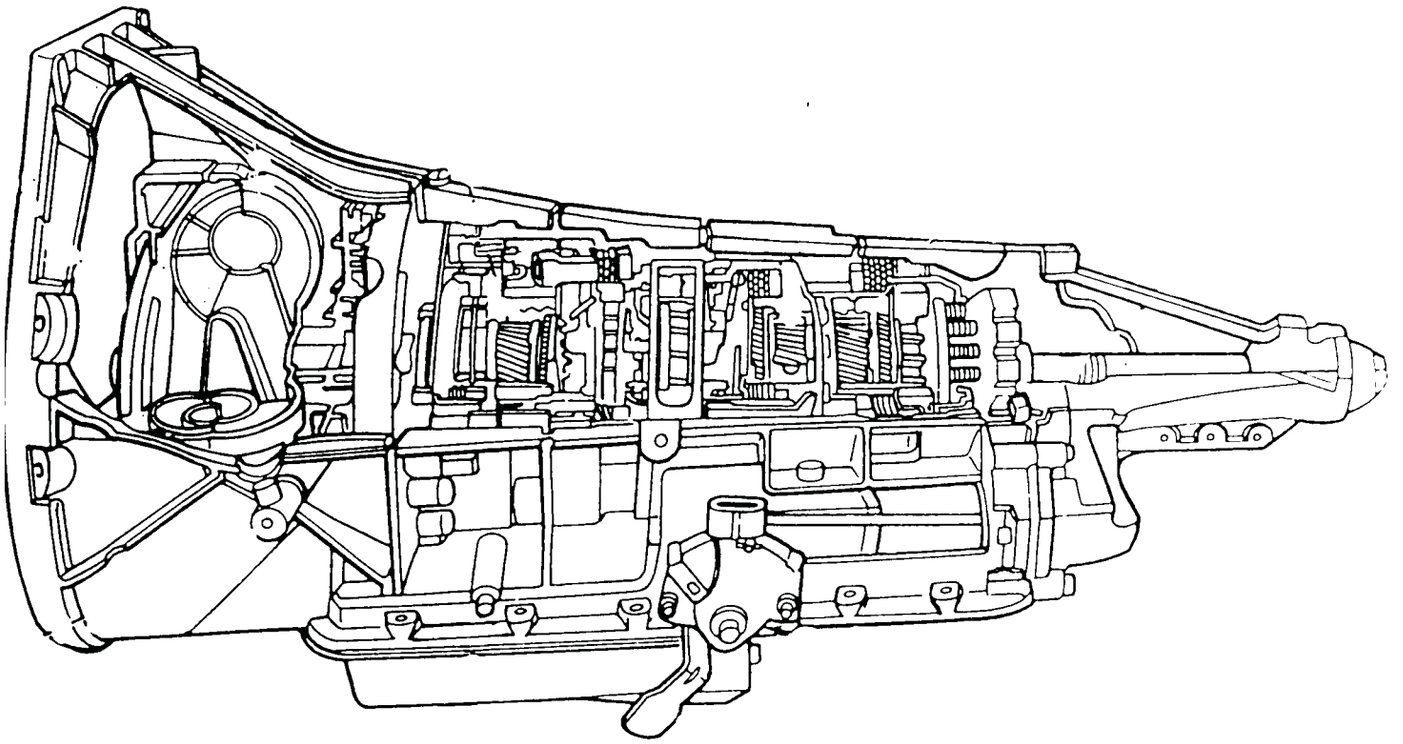
E40D
INDEX

E4OD



E4OD Automatic Transmission

The E4OD Transmission is a fully automatic, electronically controlled, four-speed unit with a three element locking torque converter. The main operating components of the E4OD transmission include a converter clutch, six multiple-disc friction clutches, one band, two sprag one-way clutches and a roller one-way clutch which provide for the desired function of three planetary gear sets.

Transmission gear selection in the Ⓓ range and converter clutch operation is controlled by the EEC-IV control system. Operating conditions are relayed to EEC-IV by various sensors throughout the vehicle. The EEC-IV compares these conditions with electronically stored parameters and logically determines the state that the transmission should operate at.

In the Ⓓ range, automatic operation of all four gears is possible. The Overdrive Cancel Switch, located on the vehicle's dashboard, disables overdrive operation and enables automatic operation through the first three gears.

Manual gear selection is available in the 1 and 2 range. Second gear is commanded when the gear selector is in the 2 range and when downshifted into the 1 range at speeds above approximately 56 Km/h (35 mph) (for diesel 48 Km/h (30 mph). First gear is commanded in the 1 range at startups and when downshifted into 1 range below approximately 56 Km/h (35 mph) (for diesel 48 Km/h (30 mph).

NOTE: Any reference to Intermediate Brake Drum and Direct Clutch Cylinder are one and the same

Technical Service Information

QUICK TEST: VISUAL CHECK / VEHICLE PREPARATION

SPECIAL NOTES

- Correct results of the QUICK TEST are dependent on the proper operation of related non-EEC-IV components.
- It may be necessary to disconnect or disassemble the harness connector assemblies to do some of the inspections. Pin locations should be noted before disassembly.
- If the engine will not start, starts but stalls, idles rough, or runs rough; continue through QUICK TEST (KOEO SELF TEST on page 13

VISUAL CHECK

1. Inspect the air cleaner and inlet ducting.
2. Check all engine vacuum hoses for damage, leaks, cracks, blockage, proper routing, etc.
3. Check EEC-IV system wiring harness for proper connections, bent or broken pins, corrosion loose wires, proper routing, etc.
4. Check the processor, sensors and actuators for physical damage.
5. Check the engine coolant for proper level.
6. Check transmission fluid level and quality.
7. Make all necessary repairs before continuing with QUICK TEST.

VEHICLE PREPARATION

1. Perform ALL safety steps required to start and run vehicle - apply parking brake, place shift lever firmly into the PARK position, and block the drive wheels, etc.
2. Turn off ALL electrical loads - radios, lights, AC, etc.
3. Start engine and run it up to operating temperature.
4. Turn engine off and proceed to QUICK TEST HOOK-UP on page 12.

DIAGNOSIS GUIDE — E4OD (Cont'd)

CONDITION	POSSIBLE SOURCE	ACTION
2-3 Shift harsh or soft (Cont'd)	5. Inspect intermediate clutch accumulator — Plunger stuck or damaged — Springs missing or tangled	5. Determine source of contamination or damage. Service as required.
	6. Inspect valve body — Dirty or sticky valves	6. Determine source of contamination. Service as required.
	7. Inspect pump air bleed check valve — Valve leaking or damaged	7. Determine source of contamination or damage. Service as required.
	8. Inspect intermediate clutch assembly — Clutch plates damaged/missing — Piston or seals damaged — Ball check stuck or missing — Feedbolt loose/missing sealant leak — Clutch hub damaged	8. Determine source of contamination or damage. Service as required.
No 2-3 upshift	1. Check fluid level — Fluid level high or low	1. Drain or fill transmission to the proper level.
	2. Check line pressure — Low to direct clutch	2. Perform line pressure test. Refer to service procedure in this section if necessary.
	3. Check solenoid operation — (S1 solenoid suspected)	3. Refer to electrical diagnosis procedure in this section. Service as required.
	4. Inspect valve body bolts — Loose or tight	4. Tighten bolts to the specification listed at the back of this section.
	5. Inspect valve body — Dirty or sticky valves	5. Determine source of contamination. Service as required.
	6. Inspect 2-3 shift valve — Valve stuck, nicked or damaged	6. Determine source of contamination. Service as required.
	7. BS5 check ball missing — Plate seat damaged	7. Service as required.
	8. Inspect direct clutch assembly — Clutch plates damaged/missing — Piston or seals damaged — Ball check assembly stuck or missing	8. Determine source of contamination. Service as required.
	9. Inspect direct clutch cylinder — Seals damaged or missing or holes blocked	9. Determine source of contamination. Service as required.
	10. Inspect center support — Damaged — Feedbolts loose or missing — Center support O.D. or case bore damaged/leaking — Teflon seal damaged	10. Service as required.

DIAGNOSIS GUIDE — E4OD (Cont'd)

CONDITION	POSSIBLE SOURCE	ACTION
Converter clutch does not release	1. Check fluid level — Fluid level high or low	1. Drain or fill transmission to the proper level.
	2. Electrical system or electronic engine control — No unlock signal — S3 solenoid malfunction — Bulkhead connector damaged — Pinched wires	2. Refer to electrical diagnosis procedure in this section. Service as required.
	3. Converter clutch control valve — Dirty or stuck valve	3. Determine source of contamination. Service as required.
Line modulator pressure high or low	1. Check line pressure — High or low line pressure	2. Perform line pressure test. Refer to service procedure in this section if necessary.
	2. Inspect line pressure modulator valve — Valve stuck or damaged — Plunger or sleeve stuck or damaged	2. Determine source of contamination or damage. Service as required.

Electrical Diagnosis

When referred to this Section, perform the Electronic Engine Control (EEC-IV) Quick Test

The following codes may appear during the EEC-IV Quick Test. Service these codes first and repeat the EEC-IV Quick Test before continuing with the transmission diagnosis.

EEC-IV Quick Test Service Codes

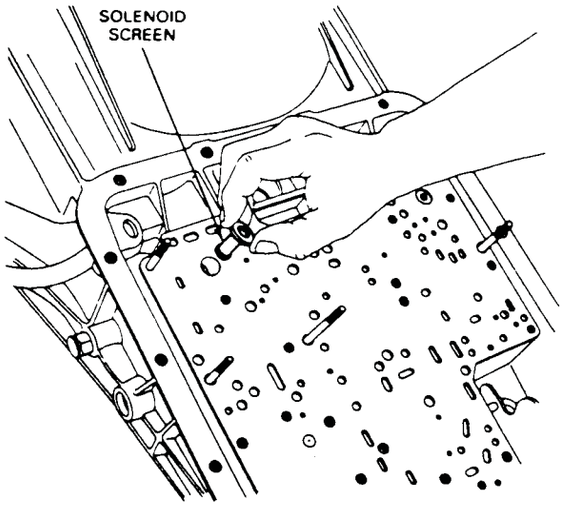
- 26: TOT Out of Self-Test Range: The Transmission Oil Temperature (TOT) sensor registers a temperature not in the allowable range of testing. The test should be repeated with the transmission warmed to the correct testing temperature. (Refer to Engine/ Emissions Diagnosis Shop Manual Volume H for correct temperature.)
- 47: 4x4 Switch Closed: Transmission transfer case is activated into four-wheel drive. Release four-wheel drive and repeat test.
- 65: Overdrive Cancel Switch Not Changing State: Operation of the Overdrive Cancel Switch was not recorded during the Engine On Quick Test. Service this switch as outlined in the Pin Point Tests in Engine/Emissions Diagnosis Manual Volume H.
- 67: MLPS Out of Range/AC On: If AC clutch is on during test, this code will appear. Shut off AC or defrost and repeat test. If the AC unit was off during the test, go to the code in the following Section.

If any of the following service codes appear during the EEC-IV Quick Test perform the Drive Cycle Test for continuous codes as outlined:

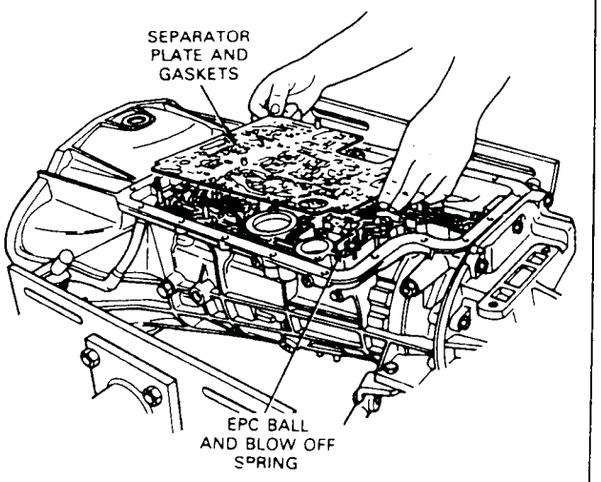
Transmission Quick Test Service Codes

- 49: 1-2 Shift Error: Engine speed drop during the 1 to 2 shift does not fall within tolerance limits.
- 56: -40 degree F indicated TOT, Sensor Circuit Open: Voltage drop across the TOT sensor exceeds the scale set for the temperature of -40 degrees F.
- 59: 2-3 Shift Error: Engine speed drop during the 2 to 3 shift does not fall within tolerance limits.
- 62: Converter Clutch Failure: The EEC-IV module picks up excessive amount of converter slip while converter is scheduled to be locked up.
- 66: 315 degrees F indicated TOT, Sensor Circuit Grounded: Voltage drop across the TOT sensor does not reach the scale set for the temperature of 315 degrees F.

Remove solenoid screen, by turning counterclockwise and pull out.

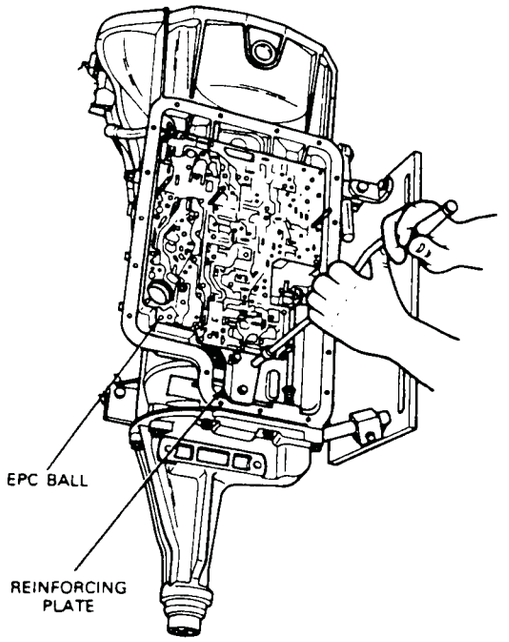


Remove separator plate, two gaskets, EPC ball and blowoff spring, discard gasket.



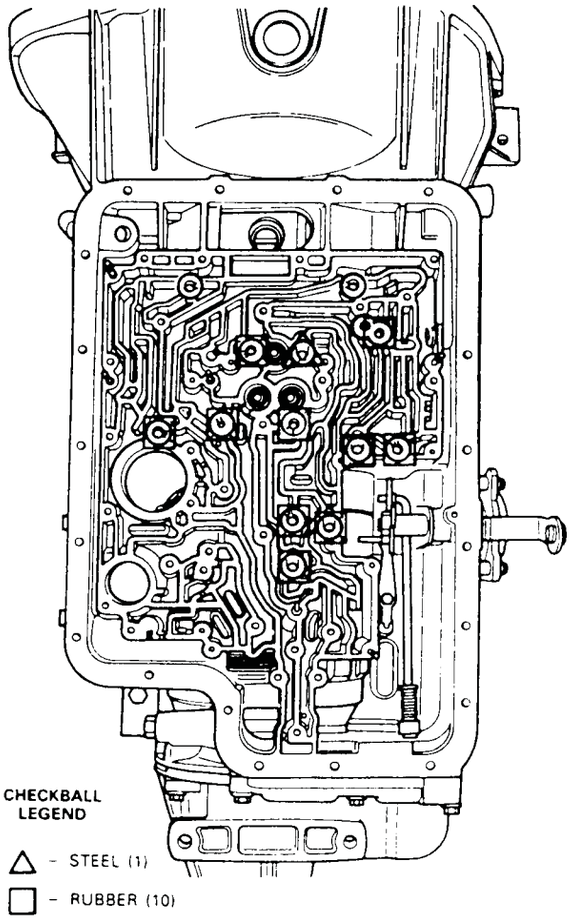
Remove three reinforcing plate bolts (8mm socket), remove plate.

NOTE: EPC ball is spring loaded under separator plate.

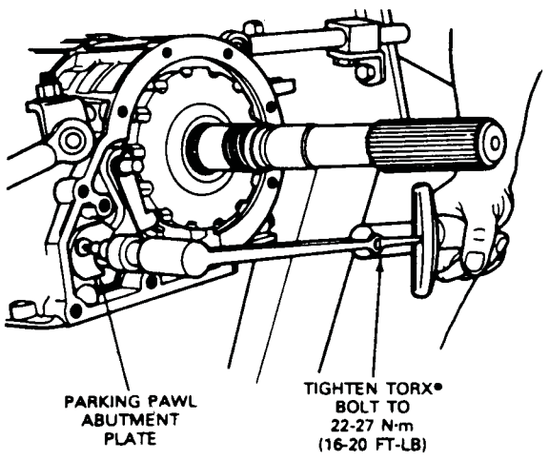


Remove one steel and ten rubber check balls from transmission, using a small screwdriver.

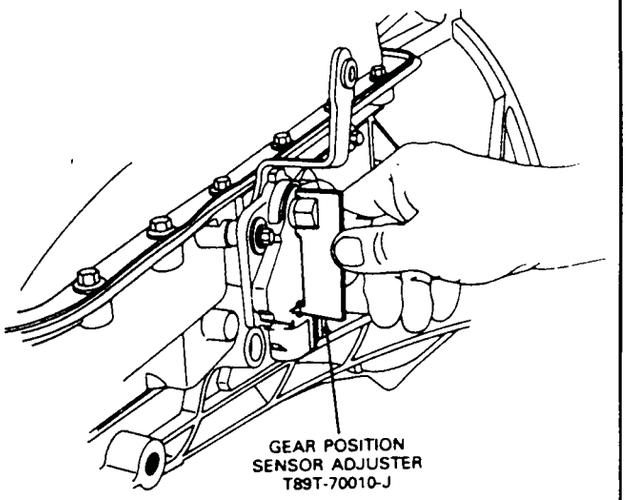
CAUTION: Do not mar rubber check balls.



Install parking pawl abutment with Torx® head bolt (40A bit) and tighten to 22-27 N·m (16-20 ft. lbs).

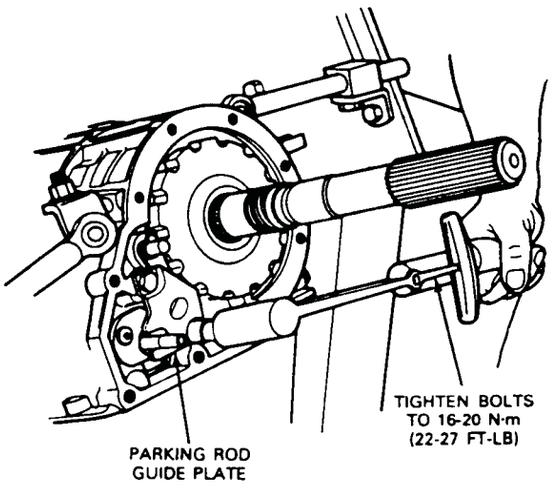


Install manual lever position sensor with two bolts (8mm socket) and washers. Do not tighten bolts at this time. Align manual lever position sensor for neutral gear position using Gear Position Sensor Adjuster T89T-70010-J or equivalent.

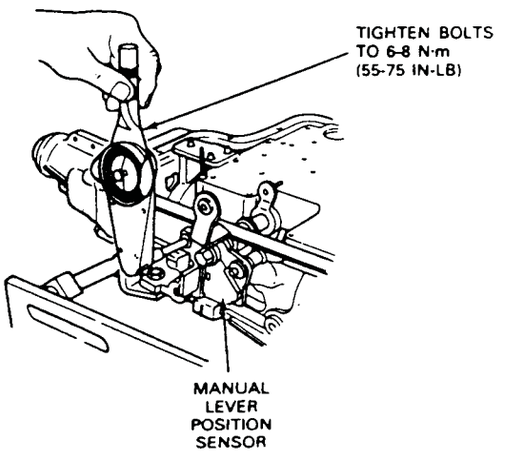


Attach parking rod guide plate with two bolts (13mm socket) and washers. Tighten to 22-27 N·m (16-20 ft9. lbs.).

NOTE: Ensure plate dimple is facing inward.

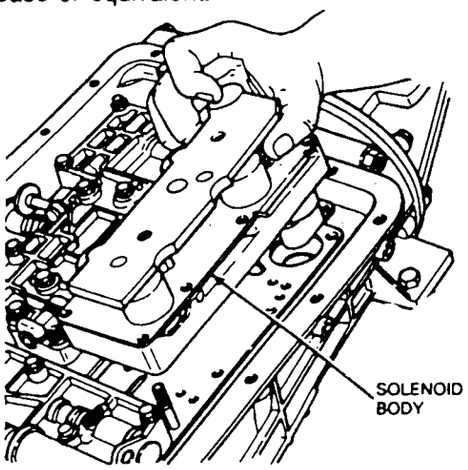


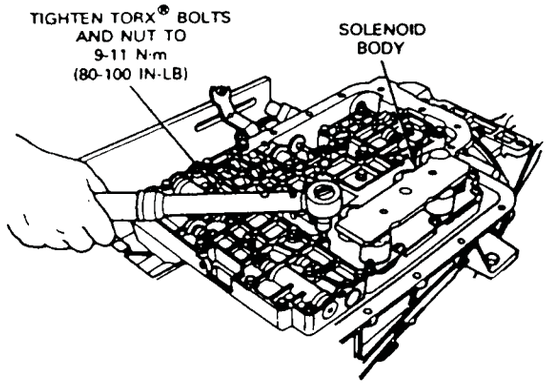
Tighten bolts (8mm socket) and washer to 6-8 N·m (55-75 in. lb.).



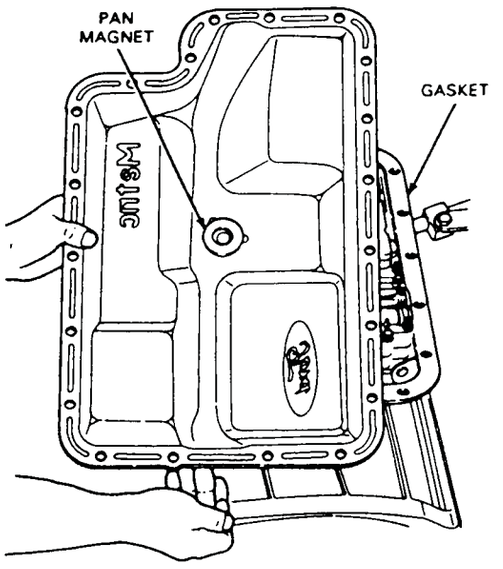
Install solenoid body over stud and attach with nine Torx® bolts (30A bit) and one nut (10mm socket). Tighten to 9-11 N·m (80-100 in-lb).

NOTE: Prior to installing solenoid body assembly, coat the case connector bore with M1C172-A grease or equivalent.



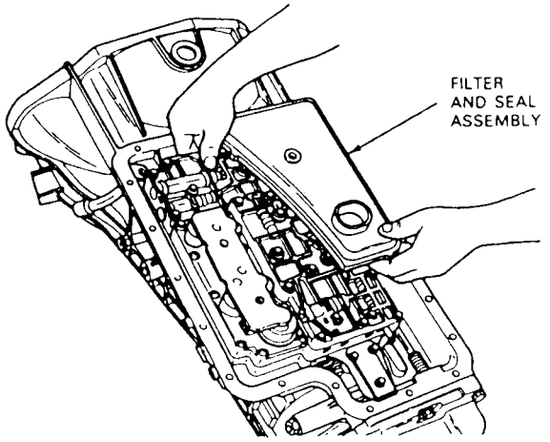


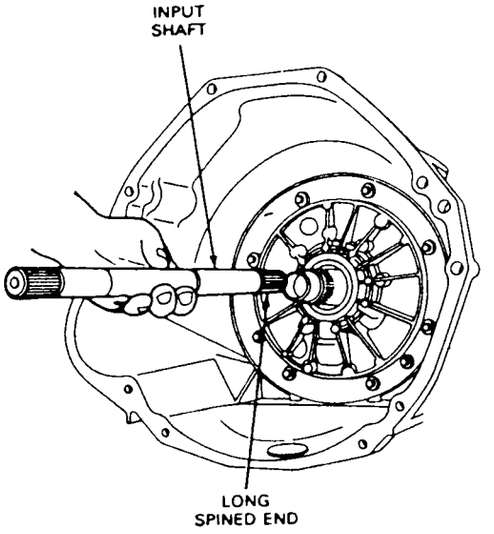
Place pan magnet on dimple in bottom of pan. Install new pan gasket. Use grease to hold in place.



TIGHTEN BOLTS TO 14-16 N·m (10-12 FT-LB)

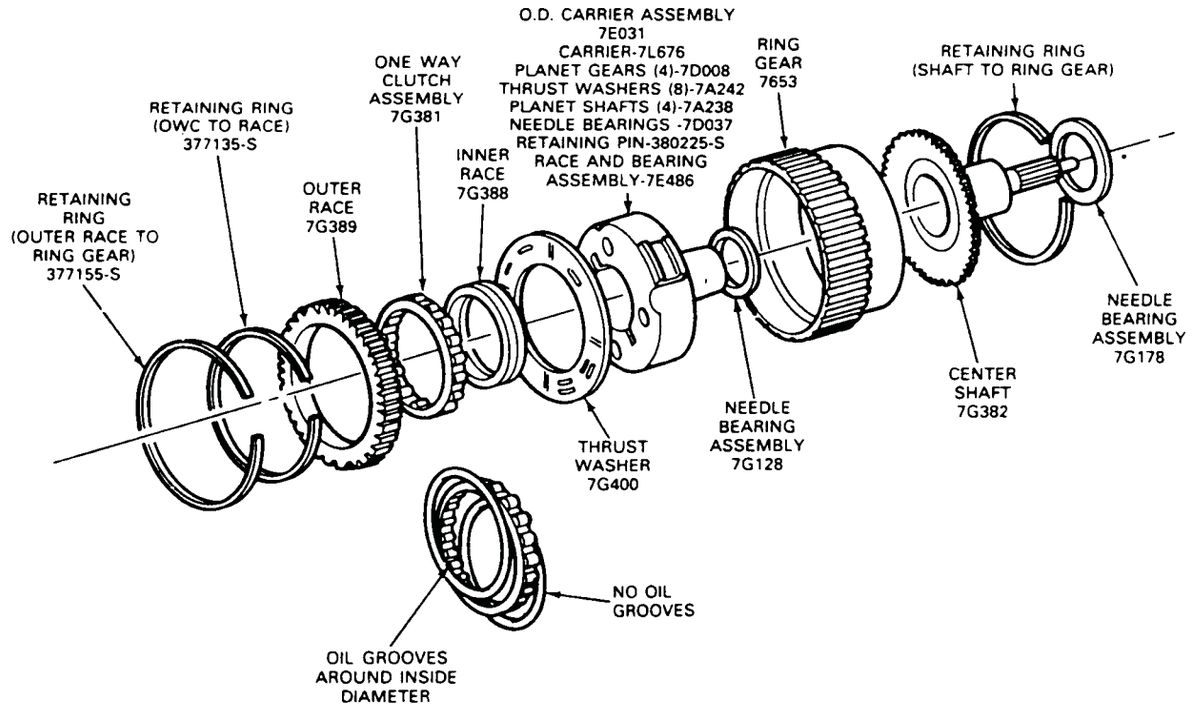
Install a new filter and seal assembly by lubricating the seal with transmission fluid and pressing the filter into place. Do not reuse old filter or seal.





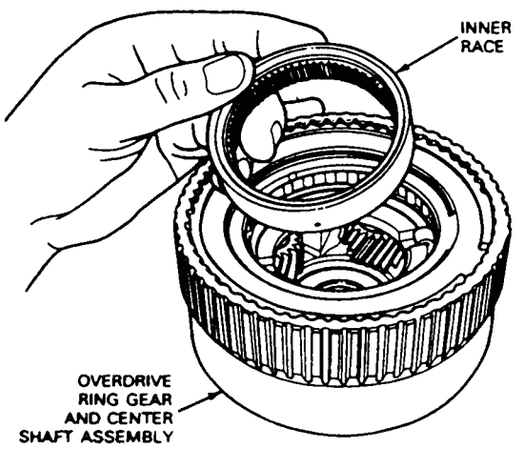
Reinstall input shaft, long splined end first.

Overdrive Ring Gear And Center Shaft Assembly

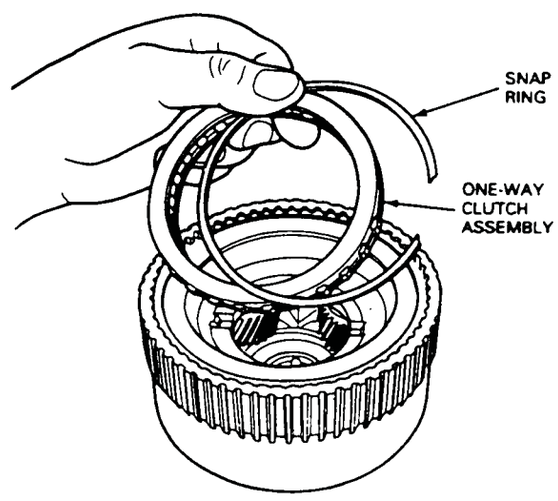


Disassembly

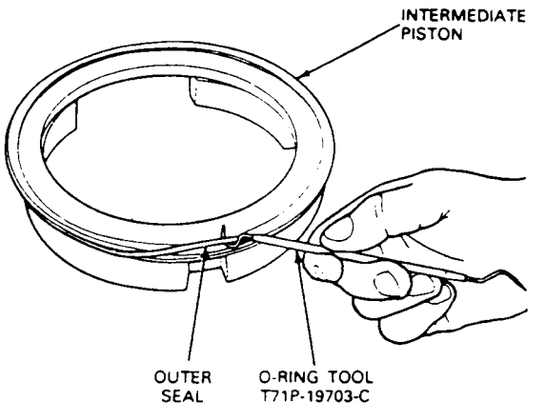
Remove inner race.



Remove small (inner) snap ring and one-way clutch assembly.

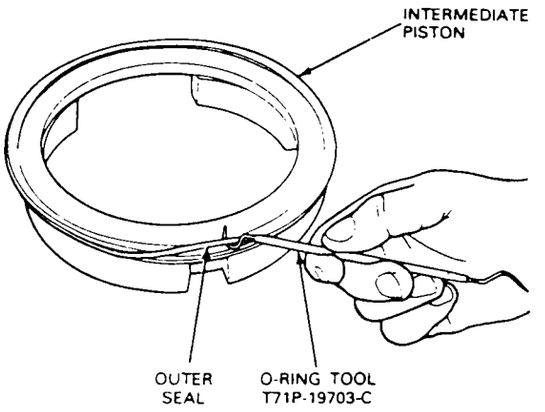


Remove outer seal from intermediate piston.

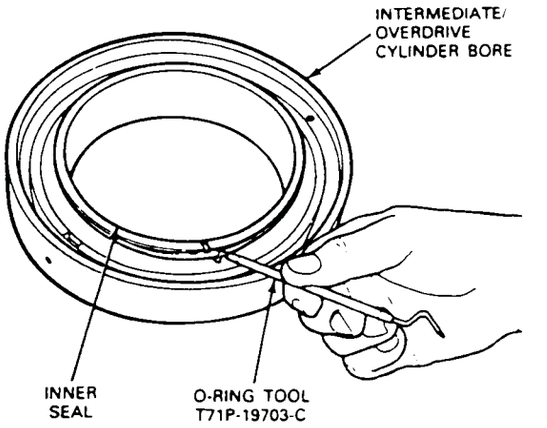


Assembly

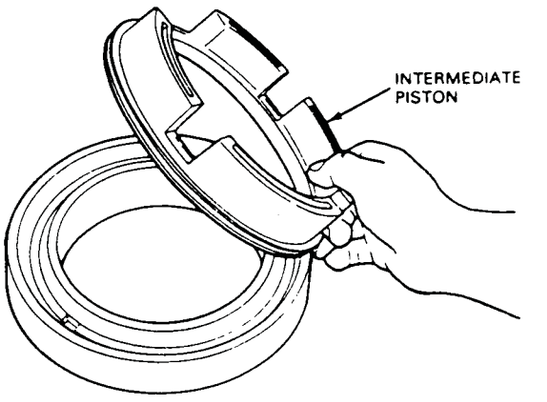
Install outer seal onto intermediate piston with lip seal facing down towards cylinder.



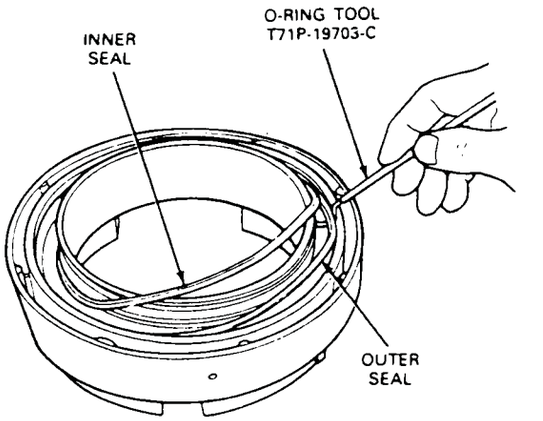
Install intermediate/overdrive inner seal into cylinder bore with lip seal facing down towards cylinder.



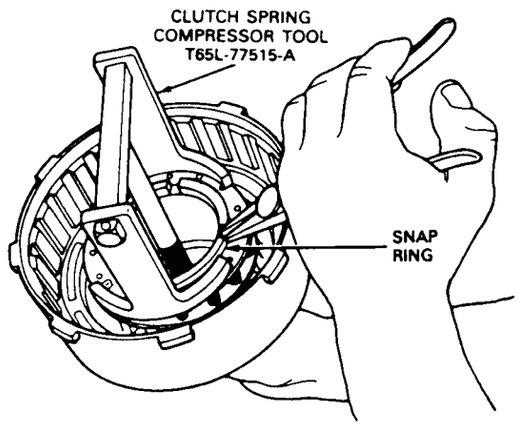
Install intermediate piston.



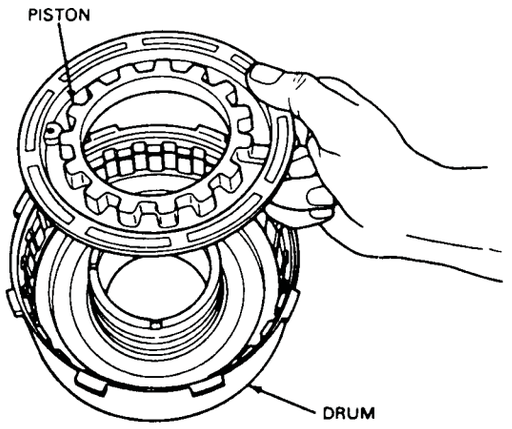
Install overdrive outer and inner seals with lip seal facing down towards cylinder.



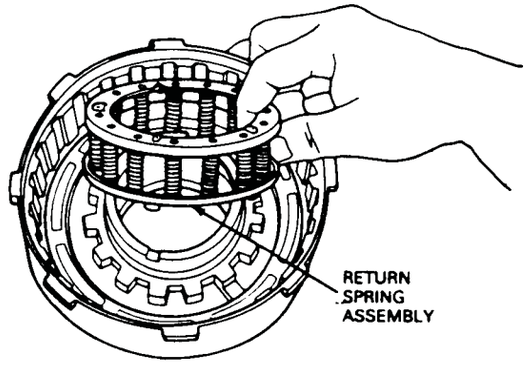
Install Clutch Spring Compressor Tool T65L-77515-A or equivalent and remove return spring snap ring.



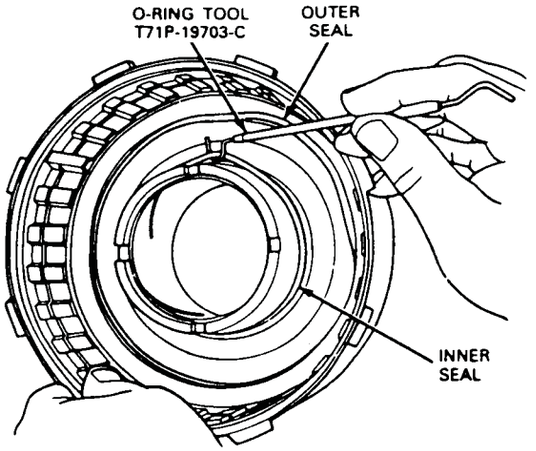
Remove piston from intermediate brake drum.



Remove return spring assembly.

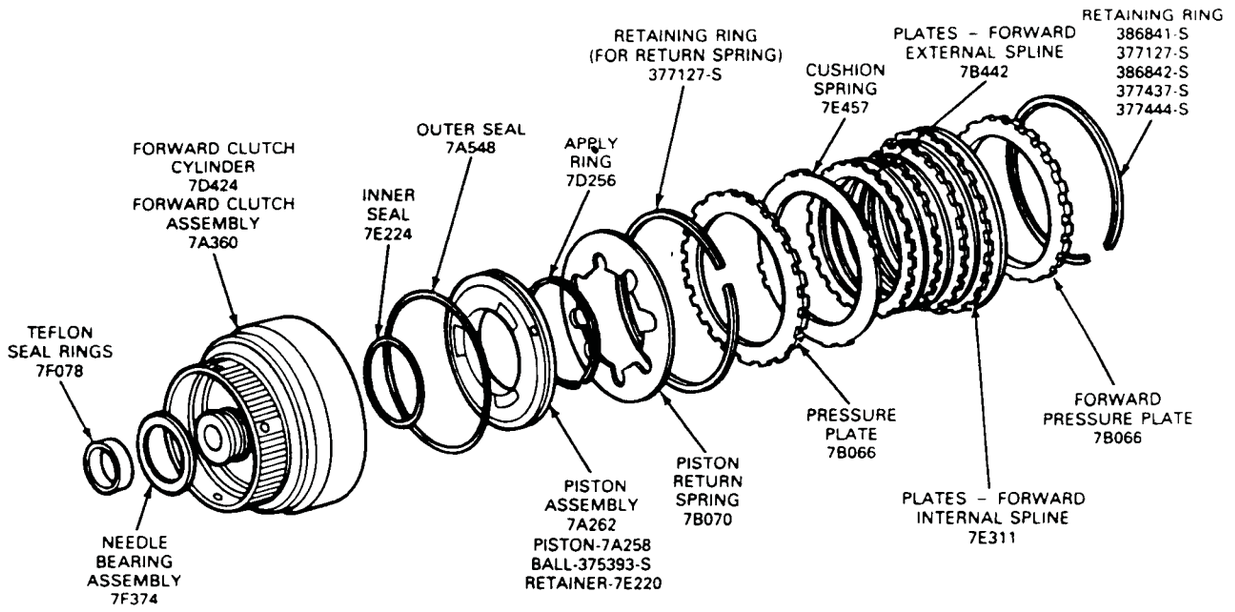


Remove inner and outer seals from drum using O-Ring Tool T71P-19703-C or equivalent.

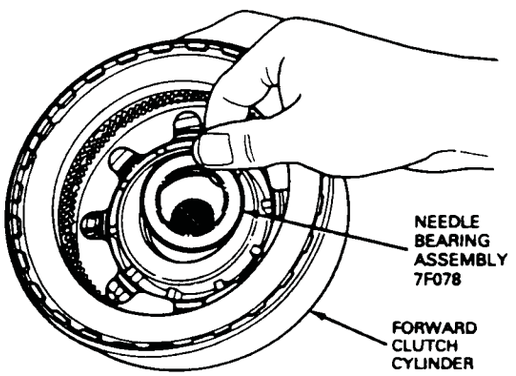


Forward Clutch Assembly

Disassembly

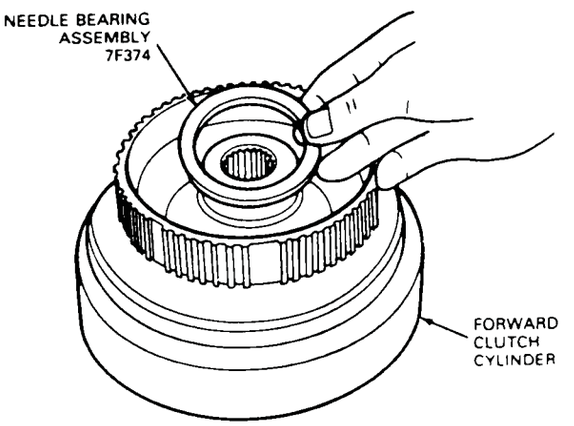


Remove needle bearing assembly from inner face of cylinder.

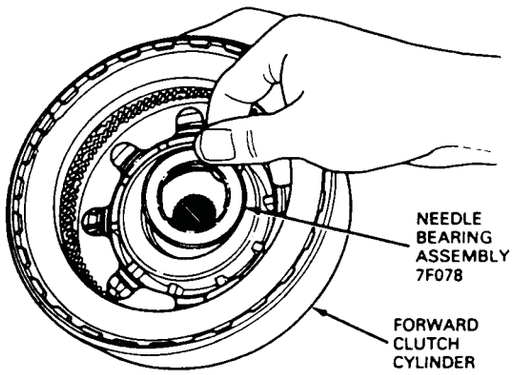


Remove needle bearing assembly No. 7F374.

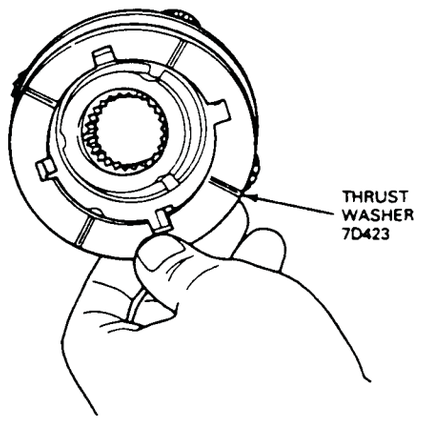
Remove both teflon seal/rings from grooves using O-Ring Tool T71P-19703-C or equivalent.



Install needle bearing assembly on inner face of cylinder, with notched inner race facing outward.



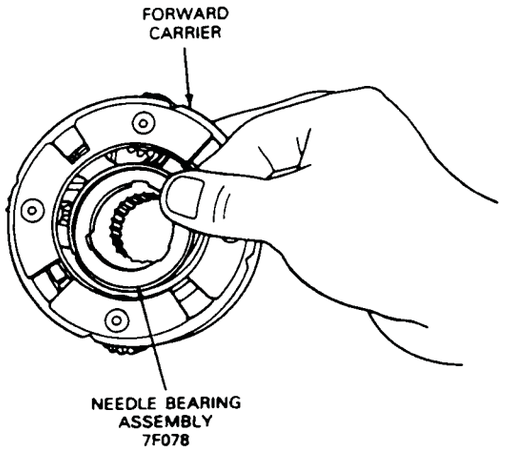
Remove thrust washer No. 7D423 from front side of carrier.



Forward Carrier

Disassembly

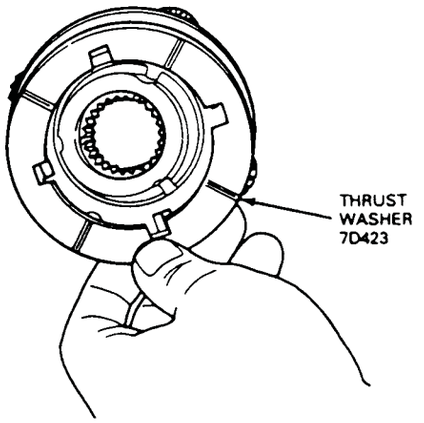
Remove needle bearing assembly No. 7F078 from carrier.

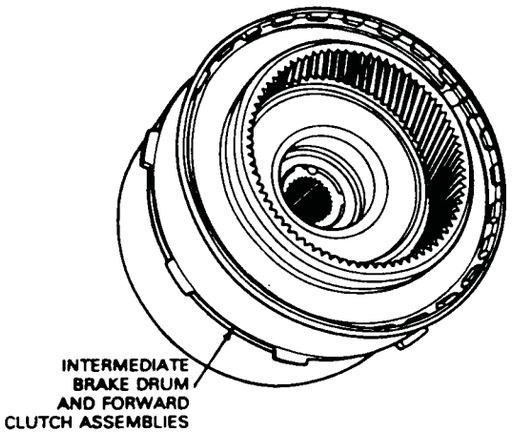


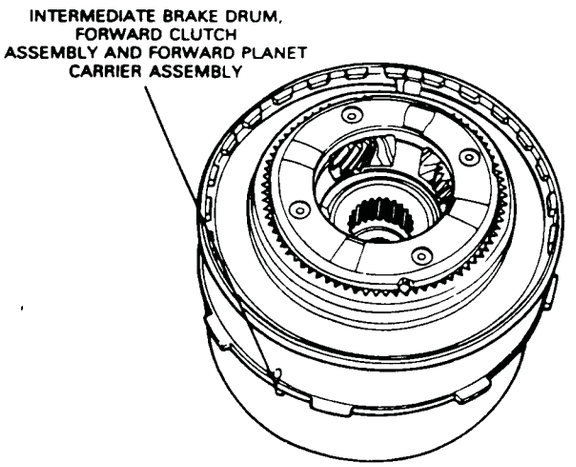
Assembly

Place thrust washer No. 7D423 on front side of carrier, using grease to hold in place.

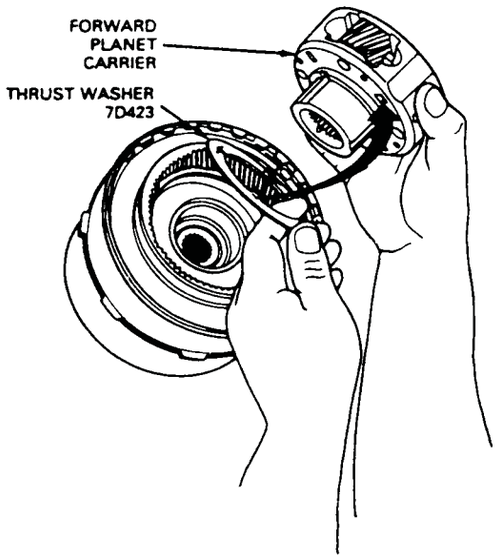
NOTE: Thrust washer tabs go into carrier.





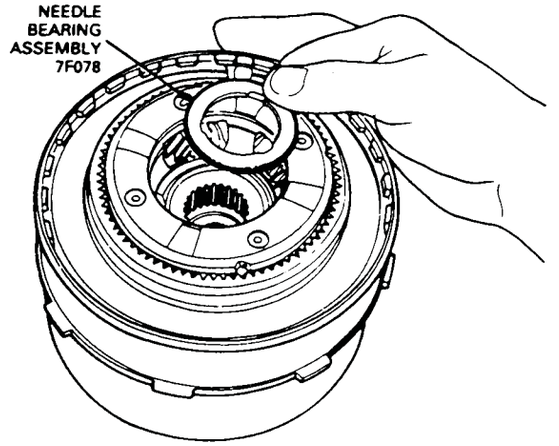


Grease thrust washer No. 7D423 and place onto forward planet carrier. Place carrier into assembly.



Install needle bearing assembly No. 7F078 into forward carrier assembly.

NOTE: Lightly grease needle bearing to hold in place. Notched inner race surface should face up.



SPECIFICATIONS

Description	Torque	
	N-m	ft-lbs
Inner O.W.C. Race to Case	24-34	(18-25)
Connector to Case (Fluid) Cooler Line	24-31	(18-23)
Plug Line Pressure Case	8-16	(6-12)
Plug — Throttle Pressure Case	8-16	(6-12)
Inner and Outer Lever to Manual Control Shaft	40-54	(30-40)
Positive Detent Spring to Case	9-11	(80-100 lb. in.)
Parking Rod Guide Plate to Case	22-27	(16-20)
Neutral Switch Assembly to Case	6-8	(55-75 lb. in.)
Center Support to Hub	9-14	(80-120 lb. in.)
Center Support Fluid Feed	11-16	(8-12)
Extension Housing to Case	27-39	(20-29)
Extension Housing to Case (4x2)	27-39	(20-29)
Extension Housing to Case (4x4)	27-39	(20-29)
Stator Support to Pump Body	9-11	(80-100 lb. in.)
Oil Pump Body to Case	24-31	(18-23)
Reinforcing Plate to Case	9-11	(80-100 lb. in.)
Main Accum. and Sol. Body to Case	9-11	(80-100 lb. in.)
Main and Lower Body to Case	9-11	(80-100 lb. in.)
Lower Body to Main Body	9-11	(80-100 lb. in.)
Sol. Body to Case	9-11	(80-100 lb. in.)
Park Rod Abutment to Case	22-27	(16-20)
Control Assembly to Pump	24-31	(18-23)
Oil Pan to Case	14-16	(10-12)
Converter Drain Plug	24-27	(18-20)
O/Drive Cylinder Fluid Feed	8-14	(6-10)
Stud — Valve Body to Case Short	9-11	(80-100 lb. in.)
Stud — Valve Body to Case Long	9-11	(80-100 lb. in.)
Nut — Valve Body to Case	9-11	(80-100 lb. in.)
Nut — Manual Detent Lever	41-54	(30-40)

Installation of Cooling Lines

Transmission	Radiator		Transmission		Fluid Line Nut	
	ft-lbs	N-m	ft-lbs	N-m	ft-lbs	N-m
E4OD	8-12	11-16	18-23	24-31	12-18	17-24

Fluid Capacity

Transmission Type	Liters	Quarts
4 x 2	16.4	15.5
4 x 4	16.9	16