INDEX

AUTOMATIC TRANSMISSION SERVICE GROUP
9200 S. DADELAND BLVD.
SUITE 720
MIAMI, FLORIDA 33156
(305) 670-4161

Updated
July, 2003

INTRODUCTION
FORD 5R55E

The 5R55E transmission produced by Ford Motor Company, was introduced in the 1997 model year, and is the first 5 speed automatic found in domestic vehicles. It is currently found in the 1997 Aerostar Van, 1997-2001 Ranger Trucks, both 2WD and 4WD, and 1997-2001 Explorer vehicles, equipped with the 4.0L engine. This unit is very similar to the 4R44E, but has different computer strategy that energizes the overdrive band in first gear, to create the added gear ratio. Refer to the application chart found on Page 7 for the new computer strategy. Many of the parts between the 4R44E and 5R55E units may look the same, but are not all interchangeable. Be very careful when selecting replacement parts, if it becomes necessary.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

DALE ENGLAND
FIELD SERVICE CONSULTANT

WAYNE COLONNA
TECHNICAL SUPERVISOR

PETER LUBAN
TECHNICAL CONSULTANT

JON GLATSTEIN
TECHNICAL CONSULTANT

JERRY GOTT
TECHNICAL CONSULTANT

GERALD CAMPBELL
TECHNICAL CONSULTANT

JIM DIAL
TECHNICAL CONSULTANT

ED KRUSE
TECHNICAL CONSULTANT

GREGORY LIPNICK
TECHNICAL CONSULTANT

DAVID CHALKER
TECHNICAL CONSULTANT

STANTON ANDERSON
TECHNICAL CONSULTANT

ROLAND ALVAREZ
TECHNICAL CONSULTANT

AUTOMATIC TRANSMISSION SERVICE GROUP
9200 S. DADELAND BLVD. SUITE 720
MIAMI, FLORIDA 33156
(305) 670-4161

FORD 5R55E
GENERAL DESCRIPTION

Transmission Description

The 5R55E automatic transmission is an electronically controlled five-speed unit.

The 5R55E transmission is used with the 4.0L engine applications.

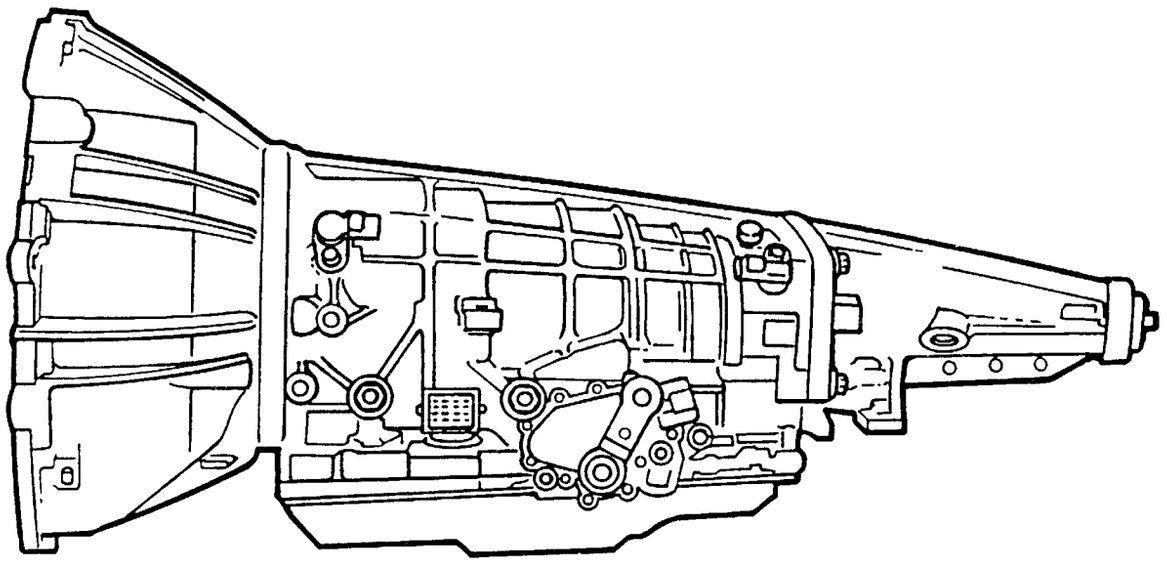
This transmission features a four element torque converter with a torque converter clutch (TCC). The geartrain includes:

- Three compound planetary gearsets
- Three bands
- Three multi-plate clutches
- Two one-way clutches

The hydraulic functions are directed by electronic solenoids to control:

- Engagement feel
- Shift feel
- Shift scheduling
- Modulated TCC applications
- Timing of the 3-2 T.D. and K.D. shifts
- Engine braking (with O/D canceled) utilizing the coast clutch
- Manual 1st timing

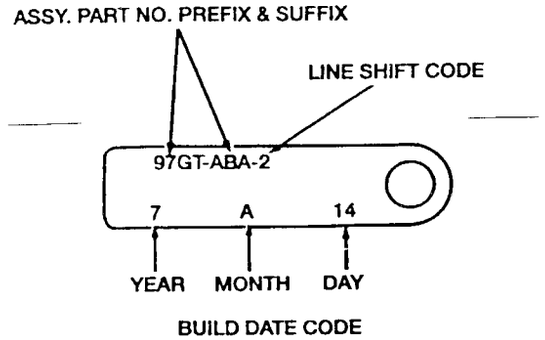
Transmission View



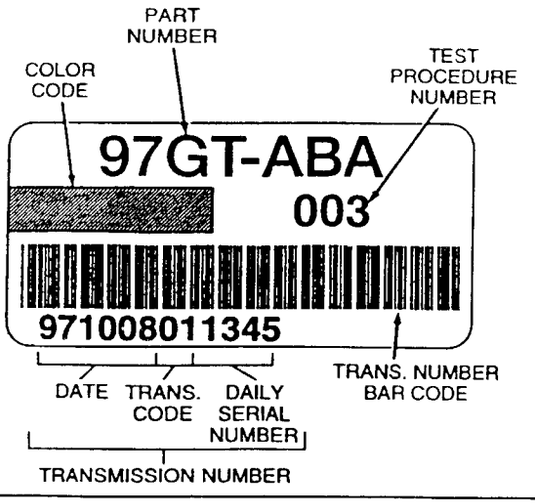
Identification Tags

Models are identified by a service identification tag affixed to the assembly. Typical service identification tags are shown below.

Located Under Extension Housing Bolt



Assembly Plant Bar Code I.D. Label Located on Fluid Pan



BRAKE SHIFT INTERLOCK SYSTEM

The Brake Shift Interlock System prevents the transmission range selector lever from being shifted out of PARK position unless the ignition key is in the ON position and the brake pedal is depressed. The brake shift consists of an electrical solenoid mounted at the base of the steering column. If ignition key is in the RUN position, the solenoid continually runs unless the brake is depressed.

If the brake circuit fuse is blown or the solenoid has internally shorted, the vehicle will not shift from the PARK position even if the ignition is on and the brake pedal is depressed. The interlock can be temporarily overridden by the following:

1. Apply parking brake.
2. Remove the ignition key.
3. Insert the ignition key and rotate one position clockwise (ignition off).
4. Shift the selector lever to neutral.

NOTE: If the vehicle is shifted into PARK, the above procedure must be repeated.

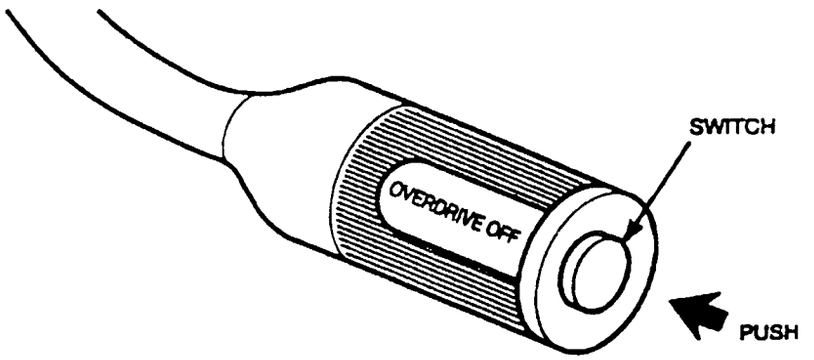
5. Start the vehicle.

Transmission Control Switch (TCS)

The Transmission Control Switch (TCS) is a driver-controlled momentary contact switch mounted on the end of the transmission range selector lever. When the TCS is activated (TCIL on), 5th gear operation (overdrive) is cancelled.

Transmission Control Indicator Lamp (TCIL)

The Transmission Control Indicator Lamp (TCIL) is located on the instrument panel or on the end of the transmission range selector lever (model dependant) and is a visual cue to let the driver know that the TCS has been depressed and 5th gear has been cancelled (TCS on/TCIL activated). The TCIL will flash if the Powertrain Control Module (PCM) detects a concern in certain transmission-related sensors or solenoids.



TRANSMISSION CONTROL SWITCH
(LOCATED ON THE END OF THE TRANSMISSION RANGE SELECTOR LEVER)

TRANSMISSION RANGE SELECTOR AND SHIFT PATTERNS

The 5R55E transmission range selector lever has six positions: P, R, N, Ⓓ, 2, 1. The driver selects the required gear position by moving the selector lever to the various positions. Interlocking cables and linkages connect the selector lever to the transmission. This allows the selector lever to move internal linkages and the manual control valve, which signals the driver demand.

Park

No powerflow is transferred through the transmission in PARK. The manual lever shaft, which is connected to a park rod, presses the parking pawl into the park gear on the output shaft. This locks the output shaft and prevents the vehicle from rolling. However, for safety reasons, the parking brake should be applied whenever the vehicle is parked.

While the engine can be started in either P or N position, the ignition key can only be removed in PARK.

Reverse

Reverse gear allows the vehicle to be operated in a rearward direction, at a reduced gear ratio.

Neutral

As in PARK, there is no power transferred through the transmission. However, the final drive is not locked by the parking pawl, so the wheels are free to rotate. The vehicle may be started in the N position, but the ignition key cannot be removed.

Overdrive

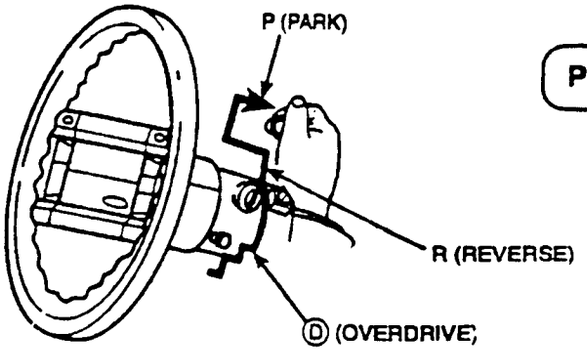
In the Ⓓ position, the transmission will upshift or downshift 1-2-3-4-5 automatically. When overdrive has been cancelled by depressing the Transmission Control Switch (TCS) and activating Transmission Control Indicator Lamp (TCIL), the transmission will not upshift to 5th gear and engine braking is provided.

2nd Position

Selection of the 2 position provides a 3rd gear hold position from a manual upshift or downshift. When the 2 position is selected from a stop, the transmission will start in 3rd gear. This allows for maximum traction on slippery surfaces. Engine braking is provided in the 2 position when the Transmission Control Switch (TCS) is on or off.

1st Position

The 1 position provides a 1st gear hold after an automatic or manual downshift. The transmission is prevented from downshifting above a specific speed (approximately 48 km/h [30 mph]) to protect the powertrain from overspeeding. Engine braking is provided in the manual 1 position when the Transmission Control Switch (TCS) or (TCIL) is on or off.



TORQUE CONVERTER

The 5R55E uses a four-element torque converter. The converter contains the standard internal components (turbine, impeller, and stator) for transfer of power and multiplication of torque. It also utilizes a disc-type Torque Converter Clutch (TCC) for maximum fuel economy.

When applied, the TCC provides a mechanical link between the converter turbine and the engine, allowing for a direct mechanical power transfer from the engine to the transmission. The converter clutch pressure plate is applied and released by fluid pressure, which is controlled by the Powertrain Control Module (PCM). The PCM controls the torque converter clutch using a pulse-width modulated TCC solenoid. The torque converter damper is functional full time for improved NVH.

Filter

All fluid drawn from the pan passes through the filter. The filter and its accompanying seals are part of the fluid path to the fluid pump.

The filter also has a bypass section. This allows the fluid, which is vented at the main regulator valve, to be recirculated to the pump without passing through the filtering element.

Pump

The pump provides the fluid pressure required to charge the torque converter, main control assembly, transmission cooling system, lubrication system and apply devices.

The 5R55E has a positive displacement gear and crescent-type pump which is driven by the torque converter hub.

Main Control Assembly

The main control assembly and related components are part of the pressure side of the 5R55E hydraulic system. The main control assembly consists of the solenoids, the valve body assembly and the separator plate.

All valves inside the main control assembly are anodized aluminum. This means they cannot be sanded, filed or dressed in any way that may damage the valves' surface. If the valves have any scratches, burrs or nicks that prevent free movement, the main control assembly must be replaced.

ELECTRONICS

Shift scheduling, timing and feel (line pressure), as well as Torque Converter Clutch (TCC) operation in the 5R55E are controlled electronically by the Powertrain Control Module (PCM).

Input signals from various engine sensors (refer to Figures 6 and 7) give the PCM information about the engine's operating state. Other inputs are based on driver demands, such as the accelerator pedal position, which is monitored by the PCM using the Throttle Position (TP) sensor. Inputs are also supplied by the transmission itself. The Turbine Shaft Speed (TSS) sensor, the Output Shaft Speed (OSS) sensor, the Overdrive Drum Speed (ODS) sensor and the Transmission Fluid Temperature (TFT) sensor supply information to the PCM.

Using these input signals, the PCM can determine when the time and conditions are right for a shift or TCC application. The PCM also determines the line pressure needed to optimize shift feel. To accomplish this, the PCM controls six solenoids (outputs): four on/off for upshifts, downshifts and coast clutch application, one for pulse-width modulated control of the torque converter clutch and one VFS for electronic line pressure control.

	FRONT BAND	INTERMEDIATE BAND	LOW/REVERSE BAND	FORWARD CLUTCH	DIRECT CLUTCH	COAST CLUTCH	FRONT ONE-WAY CLUTCH		REAR ONE-WAY CLUTCH		SHIFT SOLENOID 1 (SS1)	SHIFT SOLENOID 2 (SS2)	SHIFT SOLENOID 3 (SS3)	SHIFT SOLENOID 4 (SS4)	ENGINE BRAKING	TCIL
							DRIVE	COAST	DRIVE	COAST						
PARK											ON	OFF	OFF	OFF	NE	NE
REVERSE			A		A		H	OR			ON	OFF	OFF	OFF	NO	OFF
NEUTRAL											ON	OFF	OFF	OFF	NE	NE
1ST				A			H	OR	H	OR	ON	OFF	OFF	OFF	NO	OFF
1ST*				A		A	H	H	H	OR	ON	OFF	OFF	OFF	NO	ON
2ND	A			A			H	OR	H	OR	ON	OFF	ON	OFF	NO	OFF
2ND*	A			A			H	OR	H	OR	ON	OFF	ON	OFF	NO	ON
3RD		A		A			H	OR	OR	OR	ON	ON	OFF	OFF	NO	OFF
3RD*		A		A			H	H	OR	OR	ON	ON	OFF	OFF	NO	ON
4TH				A			H	OR	OR	OR	OFF	OFF	OFF	OFF	NO	OFF
4TH*				A	A	A	H	H	OR	OR	OFF	OFF	OFF	ON	YES	ON
5TH	A			A	A		OR	OR	OR	OR	OFF	OFF	ON	OFF	YES	OFF
MAN. 1ST			A	A		A	H	H	OR	OR	ON	OFF	OFF	ON	YES	NE
MAN. 2ND		A		A		A	H	H	OR	OR	ON	ON	OFF	ON	YES	NE

A = APPLIED H = HOLD OR = OVERRUNNING * = OVERDRIVE CANCELLED NE = NO EFFECT

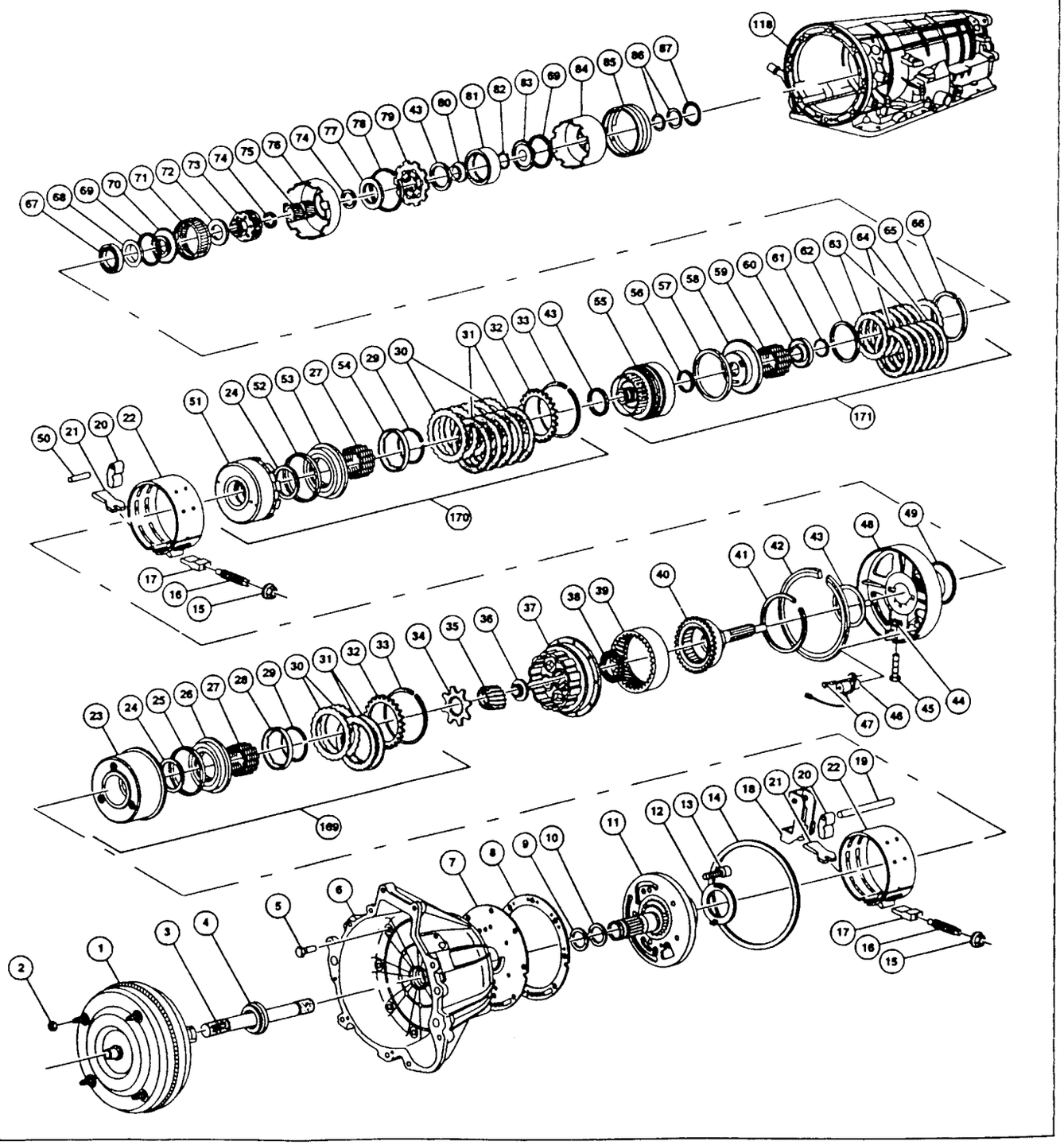
SOLENOID APPLICATION CHART — 5R55E

Transmission Range Selector Lever Position	Powertrain Control Module (PCM) Commanded Gear	5R55E Solenoid States				
		SS1	SS2	SS3	SS4	Engine Braking
P/N	P/N	On	Off	Off	Off	No
R	R	On	Off	Off	O/W[1]	Yes
D (Overdrive)	1	On	Off	Off	Off	No
D	2	On	Off	On	Off	No
D	3	On	On	Off	Off	No
D	4	Off	Off	Off	Off	No
D	5	Off	Off	On	Off	Yes
D Off[1]	1	On	Off	Off	Off	No
	2	On	Off	On	Off	No
	3	On	On	Off	Off	No
	4	Off	Off	Off	On	Yes
2	2	On	On	Off	On	Yes
1	1	On	Off	Off	On	Yes

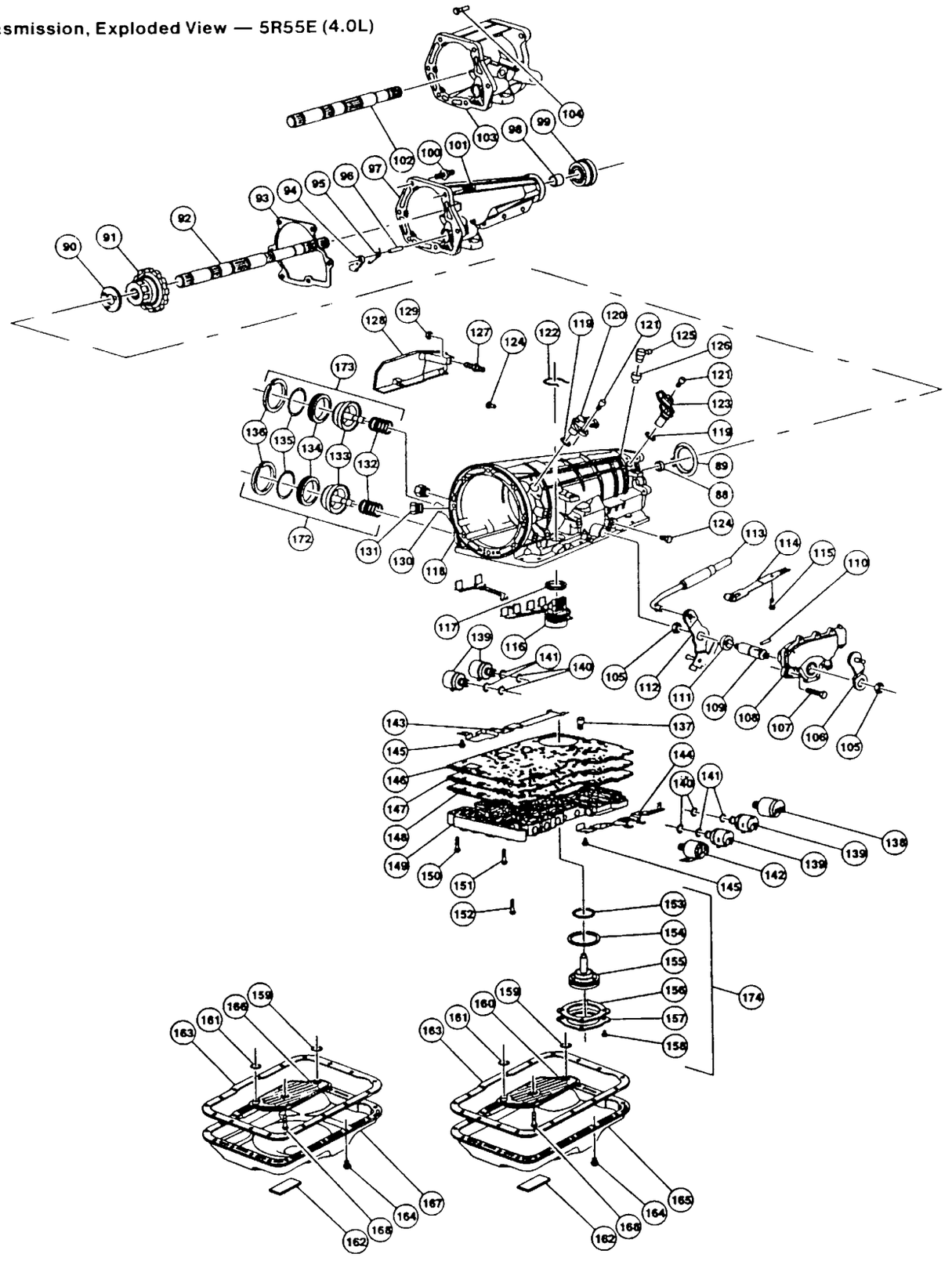
1 O/W=TCS "ON"

Exploded Views

Transmission, Exploded View — 5R55E (4.0L)



Transmission, Exploded View — 5R55E (4.0L)



Item	Part Number	Description
1	7902	Converter Assembly — (Contains Piston Type Clutch)
2	379299-S2	Nut — (Att. Converter Assembly to Flex Plate) (4 Req'd)
3	7017	Shaft — Input
4	7A248	Seal Assembly — Converter Hub to Converter Housing (Also in Converter Housing Assembly)
5	E804595-S300	Screw and Seal Assembly — M10 x 33 (Att. Converter Housing to Case) (8 Req'd)
6	7976	Housing Assembly — Converter
7	7B472	Plate — Fluid Pump Adapter
9	7L323	Seal Ring — Fluid Pump Support
10	W701431-S300	O-Ring — Fluid Pump Shaft to Inner Gear (Also in Pump Assembly)
11	7A103	Support and Gear Assembly — Fluid Pump
12	7D014	Washer — Fluid Pump Input Thrust (Select Fit — 7 Variables) No. 1
13	W701429-S309M	Screw Flange Head — 8.8 Allen, M8 x 35 (Att. Pump Assembly Converter Housing) (6 Req'd)
14	7A248	Seal Ring — Fluid Pump
15	E825100-S100	Nut and Seal Assembly — Hex Intermediate and Front Band Adjustment / Lock (2 Req'd)
16	7C492	Screw — Intermediate and Front Band Adjuster / Lock (2 Req'd)
17	7D430	Strut — Intermediate and Front Band Anchor (2 Req'd)
18	7A653	Bracket — Front Band Lever to Case (Not Serviced Separately)
19	7D433	Shaft — Front Actuating Lever
20	7330	Lever — Intermediate and Front Band Servo (2 Req'd)
21	7D029	Strut — Intermediate and Front Band Apply (2 Req'd)
22	7D034	Band Assembly — Intermediate and Front (2 Req'd)
23	7L669	Drum Assembly — Front Brake and Coast Clutch
24	7D404	Seal Ring — Coast Clutch and Direct Clutch Piston — Inner (2 Req'd)
25	7A548	Seal Ring — Coast Clutch Piston — Outer
26	7A262	Piston — Coast Clutch
27	7A480	Spring — Coast and Direct Clutch Piston (40 Req'd)
28	7A527	Retainer — Coast Clutch Piston Springs
29	E860125-S	Ring Retaining — 63 mm — Coast and Direct Clutch Piston in The Brake Drum (2 Req'd)
30	7B442	Plate — Coast (2 Req'd) and Direct (4 or 5 Req'd) Clutch External Steel
31	7B164	Plate Assembly — Coast (2 Req'd) and Direct (4 or 5 Req'd) Clutch Internal Friction
32	7B066	Plate — Coast and Direct Clutch Pressure (2 Req'd)
33	E860126-S / 129-S	Ring Retaining — Coast and Direct Clutch Plates (Select Fit)
34	7660	Adapter — Coast Clutch to Front Carrier
35	7D063	Gear Assembly — Sun Overdrive
36	7D235	Race — Sun Gear Thrust Bearing — Rear (All) No. 12
37	7B446	Carrier Assembly — Planetary Gear Front (With Trigger Wheel)
38	7L495	Bearing Assembly — Front Planet Thrust No. 2
39	7653	Gear — Overdrive Ring
40	7A658	Shaft Assembly — Center Overdrive Ring (Includes Front Overrunning Clutch 7C109)
41	W702037-S300	Ring Retaining — 110.1mm Center Shaft in Front Ring Gear
42	W702465-S300	Ring Retaining — Center Support in Case
43	7M153	Bearing Assembly — Center Shaft Thrust No. 3, No. 5 and No. 9 (3 Req'd)
44	E826160-S76	Nut and Cage Assembly — S/L Met. M6 (Att. Center Support to Case)
45	E804373-S	Screw Cap — 8.8 Allen M6 x 20 (Att. Center Support to Case)
46	7M101	Sensor — Trans Turbine Shaft Speed (TSS) With Wire to 16-Pin Connector

(Continued)

Item	Part Number	Description
47	W702297-S300	Screw — Cap M6 x 15 (Att Turbine Shaft Speed Sensor to Center Support)
48	7A130	Support Assembly — Center
49	7D014	Bearing Assembly — Intermediate Brake Drum Thrust (Select Fit — 4 Variables) No. 4
50	7D433	Shaft — Intermediate Band Actuating Lever
51	7D044	Drum Assembly — Intermediate Brake and Direct Clutch (Model Dependent)
52	7A548	Seal Ring — Direct Clutch Piston — Outer
53	7A262	Piston — Direct Clutch
54	7A527	Retainer — Direct Clutch Piston Spring
55	7A360	Cylinder Assembly — Forward Clutch
56	7A548	Seal Ring — Forward Clutch Piston — Inner
57	7A548	Seal Ring — Forward Clutch Piston — Outer
58	7A262	Piston Assembly — Forward Clutch
59	7A480	Spring — Forward Clutch Piston (15 Req'd)
60	7A527	Retainer — Forward Clutch Piston Spring
61	E860109-S	Ring Retaining 34mm — Forward Clutch Piston and Spring in Forward Clutch Cylinder
62	7B070	Spring — Forward Clutch Cushion
63	7B442	Plate — Forward Clutch External Steel (6 Req'd)
64	7B164	Plate Assembly — Forward Clutch Internal Friction (6 Req'd)
65	7B066	Plate — Forward Clutch Pressure
66	E860115-S/118-S	Ring Retaining — Forward Clutch Plates in Forward Clutch Cylinder (Select Fit)
67	7D234	Bearing Assembly — Forward Ring Gear Hub Thrust No. 6A
68	7D090	Washer — Forward Clutch Thrust No. 6B
69	E860122-S	Ring Retaining 87mm — Forward and Output Shaft Ring Gears to Hubs (2 Req'd)
70	7B067	Hub — Forward Ring Gear
71	7D392	Gear — Forward Ring (72 External Teeth and 57 Internal Teeth)
72	7F374	Bearing Assembly — Forward Planet Thrust No. 7
73	7A398	Planetary Assembly — Forward (6 Pinion) (Model Dependent)
74	E860121-S	Ring Retaining 39mm — Input Shell to Sun Gear Assembly (2 Req'd)
75	7D063	Gear Assembly — Sun (Forward)
76	7D064	Shell — Input
77	7M151	Bearing Assembly — Low/Reverse Planet Carrier Thrust No. 8
78	W702037-S300	Snap Ring
79	7D006	Planet Assembly — Low/Reverse (6 Pinion)
80	7B176	Sleeve — Output
81	7A153	Gear — Output Shaft Ring
82	E860527-S	Ring Retaining 25 x 2 mm — Output Shaft in Case
83	7D164	Hub — Output Shaft
84	7C498	Drum Assembly — Low/Reverse Brake (Includes Overrunning Clutch)
85	7D095	Band Assembly — Low/Reverse
86	7M150	Bearing Race (2 Pieces) — Output Shaft Hub Thrust No. 10A
87	7M150	Bearing Assembly — Output Shaft Hub Thrust No. 10B
88	7R205	Bearing Assembly — Output Shaft to Case (Part of Case Assembly)
89	7L339	Retainer — Splash Fluid
90	7B368	Washer — Output Shaft Thrust No. 11
91	7M167	Gear Assembly — Transmission Parking (4.0L)
92	7060	Shaft Assembly — Output (4x2)
93	7086	Gasket — Extension Housing
94	7A441	Pawl — Parking
95	7D070	Spring — Parking Pawl Return
96	7D071	Shaft — Parking Pawl
97	7A039	Housing Assembly — Extension (4x2)

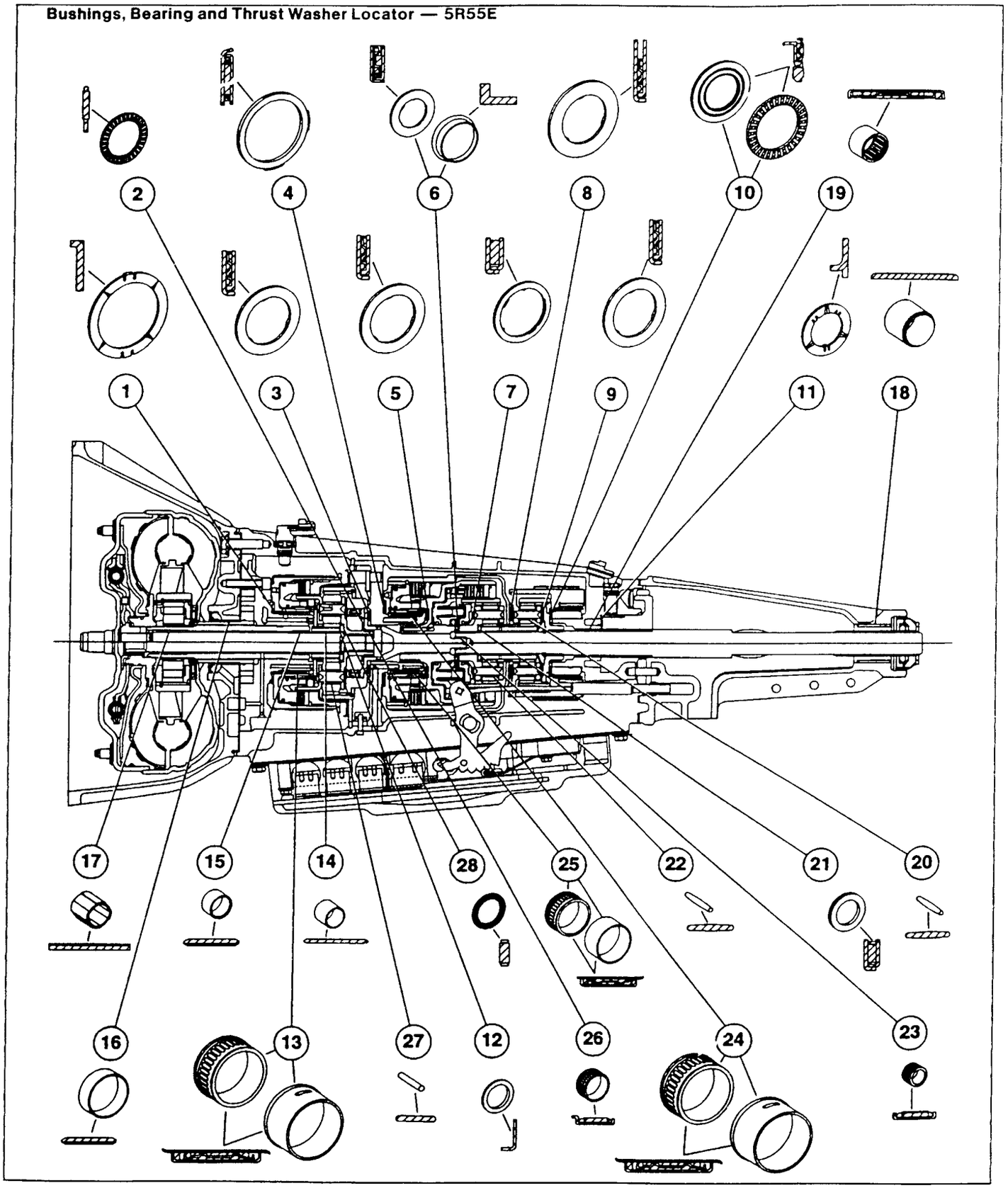
(Continued)

Item	Part Number	Description
98	7A034	Bushing — Extension Housing (4x2) (Also in Extension Housing)
99	7052	Seal Assembly — Extension Housing to Slip Yoke (Also in Extension Housing)
100	E804137-S72	Stud — (Att. Extension Housing to Case)
101	E800152-S72	Screw — M10 x 30 (Att. Extension Housing to Case) (5 Req'd)
102	7060	Shaft Assembly — Output (4x4)
103	7A039	Housing Assembly — Extension (4x4)
104	N605804-S100	Screw — M10 x 45 (Att. 4x4 Extension Housing to Transfer Case) (5 Req'd)
105	W701271-S309	Nut — (Att. Outer and Inner Manual Valves to Shaft) (2 Req'd)
106	7A256	Lever Assembly — Manual Control — Outer
107	N806933-S100	Screw — M6 x 25 (Att. Transmission Range Sensor to Case) (2 Req'd)
108	7F293	Sensor — Digital Transmission Range (DTR)
109	7A308	Shaft — Manual Valve Outer to Inner Lever
110	E840125-S	Pin — Spring (Retains Outer Manual Lever to Case)
111	7B498	Seal Assembly — Main Control Lever (Also in Case Assembly)
112	7A115	Lever — Manual Valve — Inner
113	7A232	Rod Assembly — Parking Pawl Actuating
114	7E332	Spring Assembly — Manual Valve Detent
115	E800185-S	Screw — M6 x 30 (Att Detent Spring to Main Control)
116	7Z409	Connector Assembly (16-Pin With Wire Harness to 6 Solenoids)
117	W703015-S300	O-Ring — 16-Pin Connector in Case
118	7005	Case Assembly (Model Dependent)
119	W702981-S300	O-Ring — Speed Sensor to Case (2 Req'd)
120	7M183	Sensor Assembly — Transmission Overdrive Drum Speed (ODS)
121	W702297-S300	Screw — Cap M6x15 (Att O.D. and Output Shaft Speed Sensors to Case) (4.0L Only)
122	84280020	Spring — Retains 16-Pin Connector in Case
123	7H103	Sensor Assembly — Transmission Output Shaft Speed (OSS)
124	E450102-S80	Plug — Pipe Line and EPC Pressure (Part of Case Assembly) (2 Req'd) (Not Serviced Separately)
125	7034	Vent Assembly — Also in Case Assembly (4x4)
126	7034	Vent Assembly — Also in Case Assembly (4x2)
127	E804533-S201	Stud — M6x12 (Att Heat Shield to Case) (All 4.0L and 4x4)
128	7F103	Shield — Transmission Heat (4.0L Only)
129	N620040-S36	Nut — Hex (Retains Heat Shield to Stud) (4.0L Only)
130	7A160	Tube — Lube Fluid Inlet — Short (Also in Case Assembly)
131	7D273	Connector Assembly — Fluid Tube (Also in Case Assembly)
132	7D028	Spring — Intermediate Servo Piston)
133	7D021	Piston and Rod Assembly — Intermediate and Front Servo (2 Req'd)
134	7D027	Cover and Seal Assembly — Intermediate Front Servo Assembly (2 Req'd)
135	7D040	O-Ring — Servo Cover to Case Intermediate and Front Servo (2 Req'd)
136	E860343-S	Ring Retaining — 67 x 1.5mm (Intermediate and Front Servos in Case) (2 Req'd)
137	E804357-S76	Screw — Torx M6 x 21 (Att. Separating Plate to Main Control) (Also in Main Control Assembly)
138	7G383	Solenoid Assembly — Electronic Pressure Control (EPC)
139	7G484	Solenoid Assembly — Trans Shift (SS) (Also in Main Control Assembly) (4 Req'd)
140	W702951-S300	O-Ring — Shift Solenoid to Main Control (Small) (13x1.5) (4 Req'd)

(Continued)

Item	Part Number	Description
141	W702949-S300	O-Ring — Shift Solenoid to Main Control (Large) (15x1.5) (4 Req'd)
142	7G136	Solenoid Assembly — Trans Torque Converter Clutch (TCC) PWM With Clamp (Also in Main Control Assembly)
143	7L491	Clamp (SS1 and SS3) Solenoids (Also in Main Control Assembly) (Not Serviced Separately)
144	7L491	Clamp — Converter Clutch / SS4 / SS2 and EPC Solenoids (Also in Main Control) (Not Serviced Separately)
145	E800155-S	Screw — M6 x 12 (Att. Solenoid Clamps to Main Control) (2 Req'd)
146	7C155	Gasket — Control Valve Body to Case
147	7A008	Plate — Valve Body Separating (Part of Main Control Assembly) (Not Serviced Separately)
148	7D100	Gasket — Control Valve Body Separating (Also in Main Control Assembly)
149	7A100	Control Assembly — Main (Model Dependent)
150	E800154-S	Screw — M6 x 45 (Att. Main Control to Case) (4 Req'd)
151	E800153-S	Screw — M6 x 40 (Att. Main Control to Case) (16 Req'd)
152	E800163-S	Screw — M6 x 35 (Att. Main Control to Case) (3 Req'd)
153	7423	Seal Ring — Low / Reverse Servo Piston — Small (Also in Piston Assembly)
154	7423	Seal Ring — Low / Reverse Servo Piston — Large (Also in Piston Assembly)
155	7D189	Piston Assembly — With Rod and Retainer — Low / Reverse Band Servo (Select Fit)
156	7L173	Gasket — Low / Reverse Servo Cover to Case
157	7D036	Cover — Low / Reverse Servo
158	E800156-S	Screw — M6 x 20 (Att. Low / Reverse Servo Cover to Case) (4 Req'd)
159	7A469	O-Ring — Fluid Filter Assembly — Small
160	7A098	Filter Assembly — Fluid Pan (4x2)
161	7A469	O-Ring — Fluid Filter Assembly — Large
162	7E290	Magnet — on Inner Bottom Surface
163	7A191	Gasket — Fluid Pan
164	W701203-S309M	Screw — M8 x 14 (Att. Fluid Pan to Case) (18 Req'd)
165	7A194	Pan — Fluid (4x2)
166	7A098	Filter Assembly — Fluid Pan (4x4)
167	7A194	Pan — Fluid (4x4)
168	E800329-S	Screw — M6 x 55 (Att. Fluid Filter to Main Control)
169	—	Coast Clutch
170	—	Direct Clutch
171	—	Forward Clutch
172	—	Overdrive Servo
173	—	Intermediate Servo
174	—	Reverse Servo

Bushings, Bearing and Thrust Washer Locator — 5R55E

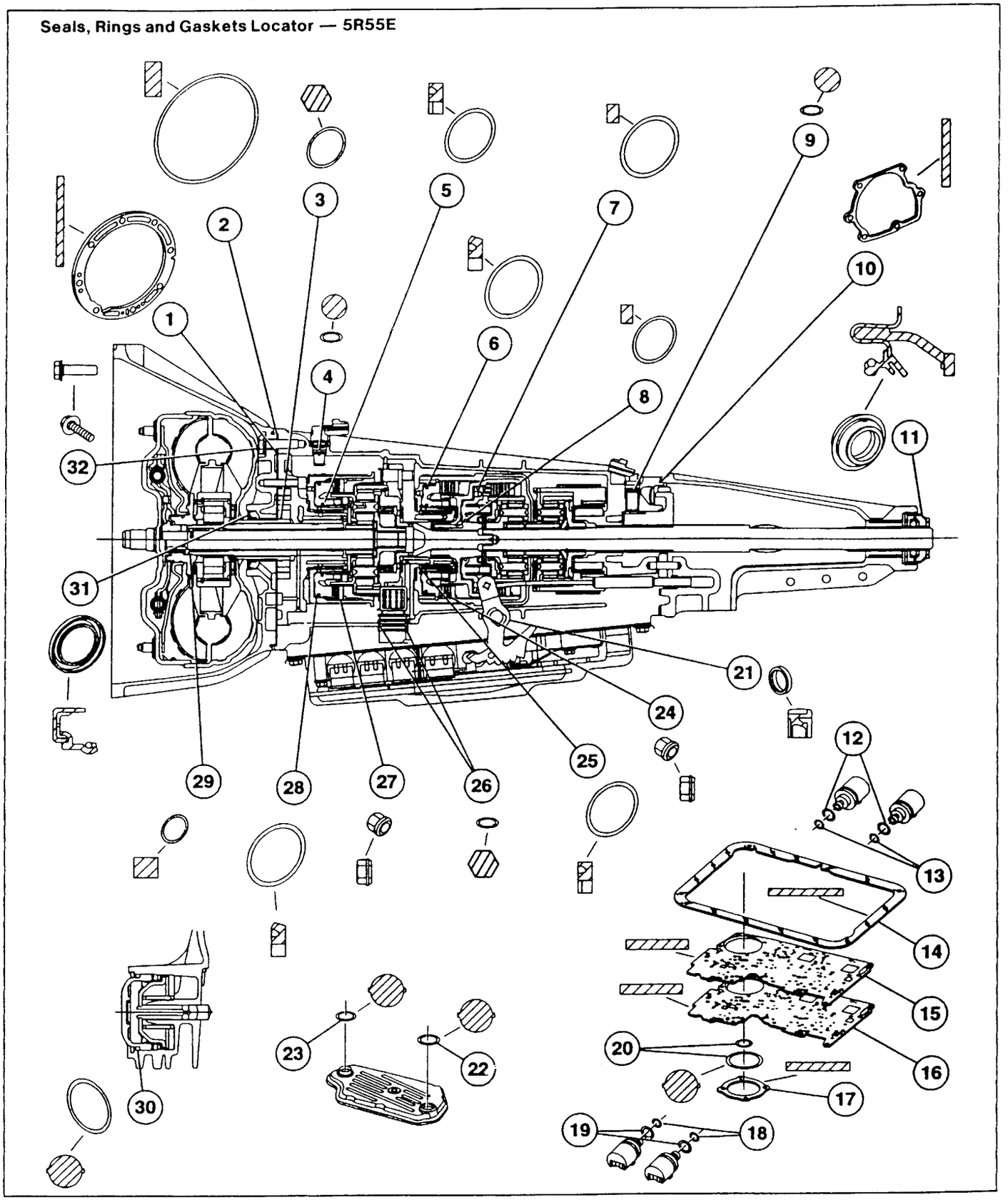


Item	Part Number	Description
1	7D014	No. 1 Selective Washer
2	7L495	No. 2 Needle Bearing
3	7M153	No. 3 Needle Bearing
4	7D014	No. 4 Selective Needle Bearing
5	7M153	No. 5 Needle Bearing
6	7D234, 7D090	No. 6A Needle Bearing and No. 6B Bushing
7	7F374	No. 7 Needle Bearing
8	7M151	No. 8 Needle Bearing
9	7M153	No. 9 Needle Bearing
10	7M150	No. 10A Bearing Race and No. 10B Needle Bearing Assembly
11	7B368	No. 11 Washer
12	7D235	No. 12 Race
13	—	Bearing, Seal Assembly and Sleeve (Not Serviced Separately)
14	—	Bushing (Part of 7D063 O.D. Sun Gear) (Not Serviced Separately)
15	—	Bushing (Part of 7L201 Pump Assembly) (Not Serviced Separately)
16	—	Bushing (Part of 7976 Converter Housing) (Not Serviced Separately)
17	—	Bushing (Part of 7L201 Pump Assembly) (Not Serviced Separately)
18	—	Bushing (Part of 7A039 Extension Housing and Available Separately)

(Continued)

Item	Part Number	Description
19	7R205	Needle Bearing
20	—	Needle Bearing (Part of 7D006 Low/Reverse Planetary Assembly) (Not Serviced Separately)
21	—	Needle Bearing (Part of 7A398 Forward Planetary Assembly) (Not Serviced Separately)
22	—	Needle Bearing (Part of 7060 Output Shaft) (Not Serviced Separately)
23	—	Needle Bearing (Part of 7A398 Forward Planetary Assembly) (Not Serviced Separately)
24	—	Bearing, Seal Assembly and Sleeve (Not Serviced Separately)
25	—	Bearing, Seal Assembly and Sleeve (Not Serviced Separately)
26	—	Needle Bearing (Part of 7B446 Front Planetary Assembly) (Not Serviced Separately)
27	—	Needle Bearing (Part of 7B446 Front Planetary Assembly) (Not Serviced Separately)
28	—	Needle Bearing (Part of 7B446 Front Planetary Assembly) (Not Serviced Separately)

Seals, Rings and Gaskets Locator — 5R55E

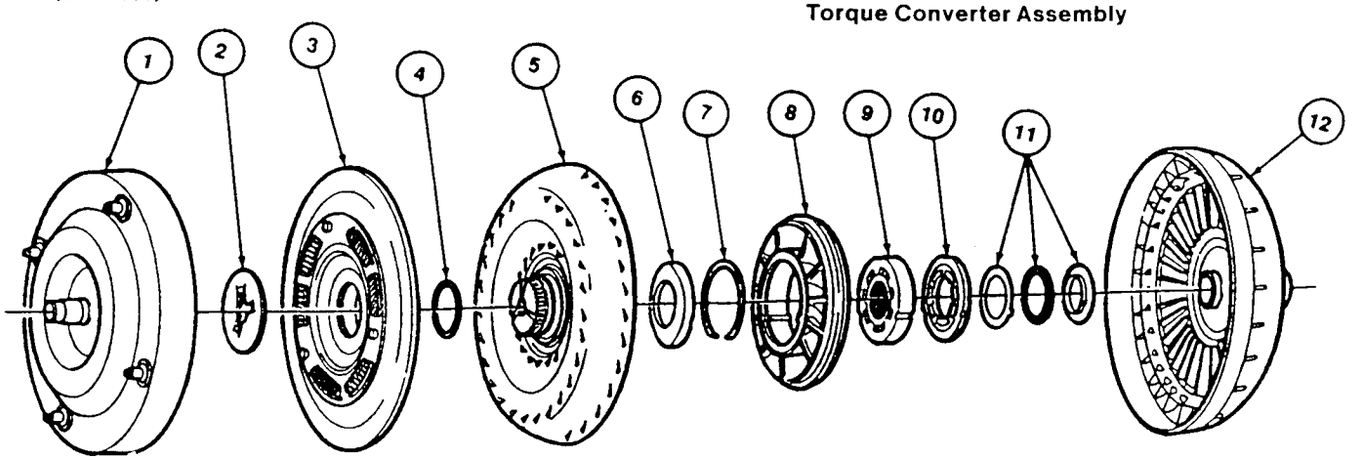


Item	Part Number	Description
1	7A136	Gasket (Fluid Pump)
2	7A248	Seal Ring (Fluid Pump)
3	W701431-S300	O-Ring
4	W7022981-S300	O-Ring
5	7D404	Seal Ring
6	7A548	Seal Ring
7	7A548	Seal Ring
8	7A548	Seal Ring
9	W702981-S300	O-Ring
10	7086	Gasket (Transmission Extension)
11	7052	Seal Assembly (Extension Housing)
12	W702949-S300	O-Ring (Large)
13	W702951-S300	O-Ring (Small)
14	7A191	Gasket (Fluid Pan)
15	7C155	Gasket (Main Control, Upper)
16	7D100	Gasket (Main Control, Lower)
17	7L173	Gasket (Low/Reverse Servo Plate Cover)

(Continued)

Item	Part Number	Description
18	W702951-S300	O-Ring (Small)
19	W702949-S300	O-Ring (Large)
20	7423	O-Ring (Low/Reverse Servo Piston)
21	7B498	Seal Assembly (Manual Lever)
22	E825100-S100	Nut and Seal (Intermediate Band Adjustment/Lock)
23	E853164	O-Ring (Large) (Fluid Filter Assembly)
24	E853163	O-Ring (Small) (Fluid Filter Assembly)
25	7D404	Seal Ring
26	84400120	O-Ring
27	E825100-S100	Nut and Seal
28	7A548	Seal Ring
29	7L323	O-Ring
30	7D040	O-Ring (Intermediate/Front Servo Covers)
31	7A248	Seal Assembly (Converter Hub)
32	E804595-S200	Screw and Seal Assembly

Torque Converter Assembly

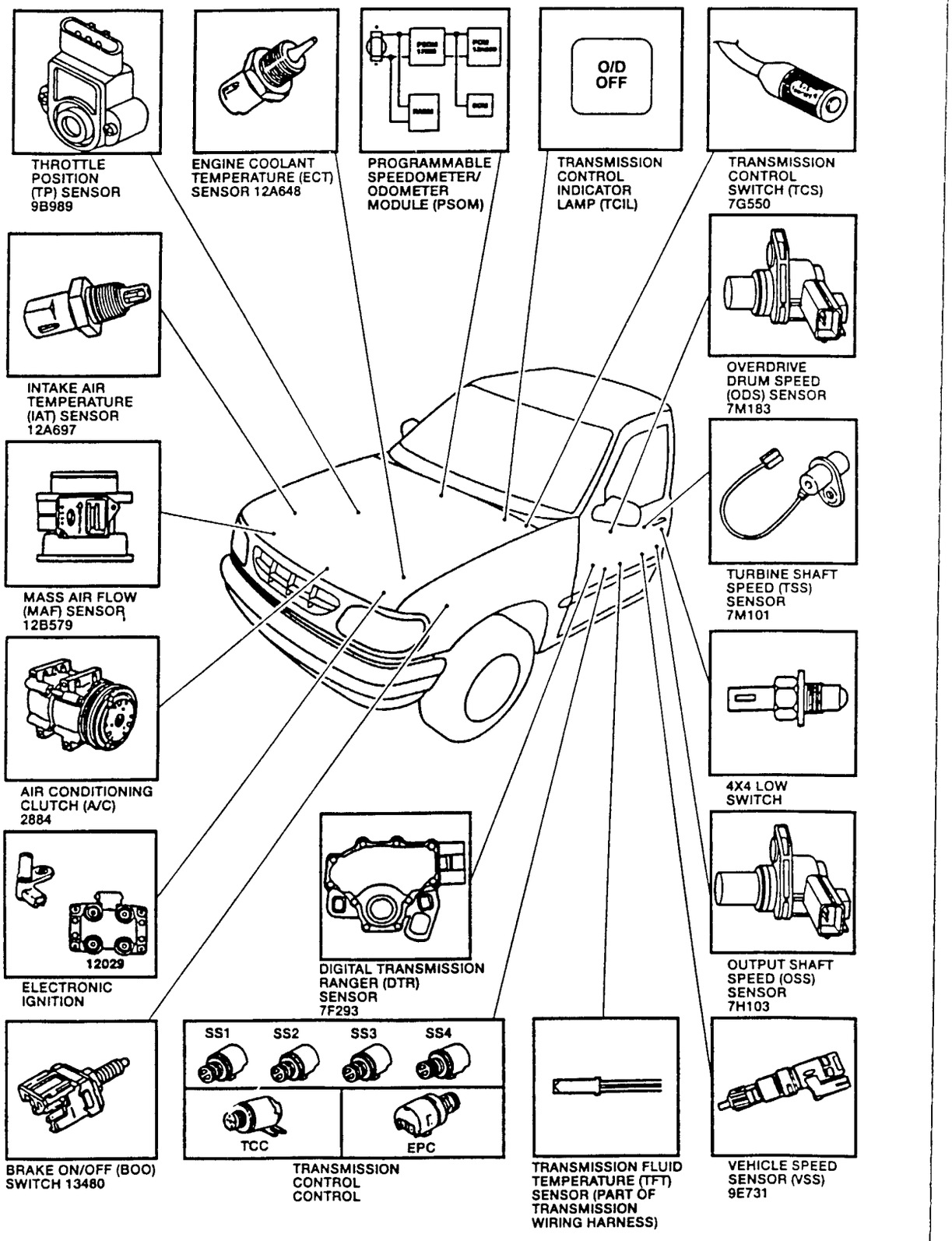


Item	Part Number	Description
1	—	Cover (Part of 7902)
2	—	Thrust Washer (Part of 7902)
3	—	Converter Damper Plate (Part of 7902)
4	—	O-Ring (Part of 7902)
5	—	Turbine Assembly (Part of 7902)
6	—	Thrust Washer (Part of 7902)

(Continued)

Item	Part Number	Description
7	—	Snap Ring (Part of 7902)
8	—	Reactor (Part of 7902)
9	—	One-Way Clutch Assembly (Part of 7902)
10	—	Thrust Washer (Part of 7902)
11	—	Thrust Bearing (Part of 7902)
12	—	Impeller Assembly (Part of 7902)

Component Locator



Powertrain Control Module (PCM) 12A650:

Description:

The powertrain control module (PCM) controls various engine functions and provides control of the 5R55E transmission.

The PCM responds to inputs and operates solenoids for electro-hydraulic control of line pressure, shift scheduling, torque converter clutch (TCC) scheduling and coast clutch control for coast braking.

The PCM has the ability to:

- Monitor its input and output devices for the presence of faults.
- Store diagnostic trouble codes (DTCs) related to detected faults.
- Alert the driver for some detected faults by turning on the malfunctioning indicator lamp (MIL) in the instrument cluster.
- Display information when a service technician connects diagnostic equipment.

Diagnostic Trouble Codes:

P0603, P0605.

Air Conditioning (A/C) Clutch 2884:

Description:

An electro-magnetic air conditioning (A/C) clutch is energized when the clutch cycling pressure switch closes. The switch is located on the suction accumulator-drier. The closing of the switch completes the circuit to the clutch and draws it into engagement with the compressor driveshaft.

When engaged, the A/C clutch is an input to the PCM to adjust electronic pressure control (EPC) pressure for the additional load on the engine. It is also used to adjust TCC modulation when the A/C clutch is engaged.

Symptoms:

Failed ON — EPC pressure slightly low with A/C off.
Failed OFF — EPC pressure slightly high with A/C on. If erratic A/C operation occurs, the customer may feel improper TCC apply and release.

Diagnostic Trouble Codes:

P1460.

Brake On/Off (BOO) Switch 13480:

Description:

The brake on/off (BOO) switch is connected to the brake pedal. When the brake pedal is pressed, the BOO switch has closed contacts allowing a voltage signal to the PCM.

The PCM may release TCC when the brakes are applied.

(Continued)

Brake On/Off (BOO) Switch 13480: (Cont'd)

Symptoms:

Failed ON — converter clutch will not engage at less than 1/3 throttle.
Failed OFF or not connected — converter clutch will not disengage when brake is applied.

Diagnostic Trouble Codes:

P1703.

Engine Coolant Temperature (ECT) Sensor 12A648:

Description:

The engine coolant temperature (ECT) sensor detects the temperature of engine coolant and supplies the information to the PCM.

The ECT sensor is threaded into the heater outlet fitting or cooling passage on the engine. For automatic transmission applications, the ECT is used to control TCC solenoid operation. For engine control applications, the ECT signal is used to modify ignition timing, exhaust gas recirculation (EGR) flow, and air-to-fuel ratio as a function of engine coolant temperature. On electronic instrument cluster applications, the ECT output is used to control a coolant temperature indicator.

Symptoms:

Torque converter clutch solenoid will always be "off," resulting in reduced fuel economy.

Diagnostic Trouble Codes:

P0117, P0118, P1116.

Electronic Ignition (EI) System:

Description:

The electronic ignition (EI) system has a crankshaft position (CKP) sensor and ignition coil packs. The CKP sensor sends crankshaft position information to the PCM. The rpm signal in the transmission strategy is then used for torque converter clutch control, EPC and shift scheduling.

Symptoms:

Engine malfunction, no torque converter clutch engagement.

Diagnostic Trouble Codes:

P0300-P0306, P0320, P0340, P1351-P1364.

4x4 Low (4x4L) Switch:

Description:

The low range switch is located on the transfer case cover. It provides an indication of when the 4x4 transfer case gear system is in the low range.

NOTE: Not all 4x4L switch concerns will set a DTC. Refer to Diagnosis by Symptom or pinpoint tests if shifts are delayed in 4x4L or shift early in normal mode.

(Continued)

4x4 Low (4x4L) Switch: (Cont'd)

Transmission Function:

Modifies shift schedule for 4x4L transfer case gear ratio.

Symptoms:

Failed on — Early shift schedule in 4x2 and 4x4H. Failed off — Shifts delayed in 4x4L. If the 4x4 low indicator light fuse is blown, the transmission will shift according to 4x4 low shift schedule regardless of transfer case position.

Diagnostic Trouble Codes:

P1781, P1729.

Overdrive Drum Speed (ODS) Sensor 7M183:

Description:

The overdrive drum speed (ODS) sensor is a magnetic pickup that sends a signal to the powertrain control module (PCM) assembly that indicates overdrive drum speed. The ODS sensor signal is used in the transmission control strategy to determine EPC pressure, shift and torque converter scheduling. The ODS sensor is mounted externally on the transmission.

Diagnostic Trouble Codes:

P1719.

Output Shaft Speed Sensor (OSS) 7H103:

Description:

The output shaft speed (OSS) sensor is a magnetic pickup that sends a signal to the powertrain control module (PCM) assembly that indicates output shaft speed. The OSS sensor signal is used in the transmission control strategy to determine EPC pressure, shift and torque converter scheduling. The OSS sensor is mounted externally on the transmission.

Symptoms:

Harsh shifts, abnormal shift schedule, no torque converter engagements.

Diagnostic Trouble Codes:

P0720, P0721.

Intake Air Temperature (IAT) Sensor 12A697:

Description:

The intake air temperature (IAT) sensor is used to determine the EPC pressure. It also provides the electronic fuel injection system with mixture (fuel and air) temperature information. The IAT is used both as a density corrector for airflow calculation and to proportion the cold enrichment fuel flow. This sensor is similar in construction to the engine coolant temperature (ECT) sensor, except it is packaged to improve sensor response time.

(Continued)

Intake Air Temperature (IAT) Sensor 12A697: (Cont'd)

Symptoms:

Incorrect EPC pressure either high or low resulting in either harsh or soft shifts.

Diagnostic Trouble Codes:

P0112, P0113, P0114.

Mass Air Flow (MAF) Sensor 12B579:

Description:

The mass air flow (MAF) sensor directly measures the mass of the air flowing into the engine. The sensor output is a DC (analog) signal ranging from about 0.5 volts to 5.0 volts used by the processor to calculate the injector pulse width for stoichiometry. For transmission strategies, this sensor is used for EPC pressure control, shift, and torque converter clutch scheduling.

Symptoms:

Incorrect shift schedule, high / low EPC pressure. Incorrect torque converter engagement scheduling and symptoms similar to a throttle position (TP) sensor malfunction. Soft or firm shift based on EPC / line pressure. Soft shifts may be caused by a restricted air inlet.

Diagnostic Trouble Codes:

P0102, P0103, P1100, P1101.

Transmission Control Switch (TCS) 7G550:

Description:

The transmission control switch (TCS) is a momentary contact switch. When the driver presses the button of the TCS, a signal is sent to the PCM. At the same time, the PCM also causes the transmission control indicator lamp (TCIL) in the instrument panel to turn on or off.

When the TCS is initially pressed, the PCM disables transmission operation in D position / 5th gear. At the same time, coast braking in 1st, 2nd, 3rd, and 4th gears occurs because the coast clutch is applied.

When the button of the TCS is pressed again, the PCM enables 5th gear operation, releases the coast clutch and turns off the TCIL.

Symptoms:

If the TCS fails with open contacts, no disabling of 5th gear and enabling of coast braking in 1st, 2nd, 3rd, and 4th gears in D position is possible.

Diagnostic Trouble Codes:

P1780.

Transmission Control Indicator Lamp (TCIL):

Description:

The transmission control indicator lamp (TCIL) is located in the instrument panel for Ranger and on the shift lever for Aerostar. It is labeled O/D OFF. The transmission control switch (TCS) and the PCM control the on/off operation of the TCIL.

When the driver initially presses the button of the TCS, the TCIL turns on to indicate that transmission operation in 4th gear is disabled. When the driver presses the TCS again, the TCIL turns off. The TCIL will flash if EPC solenoid is shorted or a monitored sensor has failed.

Symptoms:

If the TCIL fails on or off, the driver may have an incorrect indication of transmission operation or monitored sensor malfunction.

Diagnostic Trouble Code:

N/A.

Throttle Position (TP) Sensor 9B989:

Description:

The throttle position (TP) sensor is a potentiometer mounted on the throttle body. The TP sensor detects the position of the throttle plate and sends this information to the processor assembly as varying voltage signal.

The PCM uses the monitored voltage level of the TP sensor for control of EPC pressure, torque converter clutch operation and shift scheduling.

If a malfunction occurs in the TP sensor circuit, the processor will recognize that the TP sensor signal is out of specification. The processor will then operate the transmission in a high capacity mode to prevent transmission damage.

Symptoms:

Harsh engagements, firm shift feel, abnormal shift schedule, torque converter clutch does not engage, or torque converter clutch cycling.

Diagnostic Trouble Codes:

P0121-P0123, P1120, P1121, P1124, P1125.

Programmable Speedometer/Odometer Module (PSOM):

The programmable speedometer/odometer module (PSOM) receives input from the rear brake anti-lock sensor, which is mounted on the rear axle differential housing. The PSOM processes this input signal information and relays it to the powertrain control module and the speed control module. This signal tells the powertrain control module the vehicle speed in miles per hour (mph). The PSOM is also used as an input in determining shift scheduling and electronic pressure control.

(Continued)

Programmable Speedometer/Odometer Module (PSOM): (Cont'd)

Symptoms:

Harsh engagements, firm shift feel, abnormal shift schedule, unexpected downshifts may occur at closed throttle. Torque converter clutch will not engage, elevated EPC pressures

NOTE: EPC shorted to ground or failed low may result in a false VSS code. Diagnose EPC concerns first. Then recheck VSS input and PSOM.

Diagnostic Trouble Codes:

P0500, P0501, P0503, P1500, P1501.

Vehicle Speed Sensor (VSS) 9E731:

Description:

The vehicle speed sensor (VSS) is a magnetic pickup that sends a signal to the processor assembly. This VSS signal tells the processor assembly the vehicle speed.

The PCM uses this information to control shift scheduling and EPC pressure.

Symptoms:

Harsh engagements, firm shift feel, abnormal shift schedule, unexpected downshifts may occur at closed throttle. Torque converter clutch will not engage, elevated EPC pressures.

NOTE: EPC shorted to ground or failed low may result in a false VSS code. Diagnose EPC concerns first. Then recheck VSS.

Diagnostic Trouble Codes:

P0500, P0501, P0503, P1500, P1501.

Transmission Fluid Temperature (TFT) Sensor:

Description:

The transmission fluid temperature (TFT) sensor is located on the transmission main control body wiring harness assembly. It is a temperature-sensitive device called a thermistor. The resistance value of the TFT will vary with temperature change. The processor monitors the voltage across the TFT to determine the temperature of the transmission fluid.

The processor assembly uses this initial signal to determine whether a cold start shift schedule is necessary. The cold start shift schedule allows quicker shifts when the transmission fluid temperature is cold. The processor also inhibits torque converter clutch operation at low transmission fluid temperatures and corrects EPC pressures for temperature.

Symptoms:

Torque converter clutch engagement and stabilized shift schedules happen too soon after a cold start. Harsh or soft shifts.

Diagnostic Trouble Codes:

P0712, P0713, P1711, P1783.

Digital Transmission Range (DTR) Sensor 7F293:

Description:

The digital transmission range (DTR) sensor is located on the outside of the transmission at the manual lever. The DTR sensor completes the start circuit in Park and Neutral, the back-up lamp circuit in Reverse and the Neutral sense circuit (4x4 only) in Neutral. The DTR sensor also sends a digital output signal to the powertrain control module (PCM) indicating the position of the manual lever (P, R, N, D, 2, 1).

Symptoms:

Engagement concerns, wrong gear, no shifts, increase in EPC pressure.

Diagnostic Trouble Codes:

P0705, P0708, P1705, P1704.

Turbine Shaft Speed (TSS) Sensor 7M101:

Description:

A turbine shaft speed (TSS) sensor is a magnetic pickup that sends a signal to the processor assembly that indicates transmission turbine shaft input speed.

The TSS sensor provides torque converter turbine speed information for torque converter clutch control strategy. Also used in determining static EPC pressure settings.

Symptoms:

Increased engine rpm on engagements, harsh shifts (converter engaged), delayed shifts with hard apply (slip / bump feel).

Diagnostic Trouble Codes:

P0715.

Electronic Pressure Control (EPC) Solenoid 7H144:

Description:

The electronic pressure control (EPC) solenoid is a variable force style (VFS) solenoid. The VFS type solenoid is an electro-hydraulic actuator combining a solenoid and a regulating valve. It supplies EPC which regulates transmission line pressure and line modulator pressure. This is done by producing resisting forces to the main regulator and line modulator circuits. These two pressures control clutch application pressures.

Symptoms:

Maximum EPC pressure, harsh shifts and engagements, **may set a false VSS code.** Zero EPC pressure — no 2nd and 4th gear, slips in 1st and 3rd with high input torque.

Diagnostic Trouble Codes:

P1746*, P1747*.

*Output circuit check, generated only by electrical conditions.

Torque Converter Clutch (TCC) Solenoid 7F037:

Description:

The torque converter clutch (TCC) solenoid is used in the transmission control system to control the application, modulation, and release of the torque converter clutch.

Symptoms:

Failed ON — engine runs rough / vehicle shudder, engine stalls in Drive at low idle speeds (1st, 2nd, 3rd, 4th, or 5th gear).
Failed OFF — torque converter never engages.

Diagnostic Trouble Codes:

P0741**, P0743*, P1740, P1744**.

*Output circuit check, generated only by electrical conditions.

**May also be generated by a non-electrical transmission hardware condition.

Shift Solenoid Assemblies (SS1, SS2, SS3, SS4) (7G484):

Description:

Four on / off solenoids are used for electronically controlled shift scheduling. The four shift solenoids are two-way, normally open style. Solenoids SS1, SS2, SS3, and SS4 provide gear selection of 1st through 5th by controlling the pressure of the shift valves. SS4 is also used to apply and release the coast clutch.

SS1 Symptoms:

Improper gear selection depending on failure mode and manual lever position.
Failed ON: No 4th and 5th gears.
Failed OFF: No 1st and 2nd gears.

Diagnostic Trouble Codes:

P0750*, P0751**, P0731**, P0732**, P0734**, P0735**, P1714**.

SS2 Symptoms:

Improper gear selection depending on failure mode and manual lever position.
Failed ON: No 1st, 2nd, 4th, and 5th gears.
Failed OFF: No 3rd gear.

Diagnostic Trouble Codes:

P0755*, P0756**, P0731**, P0732**, P0733**, P0734**, P0735**, P1715**.

SS3 Symptoms:

Improper gear selection depending on failure mode and manual lever position.
Failed ON: No 1st, 3rd, and 4th gears.
Failed OFF: No 2nd and 5th gears.

(Continued)

Shift Solenoid Assemblies (SS1, SS2, SS3, SS4) (7G484): (Cont'd)

Diagnostic Trouble Codes:

P0760*, P0761**, P0731**, P0732**, P0733**, P0734**, P0735**, P1716***, P7162.

SS4 Symptoms:

Improper gear selection depending on failure mode and manual lever position.
Failed On: No 2nd and 5th gears.
Failed Off: No engine braking.

(Continued)

Shift Solenoid Assemblies (SS1, SS2, SS3, SS4) (7G484): (Cont'd)

Diagnostic Trouble Codes:

P0765*, P0732**, P0735**, P1717***, P1762.

*Output circuit check, generated only by electrical conditions.

**May also be generated by some other non-electrical transmission hardware condition.

***Solenoid mechanically or hydraulically stuck.

DIGITAL TRANSMISSION RANGE (DTR) SENSOR DIAGNOSIS

SELECTOR POSITION	PID:TR	*Snap-On Scanner Data* PID:TR_D				*Snap-On Scanner Data* PID:TR_V
		TR4	TR3A	TR2	TR1	TR3A (175B pin 9 to sigrtn)
PARK	***P/N***	***0***	***0***	***0***	***0***	***0.0 Volts***
REVERSE	***REV***	***1***	***1***	***0***	***0***	***1.3 to 1.8 Volts***
NEUTRAL	***NTRL***	***0***	***1***	***1***	***0***	***1.3 to 1.8 Volts***
OVERDRIVE	***OD****	***1***	***1***	***1***	***1***	***1.3 to 1.8 Volts***
MANUAL 2	***MAN 2****	***1***	***0***	***0***	***1***	***0.0 Volts***
MANUAL 1	***MAN 1***	***0***	***0***	***1***	***1***	***0.0 Volts***

**** Will read "Drive" if OD is canceled.***
***** MAN 2 = Drive for applications without OD cancel feature.***

1. TR_V is the voltage at PCM connector 175B, pin 9 (TR3A Circuit) to Signal Return.
2. TR_D: 1 = Open DTR Switch
0 = Closed DTR Switch

4. Breakout Box readings are taken from PCM signal pins for TR1, TR2, TR3A, TR4 to Signal Return.
Voltages for TR1, TR2, TR4: 0 = 0.0 Volts (Shorted to Ground)
1 = 9.0 to 14.0 Volts (Open Circuit)
Voltages for TR3A: 0 = 0.0 Volts (Circuit Shorted to Ground)
1 = 1.3 to 5.0 Volts (Open Circuit)
1.8 to 5.0 Volts is an invalid reading and is usually an open in wires or bad resistor in DTR sensor.

Special Testing Procedures

Engine Idle Speed Check

Refer to Section 4A in the Powertrain Control / Emissions Diagnosis Manual[1] for diagnosis and testing of the engine idle speed.

Line Pressure Test

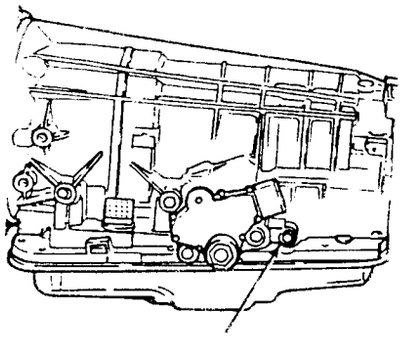
CAUTION: The Transmission Tester must be removed and the vehicle harness installed when verifying these pressures.

CAUTION: Perform Line Pressure Test prior to performing Stall Speed Test. If line pressure is low at stall, do not perform Stall Speed Test or further transmission damage will occur. Do not maintain wide open throttle in any gear range for more than five (5) seconds.

NOTE: Certain sensor failures may cause high EPC, FMEM (Failure Mode Effect Management) actions. Be sure that self test and electrical repairs have been performed, or test results may be incorrect.

This test verifies that the line pressure is within specifications.

1. Connect 0-2758 kPa (0-400 psi) pressure gauge to the line pressure tap.



D15831-A

2. Start engine and check line pressures. Refer to the following Line Pressure Specifications No. 401 chart to determine if line pressure is within specifications.

CAUTION: Do not install Transmission Tester when verifying these pressures.

NOTE: Vehicle harness must be installed at transmission connector to verify these pressures.

REFERENCE: LINE PRESSURE SPECIFICATIONS No. 401

Trans.	Transmission Model / Application	Range	Idle		WOT Stall	
			EPC	Line	EPC	Line
	4.0L Aerostar	R	57-67	100-130	112-134	282-350
	4x2, AWD	N	26-36	82-112		
5R55E		D, 2, 1	25-35	80-110	112-134	228-263
	4.0L Ranger	R	52-62	138-168	112-134	282-350
5R55E	4x2, 4x4	N	32-42	95-125		
		D, 2, 1	25-35	80-110	112-134	228-263

3. If line pressure is not within specifications, perform On-Board Diagnostics, Pinpoint Test E. Perform Air Pressure Test and repair main control or pump assembly as required.

4. If line pressure is not within specifications after mechanical checks and there are no DTCs, electronic pressure control (EPC) solenoid may be mechanically malfunctioning. Refer to the Line Pressure Diagnosis Chart for symptom diagnosis.

LINE PRESSURE DIAGNOSIS CHART

Test Results	Possible Source
High at Idle — All Ranges	• Wiring Harnesses • EPC Boost Valve • EPC Solenoid • Main Regulator Valve
Low at Idle — All Ranges	• Low Fluid Level • Fluid Inlet Filter Seal • Main Control Body • Cross Leaks • Gaskets • Pump • Separator Plate

(Continued)

LINE PRESSURE DIAGNOSIS CHART (Cont'd)

Test Results	Possible Source
Low — All Forward Ranges	• Forward Clutch • Main Control • O/D Servo
Low in Park Only	• Valve Body
Low in Reverse Only	• Separator Plate • Rear Servo Piston, Cover Seal • Reverse Clutch • O/D Servo • Valve Body • Forward Clutch
Low in Neutral Only	• Valve Body • O/D Servo
Low in Overdrive Only	• Forward Clutch • O/D Servo • Valve Body
Low in Drive Only (O/D Cancelled)	• Forward Clutch • O/D Servo • Valve Body
Low in 1st Position Only	• Forward Clutch • Valve Body
Low in 2nd Position Only	• Intermediate Servo • O/D Servo • Forward Clutch

Stall Speed Test

This test checks operation of the following items:

- Torque converter clutch
- Forward clutch
- Low one way clutch (OWC) assembly
- Engine performance

WARNING: APPLY THE PARKING BRAKE FIRMLY WHILE PERFORMING EACH STALL TEST.

CAUTION: Always perform Line Pressure Test procedures prior to performing the Stall Speed Test. If line pressure is low at stall, do not perform Stall Speed Test or further transmission damage will occur.

NOTE: The Stall Speed Test should be performed with the engine and transmission at normal operating temperatures.

1. Connect tachometer to the engine.
2. **CAUTION: After testing each of the following ranges (D), 2, 1, and R, move the transmission range selector lever to N (NEUTRAL) and run engine at 1000 rpm for about 15 seconds to allow the torque converter to cool before testing the next range.**

   CAUTION: Do not maintain wide open throttle in any range for more than five (5) seconds.

   CAUTION: If the engine rpm recorded by the tachometer exceeds maximum specified rpm, release the accelerator pedal immediately. Clutch or band slippage is indicated.

   NOTE: Prolonged use of this procedure may set Diagnostic Trouble Code P0712, P1783. After performing Stall Speed Test run OBD Test and clear DTCs from memory.

   Press accelerator pedal to floor (WOT) in each range. Record rpm reached in each range. Stall speeds should be as follows:

Vehicle	Engine	Rpm
Ranger	4.0	2405-2800
Aerostar	4.0	2454-2833

   If stall speeds were too high, refer to the following Stall Speed Diagnosis Chart. If stall speeds were too low, first check the engine idle speed. If engine idle is OK, remove torque converter and check the torque converter clutch for slippage.

STALL SPEED DIAGNOSIS CHART

Transmission Range Selector Lever Position	Stall Speeds High	Stall Speeds Low
(D)Overdrive, D, and 1	Overdrive One-Way Clutch, Rear One-Way Clutch	—
D, 2 and 1	Forward Clutch, O/D One-Way Clutch	—
(D)Overdrive	Forward Clutch, O/D One-Way Clutch	—
(D)Overdrive, D, 2, 1 and R	General Pressure Concerns, Forward Clutch, O/D One-Way Clutch	Converter One-Way Clutch or Engine Performance
R Only	High/Reverse and High Clutch and Low and Reverse Band/Servo	—
2 Only	Intermediate Band/Servo	—
1 Only	Low/Reverse Band/Servo	—

Air Pressure Tests

A no drive condition can exist, even with correct transmission fluid pressure, because of inoperative clutches or bands. An erratic shift can be located through a series of checks by substituting air pressure for fluid pressure to determine the location of the malfunction.

When the transmission range selector lever is in a forward gear range ((D), 2, 1), a no drive condition may be caused by an inoperative forward clutch, or an overrunning one-way clutch.

Failure to drive in R (REVERSE) could be caused by a malfunctioning reverse clutch, reverse servo, or band.

Follow the procedure to determine the location of the inoperative clutch or band by introducing air pressure into the various test plate passages.

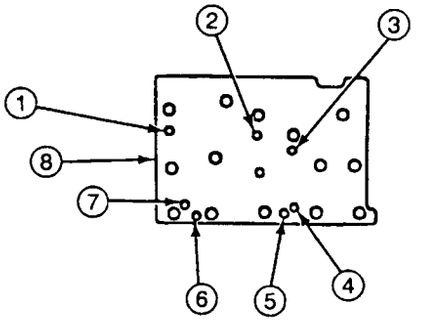
Test Procedures

NOTE: Cover vent in test plate with a clean, lint-free shop towel to prevent spray when air is applied. Plugging vent hole during testing will result in inaccurate results.

NOTE: Use only dry regulated air pressure 276kPa (40 psi) max. A dull thud should be heard when the clutch or band applies. There should be no hissing sound when band or clutch applies.

1. Drain transmission fluid and remove transmission oil pan.
2. Remove filter and seal assembly and main control valve body.
3. Install 4R44E/5R55E Transmission Test Plate T95L-77000-AH and Transmission Test Plate Gasket T95L-77000-AH1.
4. **CAUTION: Do not apply air to test the vent.**

   Apply air pressure to appropriate clutch port (refer to diagram). A dull thud may be heard or movement felt when clutch is applied or released. If clutch seals or check balls are leaking a hissing sound may be heard.



D15526-A

Item	Part Number	Description
1	—	Coast Clutch Apply
2	—	Direct Clutch Apply
3	—	Forward Clutch Apply
4	—	Intermediate Servo Release
5	—	Intermediate Servo Apply
6	—	Front Servo Release
7	—	Front Servo Apply
8	T95L-77000-AH	4R44E/5R55E Transmission Test Plate
—	T95L-77000-AH1	Transmission Test Plate Gasket

Test Results

If test results find that the servos do not operate, disassemble, clean and inspect them to locate the source of the concern.

If air pressure applied to the clutch passages fails to operate a clutch, or operates another clutch simultaneously, disassemble and use air pressure to check the fluid passages in the center support and clutches to detect obstructions.

This unit uses a new fluid MERCON V. *This fluid is NOT interchangeable with the current Mercon. Using the wrong fluid can cause transmission concerns.*

This Mercon V (XT-5-QM) is the only fluid required for the 5R55E it is a fill for life fluid under normal usage. For heavy/severe duty applications the fluid needs to be changed at 50,000 miles.

FEATURES

Shift Solenoid # 4

Used as an On / Off for Coast Clutch apply and release.

Modulated to assist the front band release during the 2-3 shift and to improve the Font Band application for the 3-2 and the 5-4 shifts. The modulation applies a variable pressure by duty cycling the solenoid.

Output Shaft Speed Sensor

Park Gear and Pulse Wheel

These components provide information that allows for a more precise electronic calibration based on input and output speed.

Coast Clutch Friction Plates

Direct Clutch Friction Plates

Forward Clutch Friction Plates

New directional friction plate grooves provide "control" of fluid flow across the plates for heat reduction.

Key to orient the clutch plates properly during assembly or damage to the transmission may result.

Workshop manuals have been updated to show correct orientation of clutch plates during installation.

These are not compatible with past models.

Digital TR Sensor,

New design, new connector to meet new durability requirements

Tequires new Transmission Tester Overlay cable, and NGS for diagnostics.

Diagnostic (DTCs, NGS,ISIG and DTR procedures)

New DTCs for DTR, TCC and SS1-4

New Procedures using NGS:

Transmission control/Function

90+% diagnostics covered

New inductive Signature (ISIG) Solenoids help identify solenoid mechanical failure using current draw

New procedures for DTR diagnosing

THEORY AND OPERATION- NEW INFORMATION

THE FOLLOWING HAVE NEW MODES FOR 5R55E;
Solenoid Operation
Solenoid Failure Modes

NEW GEAR RATIOS FOR THE 5R55E AS FOLLOWS;

1st - 2.47

2nd - 1.86

3rd - 1.47

4th - 1.00

5th - 0.75

The follwing are revised for 5R55E applications

Powerflow

Hydraulics

Diagnosis and Symtom

FORD 5R55E CONTINUED

PART DESCRIPTION	REVISION DESCRIPTION	PART NUMBER
FRONT DRUM (COAST CLUTCH)	REVISED DESIGN, CAST DRUM VERSUS STAMPING FOR IMPROVED DURABILITY	F77Z-7L669-AD
CENTER SUPPORT ASSEMBLY	NEW RADIAL BEARINGS ON SUPPORT FOR INCREASED DURABILITY	F77Z-7A130-CB
INTERMEDIATE BRAKE DRUM ASSEMBLY (DIRECT CLUTCH)	NEW DESIGN, INCREASED CLUTCH DIAMETER FOR INCREASED CAPACITY AND DURABILITY (1 GROOVE) (2 GROOVE)	 F77Z-7D044-CF F77Z-7D044-AE
FORWARD CLUTCH CYLINDER	NEW DESIGN, RADIAL BEARINGS ON STATOR FOR INCREASED DURABILITY (5 PLATE PACK) (6 PLATE PACK)	 F77Z-7A360-DD F77Z-7A360-EO
CONVERTER HOUSING HUB SEAL	NEW DESIGN, NO LONGER NEEDS THE STAKING PROCESS	F77Z-7A248-AA
CASE BEARING	NEW DESIGN, RADIAL NEEDLE BEARING REPLACES CASE BUSHING FOR INCREASED DURABILITY AND NEW SERVICE TOOL AND PROCEDURES TO AID IN PROPER INSTALLATION	F77Z-7R205-AA
EPC SOLENOID	NEW DESIGN, INCORPORATES INDUCTIVE SIGNATURE (ISIG) FOR DIAGNOSIS, AND IS NOT INTERCHANGEABLE WITH PREVIOUS MODELS	F77Z-7G383-AA
TORQUE CONVERTER CLUTCH SOLENOID	NEW DESIGN, INCORPORATES INDUCTIVE SIGNATURE (ISIG) FOR DIAGNOSIS, AND IS NOT INTERCHANGEABLE WITH PREVIOUS MODELS	F77Z-7G136-AA
NEEDLE BEARINGS NUMBER 5 AND 9	NEW FOR 1997, REPLACES THRUST WASHERS FOR INCREASED DURABILITY	F77Z-7M153-EB
NEEDLE BEARING NUMBER 8	NEW FOR 1997, REPLACES THRUST WASHERS FOR INCREASED DURABILITY	F7ZZ-7M151-BA
NEEDLE BEARING NUMBER 10A	NEW FOR 1997, REPLACES THRUST WASHERS FOR INCREASED DURABILITY	F7ZZ-7M150-DA
NEEDLE BEARING NUMBER 10B	NEW FOR 1997, REPLACES THRUST WASHERS FOR INCREASED DURABILITY	F7ZZ-7M150-CA

Diagnosing and Testing With a Scanner

NOTE: If any non-transmission codes appear, repair those first. They can effect the electrical operation of the transmission. Record and erase codes from continuous memory after repairs have been performed. After repairing any fault codes in the Quick Test, the Quick Test should be repeated.

NOTE: Check the EEC-V system wiring harness for proper connection, bent or broken pins, corrosion, loose wires, proper routing, proper seals and their condition. Check the powertrain control module, sensors, and actuators for physical damage.

If codes appear while performing the Self Test, refer to the On-Board Diagnostic Trouble Code Description Chart for the appropriate repair procedure.

ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
P0112	IAT	IAT indicates 125°C (254°F) (grounded).	Voltage drop across IAT exceeds scale set for temperature 125°C (254°F).	Incorrect EPC pressure. Either high or low which will result in harsh or soft shifts.
P0113	IAT	IAT indicates -40°C (-40°F) (open circuit).	Voltage drop across IAT exceeds scale set for temperature -40°C (-40°F).	Incorrect EPC pressure. Either high or low which will result in harsh or soft shifts.
P0114	IAT	IAT out of on-board diagnostic range.	IAT temperature higher or lower than expected during KOEO and KOER.	Rerun on-board diagnostic at normal operating temperature.
P1116	ECT	ECT out of on-board diagnostic range.	ECT temperature higher or lower than expected during KOEO and KOER.	Rerun on-board diagnostic at normal operating temperature.
P0117	ECT	ECT indicates 125°C (254°F).	Voltage drop across ECT exceeds scale set for temperature 125°C (254°F) (grounded).	Torque converter clutch will always be off, resulting in reduced fuel economy.
P0118	ECT	ECT indicates -40°C (-40°F).	Voltage drop across ECT exceeds scale set for temperature -40°C (-40°F) (open circuit).	Torque converter clutch will always be off, resulting in reduced fuel economy.
P1124	TP	TP voltage high / low for on-board diagnostic.	TP was not in the correct position for on-board diagnostic.	Rerun at appropriate throttle position per application.

ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
P0121, P0122, P0123, P1120, P1121, P1125, P1124	TP	TP concern.	PCM has detected an error. This error may cause a transmission concern.	Harsh engagements, firm shift feel, abnormal shift schedule, torque converter clutch does not engage. Torque converter clutch cycling.
P0102, P0103, P1100, P1101	MAF	MAF concerns.	MAF system has a malfunction which may cause a transmission concern.	High / low EPC pressure, incorrect shift schedule. Incorrect torque converter clutch engagement scheduling. Symptoms similar to a TP failure.
P0300-P0308, P0320, P0340, P1351-P1364	EI	EI concerns.	EI system has a malfunction which may cause a transmission concern.	Harsh engagements and shifts, late WOT shifts, no torque converter clutch engagement.
P0500, P0501, P0503, P1500, P1501	VSS	Insufficient VSS input.	PCM detected a loss of vehicle speed signal during operation.	Torque converter clutch engages, shift engagement / disengagement (hunting) on grades.
P1705	DTR	DTR not in PARK or NEUTRAL.	On-board diagnostic not run in PARK.	Rerun on-board diagnostic in PARK.
P1704	DTR	DTR sensor failure in transition state.	DTR sensor misaligned or failed electrically.	Increase in EPC pressure.
P1703	BOO	Brake not actuated during on-board diagnostic KOER.	Brake not cycled during KOER.	Failed ON or not connected — torque converter clutch will not engage at less than 1/3 throttle. Failed OFF or not connected — torque converter clutch will not disengage when brake is applied.
P1703	BOO	BOO switch circuit failed.	Brake ON circuit failure during KOEO.	Failed ON or not connected — torque converter clutch will not engage at less than 1/3 throttle. Failed OFF or not connected — torque converter clutch will not disengage when brake is applied.
P1460	A/C	A/C clutch cycling pressure switch error.	A/C or Defrost ON condition may result from A/C clutch being ON during on-board diagnostic.	DTC set during on-board diagnostic — rerun with A/C OFF. Failed ON — EPC pressure slightly low with A/C OFF.

ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
P0731**	SS1, SS2, SS3 or internal parts	1st gear error.	No 1st gear.	Improper gear selection depending on failure or mode and manual lever position. Shift errors may also be due to other internal transmission concerns (stuck valves, damaged friction material).
P0732**	SS1, SS2, SS3 or internal parts	2nd gear error.	No 2nd gear.	Improper gear selection depending on failure or mode and manual lever position. Shift errors may also be due to other internal transmission concerns (stuck valves, damaged friction material).
P0733**	SS1, SS2, SS3 or internal parts	3rd gear error.	No 3rd gear.	Improper gear selection depending on failure or mode and manual lever position. Shift errors may also be due to other internal transmission concerns (stuck valves, damaged friction material).
P0734**	SS1, SS2, SS3 or internal parts	4th gear error.	No 4th gear.	Improper gear selection depending on failure or mode and manual lever position. Shift errors may also be due to other internal transmission concerns (stuck valves, damaged friction material).
P0750*	SS1	SS1 solenoid circuit failure.	SS1 circuit failed to provide voltage drop across solenoid. Circuit open or shorted or PCM driver failure during on-board diagnostic.	Improper gear selection depending on condition mode and manual lever position. See Solenoid On/Off charts.
P0755*	SS2	SS2 solenoid circuit failure.	SS2 circuit fails to provide voltage drop across solenoid. Circuit open or shorted or PCM driver failure during on-board diagnostic.	Improper gear selection depending on condition mode and manual lever position. See Solenoid On/Off charts.

ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
—	TCIL	TCIL circuit failure	TCIL circuit open or shorted.	Failed ON — Overdrive cancel mode always ON. NO flashing TCIL for EPC failure or sensor. Failed OFF — Overdrive cancel mode never indicated. NO flashing TCIL for EPC sensor failure.
P1747**	EPC	EPC solenoid circuit failure, shorted circuit.	Voltage through EPC solenoid is checked. An error will be noted if tolerance is exceeded.	Short Circuit — Causes minimum EPC pressure (minimum capacity) and limits engine torque (alternate firm). Zero EPC — no 2nd and 4th gear. Slips in 1st and 3rd with high torque input.
P0741**, P1744**	TCC	TCC slippage detected.	The PCM picked up an excessive amount of TCC slippage during normal vehicle operation.	TCC slippage / erratic or no torque converter clutch operation. Flash TCIL.
P1780	TCS	TCS not changing states.	TCS not cycled during self test. TCS circuit open or shorted.	No (O) cancel when switch is cycled during KOER.
P1711	TFT	TFT out of on-board diagnostic range.	Transmission not at operating temperature during on-board diagnostic.	DTC set — Vehicle cold or overheated.
P0713	TFT	-40°C (-40°F) indicated TFT sensor circuit open.	Voltage drop across TFT sensor exceeds scale set for temperature -40°C (-40°F)	Firm shift feel.
P0712	TFT	157°C (315°F) indicated TFT sensor circuit grounded.	Voltage drop across TFT sensor exceeds scale set for temperature of 157°C (315°F)	Firm shift feel.
P0715	TSS	Insufficient input from Turbine Shaft Speed Sensor.	PCM detected a loss of TSS signal during operation.	Harsh shifts, abnormal shift schedule, no torque converter clutch activation.
P0743*	TCC	TCC solenoid circuit failure during on-board diagnostic.	TCC solenoid circuit fails to provide voltage drop across solenoid. Circuit open or shorted or PCM drive failure during on-board diagnostic.	Short circuit — Engine stalls in second (OD, 2 range) at low idle speeds with brake applied. Open circuit — Torque converter clutch never engages.

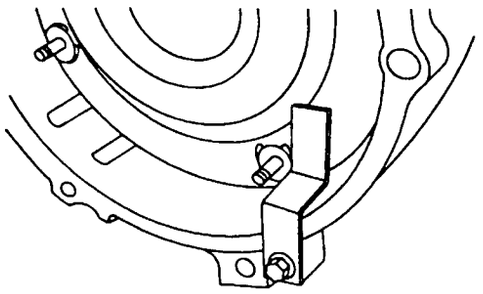
ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
P1783	TFT	Transmission overtemp condition indicated.	Transmission fluid temperature exceeded 127°C (270°F).	Increase in EPC pressure.
P0705	DTR	DTR circuit failure.	DTR sensor, circuit or PCM shorted or grounded.	Increase in EPC pressure.
P0708	DTR	DTR circuit above maximum voltage — open.	DTR sensor, circuit or PCM indicates open.	Increase in EPC pressure.
P0751••	SS1	Shift solenoid No. 1 functional failure.	Mechanical or hydraulic failure of the shift solenoid.	Improper gear selection depending on failure mode and manual lever position.
P0756••	SS2	Shift solenoid No. 2 functional failure.	Mechanical or hydraulic failure of the shift solenoid.	Improper gear selection depending on failure mode and manual lever position.
P1781	4x4L	4x4 low switch failure.	Switch closed or shorted during KOEO.	Early or delayed shifts.
P1729	4x4L	4x4 low switch failure.	Circuit open / shorted.	Early or delayed shifts.
P0761••	SS3	Shift solenoid No. 3 functional failure.	Mechanical or hydraulic failure of the shift solenoid.	Improper gear selection depending on failure mode and manual lever position.
P0760•	SS3	SS3 solenoid circuit failure.	SS3 circuit failed to provide voltage drop across solenoid. Circuit open or shorted or PCM driver failure during on-board diagnostic.	Improper gear selection depending on condition mode and manual lever position. See Solenoid On / Off chart.
P1746••	EPC	EPC solenoid circuit open.	Voltage through EPC solenoid is checked. Error is noted if tolerance is exceeded.	Open Circuit — Causes maximum EPC pressure, harsh engagements and shifts.
P1701	Transmission	Reverse engagement error.	EPC pressure is low, no drop in TSS rpm, DTR indicates reverse	EPC pressure low, SS1 is off, engine lacks power.
P1714	SS1	SS1 malfunction.	Mechanical failure of the solenoid detected.	Improper gear selection depending on condition, mode and manual lever position. See Solenoid Operation Chart.
P1715	SS2	SS2 malfunction.	Mechanical failure of the solenoid detected.	Improper gear selection depending on condition, mode and manual lever position. See Solenoid Operation Chart.

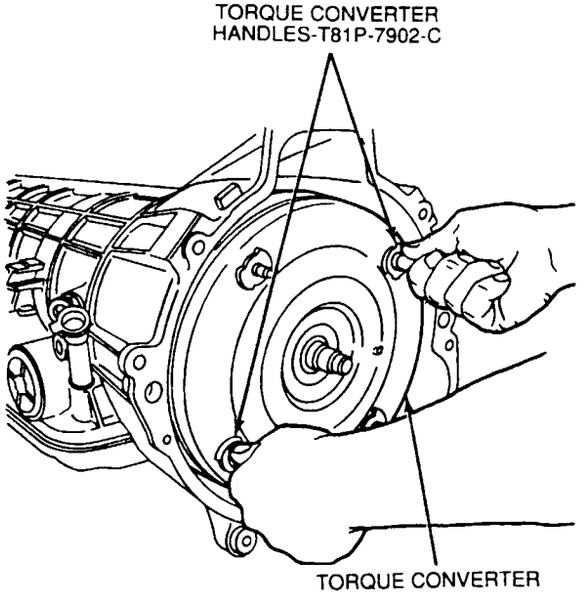
ON-BOARD DIAGNOSTIC TROUBLE CODE DESCRIPTION CHART

Four-Digit DTC	Component	Description	Condition	Symptom
P1716	SS3	SS3 malfunction.	Mechanical failure of the solenoid detected.	Improper gear selection depending on condition, mode and manual lever position. See Solenoid Operation Chart.
P1717	SS4	SS4 malfunction.	Mechanical failure of the solenoid detected.	Improper gear selection depending on condition, mode and manual lever position. See Solenoid Operation Chart.
P0735	SS1, SS2, SS3, SS4 or internal parts	5th gear error	No 5th gear.	Improper gear selection depending on failure mode or manual lever position. Shift errors may also be due to other internal transmission concerns (stuck valves, damaged friction material etc.).
P1719	ODS	Insufficient input from ODS sensor.	PCM detected a loss of ODS signal during operation.	Harsh or flaring 2-1, 2-3 or 5-4 shift.
P0765	SS4	SS4 solenoid circuit failure.	SS4 circuit failed to provide voltage drop across solenoid. Circuit open, shorted or PCM driver circuit failure during on-board diagnostics.	Improper gear selection depending on condition, mode and manual lever position. See Solenoid On/Off charts.
P1762	Transmission	SS3/SS4/OD band failure.	Failure or SS3, SS4 or the front band.	No 2nd or 5th gear.
P0743	TCC	TCC solenoid circuit failure during OBD Test.	TCC solenoid circuit fails to provide voltage drop across solenoid. Circuit open, shorted or PCM driver failure during OBD Test.	Short circuit: engine stalls in O/D or 2 position at low idle with brake applied. Open circuit: torque converter never engages.
P1740	TCC	TCC Malfunction.	Mechanical failure of the solenoid detected.	Failed ON — Engine stalls in 2nd (O/D, Manual 2 ranges) at low idle speeds with brake applied. Failed OFF — Torque converter never applies.
P0720	OSS	Insufficient input from OSS sensor.	PCM detected a loss of OSS signal during operation.	Harsh shifts, abnormal shift schedule, no torque converter clutch engagement.
P0721	OSS	Output shaft speed sensor signal noisy.	PCM has detected an erratic OSS signal.	Harsh shifts, abnormal shift schedule, no torque converter clutch engagement.

Remove Torque converter Holding Tool T97T-7902-A form transmission.

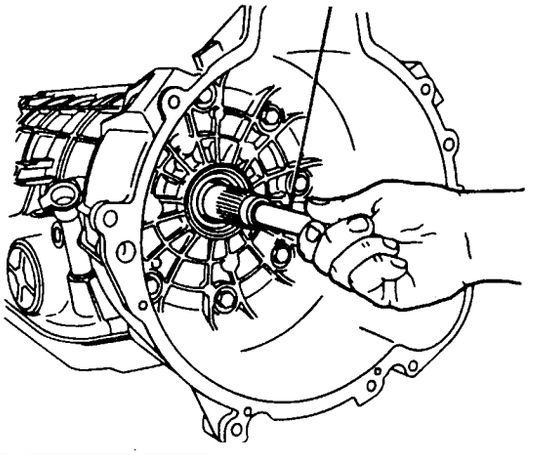


WARNING: THE TORQUE CONVERTER IS HEAVY, ESPECIALLY WHEN FULL OF FLUID.

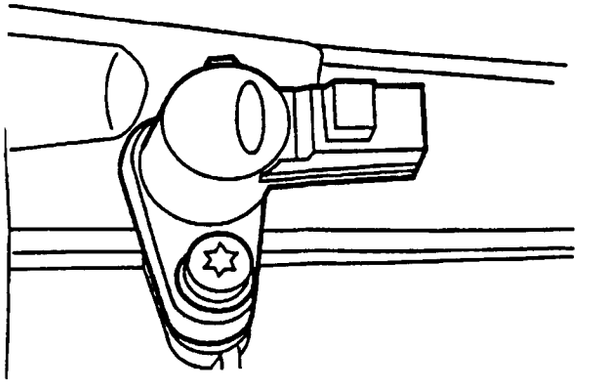


NOTE: The splines on the input shaft are not the same on both ends. The end with the shorter spline goes into the assembly.

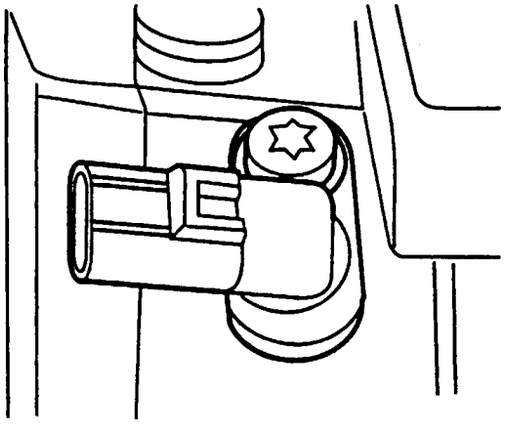
Remove the input shaft.



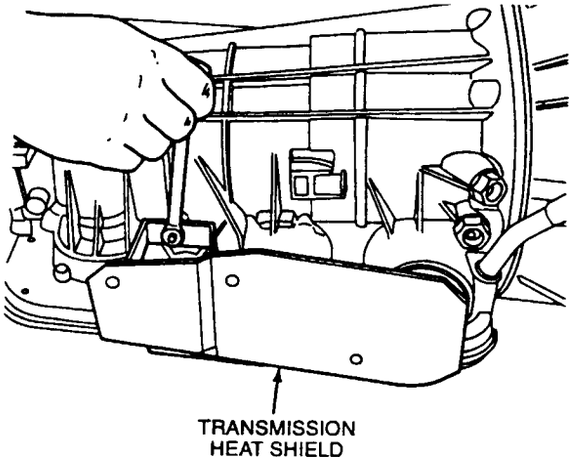
Use a T30 torx socket to remove overdrive drum speed sensor attaching bolt, then remove sensor.



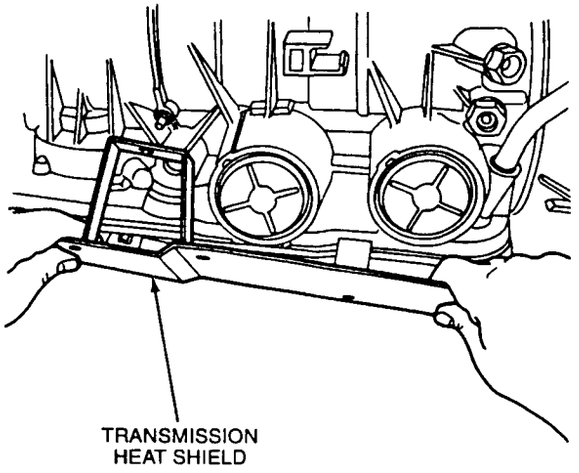
Use a T30 torx socket to remove output shaft speed sensor attaching bolt, then remove sensor.



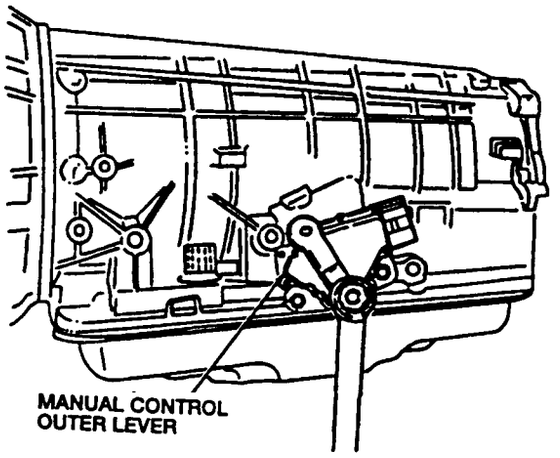
Remove the M6 x 1.0 transmission heat shield nut from the studded screw.



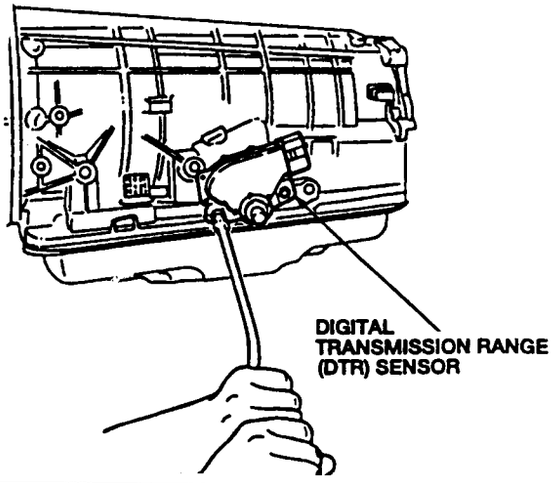
Carefully pry the transmission heat shield off of the fluid pan rail near the retaining clips.



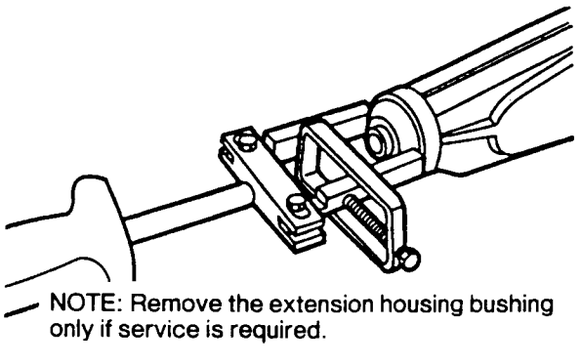
Remove the manual control outer lever nut and manual control outer lever.



Remove the two M6 x 25 digital transmission range (DTR) sensor screws and remove the DTR sensor.



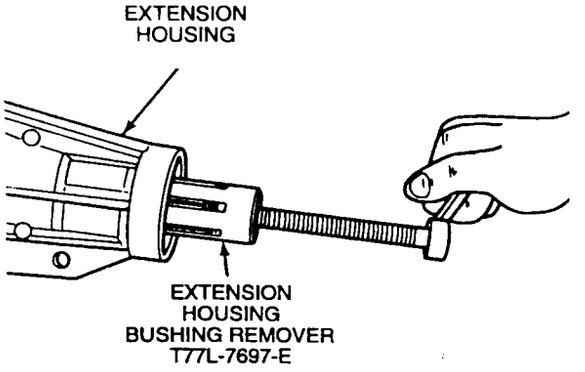
Remove the extension housing seal using Seal Remover T94P-77001-BH and Impact Slide Hammer T50T-100-A.



NOTE: Remove the extension housing bushing only if service is required.

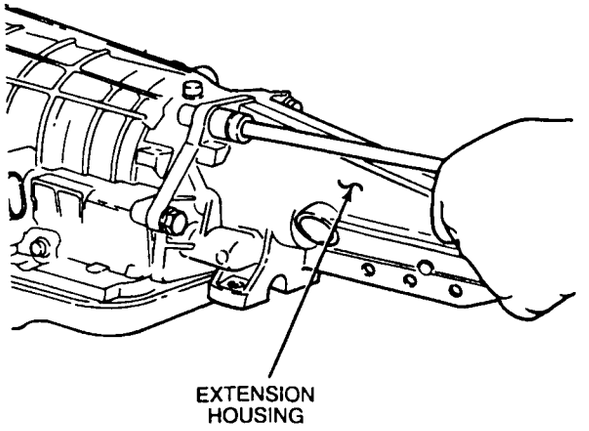
Inspect the extension housing bushing and driveshaft slip-yoke for nicks, gouges, scoring and wear.

Remove the extension housing bushing using Extension Housing Bushing Remover T77L-7697-E.

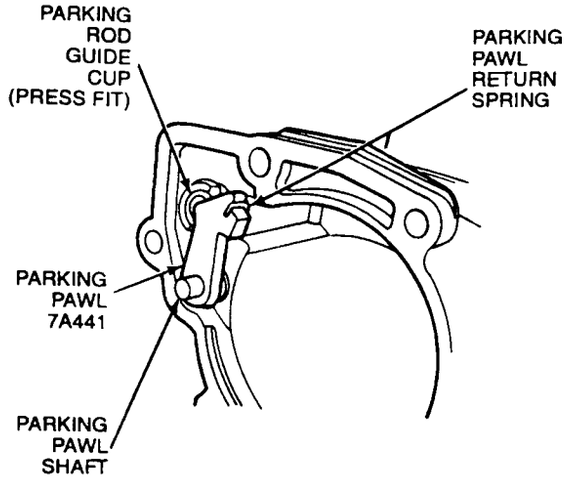


CAUTION: The parking pawl, parking pawl return spring and parking pawl shaft could fall out during removal of the extension housing.

Use a 17mm socket to remove the five M10 x 30mm extension housing-to-transmission case screws, one stud and gasket. Discard gasket.



Remove the parking pawl, parking pawl return spring and parking pawl shaft.

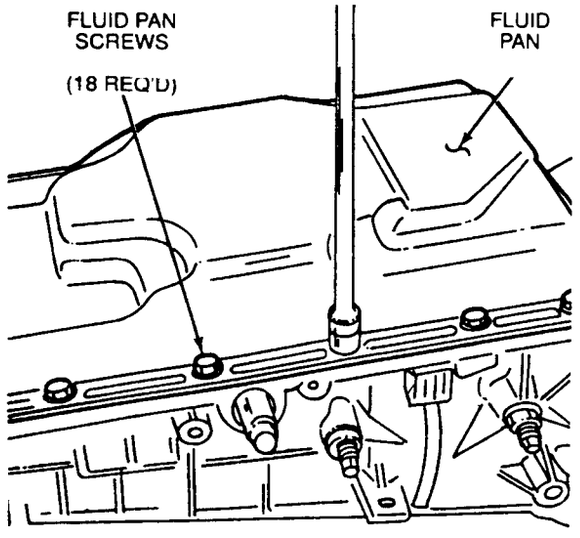


CAUTION: The parking pawl actuating rod must slip freely into the clearance hole in the adapter plate.

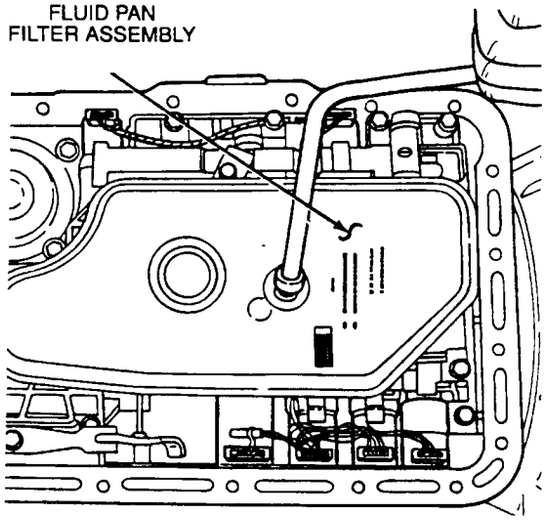
CAUTION: Do not reuse the fluid pan gasket.

Use a 13mm socket to remove the eighteen M8 x 16mm fluid pan screws. Remove the fluid pan and fluid pan gasket. Discard the fluid pan gasket.

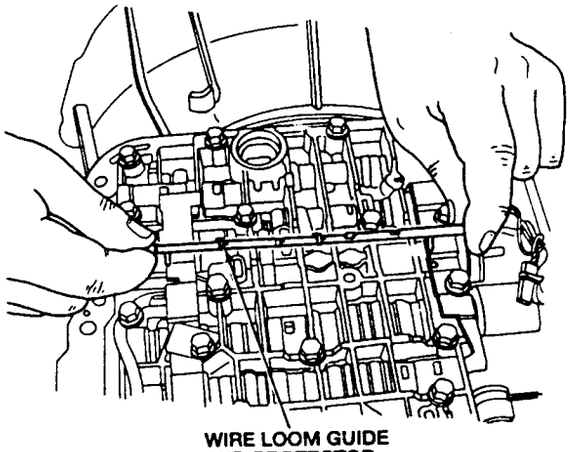
Fluid Pan Removal



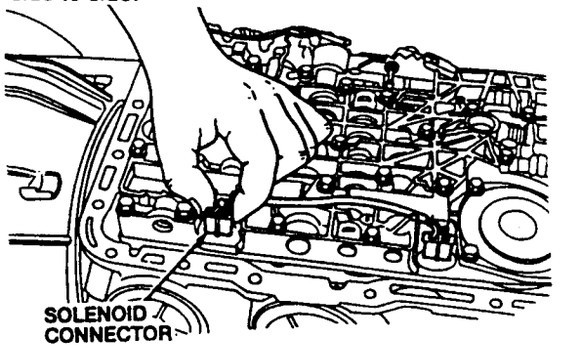
Use a 10mm socket to remove the M6 x 55mm fluid pan filter assembly screw. Remove and discard the fluid pan filter assembly.



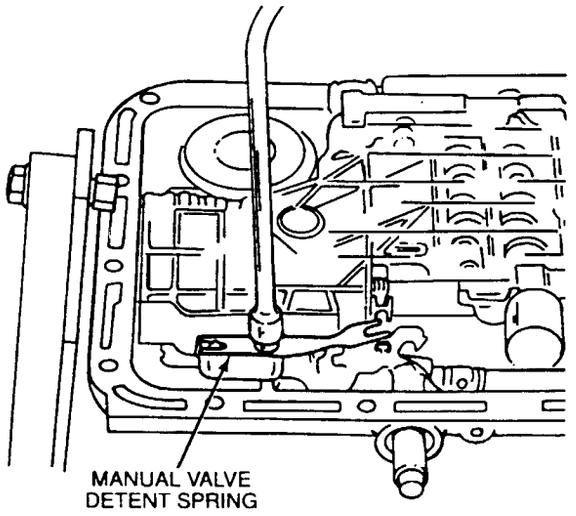
Carefully lift up on the wire loom guide and protector. Disengage the retaining pins from the solenoid clamps.



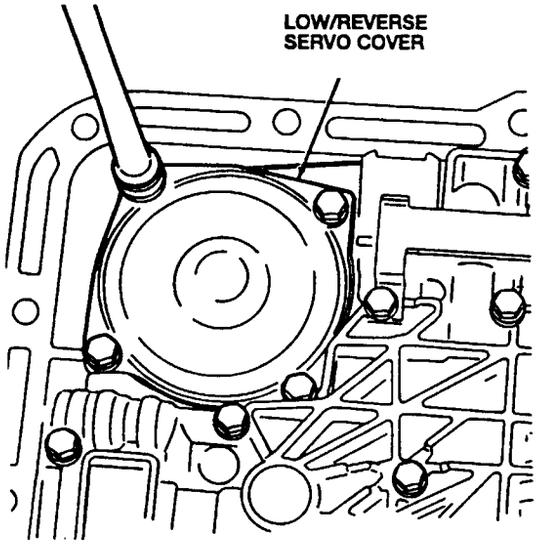
Disconnect the six solenoid connectors from the solenoids by carefully pulling upward and wiggling side to side.

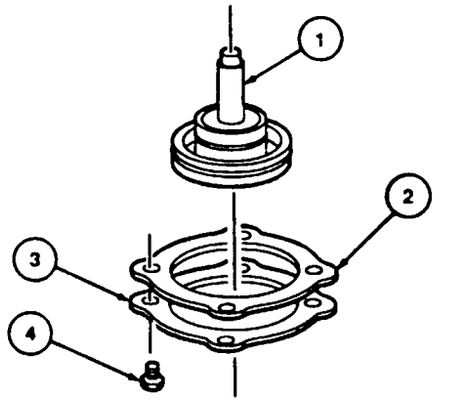


Use a 10mm socket to remove the M6 x 30mm manual valve detent spring screw. Remove the manual valve detent spring.



Use a 10mm socket to remove the four M6 x 20mm low / reverse servo cover screws. Remove the low / reverse servo cover, gasket and piston and rod assembly.



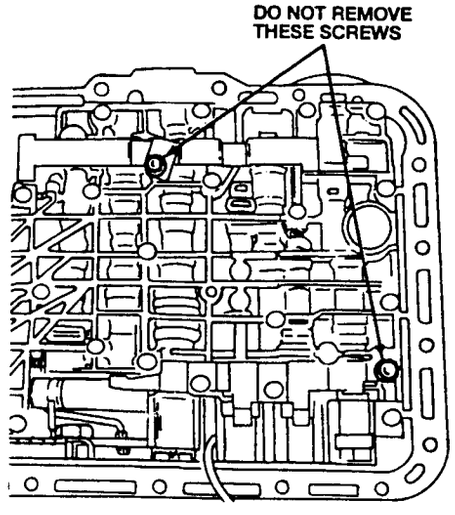


Item	Part Number	Description
1	7D189	Low / Reverse Servo and Rod Assembly
2	7L173	Low / Reverse Servo-to-Case Gasket
3	7D036	Low / Reverse Servo Cover
4	E800156-S	Low / Reverse Servo Cover-to-Case Screw (4 Req'd)

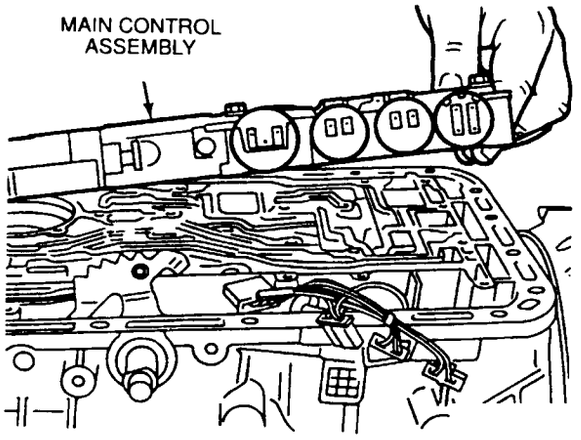
CAUTION: To prevent solenoid valves from falling out, do not remove the two screws shown below.

NOTE: Refer to the main control disassembly and assembly in this section.

Use a 10mm socket to remove the sixteen M6 x 40mm, four M6 x 45mm, two M6 x 35mm and one M6 x 30mm main control valve body screws.

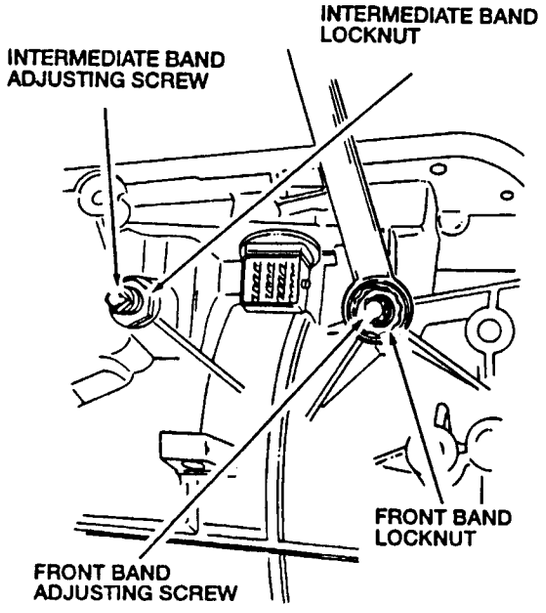


Remove the main control assembly, separator plate and gasket. Discard gasket.



CAUTION: Throw the locknuts away. The locknuts are not reusable for assembly.

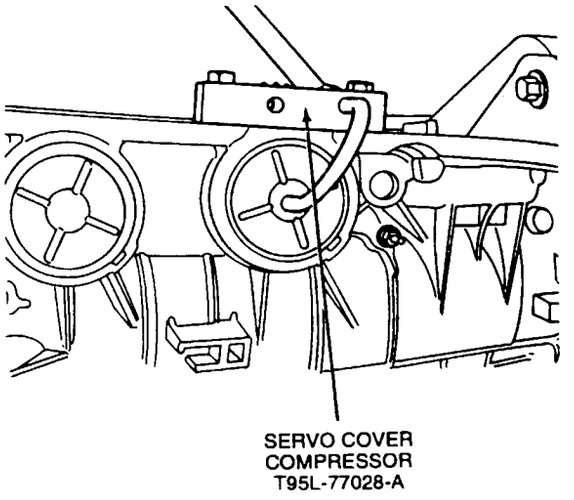
Remove the front and intermediate band locknuts and discard. Back off the band adjusting screws.



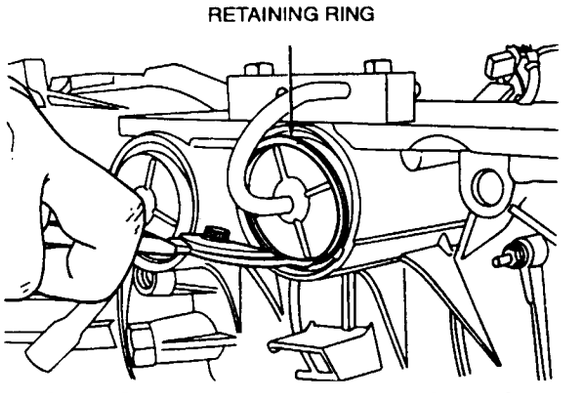
NOTE: The J-hook must be in the appropriate hole for the servo being removed.

Install Servo Cover Compressor T95L-77028-A over the intermediate servo cover at the fluid pan rail with tool stamping facing up. Tighten the screws.

Using a 1/2-inch wrench, tighten the nut on the J-hook until there is a gap between the servo cover and the snap ring.



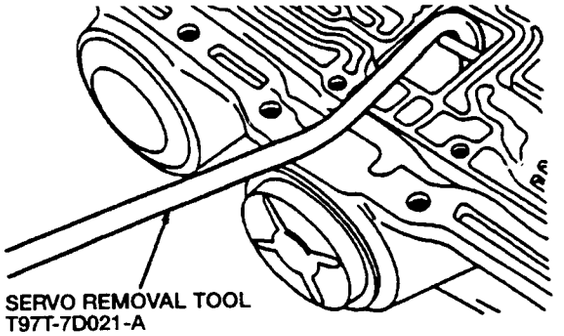
Carefully remove the servo cover retaining ring.



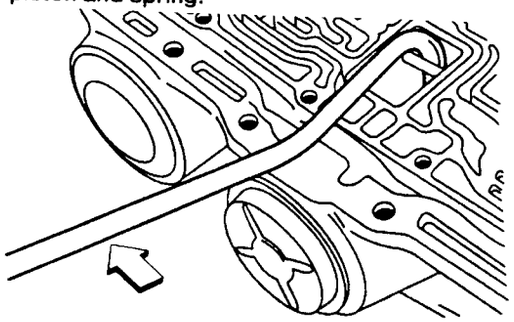
CAUTION: The servo cover is under spring tension.

Carefully back off the nut on the J-hook until the servo spring is unloaded.

Insert Servo Removal Tool T97T-7D021-A into case and locate on servo rod.

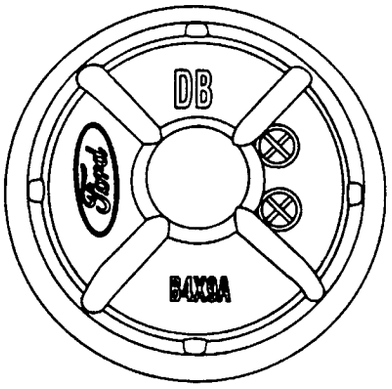


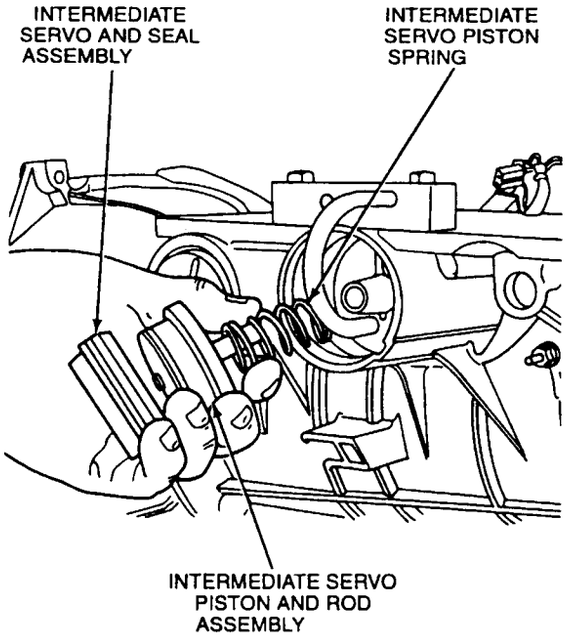
Gently push on Servo Removal Tool T97T-7D021-A to remove front servo cover, piston and spring.



NOTE: Tag the spring, piston and cover assembly. Label accordingly for assembly. The covers have letters cast on the outer surface for identification.

Remove the intermediate servo cover, piston and spring.



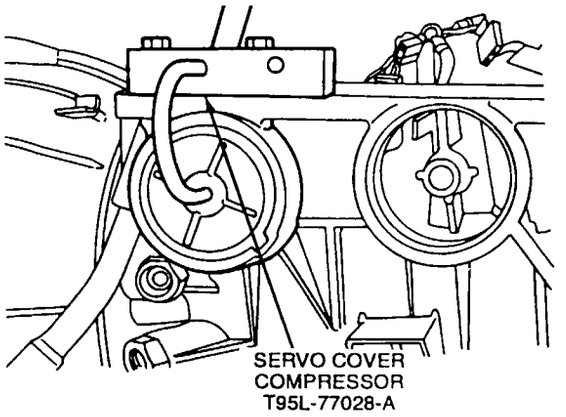


Remove Servo Cover Compressor T95L-77028-A.

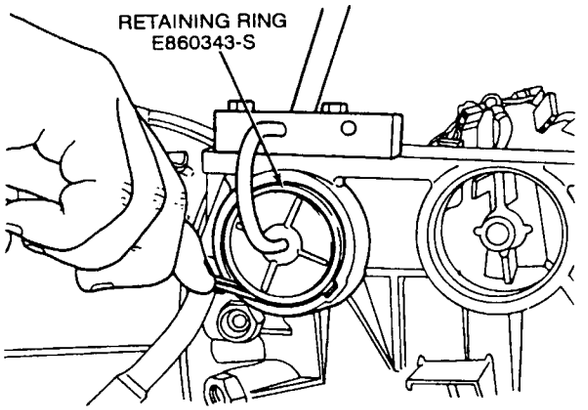
NOTE: The J-hook must be in the appropriate hole for the servo being removed.

Install Servo Cover Compressor T95L-77028-A over the front servo cover at the fluid pan rail. Tighten the screws.

Using a 1/2-inch wrench, tighten the nut on the J-hook until there is a gap between the servo cover and the retaining ring.



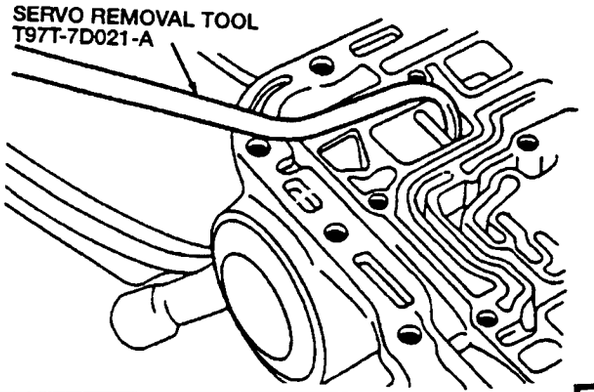
Carefully remove the servo cover retaining ring.



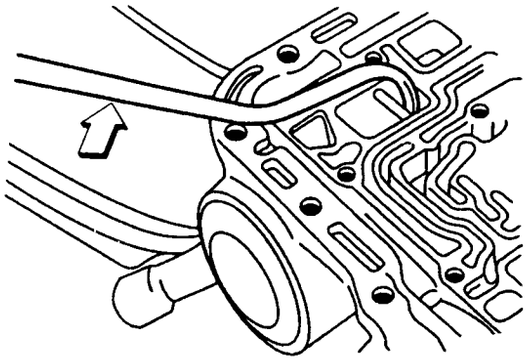
CAUTION: The servo cover is under spring tension.

Carefully back off the nut on the J-hook until the servo spring is unloaded.

Insert Servo Removal Tool T97T-7D021-A into case and locate on servo rod.

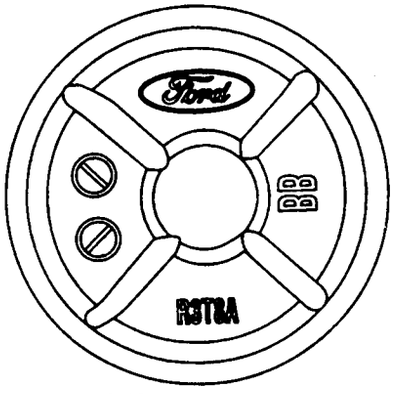


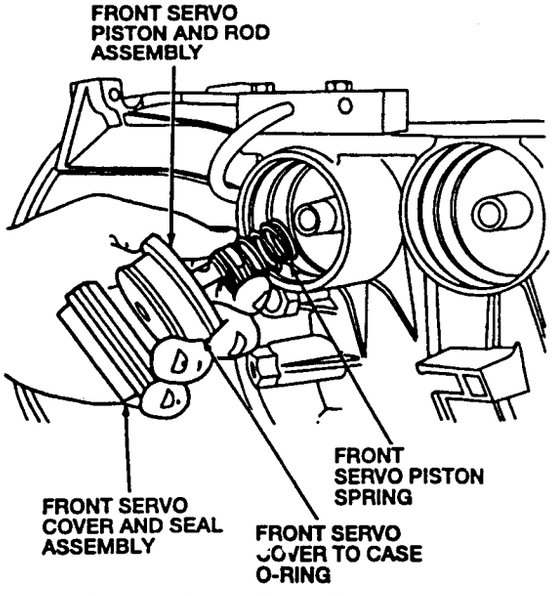
Gently push on Servo Removal Tool T97T-7D021-A to remove front servo cover, piston and spring.



NOTE: Tag the spring, piston and cover assembly. Label accordingly for assembly. The covers have letters cast on the outer surface for identification.

Remove the front servo cover, piston and spring.

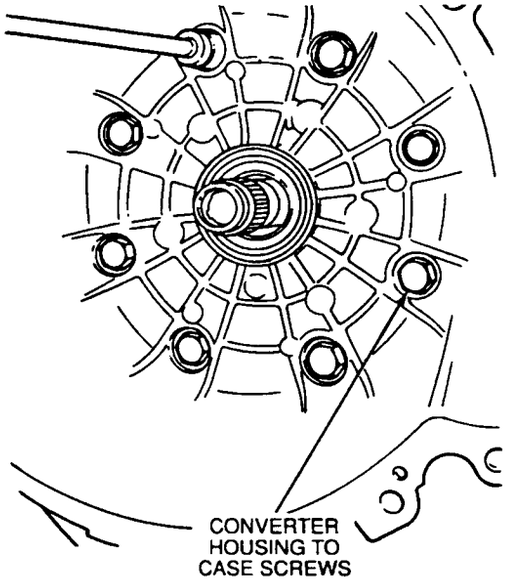




Remove Servo Cover Compressor T95L-77028-A.

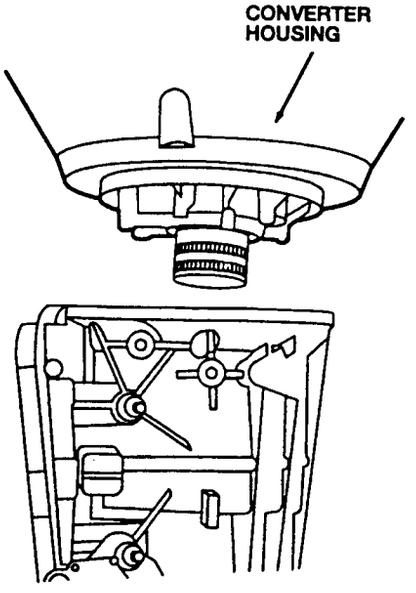
CAUTION: Throw the screws away. The screws are not reusable for assembly.

Use a 17mm socket to remove the eight M10 x 33mm converter housing-to-case screws. Discard the screws.



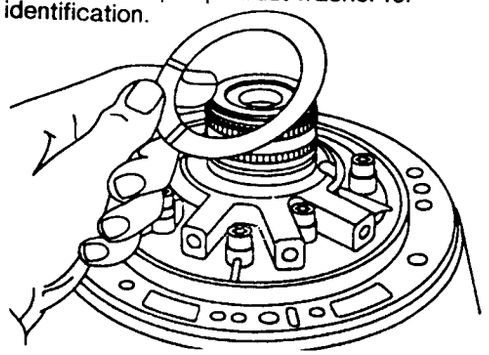
NOTE: Rotate and lift the converter housing so that the clutch assemblies will stay in place.

Remove the converter housing and fluid pump support and gear assembly.

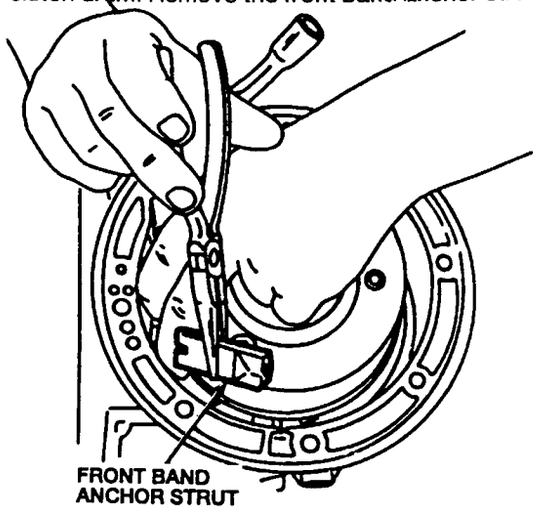


NOTE: Refer to converter housing and pump assembly under subassemblies for service information.

Remove the No. 1 fluid pump thrust washer. Tag the No. 1 fluid pump thrust washer for identification.

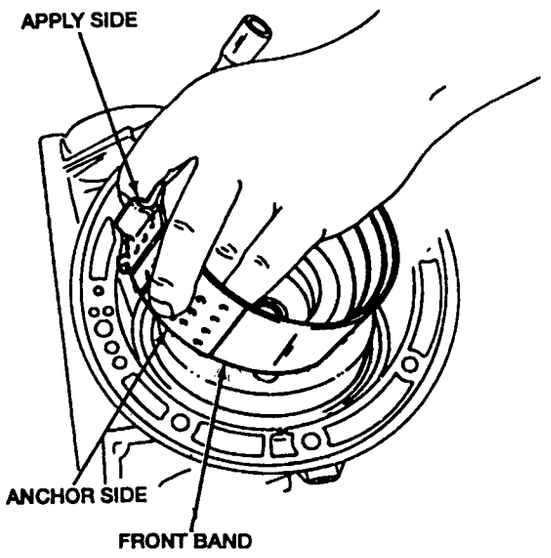


Remove front band adjusting screw. Compress the front band around the front brake and coast clutch drum. Remove the front band anchor strut.

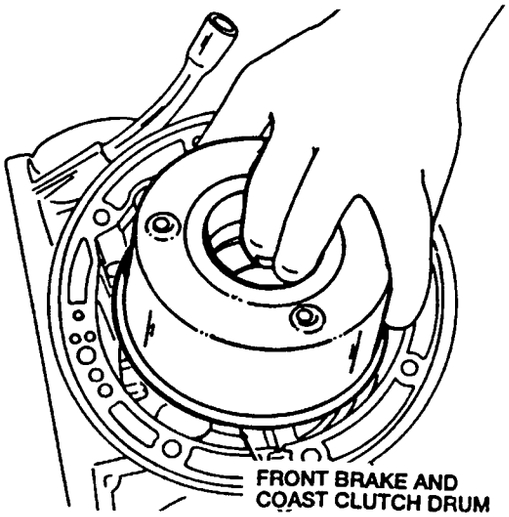


CAUTION: Identify which end of the overdrive band is the anchor side or the apply side.

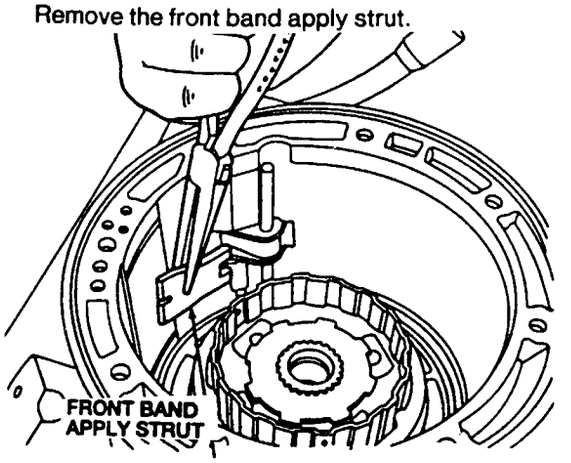
Remove the front band.



Remove the front brake and coast clutch drum.



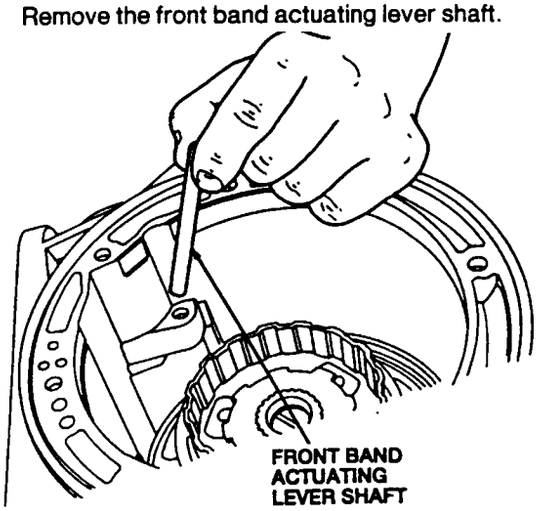
Remove the front band apply strut.



NOTE: Tag and identify the front lever for assembly. The front lever has a letter stamped into its side.

NOTE: The front band actuating lever shaft is longer than the intermediate shaft.

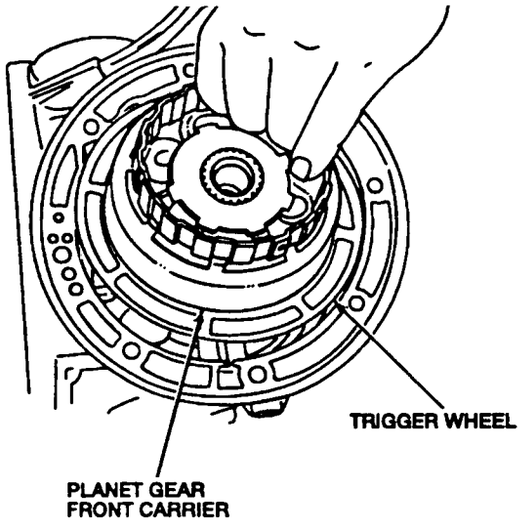
Remove the front band actuating lever shaft.



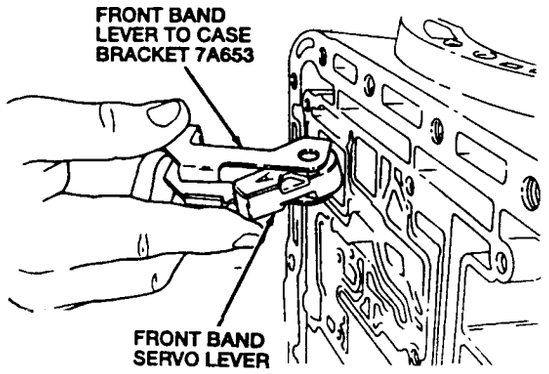
CAUTION: Do not bend the trigger wheel.

NOTE: No. 2 thrust bearing is in this assembly.

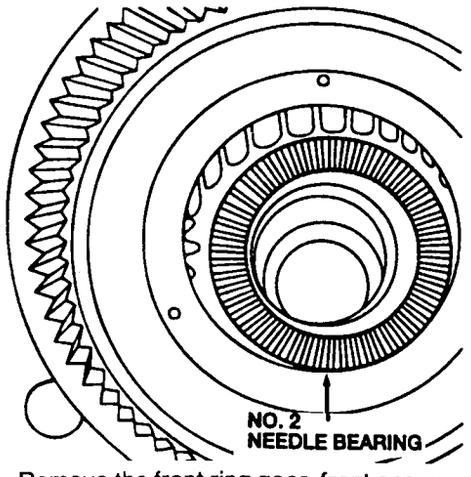
Remove the planetary gear front carrier.



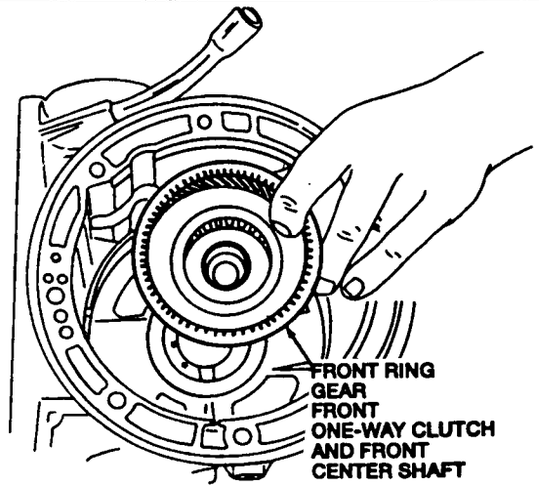
Remove the servo band lever and front control bracket.



Remove the No. 2 needle bearing if not already removed with planetary gear front carrier.

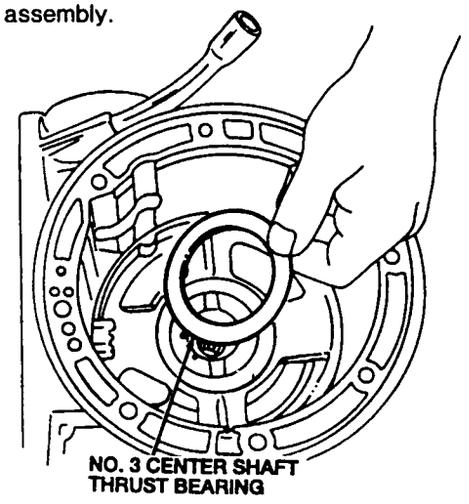


Remove the front ring gear, front one-way clutch and front center shaft assembly.

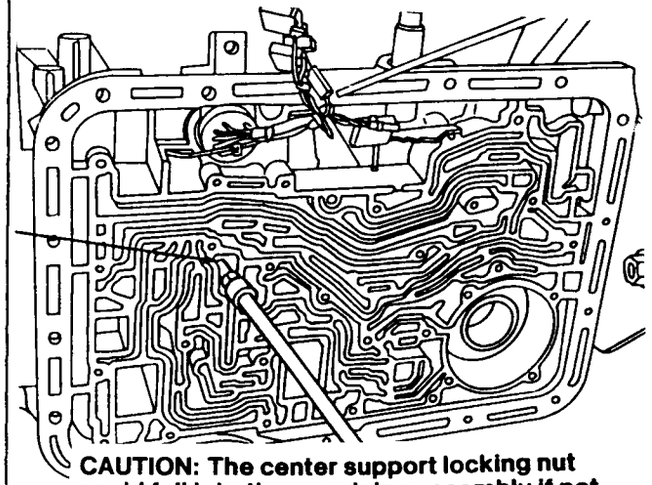


NOTE: Tag and identify the No. 3 center shaft thrust bearing assembly for assembly.

Remove the No. 3 center shaft thrust bearing assembly.

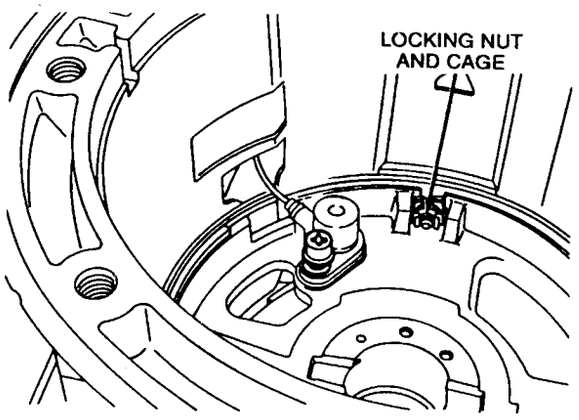


Use a 5mm Allen wrench to remove the M6 x 20mm center support capscrew.



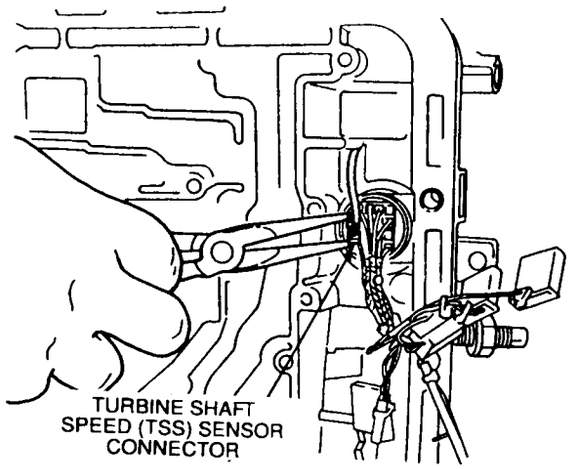
CAUTION: The center support locking nut could fall into the remaining assembly if not removed.

Remove the locking nut and cage from center support.

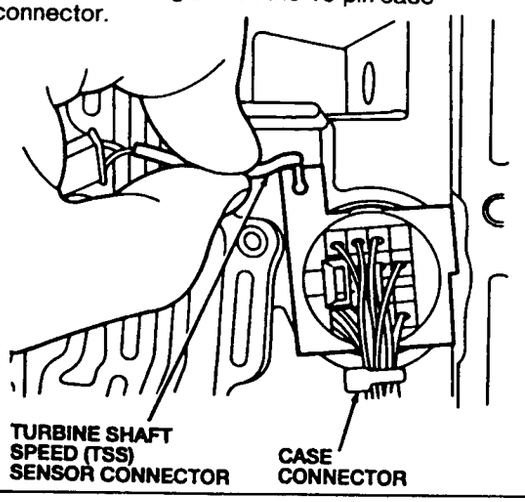


CAUTION: Do not pry on other wires or damage the connector or case surface.

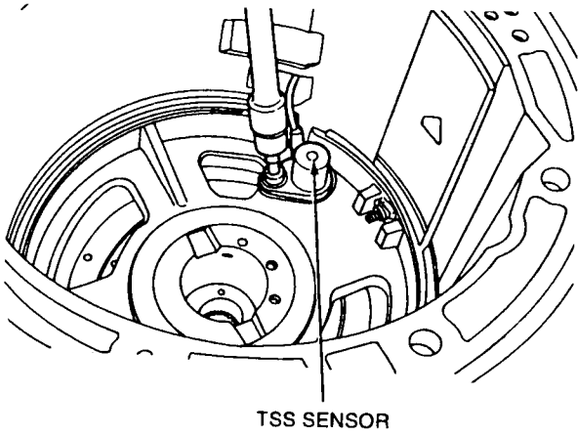
Carefully disconnect the turbine shaft speed (TSS) sensor connector from the 16-pin case connector.



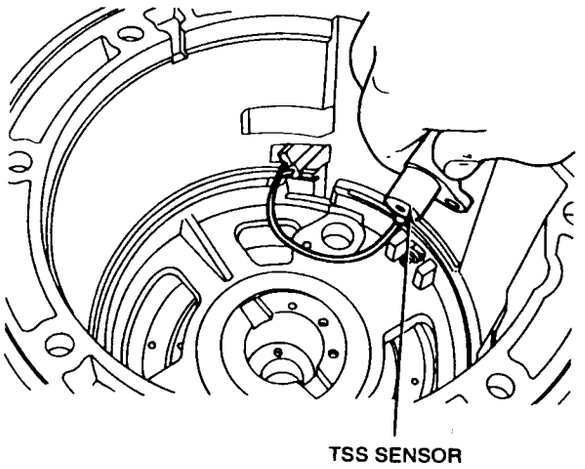
Carefully remove TSS sensor connector wires from the retaining slot on the 16-pin case connector.



Use a T30 Torx® bit to remove the TSS screw.

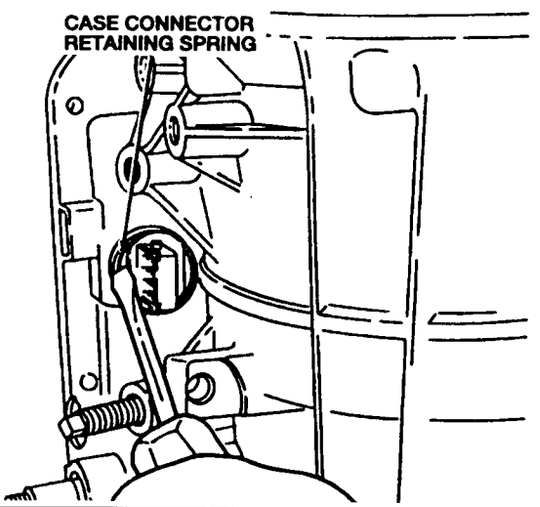


Carefully route the TSS connector and wiring into the transmission through the opening in the case. Remove the TSS.



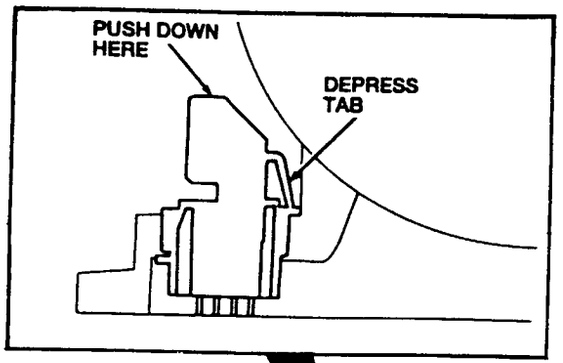
CAUTION: Do not overstretch the case connector retaining spring.

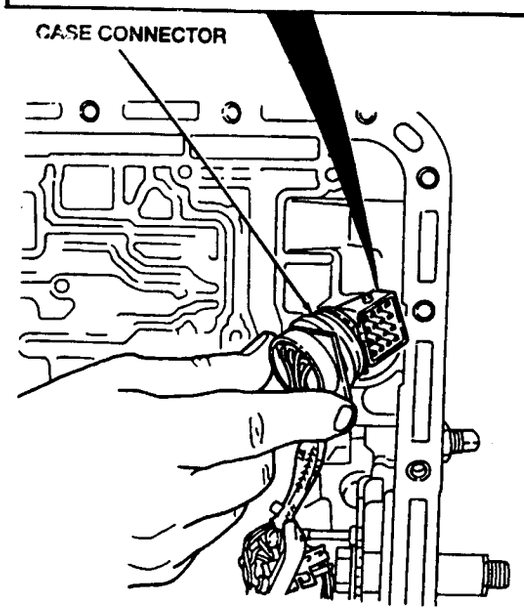
Use a screwdriver to carefully remove the case connector retaining spring.



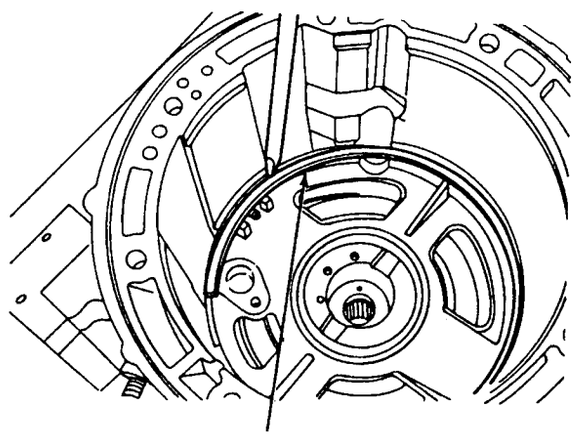
CAUTION: Do not damage the connector or harness.

Carefully push down on the top of the connector until it stops. Depress the tab on the back side of the connector and push down on the connector. Remove the connector and harness through the bottom of the case.

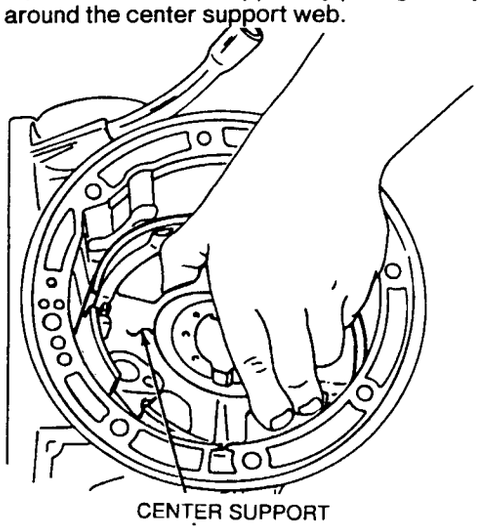




Remove the center support retaining ring.

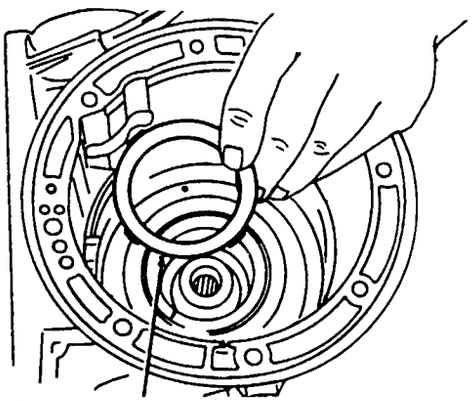


Remove the center support by pulling evenly around the center support web.

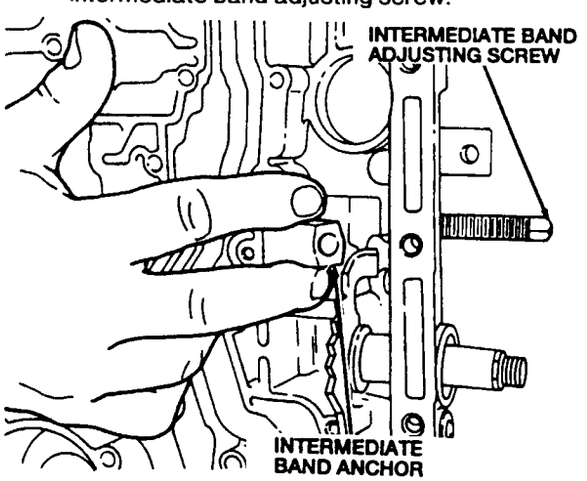


NOTE: Tag and identify the No. 4 intermediate brake drum thrust bearing for assembly.

Remove the No. 4 intermediate brake drum thrust bearing.

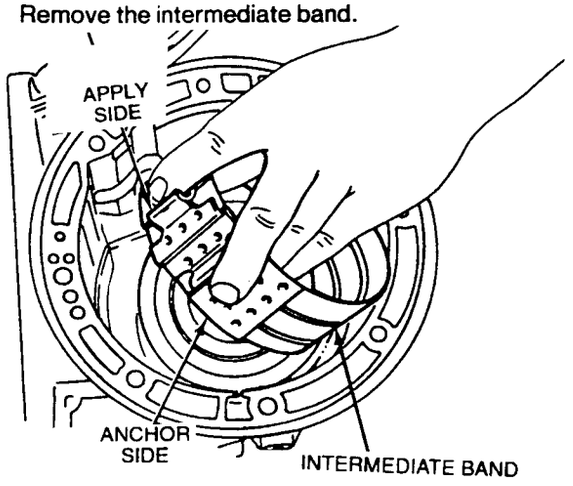


Remove the intermediate band anchor strut through the bottom of the case. Remove intermediate band adjusting screw.

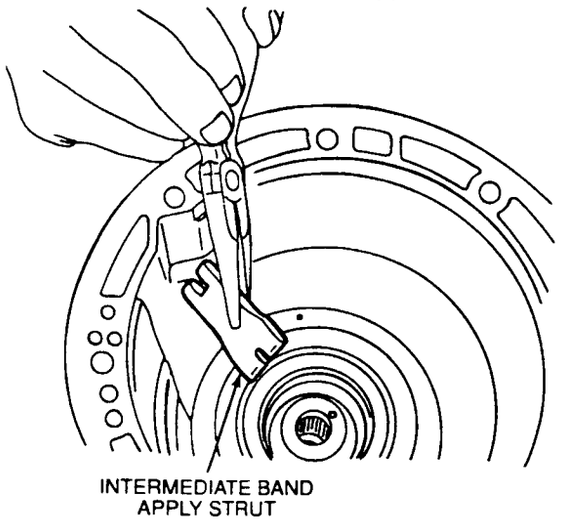


CAUTION: Identify which end of the intermediate band is the anchor side or the apply side.

Remove the intermediate band.

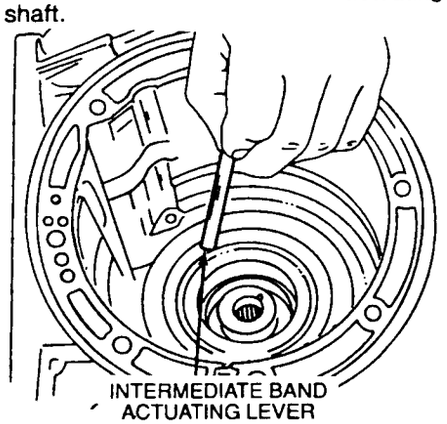


Remove the intermediate band apply strut.



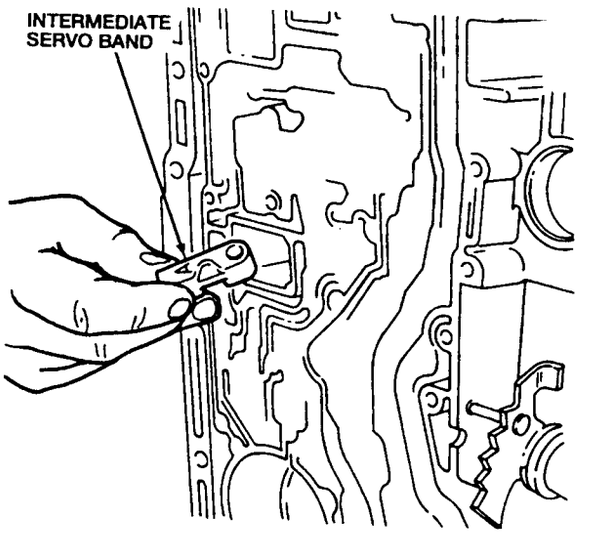
NOTE: The intermediate band actuating lever shaft is shorter than the overdrive band actuating lever shaft.

Remove the intermediate band actuating lever shaft.

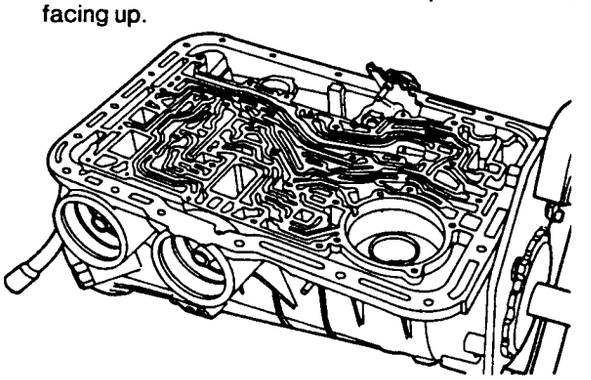


NOTE: Tag and identify the intermediate band servo lever for assembly. The intermediate band servo lever has a letter stamped on its side for identification.

Remove the intermediate band servo lever.

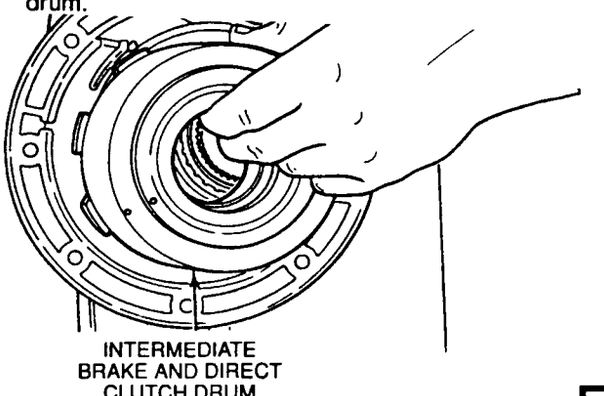


Rotate the transmission so the fluid pan surface is facing up.



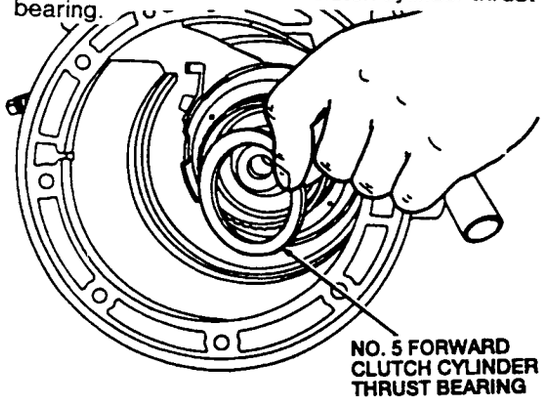
NOTE: The No. 5 forward clutch cylinder thrust bearing may come out with the intermediate brake and direct clutch drum.

Remove the intermediate brake and direct clutch drum.



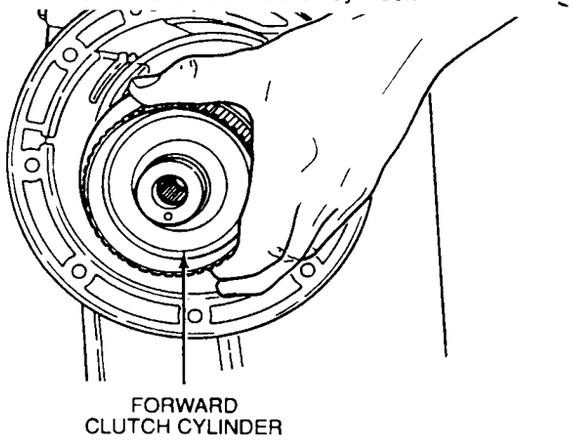
NOTE: Tag and identify the No. 5 forward clutch cylinder thrust bearing for assembly.

Remove the No. 5 forward clutch cylinder thrust bearing.

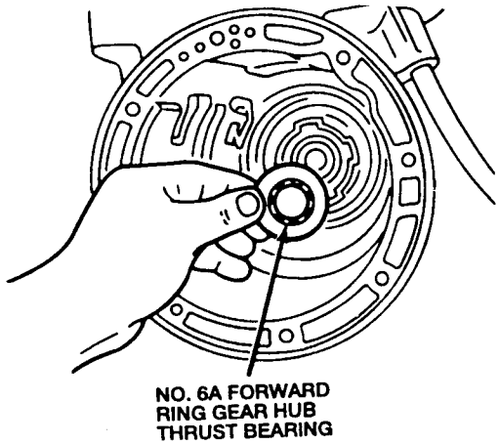


NOTE: The No. 5 forward clutch cylinder thrust bearing may come out with the forward clutch cylinder.

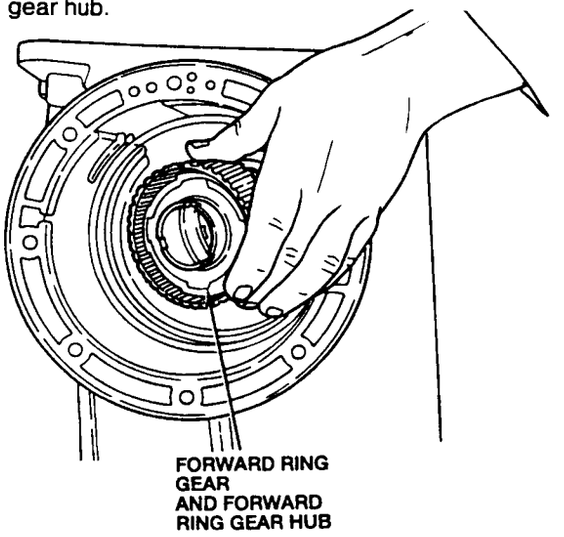
Remove the forward clutch cylinder.



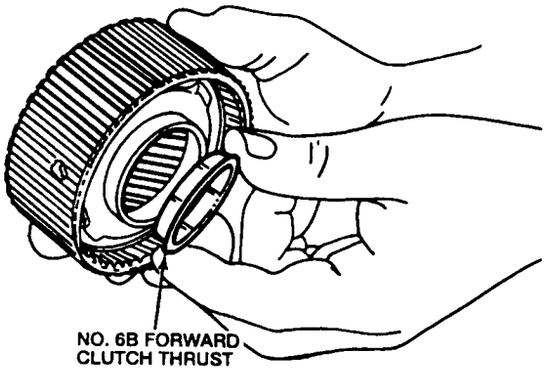
Remove No. 6A forward ring gear hub thrust bearing assembly.



Remove the forward ring gear and forward ring gear hub.

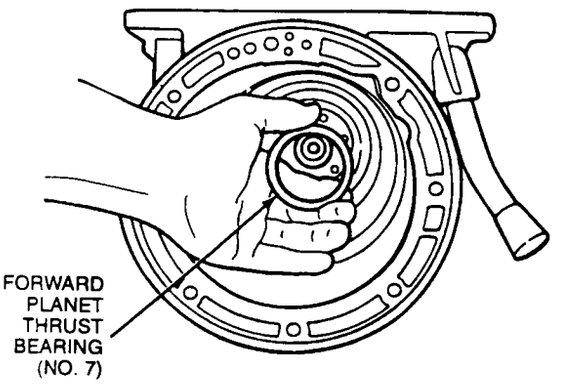


Remove No.6B forward clutch thrust washer.

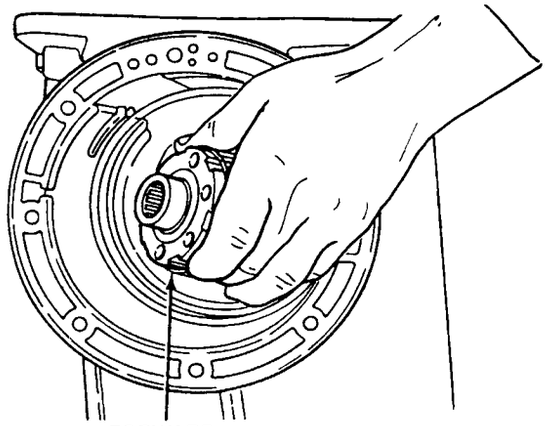


NOTE: Check black oxidized side during removal to ensure correct placement during reassembly. Black oxidized side must be toward planetary assembly. The uncoated side must face up.

Remove the No. 7 forward planetary thrust bearing.



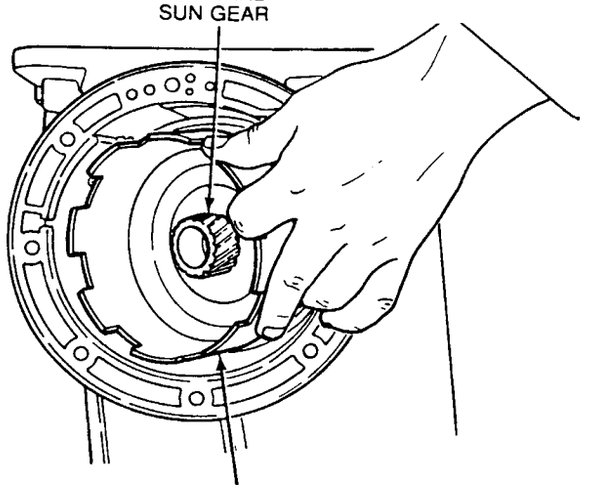
Remove the forward planetary assembly.



FORWARD
PLANET ASSEMBLY

Remove the input shell with forward sun gear.

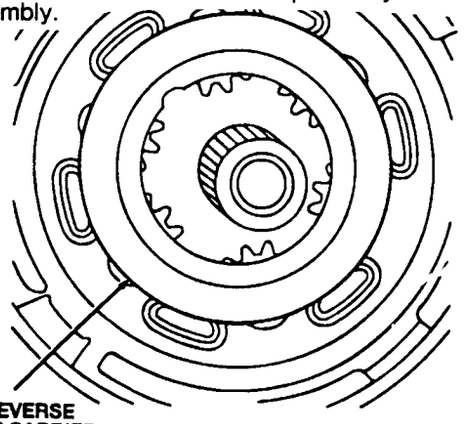
FORWARD
SUN GEAR



INPUT SHELL

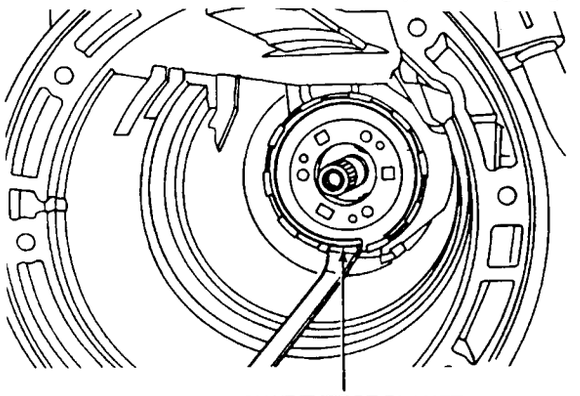
NOTE: Tag and identify the No. 8 reverse planetary carrier thrust bearing for assembly.

Remove the No. 8 low / reverse planetary carrier thrust bearing from the reverse planetary assembly.



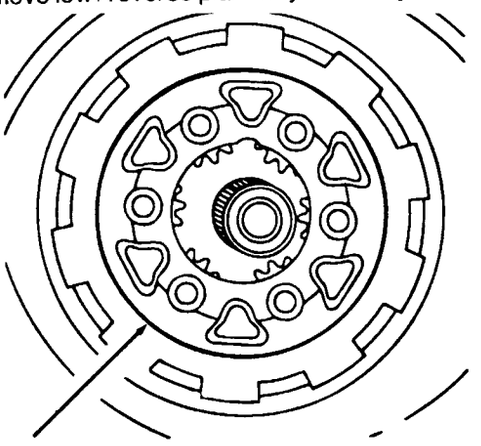
NO. 8 REVERSE PLANET CARRIER THRUST BEARING

Remove the low / reverse planetary retaining ring.



LOW/REVERSE PLANET RETAINING RING

Remove low / reverse planetary assembly.

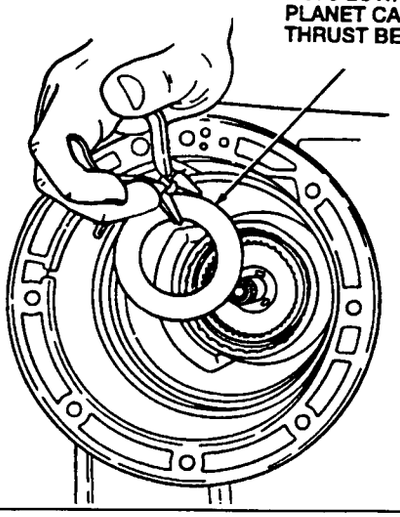


LOW/REVERSE PLANETARY ASSEMBLY

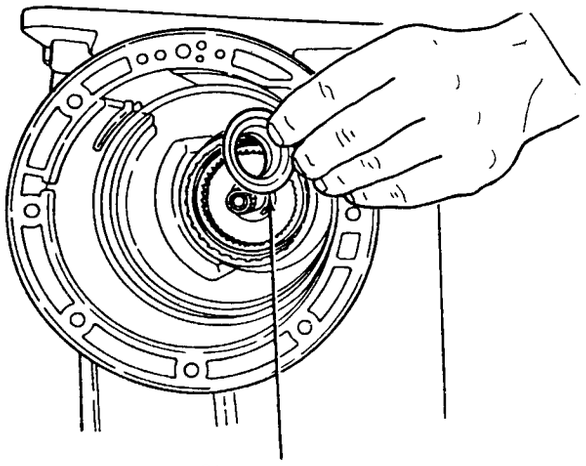
NOTE: Tag and identify the No. 9 low / reverse planetary carrier thrust bearing for reassembly.

Remove the No. 9 low / reverse planetary carrier thrust bearing.

NO. 9 LOW/REVERSE PLANET CARRIER THRUST BEARING

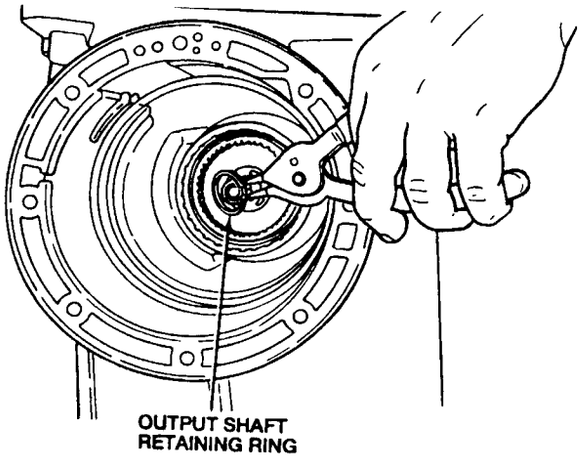


Remove the output shaft sleeve.

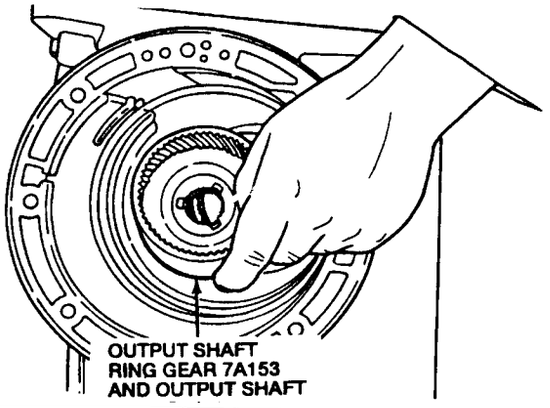


CAUTION: Discard the output shaft retaining ring. A new retaining ring must be used for assembly.

Remove the output shaft retaining ring from inside the case on the output shaft.

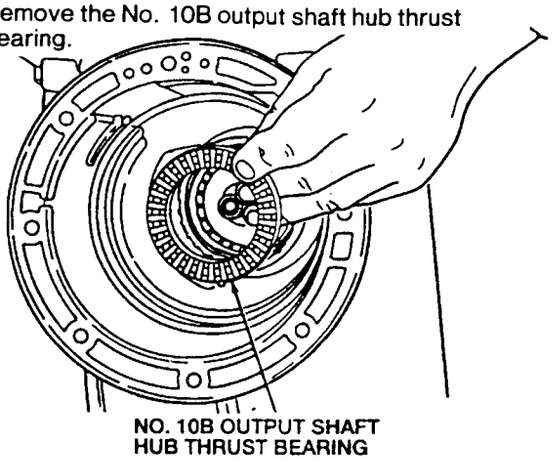


Remove the output shaft ring gear and output shaft hub.



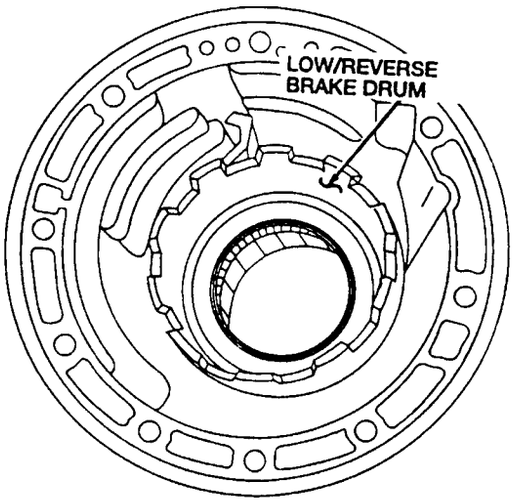
NOTE: Tag and identify the No. 10B output shaft hub thrust bearing for assembly.

Remove the No. 10B output shaft hub thrust bearing.

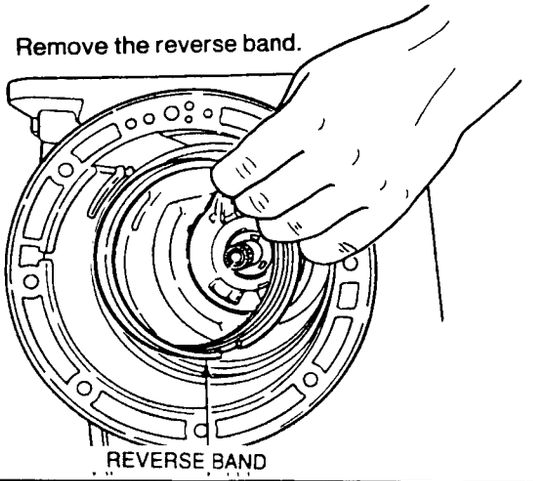


NOTE: The inner race of the rear one-way clutch is not removable. It is serviced in the case.

Remove the low / reverse brake drum and the one-way clutch assembly.

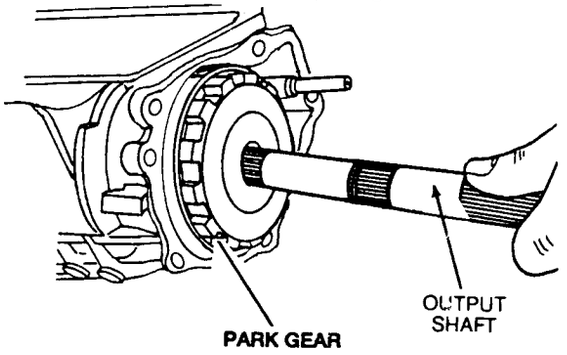


Remove the reverse band.



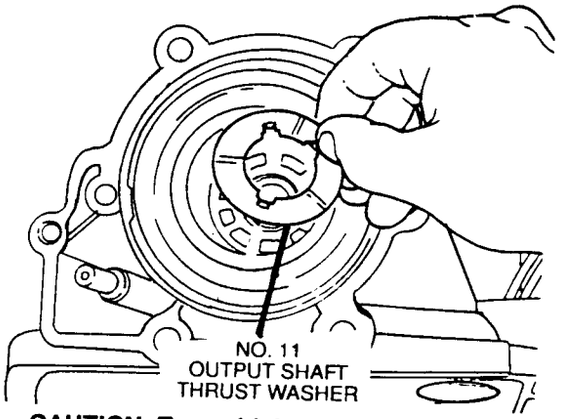
Remove the output shaft.

Remove the park gear.



NOTE: Tag and identify the No. 11 output shaft thrust washer for assembly.

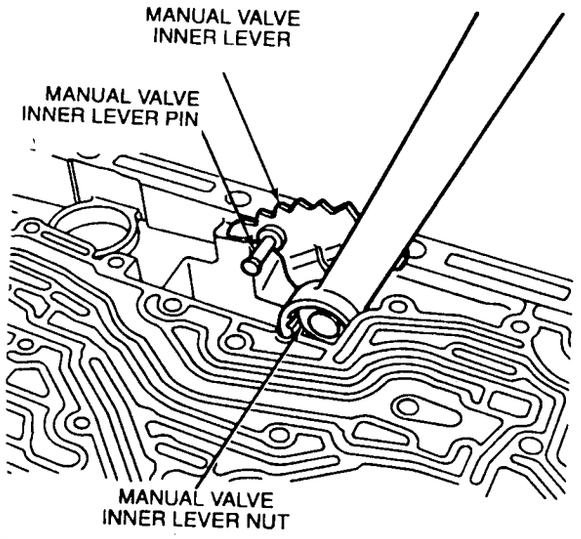
Remove the No. 11 output shaft thrust washer.



CAUTION: To avoid damage, make sure wrench does not strike the manual valve inner lever pin.

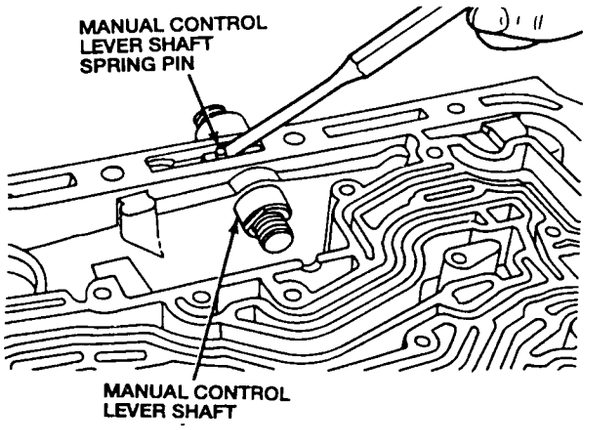
Remove the manual valve inner lever nut.

Remove the manual valve inner lever and parking pawl actuating rod assembly.



CAUTION: Do not damage the case fluid pan rail.

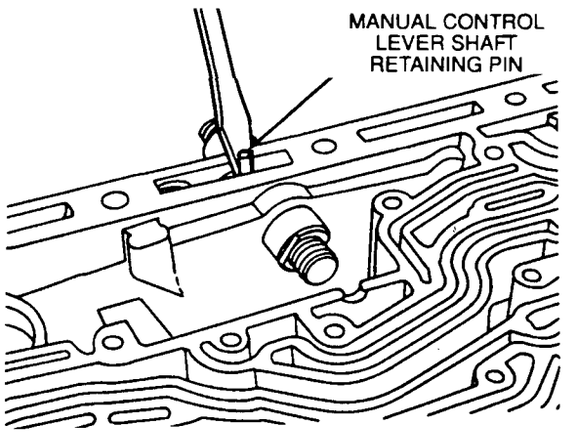
Using a small hammer and drift, tap lightly on each side of the manual control lever shaft retaining pin (two or three times). This will loosen the pin prior to removal.



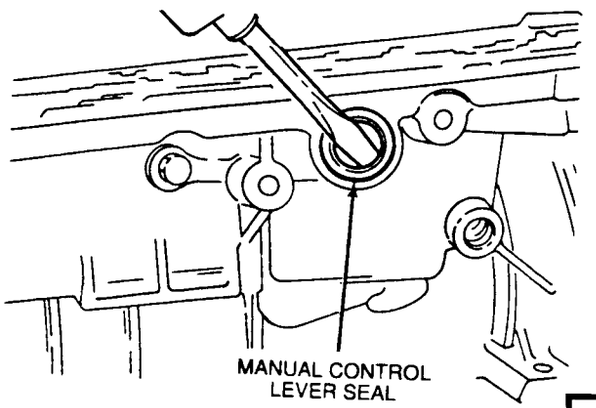
CAUTION: Do not damage the case fluid pan rail.

Remove the manual control lever shaft retaining pin with a narrow, sharp edged screwdriver from the side as shown.

Remove the manual control lever shaft.



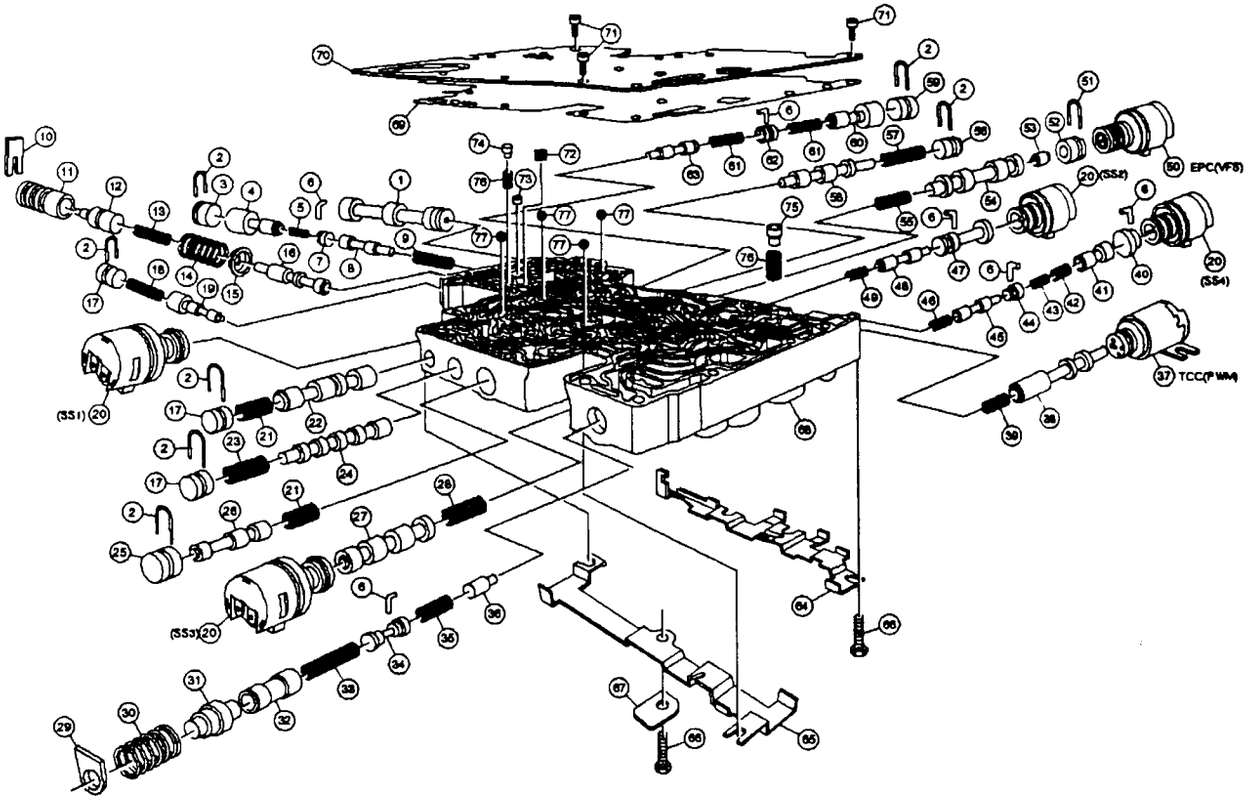
Remove the manual control lever seal.



Disassembly/Reassembly of Subassemblies

Main Control Valve Body

Main Control Valve Body



Item	Part Number	Description
1	—	Valve — Manual
2	7E335	Retainer — Valve Plug (7 Req'd)

(Continued)

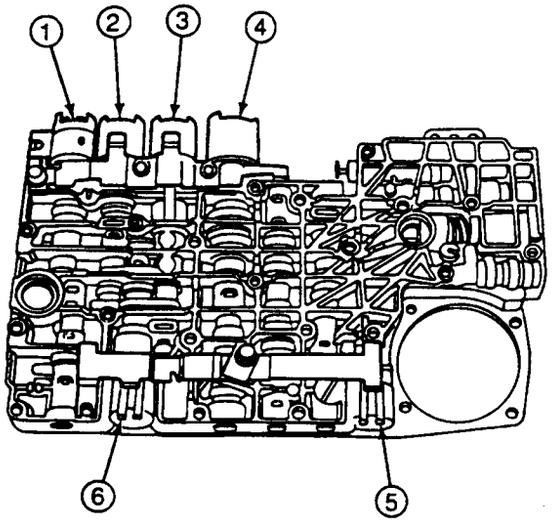
Item	Part Number	Description
3	—	Plug — Valve Retainer
4	—	Valve — Forward Modulator

(Continued)

Item	Part Number	Description
5	—	Spring — Forward Modulator
6	7E355	Retainer — Valve Plug (6 Req'd)
7	—	Plug — Valve Retainer
8	—	Valve — EPC Boost
9	—	Spring — EPC Boost
10	7E336	Retainer — Valve Plug
11	—	Sleeve — Pressure Boost Valve
12	—	Valve — Pressure Boost
13	—	Spring — Pressure Boost
14	—	Spring — Oil Pressure Regulator
15	—	Retainer — Main Regulator Spring
16	—	Valve — Pressure Regulator
17	—	Plug — Valve Retainer (3 Req'd)
18	—	Spring — Forward Engagement
19	—	Valve — Forward Engagement Control
20	7G484	Solenoid — Shift (4 Req'd)
21	—	Spring — 4-3 (K.D./T.D.) (2 Req'd)
22	—	Valve — 4-3 (K.D.)
23	—	Spring — Manual Low (1)
24	—	Valve — Manual Low (1)
25	—	Plug — Valve Retainer
26	—	Valve — 4-3 (T.D.)
27	—	Valve — 1-2 and 4-5 Shift
28	—	Spring — 1-2 and 4-5 Shift
29	7E366	Retainer — Valve Plug
30	—	Spring — Thermostat Bypass
31	—	Valve — Thermostat Bypass
32	—	Valve — Thermostatic Bypass
33	—	Spring — Thermostat Bypass
34	—	Plug — Valve Retainer
35	—	Spring — Cooler Limit
36	—	Valve — Cooler Limit
37	7G136	solenoid — Torque Converter Clutch (TCC)
38	—	Valve — Converter Clutch
39	—	Spring — Converter Clutch

(Continued)

Item	Part Number	Description
40	—	Plug — Valve Retainer
41	—	Valve — Converter Clutch
42	—	Spring — Converter Clutch
43	—	Spring — Converter Clutch
44	—	Plug — Valve Retainer
45	—	Valve — Coast Clutch
46	—	Spring — Coast Clutch
47	—	Plug — Valve Retainer
48	—	Valve — 4-3 Downshifts
49	—	Spring — 4-3 Downshifts
50	7G383	Solenoid — EPC (VFS)
51	7E335	Retainer — Valve Plug
52	—	Plug — Valve Retainer
53	—	Valve — 2-3 Shift
54	—	Valve — 2-3 Shift
55	—	Spring — 2-3 Shift
56	—	Plug — Valve Retainer
57	—	Spring — 3-4 Shift
58	—	Valve — 3-4 Shift
59	—	Plug — Valve Retainer
60	—	Valve — Reverse Modulation
61	—	Spring — Reverse Modulation (2 Req'd)
62	—	Plug — Valve Retainer
63	—	Valve — Reverse Modulation
64	7L491	Clamp — SS1/SS2
65	7L491	Clamp — SS3/SS4/EPC/TCC
66	E800155	Screw — Retain Solenoid Clamps (2 Req'd)
67	7D132	I.D. Plate
68	—	Body — Valve
69	7D100	Gasket — Separator Plate
70	7A008	Plate — Separator
71	E804357	Screw — Retain Separating Plate (3 Req'd)
72	7N113	Screen — EPC Limit Circuit
73	7D376	Extension Housing Lube Orifice
74	7E368	Valve — EPC Limit (Metal)
75	7E368	Valve — Converter Relief (Plastic)
76	7E340	Spring — EPC Limit/Converter Relief (2 Req'd)
77	7E195	Ball (4 Req'd)

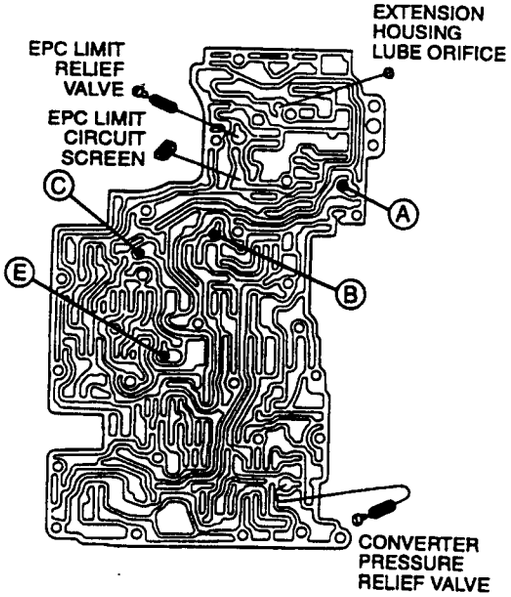


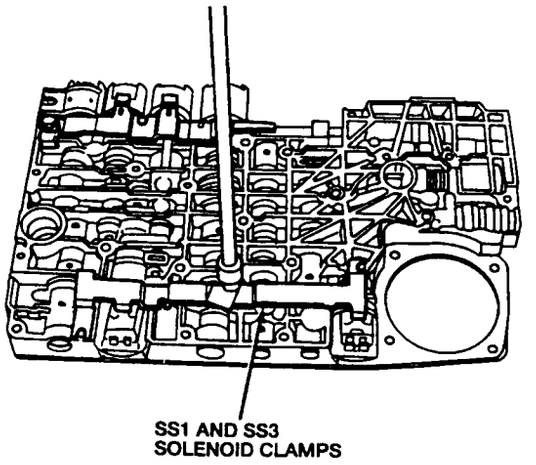
Item	Part Number	Description
1	7F037	Torque Converter Clutch Solenoid Assembly
2	7G484	Shift Solenoid 4 Assembly
3	7G484	Shift Solenoid 2 Assembly
4	7H144	EPC Solenoid Assembly
5	7G484	Shift Solenoid 1 Assembly
6	7G484	Shift Solenoid 3 Assembly

CAUTION: SS3 may pop out of its bore. This may damage the solenoid.

Use a 10mm socket to remove the SS1 and SS3 solenoid clamp screws. Remove the solenoid clamp and the solenoids.

Main Control Body Check Ball Location

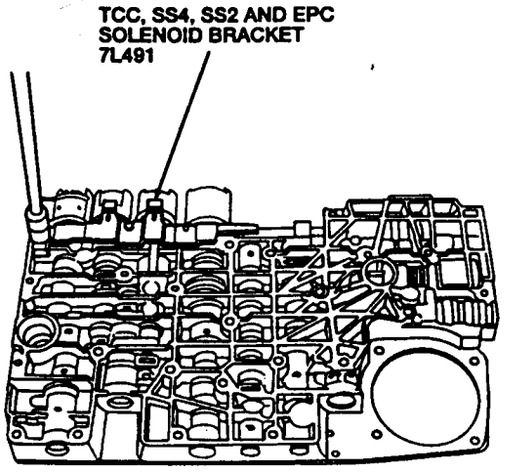




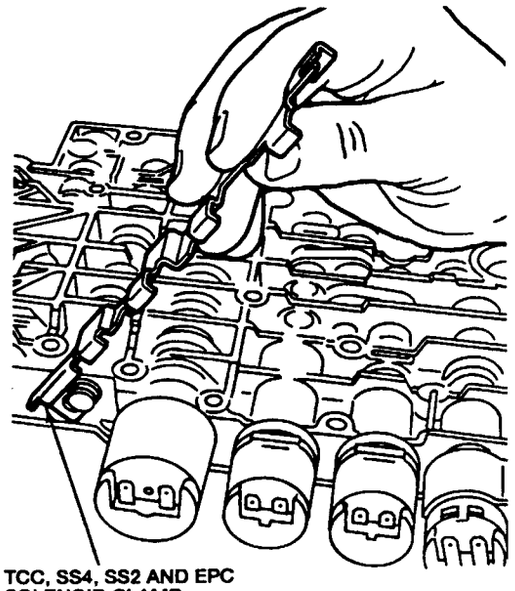
NOTE: The TCC solenoid may pop out of its bore.

The converter modulator valve may come out after the TCC solenoid has been removed. This may damage the solenoid or converter modulator valve.

Remove the TCC, SS4, SS2 and EPC solenoid clamp screw.



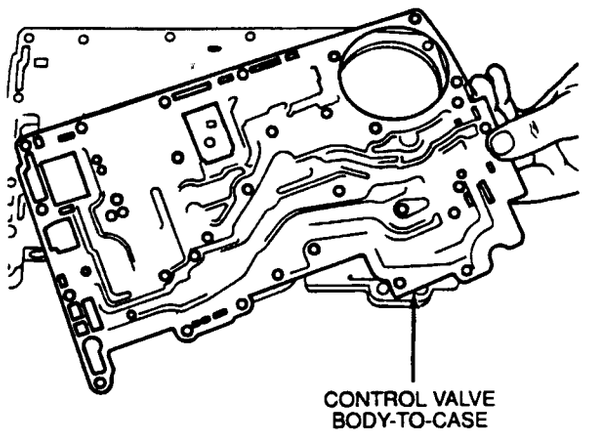
Remove the solenoid clamp and the solenoids.



TCC, SS4, SS2 AND EPC SOLENOID CLAMP

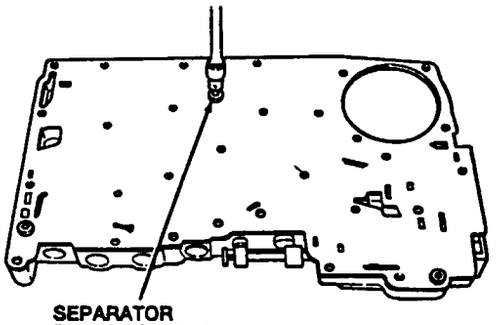
CAUTION: Valves may come out when rotating the main control.

Carefully rotate the main control assembly so that the control valve body-to-case gasket is facing up. Remove and discard the control valve body-to-case gasket.



CONTROL VALVE BODY-TO-CASE

Use a T30 Torx® bit to remove the three separator plate-to-main control screws.

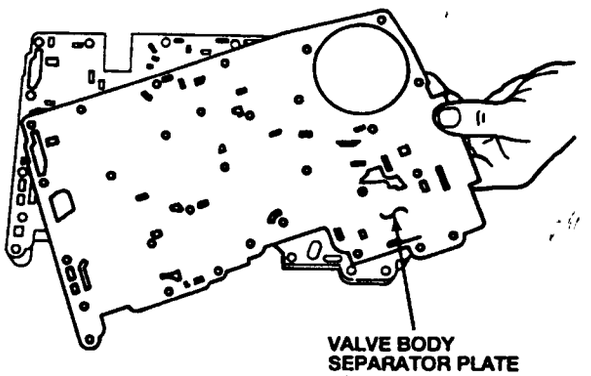


SEPARATOR PLATE-TO-MAIN CONTROL SCREWS

(3 REQ'D)

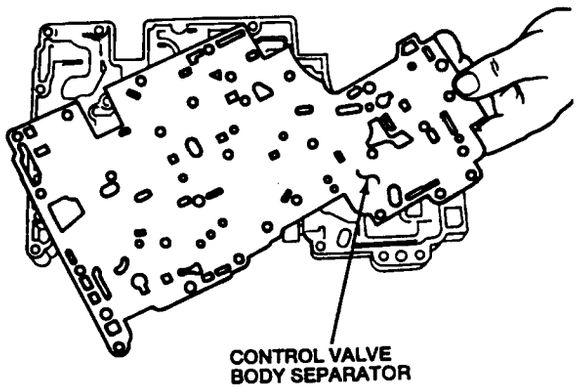
CAUTION: The extension housing lube orifice and relief valves may stick to the separator plate.

Remove the valve body separator plate.

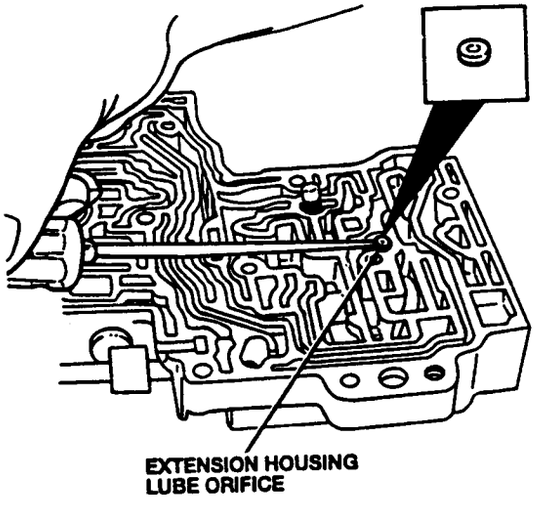


VALVE BODY SEPARATOR PLATE

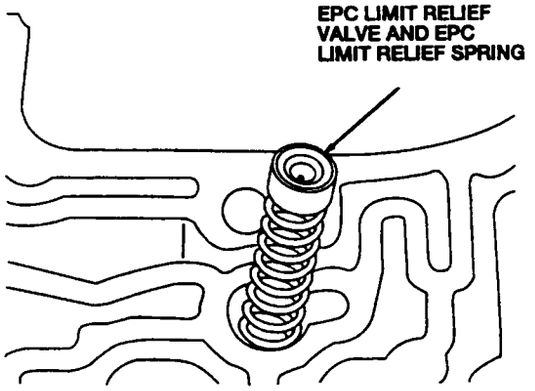
Remove and discard the control valve body separator gasket.



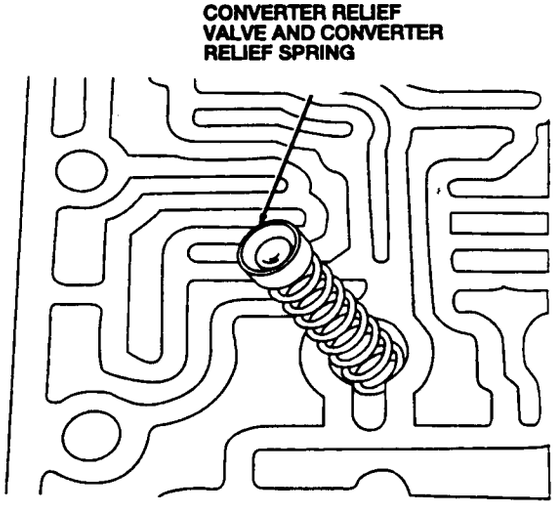
Carefully remove the extension housing lube orifice.



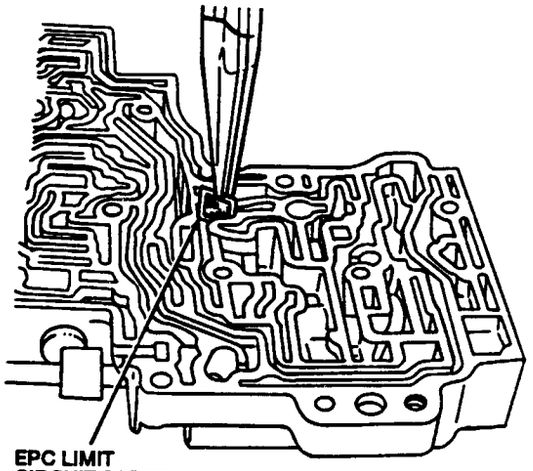
Remove the electronic pressure control (EPC) limit relief valve (metal-silver color) and spring.



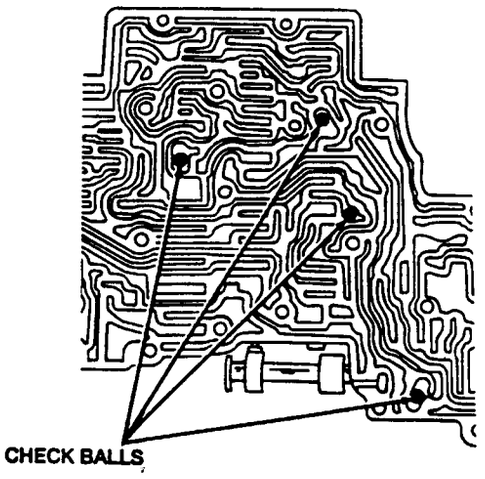
Remove the converter relief valve (plastic-dark color) and spring.



Remove the EPC limit circuit screen.



Remove the four check balls.



CAUTION: Do not lose parts when cleaning or servicing.

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

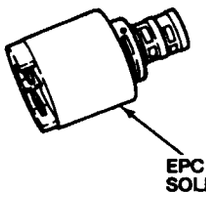
Inspect all valve and plug bores for scores. Check all fluid passages for obstructions. Inspect the check valve for free movement. Inspect all mating surfaces for burrs or distortion. Inspect all plugs and valves for burrs or scores. Replace the control valve body if the bores are scored or if the valves are scored beyond the point of being able to be cleaned.

Inspect all springs for distortion. Check all valves and plugs for free movement in their respective bores. Valves and plugs, when dry, must fall from their own weight in their respective bores.

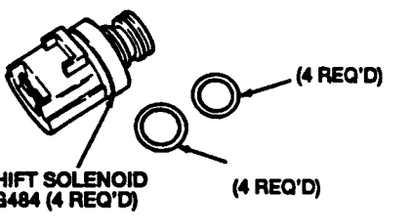
Roll the manual valve on a flat surface to check for a bent condition.

Clean and inspect the EPC limit circuit screen.

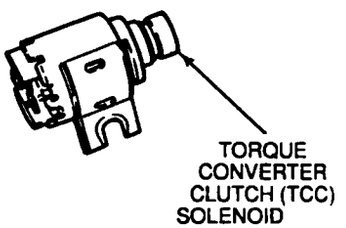
Clean and inspect the EPC solenoid screens.



Remove and replace all shift solenoid O-rings.



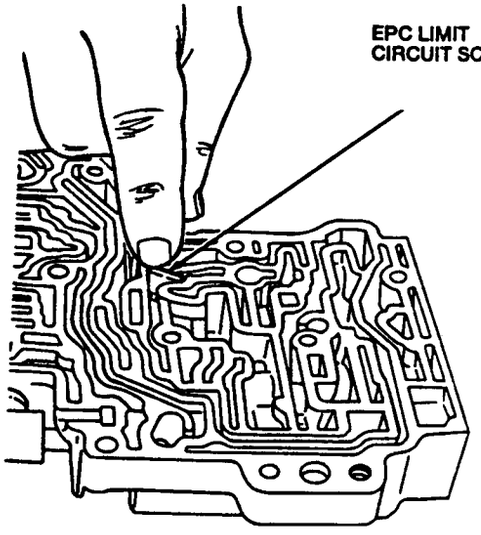
Clean and inspect the torque converter clutch (TCC) solenoid.



Assembly

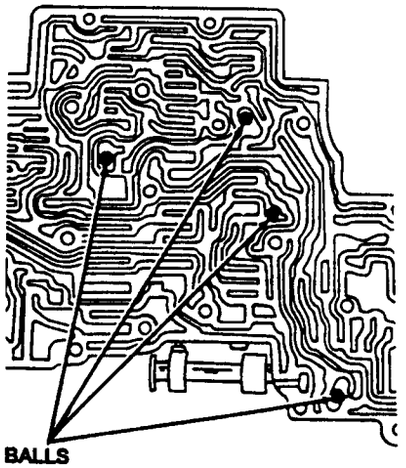
CAUTION: Make sure that the screen is properly located.

Install the EPC limit circuit screen. Push down on the EPC limit circuit screen to make sure it is fully seated.



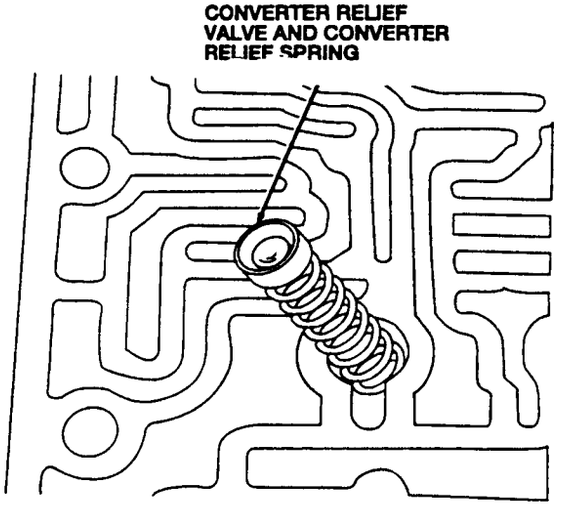
Install the four check balls in proper locations as shown.

Check Ball Installation



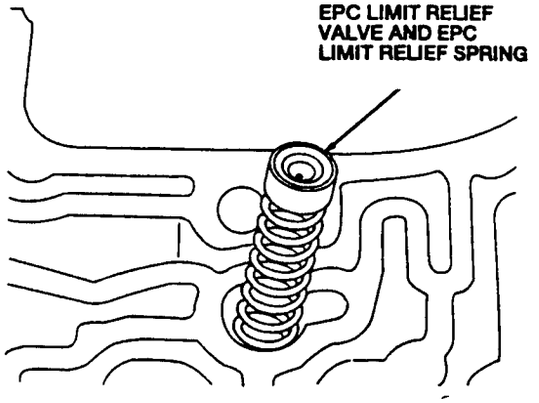
CAUTION: The springs and valves are not interchangeable.

Install the converter relief valve (plastic-dark color) and spring.

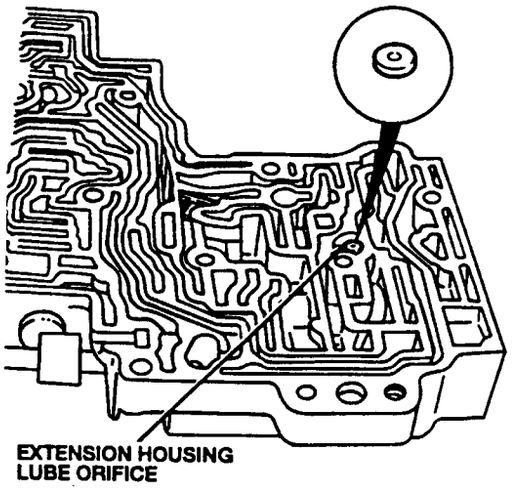


CAUTION: The springs and valves are not interchangeable.

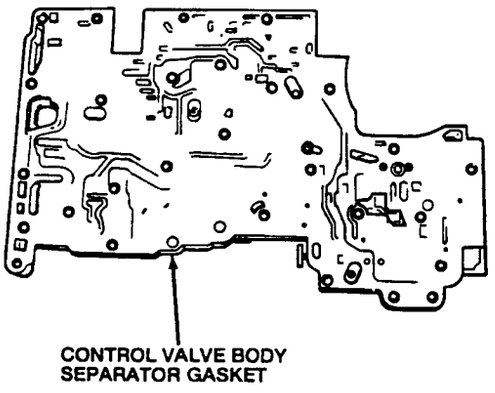
Install the EPC limit relief valve (metal-silver color) and spring.



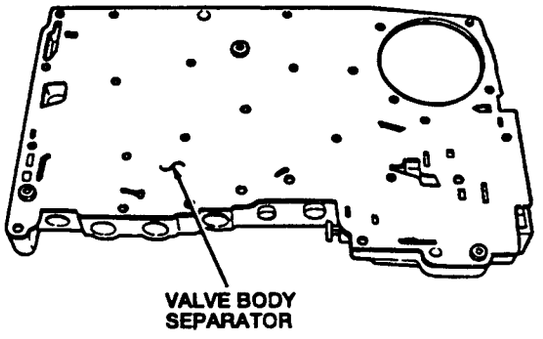
Install the extension housing lube orifice.



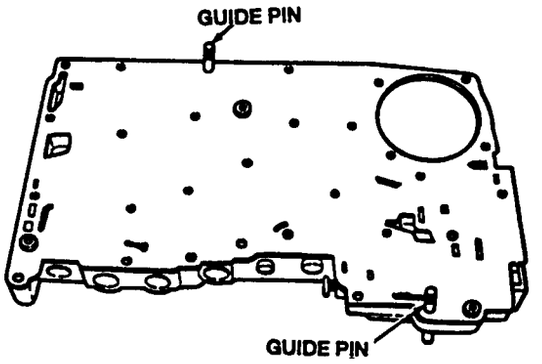
Install and align the control valve body separator gasket.



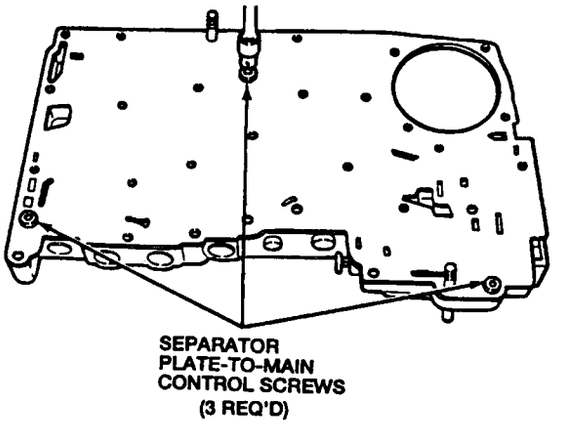
Install the valve body separator plate. Install the three (3) separating plate-to-main control screws fingertight.



Install the alignment pins in the locations shown.

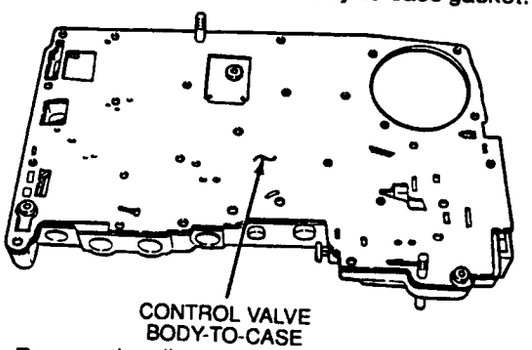


Tighten the separator plate-to-main control screws to 6-8 N·m (53-71 lb-in).



NOTE: Apply petroleum jelly on the separator surface to hold the gasket in place.

Install the control valve body-to-case gasket.



Remove the alignment pins.

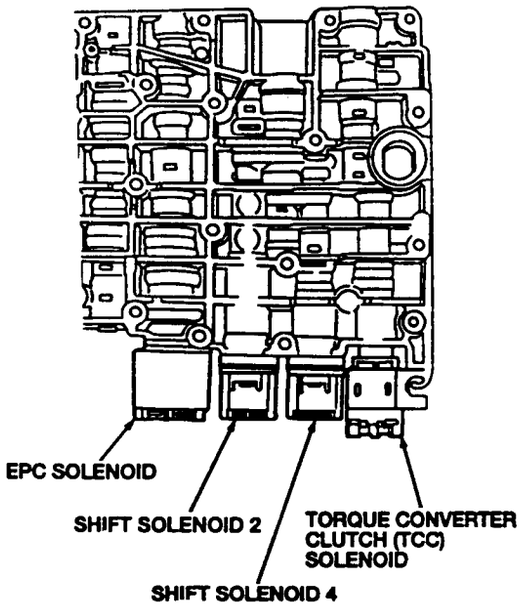
Rotate the main control so that the separator plate is facing down.

CAUTION: The shift solenoid terminals must face upward.

NOTE: All the shift solenoids are interchangeable.

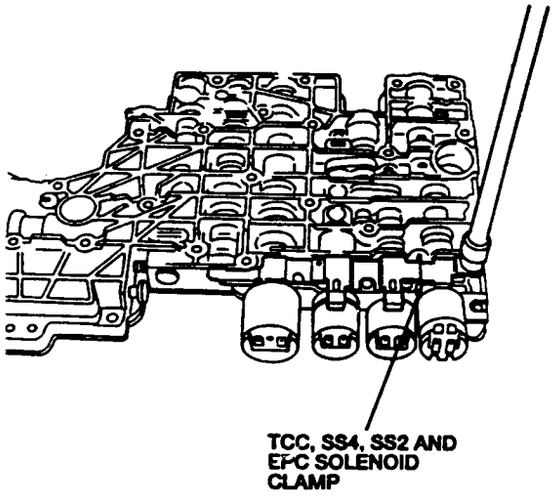
NOTE: If the TCC valve came out, use caution when installing the TCC solenoid.

Install the solenoids.

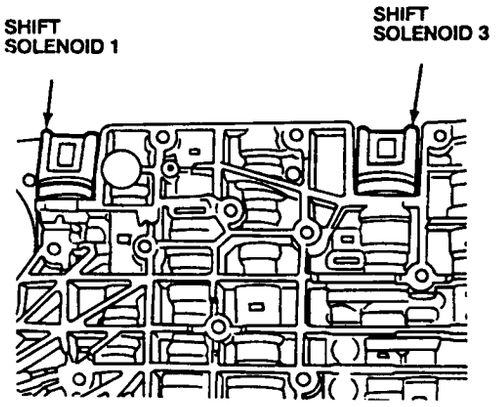


CAUTION: The solenoid clamp must be installed in the TCC and EPC solenoid grooves, shift solenoid pockets and the No. 204 plug.

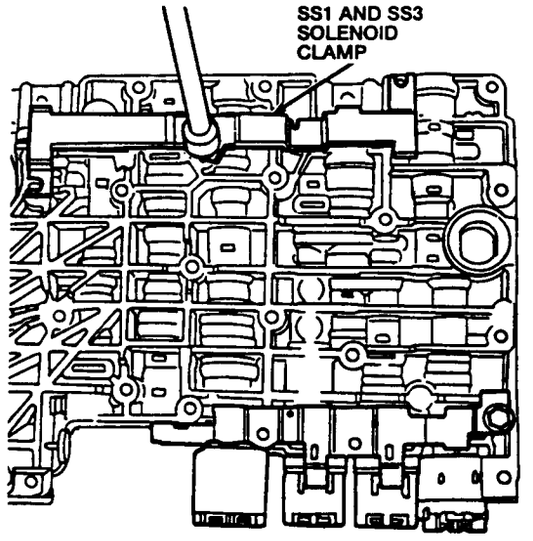
Install the solenoid clamp. Tighten the solenoid clamp screw to 6-8 N·m (53-71 lb-in).



Install shift solenoids 1 and 3.



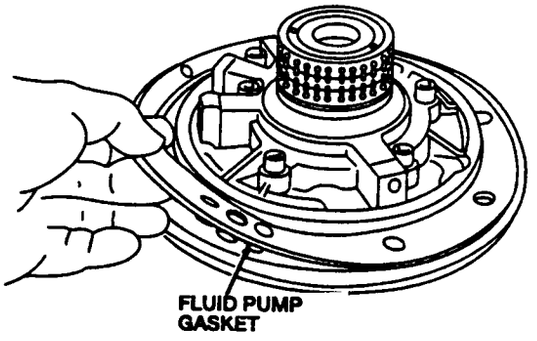
Install the solenoid clamp. Tighten the clamp screw to 6-8 N·m (53-71 lb-in).



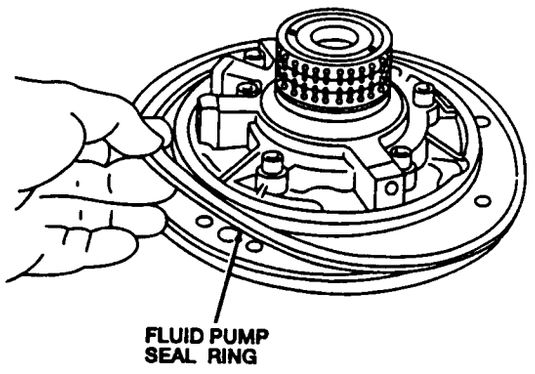
Converter Housing and Fluid Pump

Disassembly **Converter Housing and Fluid Pump**

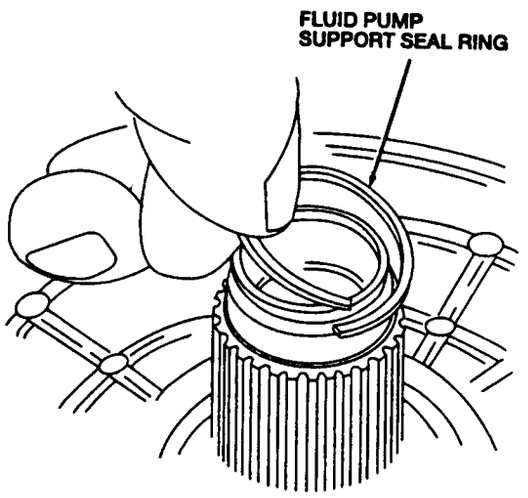
Remove and discard the fluid pump gasket.



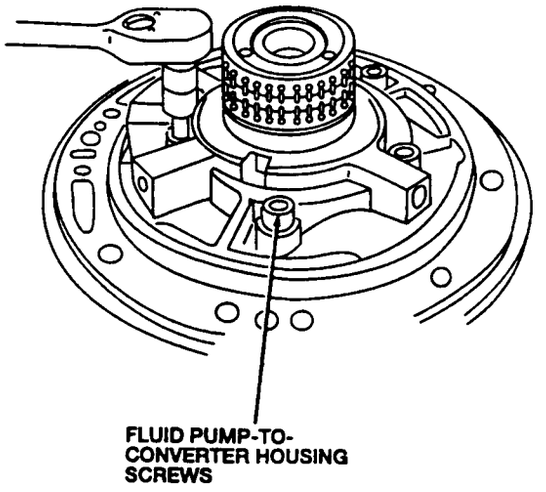
Remove and discard the fluid pump square cut seal ring.



Remove the fluid pump support seal ring.



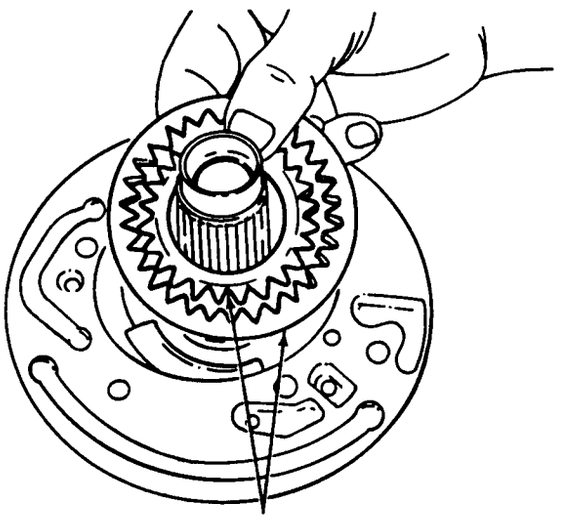
Use a Torx® 40 wrench to remove the six M8 x 35mm front pump-to-converter housing screws. Remove the fluid pump support and gear and the fluid pump adapter plate.



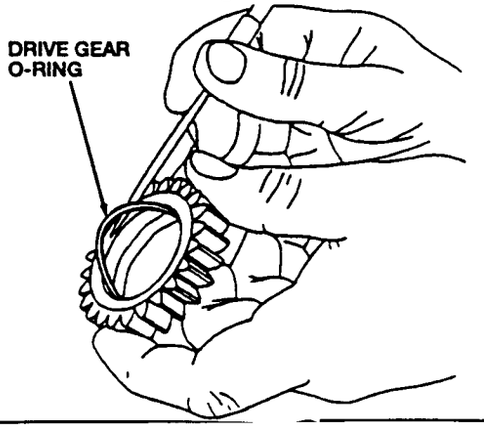
NOTE: The pump gears are part of the pump assembly and are not serviced separately.

NOTE: A rough casting on the pump surface crescent is not a flaw.

Remove the pump gears.



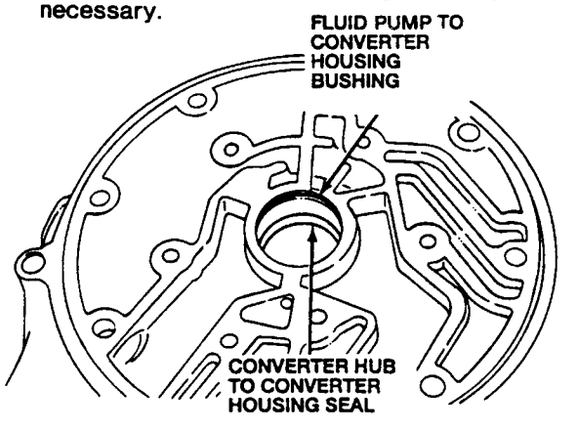
Remove the drive gear O-ring and discard.



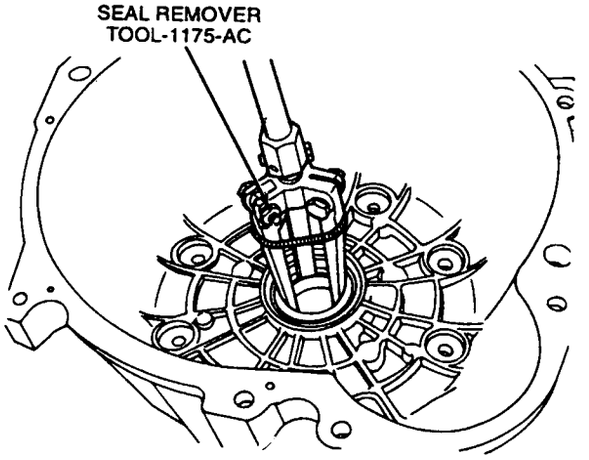
Inspect the pump gears for scoring and cracks. Replace pump assembly if damaged.

NOTE: Fluid pump-to-converter housing bushing is not serviced separately. If service is required, the converter housing assembly must be replaced.

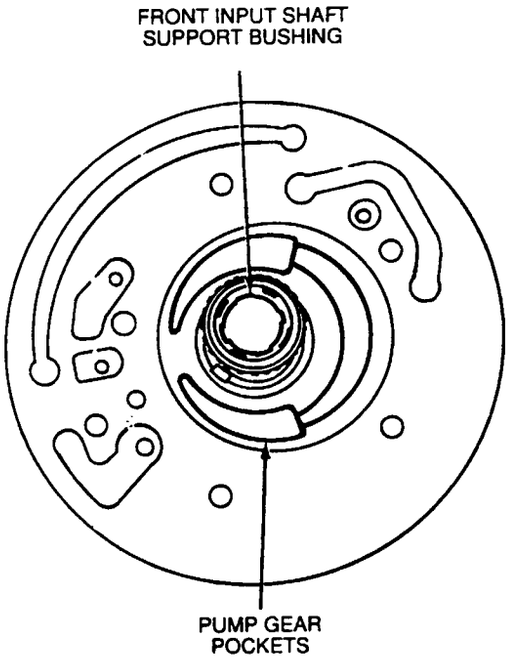
Inspect the fluid pump to converter housing bushing and converter hub to converter housing seal. Replace converter housing assembly if necessary.



Remove and discard the converter hub-to-converter housing seal using Seal Remover TOOL-1175-AC or equivalent from the converter housing as shown.



Clean and inspect the front and rear input shaft support bushings. If bushings are worn, scored or damaged, replace the fluid pump support and gear assembly. Inspect the pump gear pockets for scoring and wear. Replace if necessary.



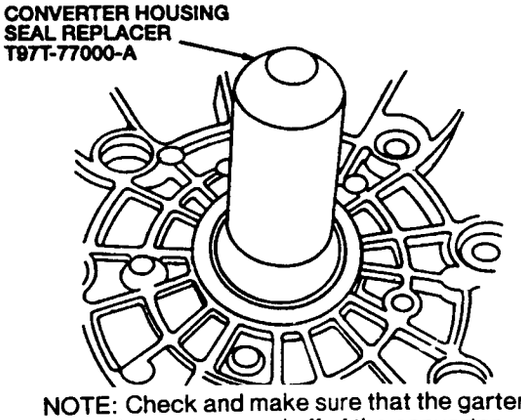
Inspect the mating surfaces of the pump body and case for burrs.

Inspect the drive and driven gear bearing surface for scores and check the gear teeth for burrs.

Inspect the fluid pump seal for cuts or nicks. Inspect the pump bushing for scoring.

Check the fluid passages for obstruction.

If any parts are found to be damaged or worn, replace the pump as an assembly. Minor burrs and scores may be removed with a crocus cloth.

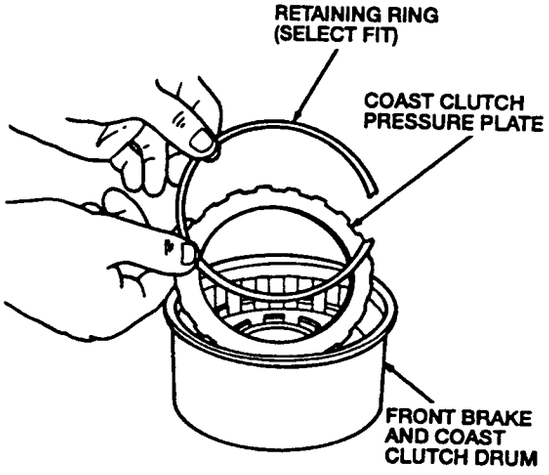


NOTE: Check and make sure that the garter spring has not popped off of the converter hub-to-converter housing seal.

Disassembly Coast Clutch

CAUTION: This is a select fit ring. See assembly procedure if the ring or clutch plate pack is replaced.

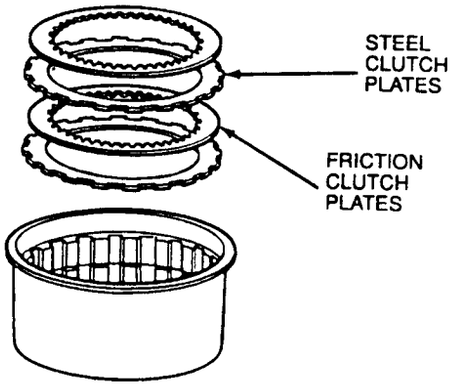
Remove the retaining ring and coast clutch pressure plate from the front brake and coast clutch drum.



CAUTION: Friction plates are directional. Note direction of grooves for installation.

CAUTION: If new clutch plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

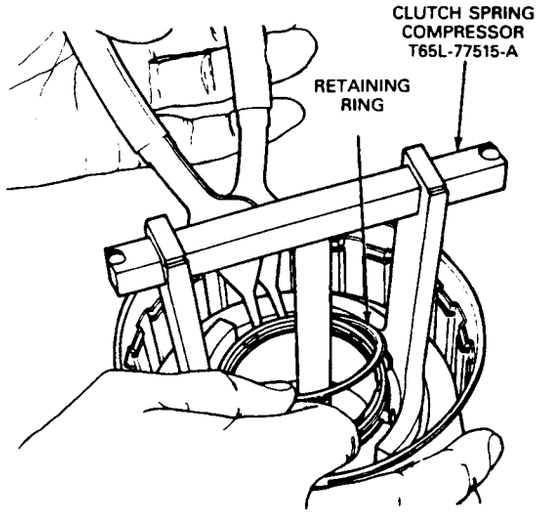
Remove the coast clutch pack. Inspect for wear, damage or overheating. Replace as necessary.



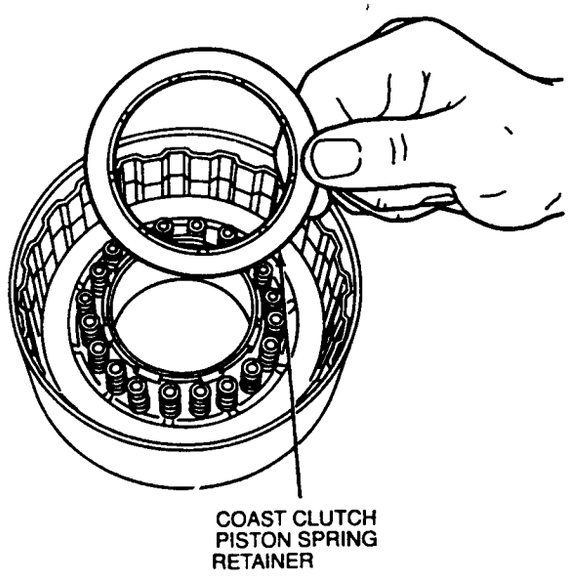
WARNING: USE CAUTION WHEN RELEASING TOOL PRESSURE ON THE REAR CLUTCH PISTON SPRINGS.

CAUTION: Do not fully compress the clutch spring compressor or damage to the spring retainer may occur.

Compress the clutch piston springs with Clutch Spring Compressor T65L-77515-A. Remove the retaining ring.

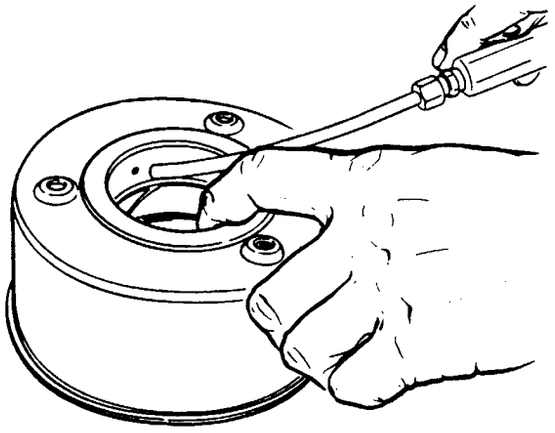


Remove the clutch piston spring retainer and 20 clutch piston springs.

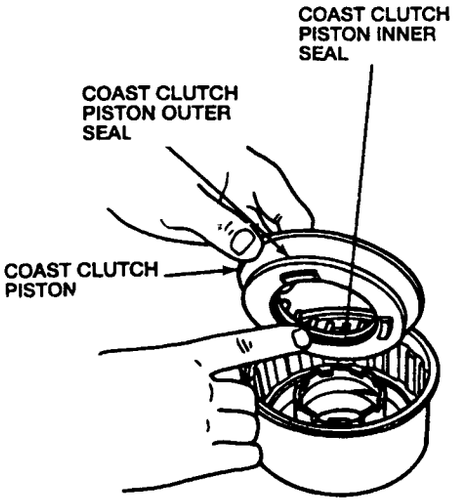


WARNING: AIR PRESSURE MUST NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR, AND MAKE SURE DRUM IS FACING DOWN AS SHOWN.

Remove the coast clutch piston by using air pressure. Apply air pressure to one hole on the inside diameter of the front brake and coast clutch drum while blocking the other hole with a finger.



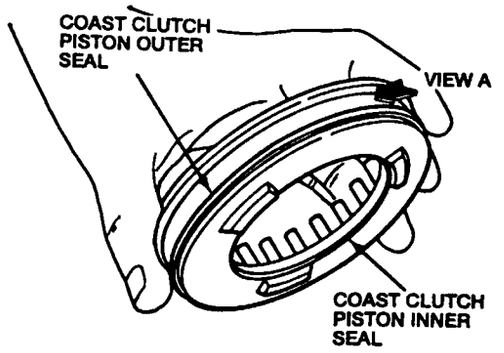
Remove the coast clutch piston inner and outer seal. Clean and replace as necessary.

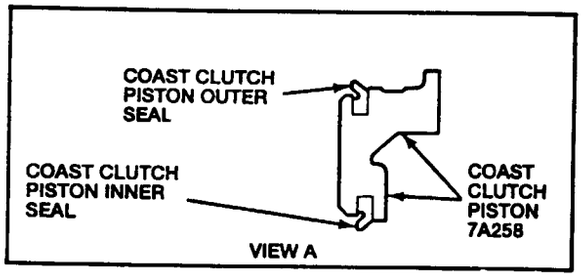


Assembly

CAUTION: The lip seals must be positioned as shown. Care must be taken to prevent roll over of the lip seal.

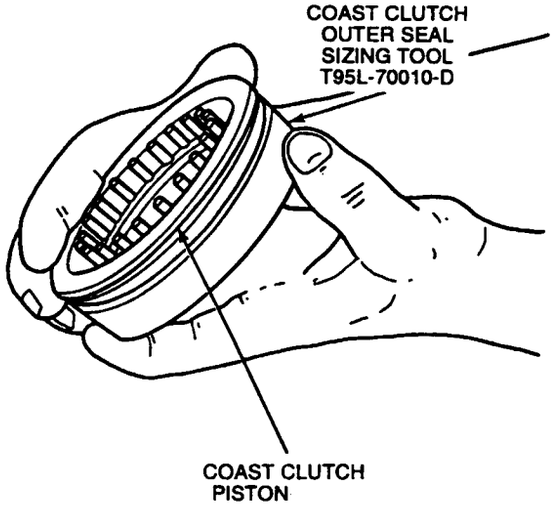
Install new coast clutch piston inner and outer seal on the coast clutch piston.





CAUTION: Lubricate the coast clutch piston inner and outer seal.

Carefully press the coast clutch piston into Coast Clutch Outer Seal Sizing Tool T95L-70010-D.



Inspect the drum band surface, bushing, and thrust surfaces for scores. Minor scores may be removed with a crocus cloth. Badly scored parts must be replaced.

Inspect the clutch piston bore and the piston and the piston inner and outer bearing surfaces for scores.

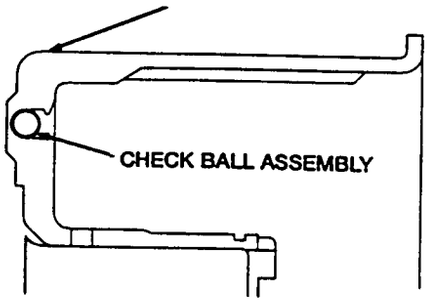
Check the fluid passages for obstructions. All fluid passages must be clean and free of obstructions.

Inspect the clutch plates for wear, scoring and fit on the clutch hub serrations. Replace all plates that are badly scored, worn or do not fit freely in the hub serrations.

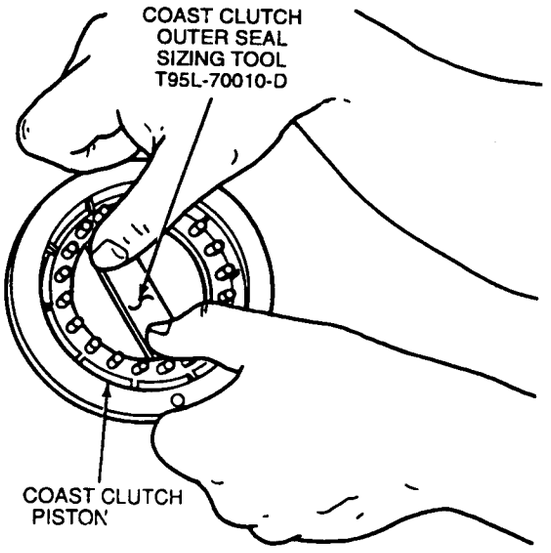
Inspect the clutch pressure plate for scores on the clutch plate surface. Check the clutch release spring(s) for distortion.

Make sure the check ball is free and clear of debris prior to installing piston. The check ball is located in the front brake and coast clutch drum.

FRONT BRAKE AND COAST CLUTCH DRUM



Carefully remove the coast clutch piston from Coast Clutch Outer Seal Sizing Tool T95L-70010-D.



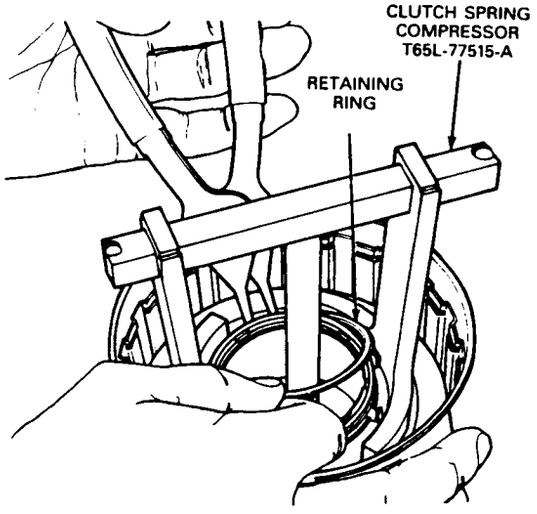
CAUTION: Care must be taken to prevent damage to the seals during installation.

Carefully install the coast clutch piston into the front brake and coast clutch drum.

Install the 20 coast clutch piston springs and coast clutch piston spring retainer onto the coast clutch piston.

CAUTION: Do not fully compress the clutch spring compressor or damage to the coast clutch piston spring retainer may occur.

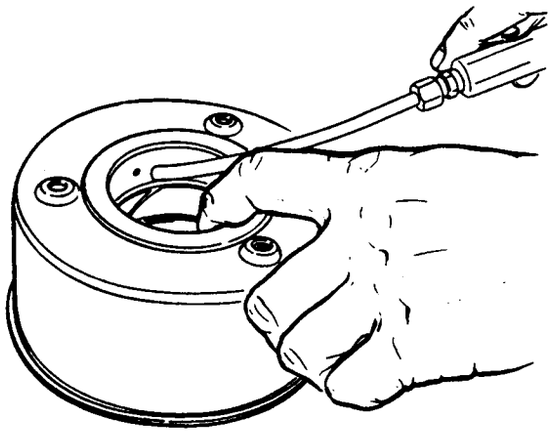
Compress the coast clutch piston springs with Clutch Spring Compressor T65L-77515-A. Install the retaining ring. Release the load on the springs applied by the tool. Remove the tool.



WARNING: AIR PRESSURE MUST NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR. MAKE SURE DRUM IS FACING DOWN AS SHOWN.

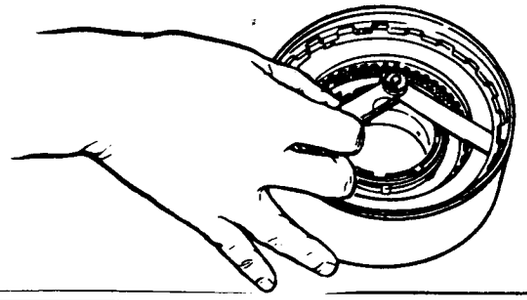
NOTE: The coast clutch piston must apply with air pressure and release when the air is removed.

Air check the assembly. Apply air to one hole on the inside diameter of the front brake and coast clutch drum while blocking the other hole with a finger.



Check the free play of the clutch pack. Push down on the clutch pack. Use a feeler gauge to check the gap between the retaining ring and the pressure plate. Specification: 1.3 to 2.0mm (.051 to .079 inch).

If the reading is not within specification, remove the retaining ring and check the thickness. Replace it with a ring that will correct free play. Verify with a feeler gauge.

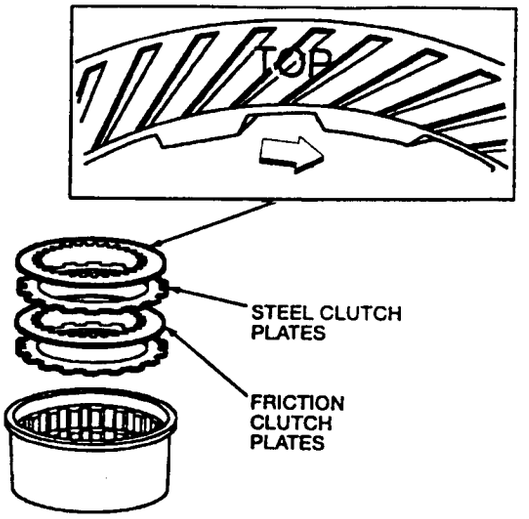


CAUTION: Coast clutch friction plates are directional and must be installed with grooves clockwise (I.D. to O.D.). The word "TOP" should face up.

CAUTION: If new clutch plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

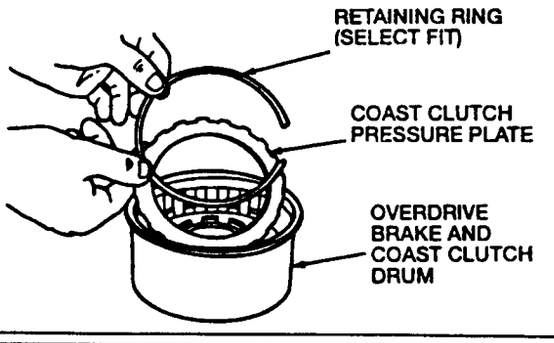
NOTE: When installing friction plates, the word "TOP" should face up. If reusing plates, grooves must be installed clockwise.

Install the two steel clutch plates and two friction clutch plates in alternating order, starting with a steel plate first.



CAUTION: The retaining ring is select fit.

Install the coast clutch pressure plate. Install the original retaining ring on top of the clutch pressure plate.



COAST CLUTCH

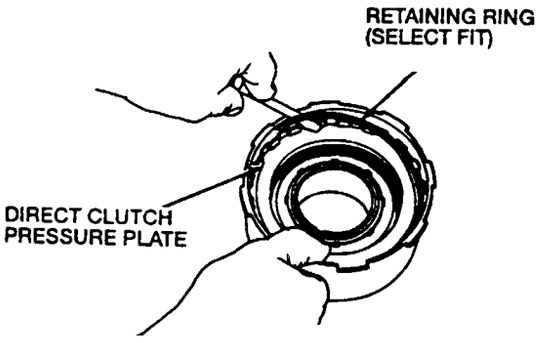
Part Number	Thickness		Diameter	
	mm	Inches	mm	Inches
E860126-S	1.37	.0539	130.1	5.122
E860127-S	1.73	.0681	130.1	5.122
E860128-S	2.08	.0819	130.1	5.122
E860129-S	2.44	.0961	130.1	5.122

Intermediate Brake and Direct Clutch Drum Assembly

Disassembly

CAUTION: The retaining ring is a select fit ring. See assembly procedure if the ring or clutch pack is replaced.

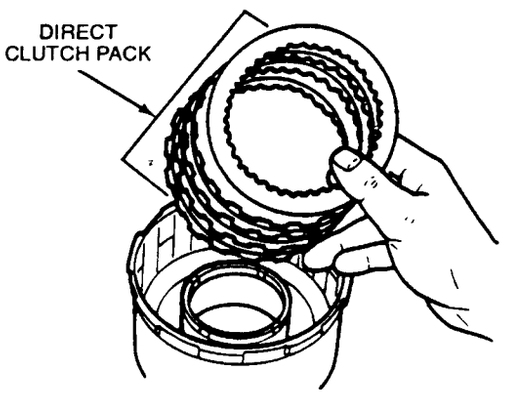
Remove the retaining ring and direct clutch pressure plate.



CAUTION: Friction plates are directional and must be installed with grooves clockwise (I.D. to O.D.). The word "TOP" should face up.

CAUTION: If new clutch plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

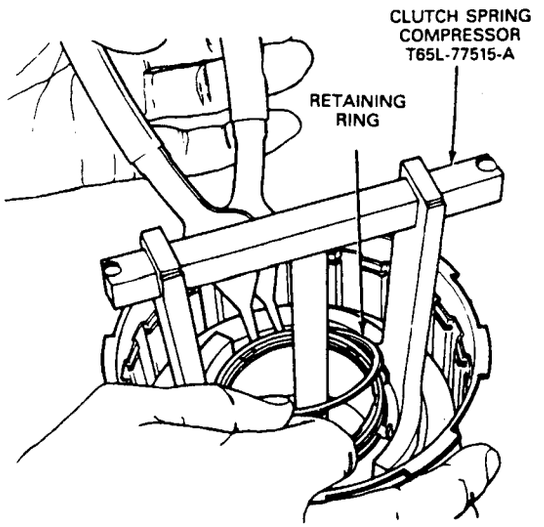
Remove the direct clutch pack. Inspect for wear, damage or overheating. Replace the steel or friction plates as necessary.



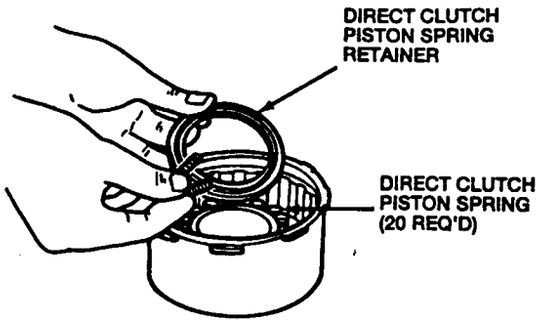
WARNING: AFTER REMOVING THE RETAINING RING, USE CARE WHEN RELEASING THE PRESSURE ON THE SPRINGS.

CAUTION: Do not fully compress the clutch spring compressor or damage to the spring retainer may occur.

Compress the direct clutch piston springs with Clutch Spring Compressor T65L-77515-A. Remove the retaining ring. Remove the tool.

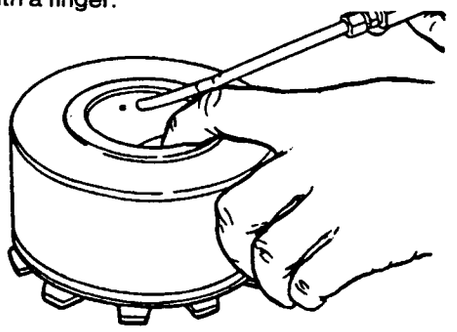


Remove the direct clutch piston spring retainer and 20 direct clutch piston springs.

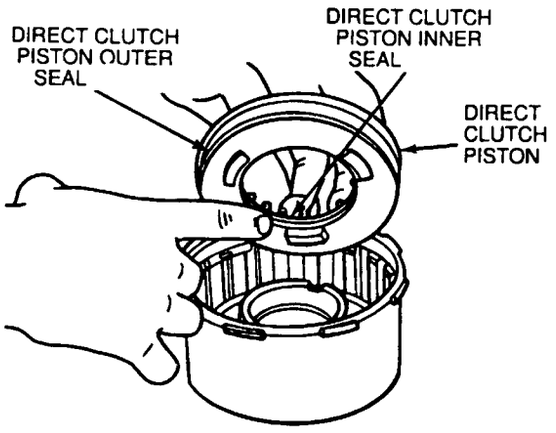


WARNING: DO NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR. MAKE SURE DRUM IS FACING DOWN AS SHOWN.

Remove the direct clutch piston using compressed air. Apply air pressure to one hole on the inside diameter of the intermediate brake and direct clutch drum while blocking the other hole with a finger.



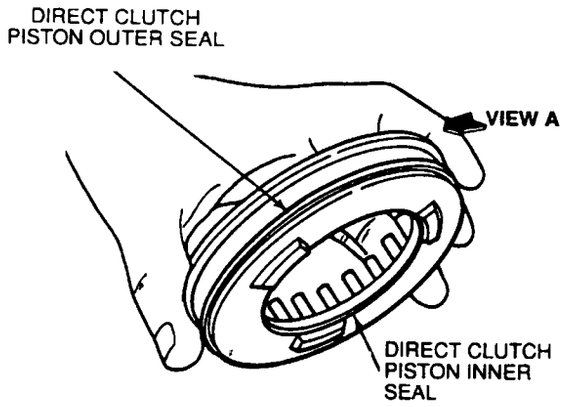
Remove the direct clutch piston inner and outer seals. Clean and replace as necessary.

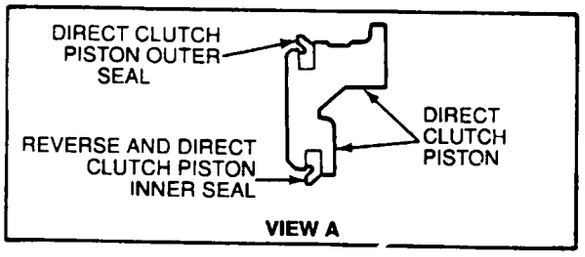


Assembly

CAUTION: The lip seals must be positioned as shown. Care must be taken to prevent rollover of the lip seal.

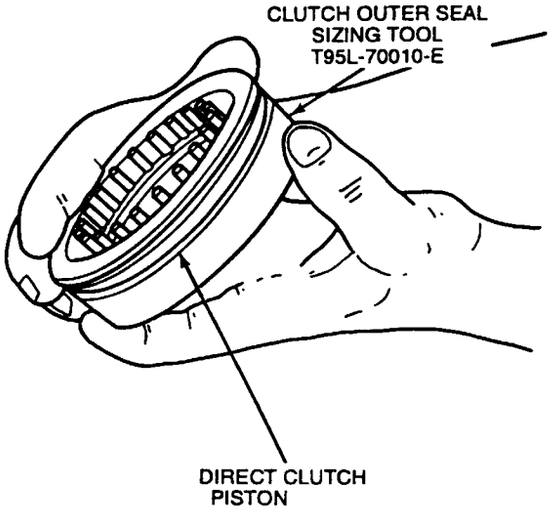
Install new direct clutch piston inner and outer seals on the direct clutch piston.





CAUTION: Lubricate the direct clutch piston inner and outer seals with MERCON V® XT-5-QM transmission fluid.

Carefully press the direct clutch piston into Direct Clutch Outer Seal Sizing Tool T95L-70010-E.



Inspect the drum band surface, bushing and thrust surfaces for scores. Minor scores may be removed with a crocus cloth. Badly scored parts must be replaced.

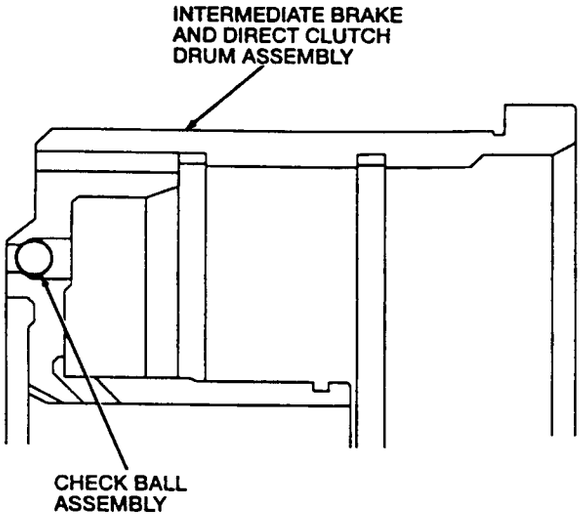
Inspect the clutch piston bore and the piston and the piston inner and outer bearing surfaces for scores.

Check the fluid passages for obstructions. All fluid passages must be clean and free of obstructions.

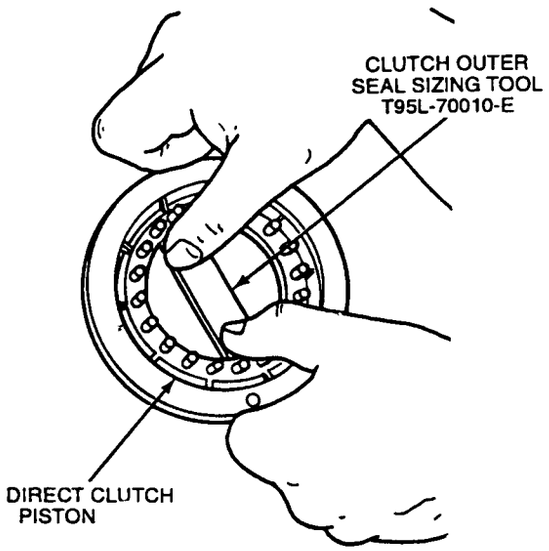
Inspect the clutch plates for wear, scoring and fit on the clutch hub serrations. Replace all plates that are badly scored, worn or do not fit freely in the hub serrations.

Inspect the direct clutch pressure plate for scores on the clutch plate bearing surface. Check the clutch release springs for distortion.

Make sure the check ball is free and clear of debris prior to installing piston. The check ball is located in the intermediate brake and direct clutch drum assembly.

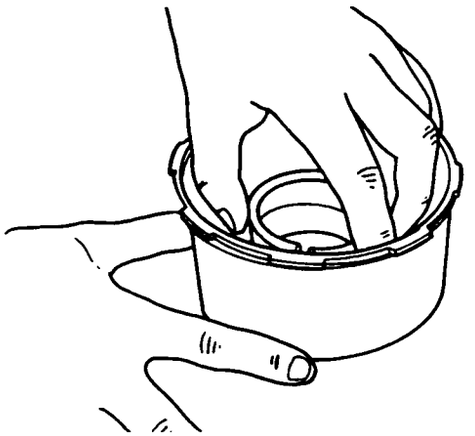


Carefully remove the direct clutch piston from Direct Clutch Outer Seal Sizing Tool T95L-70010-E.



CAUTION: Care must be taken to prevent damage to the seals during installation.

Carefully install the clutch piston into the intermediate brake and direct clutch drum.



CAUTION: Friction plates are directional and must be installed with grooves clockwise (I.D. to O.D.). The word "TOP" should be face up.

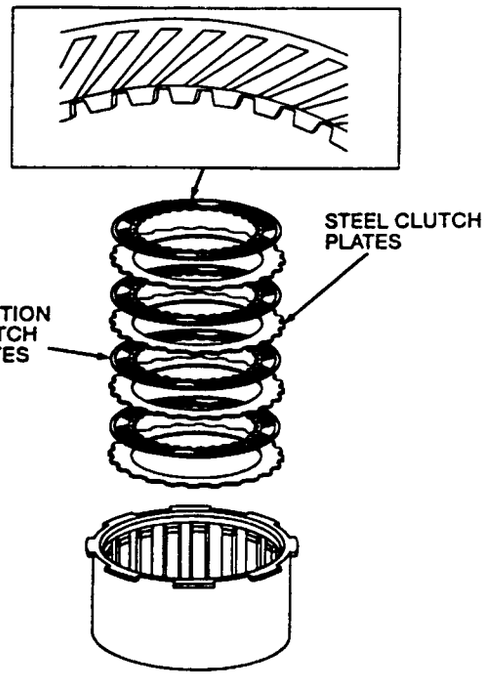
CAUTION: The number of plates is model dependent. See specifications at the end of this section. If new plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

When installing friction plates, the word "TOP" should face up. If reusing plates, grooves must be installed clockwise.

Install the steel clutch plates and friction clutch plates in alternating order, starting with a steel plate and finishing with a friction plate.

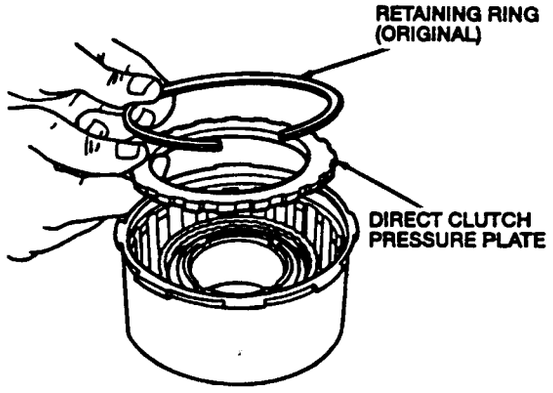
CLUTCH PACK

Engine	Steel	Friction
4.0L-EFI	4	4
4.0L-SOHC	5	5



CAUTION: The retaining ring is a select fit.

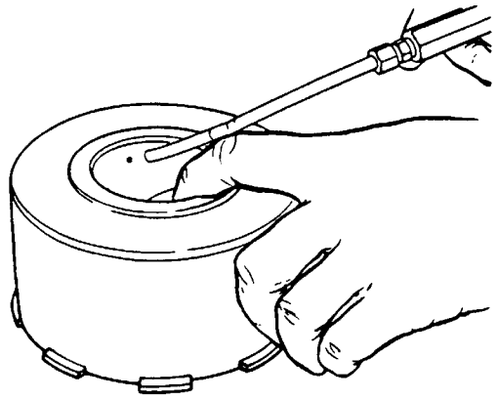
Install the direct clutch pressure plate and original retaining ring on the clutch stack.



WARNING: AIR PRESSURE MUST NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR. MAKE SURE THE DRUM IS FACING DOWN AS SHOWN.

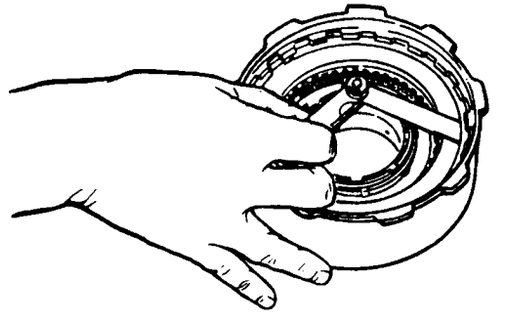
NOTE: The direct clutch piston must apply with air pressure and release when the air is removed.

Air check the assembly. Apply air to one hole on the inside diameter of the intermediate brake and direct clutch drum while blocking the other hole with a finger.



Push down on the clutch pack. Use a feeler gauge to check the gap between the retaining ring and the clutch pressure plate. Specification: 1.3 to 2.0mm (0.051 to 0.079 inch).

If the reading is not within specification, remove the retaining ring and check thickness. Replace with a ring that will correct free play, and verify with a feeler gauge.



DIRECT CLUTCH

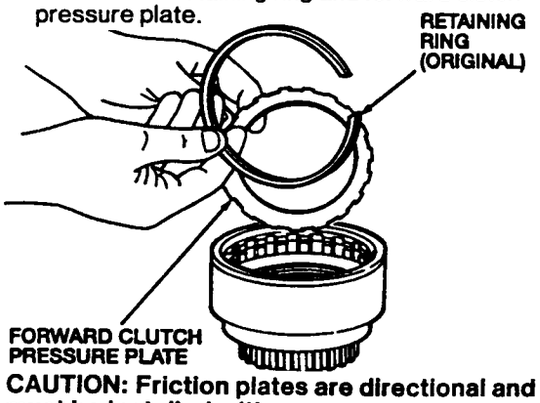
Part Number	Thickness		Diameter	
	mm	Inches	mm	Inches
E860126-S	1.37	.0539	130.1	5.122
E860127-S	1.73	.0681	130.1	5.122
E860128-S	2.08	.0819	130.1	5.122
E860129-S	2.44	.0961	130.1	5.122

Disassembly Forward Clutch

CAUTION: The retaining ring is a select fit ring. See assembly procedure if the retaining ring or clutch pack is replaced.

CAUTION: If new plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

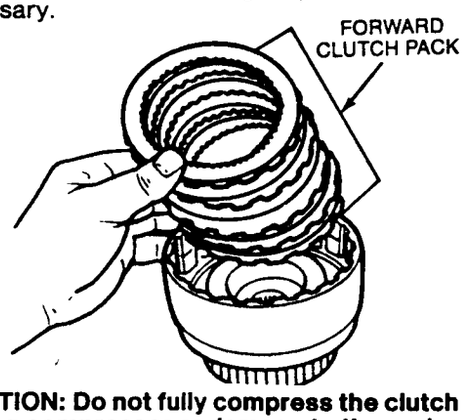
Remove the retaining ring and forward clutch pressure plate.



CAUTION: Friction plates are directional and must be installed with grooves counterclockwise (I.D. to O.D.). The word "TOP" should face up.

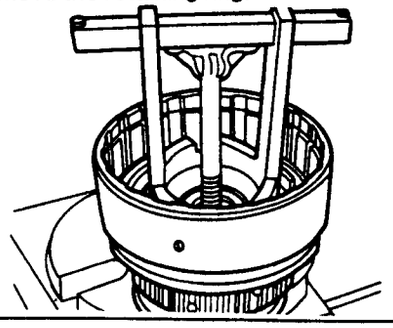
NOTE: The number of clutch plates is engine dependent.

Remove the forward clutch pack. Inspect for wear, damage or overheating. Replace as necessary.



CAUTION: Do not fully compress the clutch spring compressor or damage to the spring retainer may occur.

Compress the forward clutch piston springs with Clutch Spring Compressor T65L-77515-A. Remove the retaining ring.

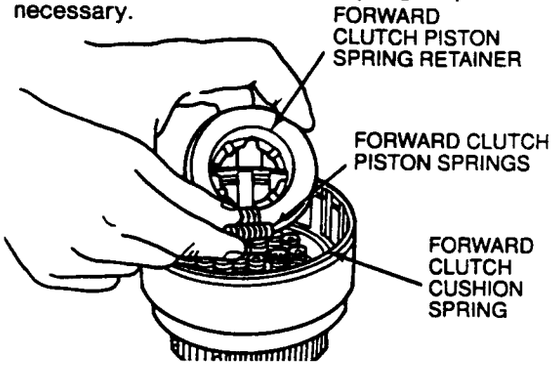


WARNING: CAREFULLY RELEASE THE TOOL PRESSURE ON THE FORWARD CLUTCH PISTON SPRINGS AND REMOVE THE TOOL.

Remove the clutch spring compressor from the forward clutch cylinder.

CAUTION: The forward clutch cushion spring is model dependent.

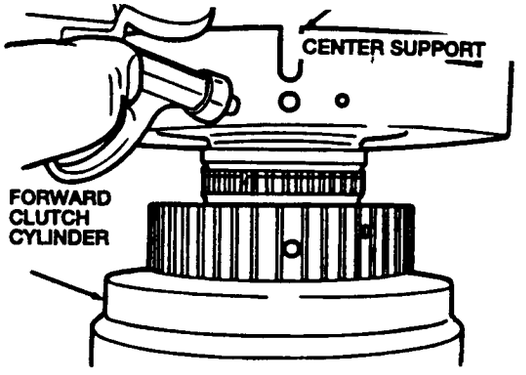
Remove the forward clutch piston spring retainer and 15 forward clutch piston springs. Remove the rubber forward clutch cushion spring. Replace as necessary.

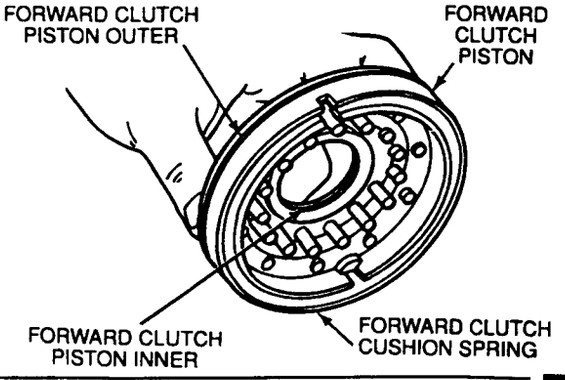


WARNING: AIR PRESSURE MUST NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR. MAKE SURE THE CYLINDER IS FACING DOWN AS SHOWN.

NOTE: This is the middle-sized port.

Use the center support to remove the forward clutch piston. Install the center support on the forward clutch cylinder. Apply air pressure to the far left port in the center support as shown.





Inspect the forward clutch cylinder thrust surfaces, piston bore and clutch plate serration for scores or burrs. Minor scores or burrs may be removed with a crocus cloth. Replace the forward clutch cylinder if it is badly scored or damaged.

Check the fluid passages in the forward clutch cylinder for obstructions. Clean out all passages. Inspect the forward clutch piston for scores and replace if necessary. Inspect the piston check ball for freedom of movement and proper seating.

Check the clutch release springs for distortion and cracks. Replace the springs if they are distorted or cracked.

Inspect the friction clutch plates, steel clutch plates and clutch pressure plate for worn or scored bearing surface. Replace all parts that are deeply scored.

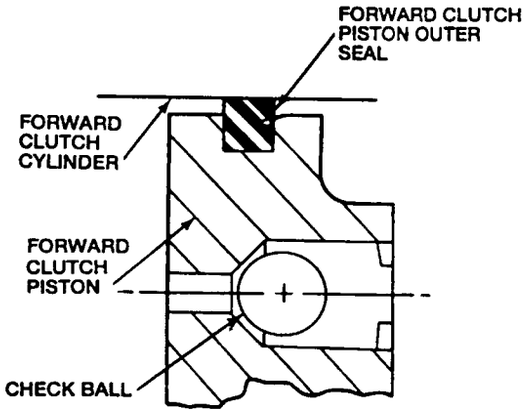
Check clutch plates for flatness and fit on the clutch hub serrations. Discard any plate that does not slide freely on the serrations or that is not flat.

Check clutch hub thrust surfaces for scores and clutch hub splines for wear.

NOTE: The check ball is located in the piston.

Make sure the check ball is free and clear of debris prior to installing the forward clutch piston.

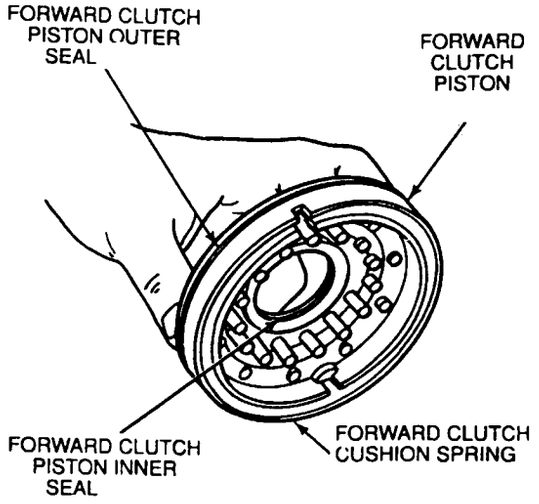
Inspect bearing and seal rings for damage.



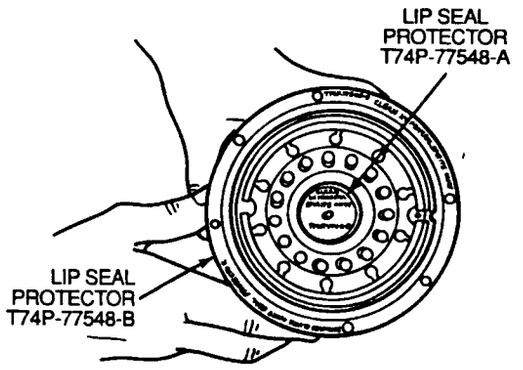
Assembly

CAUTION: If there is evidence of clutch plate burning, replace the forward clutch cushion spring.

Install new forward clutch piston inner and outer seals on the forward clutch piston. Install the forward clutch cushion spring.



To prevent damage to the forward clutch piston outer seal, install Lip Seal Protector T74P-77548-B. To prevent damage to the forward clutch piston inner seal install Lip Seal Protector T74P-77548-A into forward clutch cylinder.



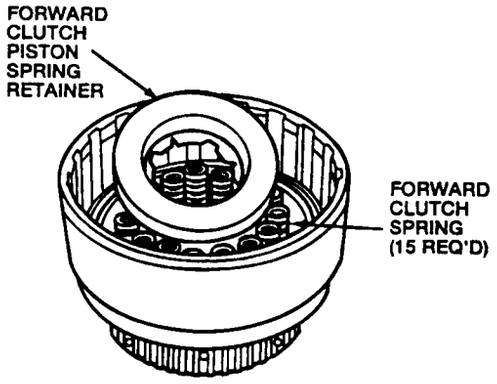
CAUTION: Care must be taken to prevent damage to the seals.

NOTE: Apply petroleum jelly to the inner and outer seals.

Carefully install the forward clutch piston into the forward clutch cylinder.

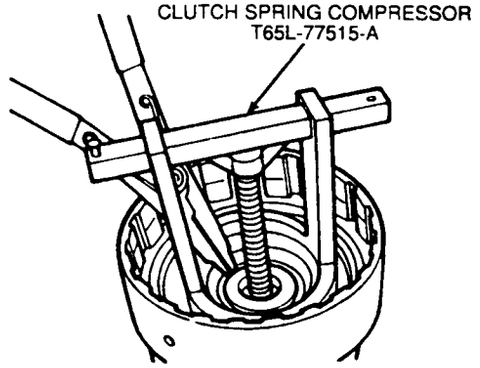
Carefully remove Lip Seal Protector T74P-77548-A and Lip Seal Protector T74P-77548-B from the forward clutch cylinder.

Install the 15 forward clutch piston springs and forward clutch piston spring retainer.



CAUTION: Do not fully compress the clutch spring compressor or damage to the forward clutch piston spring retainer may occur.

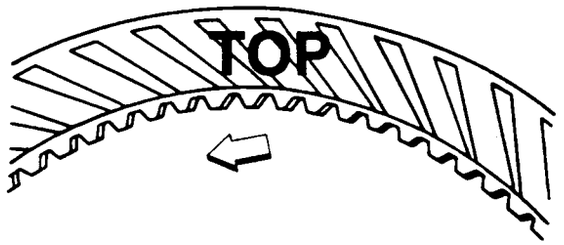
Compress the clutch piston springs with Clutch Spring Compressor T65L-77515-A and install the retaining ring. Release the load on the forward clutch piston springs and remove the tool.



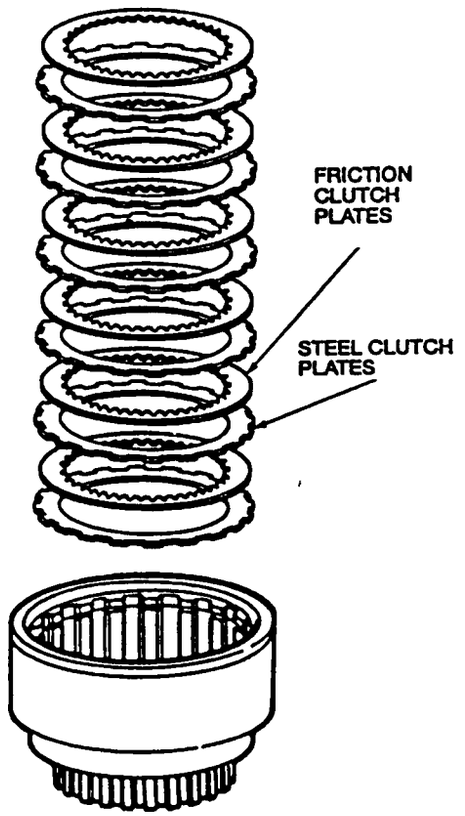
CAUTION: Friction plates are directional and must be installed with groove counterclockwise (I.D. to O.D.). The word "TOP" should face up.

CAUTION: If new plates are being used, they should be soaked in clean transmission fluid for at least 30 minutes before assembly.

When installing friction plates, the word "TOP" should face up. If reusing plates, grooves must be installed counterclockwise.



Install the steel clutch plates and friction clutch plates in alternating order, starting with a steel plate and finishing with a friction plate.

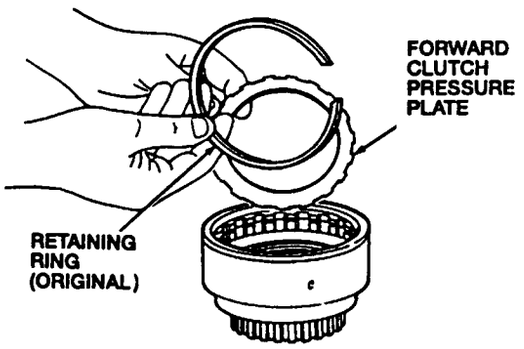


CLUTCH PACK

Engine	Steel	Friction
4.0L-EFI	6	6
4.0L-SOHC	6	6

CAUTION: The retaining ring is a select fit.

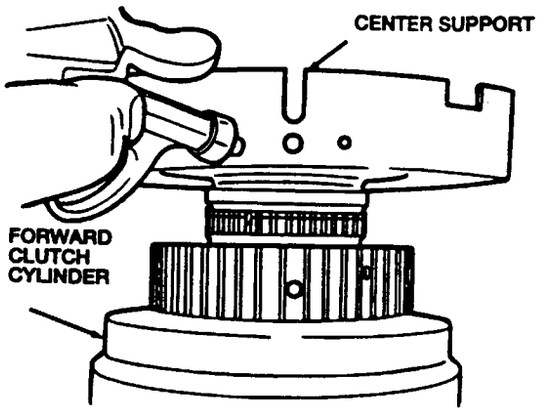
Install the forward clutch pressure plate on the clutch pack. Install the original retaining ring.



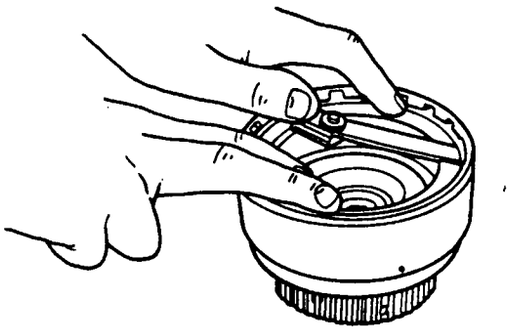
WARNING: DO NOT EXCEED 138 KPA (20 PSI). WEAR SAFETY GLASSES WHEN USING COMPRESSED AIR. MAKE SURE THE DRUM IS FACING DOWN AS SHOWN.

NOTE: The forward clutch piston must apply with air pressure and release when the air is removed.

Install the center support on the forward clutch cylinder. Apply air pressure to the far left port in the center support as shown.



Push down on the clutch pack. Use a feeler gauge to check the gap between the retaining ring and the clutch pressure plate. Specification: 1.4 to 2.1mm (.055 to .083 inch). If the reading is not within specifications, remove the retaining ring and check the thickness. Replace the retaining ring with one that will provide correct free play. Verify free play with a feeler gauge.

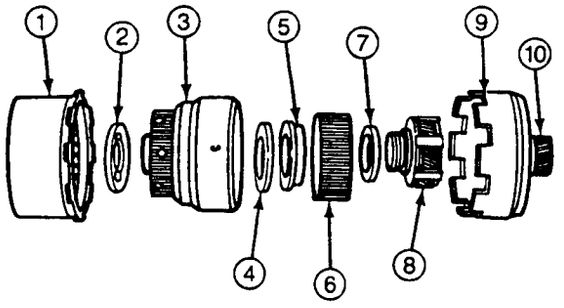


FORWARD CLUTCH CYLINDER

Part Number	Thickness		Diameter	
	mm	Inches	mm	Inches
E860115-S	1.37	.0539	125.1	4.925
E860116-S	1.73	.0681	125.1	4.925
E860117-S	2.08	.0819	125.1	4.925
E860118-S	2.44	.0961	125.1	4.925

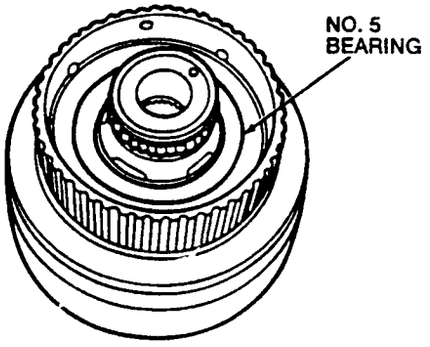
Forward Geartrain Assembly

Assembly

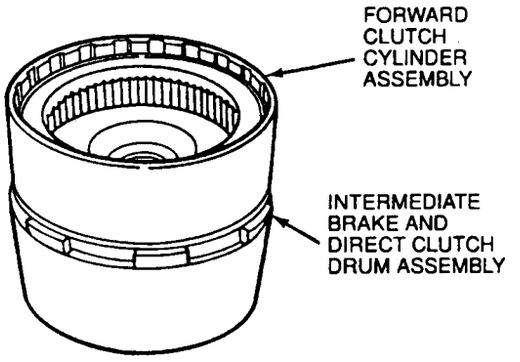


Item	Part Number	Description
1	—	Intermediate Brake and Direct Clutch Drum Assembly
2	7M153	No. 5 Forward Clutch Cylinder Thrust Bearing
3	—	Forward Clutch Cylinder Assembly
4	7D234	No. 6A Forward Ring Gear Hub Thrust Bearing Assembly
5	7D090	No. 6B Forward Clutch Thrust Washer
6	7D392	Forward Ring Gear
7	7F374	No. 7 Forward Planetary Thrust Bearing Assembly
8	7A398	Forward Planetary Assembly
9	7D064	Input Shell
10	7D063	Forward Sun Gear Assembly

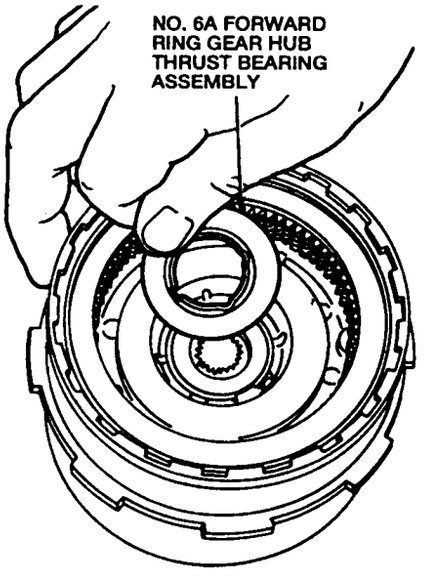
1. Install the No. 5 forward clutch cylinder thrust bearing on the forward clutch cylinder assembly. Use petroleum jelly to hold the washer in place.



Install the forward clutch cylinder assembly into the intermediate brake and direct clutch drum assembly as shown.

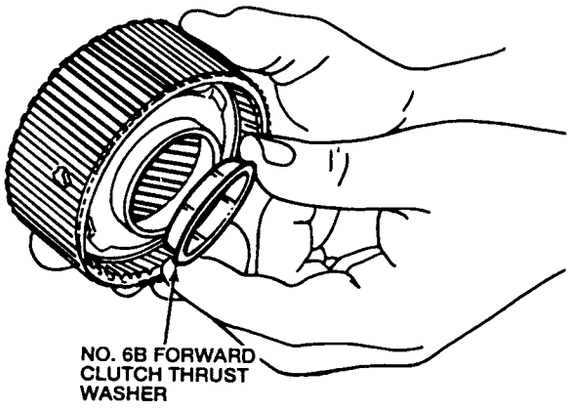


Install the No. 6A forward ring gear hub thrust bearing into the forward clutch cylinder with the tabs facing up as shown.



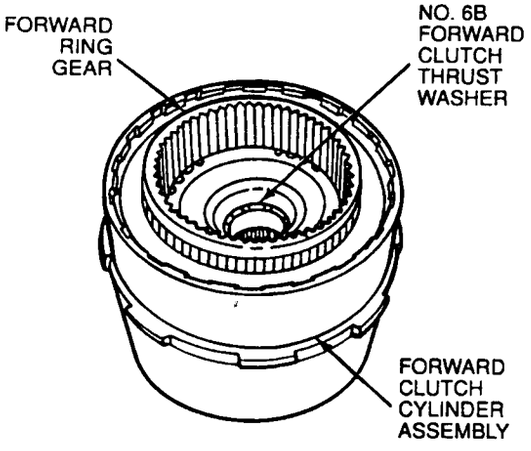
NOTE: Use petroleum jelly to hold the washer in place.

Install the No. 6B forward clutch thrust washer into the forward ring gear hub.



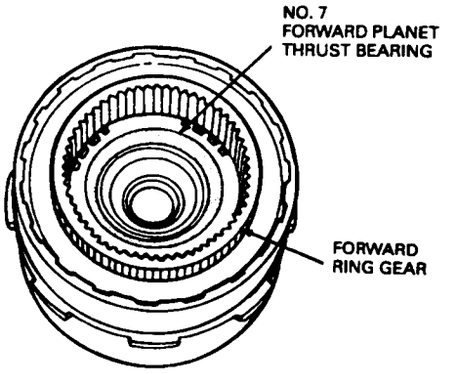
NOTE: Make sure the No. 6A bearing and No. 6B forward clutch thrust washer assembly are inside the forward ring gear.

Install the forward ring gear and forward clutch thrust washer into the forward clutch cylinder assembly as shown.



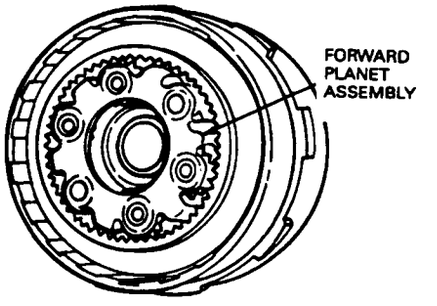
CAUTION: Black oxidized color of thrust bearing must face up toward planetary assembly.

Install the No. 7 forward planetary thrust bearing into the forward ring gear as shown.



NOTE: All service replacements are 6 pinion only.

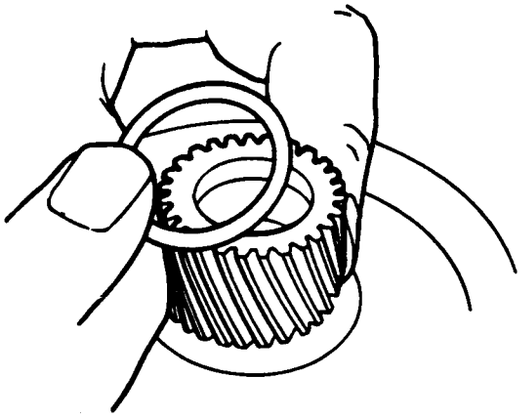
Install the forward planetary assembly into the forward ring gear as shown.



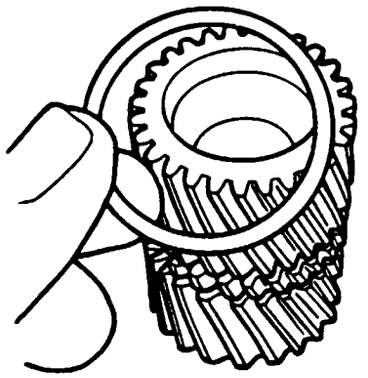
NOTE: If sun gear, retaining rings or input shell require service; perform steps a-e.

Inspect the drum gear, bushing and washer for scoring, wear or damage. Replace as required.

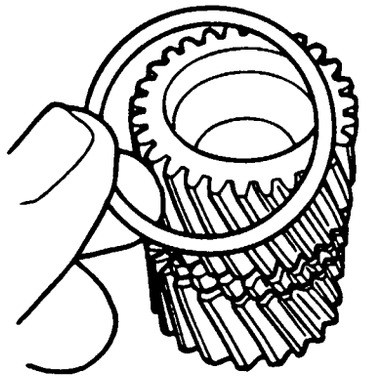
a. Remove rear retaining ring and sun gear from input shell.



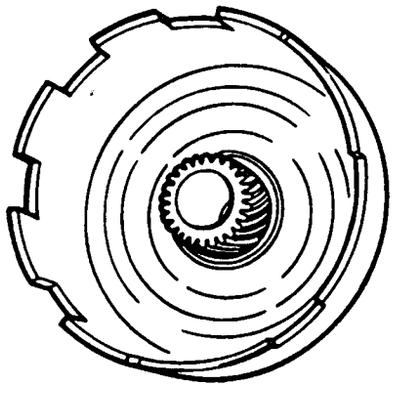
b. Remove front retaining ring from sun gear.



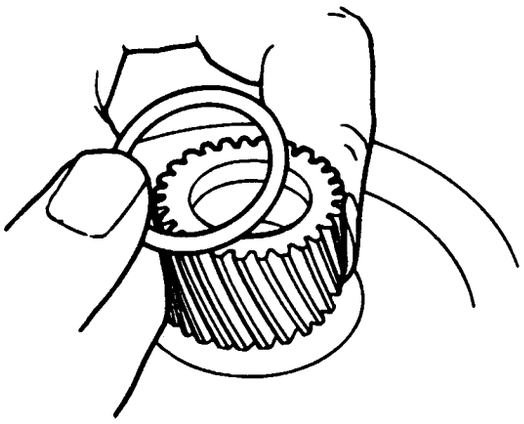
c. Install new retaining ring onto sun gear.



d. Install forward sun gear into input shell.

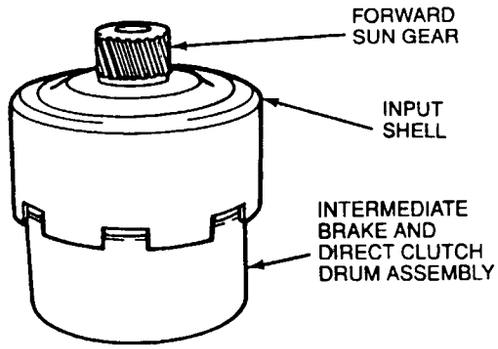


e. Install new rear retaining ring onto sun gear.



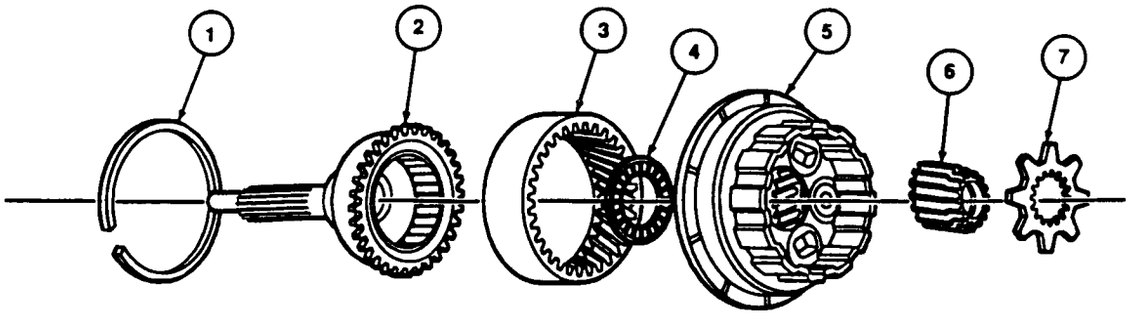
NOTE: Make sure the forward sun gear aligns with the forward planetary assembly. Make sure the input shell aligns with the intermediate brake and direct clutch drum assembly as shown.

Install the input shell with forward sun gear assembly as shown.



Overdrive Planetary and One-Way Clutch Assembly

Overdrive Planetary and One-Way Clutch Assembly



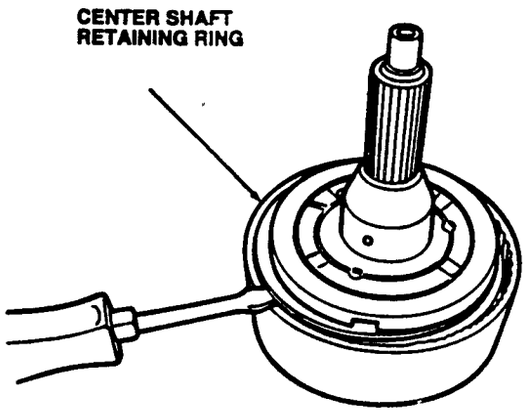
Item	Part Number	Description
1	W702037-S	Retaining Ring
2	7A658	Center Shaft Assembly
3	7653	Front Ring Gear
4	7L495	No. 2 Front Planetary Thrust Bearing

Item	Part Number	Description
5	7B446	Front Planetary Gear Carrier Assembly
6	7D063	Front Sun Gear Assembly
7	7660	Coast Clutch Adapter

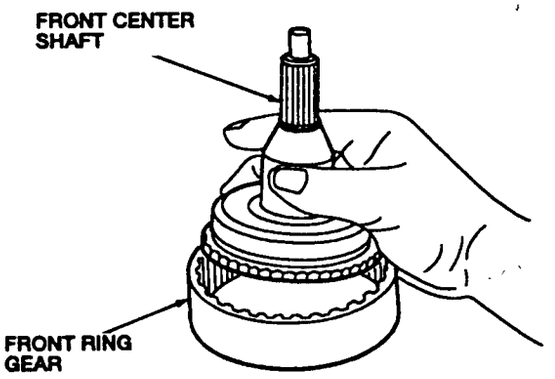
(Continued)

Disassembly

Remove the center shaft retaining ring from the front ring gear.



Remove the center shaft from the front ring gear.



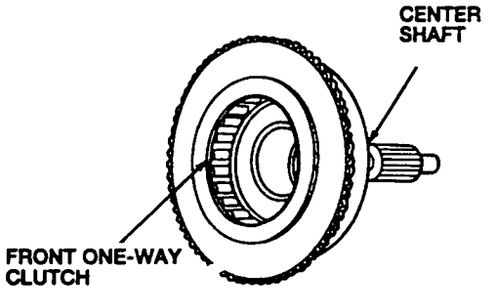
CAUTION: Do not remove the front one-way clutch. Damage to the clutch may occur if it is removed.

NOTE: The front one-way clutch is serviced with the front center shaft.

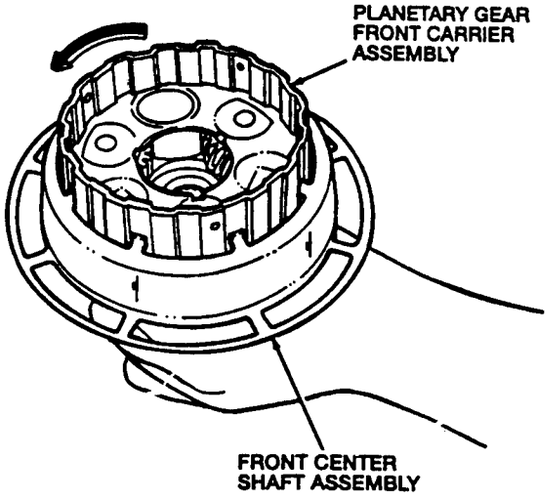
Clean and inspect the front one-way clutch and front center shaft assembly. Check for cracks in the roller cage and wear on the roller clutch. Inspect the press fit of the one-way roller clutch to the overdrive center shaft.

Inspect the rollers and springs for excessive wear or damage.

Inspect the spring and roller cage for bent or damaged spring retainers.

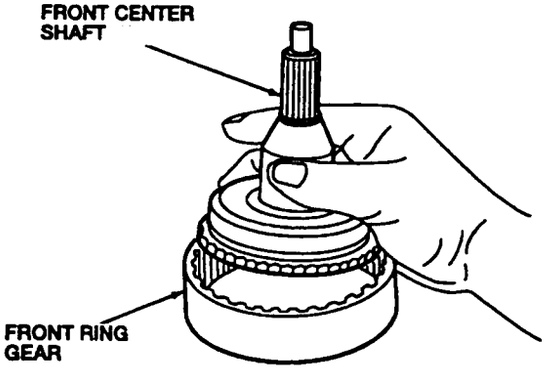


Temporarily insert the front planetary gear carrier assembly into the one-way clutch rollers for verification of the one-way clutch. The planetary must rotate counterclockwise and hold clockwise as shown. Remove the front planetary gear carrier assembly.

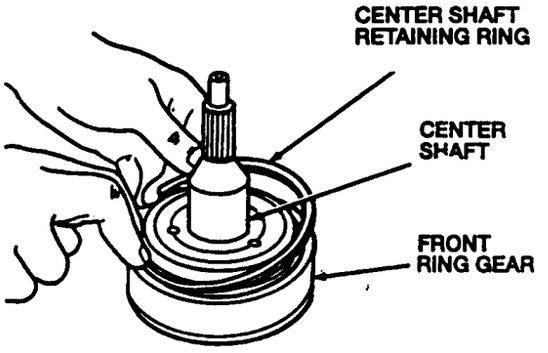


Assembly

Install the center shaft and front one-way clutch into the front ring gear.



Install the center shaft retaining ring.



CAUTION: Planetarys must be replaced. Do not restake.

NOTE: Individual parts of the planetary carriers are not serviceable.

Check the pins and shafts in the planetary assemblies for loose fit and / or complete disengagement. Use a new planetary assembly if either condition exists. Before installing a planetary assembly, the shaft retaining pins should be checked for adequate staking.

Inspect the pinion gears for damaged or excessively worn teeth.

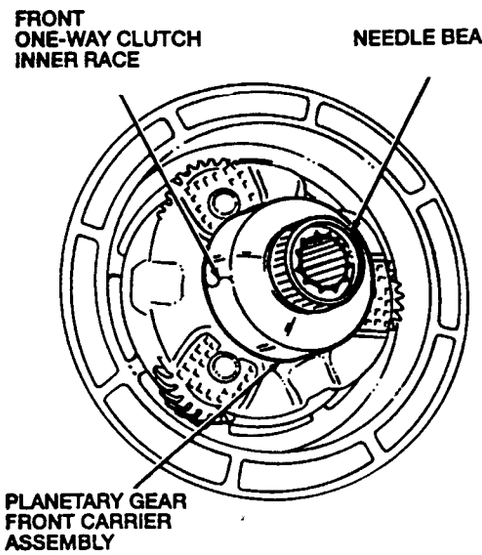
Check for free rotation of the pinion gears.

Inspect the overdrive one-way clutch inner race for scoring.

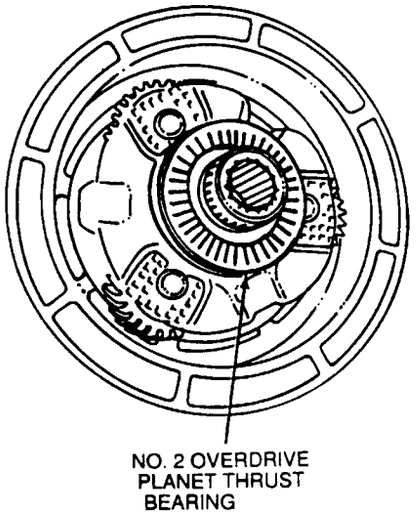
Check pinion bearing and gears.

Inspect the inner and outer races for scored or damaged surface areas where the rollers contact the races.

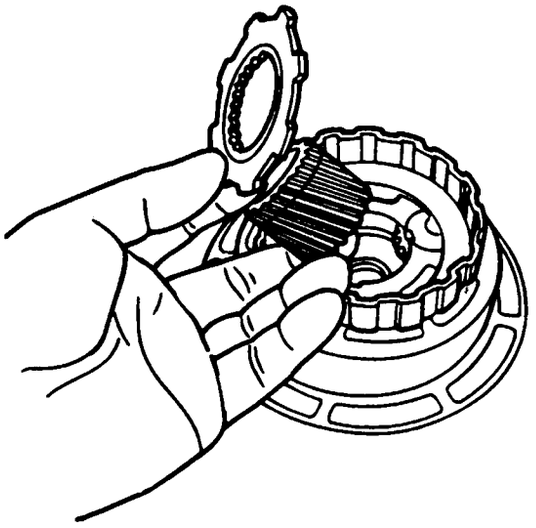
Inspect the needle bearing on the nose of the front planetary gear carrier assembly.



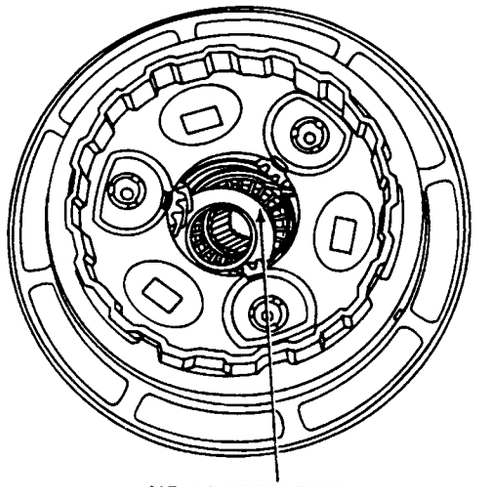
Remove and inspect the No. 2 planetary thrust bearing.



Remove coast clutch to front carrier adapter and front sun gear.



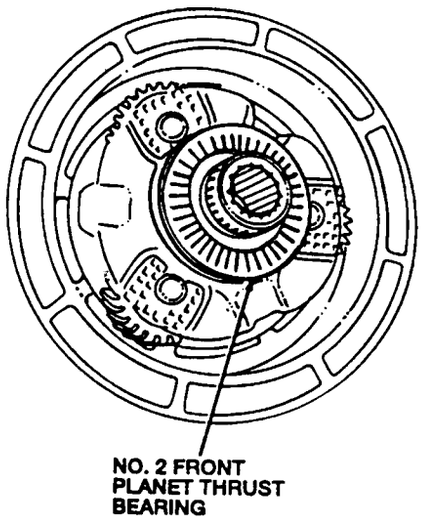
Inspect the No. 12 needle bearing inside the front planetary gear carrier.



NO. 12 NEEDLE BEARING

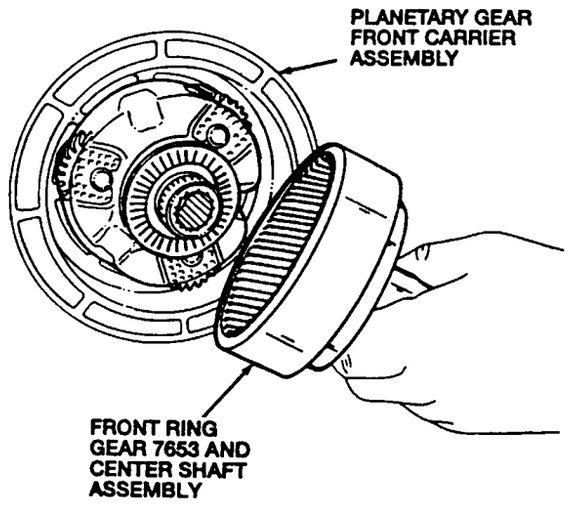
NOTE: Use petroleum jelly to hold the No. 2 front planetary thrust bearing in place.

Install the No. 2 front planetary thrust bearing between the front center shaft face and the front planetary gear carrier assembly.



NO. 2 FRONT PLANET THRUST BEARING

Install the front planetary gear carrier into the center shaft and front ring gear.



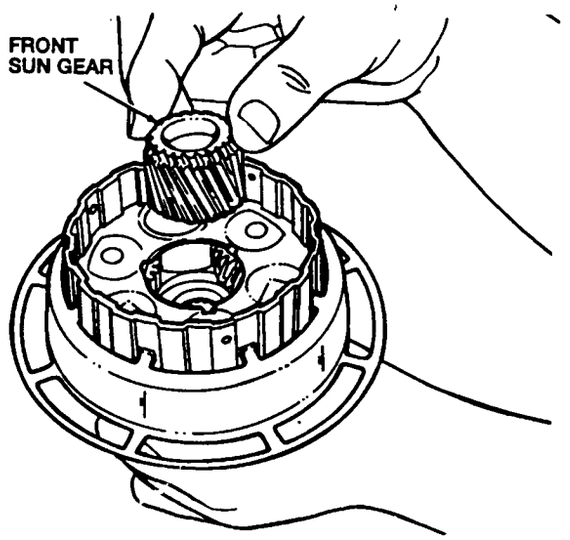
PLANETARY GEAR FRONT CARRIER ASSEMBLY

FRONT RING GEAR 7653 AND CENTER SHAFT ASSEMBLY

CAUTION: Use care not to bend or damage the exciter wheel.

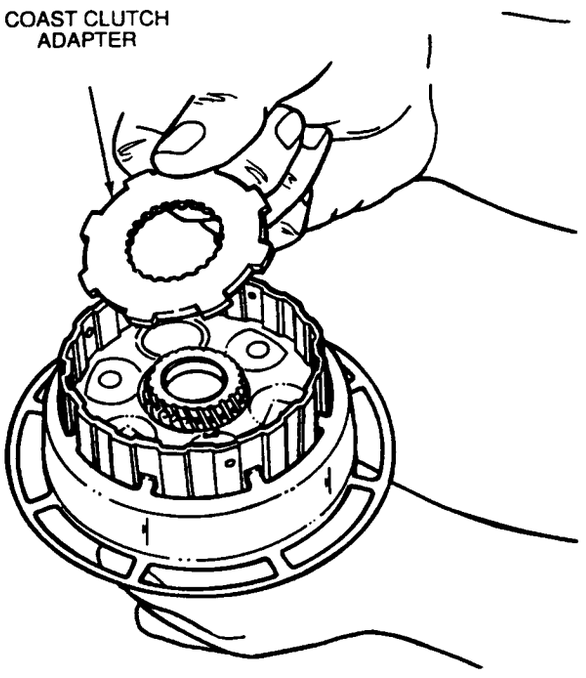
CAUTION: Before installing the front sun gear into the front planetary gear carrier, make sure the No. 12 sun gear thrust bearing race is aligned with the needle bearing inside the front planetary gear carrier. The front sun gear will not seat properly if the No. 12 sun gear thrust bearing race is not aligned in the center of the front sun gear.

Install the front sun gear into the front planetary gear carrier.



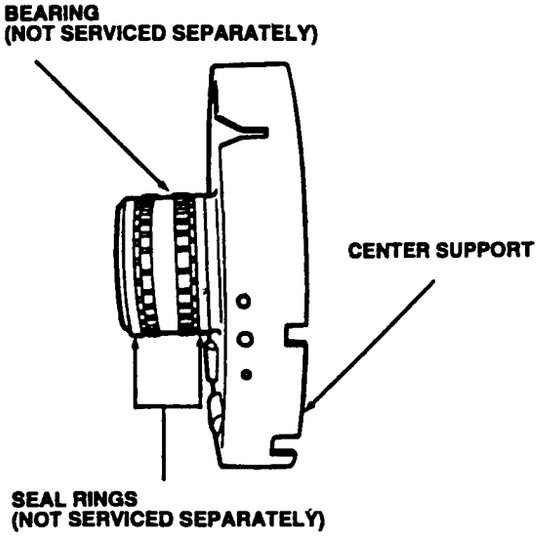
FRONT SUN GEAR

Install the coast clutch adapter on the front sun gear.

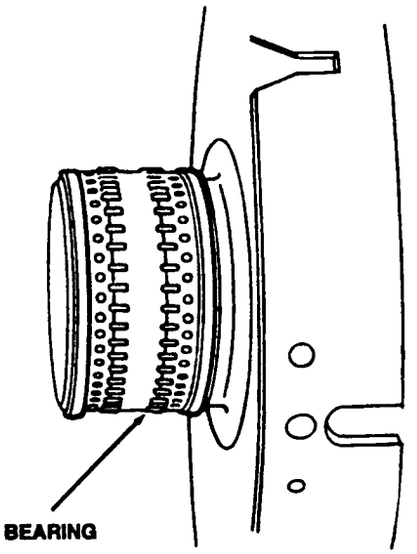


Center Support

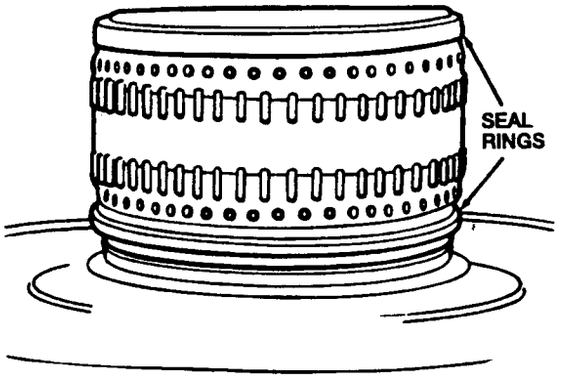
Inspection



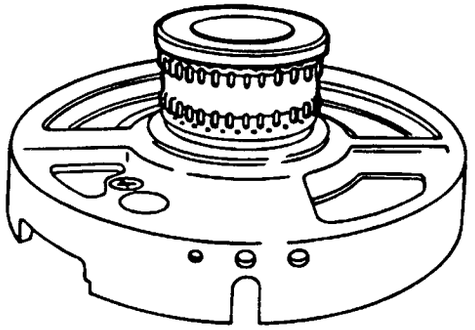
Inspect center support for damage. If damaged, replace center support assembly.

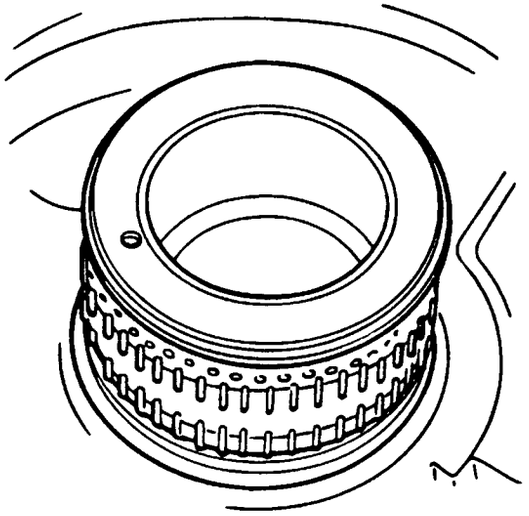


Inspect seal rings for damage. If damaged, replace center support.



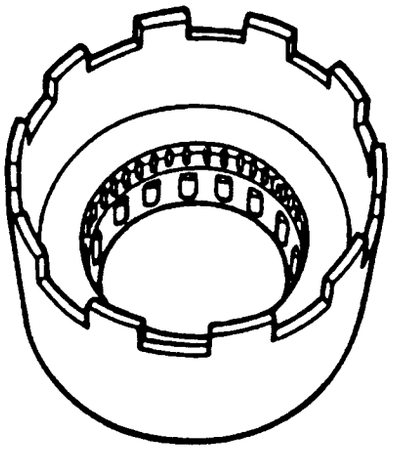
Inspect thrust surface for wear, scoring or damage. Inspect forward clutch sealing surface for scoring or damage. Inspect hydraulic passages for damage or restrictions.

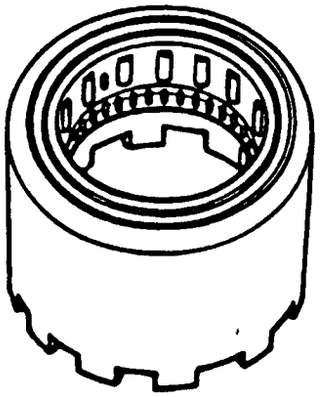




Low/Reverse Brake Drum

Low/Reverse Brake Drum Assembly

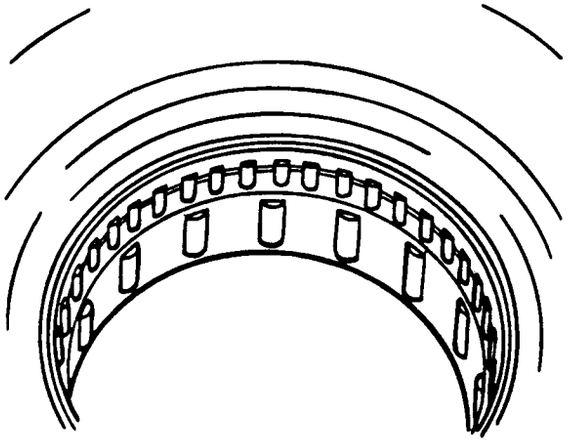




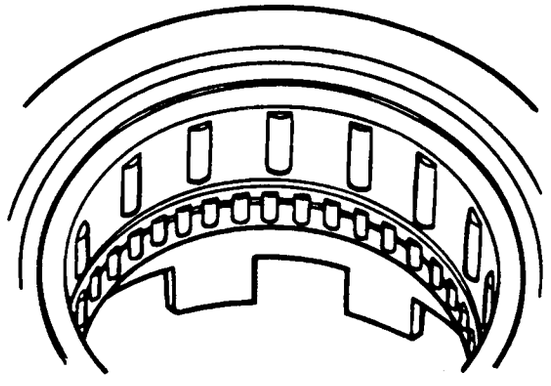
Inspection

NOTE: The rear one-way clutch is part of the reverse drum assembly.

Inspect rollers, sprags, and low / reverse drum for damage. If damaged, replace drum assembly.



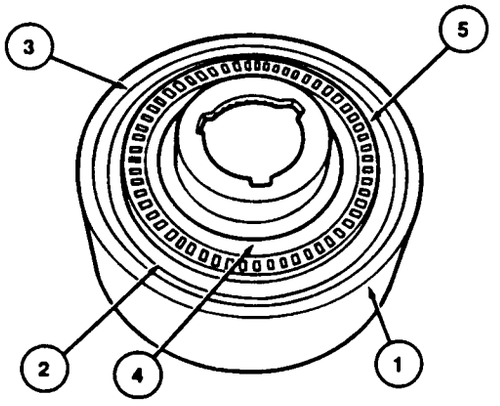
INSIDE VIEW



OUTSIDE VIEW

Output Shaft Ring Gear and Hub Assembly

Output Shaft Ring Gear and Hub Assembly

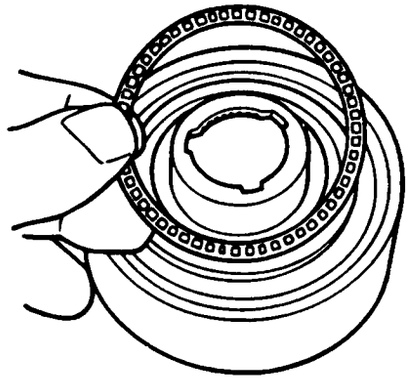


Item	Part Number	Description
1	7A153	Output Shaft Ring Gear
2	7D164	Output Shaft Hub
3	E860122-S	Retaining Ring
4	7M150	No. 10A Bearing Race Assembly
5	7M150	No. 10B Needle Bearing

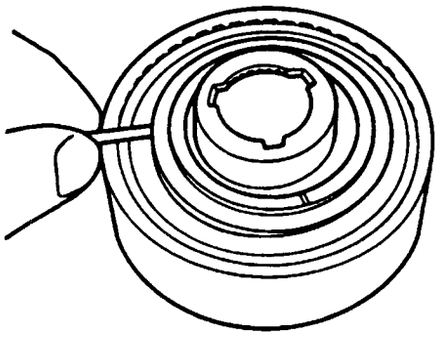
Disassembly

Inspect the ring gear, hub, No. 10B needle bearing and No. 10A bearing race assembly for damage. If service is required, use the following procedures.

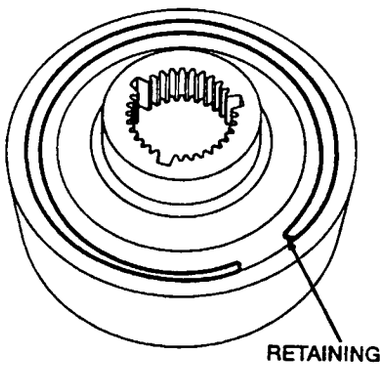
Remove No. 10B needle bearing, if not already removed.



Remove No. 10A bearing race assembly.

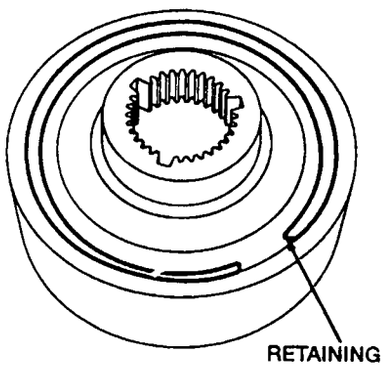


Separate ring gear from hub by removing retaining ring.

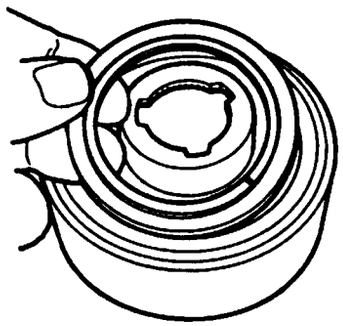


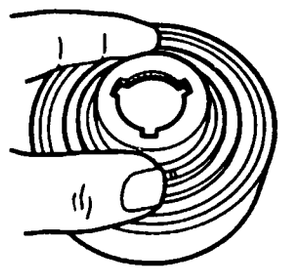
Assembly

Install output shaft hub into ring gear. Install retaining ring.

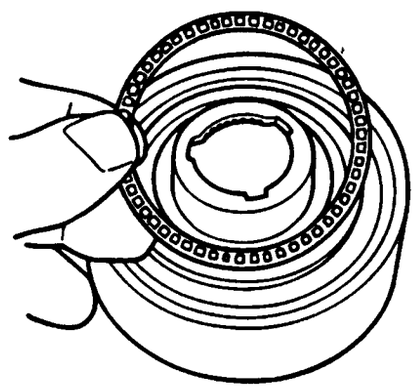


Install No. 10A bearing race assembly onto outshaft hub. Press on - snap fit.





Using petroleum jelly, install No. 10B needle bearing onto output shaft ring gear and hub assembly.



Torque Converter Service Procedures

Cleaning/Inspection

When internal wear or damage has occurred in the transmission, metal particles, clutch plate material, or band material may have been carried into the torque converter. These contaminates are a major cause of recurring transmission troubles and MUST be removed from the system before the transmission is put back into the vehicle.

Whenever a transmission has been disassembled to replace worn or damaged parts, or because the valve body sticks repeatedly from foreign material, the torque converter MUST be cleaned using a mechanical agitated cleaner, such as Rotunda Torque Converter / Transmission Oil Cooler Cleaner 014-00028 or equivalent.

Torque Converter Flushing

NOTE: Mineral spirits used to clean the torque converter must be fresh, non-chlorinated and non-halogenated.

Following the instructions included with the Torque Converter / Transmission Oil Cooler Cleaner 014-00028, flush out the converter.

After flushing the torque converter, follow these steps:

— Thoroughly drain the remaining solvent through the impeller hub.

— Add 1.9L (2.0 quarts) of clean MERCON V® XT-5-QM Automatic Transmission Fluid into fluid filler tube.

— Agitate the solution inside the torque converter by hand.

— Thoroughly drain the torque converter through the impeller hub.

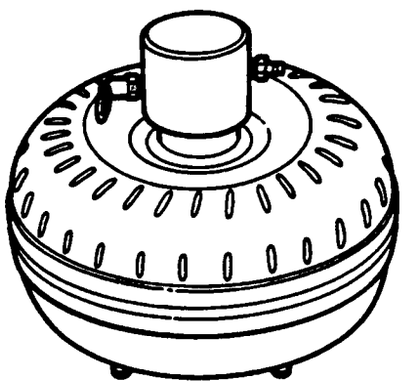
Torque Converter Leak Check

SPECIAL SERVICE TOOL(S) REQUIRED

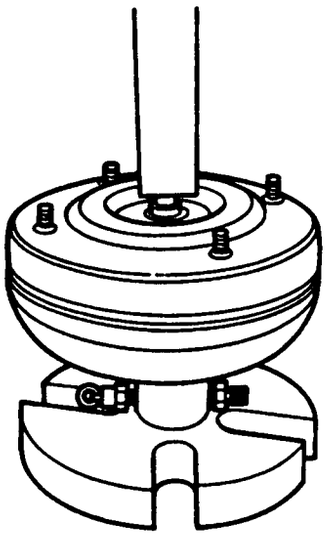
Description	Tool Number
Torque Converter Leak Check Tool and Gasket	014-R1075

Clean the outside surface at the torque converter.

Install Torque Converter Leak Check Tool and Gasket 014-R1075 into converter hub.



Install torque converter with installed Torque Converter Leak Check Tool and Gasket 014-R1075 into press.

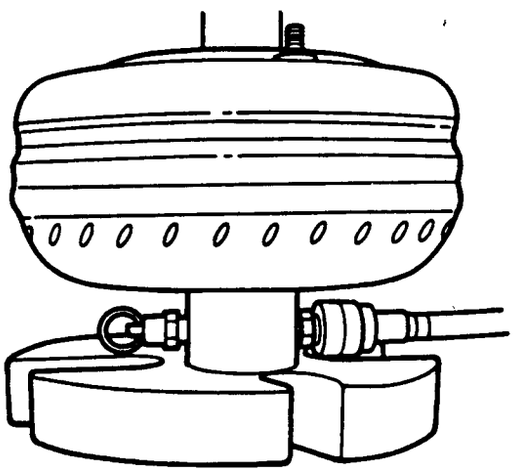


WARNING: ALWAYS FOLLOW PROPER SAFETY PROCEDURES WHILE USING PRESS.

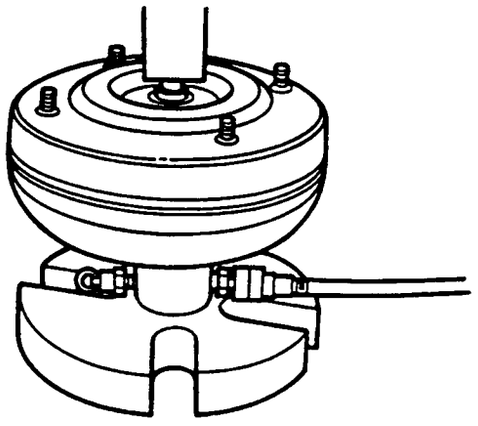
Secure press. Apply enough force from press to seal tool into torque converter.

NOTE: Use clean dry shop air.

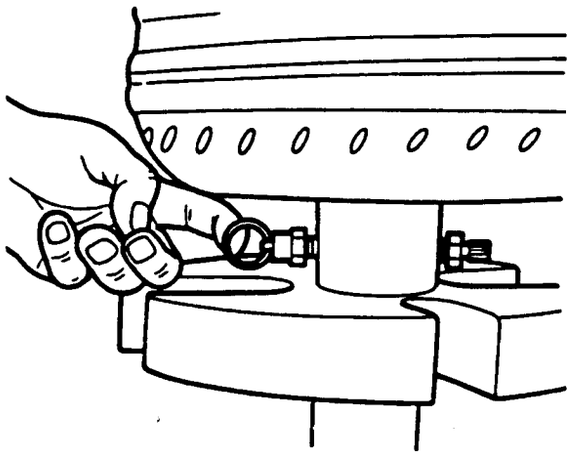
Apply air pressure 80 psi (MAX) to valve on Torque Converter Leak Check Tool and Gasket 014-R1075.



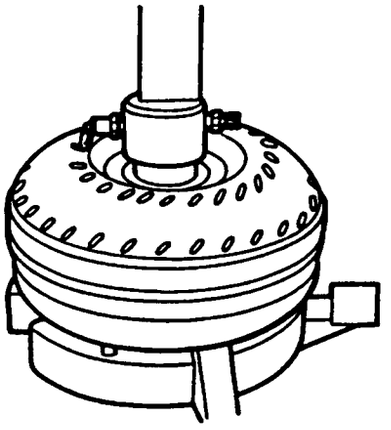
With air pressure applied to valve, inspect for leaks at studs, seams and pilot hub. A soap bubble solution may be applied around those areas to aid in diagnosis. If leaks are present, replace converter.



Release pressure and then slowly release press. Remove air hose.



Rotate torque converter and tool then reinstall into press with tool up.

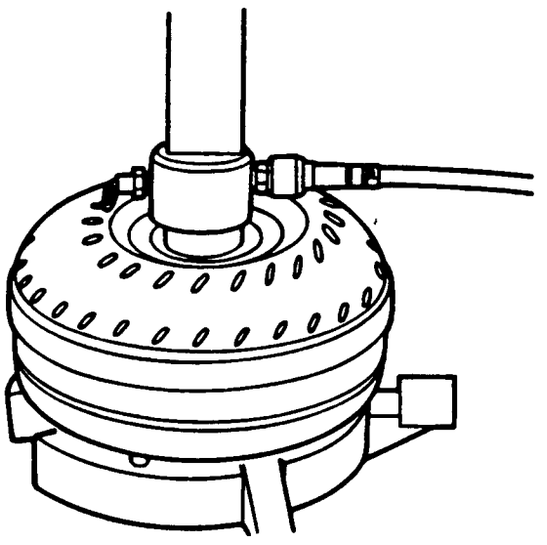


WARNING: ALWAYS FOLLOW PROPER SAFETY PROCEDURES WHILE USING PRESS.

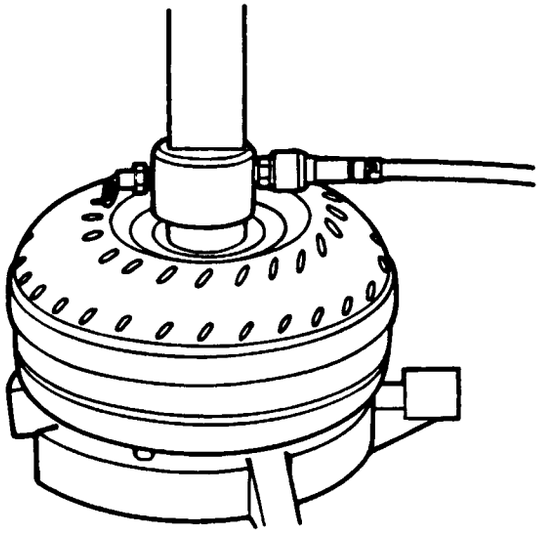
Secure press. Apply enough force from press to seal tool into torque converter.

NOTE: Use clean dry shop air.

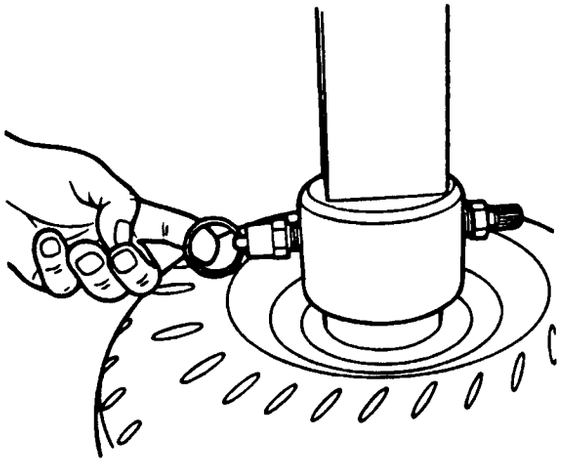
Apply air pressure 80 psi (MAX) to valve on leak check tool.



With air pressure applied to valve, inspect for leaks at converter hub, seams and studs. A soap bubble solution may be applied around those areas to aid in diagnosis. If leaks are present, replace converter.



Remove air hose. Release pressure and then slowly release press. Remove converter. Remove tool.

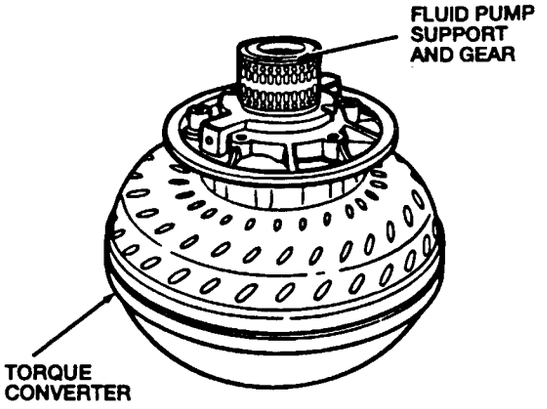


Stator to Impeller Interference Check

SPECIAL SERVICE TOOL(S) REQUIRED

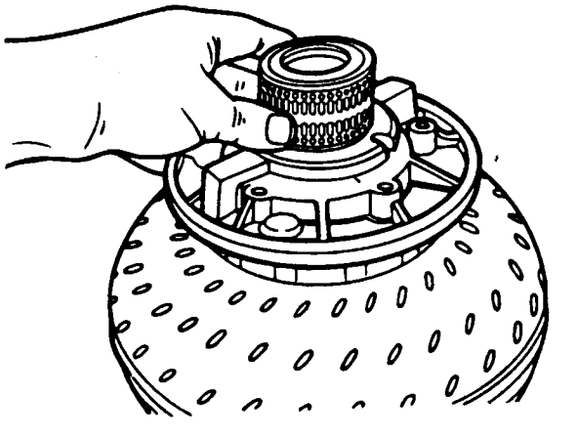
Description	Tool Number
End Play Checking Tool	T80L-7902-A

Install the fluid pump support into torque converter. Engage the splines of the one-way clutch inner race with the mating splines of the stator support.



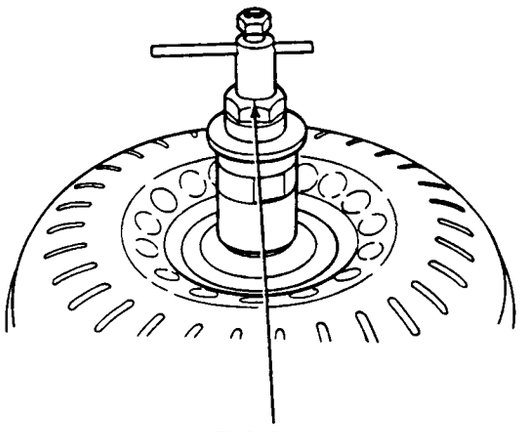
Rotate the torque converter both clockwise and counterclockwise. The fluid pump support should rotate freely without any signs of interference or scraping within the torque converter.

If there is an indication of scraping, the trailing edges of the stator blades may be interfering with the leading edges of the impeller blades. In such cases, replace the torque converter.



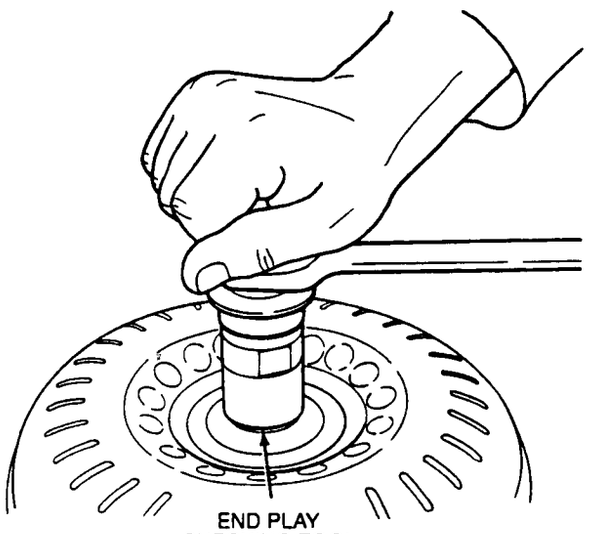
Torque Converter End Play Check

Install End Play Checking Tool T80L-7902-A into the converter turbine hub until it bottoms.



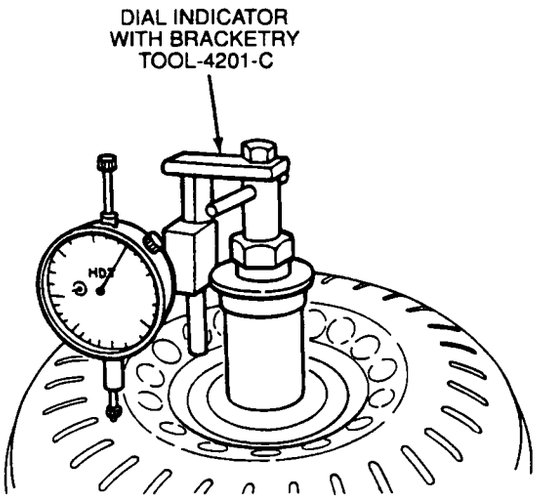
END PLAY
CHECKING TOOL
T80L-7902-A

Expand the sleeve in the turbine spline by tightening the threaded inner post until the tool is securely locked in the spline.



END PLAY
CHECKING TOOL
T80L-7902-A

Attach Dial Indicator with Bracketry TOOL-4201-C or equivalent to End Play Checking Tool T80L-7902-A. Position the indicator button on the converter impeller housing and set the dial face to zero (0).



DIAL INDICATOR
WITH BRACKETRY
TOOL-4201-C

Lift the tool upwards as far as it will go and note the indicator reading. The indicator reading is the total end play which the turbine and stator share. Replace the torque converter if the total end play exceeds the specifications.

CONVERTER END PLAY

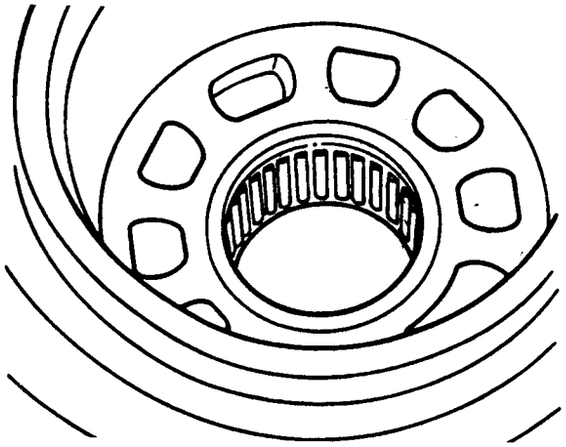
New or Rebuilt Converter		Used Converter	
mm	Inch	mm	Inch
0.58 Max.	0.023 Max.	1.27 Max.	0.050 Max.

Loosen the threaded inner post to remove the tool from the torque converter.

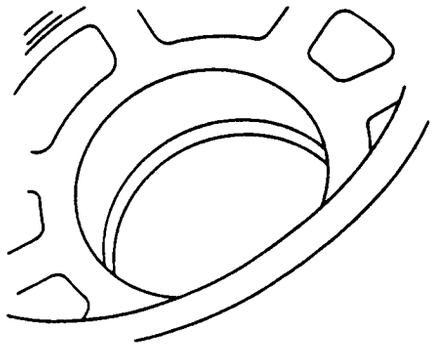
ASSEMBLY

Inspect the case for cracks and stripped threads. Inspect the gasket surfaces and mating surfaces for burrs. Check the vent for obstructions and check all fluid passages for obstructions and leakage.

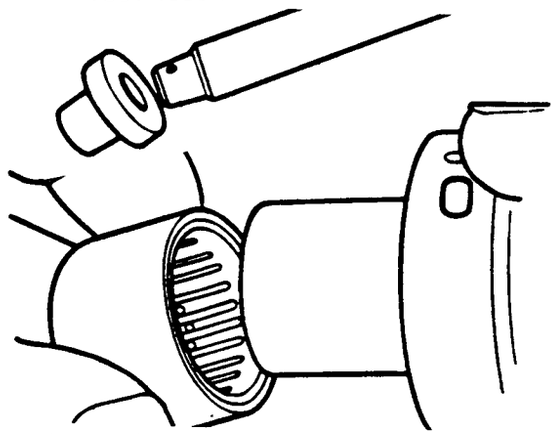
Inspect case bearing for damage. If damaged, replace bearing. Refer to steps a-d.



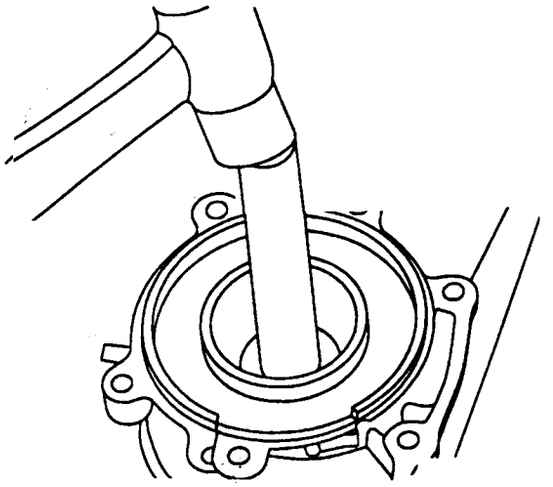
Inspect case bore for nicks and burrs. Remove with oil stone prior to installation of new bearing.



Install Drive Handle T80T-4000-W into Case Bearing Installation Tool T97T-77110-A. Install new bearing on Case Bearing Installation Tool T97T-77110-A. Make sure bearing seal ring is facing Drive Handle T80T-4000-W.

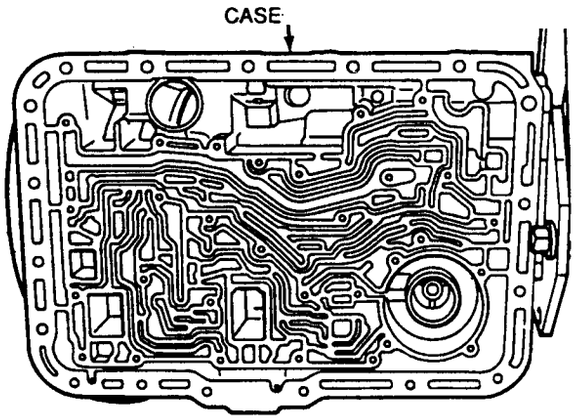


Using a hammer, tap bearing into place with Case Bearing Installation Tool T97T-77110-A.

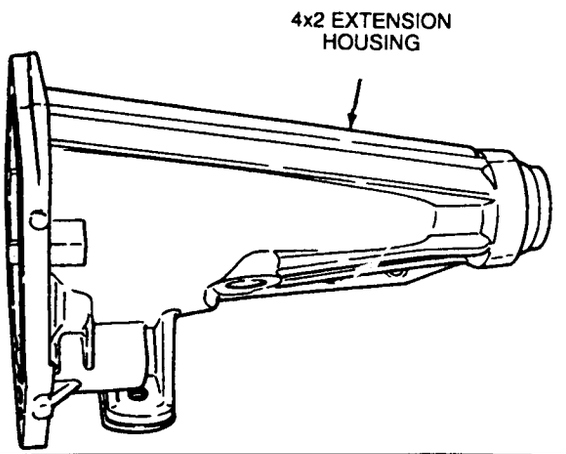


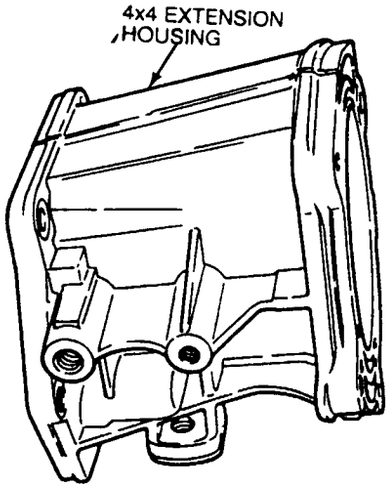
Check all parking linkage for wear or damage.

Inspect all case threads for damage.



Inspect the extension housing for cracks. Inspect the gasket surfaces for burrs or warpage.



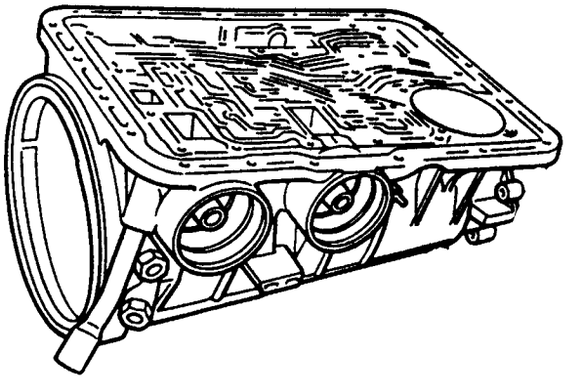


Inspect the bushing for scores or wear. Replace if required.

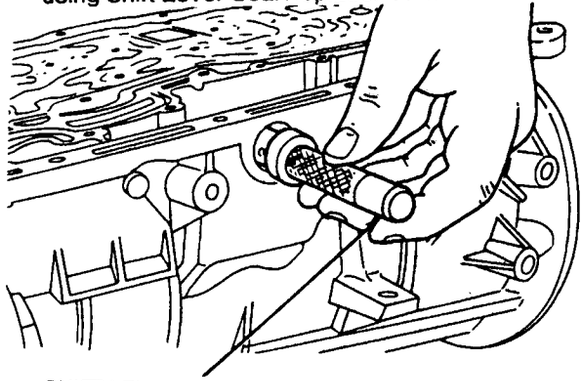
Inspect the rear seal for hardness, cracks or wear. If the seal shows wear or deterioration, replace the seal.

Inspect the seal counterbore and remove all burrs and scores with a crocus cloth.

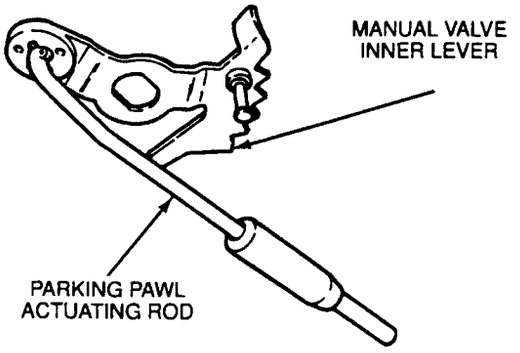
rotate so the transmission fluid pan rail is facing up.



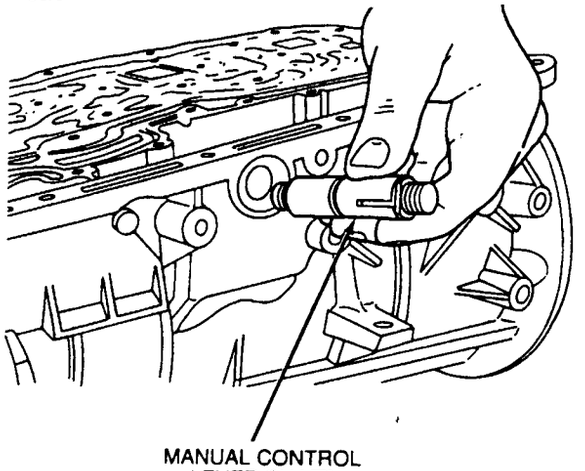
Lubricate and install the main control lever seal using Shift Lever Seal Replacer T74P-77498-A.



Assemble the manual valve inner lever and parking pawl actuating rod as shown.

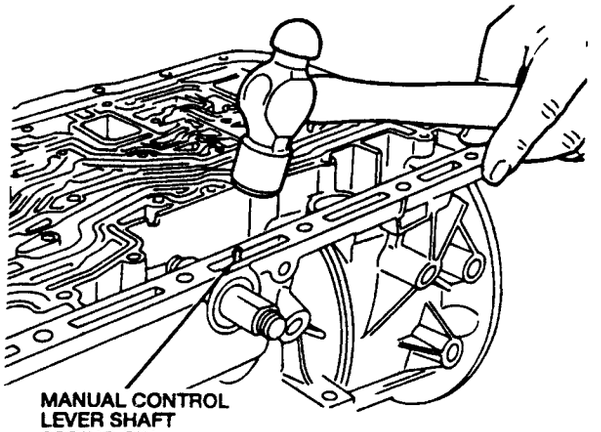


Install the manual control lever shaft into the case.



CAUTION: Use care not to damage the fluid pan rail surface when installing the retaining pin.

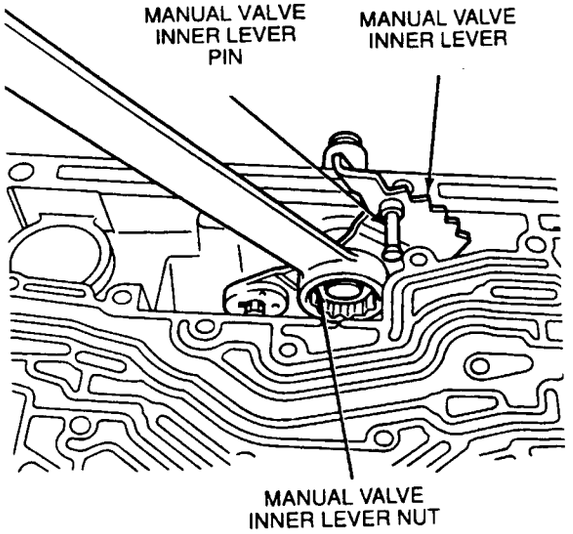
Align the manual control lever shaft with the manual control lever shaft retaining pin. Install the retaining pin.



Install the manual valve inner lever and parking pawl actuating rod into the case. Align the flats of the manual valve inner lever with the flats on the manual control lever shaft.

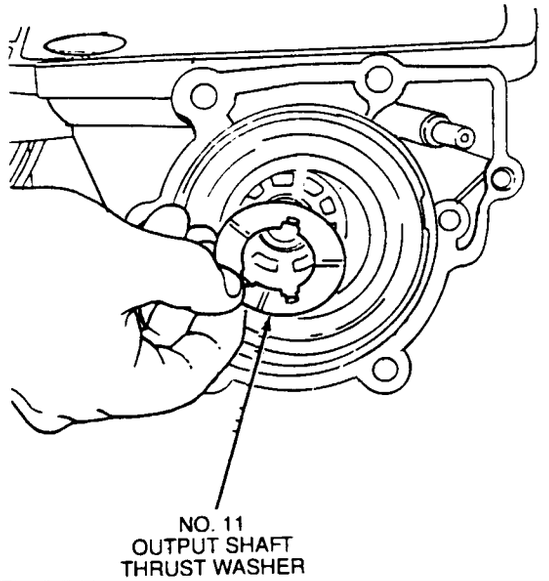
CAUTION: To avoid damage, do not allow wrench to strike the manual valve inner lever pin.

Install manual valve inner lever nut and tighten to 41-54 N·m (30-40 lb-ft).

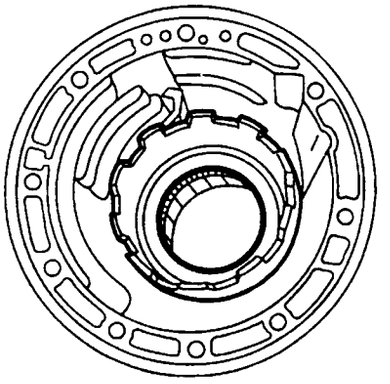


CAUTION: The tabs on the No. 11 output shaft thrust washer point into the case. Ensure that the thrust washer is properly seated.

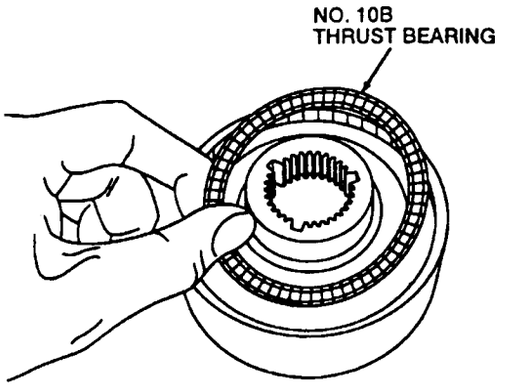
Apply petroleum jelly to the No. 11 output shaft thrust washer and install into the rear of the case bore.



Rotating the reverse brake drum assembly clockwise, install into case.

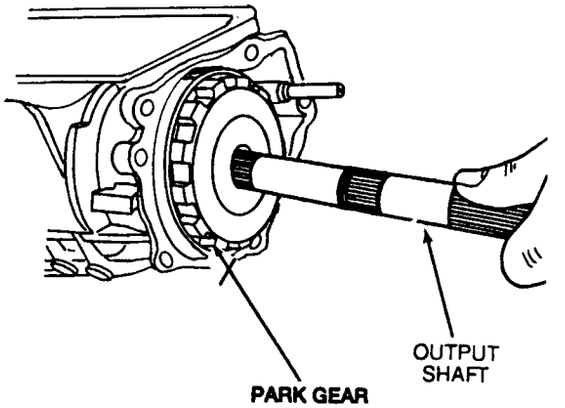


If not already installed, use petroleum jelly to install No. 10B thrust bearing onto output shaft ring gear and hub assembly.

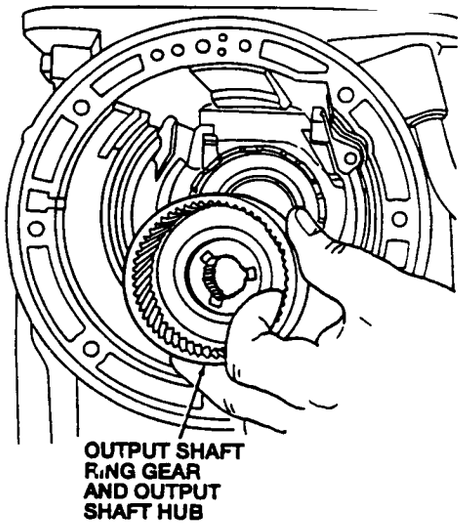


Install the park gear into the rear case bore.

Install the output shaft through the output shaft park gear.

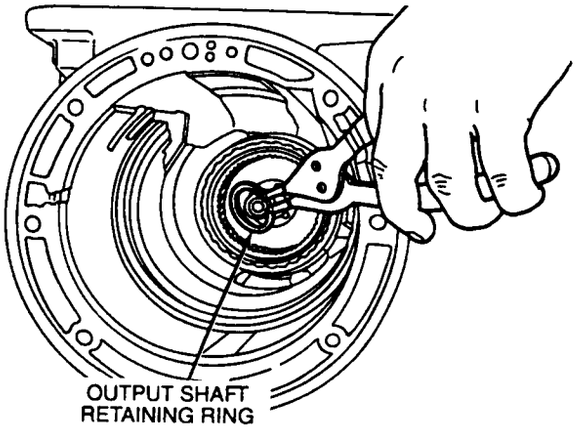


Install the output shaft ring gear and output shaft hub assembly.



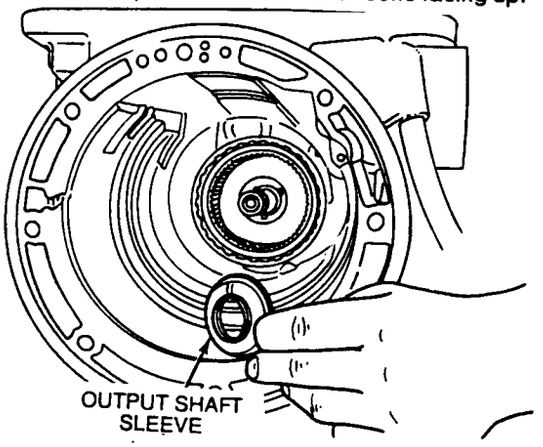
CAUTION: Always use a new retaining ring.

Install a new output shaft retaining ring in the output shaft retaining ring groove.



NOTE: Use petroleum jelly to hold the sleeve in place.

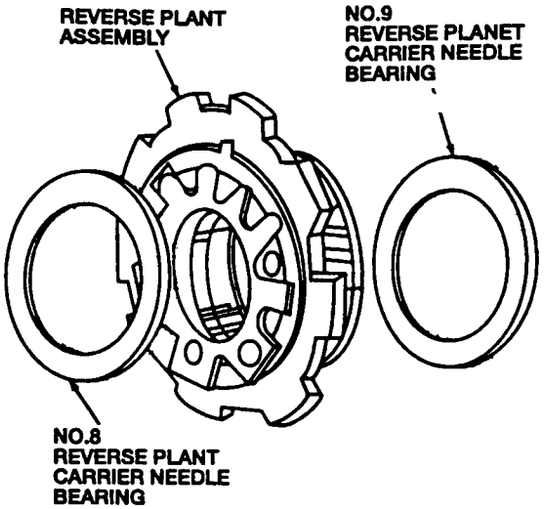
Install the output shaft sleeve with cone facing up.



NOTE: Use petroleum jelly to hold the needle bearings in place.

Position the No. 8 low / reverse planetary carrier needle bearing on the front face of the low / reverse planetary. Position the No. 9 low / reverse planetary carrier needle bearing on the rear face of the low / reverse planetary.

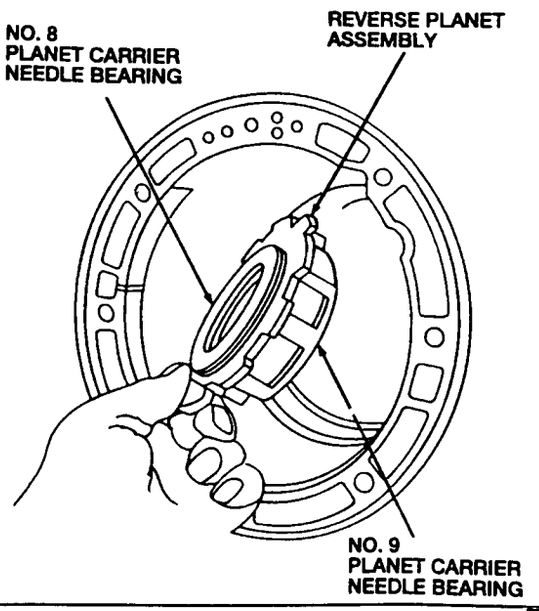
No. 8 and 9 Low / Reverse Planetary Carrier Needle Bearing Position



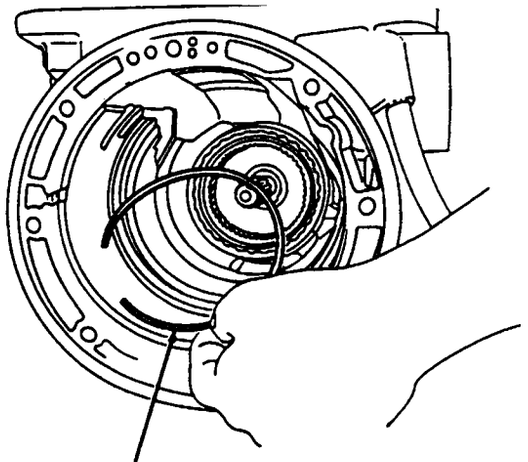
CAUTION: Make sure the needle bearings stay in place.

Install the low / reverse planetary assembly, with No. 8 and No. 9 low / reverse planetary carrier needle bearings, into the output shaft ring gear.

Reverse Planetary Assembly Installation



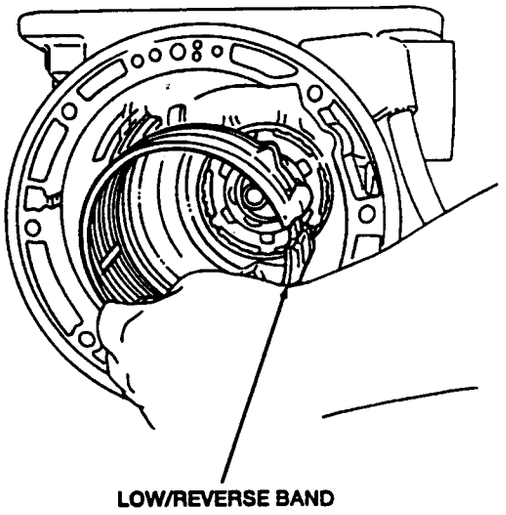
Pull the low / reverse brake drum forward and install the retaining ring into the low / reverse brake drum groove. This will hold the low / reverse planetary assembly in place.



LOW/REVERSE PLANET RETAINING RING

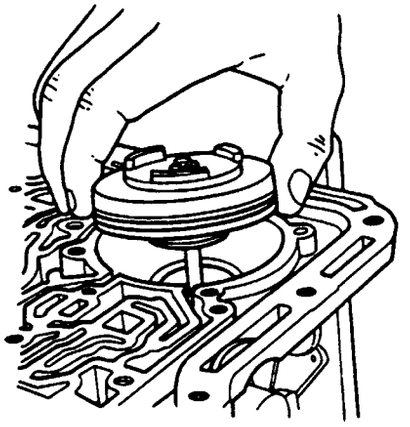
CAUTION: Make sure band is resting on the two anchor pins in the case.

Install the low / reverse band over the low / reverse brake drum.

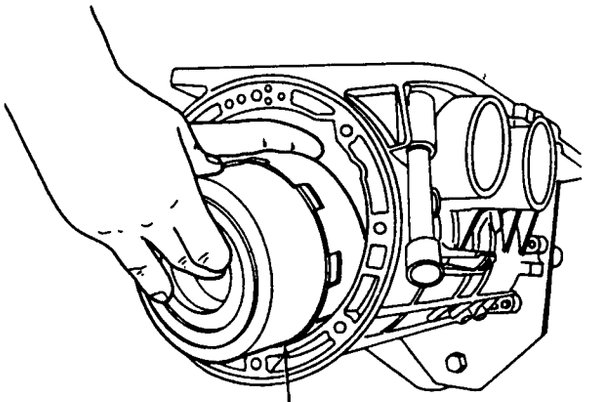


LOW/REVERSE BAND

Install the low / reverse band servo piston and rod temporarily to hold the low / reverse clutch band in position.



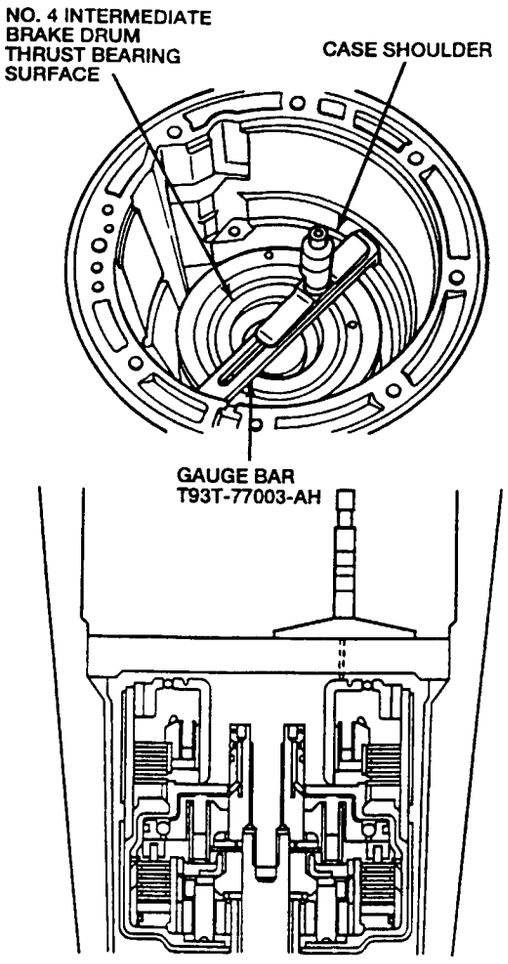
Install the previously assembled forward geartrain assembly.



FORWARD GEARTRAIN ASSEMBLY

Select the No. 4 intermediate brake drum thrust bearing as follows:

a. Place Gauge Bar T93T-77003-AH on the case assembly shoulder. Set the micrometer on top of the gauge bar as shown.



b. Extend the micrometer probe until it contacts the No. 4 thrust bearing surface at the intermediate brake drum. This is dimension "A."

c. Remove the micrometer and record dimension "A."

d. Place the micrometer on the opposite side of gauge bar. Extend the micrometer probe until it contacts the No. 4 thrust bearing surface at the intermediate brake drum. This is dimension "B."

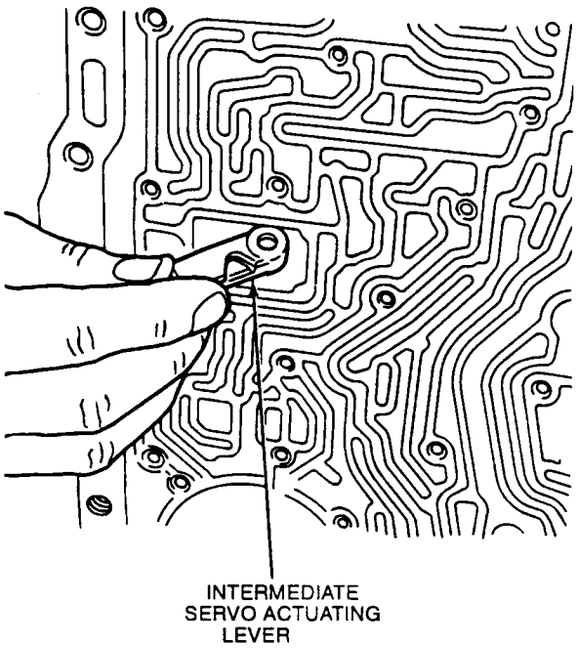
e. Add dimensions "A" and "B" together, divide by 2, then subtract the thickness of Gauge Bar T93T-77003-AH (17.78mm [0.700 inch]). This is dimension "C."

f. See the following chart and use dimension "C" to select the proper thrust bearing.

TRANSMISSION LOWER END CLEARANCE

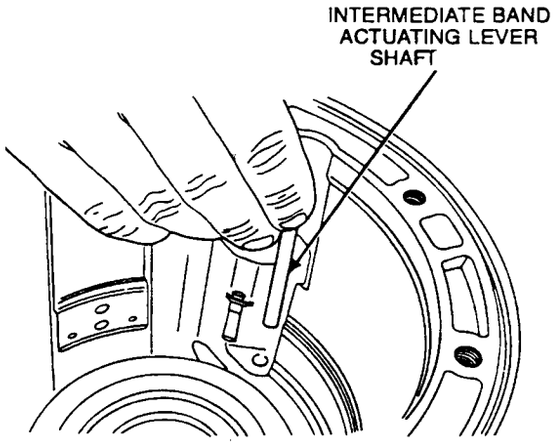
Dimension "C"	Identification: Number of Notches	Service Part Number	Bearing Thickness
1.67-1.85mm (0.066-0.073 In.)	0	97GT-7D014-GA	2.65-2.80mm (0.104-0.110 In.)
1.86-2.04mm (0.073-0.080 In.)	1	97GT-7D014-HA	2.80-2.95mm (0.110-0.116 In.)
2.05-2.23mm (0.081-0.088 In.)	2	97GT-7D014-KA	3.00-3.15mm (0.118-0.124 In.)
2.25-2.43mm (0.089-0.096 In.)	3	97GT-7D014-LA	3.20-3.35mm (0.126-0.132 In.)
Rear No.4 Reference End Play 0.21-0.51mm (0.008-0.020 In.)			

Install the intermediate servo actuating lever as shown.

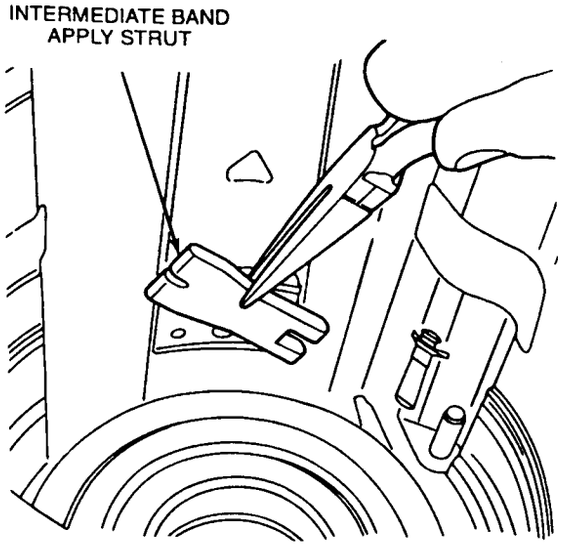


NOTE: The intermediate band actuating lever shaft is shorter than the overdrive shaft.

Install the intermediate band actuating lever shaft through the intermediate servo lever.

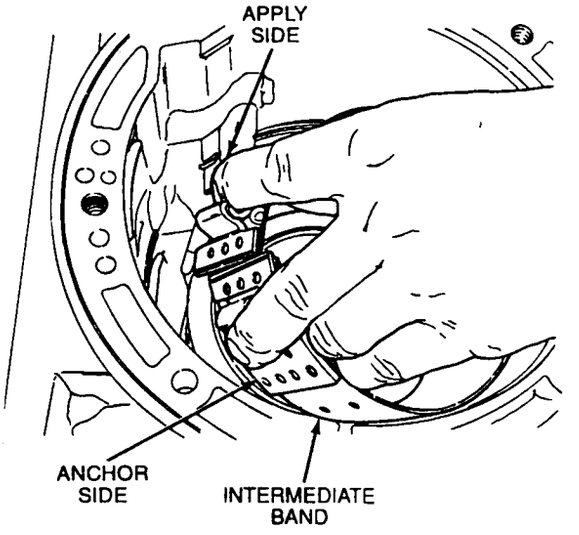


Install the intermediate band apply strut on the intermediate servo lever.



NOTE: Make sure the apply strut is aligned with the band notch.

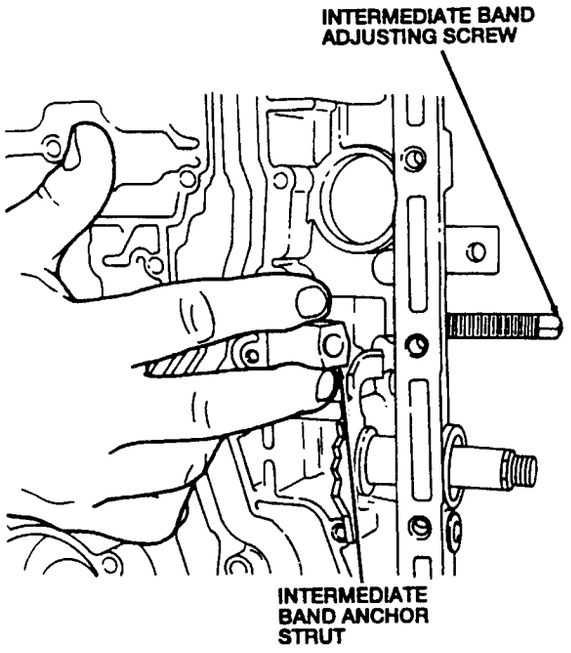
Install the intermediate band.



NOTE: Use the intermediate band adjusting screw as a temporary alignment guide.

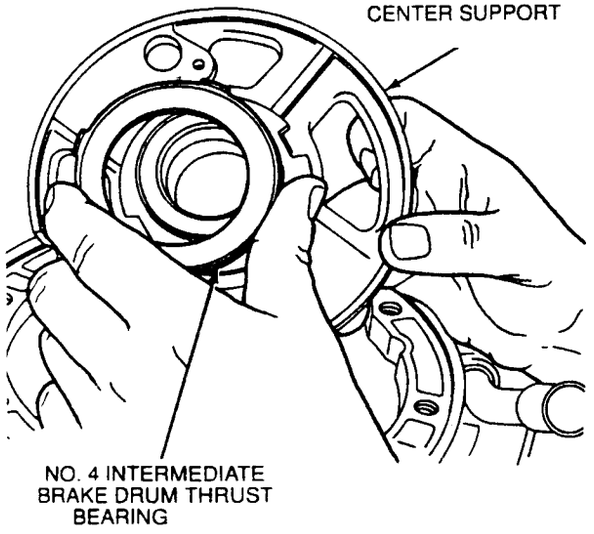
NOTE: The front and intermediate band anchor struts are the same.

Install the intermediate band anchor strut and intermediate band adjusting screw.



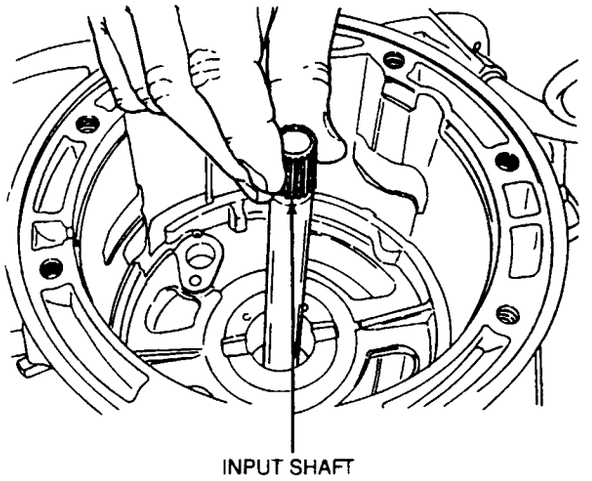
NOTE: Use petroleum jelly to hold the No. 4 intermediate brake drum thrust bearing in place.

Install the correctly selected No. 4 intermediate brake drum thrust bearing over the center support as shown.



CAUTION: Do not apply pressure to the rear planetary support while installing. Damage to the sealing rings may result. Make sure the rear planetary support is seated.

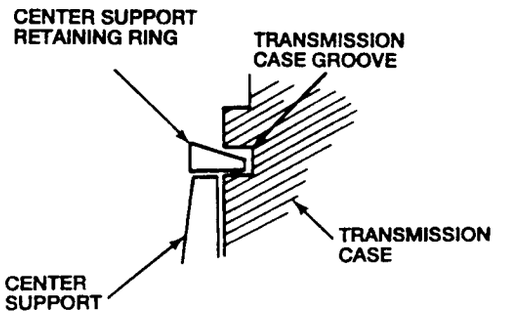
Position the center support into the reverse clutch drum. Use the input shaft as an aid to seat the center support. Gently wiggle the input shaft from side to side until the center support is seated against the case shoulder. Remove the input shaft.

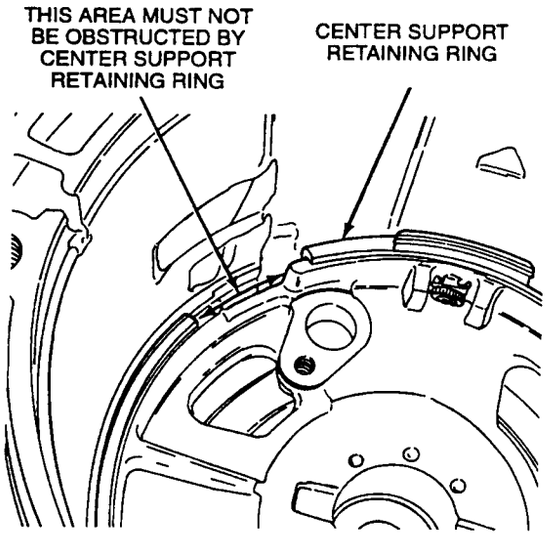


CAUTION: Install the retaining ring in the transmission case groove with the tapered side facing up.

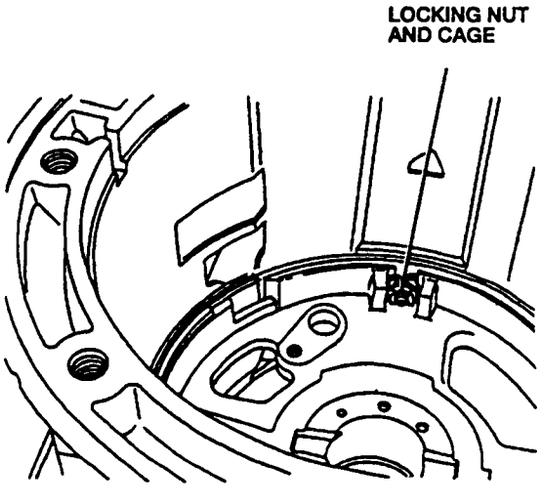
CAUTION: The retaining ring must be installed so the notch opening is not obstructed by the center support retaining ring. This will prevent damage to the turbine shaft speed (TSS) sensor wires.

Install the center support retaining ring in the transmission case groove.

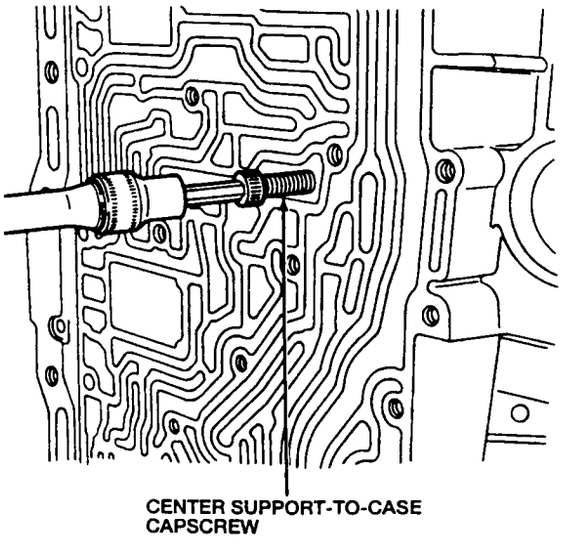




Ensure that the nut and cage assembly is in place.

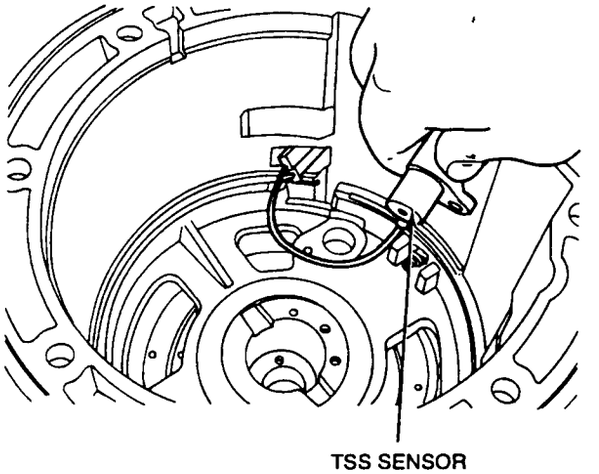


Use a 5mm Allen wrench to install the M6 x 20mm center support-to-case capscrew into the nut and cage assembly as shown. Tighten the center support-to-case capscrew to 9-13 N·m (80-115 lb-in).

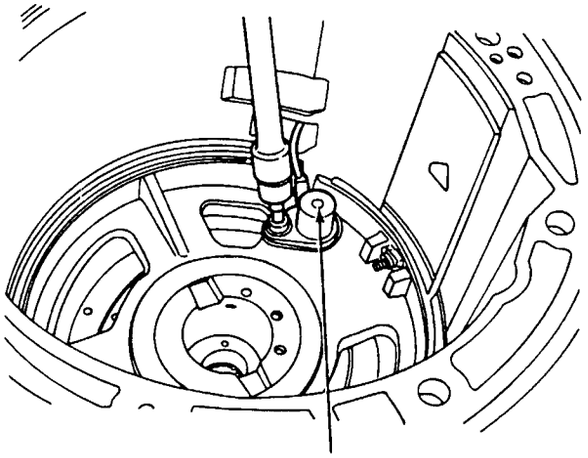


CAUTION: Carefully route the turbine shaft speed (TSS) sensor connector and wiring harness through the opening in the case. Do not damage the wiring.

Route the TSS sensor connector and wiring harness through the opening in the case.



Install the turbine shaft speed (TSS) sensor on the center support. Use a T30 torx socket to install the TSS screw. Tighten the TSS sensor-to-center support screw to 8-11 N·m (71-97 lb-in).

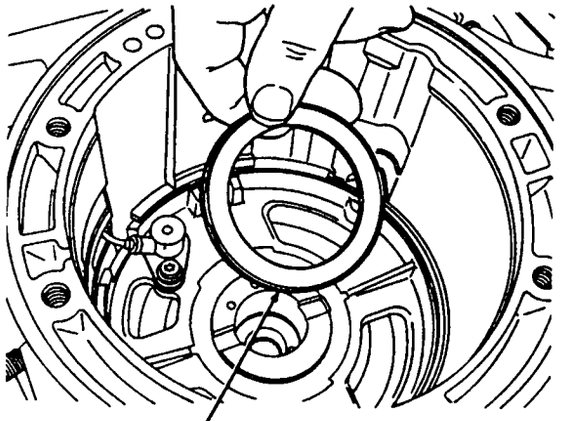


TSS SENSOR

CAUTION: Use only the No. 3 center shaft thrust bearing assembly.

NOTE: No. 3 center shaft thrust bearing assembly has no notches on the outer race.

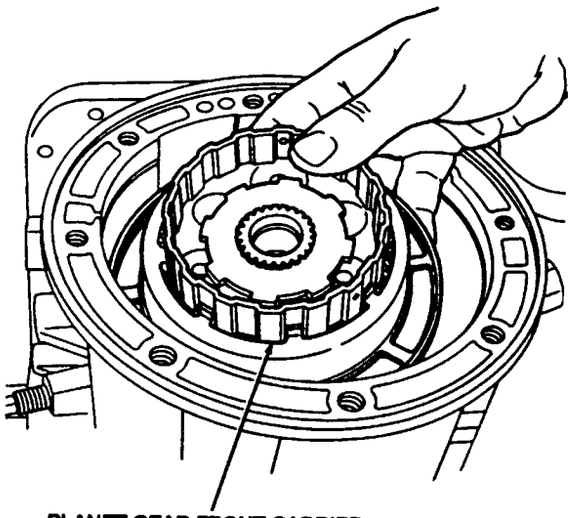
Install the No. 3 center shaft thrust bearing assembly.



NO. 3 CENTER SHAFT THRUST BEARING ASSEMBLY

CAUTION: Do not bend the trigger wheel.

Install the planetary gear front carrier, front ring gear, front one-way clutch and center shaft assembly.

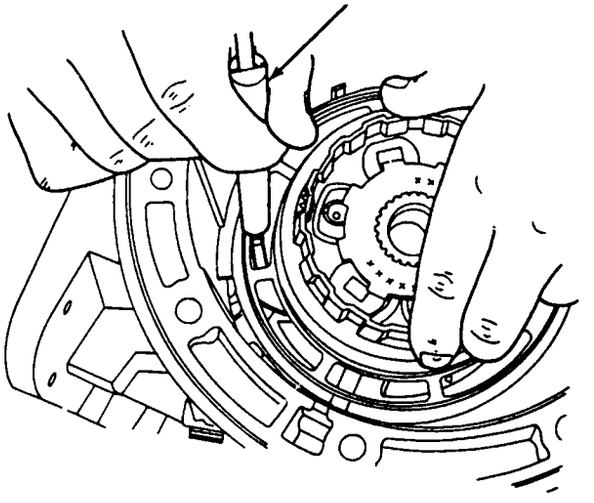


PLANET GEAR FRONT CARRIER, FRONT RING GEAR, FRONT ONE-WAY CLUTCH AND CENTER SHAFT ASSEMBLY

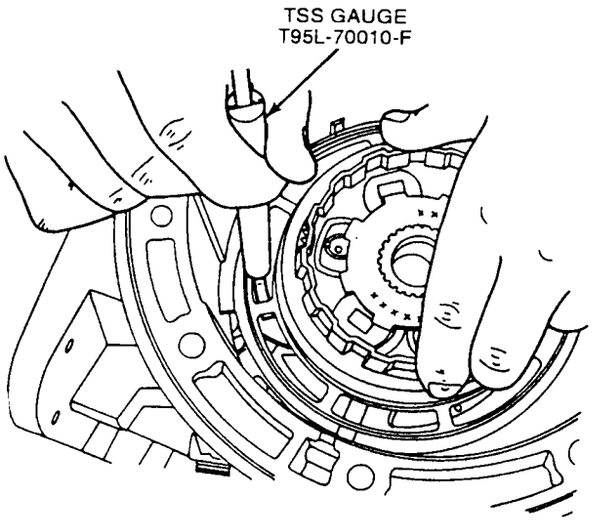
NOTE: **Perform TSS air gap clearance check.** This step and the next two steps describe the procedures for checking the turbine shaft speed (TSS) sensor air gap clearance.

Place the thin blade of Turbine Shaft Speed Sensor Gauge T95L-70010-F over the turbine shaft speed (TSS) sensor as shown. Rotate the trigger wheel. The trigger wheel window should pass over the thin blade of the TSS gauge. If it doesn't, the planetary gear overdrive carrier and trigger wheel must be replaced.

TSS GAUGE
T95L-70010-F

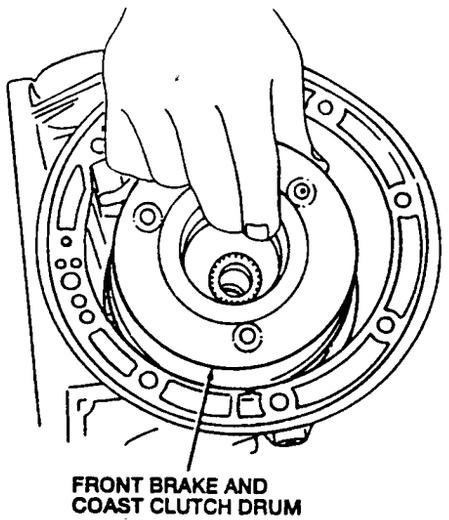


Place the thick blade of Turbine Shaft Speed Sensor Gauge over the turbine shaft speed (TSS) sensor as shown. Rotate the trigger wheel. The trigger wheel window should not pass over the thick blade of the TSS gauge. If it does, the planetary gear overdrive carrier and trigger wheel must be replaced.

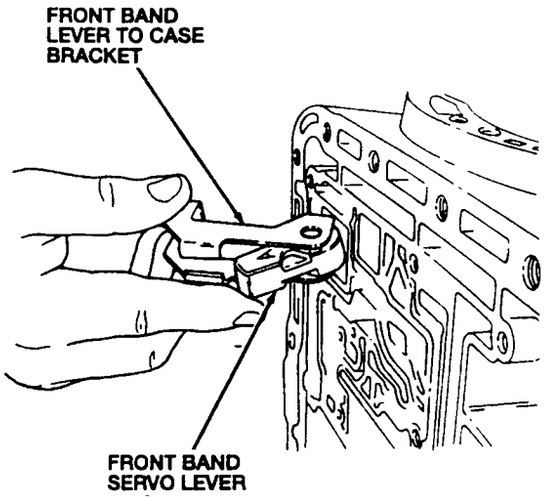


Repeat the previous two steps for the remaining trigger wheel windows.

Align the clutch plates and front adapter gear and install the front brake and coast clutch drum assembly.

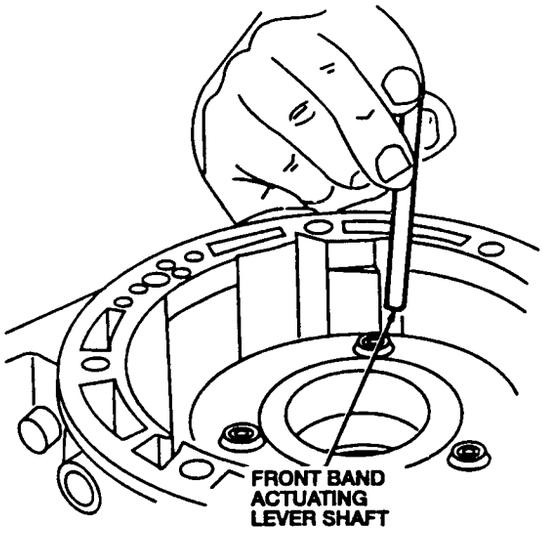


Install the front band lever-to-case bracket and front band servo lever as shown.

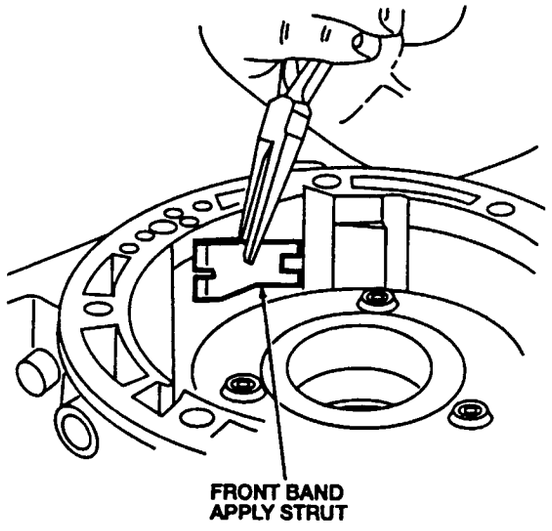


NOTE: The front band actuating lever shaft is longer than the intermediate band actuating lever shaft.

Install the front band actuating lever shaft through the front band lever to case bracket and front band servo actuating lever.

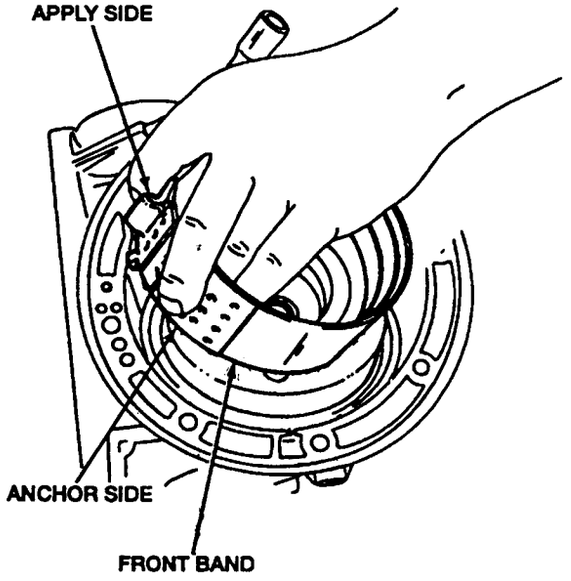


Install the front band apply strut.



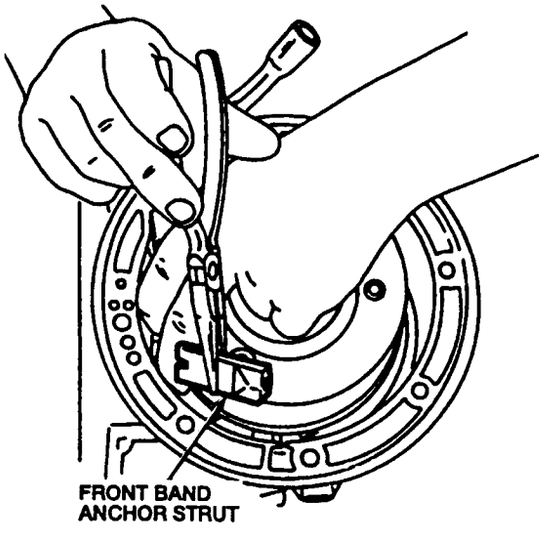
NOTE: If the front band is reused, it must be installed in the same position as when removed.

Install the front band assembly over the front brake and coast clutch drum.

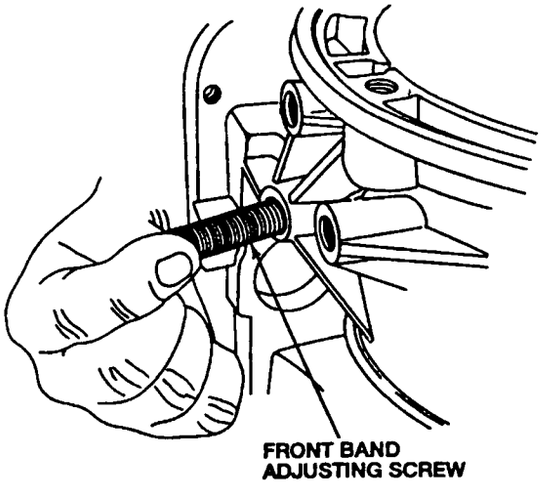


NOTE: Use the band adjusting screw as a temporary alignment guide.

Install the front band anchor strut.



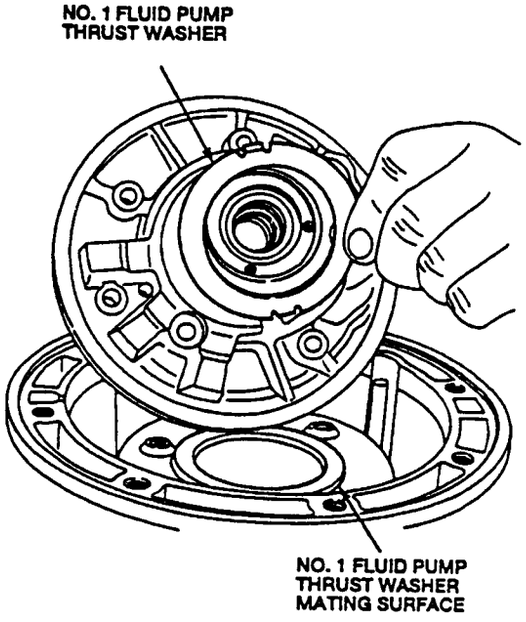
Install the front band adjusting screw.



Perform the front end play check procedure as follows:

a. **CAUTION: Be sure the pump body is seated against the washer and front brake and coast clutch drum. The pump body must be below the level of the case gasket surface.**

Use petroleum jelly to hold any No. 1 fluid pump thrust washer on the rear of the pump. The washer tabs go into the pump face. Place the pump into position in the case.



b. **CAUTION: The gauge bar must rest on the gasket surface.**

Place Gauge Bar T93T-77003-AH across the case as shown.

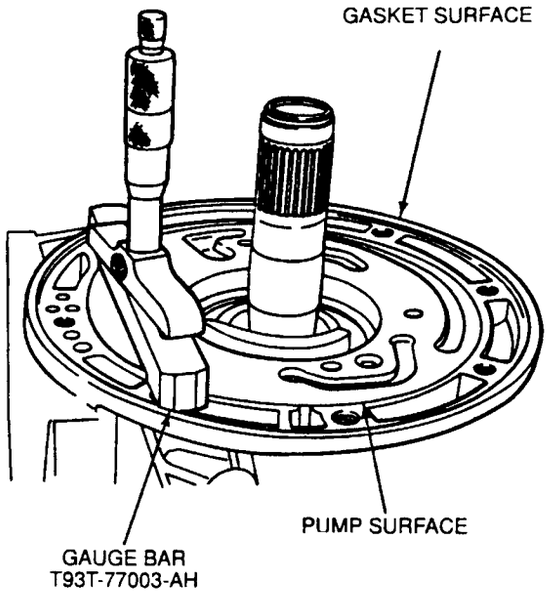
c. Place a micrometer on the gauge bar and extend the probe until it contacts the pump surface.

d. Read the micrometer and subtract the thickness of the gauge bar (17.78mm [0.700 inch]). Record this as dimension "A."

e. Move the gauge bar to the opposite side of the case.

f. Repeat Steps c and d and record this measurement as dimension "B."

g. Add dimensions "A" and "B" together and divide by 2. This is the front end clearance, dimension "C."



h. **CAUTION: If the average is below the specification, choose a thinner washer. If the average is above the specification, choose a thicker washer.**

NOTE: The front end play specification is 0.18-0.70mm (0.007-0.028 in).

NOTE: The tabs on the washer go into the pump face.

Remove the pump and install the correct No. 1 thrust washer. Use petroleum jelly to hold the washer in place.

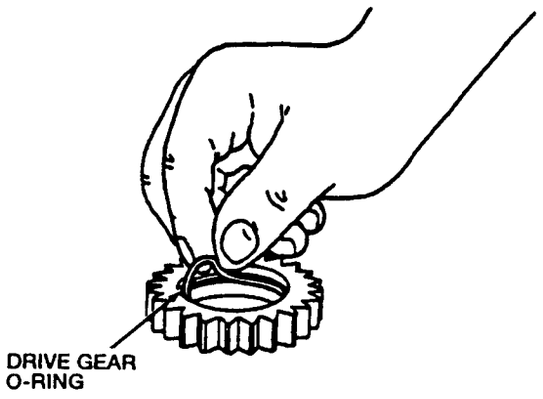
TRANSMISSION END CLEARANCE

Dimension "C"	Identification: Color	Service Part Number	Washer Thickness
Front No. 1 (All Engines) 0.18-0.70mm (0.007-0.028 In.) Without Gasket	White	97GT-7D014-TA	1.55-1.60mm (0.061-0.063 In.)
	Green	97GT-7D014-MA	1.75-1.80mm (0.069-0.071 In.)
	Red	97GT-7D014-NA	1.85-1.90mm (0.073-0.075 In.)
	Beige	97GT-7D014-PA	1.95-2.00mm (0.077-0.079 In.)
	Black	97GT-7D014-RA	2.05-2.10mm (0.081-0.083 In.)
	Yellow	97GT-7D014-SA	2.15-2.20mm (0.085-0.087 In.)

NOTE: Front end clearance specification is 0.18-0.70mm (0.007-0.028 in).

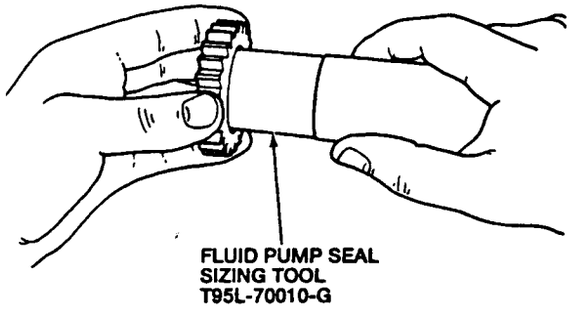
Verify front and clearance is correct, repeat steps a-g.

Install a new drive gear O-ring.



Lubricate Fluid Pump Seal Sizing Tool T95L-70010-G to seat drive gear O-ring.

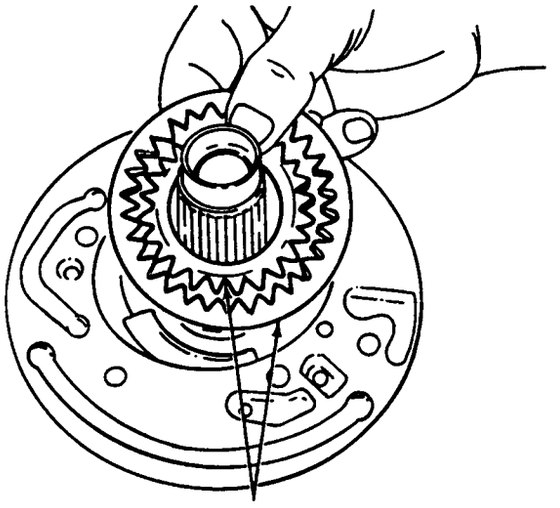
Install Fluid Pump Seal Sizing Tool into pump drive gear to seat drive gear O-ring into groove.



Remove Fluid Pump Seal Sizing Tool.

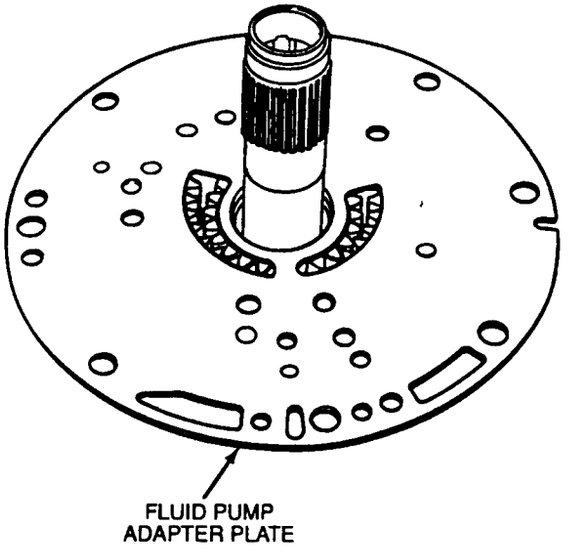
CAUTION: The chamber on the inside edge of the small gear must be up when in the pump housing gear pocket. The dimple on the larger gear must be down when in the pump housing gear pocket.

Position the two pump gears into the pump housing. Apply a lubricant to the pump gears to prevent scoring at initial start-up.



CAUTION: Make sure the holes in the plate line up with the holes in the pump.

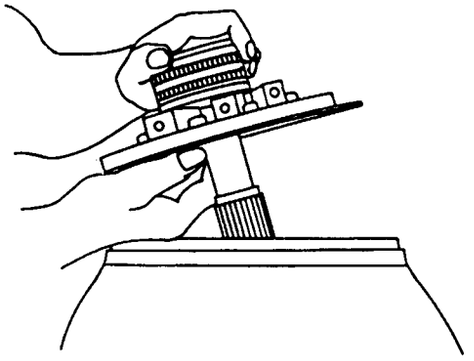
Install the fluid pump adapter plate.



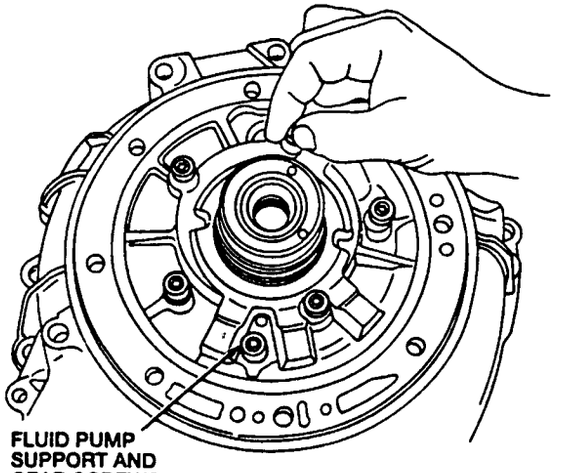
CAUTION: Do not allow the pump gears to come out of the pump housing pocket.

NOTE: The notch on the outside of the fluid pump adapter plate will be at the nine o'clock position, relative to the converter housing.

Turn the converter housing face down on the bench. Hold the fluid pump adapter plate against the front pump support and gear to keep the pump gears in place. Turn the pump and adapter plate over and place on the converter housing.



Install the six M8 x 35mm Torx® head front pump support and gear screws fingertight only.

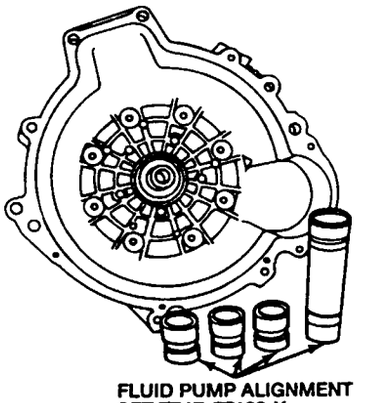


FLUID PUMP SUPPORT AND GEAR SCREWS

(6 REQ'D)

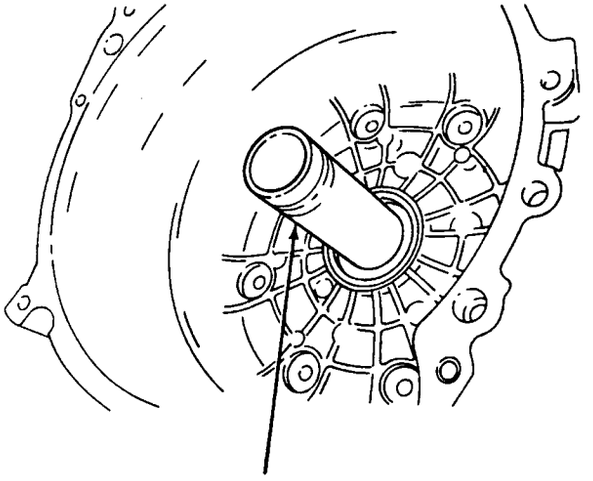
CAUTION: Fluid Pump Alignment Set T74P-77103-X must be used to properly align the front pump support and gear to the fluid pump adapter plate. This will prevent seal leakage, gear noise, broken gears and bushing failure.

Select the gauge that will be the snuggest fit when placed over the fluid pump support and gear.



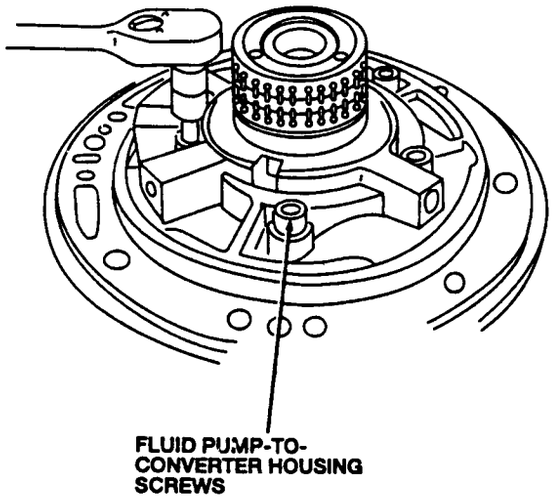
FLUID PUMP ALIGNMENT SET T74P-77103-X

Thread the gauge into Pump Alignment Handle T74P-77103-H (Part of T74P-77103-X, Fluid Pump Alignment Set). Slide the tool over the front pump support and gear until it bottoms out in the pump gear pocket. This centers the pump to the converter housing.

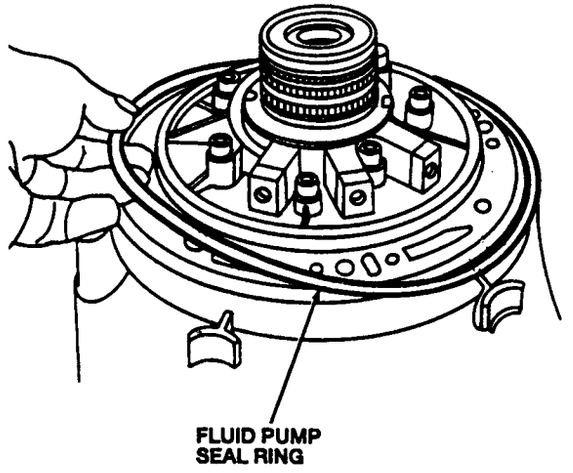


PUMP ALIGNMENT HANDLE T74P-77103-H

Use a Torx® 40 socket wrench to tighten the six M8 x 35mm fluid pump support and gear-to-converter housing screws. Tighten the fluid pump support and gear-to-converter housing screws in a star pattern to 22-28 N·m (16-21 lb-ft). Remove the Pump Alignment Handle.

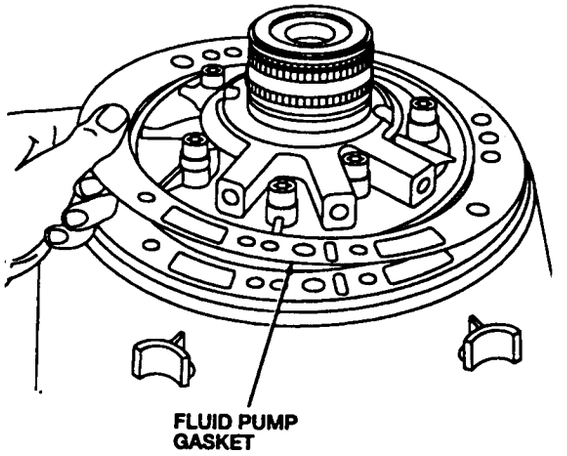


Install a new fluid pump seal ring.

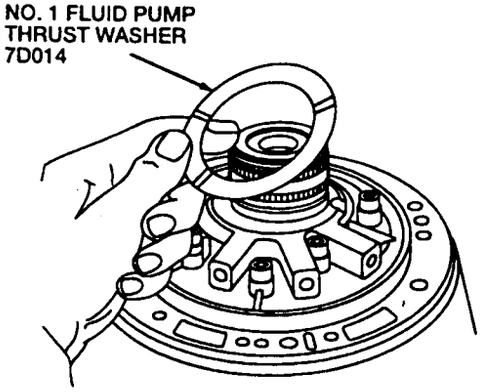


NOTE: Make sure the fluid pump seal ring is installed on the converter housing and pump assembly.

Place a new fluid pump gasket on the fluid pump adapter plate as shown. Use petroleum jelly to hold the fluid pump gasket in place.



Install the correct No. 1 fluid pump thrust washer on the fluid pump support and gear. Use petroleum jelly to hold the washer in place.

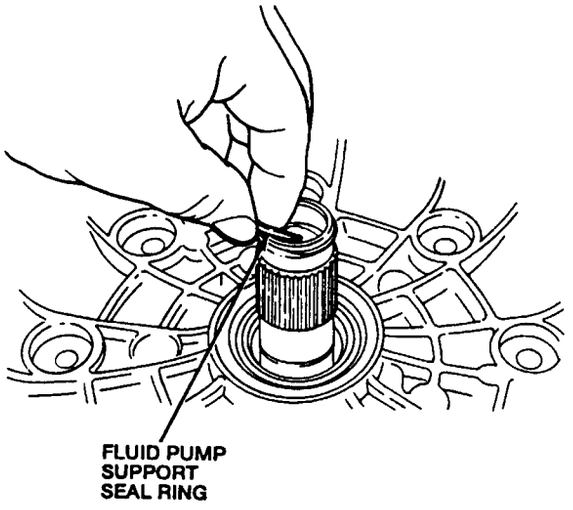


NOTE: Verify correct seal installation. Be sure seal grooves are clean and free of burrs.

Turn the converter housing over and install the front pump support seal ring.

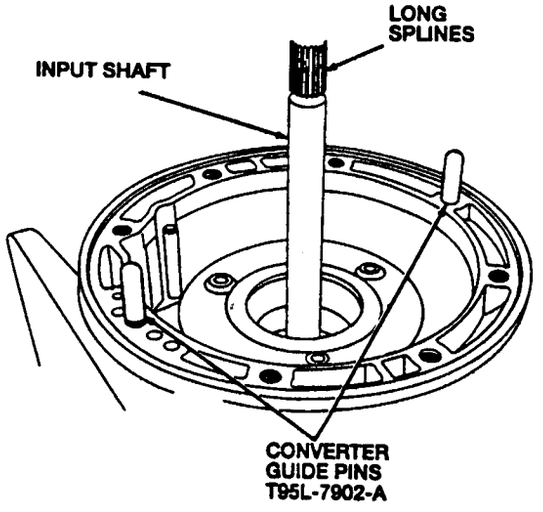
RIGHT

WRONG

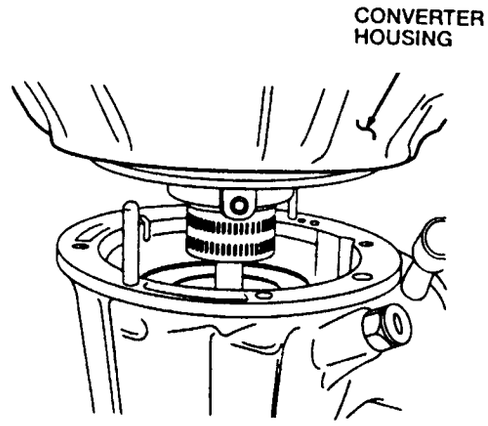


NOTE: The splines on the input shaft are not the same length. The shorter splines go into the assembly.

Install the input shaft as a guide for the converter housing and fluid pump support and gear assembly. Install the Converter Guide Pins T95L-7902-A as shown.

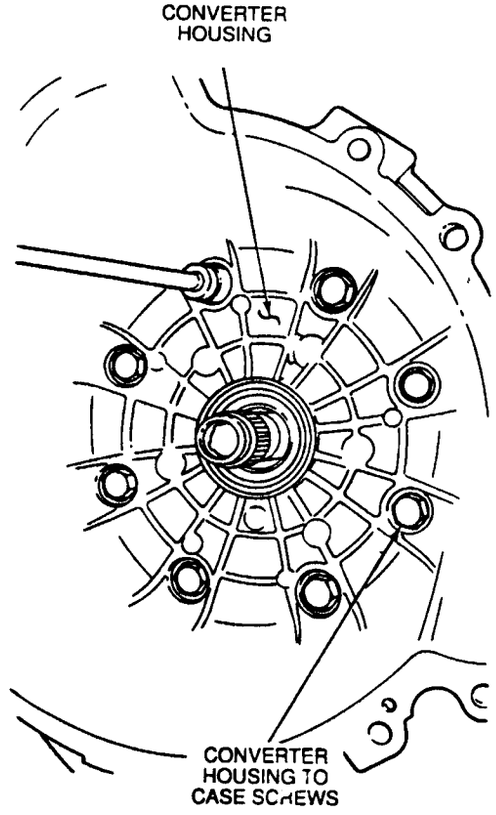


Install the converter housing and fluid pump support and gear assembly (with the fluid pump gasket) and the No. 1 fluid pump thrust washer to the case.



NOTE: Lubricate O-rings on converter housing screws.

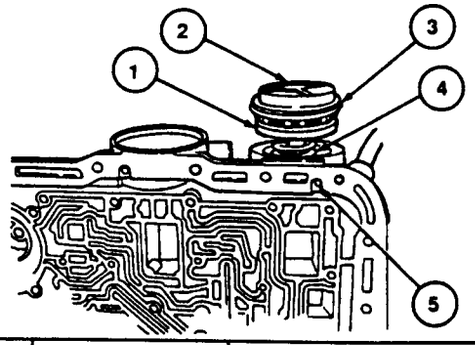
Remove Converter Guide Pins and use a 17mm socket wrench to install the eight new M10 x 33mm converter housing-to-case screws. Tighten the converter housing-to-case screws in a star pattern to 36-52 N·m (27-39 lb-ft).



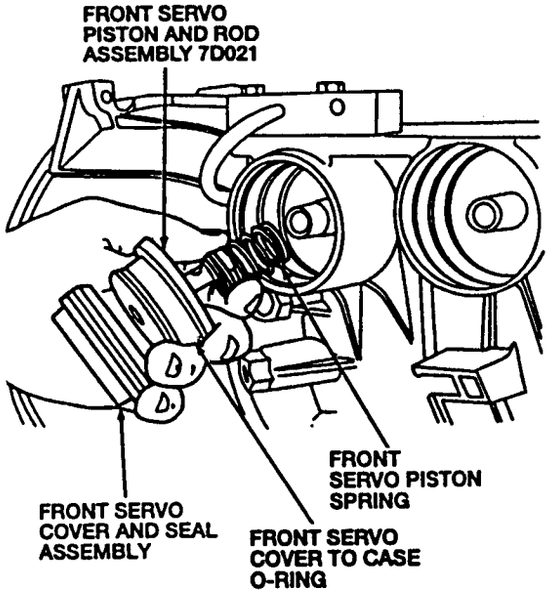
Remove the input shaft.

CAUTION: Do not damage the front servo cover to case O-ring during installation. Do not press the front servo cover and O-ring past the relief hole in the case. O-ring damage may occur.

Install the front servo piston spring, servo piston and rod assembly, servo cover to case O-ring with servo cover.



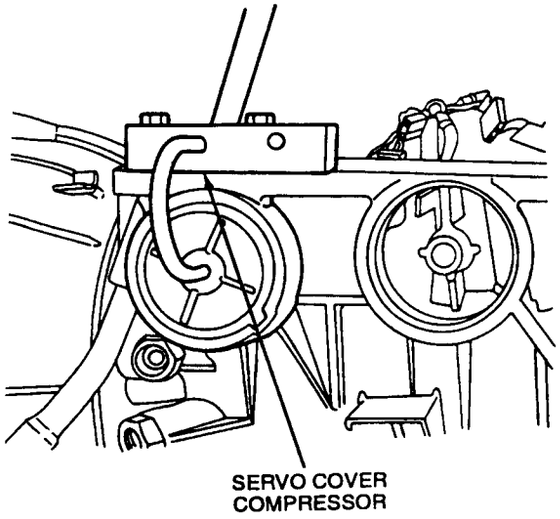
Item	Part Number	Description
1	7D021	Front Servo Piston and Rod Assembly
2	7D027	Front Servo Cover and Seal Assembly
3	7D040	Front Servo O-Ring
4	7D028	Front Servo Piston Spring
5	—	Relief Hole (Part of 7005)



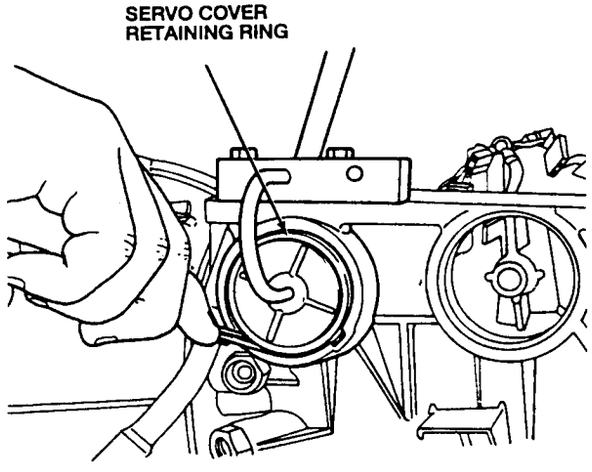
NOTE: The J-hook must be in the appropriate hole for the servo being removed, and tool number should be facing up.

Install Servo Cover Compressor T95L-77028-A over the front servo cover at the fluid pan rail. Tighten the screws.

Use a 1/2-inch wrench to tighten the nut on the J-hook until there is a gap between the servo cover and the snap ring.



Carefully install the servo cover retaining ring.



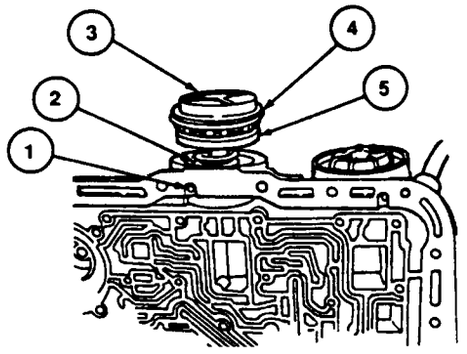
CAUTION: The servo cover is under spring tension.

Carefully back off the nut on the J-hook until the servo spring is unloaded.

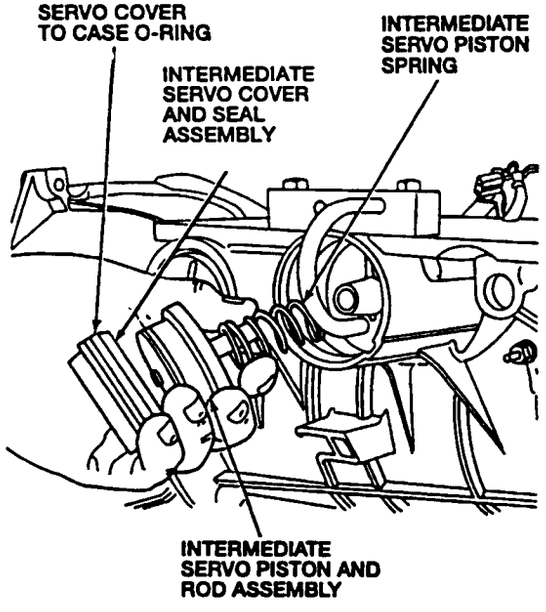
Remove Servo Cover Compressor T95L-77028-A.

CAUTION: Do not damage the intermediate servo cover to case O-ring during installation. Do not press the intermediate servo cover and seal assembly and O-ring past the relief hole in the case. O-ring damage may occur.

Install the intermediate servo piston spring, servo piston and rod assembly, servo cover to case O-ring with servo cover assembly with O-ring.



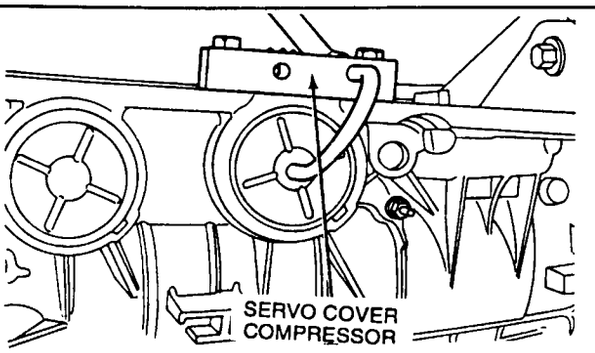
Item	Part Number	Description
1	—	Relief Hole (Part of 7005)
2	7D028	Intermediate Servo Piston Spring
3	7D027	Intermediate Servo Cover and Seal Assembly
4	7D040	Intermediate Servo O-Ring
5	7D021	Intermediate Servo Piston and Rod Assembly



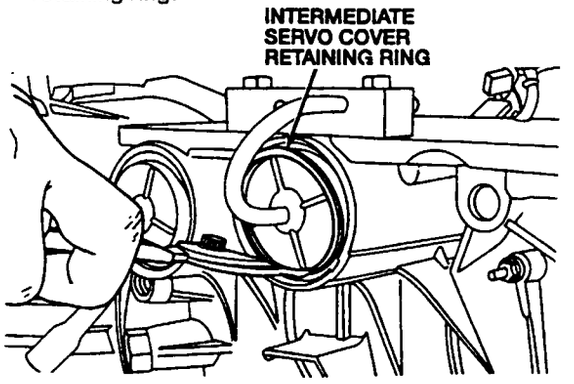
NOTE: The J-hook must be in the appropriate hole for the servo being removed, and tool number should be facing up.

Install Servo Cover Compressor T95L-77028-A over the intermediate servo cover at the fluid pan rail. Tighten the screws.

Use a 1/2-inch wrench to tighten the nut on the J-hook until there is a gap between the servo cover and the snap ring.



Carefully install the intermediate servo cover retaining ring.



CAUTION: The servo cover is under spring tension.

Carefully back off the nut on the J-hook until the servo piston spring is unloaded.

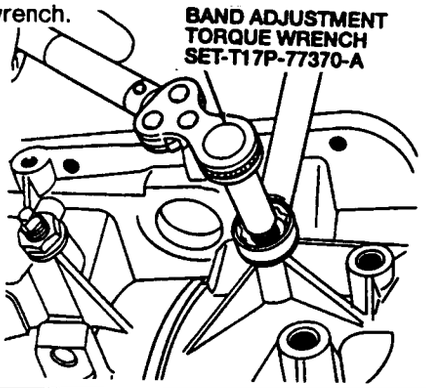
Remove Servo Cover Compressor T95L-77028-A.

CAUTION: Install, but do not tighten, a new locknut on the band adjusting screw. Apply petroleum jelly to the locknut seal.

CAUTION: The front servo must be installed prior to band adjustment.

Install a new locknut.

Tighten the front band adjusting screw using Band Adjustment Torque Wrench Set T71P-77370-A. The wrench will click at 14 N·m (10 lb-ft). Back off the band adjusting screw exactly two (2) turns and hold that position. Tighten the front band locknut to 47-61 N·m (35-45 lb-ft) using a 19mm wrench.

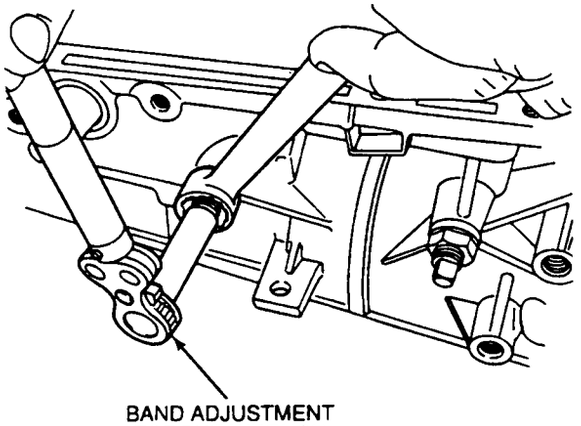


CAUTION: Install, but do not tighten, a new locknut on the band adjusting screw. Apply petroleum jelly to the locknut seal.

CAUTION: Intermediate servo must be installed prior to band adjustment.

Install a new locknut.

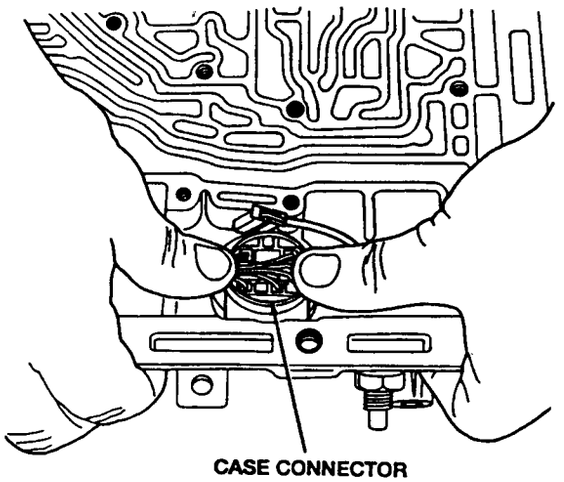
Tighten the intermediate band adjusting screw using Band Adjustment Torque Wrench Set T71P-77370-A. The wrench will click at 14 N·m (10 lb-ft). Back off the band adjusting screw exactly two and one-half (2 1/2)turns and hold that position. Tighten the intermediate band locknut to 47-61 N·m (35-45 lb-ft) using a 19mm wrench.



BAND ADJUSTMENT TORQUE WRENCH SET-T71P-77370-A

NOTE: Make sure the tab is in the lock position.

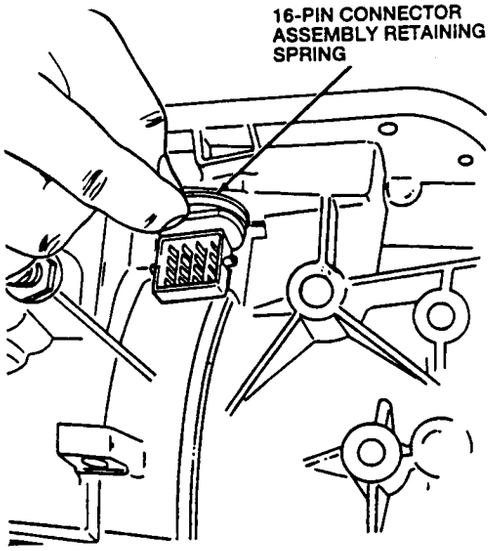
Inspect O-rings (W703015-S300) for damage. Replace if damaged. Lubricate and install the 16-pin connector assembly through the case until a click is heard.



CASE CONNECTOR

CAUTION: Do not overstretch the 16-pin connector assembly retaining spring.

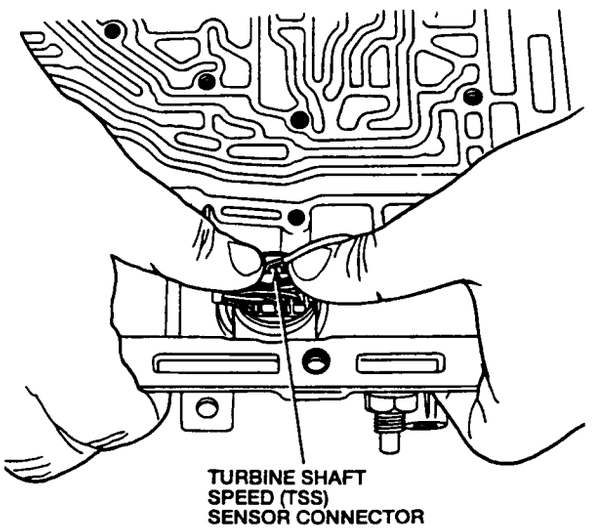
Install the 16-pin connector assembly retaining spring.



16-PIN CONNECTOR ASSEMBLY RETAINING SPRING

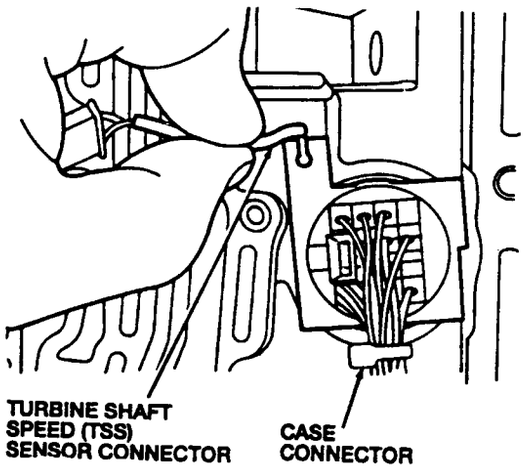
NOTE: Align the slot on the turbine shaft speed (TSS) sensor connector with the slot on the 16-pin connector assembly.

Carefully install the TSS sensor connector into the 16-pin connector assembly.

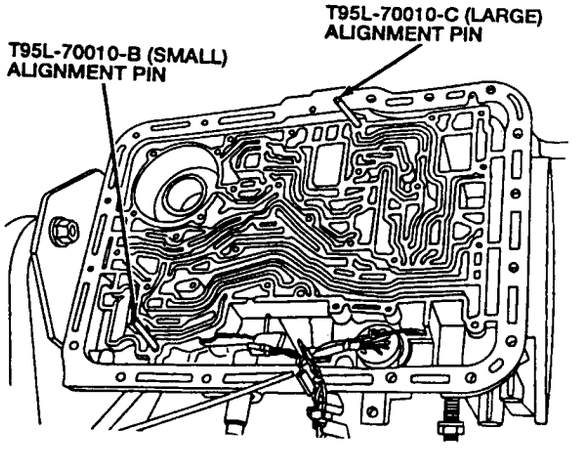


TURBINE SHAFT SPEED (TSS) SENSOR CONNECTOR

Carefully insert TSS sensor connector wires into the retaining slot on the 16-pin case connector.

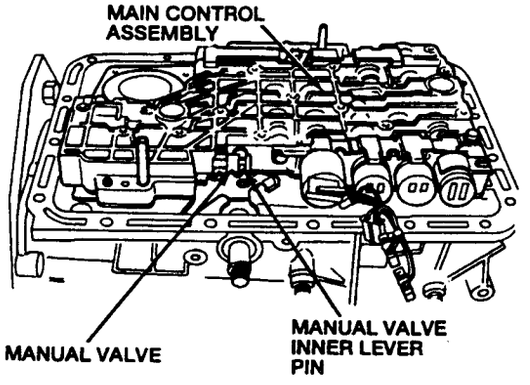


Install the valve body guide pins into the case in the positions shown.



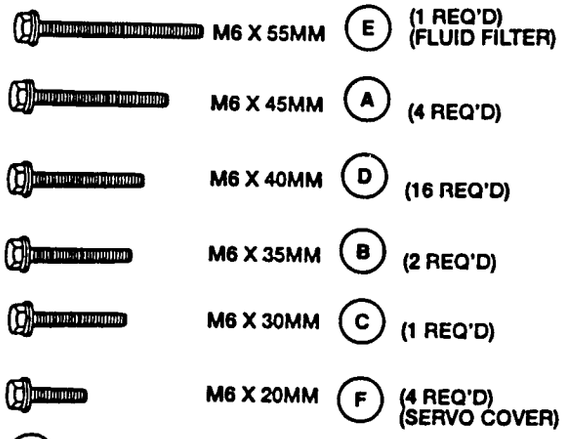
NOTE: Ensure main control assembly gasket is properly aligned.

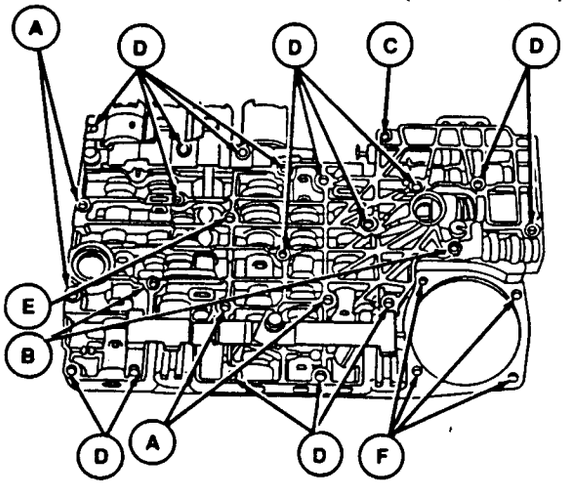
Install the main control assembly on the case. Align the manual valve with the manual valve inner lever pin as shown.



Install four M6 x 45mm main control assembly-to-case screws in location A. Fingertighten.

Main Control Assembly Screws and Locations

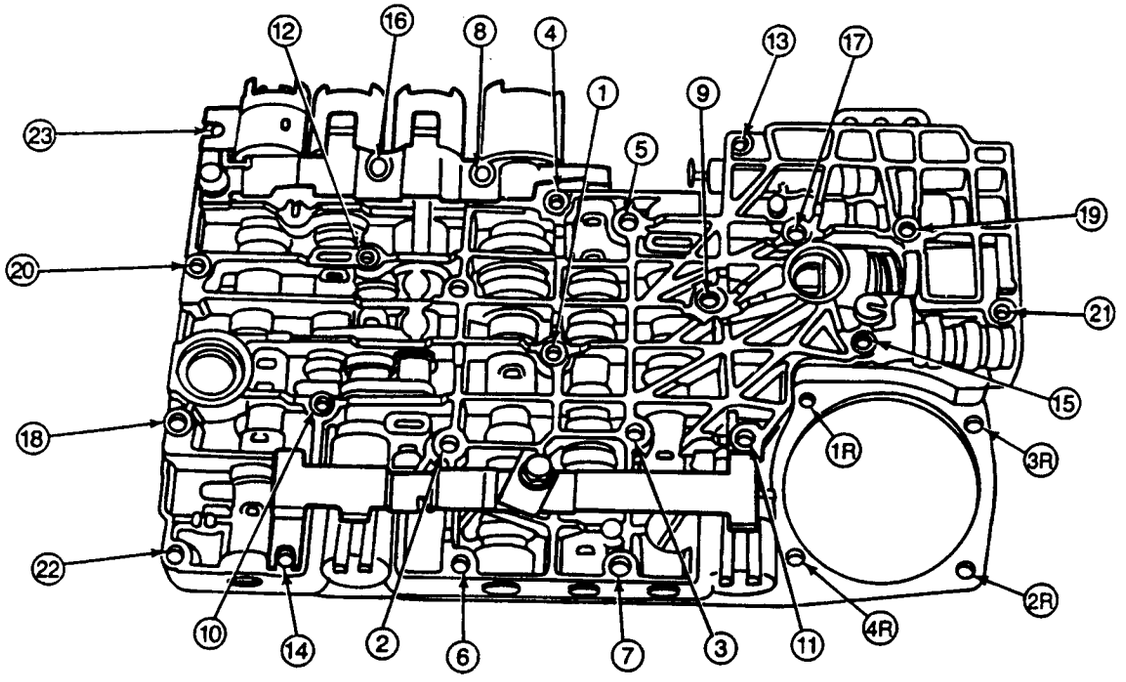




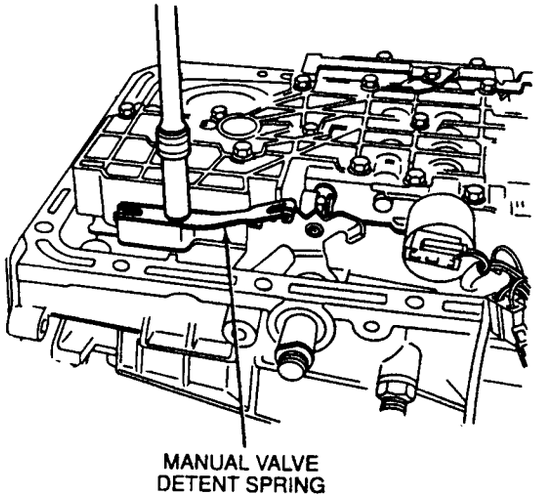
Install two M6 x 35mm main control assembly-to-case screws in location B. Fingertighten.

- Install one M6 x 30mm main control assembly-to-case screw in location C. Fingertighten.
- Remove both Valve Body Guide pins T95L-70010-B and T95L-70010-C.
- Install sixteen M6 x 40mm main control assembly-to-case screws in location D. Fingertighten.
- Tighten all main control assembly-to-case screws including reverse servo cover sequence (1R, 2R, 3R and 4R), to 8-11 N·m (71-97 lb-in) in sequence shown, using a 10mm socket wrench.

Tightening Sequence



Install the manual valve detent spring. Install the manual valve detent spring screw in location A. Tighten the manual valve detent spring screw to 8-11 N·m (71-97 lb-in).



MANUAL VALVE
DETENT SPRING

Remove the low/reverse servo piston and rod from the case.

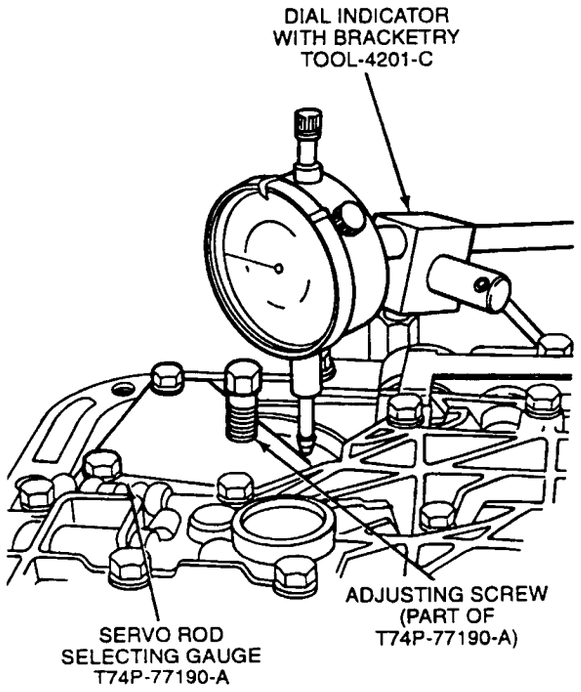
NOTE: An A4LD Reverse Servo Return Spring D4ZZ-7D031-A is to be used only as a test spring.

Install the low/reverse servo piston and rod into the servo bore along with a D4ZZ-7D031-A reverse servo return spring.

Install a new low/reverse servo separator plate cover gasket. Install Servo Rod Selecting Gauge T74P-77190-A and tighten with the three screws.

Tighten the servo gauge adjusting screw to 4 N·m (35.5 lb-in).

Install Dial Indicator with Bracketry TOOL-4201-C or equivalent on the transmission case. Position the indicator on the piston pad. Set the dial indicator to zero.



NOTE: If the piston travel in this step is 3-5.6mm (0.120-0.220 inch), it is within specification. If the piston travel is greater than 5.6mm (0.220 inch), use the next longer piston and rod. If the piston travel is less than 3mm (0.120 inch), use the next shorter piston and rod.

Back out the servo gauge adjusting screw until it bottoms out on the tool. Record the distance the servo piston traveled.

CAUTION: Make sure the test spring is removed after this step.

Use the above procedure to check the piston travel with the newly selected reverse band servo piston and rod (if required) to make sure that the piston travel is 3-5.6mm (0.120-0.220 inch).

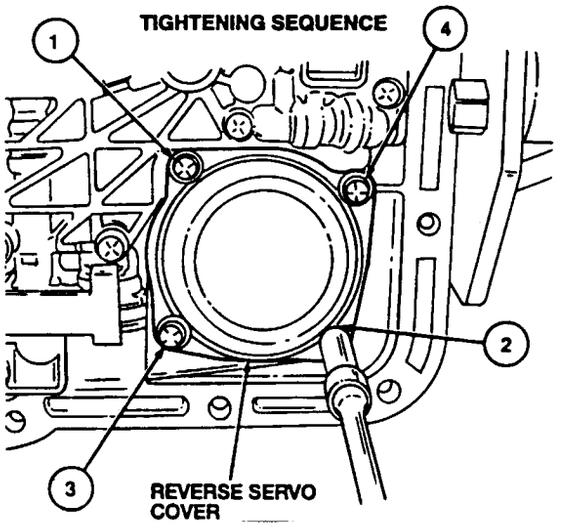
Remove the servo gauge and the reverse band servo return spring.

NOTE: Grooves are located on reverse servo rod.

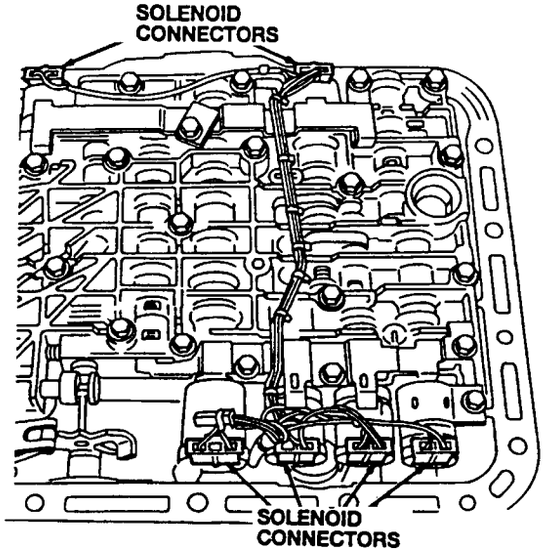
Length — mm	Length — Inches	I.D.
54/53	2.112/2.085	1 Groove
51/50	2.014/1.986	No Groove
49/48	1.915/1.888	2 Grooves

CAUTION: The reverse servo test spring must be removed.

Install the low/reverse servo cover and the four low/reverse servo cover-to-case screws. Tighten the low/reverse servo cover-to-case screws to 12-14 N·m (106-124 lb-in) in the sequence shown.

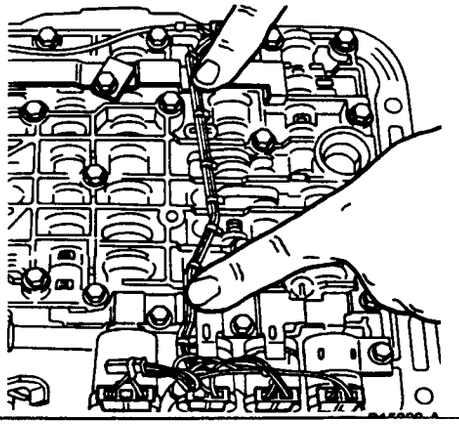


Carefully press down to install the solenoid connectors on the solenoids as shown.

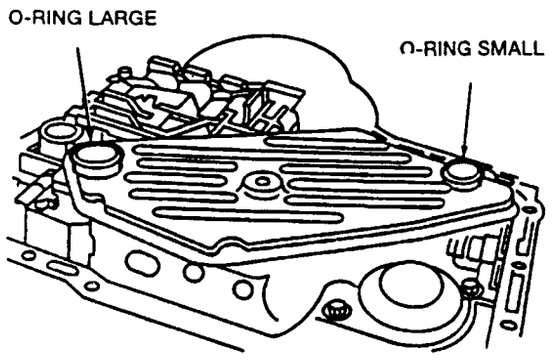


CAUTION: Excessive pressure may break the locating pins.

Install the wiring loom protector and guide. Align the pins in the holes of the solenoid clamps and gently push down.

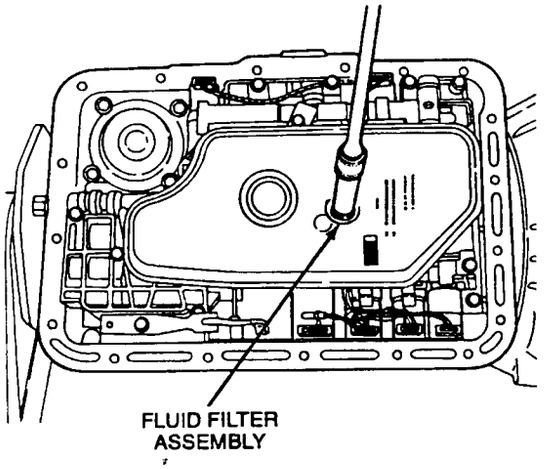


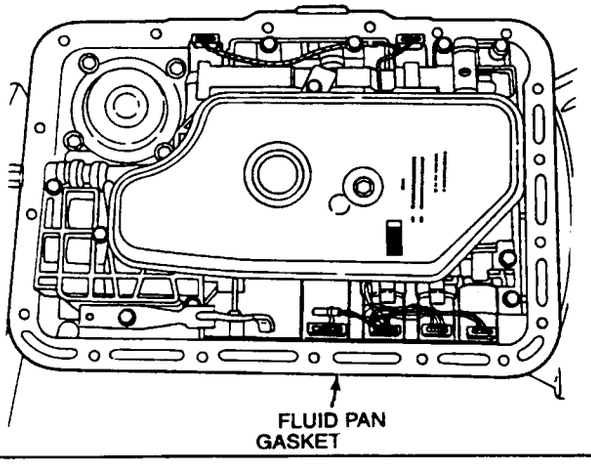
Ensure that both O-rings are properly installed on filter prior to installation.



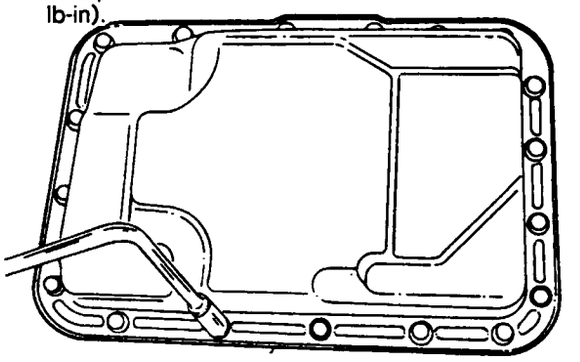
CAUTION: Lubricate the fluid filter O-rings with MERCON V® XT-5-QM or equivalent approved fluid, or they may be damaged.

Lubricate and install new O-rings onto filter assembly. Install a new fluid filter assembly into the main control assembly. Install one "E" length M6 x 55 fluid filter assembly-to-main control assembly screw and tighten to 8-11 N·m (71-97 lb-in).





Install the fluid pan on top of the gasket. Use a 13mm socket wrench to install the eighteen M8 x 16mm fluid pan-to-case screws. Tighten the fluid pan-to-case screws to 13-15 N·m (115-133 lb-in).



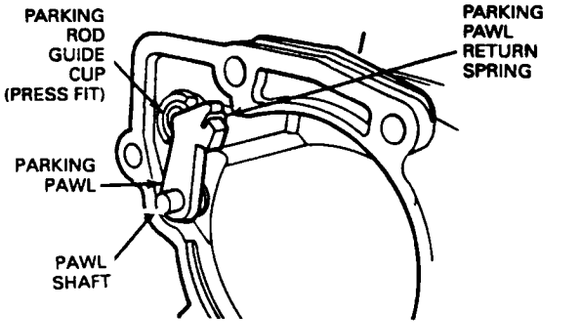
CAUTION: Make sure the parking lever actuating rod is correctly seated into the case parking rod guide cup.

NOTE: Use petroleum jelly to hold the gasket in place.

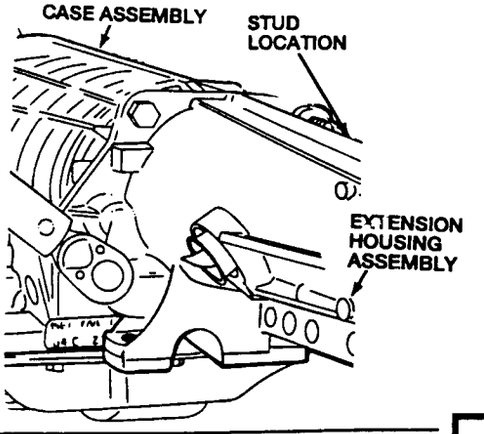
NOTE: The guide cup is press-fit into the extension housing and is not serviced separately.

Install a new extension housing gasket on the case.

Install the parking pawl, pawl return spring and pawl shaft into the extension housing.



Install the extension housing. Install the five M10 x 30mm extension housing-to-case screws and one stud. Tighten the extension housing-to-case screws and stud to 36-52 N·m (27-39 lb-ft).



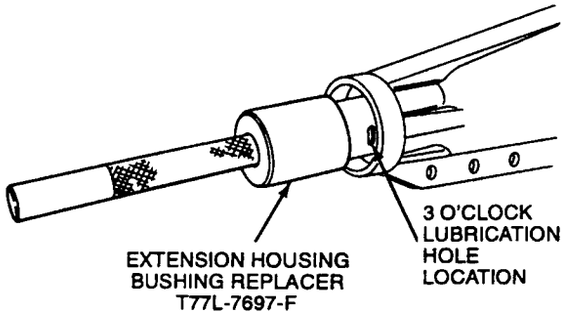
CAUTION: The lube hole in the bushing must be aligned with the lube groove in the extension housing.

CAUTION: Tool will bottom when bushing is in the proper position.

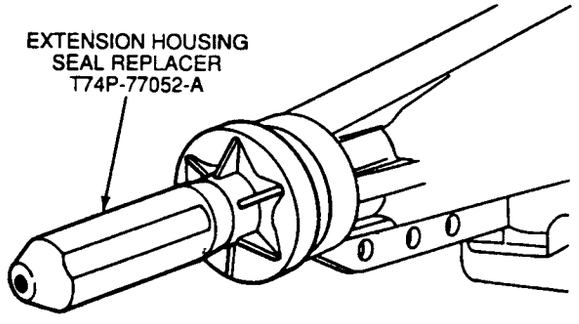
NOTE: The lube hole should be located at the 3 o'clock position with view extension from the rear.

NOTE: Install the extension housing bushing only if it was removed in disassembly.

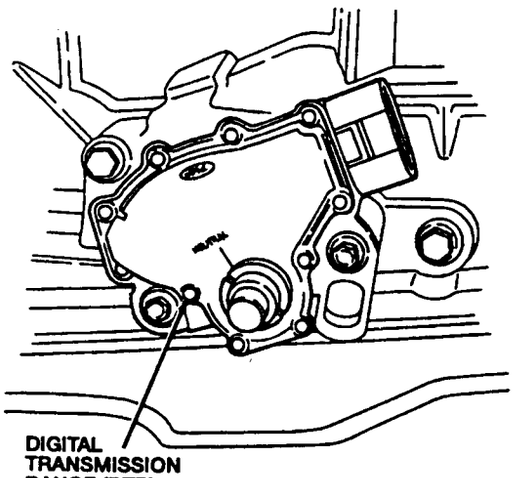
Install the extension housing bushing using Extension Housing Bushing Replacer T77L-7697-F.



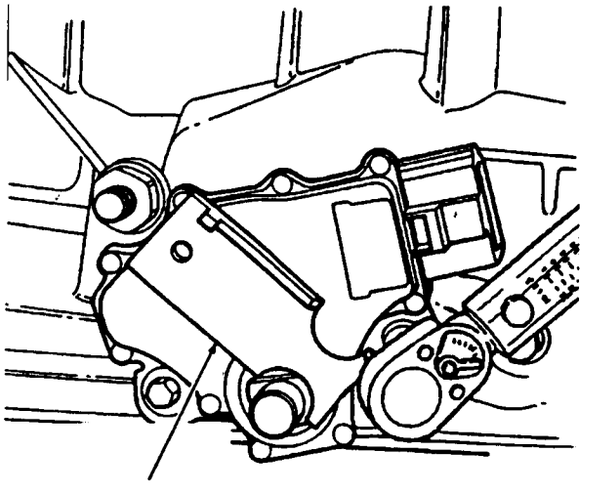
Position the extension housing seal drain hole at the 6 o'clock (down) position and install the extension housing seal using Extension Housing Seal Replacer T74P-77052-A.



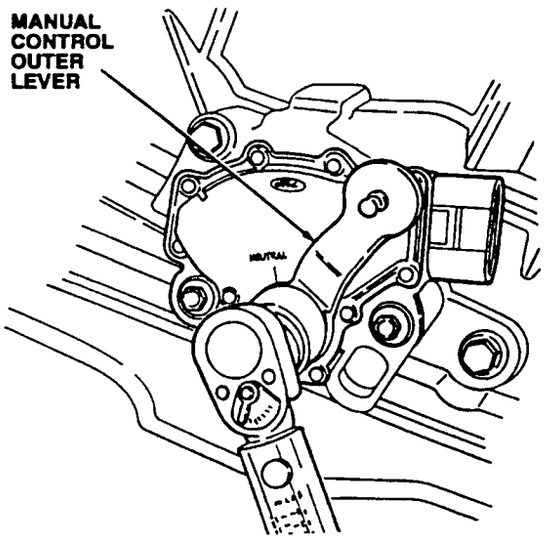
Install the digital transmission range (DTR) sensor on the manual lever. Install the two TR sensor screws and finger tighten. Rotate the manual lever to the neutral position (two detents rearward).



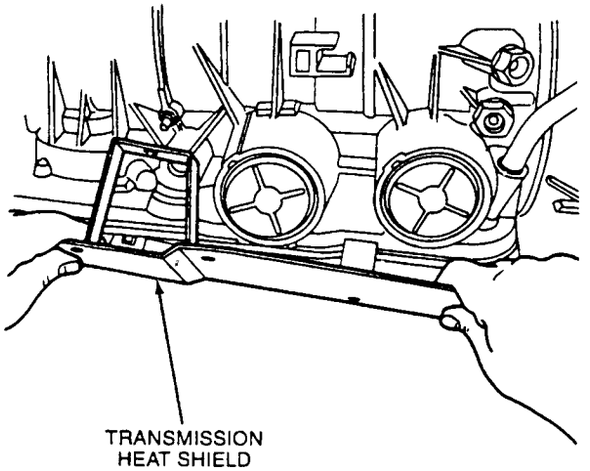
Install Digital TR Sensor Alignment Tool T97L-70010-A into the three slots on the DTR sensor. Tighten the TR sensor-to-case screws to 8-11 N·m (71-97 lb-in). Remove the alignment tool.



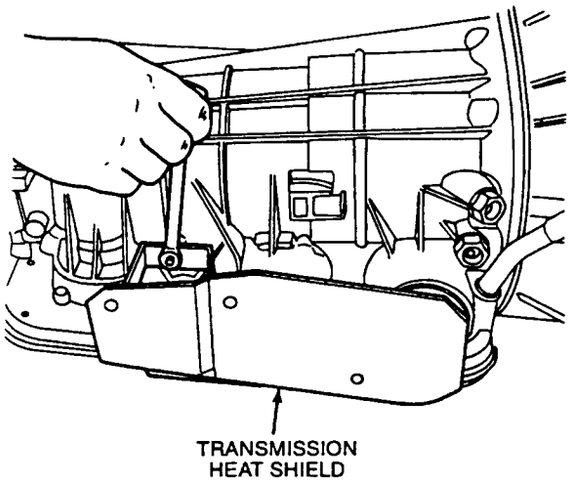
Install the manual control outer lever and manual control outer lever nut. Tighten the manual control outer lever nut to 41-54 N·m (30-40 lb-ft).



Align transmission heat shield retaining clips over fluid pan rail and install the heat shield on the fluid pan rail.

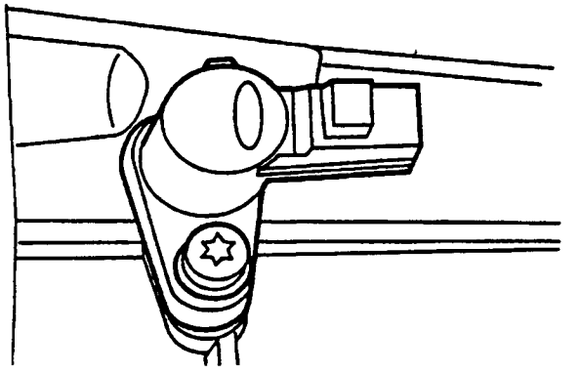


Install the transmission heat shield nut. Tighten the transmission heat shield nut to 8-11 N·m (71-97 lb-in).



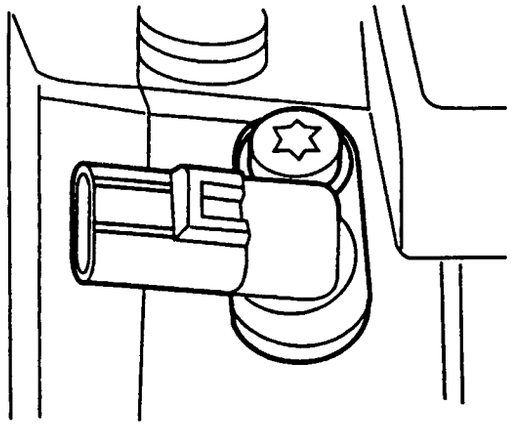
Inspect O-ring (W702981) for damage. If damaged, replace O-ring.

Install overdrive drum speed (7M183) sensor into case. Install attaching bolt and tighten to 8-11 N·m (71-97 lb-in).



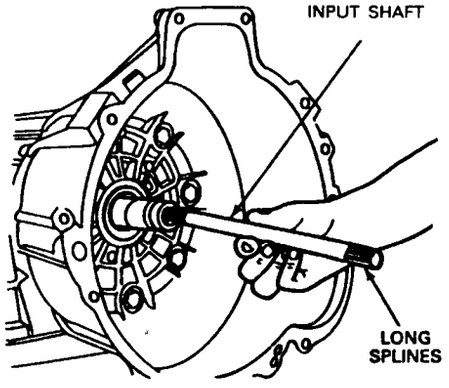
Inspect O-ring (W702981) for damage. If damaged, replace O-ring.

Install output shaft speed (7H103) sensor into case. Install attaching bolt and tighten to 8-11 N•m (71-97 lb-in).

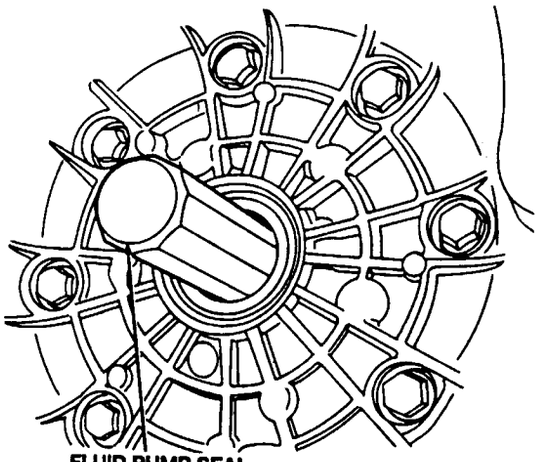


CAUTION: The splines are not the same on both ends. The shaft end with the shorter splines goes into the front pump support and gear.

Install the input shaft into the front pump support and gear.



Insert Fluid Pump Seal Sizing Tool T95L-70010-G into pump drive gear to make sure the drive gear O-ring is properly seated prior to installing the torque converter. Remove tool.



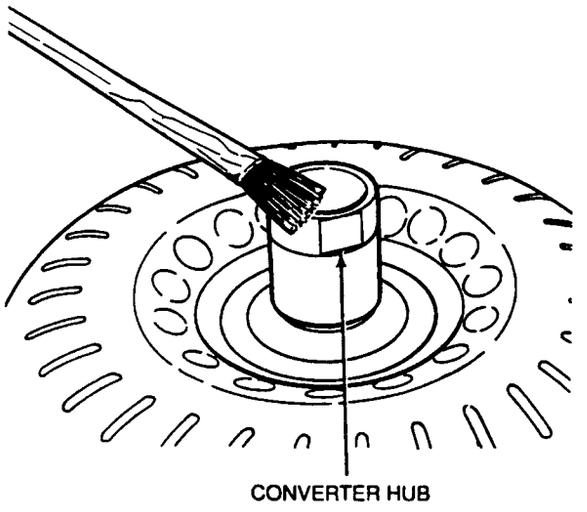
WARNING: THE TORQUE CONVERTER CAN FALL OUT IF THE TRANSMISSION IS TIPPED.

CAUTION: Do not damage the pump drive gear O-ring when installing the torque converter.

CAUTION: Make sure the converter hub is fully engaged in the front pump support and gear and rotates freely. Do not damage the hub seal.

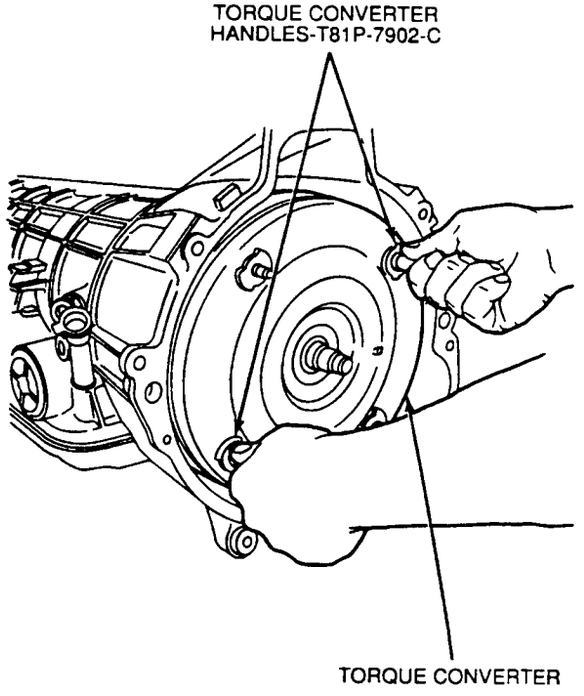
CAUTION: If the torque converter slides out, the hub seal may be damaged.

Lightly lubricate the converter hub with MERCON V ® XT-5-QM transmission fluid.



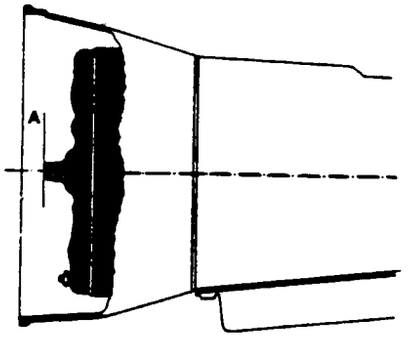
WARNING: THE TORQUE CONVERTER IS HEAVY, ESPECIALLY WHEN FULL OF FLUID.

Use Torque Converter Handles T81P-7902-C to install the torque converter by pushing and rotating.

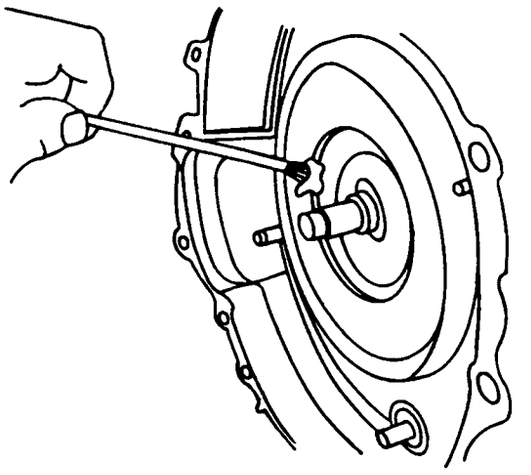


NOTE: dimension "A" should be 10.23-14.43mm (0.43-0.56 inch).

Check dimension "A."

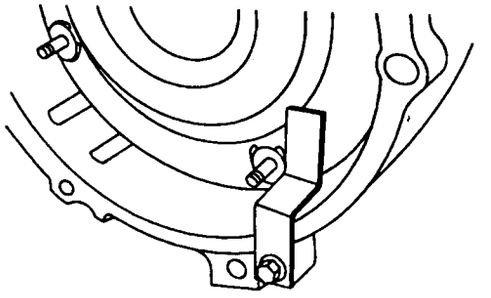


Prior to vehicle installation, lubricate the converter pilot hub with Ford Multi Purpose Grease (D0AZ-19584-A, specification ESA-M1C45-A).



Before installing transmission, make sure that the transmission cooling system (line and cooler[s]) have been thoroughly flushed. Use procedures found in this section. If contamination cannot be removed or proper flow cannot be obtained, replace cooler(s) and/or lines.

Install Torque Converter Holding Tool T97T-7902-A on case using a standard bolt and nut to prevent converter from falling forward when moving to jackstand and to vehicle.



SPECIFICATIONS

FLUID CAPACITY

Vehicle	Engine	Approximate Refill Capacity[1]	
		Liters	U.S. Quarts
Aerostar, Ranger — 5R55E (4x2)	4.0L	9.0	9.5
Aerostar, Ranger — 5R55E (4x4)	4.0L	9.3	9.8

1 Approximate dry capacity, includes cooler and lines. Fluid level indicator should be used to determine actual fluid requirements and fluid specification. Check level at normal operating temperature. DO NOT OVERFILL.
If it is necessary to add or replace fluid, use only fluid which has been certified by the supplier as meeting one of the Ford Motor Company specifications shown.

NOTE: Use Motorcraft MERCON V® or fluid meeting Ford specification XT-5-QM.

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft	Lb-In
Extension Housing-to-Case Screws and Stud	36-52	27-39	—
Transmission Mounting Pad Nuts and Bolts	68-95	50-70	—
Transmission Range Sensor-to-Case	8-11	—	71-97
Manual Control Outer Lever Nut	41-54	30-40	—
Heat Shield Nut	8-11	—	71-97
Fluid Pan-to-Case Screws	13-15	—	115-133
Solenoid Clamps-to-Main Control Screws	8-11	—	53-71
Reverse Servo Cover-to-Case Bolts	12-14	—	106-124
Manual Valve Inner Lever Nut	41-54	30-40	—
Main Control Assembly-to-Case Screws	8-11	—	71-97
Manual Valve Detent Spring Screw	8-11	—	71-97
Front Band Locknut-to-Case Adjusting Screw	47-61	35-45	—
Intermediate Band Locknut-to-Case Adjusting Screw	47-61	35-45	—
Center Support-to-Case Capscrew	9-13	—	80-115

(Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft	Lb-In
Turbine Shaft Speed (TSS) Sensor-to-Center Support Screw	8-11	—	71-97
Fluid Pump Support and Gear-to-Converter Housing Bolts	22-28	16-21	—
Converter Housing-to-Case Screw	36-52	27-39	—
Fluid Filter Assembly-to-Main Control Assembly Screw	8-11	—	71-97
Heat Shield-to-Case Stud	12-16	—	106-142
Converter Housing-to-Engine Bolts	40-55	30-41	—
Catalytic Converter-to-Crossover Pipe Nuts	34-46	25-34	—
Catalytic Converter-to-Exhaust Pipe Nuts and Bolts	34-46	25-34	—
Engine Support-to-Crossmember Bolts (Aerostar)	98-132	73-97	—
Engine Support-to-Crossmember Nuts (Ranger)	88-115	65-85	—
Rear Engine Support-to-Crossmember Nuts	85-115	63-87	—

(Continued)

SPECIFICATIONS

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft	Lb-In
Crossmember-to-Frame Through Bolts and Nuts (Aerostar)	37-52	28-38	—
Crossmember-to-Frame Through Bolts and Nuts (Ranger)	88-115	65-85	—
Transmission Cooler Lines Case Connectors	35-43	26-32	—
Transmission Fluid Cooler Line Nuts-to-Case Connector	24-31	18-23	—
Overdrive Drum Speed (ODS) Sensor Attaching Screw	8-11	—	71-97
Output Shaft Speed (OSS) Sensor Attaching Screw	8-11	—	71-97

(Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft	Lb-In
Flexplate-to-Converter Nuts	30-40	22-30	—
Transfer Case Vent Bracket Bolts	34-46	25-34	—
Transfer Case-to-Extension Housing Bolts	34-48	25-35	—
Catalytic Converter and Crossover Pipe Nuts	24-34	18-25	—
Catalytic Converter-to-Exhaust Bolts	24-34	18-25	—
Transfer Case Skid Plate Bolts	22-28	16-21	—
Separator Plate-to-Main Control Screws	6-8	—	53-71
Pressure Plug-to-Case	10-15	—	89-133
Servo Gauge Adjusting Screw	4	—	35.5

END PLAY SPECIFICATIONS

Transmission End Play Dimension "C"	Selective Thrust Washer (Nylon)		
	Part Number	Thickness	Identification: Color
Front No. 1 0.18-0.70mm (0.007-0.028 In.) Without Gasket	97GT-7D014-TA 97GT-7D014-MA 97GT-7D014-NA 97GT-7D014-PA 97GT-7D014-RA 97GT-7D014-SA	1.55-1.60mm (0.061-0.063 In.) 1.75-1.80mm (0.069-0.071 In.) 1.85-1.90mm (0.073-0.075 In.) 1.95-2.00mm (0.077-0.079 In.) 2.05-2.10mm (0.081-0.083 In.) 2.15-2.20mm (0.085-0.087 In.)	White Green Red Beige Black Yellow

END PLAY SPECIFICATIONS

Transmission End Play Dimension "C"	Selective Needle Bearings		
	Part Number	Thickness	Identification: Notches
1.67-1.85mm (0.066-0.073 In.) 1.86-2.04mm (0.073-0.080 In.) 2.05-2.23mm (0.081-0.088 In.) 2.25-2.43mm (0.089-0.096 In.) Rear No. 4 Reference End Play 0.21-0.51mm (0.008-0.020 In.)	97GT-7D014-GA 97GT-7D014-HA 97GT-7D014-KA 97GT-7D014-LA	2.65-2.80mm (0.104-0.110 In.) 2.80-2.95mm (0.110-0.116 In.) 3.00-3.15mm (0.118-0.124 In.) 3.20-3.35mm (0.126-0.132 In.)	0 1 2 3

TORQUE CONVERTER END PLAY

Transmission Model	Converter End Play			
	New or Rebuilt Converter		Used Converter	
	mm	Inch	mm	Inch
5R55E	0.58 Max.	0.023 Max.	1.27 Max.	0.050 Max.

SELECTIVE SNAP RINGS

Coast and Reverse Clutch Drum					Forward Clutch Cylinder				
Part Number	Thickness		Diameter		Part Number	Thickness		Diameter	
	mm	Inches	mm	Inches		mm	Inches	mm	Inches
E 860126-S	1.37	.0539	130.1	5.122	E 860115-S	1.37	.0539	125.1	4.925
E 860127-S	1.73	.0681	130.1	5.122	E 860116-S	1.73	.0681	125.1	4.925
E 860128-S	2.08	.0819	130.1	5.122	E 860117-S	2.08	.0819	125.1	4.925
E 860129-S	2.44	.0961	130.1	5.122	E 860118-S	2.44	.0961	125.1	4.925

SPECIFICATIONS

BAND ADJUSTMENT AND TORQUE CHART

Description	Number of Turns to Back Off	Locknut		Screw	
		N·m	Lb-Ft	N·m	Lb-Ft
Intermediate Band	2.5	47-61	35-45	14	10
Front Band	2.0	47-61	35-45	14	10

CLUTCH PLATE USAGE AND CLEARANCE SPECIFICATIONS

Clutch	Steel	Friction	Clearance	Selective Snap Rings	
				Part Number	Thickness
Forward Clutch					
4.0L	6	6	0.055-0.083	E 860115-S E 860116-S E 860117-S E 860118-S	1.37mm (0.0539 In.) 1.73mm (0.0681 In.) 2.08mm (0.0819 In.) 2.44mm (0.0961 In.)
Direct, Low/Reverse Clutch					
4.0L	5	5	0.051-0.079	E 860126-S E 860127-S E 860128-S E 860129-S	1.37mm (0.0539 In.) 1.73mm (0.0681 In.) 2.08mm (0.0819 In.) 2.44mm (0.0961 In.)
Coast Clutch					
All Engines	2	2	0.051-0.079	E 860126-S E 860127-S E 860128-S E 860129-S	1.37mm (0.0539 In.) 1.73mm (0.0681 In.) 2.08mm (0.0819 In.) 2.44mm (0.0961 In.)

5R55E SERVICE IDENTIFICATION MODEL CHART

7000 Prefix and Suffix	Speedo Drive Teeth	C=Column F=Floor	Engine Displacement	Vehicle Application
Vehicle Application (750 N·m)				
97GT-KAA	7T	C	4.0L-EFI	Ranger (4x2)
97GT-LAA	7T	C	4.0L-EFI	Ranger (4x4)
97GT-RAA	7T	C	4.0L-EFI	Aerostar (4x2) Wagon
97GT-SAA	7T	C	4.0L-EFI	Aerostar (AWD) Wagon