1.23 mm | XS4P-7F119-VB | 1.38 – 1.42 mm (0.0543 – 0.0559 in) |
| OVER 1.23 – 1.28 mm | XS4P-7F119-XB | 1.43 – 1.47 mm (0.0562 – 0.0578 in) |
| OVER 1.28 – 1.33 mm | XS4P-7F119-YB | 1.48 – 1.52 mm (0.0582 – 0.0598 in) |
| OVER 1.33 – 1.38 mm | XS4P-7F119-ZB | 1.53 – 1.57 mm (0.0602 – 0.0618 in) |

Figure 143

*COMPONENT REBUILD SECTION*
*BEARING REPLACEMENT AND SET-UP (CONT'D)*

64. Using the dimension that you recorded from differential tool, select the correct differential bearing shim from the chart in Figure 143.
65. Install the selected shim for the differential bearing into the converter housing, as shown in Figure 144.

**Continued on Page 73**

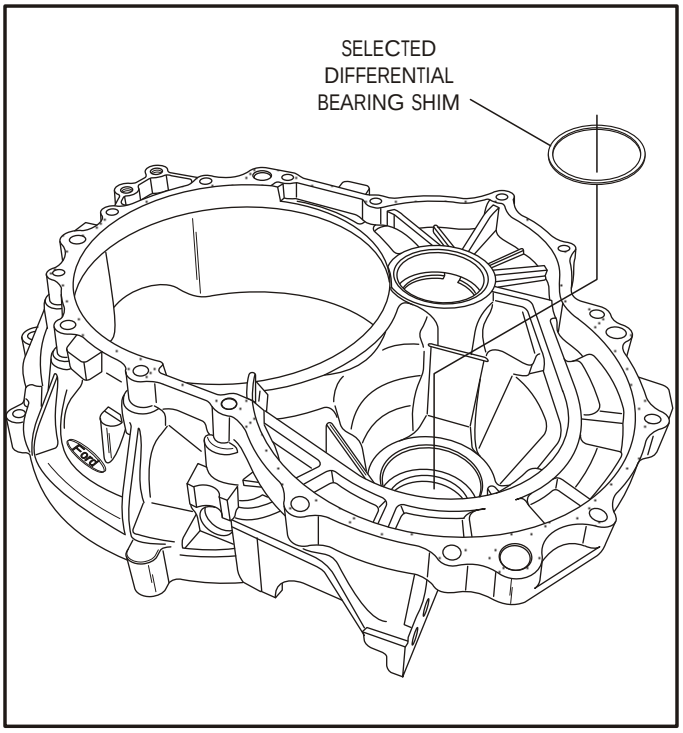



Figure 144

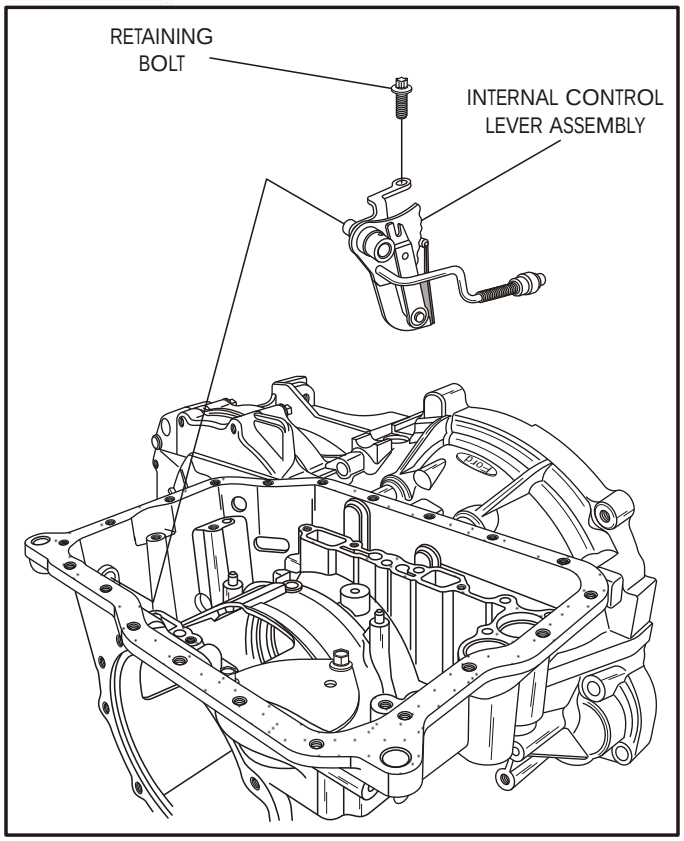



Figure 153

*TRANSMISSION ASSEMBLY*

*INTERNAL COMPONENTS (CONT'D)*

6. Install the internal control lever assembly into transaxle case, as shown in Figure 153, and ensure that parking rod is engaged properly with the parking pawl.
7. Install the retaining bolt loosely at this time.
8. Lubricate the manual lever shaft "O" ring seals and install the manual lever shaft, as shown in Figure 154.
9. Align the manual lever shaft inside of internal control lever assembly and install new roll pin, as shown in Figure 155.
10. Check the operation of the manual linkage and ensure that park rod engages the parking pawl without binding. Torque the internal control lever bolt to 13 N•m (10 ft.lb.).

**Continued on Page 77**

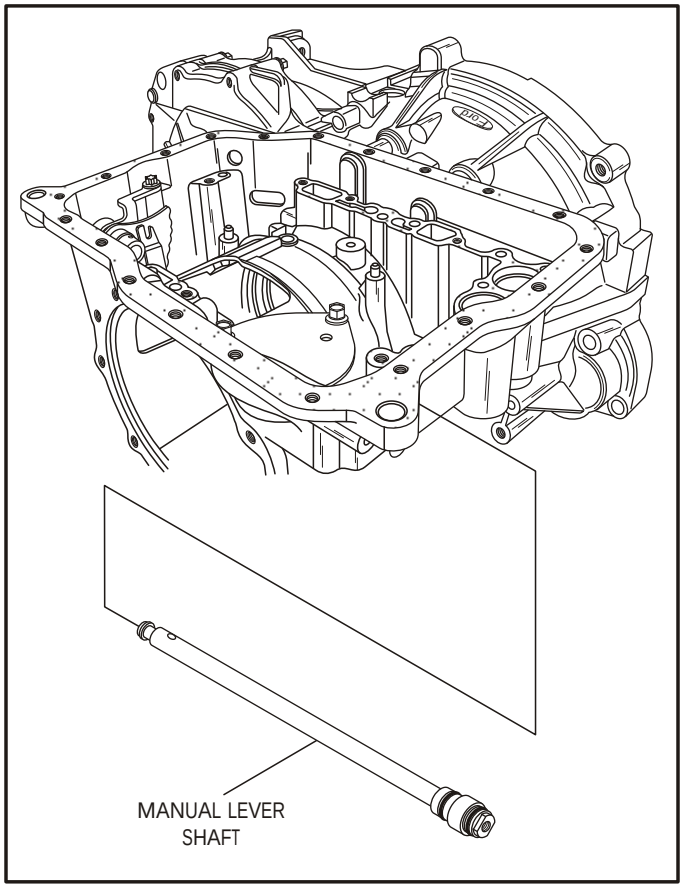



Figure 154

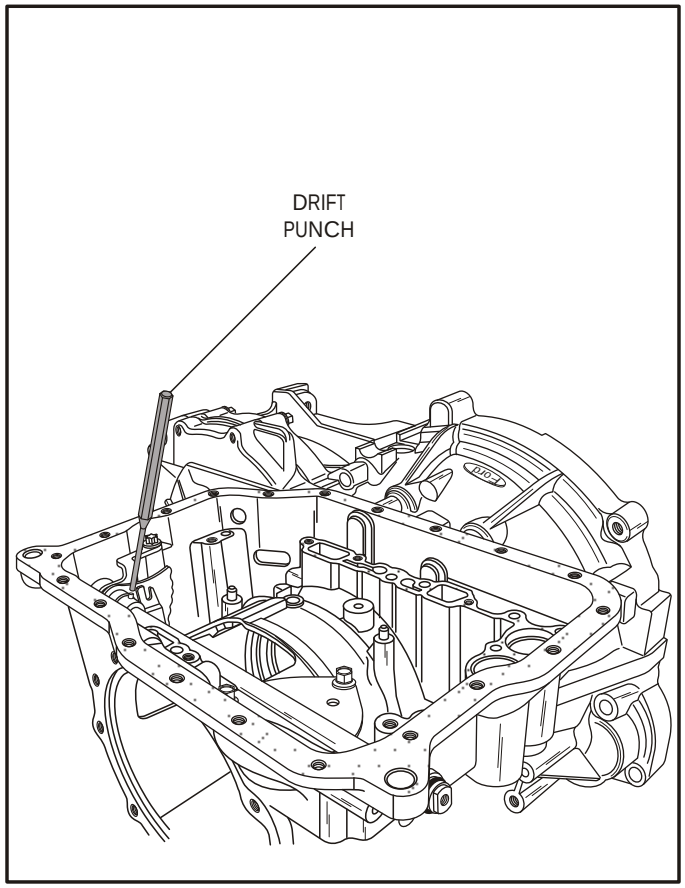
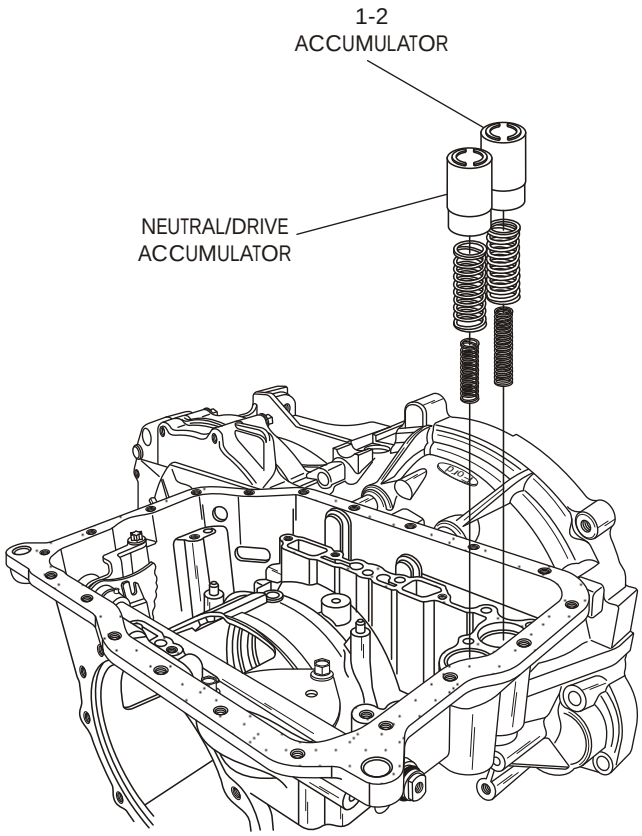



Figure 155




| | |
|---|---|
| NEUTRAL-DRIVE OUTER | 1-2 OUTER |
| FREE LENGTH ---------- 2.945" | FREE LENGTH ---------- 2.655" |
| DIAMETER ---------- .824" | DIAMETER ---------- .824" |
| WIRE DIAMETER --------- .089" | WIRE DIAMETER --------- .137" |
| COLOR I.D. ---------- NONE | COLOR I.D. ---------- YELLOW |
| NEUTRAL-DRIVE INNER | 1-2 INNER |
| FREE LENGTH ---------- 2.145" | FREE LENGTH ---------- 2.655" |
| DIAMETER ---------- .610" | DIAMETER ---------- .510" |
| WIRE DIAMETER --------- .094" | WIRE DIAMETER --------- .087" |
| COLOR I.D. ---------- NONE | COLOR I.D. ---------- YELLOW |

Figure 156

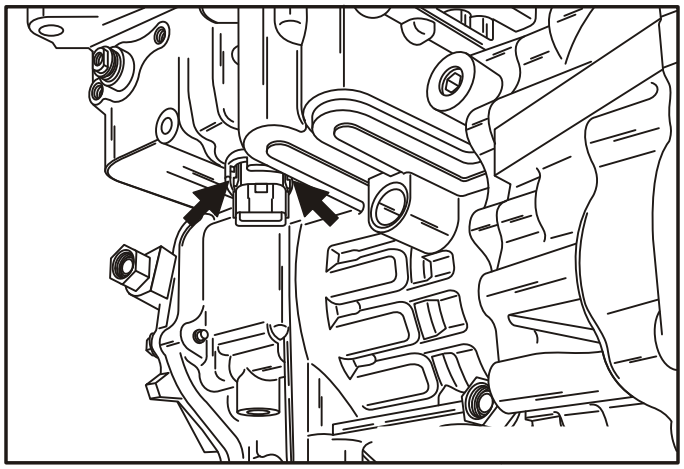


Figure 157

*TRANSMISSION ASSEMBLY*

*INTERNAL COMPONENTS (CONT'D)*

11. Install the 1-2 accumulator piston and springs in the bore closest to the converter housing, as shown in Figure 156.
12. Install the neutral/drive accumulator piston and springs in case bore, as shown in Figure 156. ***Note: Each of the two accumulators have two springs. All four springs are different sizes. Spring specifications are listed in Figure 156. The two accumulator pistons are the same.***
13. Install a new "O" ring on the connector of the internal wire harness, lubricate and install the internal wire harness through the case bore until the tabs lock it into position, as shown in Figure 157.
14. Install the pre-assembled valve body assembly onto transaxle case, as shown in Figure 158. ***Note: Ensure that manual valve is engaged with internal lever and V.B. is over dowels.***
15. Install eleven 40 mm length bolts and two 71 mm length bolts in the positions that are shown in Figure 158.

**Continued on Page 78**

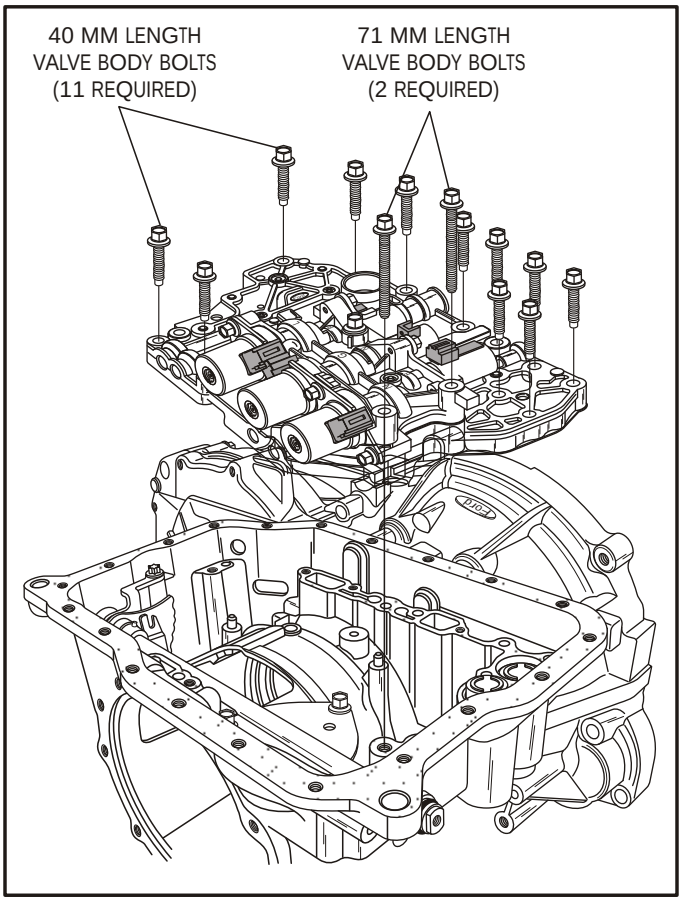



Figure 158

*TRANSMISSION ASSEMBLY*

*EXTERNAL COMPONENTS*

9. Remove the transaxle from bench fixture and remove mounting bracket from transaxle, as shown in Figure 194.
10. Lubricate the converter hub and install torque converter using the 307-091 handles as shown in Figure 195.

*CONGRATULATIONS*
*YOU ARE FINISHED!*

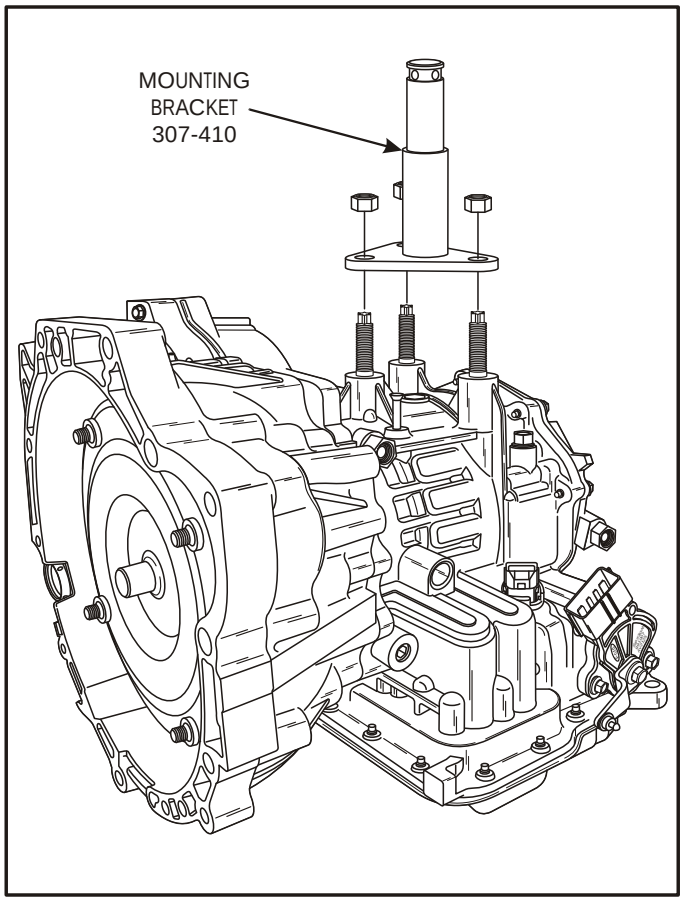



Figure 194

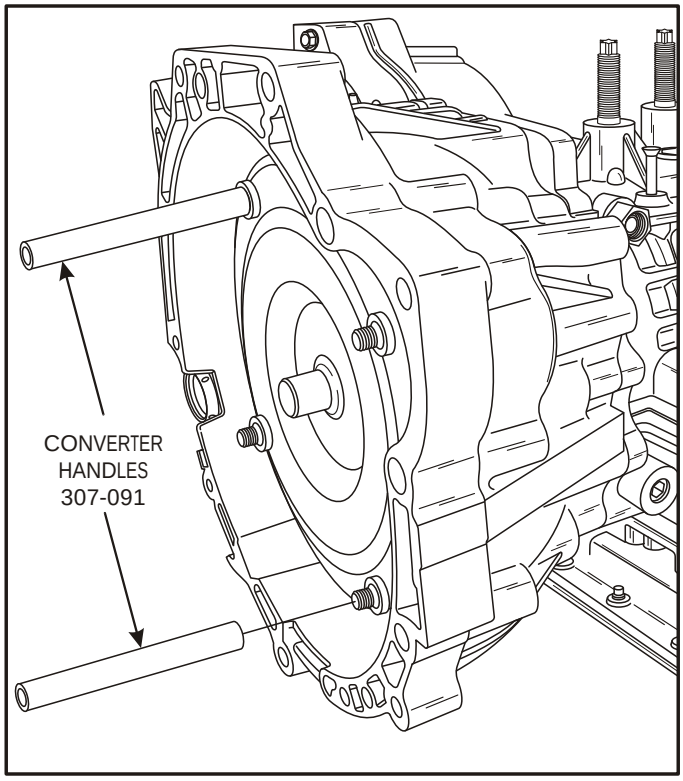



Figure 195