



# FORD CD4E

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# Technical Service Information

## DIAGNOSIS AND TESTING

**CAUTION: The Transmission Tester MUST be removed from the transaxle and the vehicle harness reinstalled to verify these pressures.**

### LINE PRESSURE SPECIFICATIONS

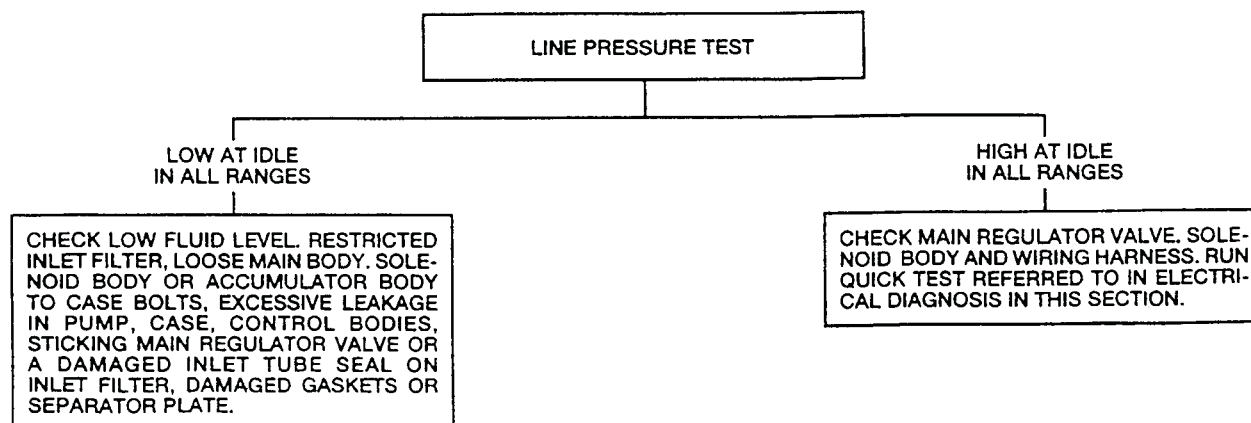
Line Pressure Range Selector Position	Idle		Stall	
	KPA	PSI	KPA	PSI
PARK, NEUTRAL	441-524	64-76	.....	.....
REVERSE	441-524	64-76	1786-2027	259-294
D	310-365	45-63	1158-1269	168-184
2	310-365	45-63	1158-1269	168-184
1	310-365	45-63	1158-1269	168-184

### OTHER CONCERN: CLUTCH/BAND APPLICATION CHART #601

Gear	2/4 Band	Reverse Clutch	Direct Clutch	Forward Clutch	Forward One-Way Clutch		Coast Clutch	Low/Rev Clutch	Low One-Way Clutch	
					Drive	Coast			Drive	Coast
REV		X						X		
1ST				X	X	OR			X	OR
2ND	X			X	X	OR			OR	OR
3RD			X	X	X	OR			OR	OR
4TH	X		X	X	OR	OR			OR	OR
M-2ND	X			X	X		X		OR	OR
M-1ST				X	X		X	X	X	

X = TRANSMITS TORQUE    OR = OVERRUNNING

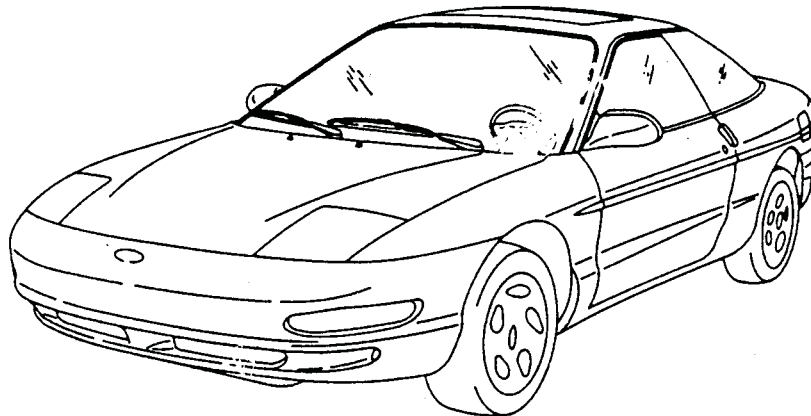
### Line Pressure Test Chart

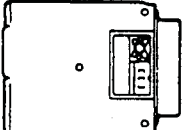
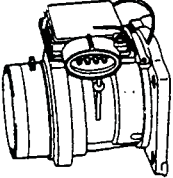
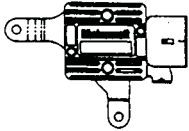
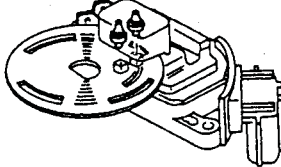

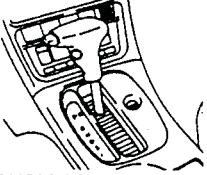
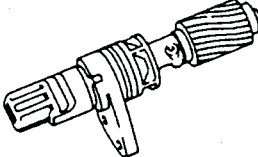
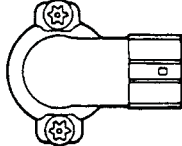
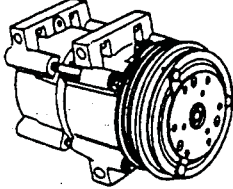
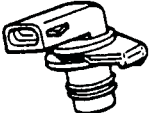
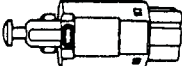

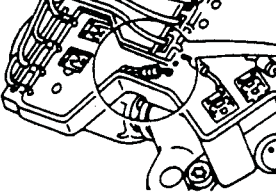
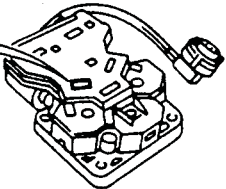
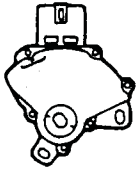


# Technical Service Information

## DESCRIPTION AND OPERATION

### Component Illustrations



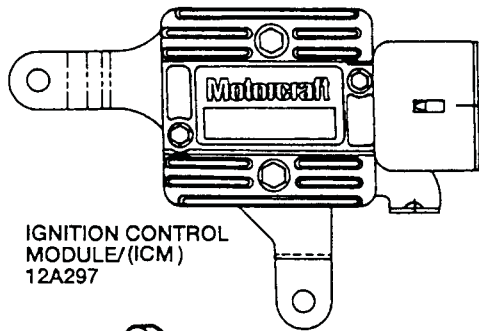
 <p><b>POWERTRAIN CONTROL MODULE (PCM) 12A650</b></p>	 <p><b>MASS AIR FLOW (MAF) SENSOR 12B579</b></p>	 <p><b>IGNITION CONTROL MODULE (ICM) 12A297</b></p>	 <p><b>CRANKSHAFT POSITION (CKP) SENSOR (PART OF 12127)</b></p>
 <p><b>TRANSMISSION CONTROL INDICATOR LAMP (TCIL)</b></p>	 <p><b>TRANSMISSION CONTROL SWITCH (TCS) 7Z247</b></p>	 <p><b>VEHICLE SPEED SENSOR (VSS) 9E731</b></p>	 <p><b>THROTTLE POSITION (TP) SENSOR 9B989</b></p>
 <p><b>AIR CONDITIONING CLUTCH (ACC)</b></p>	 <p><b>TRANSMISSION SPEED SENSOR (TSS) 7M101</b></p>	 <p><b>BRAKE ON/OFF (BOO) SWITCH 13480</b></p>	 <p><b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR 12A648</b></p>
 <p><b>TRANSMISSION OIL TEMPERATURE (TOT) SENSOR 7H141</b></p>	 <p><b>SOLENOID BODY ASSEMBLY</b></p> <p><b>INCLUDES:</b></p> <ul style="list-style-type: none"> <li>• ELECTRONIC PRESSURE CONTROL SOLENOID (EPC,</li> <li>• TORQUE CONVERTER CLUTCH SOLENOID (TCC)</li> <li>• TRANSMISSION OIL TEMPERATURE (TOT) SENSOR</li> <li>• 2 SHIFT SOLENOIDS (SS1 &amp; SS2)</li> <li>• 3-2 TIMING/COAST CLUTCH SOLENOID (3-2T/CCS)</li> </ul>	 <p><b>MANUAL LEVER POSITION (MLP) SENSOR 7F293</b></p>	

# Technical Service Information

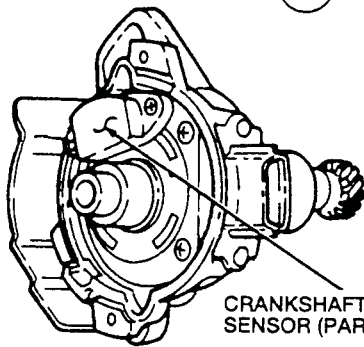
## DESCRIPTION AND OPERATION (Continued)

### Distributor Ignition (DI) System

The Distributor Ignition (DI) system has a Crankshaft Position (CKP) sensor and an Ignition Control Module (ICM). The CKP sensor sends crankshaft position information to the ICM, which sends an engine speed signal to the Powertrain Control Module (PCM).



IGNITION CONTROL  
MODULE/ (ICM)  
12A297



CRANKSHAFT POSITION (CKP)  
SENSOR (PART OF 12127)

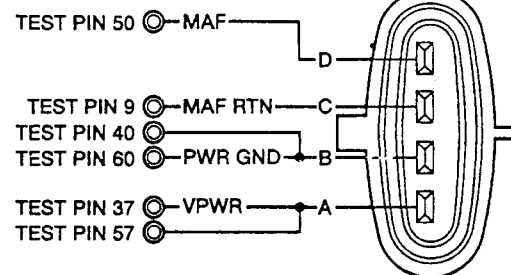
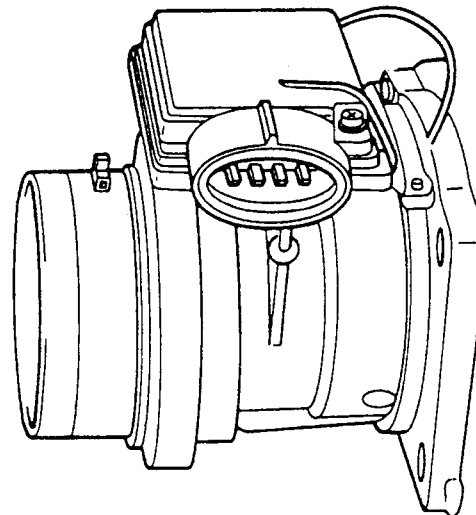
**Transaxle Function:** The PCM uses the engine speed signal from the DI system for control of line pressure, shift scheduling and Torque Converter Clutch (TCC). Wide Open Throttle (WOT) shift control is also affected by the DI system input.

**Symptoms:** If the engine speed signal has a fault, harsh engagements, firm shifts, or late WOT shifts may occur. Also, TCC apply may not occur.

**DTCs:** 211-217 and 225-241

### Mass Air Flow (MAF) Sensor 12B579:

The Mass Airflow Sensor (MAF) directly measures the mass of the air flowing into the engine. The MAF sensor output is a D.C. (analog) signal ranging from about 0.5 volts to 5.0 volts used by the Powertrain Control Module (PCM) to calculate the injector pulse width for stoichiometry. For transaxle strategies, the MAF sensor is used for Electronic Pressure Control (EPC) pressure control, shift and Torque Converter Clutch (TCC) scheduling.



**Transaxle Function:** EPC Pressure Control, Shift and TCC scheduling.

**Symptoms:** Incorrect shift schedule, EPC pressure hi or low, incorrect TCC engagement scheduling and symptoms similar to a Throttle Position (TP) Sensor malfunction. Malfunction Indicator Lamp (MIL) on.

**DTCs:** 157, 158, 159, 184 and 185

# Technical Service Information

## DESCRIPTION AND OPERATION (Continued)

### Solenoid Operations Chart

SOLENOID OPERATION CHART — CD4E

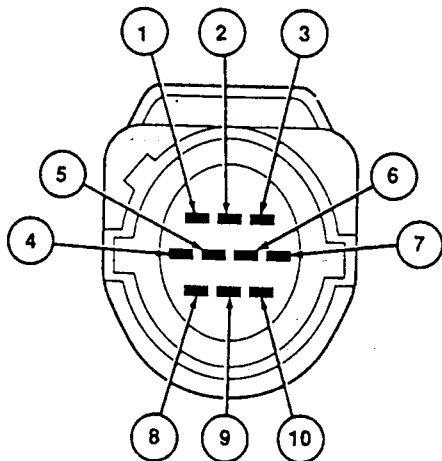
Transaxle Range Selector Lever Position	PCM Commanded Gear	CD4E Solenoids			
		SS1	SS2	3-2T/CCS	TCC
PARK	-	OFF	ON	-	OFF
REVERSE	-	OFF	OFF	-	#
NEUTRAL	-	OFF	ON	-	OFF
<b>OD</b>					
D	1	ON	ON	-	#
D	2	OFF	ON	-	.
D	3	OFF	OFF	-	.
D	4	ON	OFF	ON	.
<b>OD OFF</b>					
D	1	ON	ON	ON	#
D	2	OFF	ON	OFF	.
D	3	OFF	OFF	OFF	.
2	2	OFF	ON	OFF	.
" 2	3 "	OFF	OFF	OFF	.
1	1	ON	OFF	OFF	.
" 1	2	OFF	OFF	OFF	.
" 1	3	OFF	ON	OFF	.

# Not allowed by Hydraulics.

. Powertrain Control Module (PCM) commanded.

.. When a manual pull-in occurs above a calibrated speed the transaxle will not downshift from the higher gear until the vehicle speed drops below this calibrated speed.

### Transaxle Connector/Harness Diagram



D12352-C

CD4E TRANSAXLE CONNECTOR PIN LOCATIONS

Pin	Description	PCM Test Pin
1	TCC Power	37, 57
2	Signal Return	46

(Continued)

CD4E TRANSAXLE CONNECTOR PIN LOCATIONS (Cont'd)

Pin	Description	PCM Test Pin
3	TOT Signal	49
4	SS1 Signal	51
5	Solenoid Power	37, 57
6	SS2 Signal	52
7	TCC Signal	53
8	EPC Signal	38
9	EPC Power	37, 57
10	3-2T/CCS Signal	55

### DIAGNOSIS AND TESTING

#### Diagnostic Strategy

Troubleshooting an electronically controlled automatic transaxle is simplified by using the proven method of diagnosis. One of the most important things to remember is that there is a definite procedure to follow. **DO NOT TAKE SHORT CUTS OR ASSUME THAT CRITICAL CHECKS OR ADJUSTMENTS HAVE ALREADY BEEN MADE.** Follow the procedures as written to avoid missing critical components or steps.

To properly diagnose a concern, the technician should have the following publications available:

## Technical Service Information

### DIAGNOSTIC TROUBLE CODE DESCRIPTION CHARTS DTC DESCRIPTIONS

Three Digit DTC	Component	Description	Condition	Symptoms
645**	SS1, SS2, or internal parts.	1st gear failure.	No 1st gear.	Improper gear selection depending on condition mode and manual lever position: see solenoid ON/OFF chart. Shift errors may also be due to other internal transmission concerns (e.g., stuck valves, damaged friction material). May flash TCIL.
646**	SS1, SS2, or internal parts.	2nd gear failure.	No 2nd gear.	Improper gear selection depending on condition mode and manual lever position: see solenoid ON/OFF chart. Shift errors may also be due to other internal concerns (e.g., stuck valves, damaged friction material). May flash TCIL.
647**	SS1, SS2, or internal parts.	3rd gear failure.	No 3rd gear.	Improper gear selection depending on condition mode and manual lever position: see solenoid ON/OFF chart. Shift errors may also be due to other internal transmission concerns (e.g., stuck valves, damaged friction material). May flash TCIL.

\* Output circuit check, generated only by electrical symptoms.

\*\* May also be generated by some other non-electric transmission hardware system.

# Technical Service Information

## DIAGNOSIS AND TESTING (Continued)

### SHIFT CONCERNS: FEEL — SOFT/SLIPPING (Cont'd)

Possible Component	Reference / Action
<b>External Shift Linkage</b> <ul style="list-style-type: none"> <li>• Damaged, misadjusted or misassembled</li> </ul>	<ul style="list-style-type: none"> <li>• INSPECT and SERVICE as required. ADJUST linkage as outlined in the Service Manual. After servicing linkage, VERIFY that the Manual Lever Position Sensor is properly adjusted. REFER to Disassembly / Assembly procedures in Service Manual.</li> </ul>
<b>Improper Pressures</b> <ul style="list-style-type: none"> <li>• Low Line Pressure</li> </ul>	<ul style="list-style-type: none"> <li>• CHECK pressures at Line tap. PERFORM Line Pressure Tests. REFER to Pressure Chart #401 for specifications. If pressures are low or all shifts are soft / slipping, GO to Main Control, Oil Pump Assembly, Oil Filter / Seal Assembly.</li> <li>• If pressures are OK and a specific shift is soft / slipping, REFER to the appropriate routine(s) for additional diagnosis.</li> </ul> <p> <b>Shift 1-2, Routine 226 / 326</b>  <b>Shift 2-3, Routine 227 / 327</b>  <b>Shift 3-4, Routine 228 / 328</b>  <b>Shift 4-3, Routine 229 / 329</b>  <b>Shift 3-2, Routine 230 / 330</b>  <b>Shift 2-1, Routine 231 / 331</b> </p>
<b>Internal Shift Linkage</b> <ul style="list-style-type: none"> <li>• Damaged, misadjusted or misassembled</li> </ul>	<ul style="list-style-type: none"> <li>• INSPECT and SERVICE as required. ADJUST linkage as outlined in the Service Manual. After servicing linkage, VERIFY that the Manual Lever Position Sensor is properly adjusted. REFER to Disassembly / Assembly procedures in Service Manual.</li> </ul>
<b>Main Controls</b> <ul style="list-style-type: none"> <li>• Bolts not torqued to specifications</li> <li>• Gaskets damaged</li> <li>• Main Regulator Valve, Line Modulator Valve stuck, damage or misassembled or springs missing, tangled or damaged</li> <li>• EPC Solenoid stuck or damaged</li> <li>• Separator Plates damaged, blocked</li> <li>• Pressure Tap Plate / Gasket damaged or missing</li> </ul>	<ul style="list-style-type: none"> <li>• RETORQUE bolts to specifications.</li> <li>• INSPECT gaskets and REPLACE as required.</li> <li>• INSPECT for damage. SERVICE as required.</li> <li>• INSPECT for damage, contamination. ACTIVATE solenoid using the trans tester. SERVICE as required.</li> <li>• INSPECT for damage. SERVICE as required.</li> <li>• INSPECT for damage. SERVICE as required.</li> </ul>
<b>Oil Pump Assembly</b> <ul style="list-style-type: none"> <li>• Bolts are not torqued to specifications</li> <li>• Gaskets damaged</li> <li>• Porosity / cross leaks</li> </ul>	<ul style="list-style-type: none"> <li>• RETORQUE bolts to specifications.</li> <li>• INSPECT for damage and REPLACE as required.</li> <li>• INSPECT for porosity. SERVICE as required.</li> </ul>
<b>Oil Filter / Seal Assembly</b> <ul style="list-style-type: none"> <li>• Filter / Seal damaged, plugged or missing</li> <li>• Recirculating Seal damaged or out of position</li> </ul>	<ul style="list-style-type: none"> <li>• REPLACE filter and seal assembly.</li> <li>• REPLACE Recirculating Seal.</li> </ul>

### SHIFT CONCERNS: FEEL — HARSH

Possible Component	Reference / Action
<b>214 — ELECTRICAL ROUTINE</b>	
<b>Powertrain Control System</b> <ul style="list-style-type: none"> <li>• Electrical Inputs / Outputs, Vehicle Wiring Harnesses, Powertrain Control Module, EPC Solenoid, Transmission Oil Temperature Sensor, TSS, Throttle Position Sensor, Vehicle Speed Sensor, Mass Airflow Sensor, TCC Solenoid, Manual Lever Position Sensor, 3-2T / CCS</li> </ul>	<ul style="list-style-type: none"> <li>• PERFORM Torque Converter Clutch Operation Test</li> <li>• Run OBD Tests with a scanner. SERVICE as required. CLEAR codes. ROAD TEST and RERUN OBD Tests.</li> </ul>
<b>314 — HYDRAULIC / MECHANICAL ROUTINE</b>	
<b>Fluid</b> <ul style="list-style-type: none"> <li>• Improper level</li> <li>• Condition</li> </ul>	<ul style="list-style-type: none"> <li>• ADJUST fluid to proper level.</li> <li>• INSPECT per Service Manual instructions under Fluid Condition Check.</li> </ul>
<b>CV Joint / Front Wheel Driveshafts and Joints</b> <ul style="list-style-type: none"> <li>• Damaged, loose, splines damaged</li> </ul>	<ul style="list-style-type: none"> <li>• INSPECT for damage. SERVICE as required.</li> </ul>
<b>Powertrain Mounts</b>	

(Continued)



# Technical Service Information

## DIAGNOSIS AND TESTING (Continued)

### SHIFT CONCERNS: SOFT/SLIPPING 4-3 SHIFT (AUTOMATIC)

Possible Component	Reference/Action
<b>229 — ELECTRICAL ROUTINE</b>	
<b>Powertrain Control System</b> <ul style="list-style-type: none"> <li>● Electrical Inputs / Outputs, Vehicle Wiring Harnesses, Powertrain Control Module, EPC Solenoid, Vehicle Speed Sensor, Mass Airflow Sensor, Throttle Position Sensor</li> </ul>	<ul style="list-style-type: none"> <li>● Run OBD Tests with a scanner. SERVICE as required. CLEAR codes. ROAD TEST and RERUN OBD Tests.</li> </ul>
<b>329 — HYDRAULIC/MECHANICAL ROUTINE</b>	
<b>Main Control</b> <ul style="list-style-type: none"> <li>● Bolts not torqued to specifications</li> <li>● Gasket Leaks</li> <li>● Servo Release Shuttle Valve, Main Regulator Valve stuck, damaged, or misassembled</li> <li>● Hydraulic passages damaged</li> <li>● Pressure Tap Plate / Gasket leaks, or damaged</li> <li>● Separator Plates damaged, blocked</li> </ul>	<ul style="list-style-type: none"> <li>● RETORQUE bolts to specifications.</li> <li>● INSPECT for damage and REPLACE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> </ul>
<b>INT/OD Band and Servo Assembly</b> <ul style="list-style-type: none"> <li>● INT/OD Band and Reverse Clutch Drum Assembly worn, damaged or misassembled</li> <li>● Servo Return Spring broken</li> <li>● Servo Rod damaged</li> <li>● Piston seal damaged</li> </ul>	<ul style="list-style-type: none"> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> </ul>
<b>Direct Clutch Assembly</b> <ul style="list-style-type: none"> <li>● Seals damaged, missing</li> <li>● Piston damaged</li> <li>● Check Ball damaged, missing or leaking</li> <li>● Return Spring damaged</li> <li>● Friction elements damaged</li> </ul>	<ul style="list-style-type: none"> <li>● PERFORM Air Pressure Check.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> </ul>
<b>Forward/Coast Clutch Assembly</b> <ul style="list-style-type: none"> <li>● Seals damaged, missing</li> <li>● Piston damaged</li> <li>● Friction Elements worn, damaged</li> <li>● Check Ball not functioning</li> <li>● Forward Clutch Piston and Return Spring damaged</li> </ul>	<ul style="list-style-type: none"> <li>● PERFORM Air Pressure Check.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> </ul>
<b>Case</b> <ul style="list-style-type: none"> <li>● Porosity / cross leaks in Servo Apply, Servo Release, Direct Clutch circuits</li> </ul>	<ul style="list-style-type: none"> <li>● INSPECT for damage. PERFORM Air Pressure Check. SERVICE as required.</li> </ul>

### SHIFT CONCERNS: SOFT/SLIPPING 3-2 SHIFT (AUTOMATIC)

Possible Component	Reference/Action
<b>230 — ELECTRICAL ROUTINE</b>	
<b>Powertrain Control System</b> <ul style="list-style-type: none"> <li>● Electrical Inputs / Outputs, Vehicle Wiring Harnesses, Powertrain Control Module, EPC Solenoid, Throttle Position Sensor, Vehicle Speed Sensor, Mass Airflow Sensor, 3-2 Timing / Coast Clutch Solenoid (3-2T/CCS)</li> </ul>	<ul style="list-style-type: none"> <li>● Run OBD Tests with a scanner. SERVICE as required. CLEAR codes. ROAD TEST and RERUN OBD Tests.</li> </ul>
<b>330 — HYDRAULIC/MECHANICAL ROUTINE</b>	
<b>Main Control</b> <ul style="list-style-type: none"> <li>● Bolts not torqued to specifications</li> <li>● Gasket damaged</li> <li>● 3-2 Timing Valve, Solenoid Regulator Valve, 3-2 Control Valve stuck, damaged or misassembled</li> <li>● 3-2T/CCS Solenoid malfunction</li> </ul>	<ul style="list-style-type: none"> <li>● RETORQUE bolts to specifications.</li> <li>● INSPECT for damage and REPLACE as required.</li> <li>● INSPECT for damage. SERVICE as required.</li> <li>● ACTIVATE solenoid using transmission tester. SERVICE as required.</li> </ul>

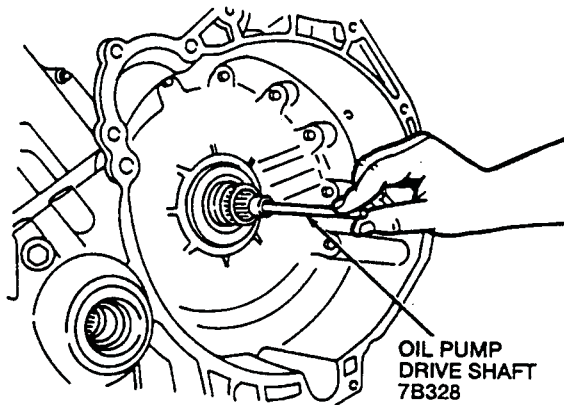
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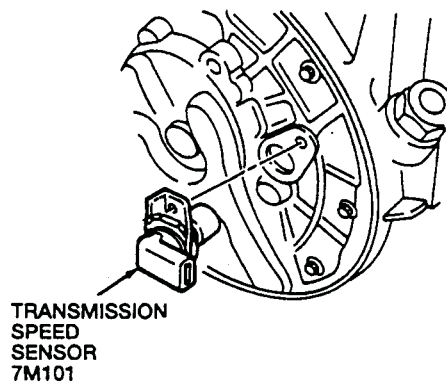
# Technical Service Information

## DISASSEMBLY

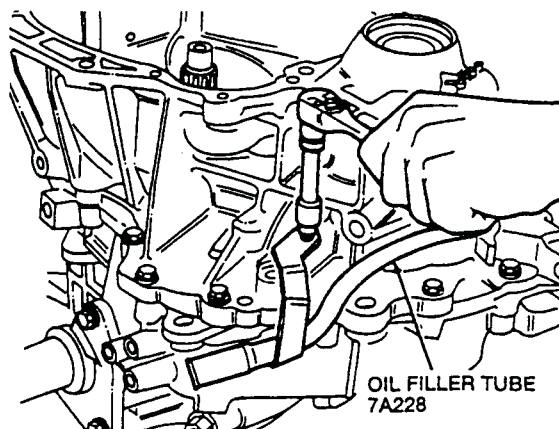
Remove the oil pump drive shaft by pulling it from the end of the turbine shaft assembly.



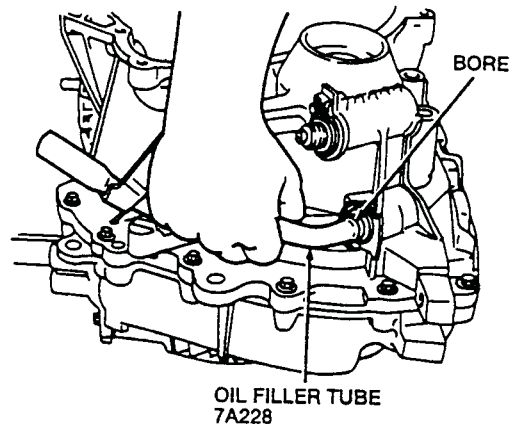
Pull the transmission speed sensor from the bore.



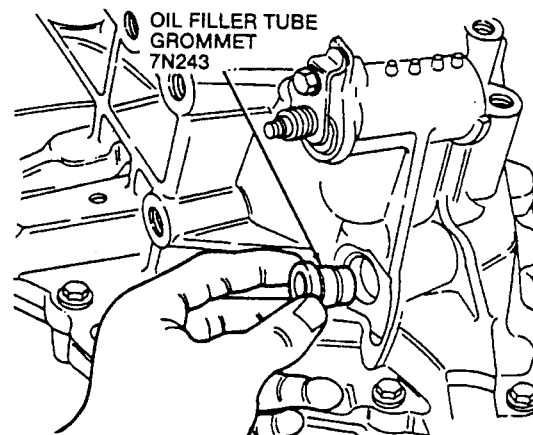
Remove the oil filler tube bolt.



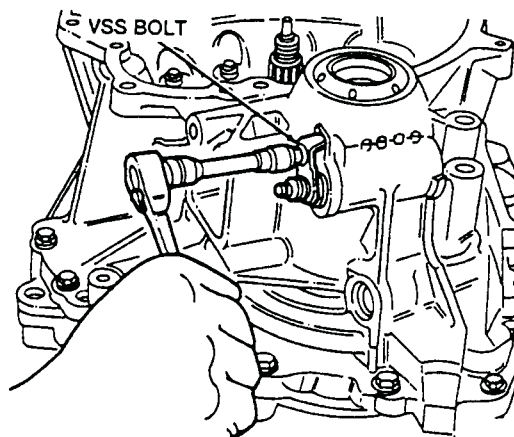
Pull the oil filler tube from the bore.



Remove the oil filler tube and discard the oil filler tube grommet.



Remove the Vehicle Speed Sensor (VSS) bolt using an 8mm socket.

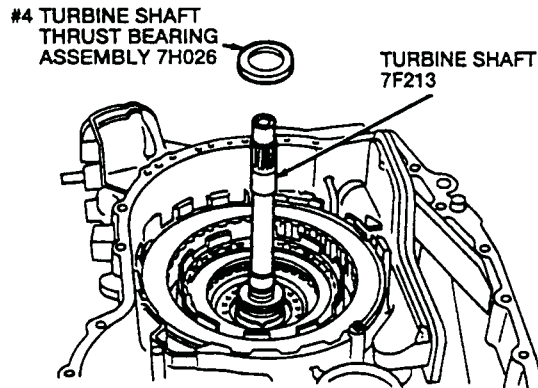


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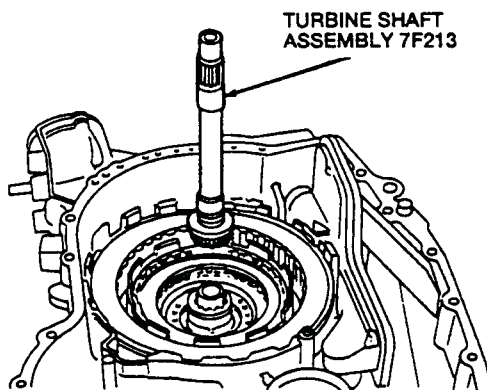
## DISASSEMBLY (Continued)

NOTE: The #4 turbine shaft thrust bearing assembly may be attached to the forward one-way clutch and Low-Intermediate sun gear assembly.

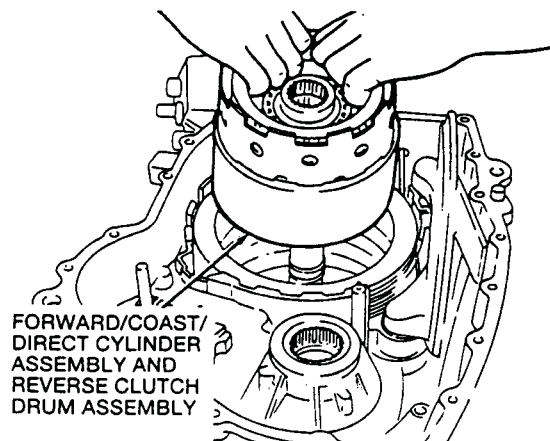
Remove the #4 turbine shaft thrust bearing assembly.



Remove the turbine shaft assembly.

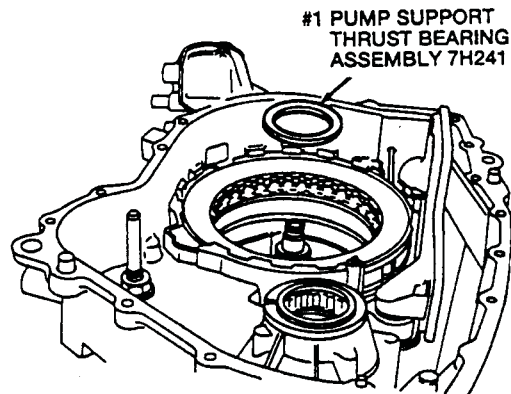


Remove the assembly of the Forward/Coast/Direct (F/C/D) cylinder assembly and reverse clutch drum assembly.



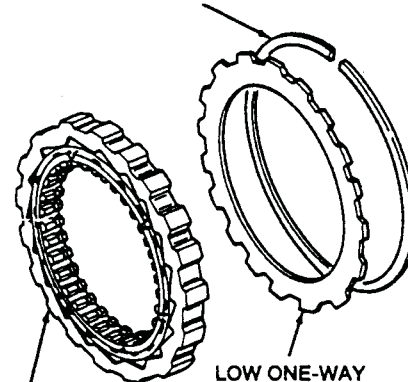
NOTE: The #1 pump support thrust bearing assembly may be attached to the reverse clutch drum assembly.

Remove the #1 pump support thrust bearing assembly.



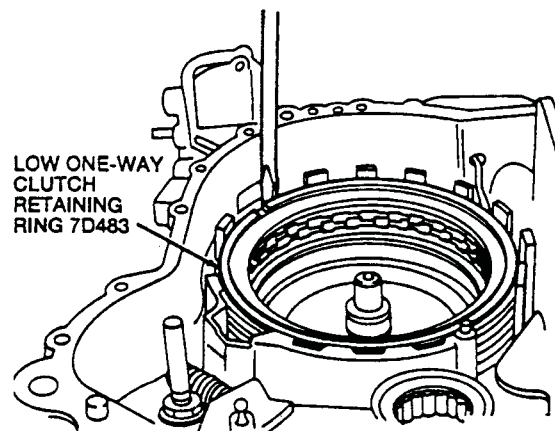
### Low One-Way Clutch Assembly

LOW ONE-WAY CLUTCH RETAINING RING 7D483



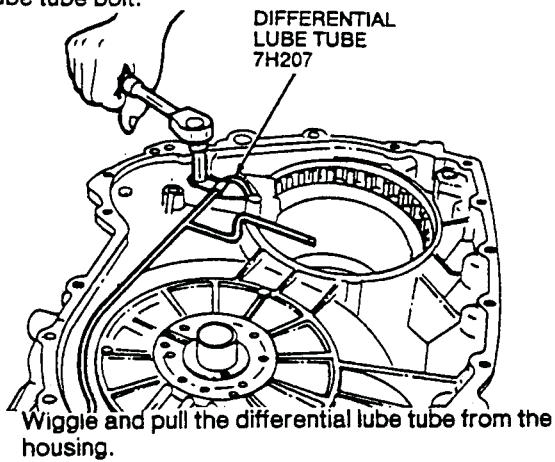
LOW ONE-WAY CLUTCH ASSEMBLY 7A089

Remove the low one-way clutch retaining ring.

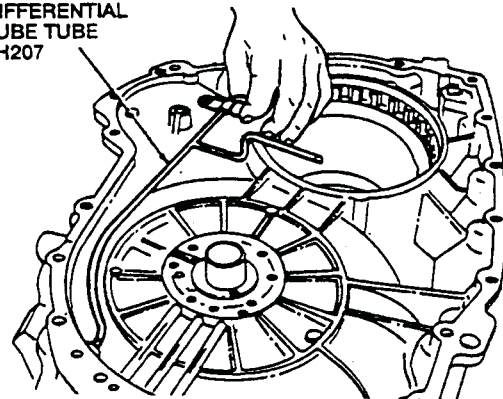


# Technical Service Information

Use an 8mm socket to remove the differential lube tube bolt.

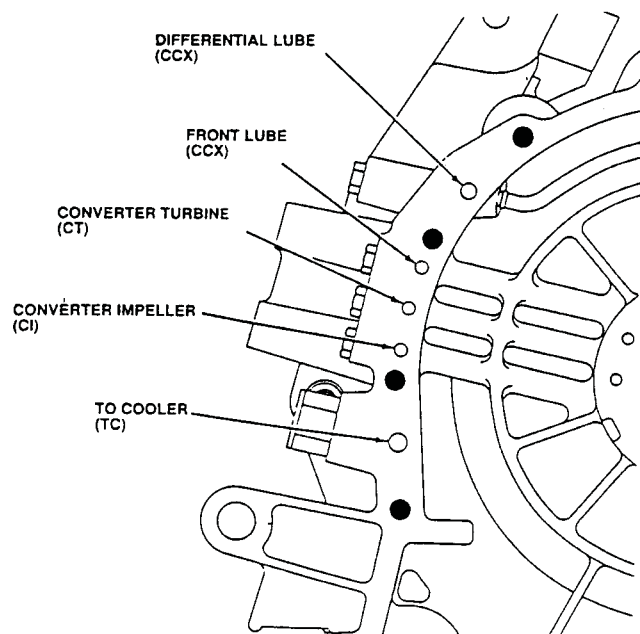


DIFFERENTIAL LUBE TUBE 7H207



Clean all parts thoroughly in clean solvent and blow dry with moisture-free compressed air.

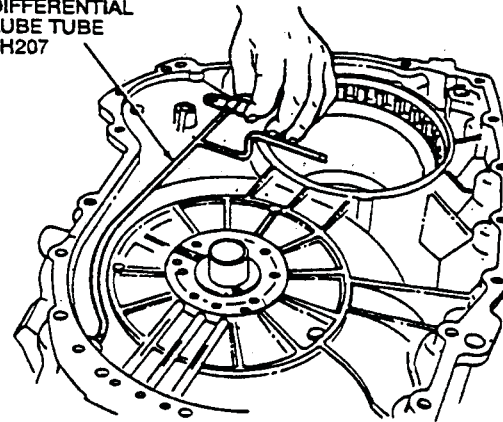
## HYDRAULIC PASSAGES CONVERTER HOUSING



## Assembly

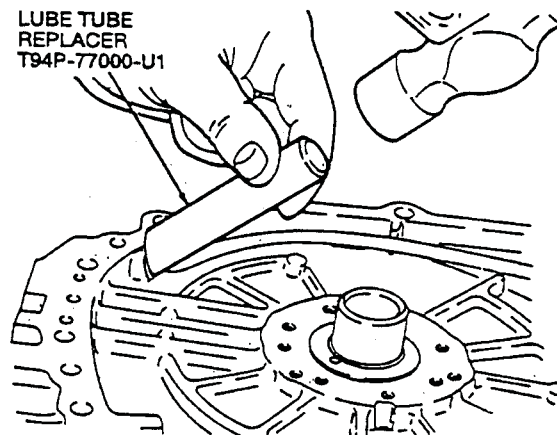
Push the differential lube tube into the converter housing.

DIFFERENTIAL LUBE TUBE 7H207

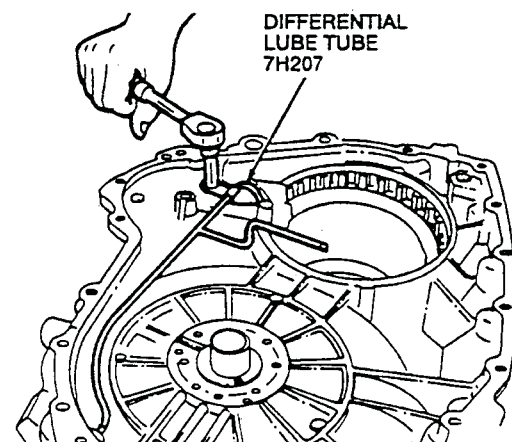


Seat the end of the differential lube tube with a Lube Tube Replacer T94P-77000-V1 (part of Lube Tube Replacer Set T94P-77000-U).

LUBE TUBE REPLACER T94P-77000-U1



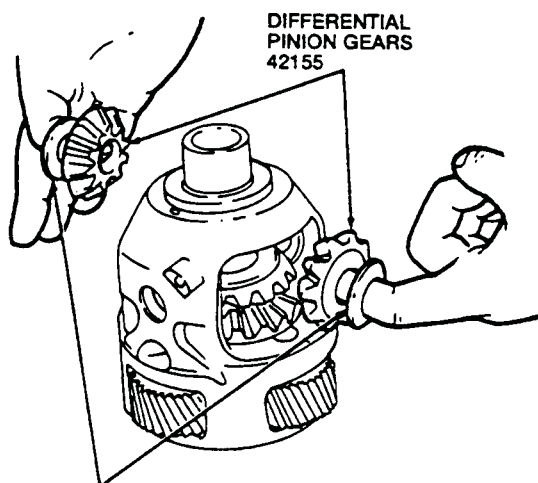
Use an 8mm socket to install and tighten the differential lube tube bolt to 13 N·m (10 lb-ft).



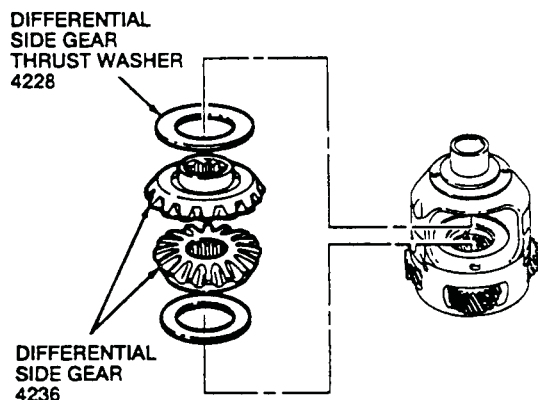
# Technical Service Information

(Continued)

Remove the differential pinion gears and differential pinion thrust washers (4230).



Remove the differential side gears and differential side gear thrust washers (4228).



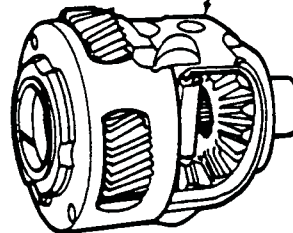
Clean all parts thoroughly in clean solvent and blow dry with moisture-free compressed air. Inspect the differential parts for damage and wear.

- gear teeth
- thrust washer surface
- thrust bearing surface
- pinion shaft

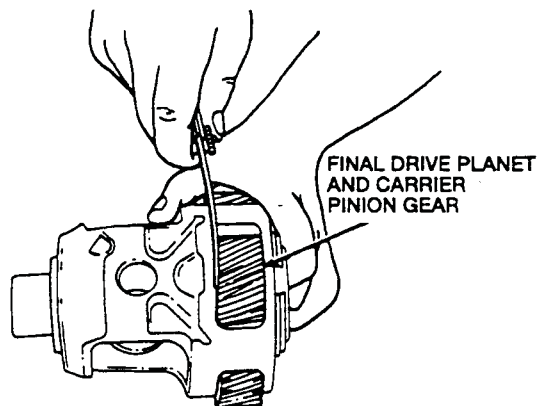
Inspect the final drive planet and carrier (7F465):

- Pinion gear teeth
- Pinion gear bearings
- Thrust bearing surfaces
- Bushing surfaces

FINAL DRIVE CARRIER AND DIFFERENTIAL ASSEMBLY

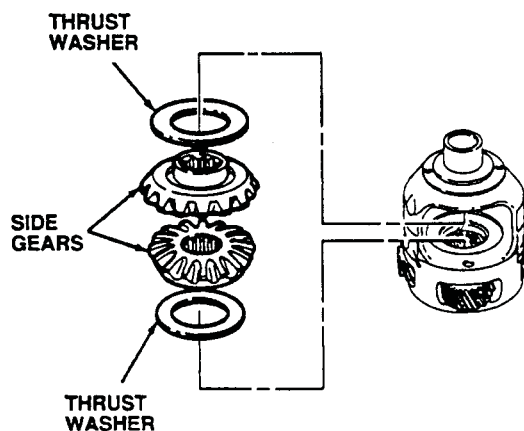


Inspect the final drive planet and carrier pinion gear end play. End play should be between 0.17 to 0.65mm (0.006 to 0.025 inch).



## Assembly

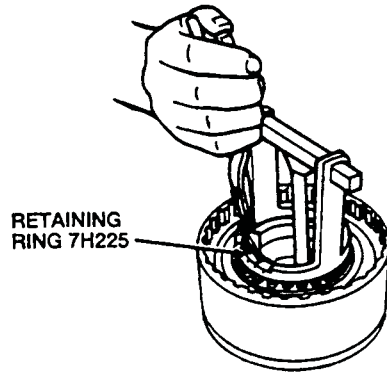
Install the differential side gears and differential side gear thrust washers.



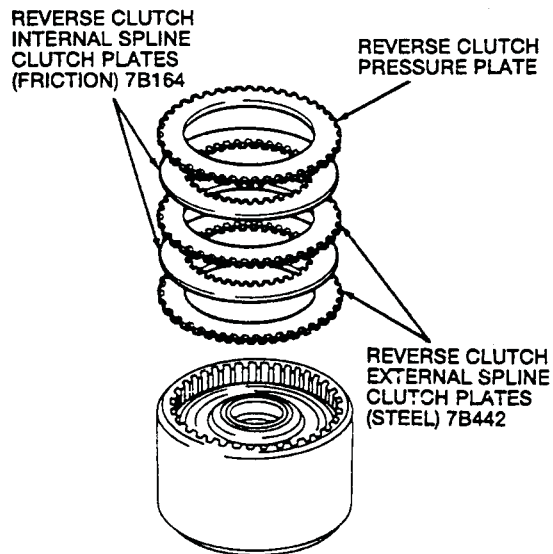
# Technical Service Information

## DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES (Continued)

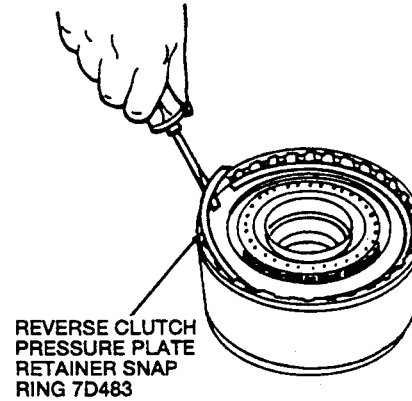
Use a pair of snap ring pliers to install the retaining ring.



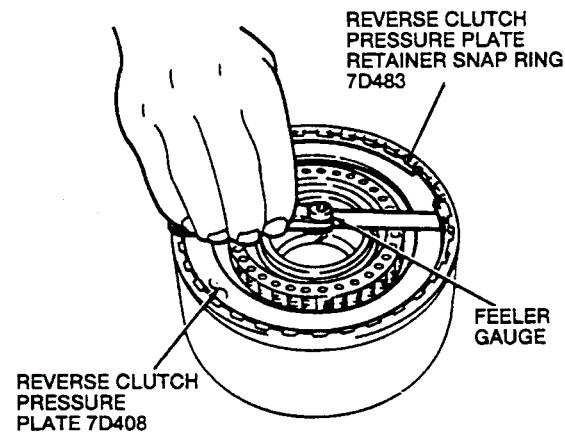
Remove the spring compressor.  
Install the reverse clutch plates.



Install the reverse clutch pressure plate retainer snap ring (selective fit).



Use a feeler gauge to measure the clearance between the reverse clutch pressure plate and the reverse clutch pressure plate retainer snap ring. Make a second measurement on the opposite side. Average the two measurements to get the clearance.



The standard clearance is 0.33 to 0.89mm (0.01 to 0.04 inch). If the clearance is not within the specification, select and install the proper thickness snap ring to obtain the standard clearance.

Snap ring sizes are as follows:

Thickness mm (inch)
1.39-1.49 (0.055 to 0.059)
1.53-1.63 (0.060 to 0.064)
1.68-1.78 (0.066 to 0.070)

### Forward/Coast/Direct Clutches

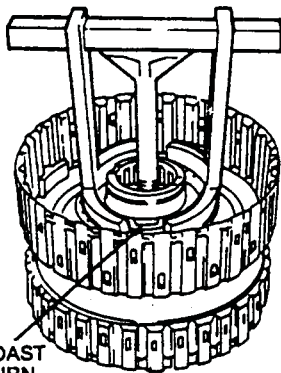
The following illustration is an exploded view of the forward/clutch/direct clutches.



# Technical Service Information

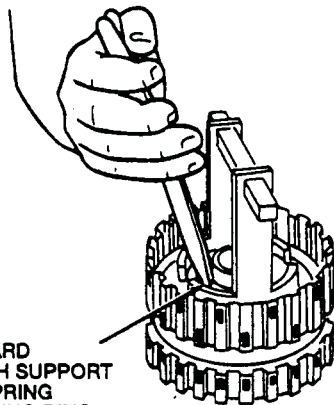
## DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES (Continued)

Use Clutch Spring Compressor T65L-77515-A to compress the forward/coast clutch return spring assembly.



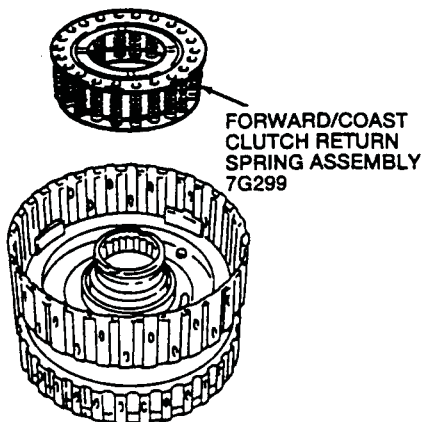
FORWARD/COAST CLUTCH RETURN SPRING ASSEMBLY 7G299

Use a pair of snap ring pliers to remove the forward clutch spring retaining ring.



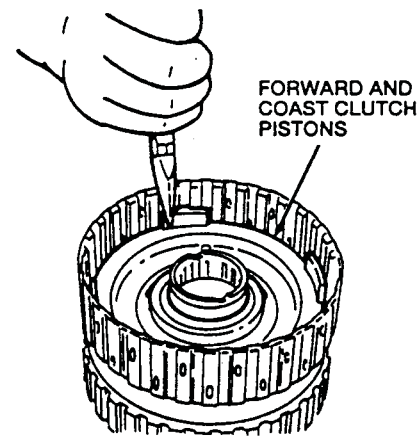
FORWARD CLUTCH SUPPORT AND SPRING RETAINING RING

Remove the spring compressor and the forward/coast clutch return spring assembly.



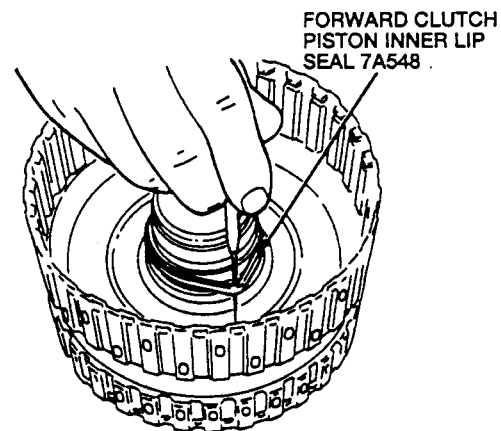
FORWARD/COAST CLUTCH RETURN SPRING ASSEMBLY 7G299

14. Use a pair of needle nose pliers to remove the forward and coast clutch pistons.



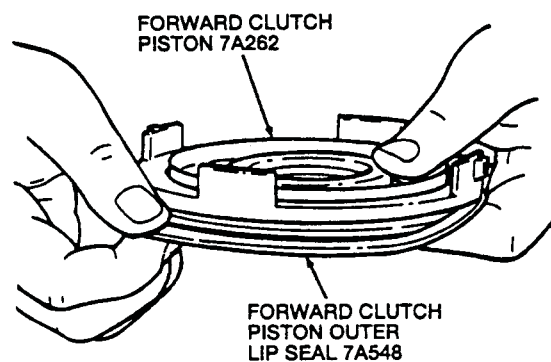
FORWARD AND COAST CLUTCH PISTONS

Use O-Ring Tool T71P-19703-C to remove the forward clutch piston inner lip seal from the Forward/Coast/Direct clutch cylinder assembly. Discard the seal.



FORWARD CLUTCH PISTON INNER LIP SEAL 7A548

Remove the forward clutch piston outer lip seal. Discard the seal.



FORWARD CLUTCH PISTON 7A262

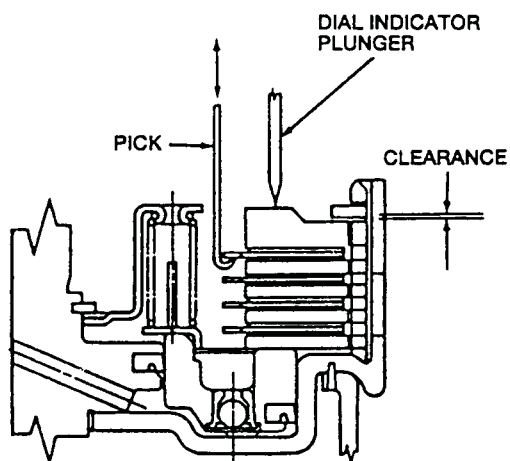
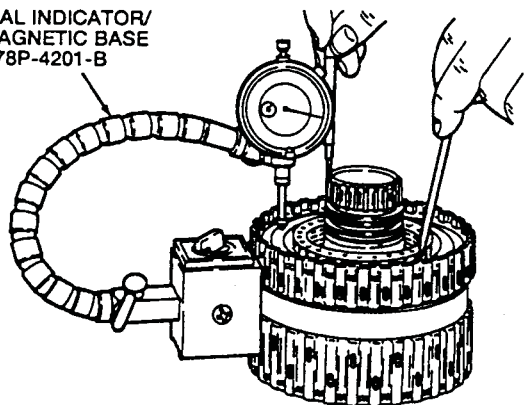
FORWARD CLUTCH PISTON OUTER LIP SEAL 7A548

# Technical Service Information

## DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES (Continued)

- Use two picks to pull the direct clutch pressure plate upward. Observe the dial indicator reading.

DIAL INDICATOR/  
MAGNETIC BASE  
D78P-4201-B



- Make a second measurement on the opposite side. Average the two measurements to get the clearance.

The standard clearance is 0.52 to 1.12mm (0.02 to 0.04 inch). If the clearance is not within the specification, select and install the proper thickness direct clutch pressure plate retainer snap ring to obtain the standard clearance.

Retaining ring sizes are as follows:

Thickness mm (inch)
1.28-1.38 (0.05-0.054)
1.39-1.49 (0.055-0.59)
1.52-1.62 (0.06-0.064)
1.65-1.75 (0.065-0.069)

## Forward/Coast/Direct Clutch Cylinder Assembly and Reverse Clutch Drum Assembly (Assembly)

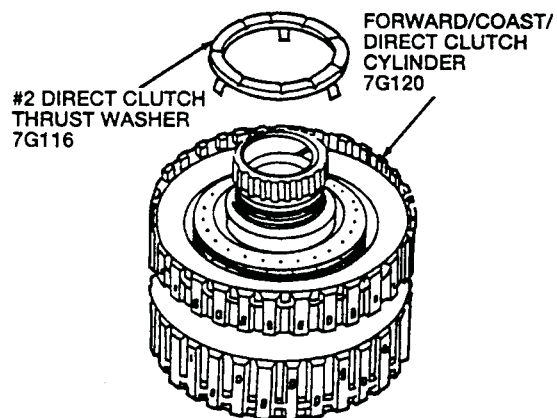
### Assembly

#### SPECIAL SERVICE TOOL(S) REQUIRED

Description	Tool Number
Coast Clutch Piston Seal Sizer	T94P-77000-D4

**CAUTION:** The tabs on the #2 direct clutch thrust washer must be seated in the direct clutch support and spring.

Install the #2 direct clutch thrust washer on the Forward/Coast/Direct clutch cylinder with the tabs facing down.



**NOTE:** Ensure that the reverse clutch cylinder seals are overlapped correctly.

