GENERAL MOTORS
200C

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INTRODUCTION

GENERAL MOTORS 200C

This contains the general description, diagnosis and overhaul procedures necessary to repair, overhaul or service this transmission

***We wish to thank General Motors Co.
for the information and some illustrations
that have made this booklet possible.***

***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.***

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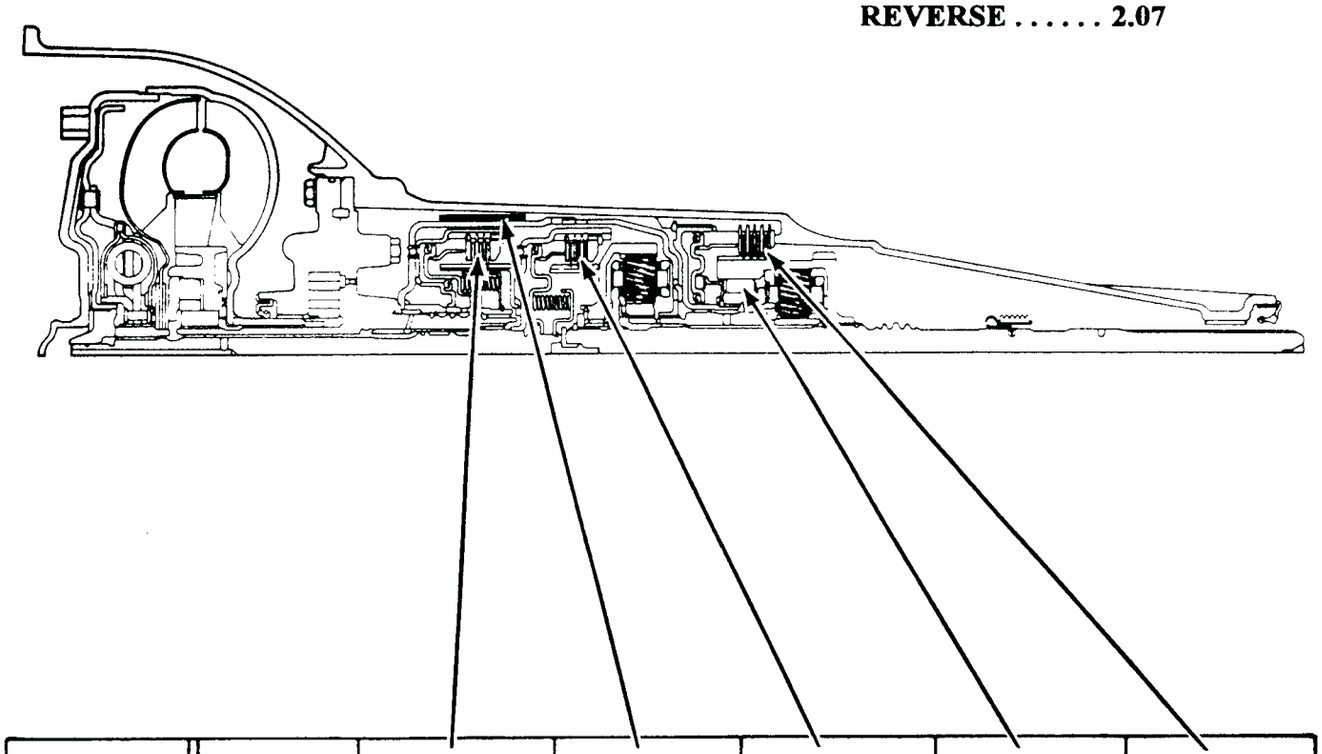
RANGE REFERENCE CHART

FIRST 2.74
SECOND 1.57
THIRD 1.00
REVERSE 2.07



RANGE	GEAR	DIRECT CLUTCH	INT. BAND	FORWARD CLUTCH	ROLLER CLUTCH	LO-REVERSE CLUTCH
PARK-NEUT.						
DRIVE	FIRST			APPLIED	HOLDING	
	SECOND		APPLIED	APPLIED		
	THIRD	APPLIED		APPLIED		
INT.	FIRST			APPLIED	HOLDING	
	SECOND		APPLIED	APPLIED		
LO	FIRST			APPLIED	HOLDING	APPLIED
	SECOND		APPLIED	APPLIED		
REV.		APPLIED				APPLIED

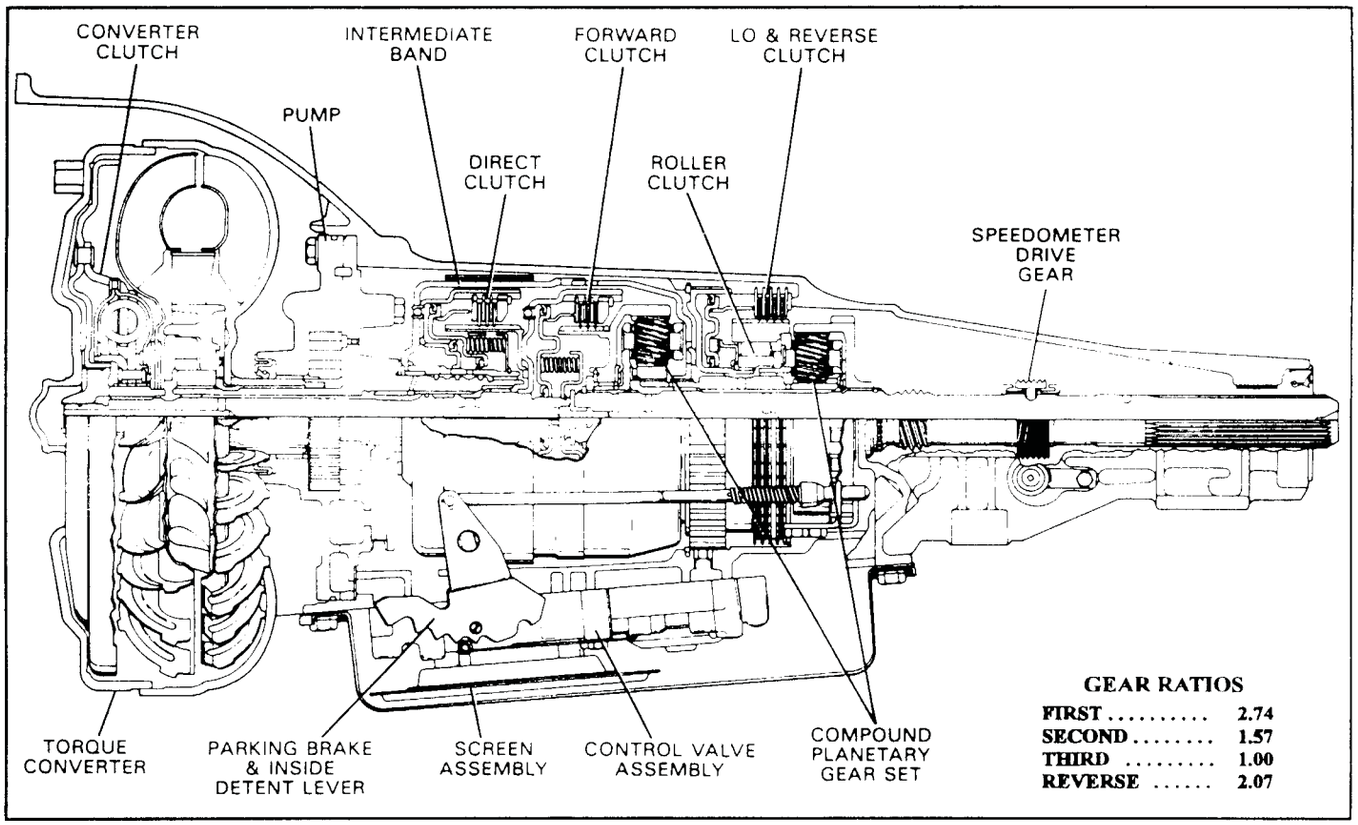


Figure 1

GENERAL DESCRIPTION

The THM 200C is a fully automatic transmission for rear wheel drive vehicles which provides three forward gear ranges and a reverse.

THE MAJOR COMPONENTS OF THIS TRANSMISSION ARE:

- **ONE BAND ASSEMBLY**
  - **(1) Intermediate Band**
- **THREE MULTIPLE DISC CLUTCH ASSEMBLIES**
  - **(1) Forward Clutch**
  - **(2) Direct Clutch**
  - **(3) Low/Reverse Clutch**
- **ONE OVERRUNNING CLUTCH ASSEMBLY**
  - **(1) Low Overrunning Roller Clutch**
- **TWO PLANETARY GEAR SETS**

The oil pressure and shift points are controlled by throttle opening with a throttle valve cable. See Index for T.V. cable information.

P - Park position prevents the vehicle from rolling either forward or backward. For safety reasons the parking brake should be used in addition to the park position.

R - Reverse allows the vehicle to be operated in a rearward direction.

N - Neutral allows the engine to be started and operated without driving the vehicle. If necessary this position may be selected if the engine must be restarted with the vehicle moving.

D - Drive is used for all normal driving conditions. It provides three gear ratios plus converter clutch operation. Downshifts are available for safe passing by depressing the accelerator.

2 - Manual second is used to provide acceleration and engine braking. This range may be selected at any vehicle speed.

1 - Manual Lo is used to provide maximum engine braking. This range may also be selected at any vehicle speed, but will only drop to 2nd gear, until vehicle speed reachs approximately 35 MPH.

ROAD TEST PROCEDURE

- Perform the road test following the sequence that is given below.
- MPH (KPH) shift points will vary with actual throttle position and driver habits.
- Compare the results of the test with shift speed chart information shown in Figure 2. Use these results and the diagnostic charts to evaluate the transmission.
- This test should only be performed when the traffic and road conditions permit.
- Observe all traffic safety regulations.

GARAGE SHIFT CHECK

(1) Start the engine.
(2) Depress the service brake pedal.
(3) Move the gear selector lever to the "REVERSE" (R) position, and then to the "NEUTRAL" (N) position, and then to the "DRIVE" (D) position. Gear selections should be immediate, but should not be harsh.

UPSHIFTS AND TCC APPLY

(1) Place the gear selector in "DRIVE" (D) position.
(2) Accelerate using a steady throttle pressure, with the pedal at approximately 1/3 throttle.
(3) Note the shift speeds and the gear engagements for both 2nd and 3rd gear.
(4) Note the speed at which the TCC applies, and the quality of the TCC apply. This should occur with the transmission in 3rd gear. If the apply is never noticed, refer to the diagnostic charts.
NOTE: The converter clutch will not engage until engine coolant has reached a minimum of operating temperature of approximately 130 F.

PART THROTTLE DETENT DOWNSHIFTS

(1) At vehicle speeds of 40-55 MPH (64-88 KPH), quickly depress the accelerator to a half open position and observe the following:
(2) The converter clutch releases.
(3) The transmission downshifts to 2nd immediately.

FULL THROTTLE DETENT DOWNSHIFTS

(1) At vehicle speeds of 40-55 MPH (64-88 KPH), quickly depress the accelerator to a wide open position and observe the following:
(2) The converter clutch releases.
(3) The transmission downshifts to 2nd immediately.

MANUAL DOWNSHIFTS

(1) At vehicle speeds of 40-55 MPH (64-88 KPH), release the accelerator pedal while moving the gear selector to "Second" (2) gear and observe the following:
(2) The torque converter clutch releases.
(3) The transmission downshift to 2nd gear should be immediate.
(4) Engine should now slow vehicle down.
(5) Move the selector to "Drive" (D) and accelerate to 25 MPH (40 KPH). Release the accelerator while moving the gear selector to "First" (1) gear and observe the following:
(6) The torque converter clutch releases.
(7) The transmission downshift to 1st gear should be immediate.
(8) Engine should now slow vehicle down.

COASTDOWN DOWNSHIFT

(1) With the gear selector in the "Drive" (D) position accelerate to 3rd gear with the TCC applied.
(2) Release the accelerator pedal and lightly apply the brakes and observe the following:
(3) The torque converter clutch releases.
(4) Watch the downshift speeds and ensure that the downshifts occur.

MANUAL 2ND GEAR SELECTION

(1) With vehicle stopped, place the gear selector in "Second" (2) gear, accelerate and observe the following:
(2) The 1st to 2nd gear shift speed.
(3) Accelerate to 30 MPH and ensure that a shift to 3rd gear does not occur.
(4) The converter clutch should not apply.

MANUAL 1ST GEAR SELECTION

(1) With vehicle stopped, place the gear selector in "First" (1) gear, accelerate and observe the following:
(2) Accelerate to 20 MPH and ensure that no upshift occurs at all.
(3) The converter clutch should not apply.

REVERSE GEAR SELECTION

(1) With vehicle stopped, place gear selector into "Reverse" (R) and slowly accelerate to observe reverse gear operation.

1987 "THM 200-C" SPEED SHIFT CHART

Model	1-2 Min Throt	2-3 Min Throt	3-2 Part Throt	2-1 Part Throt	3-2 Coast Down	2-1 Coast Down	2-1 Man Low
BHB	12	19	41	31	18	10	33
CAB	9	18	45	32	16	7	34
CUB	11	20	55 +	39	18	8	41
HHB	10	17	43	35	15	7	38
HLB	10	17	45	33	15	7	40
KBB	13	22	53	40	19	9	52

NOTES:
1. ALL SPEEDS INDICATED ARE IN MILES PER HOUR. CONVERSION TO KPH = MPH × 1.609.
2. SHIFT POINTS WILL VARY SLIGHTLY DUE TO ENGINE LOAD AND VEHICLE OPTIONS.
3. SPEEDS LISTED WITH + EXCEED 55 MPH.

Figure 2

1987 200C AUTOMATIC TRANSMISSION OIL PRESSURES

[1]**NOTICE:** TOTAL RUNNING TIME FOR THIS COMBINATION NOT TO EXCEED (2) MINUTES, AND BRAKES MUST BE APPLIED AT ALL TIMES. (SEE FIGURE 200C-17 FOR LINE PRESSURE TAP LOCATION.)

[2]**NOTE:** FULL T.V. REVERSE LINE PRESSURE TO BE CHECKED AT 2,000 R.P.M.

MODEL	RANGE	NORMAL OIL PRESSURE AT MINIMUM T.V.		NORMAL OIL PRESSURE AT FULL T.V.	
		kPa	P.S.I.	kPa	P.S.I.
BHB, CAB, CUB, HHB, HLB, KBB	PARK @ 1000 RPM	458 - 506	66 - 74	No T.V. pressure in Park. Line pressure is same as Park at Minimum T.V.	
BHB, CAB, CUB, HHB, HLB KBB	[1,2] REVERSE @ 1000 RPM	1012 - 1480 1012 - 1480	147 - 215 147 - 215	1427 - 1819 1382 - 1819	207 - 264 200 - 264
BHB, CAB, CUB, HHB, HLB KBB	[1]DRIVE & NEUTRAL @ 1000 RPM	459 - 541 459 - 541	67 - 78 67 - 78	874 - 986 828 - 933	127 - 143 120 - 135
BHB, CAB, CUB, HHB, HLB, KBB	[1]INTERMEDIATE @ 1000 RPM	888 - 1073	129 - 156	888 - 1073	129 - 157
BHB, CAB, CUB, HHB, HLB, KBB	[1]LO @ 1000 RPM	888 - 1073	130 - 155	888 - 1073	129 - 157

Figure 3

LINE PRESSURE CHECK

1. Install a 0-300 pound gage into the line pressure port. The line pressure plug location is shown in Figure 4.
2. Check line pressures at both Min. and Max. T.V., using the line pressure chart shown in Figure 3 as a guide. Line pressures may vary slightly from the chart provided.
3. The cooler feed and cooler return fittings are identified in Figure 5.

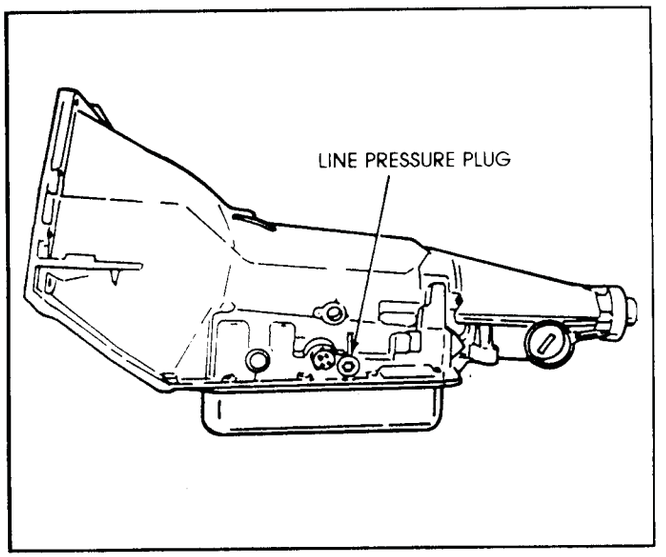


Figure 4

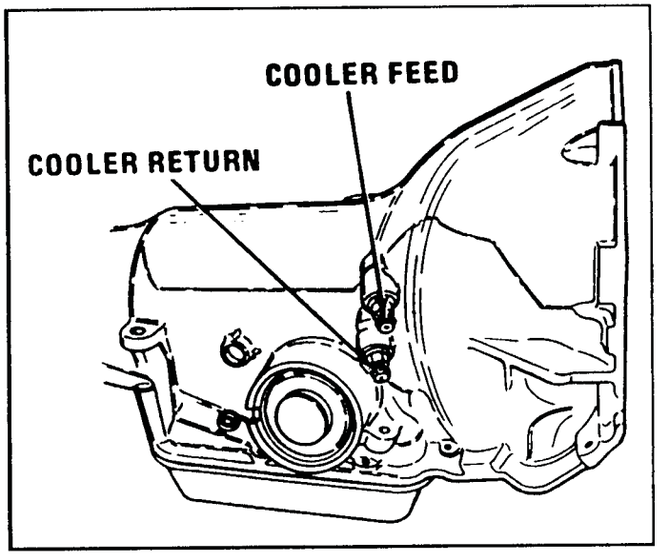


Figure 5

CONDITION	INSPECT COMPONENT	FOR CAUSE
NO DRIVE IN DRIVE RANGE (Install Pressure Gage)	• Oil Level	— Incorrect level. — External leaks.
	• Manual Linkage	— Maladjusted.
	• Oil Pressure	— Plugged or restricted oil screen. — Oil screen gasket off location. — Pump assembly - pressure regulator. — Pump drive gear - tangs damaged by converter. — Case - porosity in intake bore.
	• Forward Clutch	— Piston cracked, seals missing, damaged; clutch plates burned; snap ring out of groove. — Oil seal rings missing or damaged on turbine shaft; leak in feed circuits; pump to case gasket mispositioned or damaged. — Clutch housing ball check stuck or missing. — Cup plug leaking or missing in the rear of the turbine shaft in the clutch apply passage. — Wrong forward clutch piston assembly or wrong number of clutch plates. — Feed orifice plugged in turbine shaft.
	• Roller Clutch	— Springs missing. — Rollers galled or missing.
HIGH OR LOW PRESSURE (Refer To Oil Pressure Checks)	• Throttle Valve Cable	— Misadjusted, binding, unhooked or broken.
	• Throttle Valve Assembly No. 1 Ball Check	— Throttle lever and bracket assy. binding, unhooked or mispositioned. — Throttle valve or plunger valve binding. — Shift T.V. valve binding. — Missing or leaking.
	• Pressure Regulator Valve & Spring	— Valve binding. — Wrong spring - check pressures. — Oil pressure control orifice in pump cover plugged, causing high oil pressure. — Pressure regulator bore plug leaking.
	• Manual Valve	— Unhooked.
	• Intermediate Boost Valve	— Valve binding - pressures will be incorrect in intermediate and low ranges only. — Orifice in spacer plate at end of valve plugged.
	• Reverse Boost Valve	— Valve binding - pressures will be incorrect in reverse only. — Orifice in spacer plate at end of valve plugged.

Figure 6

CONDITION	INSPECT COMPONENT	FOR CAUSE
1-2 SHIFT - FULL THROTTLE ONLY	• Throttle Valve Cable	— Binding, unhooked or broken. — Misadjusted.
	• Throttle Lever & Bracket Assembly	— Binding or unhooked.
	• T.V. Exhaust Ball Lifter Or No. 5 Ball	— Binding, mispositioned or unhooked. (Allowing No. 5 ball to seat causes full T.V. pressure regardless of throttle valve position.)
	• Throttle Valve & Plunger	— Binding.
	• Control Valve Assembly	— Valve body gaskets leaking, damaged, incorrectly installed.
	• Case Assembly	— Porosity.
NO 1-2 SHIFT	• Governor & Governor Feed Passages	— Plugged governor oil feed orifice in spacer plate. — Plugged orifice in spacer plate that feeds governor oil to the shift valves. — Ball or balls missing in governor assembly. — Inner governor cover rubber "O" ring seal missing or leaking. (If the outer governor cover "O" ring seal leaks, an external leak will be present along with no up-shifts.) — Governor shaft seal missing or damaged. — Governor driven gear stripped. — Governor weights binding on pin.
	• Control Valve Assembly	— 1-2 shift valve or 1-2 throttle valve stuck in downshift position.
	• Case	— Porosity in case channels or undrilled 2nd speed feed holes. — Excessive leakage between case bore and intermediate band apply ring. — Intermediate band anchor pin missing or unhooked from band. — Broken or missing band.
	• Intermediate Servo Assembly	— Servo to cover oil seal ring missing or damaged. — Porosity in servo cover or piston. — Wrong intermediate band apply pin. — Incorrect usage of cover and piston.
NO 2-3 SHIFT	• Control Valve Assembly & Spacer Plate	— 2-3 shift valve or 2-3 throttle valve stuck in the downshift position. — Direct clutch feed orifice in spacer plate plugged. — Valve body gaskets leaking, damaged or incorrectly installed.

Figure 7

CONDITION	INSPECT COMPONENT	FOR CAUSE
NO 2-3 SHIFT (Continued)	• Case	— Porosity in case channels.
	• Pump	— Channels in pump plugged or leaking. — Pump to case gasket off location. — Rear oil seal ring on pump cover leaking or missing.
	• Direct Clutch	— Oil seals missing or damaged on piston. — Direct clutch piston or housing cracked. — Direct clutch plates damaged or missing. — Direct clutch backing plate snap ring out of groove.
	• Intermediate Servo Assy. (Direct Clutch Accumulator Oil Passages)	— Servo to case oil seal ring broken or missing on intermediate servo piston. — Exhaust hole in case between servo piston seal rings plugged or undrilled.
DRIVE IN NEUTRAL	• Manual Linkage	— Misadjusted or disconnected.
	• Forward Clutch	— Clutch does not release.
	• Pump	— Cross leakage in pump passages.
	• Case	— Cross leakage to forward clutch passages.
NO REVERSE OR SLIPS IN REVERSE (Install Pressure Gage)	• Throttle Valve Cable	— Binding or misadjusted.
	• Manual Linkage	— Misadjusted.
	• Throttle Valve	— Binding.
	• Shift T.V. Valve	— Binding in valve body bore.
	• Reverse Boost Valve	— Binding in valve body bore.
	• Low Overrun Clutch Valve	— Binding in valve body bore. (Line pressure readings will be normal.)
	• Reverse Clutch	— Piston cracked, broken or missing seals. Clutch plates burned. — Wrong selective spacer ring.

Figure 8

CONDITION	INSPECT COMPONENT	FOR CAUSE
NO REVERSE OR SLIPS IN REVERSE (Install Pressure Gage) (Continued)	• Direct Clutch Passages	— Porosity in case passages. — Pump - case to pump gasket mispositioned or damaged. — Pump channels cross feeding, leaking or restricted. — Pump cover oil seal rings damaged or missing. — Piston or housing cracked. — Piston seals cut or missing. — Housing ball check stuck, leaking or missing. — Plates burned. — Incorrect piston. — Orifices plugged in spacer plate. — Intermediate servo to case oil seal ring cut or missing.
SLIP IN 1-2 SHIFT	• Oil Level	— Low.
	• Spacer Plate & Gaskets	— Second speed feed orifice partially blocked. — Gaskets damaged or mispositioned.
	• 1-2 Accumulator Valve	— Sticking in valve body causing low 1-2 accumulator pressure. — Weak or missing spring.
	• 1-2 Accumulator Piston	— Seal leaking, spring broken or missing. — Leak between piston and pin.
	• Intermediate Band Apply Pin	— Wrong selection of apply pin. — Excessive leakage between apply pin and case.
	• Intermediate Servo Assy.	— Porosity in piston. — Cover to servo oil seal ring damaged or missing. — Incorrect usage of cover and piston.
	• Throttle Valve Cable	— Not properly adjusted.
	• Throttle Valve	— Binding.
	• Shift T.V. Valve	— Binding.
	• Intermediate Band	— Worn or burned.
	• Case	— Porosity in 2nd clutch passages.
ROUGH 1-2 SHIFT	• Throttle Valve Cable	— Not adjusted properly. — Binding.
	• Throttle Valve	— Plunger or valve binding.

Figure 9

CONDITION	INSPECT COMPONENT	FOR CAUSE
ROUGH 1-2 SHIFT (Continued)	• Shift T.V. Valve	— Binding.
	• 1-2 Accumulator Valve	— Binding.
	• Intermediate Servo Assy.	— Wrong apply pin. — Servo piston to case oil seal ring damaged or missing.
	• 1-2 Accumulator	— Oil ring damaged. — Piston stuck. — Broken or missing spring. — Bore damaged.
SLIP IN 2-3 SHIFT	• Oil Level	— Low.
	• Throttle Valve Cable	— Not adjusted properly.
	• Throttle Valve	— Binding.
	• Spacer Plate & Gaskets	— Direct clutch orifice partially blocked in spacer plate. — Gaskets mispositioned or damaged.
	• Intermediate Servo Assy.	— Servo to case oil seal ring damaged.
	• Direct Clutch Feed	— Porosity in direct clutch feed channels in case. — Pump to case gasket mispositioned or damaged. — Pump channels cross feeding, leaking or restricted. — Pump cover oil seal rings damaged or missing. — Direct clutch piston or housing cracked. — Piston seals cut or missing. — Direct clutch plates burned.
ROUGH 2-3 SHIFT	• Throttle Valve Cable	— Mispositioned or missing.
	• Throttle Valve & Plunger	— Binding.
	• Shift T.V. Valve	— Binding.
	• Intermediate Servo Assy.	— Exhaust hole undrilled or plugged between intermediate servo piston seals, not allowing intermediate servo piston to complete its stroke.
	• Direct Clutch Exhaust Valve Ball Check No. 4	— Missing or mispositioned.

Figure 10

CONDITION	INSPECT COMPONENT	FOR CAUSE
NO ENGINE BRAKING IN L2 RANGE - 2ND GEAR	• Intermediate Boost Valve	— Binding in valve body.
	• Intermediate Rev. Ball Check (No. 3 Ball)	— Mispositioned or missing.
	• Shift T.V. Ball Check (No. 1 Ball)	— Mispositioned or missing.
	• Intermediate Servo Assy.	— Servo to cover oil seal ring missing or damaged.
	• Intermediate Band	— Off anchor pin. — Broken or burned.
NO ENGINE BRAKING IN L1 RANGE - 1ST GEAR	• Low Overrun Clutch Valve	— Binding in valve body.
	• Low/Reverse Clutch Assy.	— Piston seals broken or missing. — Porosity in piston or housing. — Clutch housing snap ring out of case. — Cup plug or rubber seal missing or damaged between case and low reverse clutch housing.
NO PART THROTTLE DOWNSHIFT (Install Pressure Gage)	• Throttle Plunger Bushing	— Passages not open.
	• 2-3 Throttle Valve Bushing	— Passages not open.
	• Valve Body Gaskets	— Mispositioned or damaged.
	• Spacer Plate	— Hole plugged or undrilled.
	• Throttle Valve Cable	— Improperly set.
	• Shift T.V. Valve	— Binding.
	• Throttle Valve	— Binding.
LOW OR HIGH SHIFT POINTS (Install Pressure Gage)	• Throttle Valve Cable	— Binding or disconnected.
	• Throttle Valve	— Binding.
	• Shift T.V. Valve	— Binding.
	• T.V. Shift Ball, (No. 1 Ball)	— Missing or mispositioned.
	• Throttle Valve Plunger	— Binding.
	• 1-2 Or 2-3 Throttle Valves	— Binding in bushings.
	• Valve Body Gaskets	— Mispositioned or damaged.

Figure 11

CONDITION	INSPECT COMPONENT	FOR CAUSE
LOW OR HIGH SHIFT POINTS (Install Pressure Gage) (Continued)	• Pressure Regulator Valve	— Binding.
	• T.V. Exhaust Ball (No. 5) & Lifter	— Mispositioned, unhooked or missing.
	• Throttle Lever & Bracket Assembly	— Binding, unhooked or loose at mounting valve body bolt. — Not positioned at the throttle value plunger bushing pin locator.
	• Governor Shaft To Cover Seal Ring	— Broken or missing.
	• Governor Cover "O" Rings	— Broken or missing. — The outer ring will leak externally and the inner ring internally.
	• Case	— Porosity.
	• Pump Body Check Ball (2-3 Only)	— Missing.
WON'T HOLD IN PARK	• Manual Linkage	— Misadjusted.
	• Internal Linkage	— Park pawl binding in case. — Actuator rod or plunger damaged. — Parking pawl broken. — Parking bracket loose or damaged.
	• Inside Detent Lever & Pin Assembly	— Nut loose. — Hole in lever worn or damaged.
	• Manual Detent Roller & Spring Assembly	— Bolt loose that holds roller assembly to valve body. — Pin or roller damaged, mispositioned or missing.

Figure 12

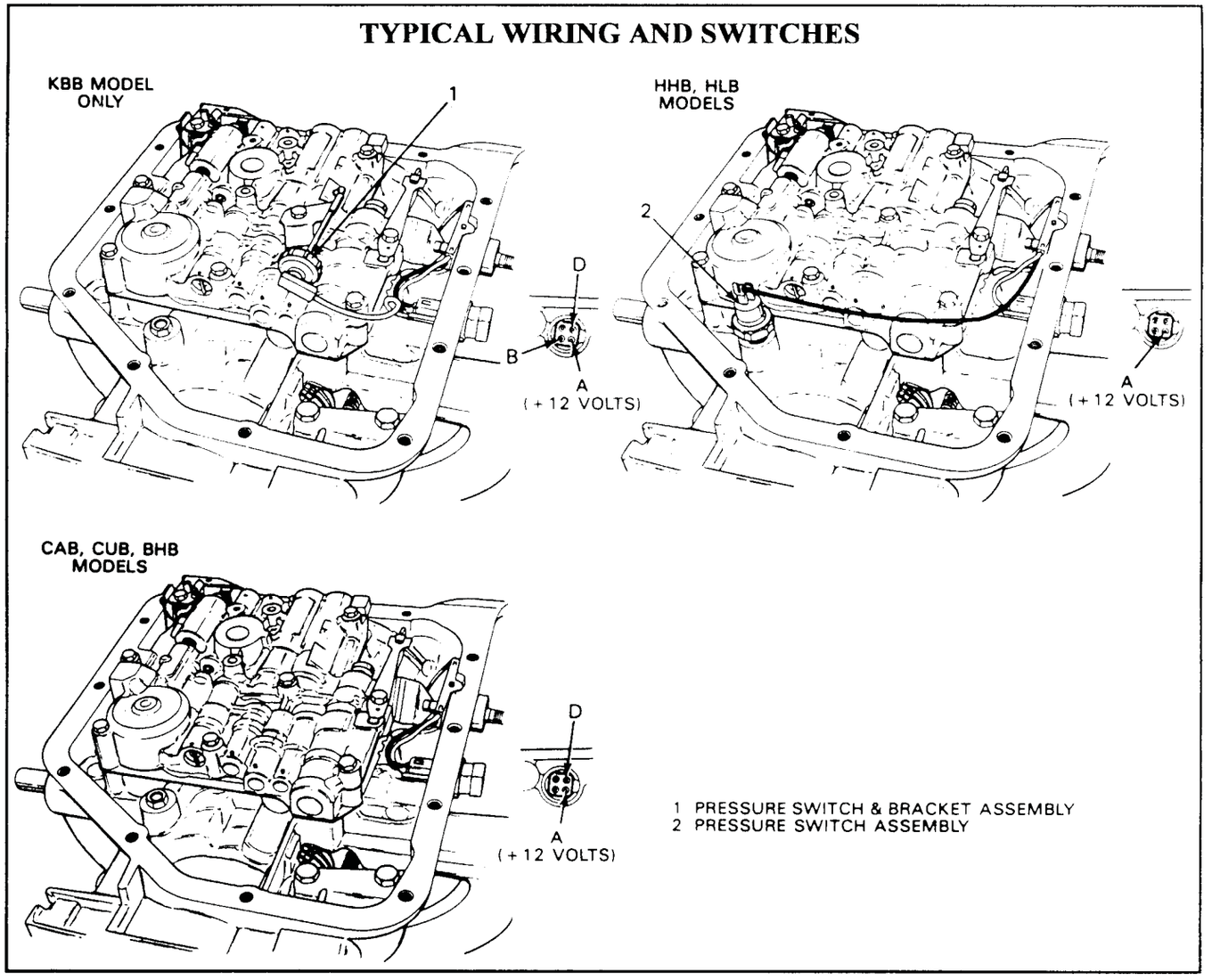


Figure 13

TYPICAL ECM INPUTS AFFECTING TCC OPERATION

E.C.M. INPUTS	DESCRIPTION AND OPERATION	LOCATION	CONDITION E.C.M. NEEDS TO PROVIDE T.C.C. GROUND
1. COOLANT SENSOR	Variable resistor. E.C.M. sends 5 volts through resistor; uses return voltage (0 volts – very cold engine; 5 volts – very hot engine) to calculate coolant temperature.	In coolant flow; see Service Manual for location in specific models	Coolant temperature of 130° to 150° F
2. VEHICLE SPEED SENSOR (VSS)	A light-emitting diode and a photo transistor. Light pulses recorded and sent back to E.C.M. as electrical signal, which E.C.M. measures to calculate speed.	In speedometer head	Road speed of 25-40 mph, depending on model
3. VACUUM SENSOR (in carbureted engines) MAP SENSOR (in EFI-equipped engines)	Variable resistors that measure the vacuum in the intake manifold and send back 1 (high vacuum) to 5 (low vacuum) volts to E.C.M.	On front body panel, higher than intake manifold	Partial vacuum; also, E.C.M. compares this signal to TPS signal for indication of engine load; load must be light before E.C.M. will provide ground for T.C.C.
4. THROTTLE POSITION SENSOR (TPS)	Variable resistor that measures the throttle opening and sends back 1 (closed throttle) to 5 (wide-open throttle) volts to E.C.M.	Mounted on carburetor or throttle body	Partial throttle; also, E.C.M. compares this signal to that of vacuum or MAP sensor for indication of engine load; load must be light before E.C.M. will provide ground for T.C.C.
5. PARK/NEUTRAL SWITCH (P/N SWITCH)	Switch that closes when gear selector indicates park or neutral, and opens in gear.	Mounted on gear selector	Must be open

Figure 14

TORQUE CONVERTER CLUTCH COMPLAINTS

CONDITION	INSPECT COMPONENTS	FOR CAUSE
CONVERTER CLUTCH DOES NOT APPLY	• Electrical Connector At Case	– Not receiving +12 volts and/or ground signal– check engine controls. – Contact pins or sockets damaged. – Internal wires not connected.
	• Solenoid Assembly	– Not sealing direct clutch oil exhaust when energized. (Energize and blow into, to check.) – Wires pinched and shorted. – Internal wiring damaged. – O-ring seal missing.

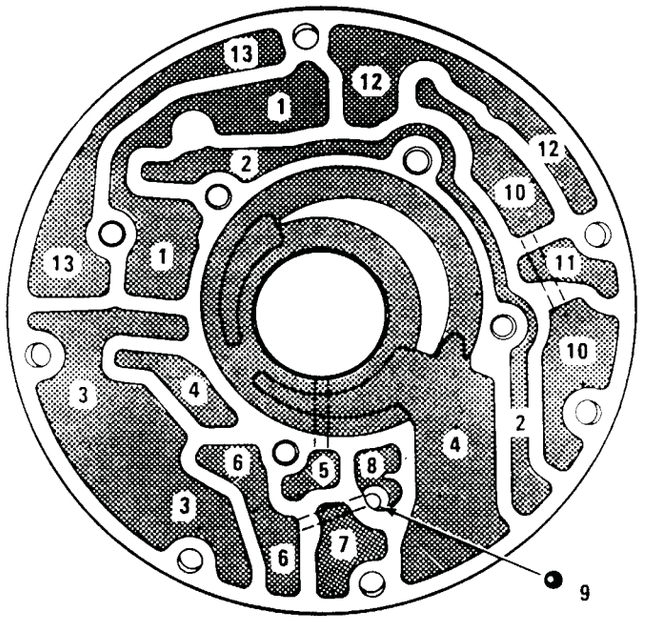
Figure 15

TORQUE CONVERTER CLUTCH COMPLAINTS (CONTINUED)

CONDITION	INSPECT COMPONENT	FOR CAUSE
CONVERTER CLUTCH DOES NOT APPLY (Continued)	• Governor Pressure Switch (When Used)	– Solenoid wires not connected. – Internally damaged – not supplying ground signal under pressure.
	• Oil Pump Assembly	– Solenoid mounting bolts loose. – Actuator and/or apply valves stuck (may be caused by over-torqued pump bolts). – Converter clutch apply valve bushing porosity or damage. – Actuator valve bore damaged or burred. – Cup plug in pump body blocked or not orificed. (See pump body illustration.) – Cup plug in pump cover blocked or not orificed. (See pump cover illustration.)
	• Forward Clutch Assembly	– Turbine shaft O-ring missing or damaged.
	• Torque Converter	– Damaged internally – replace torque converter.
HARSH CONVERTER CLUTCH APPLY	• Oil Pump Assembly	– Orificed cup plug missing from external area of pump cover. (See illustration.) – Torque converter damaged internally – replace converter.
CONVERTER CLUTCH DOES NOT APPLY WHEN HOT	• Solenoid	– Wiring internally shorted and insulation breaks down when hot. – Solenoid O-ring leaking.
	• Oil Pump Assembly	– Casting porosity in pump and/or in converter clutch valve bushing.
CONVERTER CLUTCH APPLIES ERRATICALLY – VERY LOW AND/OR VERY HIGH VEHICLE SPEEDS	• External Controls	–*Vehicle speed sensor malfunction. – Intermittent short or ground in T.C.C. control system.
	• Internal Controls	–*Governor pressure switch malfunction. – Solenoid malfunction.
CONVERTER CLUTCH APPLIES IMMEDIATELY AFTER 2-3 UPSHIFT REGARDLESS OF VEHICLE SPEED (MAY ALSO STALL ENGINE WHEN PLACED IN REVERSE)	• External Controls	–*Vehicle speed sensor malfunction.
	• Internal Controls	–*Governor pressure switch is grounded. – Solenoid ground wire is pinched and grounded. – Solenoid mechanically malfunctioning. (Will not exhaust oil.)
CONVERTER CLUTCH IS APPLIED IN ALL RANGES ENGINE STALLS WHEN TRANSMISSION IS PUT INTO GEAR	• Oil Pump Assembly	– Converter clutch apply valve stuck in apply position. (Pump bolts overtorqued.)
ENGINE STALLS DURING HARD BRAKING – CONVERTER CLUTCH NOT RELEASING WHEN BRAKING	• External Controls	– Brake switch malfunction or misadjustment.
HUNTING OR ON/OFF APPLY OF CONVERTER CLUTCH OR SHUDDER AFTER APPLY	• Torque Converter	– Warped pressure plate. – Poppet valve malfunction. (Diesel model pressure plates.)

Figure 16 * On Vehicles So Equipped

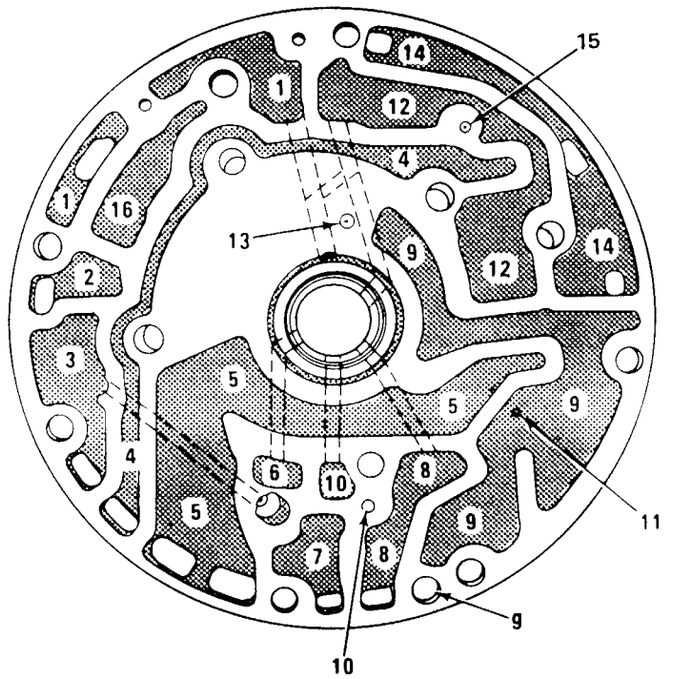
PUMP BODY OIL PASSAGES



ILL. NO.	DESCRIPTION
1	CONVERTER FEED
2	LINE BOOST
3	LINE
4	PUMP INTAKE
5	SEAL DRAIN BACK HOLE
6	REVERSE
7	DRIVE
8	3RD/REVERSE
9	CHECK BALL, 7.14 mm (.281")
10	DIRECT CLUTCH
11	FROM COOLER TO LUBE
12	CONVERTER TO COOLER
13	VOID

Figure 17

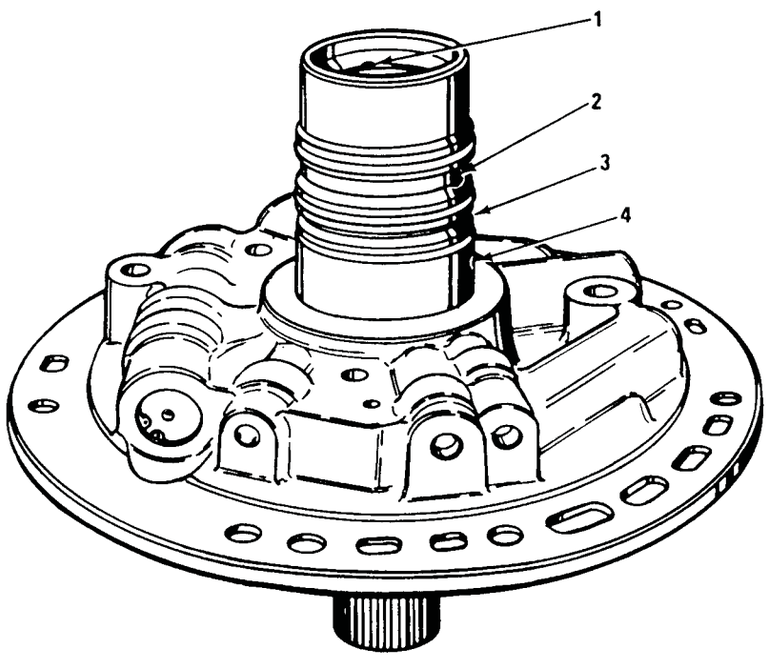
PUMP COVER OIL PASSAGES



ILL. NO.	DESCRIPTION
1	CONVERTER TO COOLER (T.C.C. APPLY)
2	FROM COOLER TO LUBE
3	DIRECT CLUTCH
4	LINE BOOST
5	PUMP INTAKE
6	3RD/REVERSE
7	DRIVE
8	REVERSE
9	LINE
10	SEAL DRAIN BACK HOLE
11	OIL PRESSURE CONTROL ORIFICE
12	CONVERTER FEED & T.C.C. RELEASE
13	AIR BLEED ORIFICE
14	VOID
15	RETAINING PIN HOLE
16	DIRECT CLUTCH TO T.C.C. ACTUATOR VALVE

Figure 18

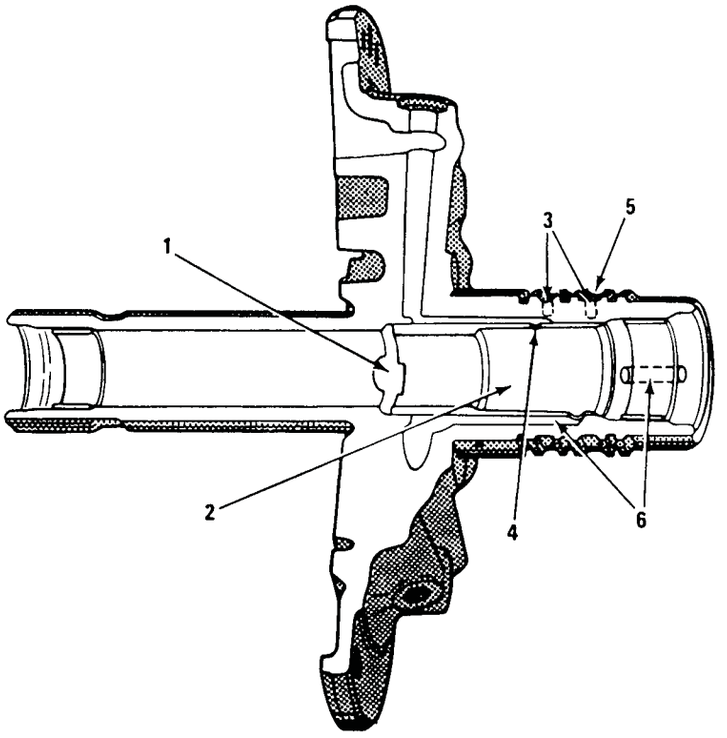
PUMP COVER PASSAGES



ILL. NO.	DESCRIPTION
1	LUBE
2	DIRECT CLUTCH
3	REVERSE
4	LUBE HOLE

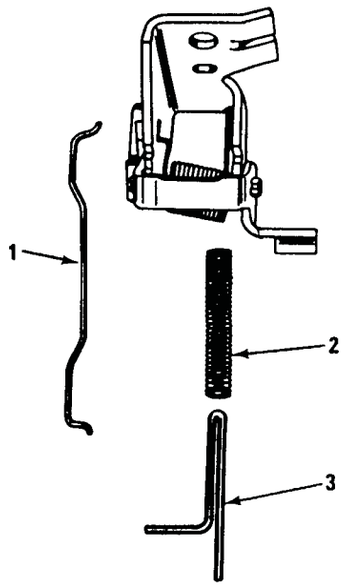
Figure 19

PUMP COVER PASSAGES



ILL. NO.	DESCRIPTION
1	CONVERTER FEED
2	PUMP COVER SLEEVE
3	REVERSE
4	DRIVE
5	DIRECT CLUTCH (3RD)
6	COOLER TO LUBE

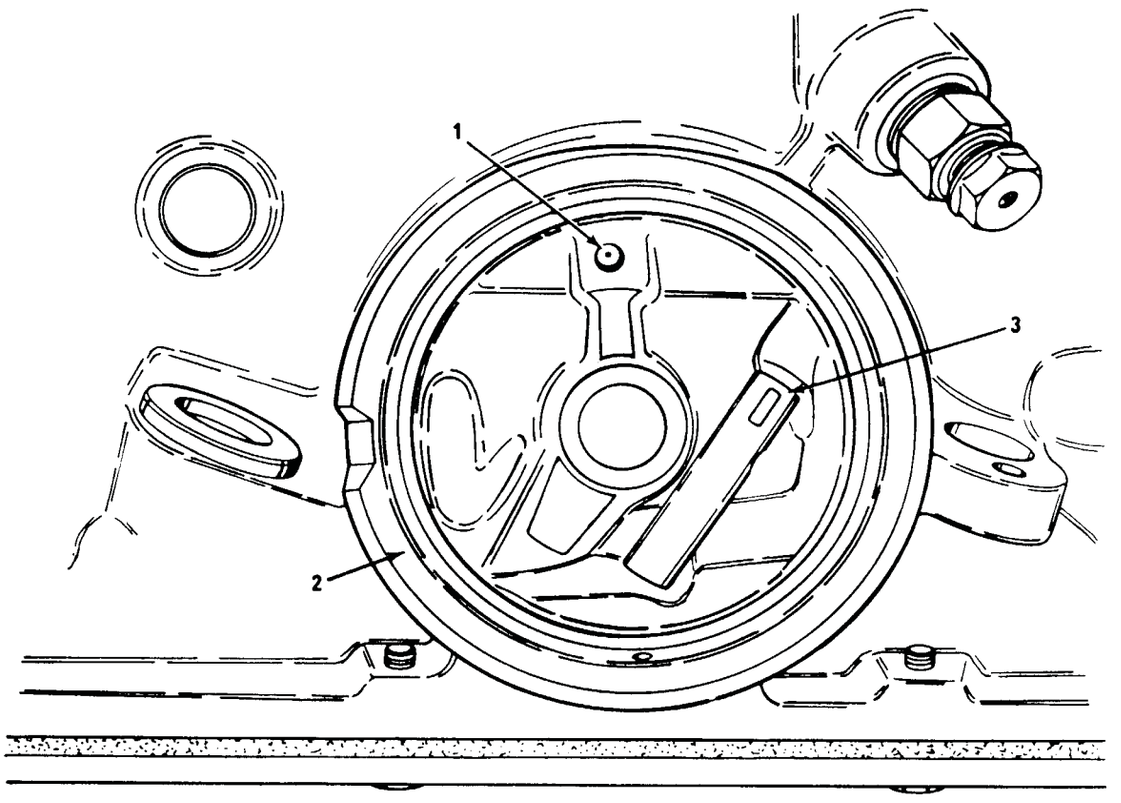
Figure 20



ILL. NO.	DESCRIPTION
1	THROTTLE LEVER TO CABLE LINK
2	T.V. EXHAUST VALVE LIFTER SPRING
3	T.V. EXHAUST VALVE LIFTER

Figure 21

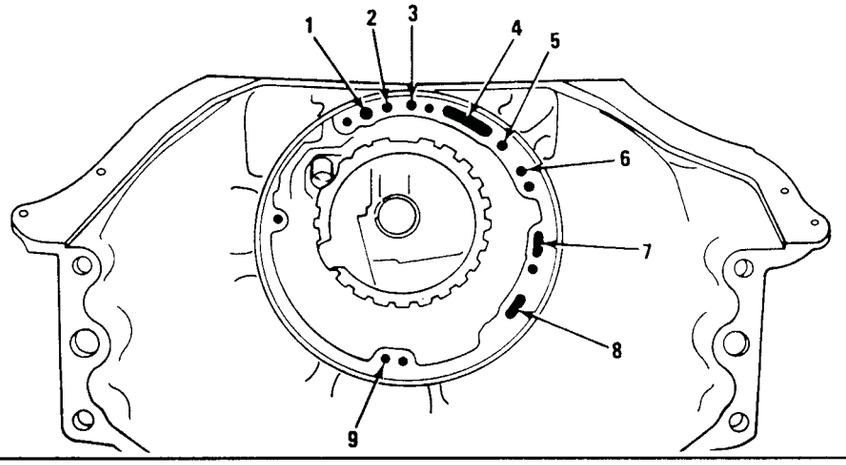
SERVO PASSAGES



1 CASE SERVO ORIFICE PLUG
2 INTERMEDIATE SERVO BORE
3 3RD ACCUMULATOR CHECK VALVE ASSY.

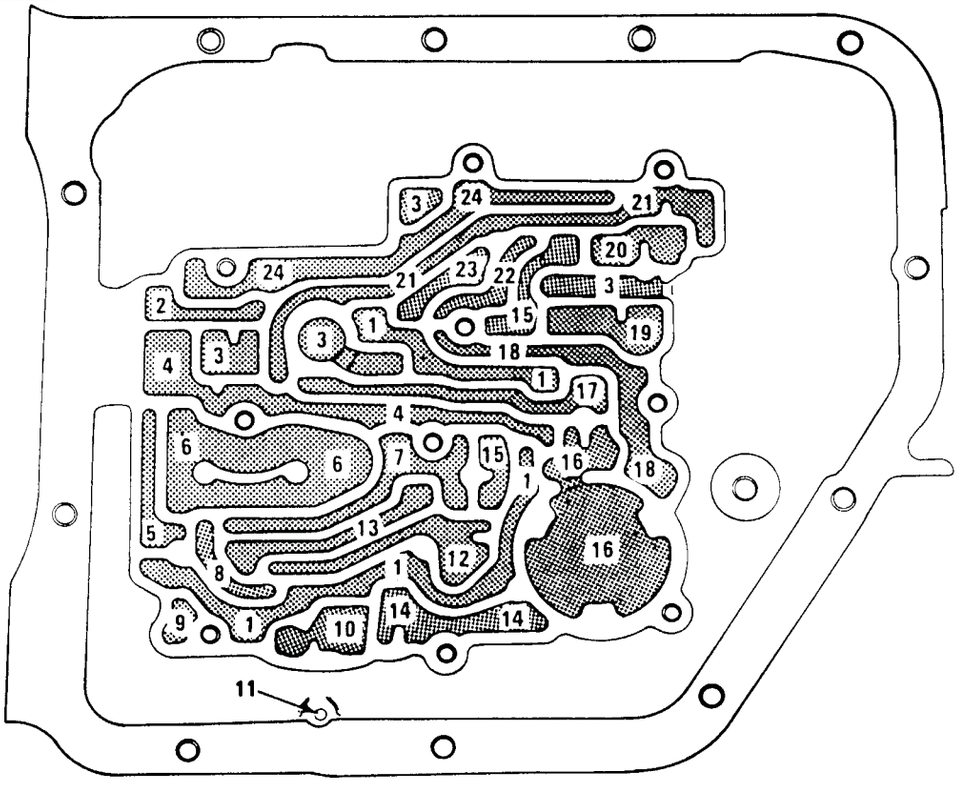
Figure 22

PUMP FACE CASE PASSAGES



ILL. NO.	DESCRIPTION
1	LINE
2	REVERSE
3	DRIVE
4	PUMP INTAKE
5	LINE BOOST
6	DIRECT CLUTCH
7	FROM COOLER
8	TO COOLER
9	CASE VENT

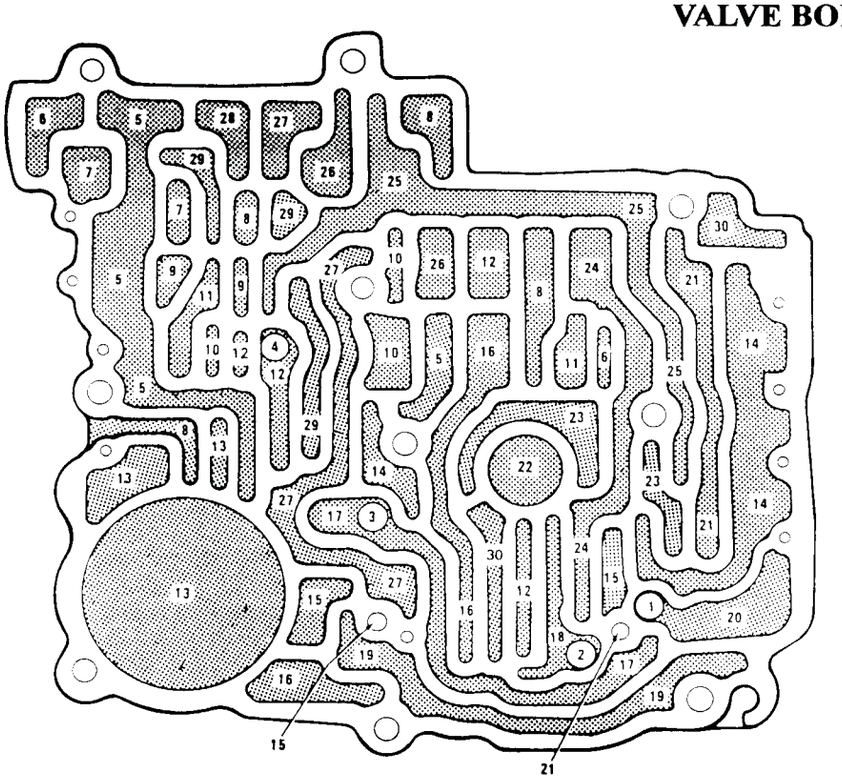
Figure 23



ILL. NO.	DESCRIPTION	ILL. NO.	DESCRIPTION	ILL. NO.	DESCRIPTION
1	DIRECT CLUTCH	9	T.V. EXHAUST	17	LO-1ST
2	REVERSE	10	DIRECT CLUTCH ACCUM.	18	GOVERNOR
3	EXHAUST	11	SERVO EXHAUST	19	LO & REVERSE CLUTCH
4	DRIVE	12	THROTTLE VALVE	20	INTERMEDIATE
5	LINE BOOST	13	SHIFT T.V.	21	LO
6	PUMP INTAKE	14	2ND	22	RNDI
7	REVERSE BOOST	15	INTERMEDIATE BOOST	23	RND
8	PART THROTTLE	16	1-2 ACCUMULATOR	24	LINE

Figure 24

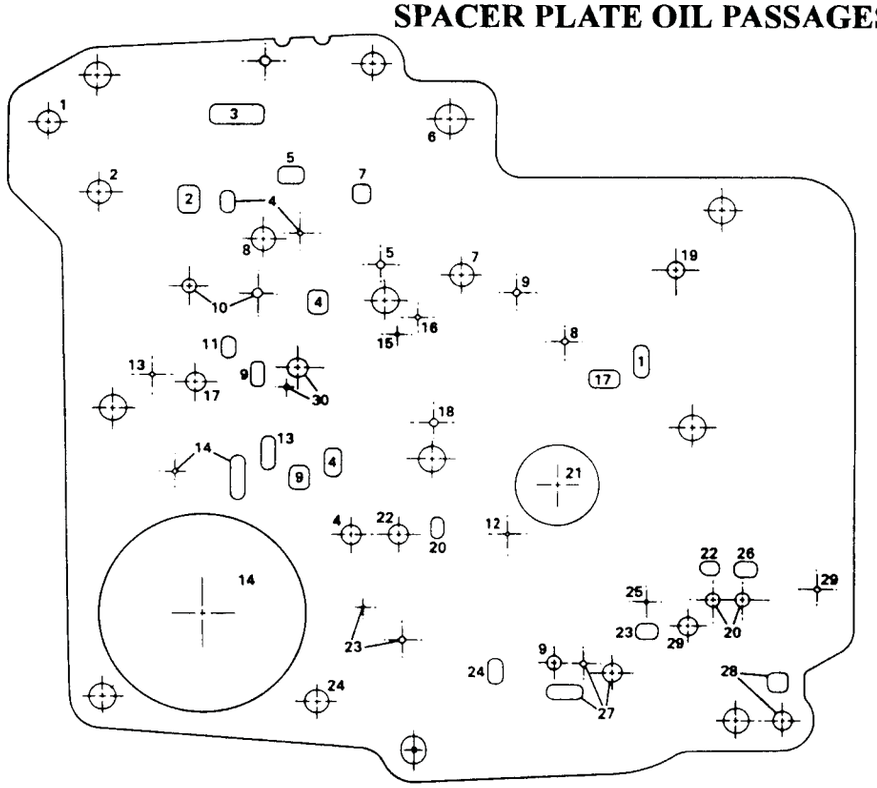
VALVE BODY OIL PASSAGES



1 #1 CHECK BALL
2 #2 CHECK BALL
3 #3 CHECK BALL
4 #4 CHECK BALL
5 DRIVE
6 LO
7 INTERMEDIATE
8 EXHAUST
9 LO & REVERSE CLUTCH
10 GOVERNOR
11 LO 1ST
12 DIRECT CLUTCH
13 1-2 ACCUMULATOR
14 SHIFT THROTTLE VALVE
15 THROTTLE VALVE
16 2ND
17 R I L BOOST
18 DIRECT CLUTCH ACCUM.
19 THROTTLE VALVE EX
20 LINE BOOST
21 PART THROTTLE
22 PUMP INTAKE
23 REVERSE BOOST
24 DETENT
25 REVERSE
26 RND
27 RNDI
28 LINE
29 INTERMEDIATE BOOST
30 VOID

Figure 25

SPACER PLATE OIL PASSAGES



1 LO
2 INTERMEDIATE
3 LINE
4 INTERMEDIATE BOOST
5 RNDI
6 REVERSE EXHAUST
7 RND
8 EXHAUST
9 DIRECT CLUTCH
10 LO-REV. CLUTCH
11 GOVERNOR
12 VOID
13 DRIVE
14 1-2 ACCUMULATOR
15 GOVERNOR TO 1-2
16 GOVERNOR TO 2-3
17 LO-1ST
18 INTER. BAND FEED
19 REVERSE TO DIRECT CL.
20 SHIFT THROTTLE VALVE
21 PUMP INTAKE
22 REVERSE BOOST
23 THROTTLE VALVE
24 2ND
25 SHIFT THROTTLE VALVE FEED
26 PART THROTTLE
27 DIRECT CL. ACCUM.
28 THROTTLE VALVE EX.
29 LINE BOOST
30 DIRECT CLUTCH FEED

Figure 26

FORWARD CLUTCH HOUSING ASSEMBLIES

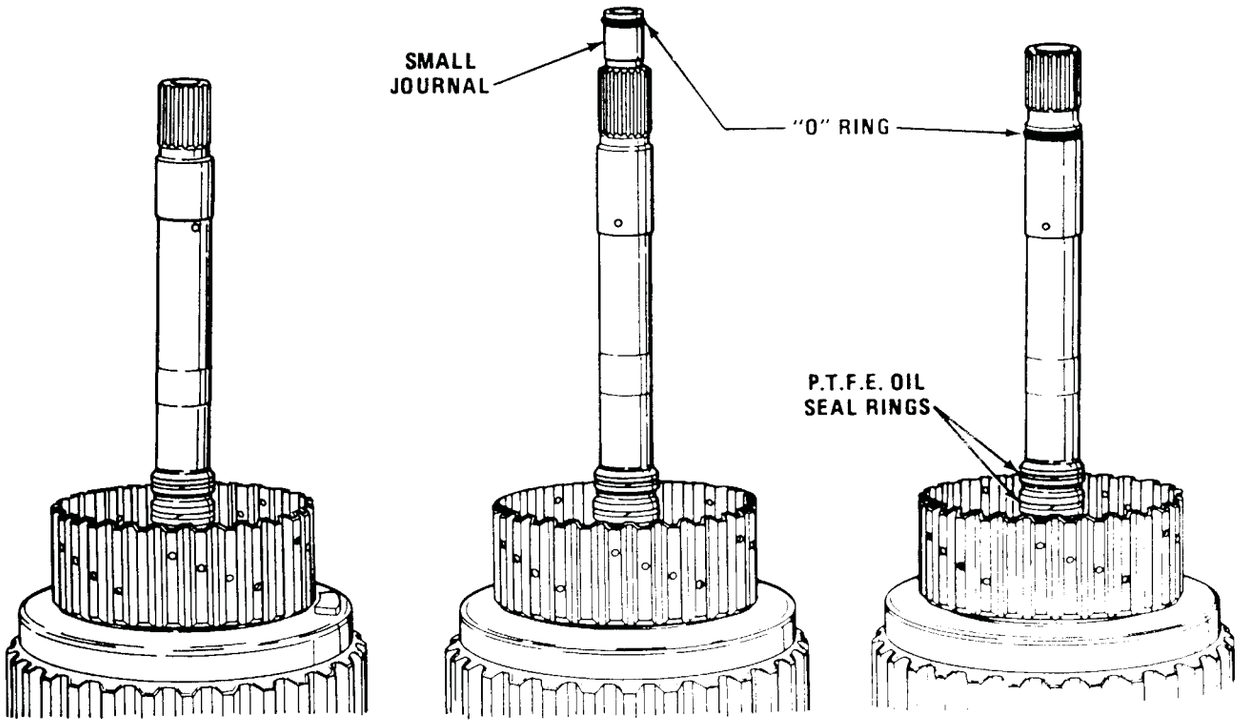
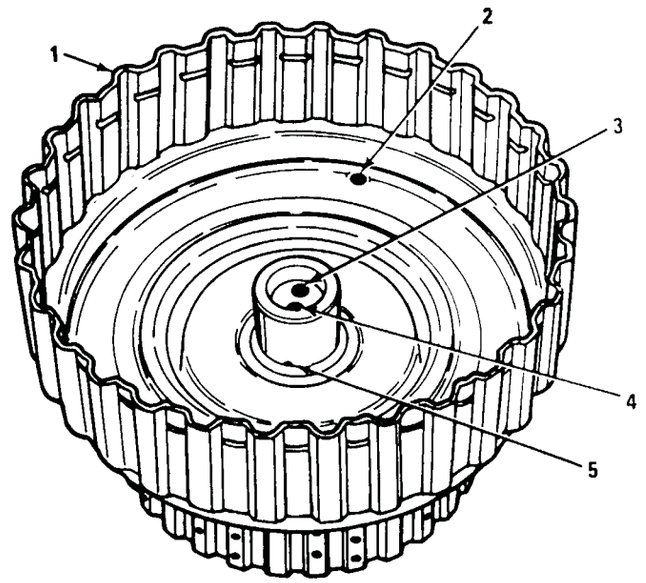


Figure 27

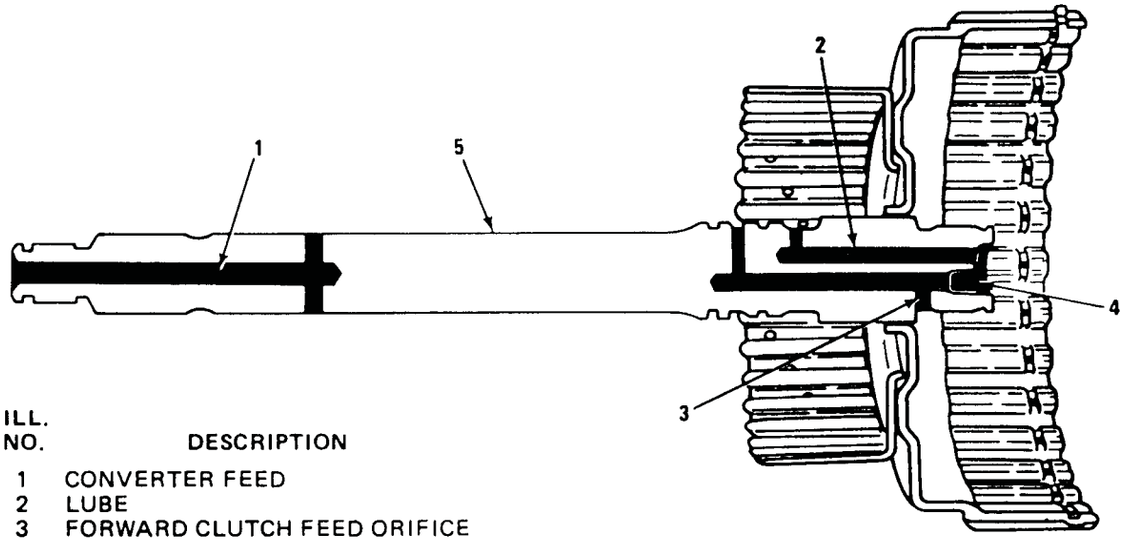
FORWARD CLUTCH HOUSING PASSAGES



ILL. NO.	DESCRIPTION
1	FORWARD CLUTCH HOUSING
2	EXHAUST CHECK BALL
3	LUBE HOLE
4	CUP PLUG
5	FORWARD CLUTCH FEED HOLE

Figure 28

FORWARD CLUTCH HOUSING PASSAGES



ILL. NO.	DESCRIPTION
1	CONVERTER FEED
2	LUBE
3	FORWARD CLUTCH FEED ORIFICE
4	CUP PLUG
5	TURBINE SHAFT

Figure 29

DIRECT CLUTCH HOUSING

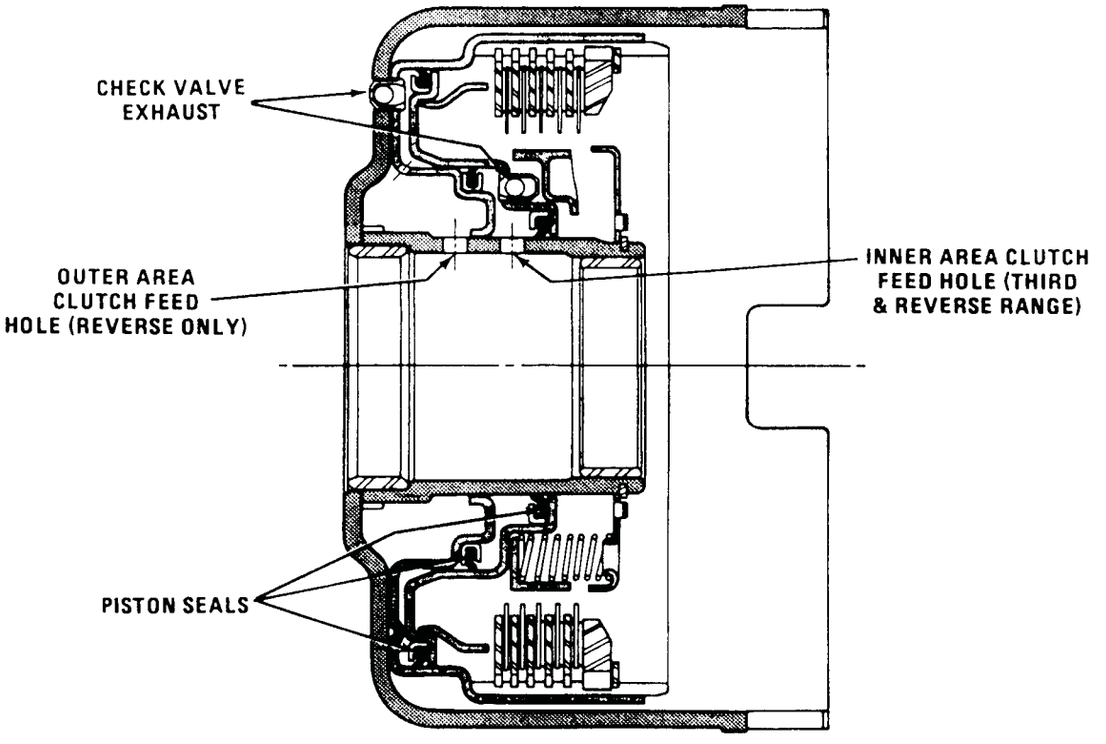


Figure 30

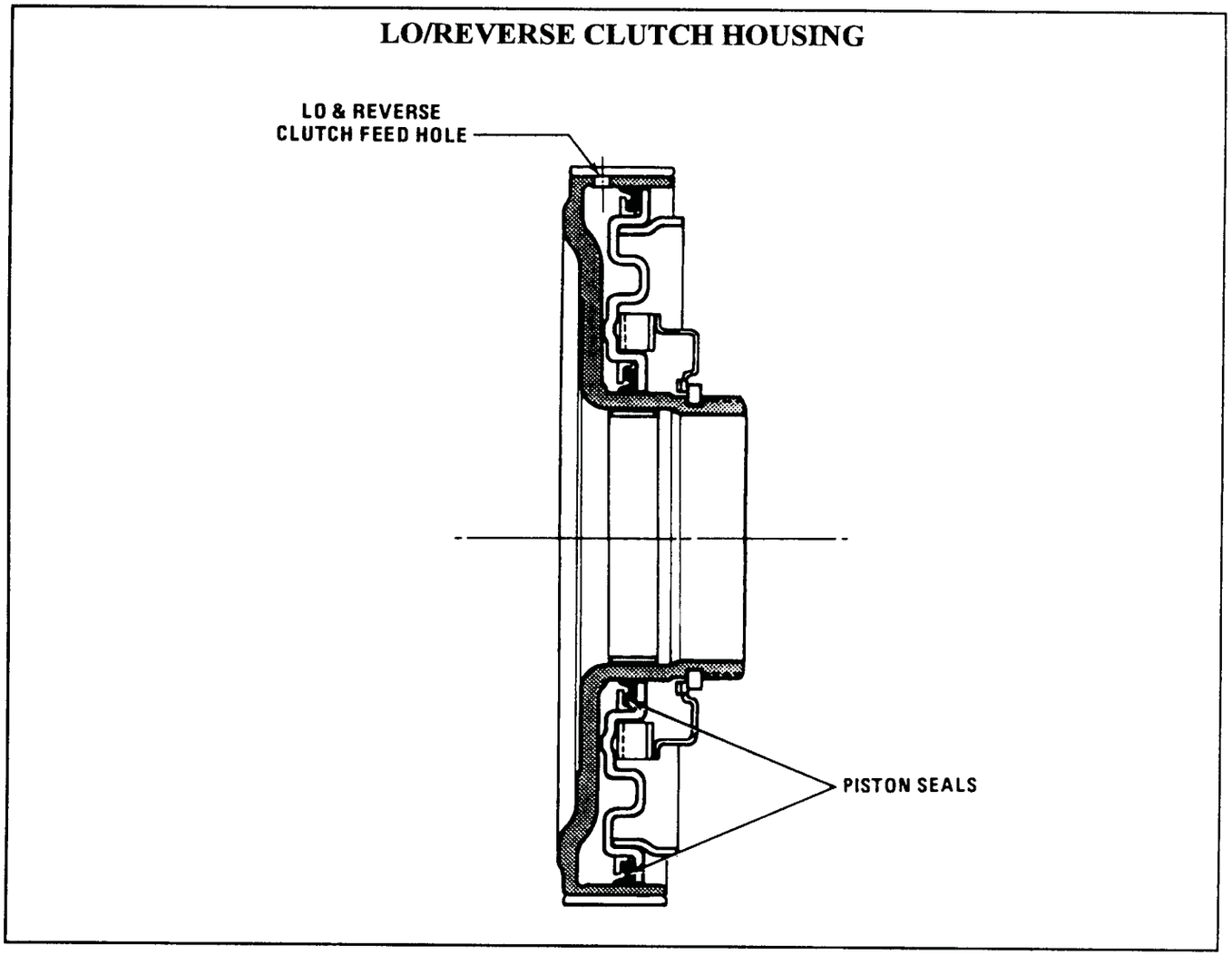


Figure 31

CASE AND EXTERNAL PARTS

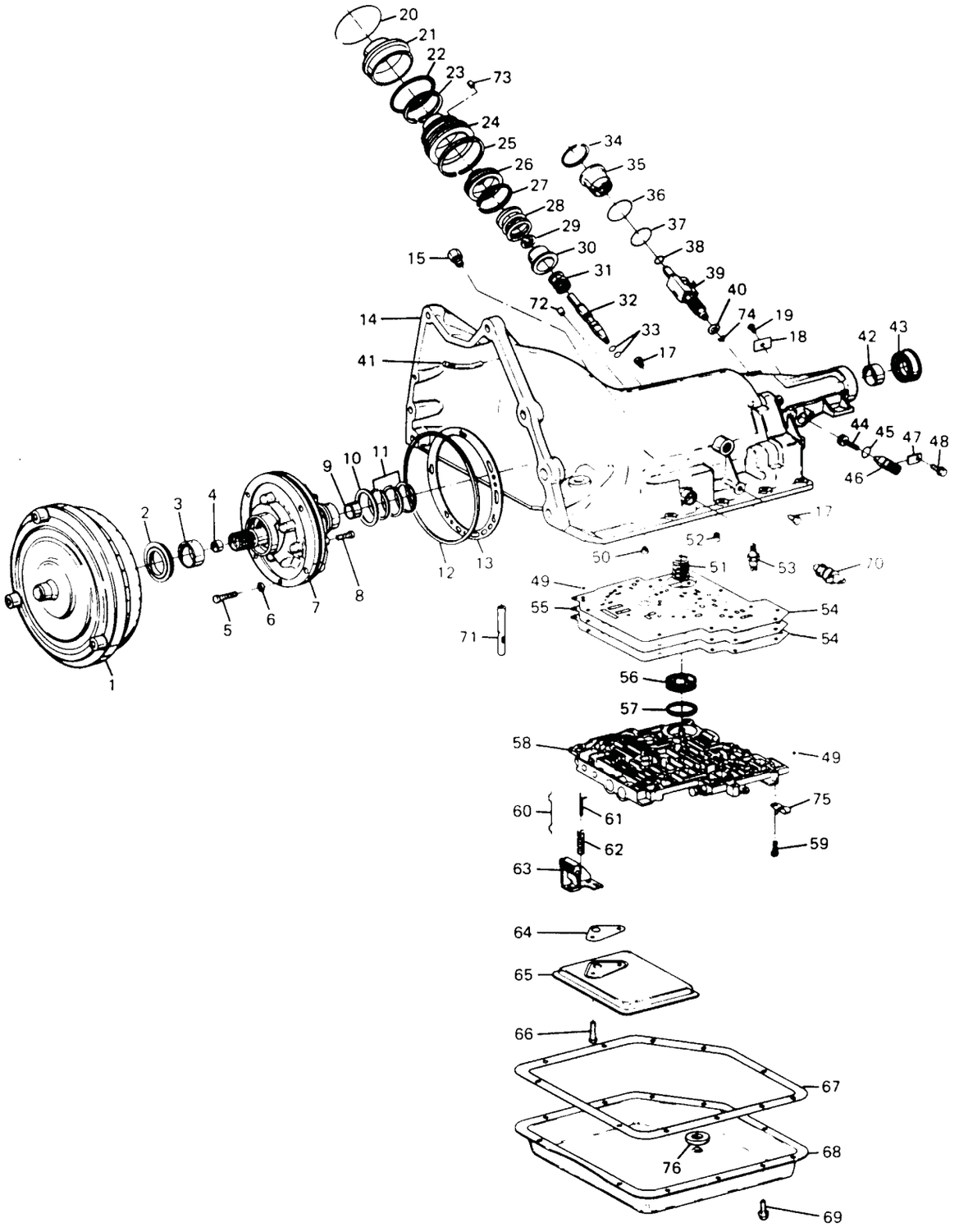


Figure 32

ILL. NO.	DESCRIPTION
1	CONVERTER ASSEMBLY, COMPLETE
2	HELIX SEAL ASSEMBLY, OIL FRONT
3	BUSHING, PUMP BODY
4	BUSHING, PUMP COVER (FRONT)
5	BOLT, PUMP TO CASE M8 X 1.25 X 35
6	WASHER, PUMP TO CASE BOLT
7	PUMP BODY ASSEMBLY
8	BOLT, PUMP CASE M8 X 1.25 X 45
9	BUSHING, PUMP COVER (REAR)
10	WASHER, THRUST PUMP TO DIRECT CLUTCH HSG.
11	RING, OIL SEAL PUMP COVER (TEFLON)
12	SEAL, RING (PUMP/CASE)
13	GASKET, PUMP TO CASE
14	CASE, TRANSMISSION
15	CONNECTOR, INVERTED FLARE (BRASS)
17	PLUG, HEX HEAD (1/8" PIPE)
18	NAMEPLATE
19	SCREW, TRUSS-HD. DRIVE NAMEPLATE
20	RING, SERVO COVER RETAINER
21	COVER, INTERMEDIATE SERVO
22	SEAL, "O" RING (INTERMEDIATE SERVO COVER)
23	RING, OIL SEAL (OUTER)
24	PISTON, INTERMEDIATE SERVO (OUTER)
25	RING, OIL SEAL (INNER)
26	PISTON, INTERMEDIATE SERVO (INNER)
27	RING, OIL SEAL PISTON (INNER)
28	SPRING, INTERMEDIATE SERVO CUSHION
29	RING, SNAP
30	RETAINER, SERVO SPRING
31	SPRING, INTERMEDIATE SERVO (INNER)
32	PIN, INTERMEDIATE BAND APPLY
33	SEAL, INTERMEDIATE BAND APPLY PIN
34	RING, GOVERNOR COVER RETAINER
35	COVER KIT, GOVERNOR W/SEAL
36	SEAL KIT, GOVERNOR W/COVER
37	SEAL, GOVERNOR COVER
38	RING, OIL SEAL
39	GOVERNOR
40	WASHER, THRUST GOVERNOR DRIVE GEAR/CASE
41	PIPE, VENT
42	BUSHING, TRANSMISSION CASE (REAR)
43	SEAL, EXTERNAL OIL
49	BALL, CHECK (5)
50	PIN, BAND ANCHOR
51	SPRING, 1-2 ACCUMULATOR PISTON
52	SEAL, REVERSE OIL (CASE TO HOUSING)
53	SWITCH, PRESSURE TRANSMISSION VALVE BODY
54	GASKET KIT, VALVE BODY/SPACER PLATE
55	PLATE, VALVE BODY SPACER
56	PISTON, 1-2 ACCUMULATOR
57	SEAL, ACCUMULATOR PISTON
58	VALVE, CONTROL
59	BOLT, HEX HEAD 6.3 X 1 X 45
60	LINK, THROTTLE LEVER TO CABLE
61	LIFTER, T.V. EXHAUST VALVE
62	SPRING, LIFTER T.V. EXHAUST VALVE
63	LEVER, W/BRACKET THRUST
64	GASKET, TRANSMISSION OIL PUMP SCREEN
65	SCREEN ASSEMBLY, TRANSMISSION OIL
66	BOLT, HEX HEAD 6.3 X 1 X 55
67	GASKET, TRANSMISSION OIL
68	PAN, TRANSMISSION OIL
69	SCREW & CONICAL WASHER ASM., HEX HEAD
70	ELECTRICAL CONNECTOR & "O" RING ASM.
71	CHECK VALVE ASSEMBLY, 3RD ACCUMULATOR
72	PLUG, CUP (6, 4 DIA.) (2)
73	PLUG, ORIFICE (SERVO PISTON)
74	RING, GOVERNOR GEAR RETAINING
75	CLIP, ELECTRICAL WIRE
76	MAGNET
77	PRESSURE SWITCH BRACKET ASM., 3RD CLUTCH

Figure 32 Legend

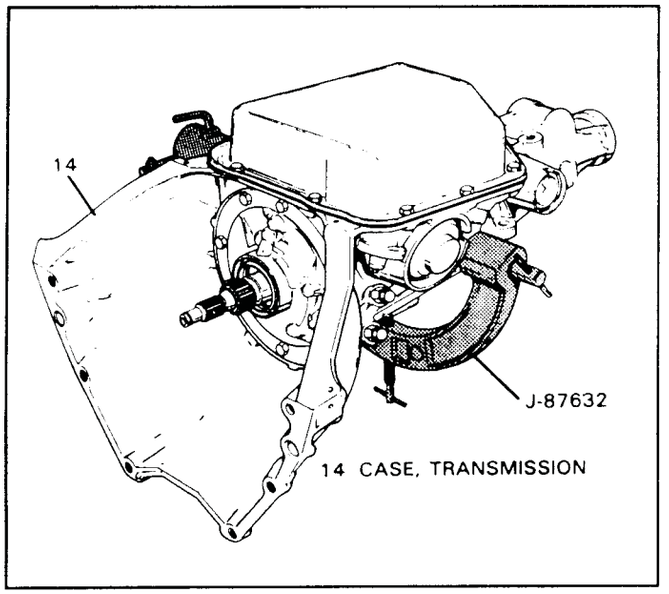


Figure 33

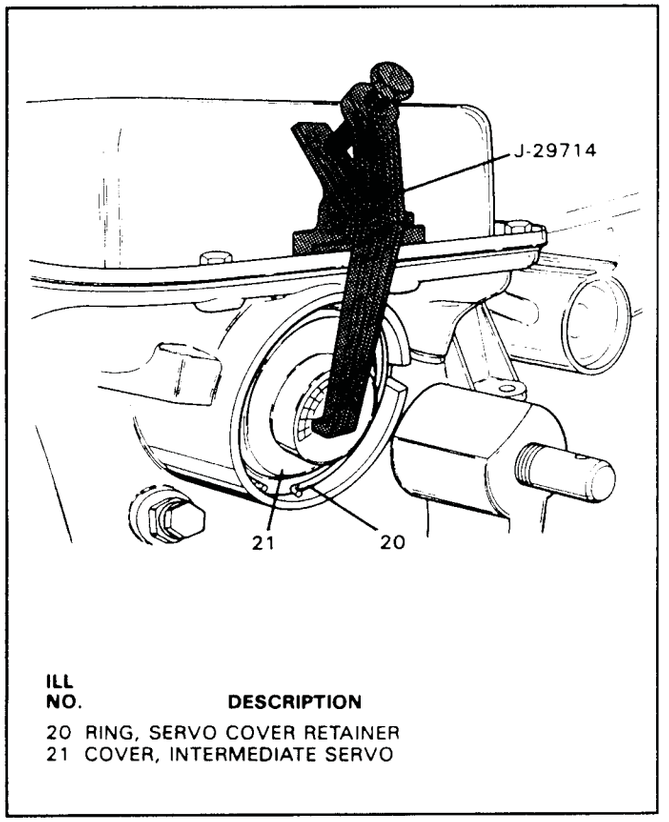


Figure 34

GENERAL SERVICE INFORMATION

- OIL SEAL RINGS
  If any seal rings are damaged, cut or do not rotate freely in their groove, be certain to check the ring groove for debeis, burrs, or damage.
- THRUST WASHER SURFACES
  Thrust washers and bearing surfaces may appear to be polished. This is a normal condition, and should not be considered damage.
- SNAP RINGS
  Do not over expand snap rings during removal and installation process.

TRANSMISSION DISASSEMBLY

MAIN CASE AND EXTERNAL PARTS

1. Thoroughly clean the exterior of the transmission before disassembly.
2. Remove the torque converter from transmission.
3. Install J-8763-02 holding fixture on transmission case, as shown in Figure 33.
4. Mount holding fixture and transmission into the base on work bench, as shown in Figure 33.
5. Drain the transmission through the rear of the transmission into a sutiable drain pan.
6. Rotate the transmission with the bottom pan facing up, as shown in Figure 33.
7. Install servo cover compressor tool J-29714 on case with two oil pan bolts (See Figure 34).
8. Compress the servo cover using the bolt.
9. Remove the servo cover retaining ring, using a small screwdriver (See Figure 34).
10. Remove the servo compressor tool.
11. Remove the intermediate servo assembly from the case servo bore (See Figure 35).

SERVO PIN LENGTH

12. As a diagnostic aid, the servo pin length should now be checked for proper length.
13. Install J-25014-2 checking tool in intermediate servo bore, and retain with the servo cover snap ring, as shown in Figure 36. Align the retaining ring with gap at case slot.
14. Install pin J-25014-1, and assure tapered pin end is against band apply lug (See Figure 36).
15. Install dial indicator against top of J-25014-2 zero post, as shown in Figure 36.
16. Apply 100 in.lbs. to hex nut on the gaging tool as shown in Figure 36.
17. Use the servo pin selection chart in Figure 37 to determine the correct pin length.

ILL. NO.	DESCRIPTION
20	RING, SERVO COVER RETAINER
21	COVER, INTERMEDIATE SERVO
22	SEAL, "O" RING (INTERMEDIATE SERVO COVER)
23	RING, OIL SEAL (OUTER)
24	PISTON, INTERMEDIATE SERVO (OUTER)
25	RING, OIL SEAL (INNER)
26	PISTON, INTERMEDIATE SERVO (INNER)
27	RING, OIL SEAL PISTON (INNER)
28	SPRING, INTERMEDIATE SERVO CUSHION
29	RING, SNAP
30	RETAINER, SERVO SPRING
31	SPRING, INTERMEDIATE SERVO (INNER)
32	PIN, INTERMEDIATE BAND APPLY
33	SEAL, INTERMEDIATE BAND APPLY PIN
34	RING, GOVERNOR COVER RETAINER
35	COVER KIT, GOVERNOR W/SEAL
36	SEAL KIT, GOVERNOR W/COVER
37	SEAL, GOVERNOR COVER
39	GOVERNOR

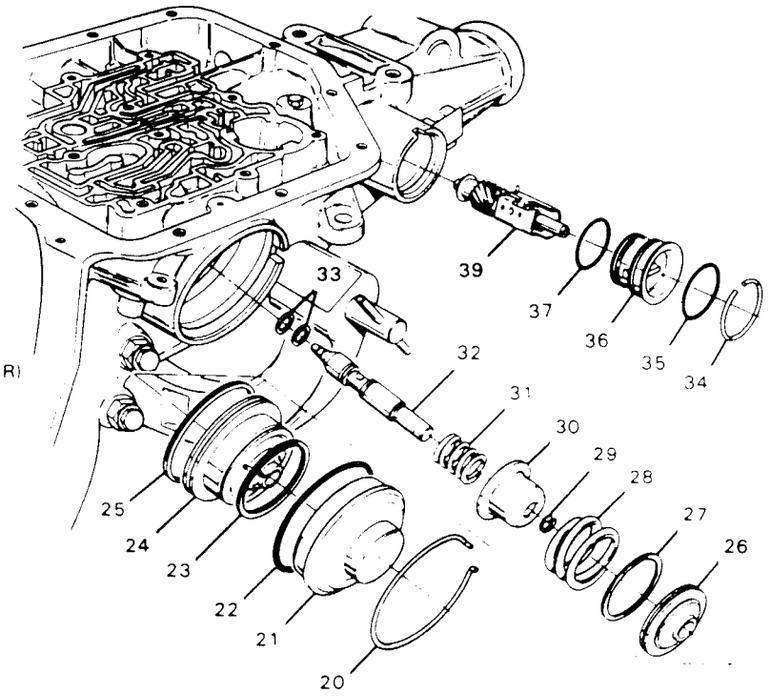
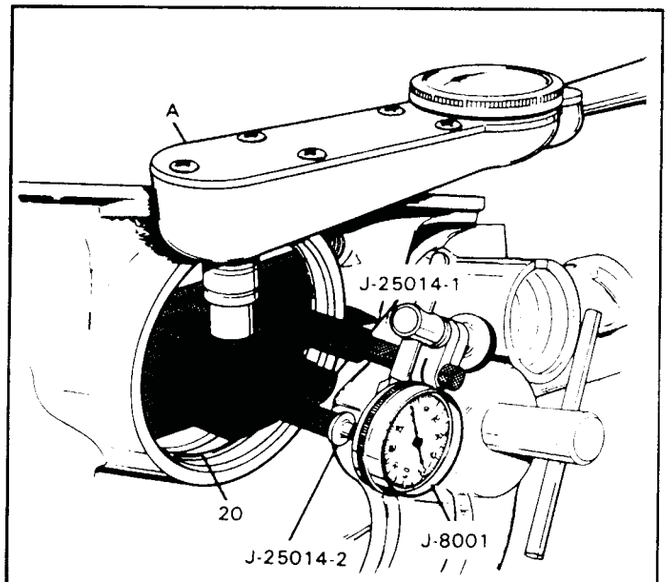


Figure 35



ILL NO.	DESCRIPTION
A	TORQUE WRENCH
20	RING, SERVO COVER RETAINER

Figure 36

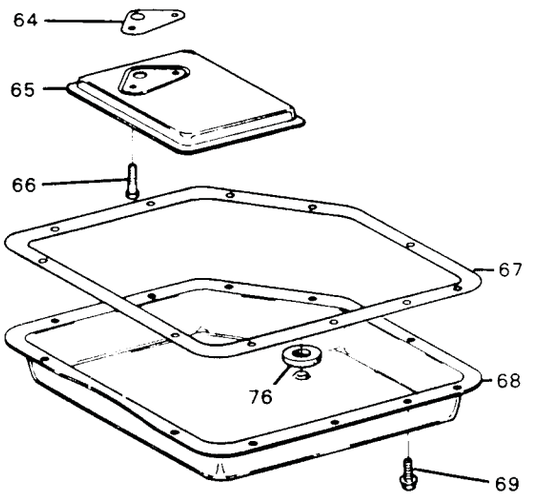
DIAL INDICATOR TRAVEL		APPLY PIN IDENTIFICATION
.0 - .72mm	(.0" - .029")	1 RING
.72 - 1.44mm	(.029" - .057")	2 RINGS
1.44 - 2.16mm	(.057" - .086")	3 RINGS
2.16 - 2.88mm	(.086" - .114")	WIDE BAND

Figure 37

GOVERNOR ASSEMBLY

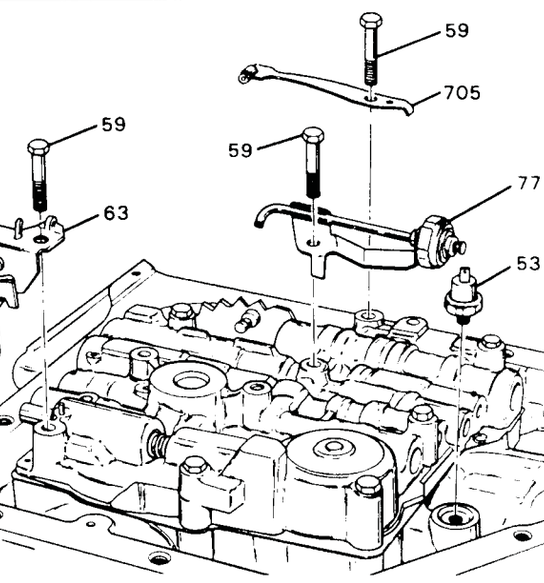
18. Remove the governor cover retaining ring from the case (See Figure 35).
19. Remove the governor cover and both seals, as shown in Figure 35.
20. Remove the governor assembly from the case, as shown in Figure 35. It may be necessary to turn the output shaft counterclockwise to remove the governor.
21. DO NOT USE PLIERS TO REMOVE THE GOVERNOR ASSEMBLY FROM CASE.

(Continued on next Page)



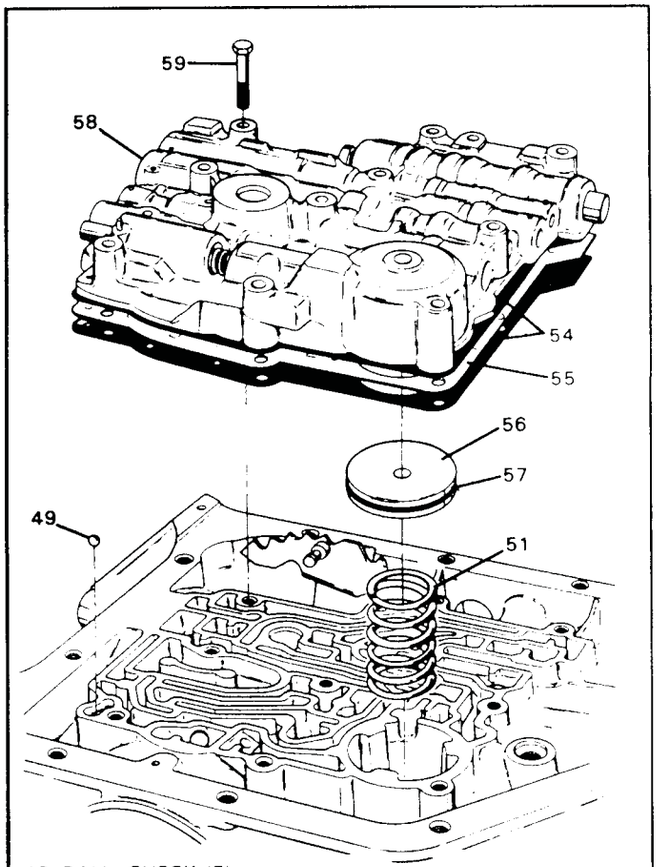
ILL NO.	DESCRIPTION
64	GASKET, TRANSMISSION OIL PUMP SCREEN
65	SCREEN ASSEMBLY, TRANSMISSION OIL
66	BOLT, HEX HEAD 6.3 X 1 X 55
67	GASKET, TRANSMISSION OIL
68	PAN, TRANSMISSION OIL
69	SCREW & CONICAL WASHER ASM., HEX HEAD
76	MAGNET

Figure 38



ILL. NO.	DESCRIPTION
53	SWITCH, PRESSURE TRANSMISSION VALVE BODY
59	BOLT, HEX HEAD 6.3 X 1 X 45
63	LEVER, W/BRACKET THRUST
77	PRESSURE SWITCH BRACKET ASM., 3RD CLUTCH
705	ROLLER, DETENT MANUAL & SPRING

Figure 39

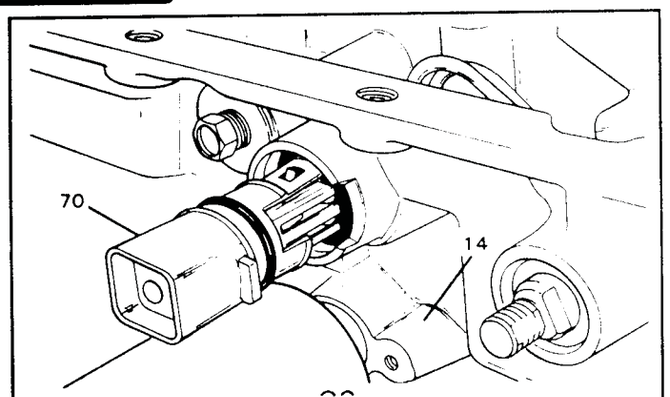


49	BALL, CHECK (5)
51	SPRING, 1-2 ACCUMULATOR PISTON
54	GASKET, VALVE BODY/SPACER PLATE
55	PLATE, VALVE BODY SPACER
56	PISTON, 1-2 ACCUMULATOR
57	SEAL, ACCUMULATOR PISTON
58	VALVE, CONTROL
59	BOLT, HEX HEAD 6.3 X 1 X 45

Figure 40

(Continued from Page 29)

22. Remove the oil pan and gasket, and discard the pan gasket.
23. Remove the two oil screen retaining bolts, and remove the oil screen (See Figure 38).
24. Oil screen attaching bolts are approximately 3/8" longer than valve body retaining bolts. Ensure that you do not interchange them.
25. Remove the wires from pressure switches and the wire clips (See Figure 39).
26. Remove governor switch from the case if the unit is so equipped (See Figure 39).
27. Remove wire from 3rd clutch pressure switch, if so equipped, and the switch and bracket assembly (See Figure 39).
28. Remove the throttle lever and bracket assembly as shown in Figure 39.
29. Remove the manual lever detent roller and spring assembly, as shown in Figure 39.



ILL. NO.	DESCRIPTION
14	CASE, TRANSMISSION
70	ELECTRICAL CONNECTOR & "O" RING ASM.

Figure 41

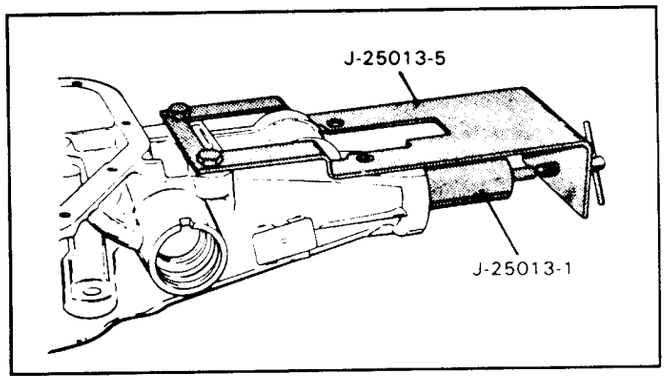
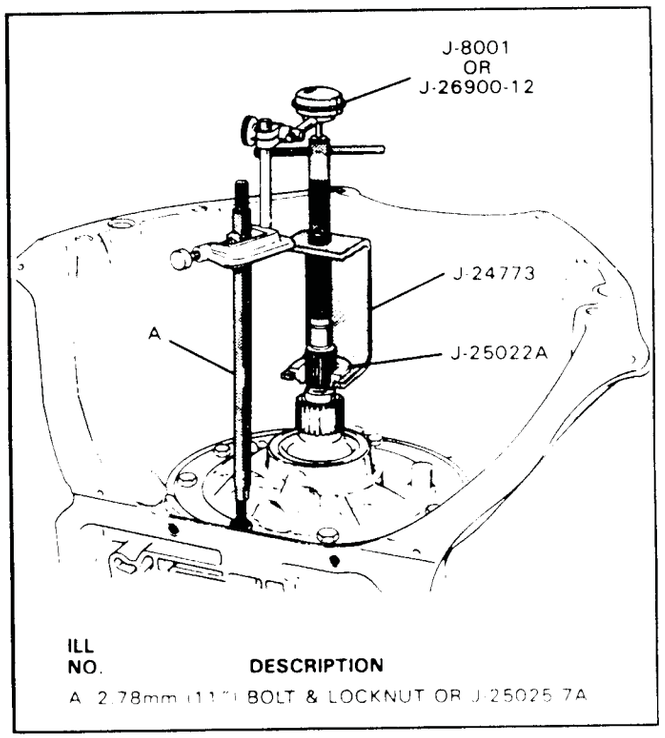


Figure 42

30. Remove the remaining valve body attaching bolts and remove the valve body, spacer plate, and both gaskets. Discard both valve body gaskets. There are 4 checkballs in the valve body, don't lose them. (See Figure 40).
31. Remove the 1-2 accumulator piston and spring, as shown in Figure 40.
32. Remove the number 5 checkball from case, if it is so equipped (See Figure 40).
33. Remove the electrical connector from the case and discard the "O" ring (See Figure 41).
34. Install output shaft and rear support fixture at this time, as shown in Figure 42.
35. Rotate transmission so that pump is facing up, and install dial indicator and lifting tool on transmission as shown in Figure 43.
36. As a diagnostic aid transmission end play should be checked prior to removing the internal parts.
37. Zero the dial indicator, pull up on lifting tool, and end play should measure .015" to .030".
38. Refer to Figure 43, and the washer selection chart in Figure 44.



ILL NO.	DESCRIPTION
A	2.78mm (.11") BOLT & LOCKNUT OR J-25025-7A

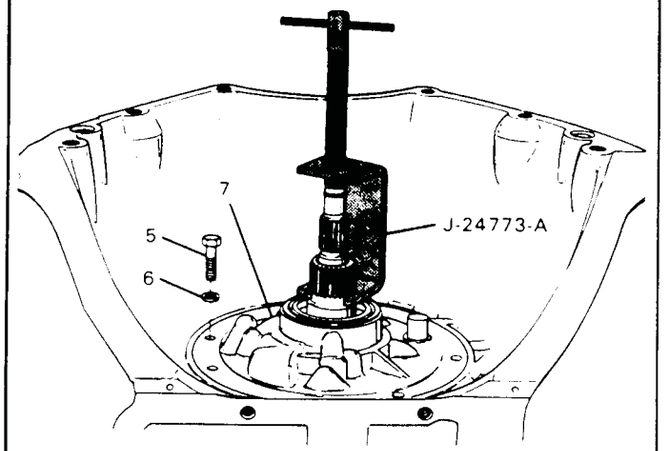
Figure 43

THICKNESS		IDENTIFICATION NUMBER AND/OR COLOR
1.66-1.77mm	(0.065"-0.070")	1 -
1.79-1.90mm	(0.070"-0.075")	2 -
1.92-2.03mm	(0.076"-0.080")	3 BLACK
2.05-2.16mm	(0.081"-0.085")	4 LIGHT GREEN
2.18-2.29mm	(0.086"-0.090")	5 SCARLET
2.31-2.42mm	(0.091"-0.095")	6 PURPLE
2.44-2.55mm	(0.096"-0.100")	7 COCOA BROWN
2.57-2.68mm	(0.101"-0.106")	8 ORANGE
2.70-2.81mm	(0.106"-0.111")	9 YELLOW
2.83-2.94mm	(0.111"-0.116")	10 LIGHT BLUE
2.96-3.07mm	(0.117"-0.121")	11 BLUE
3.09-3.20mm	(0.122"-0.126")	12 -
3.22-3.33mm	(0.127"-0.131")	13 PINK
3.35-3.46mm	(0.132"-0.136")	14 GREEN
3.48-3.59mm	(0.137"-0.141")	15 GRAY

Figure 44

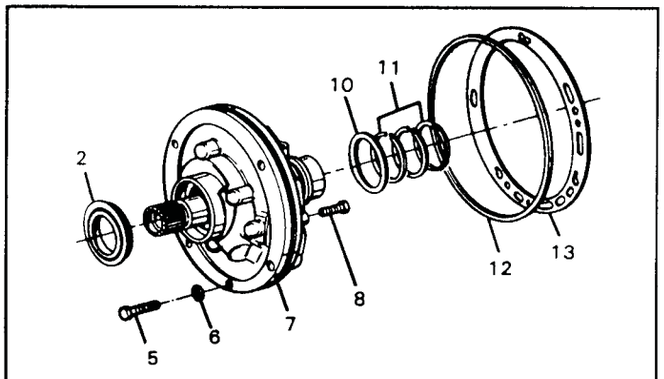
39. Remove the dial indicator and lifting tool from the transmission (See Figure 43).
40. DO NOT remove the output shaft and the rear support tool, leave in place (See Figure 42).

(Continued on next Page)



ILL. NO.	DESCRIPTION
5	BOLT, PUMP TO CASE M8 X 1.25 X 35
6	WASHER, PUMP TO CASE BOLT
7	PUMP BODY ASSEMBLY

Figure 45



ILL. NO.	DESCRIPTION
2	HELIX SEAL ASSEMBLY, OIL FRONT
5	BOLT, PUMP TO CASE M8 X 1.25 X 35
6	WASHER, PUMP TO CASE BOLT
7	PUMP BODY ASSEMBLY
8	BOLT, PUMP CASE M8 X 1.25 X 45
10	WASHER, THRUST PUMP TO DIRECT CLUTCH HSG.
11	RING, OIL SEAL PUMP COVER (TEFLON)
12	SEAL, RING (PUMP/CASE)
13	GASKET, PUMP TO CASE

Figure 46

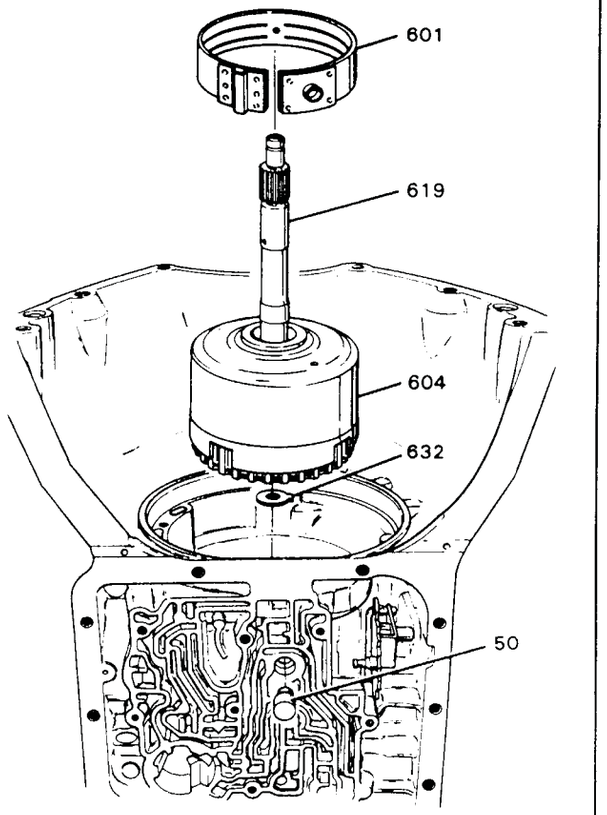
OIL PUMP AND INTERNAL PARTS

1. Remove all remaining oil pump bolts and washers (See Figure 45).
2. Install oil pump remover J-24773-A, as shown in Figure 45.
3. Remove the oil pump by turning "T" handle on the pump removing tool (See Figure 45).
4. Remove the pump to case sealing ring, oil pump to case gasket, pump cover sealing rings, and discard all of them (See Figure 46).
5. Remove the oil pump to direct clutch drum thrust washer (See Figure 46).
6. Set the oil pump aside for component assembly.
7. Grasp the turbine shaft and lift out the forward clutch housing, and the direct clutch housing as one assembly (See Figure 47).
8. Remove the band anchor pin (See Figure 47).
9. Remove the intermediate band assembly, shown in Figure 47.
10. Remove the output shaft to turbine shaft front selective thrust washer (See Figure 47).

REAR END PLAY CHECK

11. As a diagnostic aid transmission rear unit end play should be checked prior to removing all of the internal parts.
12. Install dial indicator with extension set on output shaft, as shown in Figure 48, and zero indicator.
13. Move output shaft upward by turning adjusting screw on rear holding tool J-25013-5.
14. End play should be .005" to.010".
15. Use the chart in Figure 49 to select the proper thrust washer thickness.

(Continued on Page 36)



ILL. NO.	DESCRIPTION
50	PIN, BAND ANCHOR
601	BAND ASSEMBLY, INTERMEDIATE
604	HOUSING, DIRECT CLUTCH & SEAL
619	HOUSING ASSEMBLY, FORWARD CLUTCH
632	WASHER, THRUST SELECTIVE (FRONT)

Figure 47

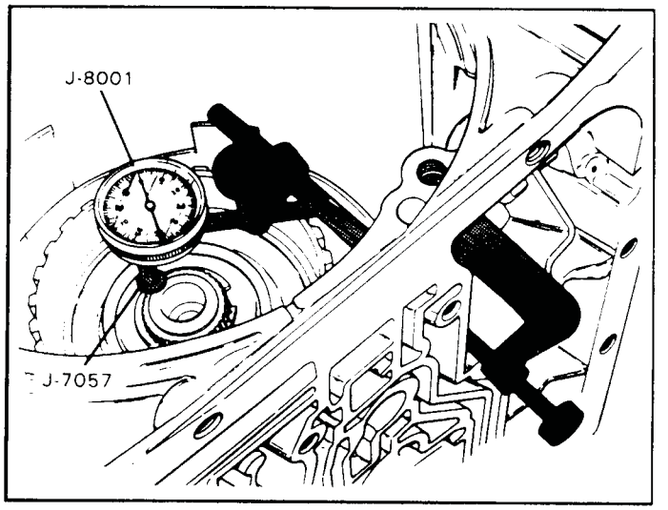


Figure 48

THICKNESS		IDENTIFICATION NUMBER AND/OR COLOR
2.90-3.01mm	(0.114"-0.119")	1 - ORANGE
3.08-3.19mm	(0.121"-0.126")	2 - WHITE
3.26-3.37mm	(0.128"-0.133")	3 - YELLOW
3.44-3.55mm	(0.135"-0.140")	4 - BLUE
3.62-3.73mm	(0.143"-0.147")	5 - RED
3.80-3.91mm	(0.150"-0.154")	6 - BROWN
3.98-4.09mm	(0.157"-0.161")	7 - GREEN
4.16-4.27mm	(0.164"-0.168")	8 - BLACK
4.34-4.45mm	(0.171"-0.175")	9 - PURPLE

Figure 49

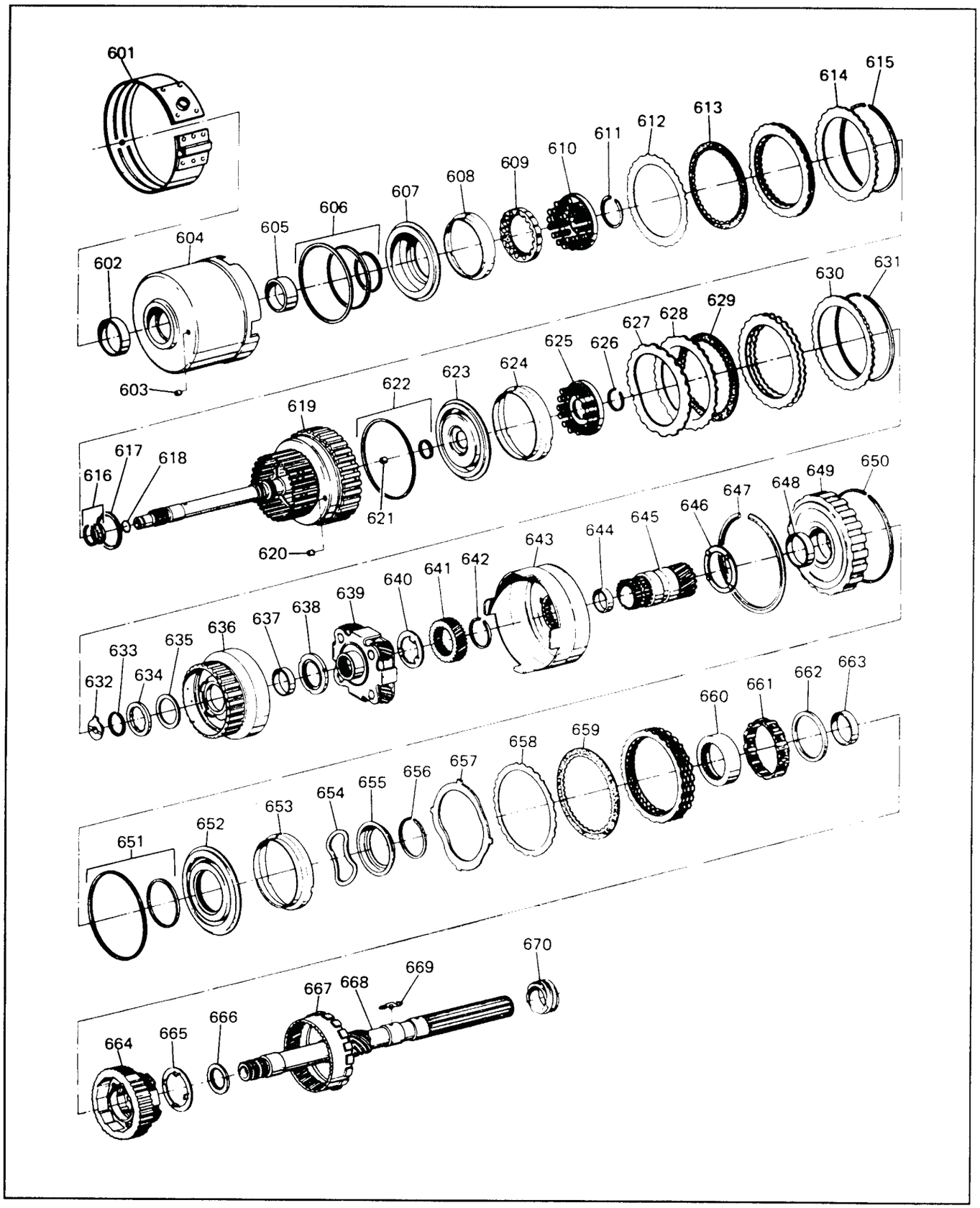
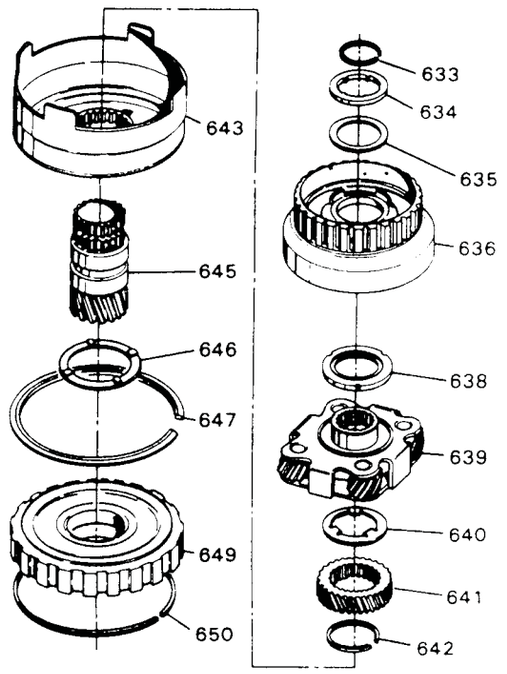


Figure 50

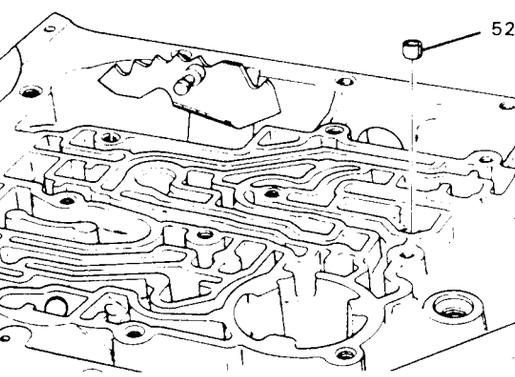
ILL. NO.	DESCRIPTION
601	BAND, INTERMEDIATE
602	BUSHING, DIRECT CLUTCH (FRONT)
603	RETAINER, CHECK W/BALL
604	HOUSING, DIRECT CLUTCH & SEAL
605	BUSHING, DIRECT CLUTCH (REAR)
606	SEAL KIT, DIRECT CLUTCH
607	PISTON ASSEMBLY, DIRECT CLUTCH
608	RING, DIRECT CLUTCH APPLY
609	GUIDE, RELEASE SPRING
610	RETAINER & SPRING
611	RING, SPRING RETAINER (SNAP)
612	PLATE, DIRECT CLUTCH (FLAT STEEL) 2.324
613	PLATE, DIRECT CLUTCH (FLAT STEEL)
614	PLATE, DIRECT (FORWARD CLUTCH BACKING)
615	RING, SNAP (FORWARD CLUTCH HOUSING)
616	SEAL, RING (TURBINE SHAFT)
617	WASHER, DIRECT & FORWARD CLUTCH (THRUST)
618	SEAL, TURBINE SHAFT TO SELECTIVE WASHER
619	HOUSING ASSEMBLY, FORWARD CLUTCH
620	RETAINER, CHECK VALVE W/BALL
621	PLUG, CUP TURBINE SHAFT
622	SEAL KIT, FORWARD CLUTCH PISTON
623	PISTON, FORWARD CLUTCH W/RING
624	RING, FORWARD CLUTCH APPLY
625	RETAINER, FORWARD CLUTCH W/SPRING
626	RING, SNAP FORWARD SPRING RETAINER
627	PLATE, FORWARD CLUTCH (WAVED)
628	PLATE, FORWARD CLUTCH (FLAT STEEL) 2.045
629	PLATE, FORWARD CLUTCH BACKING
630	PLATE, FORWARD CLUTCH (FLAT STEEL) 6.30mm
631	RING, DIRECT CLUTCH PLATE HOUSING (SNAP)
632	WASHER, THRUST SELECTIVE (FRONT)
633	RING, OUTPUT SHAFT (SNAP)
634	WASHER, SELECTIVE
635	WASHER, FRONT INTERNAL GEAR
636	GEAR, FRONT INTERNAL /BUSHING
637	BUSHING, FRONT INTERNAL GEAR
638	BEARING, FRONT INTERNAL CARRIER THRUST
639	CARRIER, FRONT
640	BEARING, FRONT CARRIER SUN GEAR W/RACE
641	GEAR, FRONT SUN
642	RING, SNAP (DRUM TO SUN GEAR)
643	DRUM, INPUT
644	BUSHING, REAR SUN GEAR
645	GEAR, REAR SUN W/BUSHING
646	WASHER, THRUST (DRUM TO HOUSING)
647	RING, SNAP HOUSING TO CASE
648	BUSHING, REVERSE CLUTCH HSG. 53.13 X 9.53
649	HOUSING ASSEMBLY, LO & REVERSE CLUTCH
650	SPACER, REVERSE CLUTCH HOUSING
651	SEAL KIT, REVERSE CLUTCH
652	PISTON ASSEMBLY, LO & REVERSE CLUTCH
653	RING, LO & REVERSE
654	SPRING, REVERSE CLUTCH RELEASE (WAVE)
655	RETAINER, LO & REVERSE CLUTCH SUPPORT
656	RING, RETAINER REVERSE CLUTCH HSG. (SNAP)
657	PLATE, REVERSE CLUTCH (WAVED)
658	PLATE, REVERSE CLUTCH (FLAT)
659	PLATE, REVERSE CLUTCH (FACED)
660	RACE, LO ROLLER CLUTCH
661	ROLLER, LO CLUTCH
662	WASHER, REAR CARRIER TO LO ROLLER CL. THRUST
663	BUSHING, REAR CARRIER
664	CARRIER ASSEMBLY, REAR (COMPLETE)
665	WASHER, REAR CARRIER TO INT. GEAR THRUST
666	BEARING, THRUST (SUN GEAR TO INT. GEAR)
667	GEAR, REAR INTERNAL
668	SHAFT, OUTPUT W/BUSHING
669	CLIP, SPEEDO DRIVE GEAR
670	GEAR, SPEEDO DRIVE

Figure 50 Legend



ILL. NO.	DESCRIPTION
633	RING, OUTPUT SHAFT (SNAP)
634	WASHER, SELECTIVE
635	WASHER, FRONT INTERNAL GEAR
636	GEAR, FRONT INTERNAL /BUSHING
638	BEARING, FRONT INTERNAL CARRIER THRUST
639	CARRIER, FRONT
640	BEARING, FRONT CARRIER SUN GEAR W/RACE
641	GEAR, FRONT SUN
642	RING, SNAP (DRUM TO SUN GEAR)
643	DRUM, INPUT
645	GEAR, REAR SUN W/BUSHING
646	WASHER, THRUST (DRUM TO HOUSING)
647	RING, SNAP HOUSING TO CASE
649	HOUSING ASSEMBLY, REVERSE & LO CLUTCH
650	SPACER, REVERSE CLUTCH HOUSING

Figure 51



ILL. NO.	DESCRIPTION
52	SEAL, REVERSE OIL (CASE TO HOUSING)

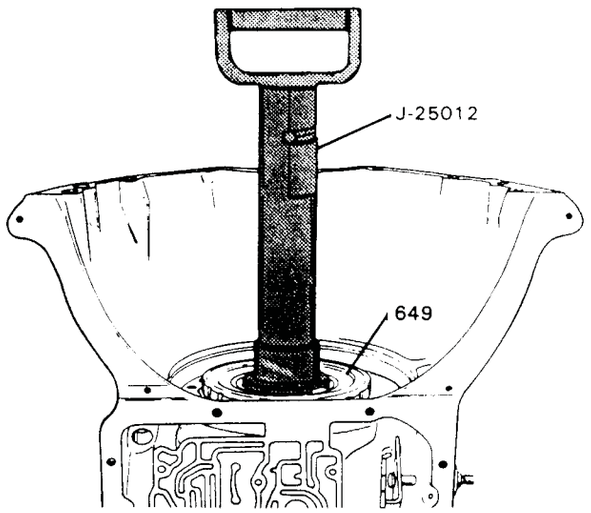
HH0043-200C

Figure 52

REAR UNIT PLANETARY GEAR SETS

1. Remove the output shaft snap ring using a pair of snap ring pliers. Use care not to over expand the snap ring (See Figure 51).
2. Remove the front planetary ring gear with the selective washer and thrust washer, as shown in Figure 51.
3. Remove the front planetary carrier with the thrust bearing as shown in Figure 51.
4. Remove the thrust bearing assembly and the input sun gear as shown in Figure 51.
5. Remove the sun gear shell and the rear sun gear, as shown in Figure 51. Thrust washer (646) may be stuck to back of sun gear shell (See Figure 51).
6. Remove the Lo/Reverse oil seal from the case using a #4 screw extractor (See Figure 52).
7. Remove the snap ring from transmission case that retains the Lo/Reverse clutch housing(Figure 51).
8. Remove the Lo/Reverse clutch housing, using the removal tool J-25012, as shown in Figure 53.
9. Remove the remaining components by grasping the output shaft and lifting upwards to remove them from the transmission case (See Figure 54).

(Continued on Page 38)



ILL. NO.	DESCRIPTION
649	HOUSING ASSEMBLY, REVERSE & LO CLUTCH

Figure 53

657 PLATE, REVERSE CLUTCH (WAVED)
658 PLATE, REVERSE CLUTCH (FLAT)
659 PLATE, REVERSE CLUTCH (FACED)
660 RACE, LO ROLLER CLUTCH
661 ROLLER, LO CLUTCH
662 WASHER, REAR CARRIER TO LO ROLLER CL. THRUST
664 CARRIER ASSEMBLY, REAR (COMPLETE)
665 WASHER, REAR CARRIER TO INT. GEAR THRUST
666 BEARING, THRUST (SUN GEAR TO INT. GEAR)
667 GEAR, REAR INTERNAL
668 SHAFT, OUTPUT W/BUSHING
669 CLIP, SPEEDO DRIVE GEAR

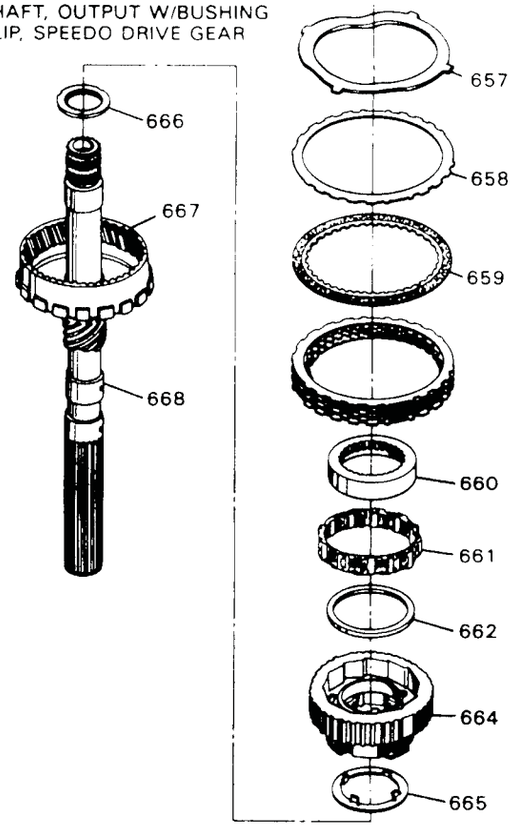
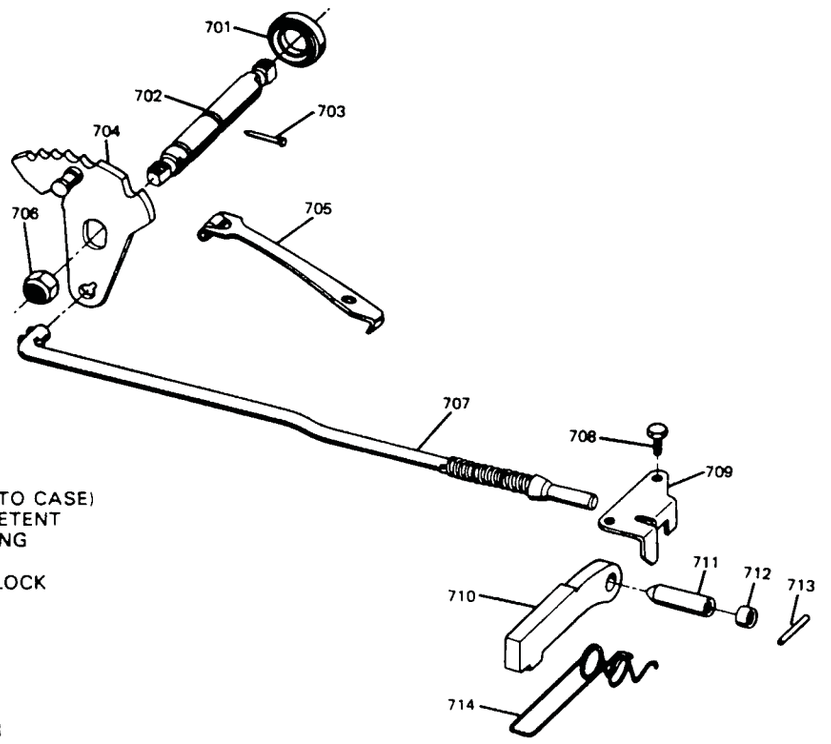


Figure 54

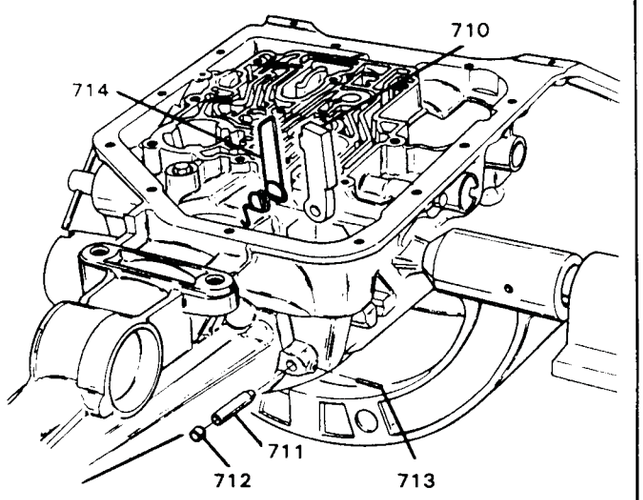


ILL. NO.	DESCRIPTION
701	SEAL, MANUAL SHAFT
702	SHAFT, MANUAL
703	PIN, RETAINING (MANUAL SHAFT TO CASE)
704	LEVER & PIN ASSEMBLY, INSIDE DETENT
705	ROLLER, DETENT MANUAL & SPRING
706	NUT, HEX
707	ACTUATOR ASSEMBLY, PARKING LOCK
708	BOLT, BRACKET TO CASE
709	BRACKET, PARKING LOCK
710	PAWL, PARKING LOCK
711	SHAFT, PARKING LOCK PAWL
712	PLUG, STEEL CAP
713	PIN, SLOTTED SPRING
714	SPRING, PARKING PAWL RETAINER

Figure 55

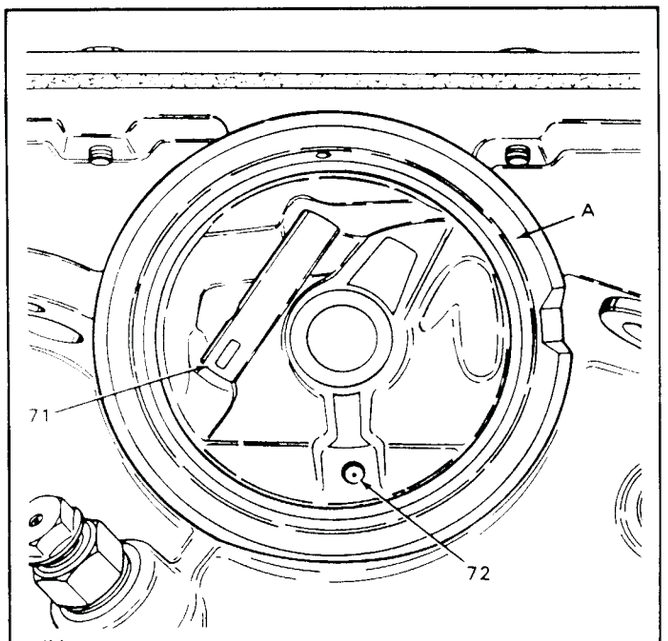
(Continued from Page 36)

10. Remove hex nut and the inside detent lever shown in Figure 55.
11. Remove the parking actuator rod assembly shown in Figure 55.
12. Remove the retaining pin (Nail) from case that is holding the manual shaft (See Figure 55).
13. Carefully remove the manual shaft from the case. It may be necessary to file the burrs from shaft at inside "Flats" to get it out.
14. Remove and discard manual shaft seal from the transmission case.
15. Remove the parking pawl and spring ONLY IF NECESSARY from the transmission case shown in Figure 56.
16. Use a modified #4 easy out to remove the cup plug from case if necessary.



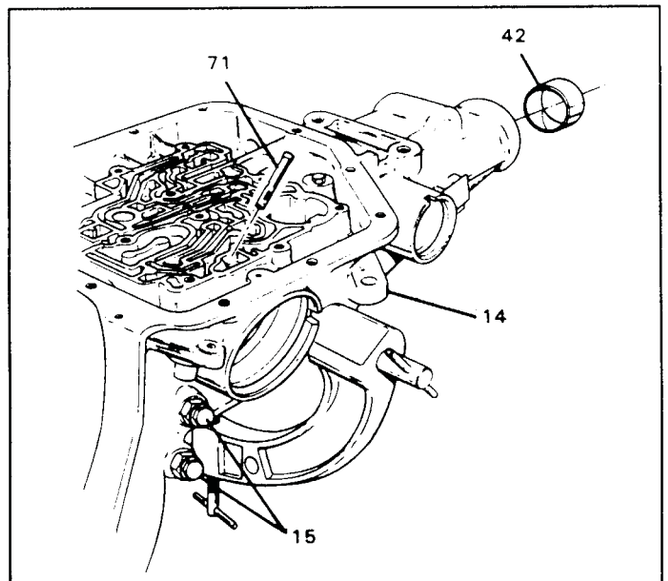
ILL. NO.	DESCRIPTION
710	PAWL, PARKING LOCK
711	SHAFT, PARKING LOCK PAWL
712	PLUG, STEEL CAP
713	PIN, SLOTTED SPRING
714	SPRING, PARKING PAWL RETAINER

Figure 56



ILL. NO.	DESCRIPTION
A	INTERMEDIATE SERVO BORE
71	CHECK VALVE ASSEMBLY, 3RD ACCUMULATOR
72	PLUG, CUP (6, 4 DIA.) (2)

Figure 57



ILL. NO.	DESCRIPTION
14	CASE, TRANSMISSION
15	CONNECTOR, INVERTED FLARE (BRASS)
42	BUSHING, TRANSMISSION CASE (REAR)
71	CHECK VALVE ASSEMBLY, 3RD ACCUMULATOR

Figure 58

COMPONENT REPAIR AND TRANSMISSION ASSEMBLY

CASE AND INTERNAL COMPONENTS

1. Thoroughly clean the transmission case and blow dry with compressed air.
2. DO NOT WIPE DRY WITH CLOTH.
3. Inspect the following:
   - Case exterior for cracks or porosity.
   - Case to valve body face for any damage and/or inter connected oil passages and for flatness. The flatness should be checked with a accurate straightedge.
   - Vent pipe for any damage.
   - Air check all oil passages through case.
   - Intermediate servo bore for porosity, damage, or burrs (See Figure 57).
   - Inspect the orifice cup plug in servo bore for debris or any damage (See Figure 57).
   - Inspect 1-2 accumulator bore for porosity, any damage, or burrs.
   - Speedometer bore for damage, or burrs.
   - All bolt holes for any thread damage. These can be repaired with Heli-Coil as necessary.
   - Cooler connectors for damage.
   - Case interior for damaged ring grooves, and reverse clutch lugs for wear or damage.
   - Inspect 3rd accumulator check valve for the proper operation and case extension bushing for wear and/or damage.

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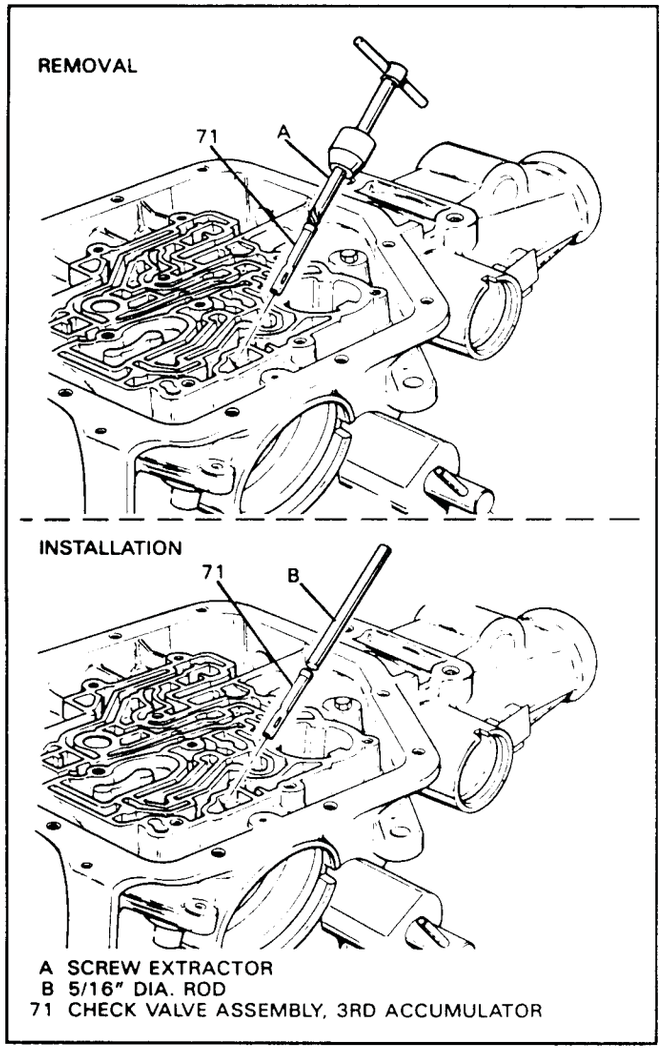


Figure 59

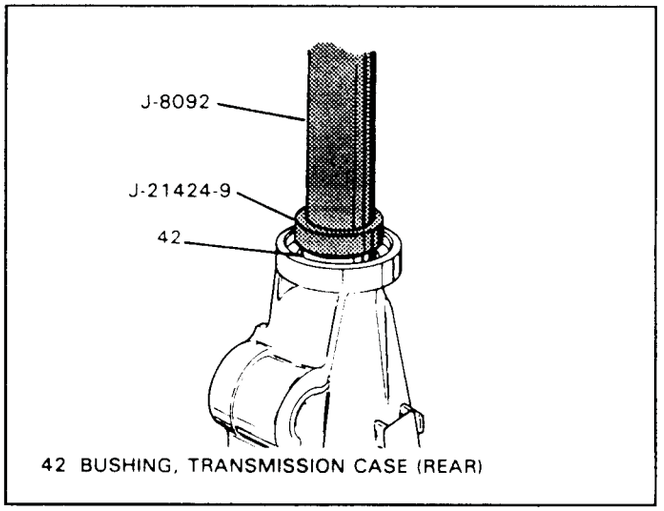


Figure 60

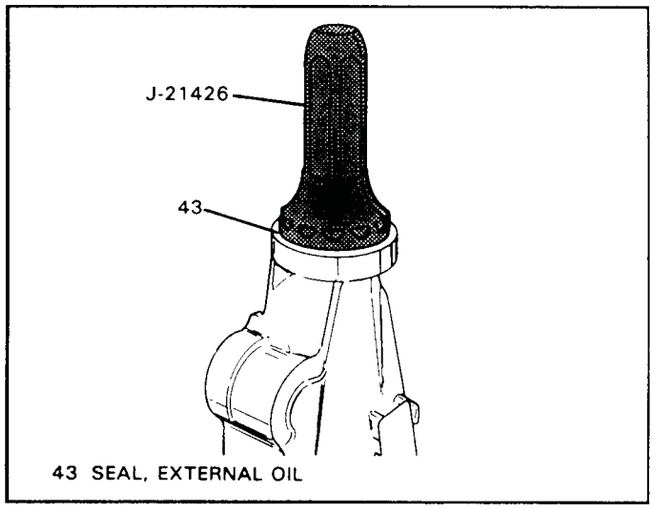


Figure 61

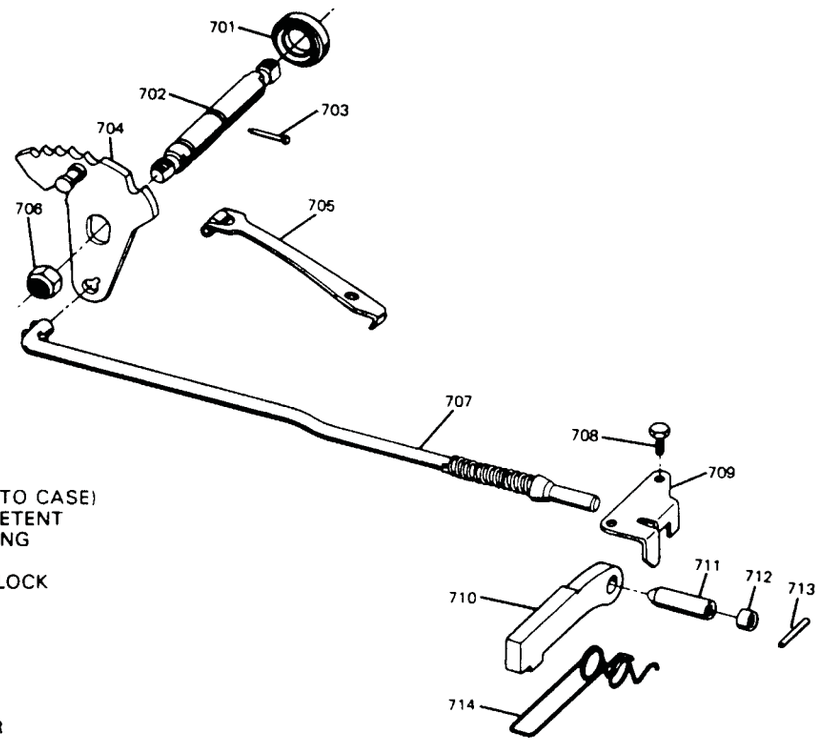
REPLACEMENT PROCEDURE - 3RD ACCUM BALL CAPSULE (IF NECESSARY)

1. Remove the 3rd accumulator ball capsule Asm, using a #4 easy out as shown in Figure 59.
2. Part number for new 3rd accumulator ball capsule is 8630570 from OEM.
3. Install new 3rd accumulator ball capsule using a 3/8" diameter steel rod, as shown in Figure 59.
4. The new assembly must be flush or below surface of the valve body, and oil feed slots in the tube must face the servo cover as shown in Figure 57.

(Continued from Page 39)

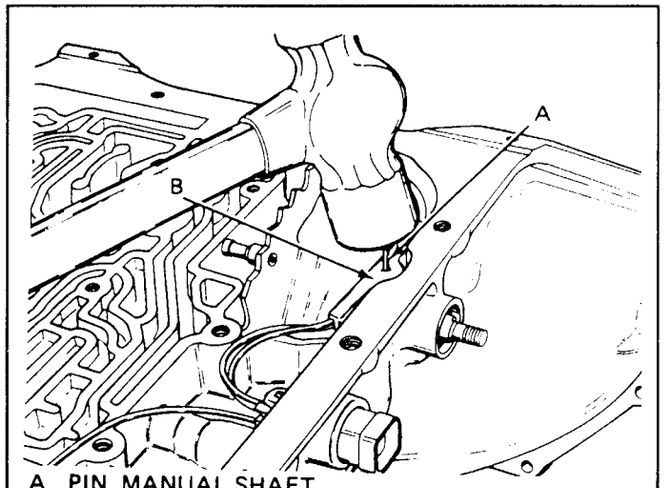
4. Install new case extension bushing as necessary, using bushing driver as shown in Figure 60.
5. Install new rear case extension oil seal, using the seal driver, as shown in Figure 61.
6. Inspect all park and linkage parts for any damage.
7. Install new manual shaft seal into case bore, and insure that it is fully seated.
8. Install the manual shaft through case bore, using a small amount of "Trans-Jel" for lubrication.
9. Install the park rod into the inside detent lever, install the inside detent lever on manual shaft and insure it is engaged on flats (See Figure 62).
10. Install manual shaft nut onto the manual shaft and torque to 20-25 ft.lbs. (See Figure 62).
11. Install the manual shaft retaining pin (Nail) into case and insure it is engaged in shaft groove, as shown in Figure 63.
13. Use Figure 64 to reinstall parking pawl and the return spring if it was removed.

(Continued on Page 42)



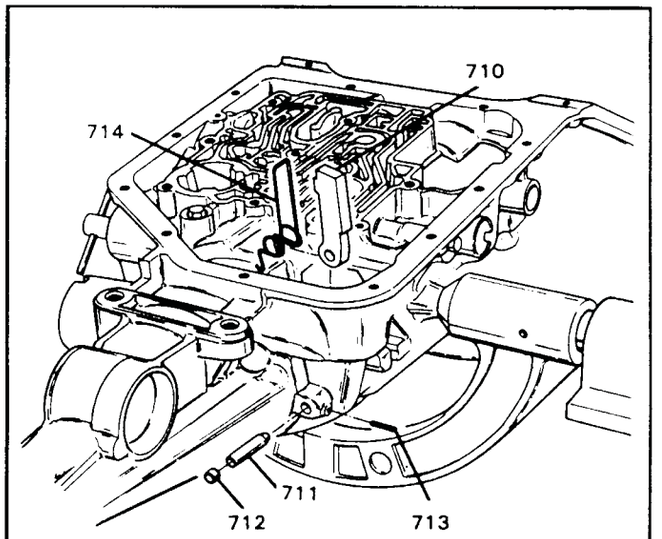
ILL. NO.	DESCRIPTION
701	SEAL, MANUAL SHAFT
702	SHAFT, MANUAL
703	PIN, RETAINING (MANUAL SHAFT TO CASE)
704	LEVER & PIN ASSEMBLY, INSIDE DETENT
705	ROLLER, DETENT MANUAL & SPRING
706	NUT, HEX
707	ACTUATOR ASSEMBLY, PARKING LOCK
708	BOLT, BRACKET TO CASE
709	BRACKET, PARKING LOCK
710	PAWL, PARKING LOCK
711	SHAFT, PARKING LOCK PAWL
712	PLUG, STEEL CAP
713	PIN, SLOTTED SPRING
714	SPRING, PARKING PAWL RETAINER

Figure 62



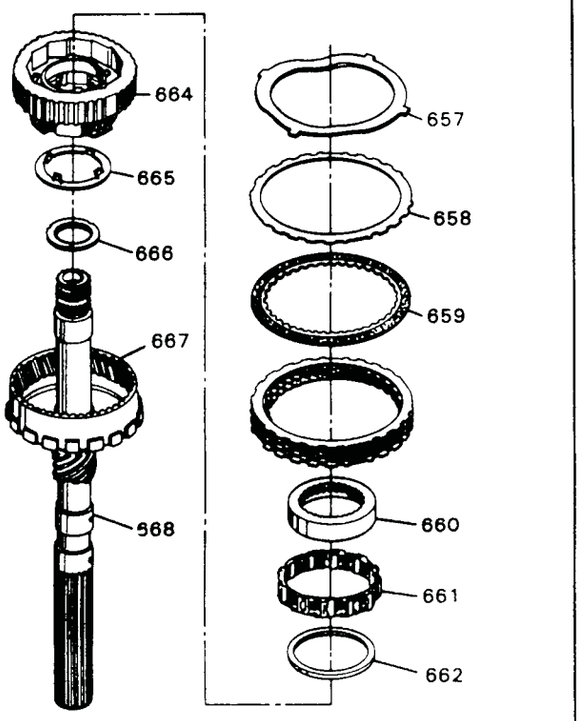
A PIN, MANUAL SHAFT
B CLIP, WIRE

Figure 63



ILL. NO.	DESCRIPTION
710	PAWL, PARKING LOCK
711	SHAFT, PARKING LOCK PAWL
712	PLUG, STEEL CAP
713	PIN, SLOTTED SPRING
714	SPRING, PARKING PAWL RETAINER

Figure 64



ILL. NO.	DESCRIPTION
657	PLATE, REVERSE CLUTCH (WAVED)
658	PLATE, REVERSE CLUTCH (FLAT)
659	PLATE, REVERSE CLUTCH (FACED)
660	RACE, LO ROLLER CLUTCH
661	ROLLER, LO CLUTCH
662	WASHER, REAR CARRIER TO LO ROLLER CL. THRUST
664	CARRIER ASSEMBLY, REAR (COMPLETE)
665	WASHER, REAR CARRIER TO INT. GEAR THRUST
666	BEARING, THRUST (SUN GEAR TO INT. GEAR)
667	GEAR, REAR INTERNAL
668	SHAFT, OUTPUT W/BUSHING

Figure 65

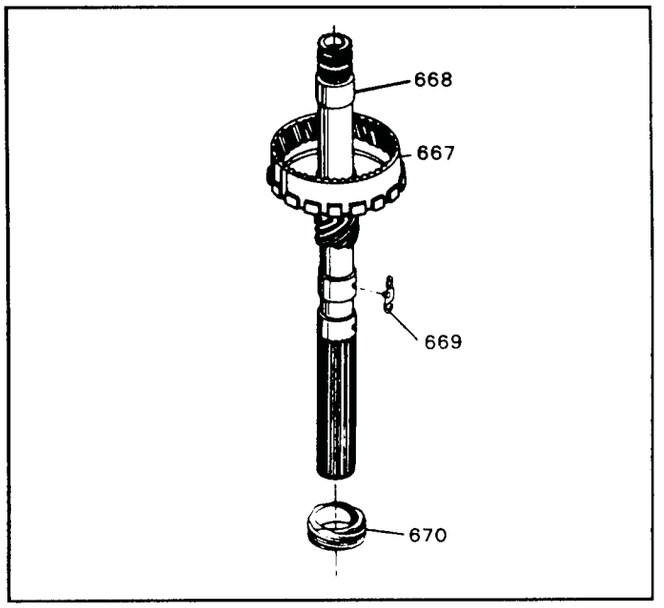


Figure 66

REAR INTERNAL PARTS

14. Inspect the output shaft and the rear internal gear for any wear and/or damage (See Figure 65).
15. Install speedometer gear clip in output shaft, as shown in Figure 66.
16. Install speedometer gear on output shaft, and over the clip as shown in Figure 66.

NOTE:

Install the speedometer gear and clip in the location shown in Figure 67, so that it will be in line with the speedometer bore in case.

17. Install the 4 tanged thrust washer onto rear carrier, and retain with "Trans-Jel" (See Figure 65).
18. Install the rollers into cage of the low roller clutch as shown in Figure 65.
19. Install thrust washer (662) into the rear carrier, as shown in Figure 65.
20. Install the low roller clutch assembly into the rear carrier (See Figure 65).
21. Install the roller clutch inner race, with the spline side facing out, into the rollers by rotating counter clockwise into position and pushing down for full engagement (See Figure 65).
22. Install the thrust bearing (666) into the rear ring gear, as shown in Figure 65.
23. Install the entire rear carrier and low roller clutch assembly into the rear ring gear by rotating down into position (See Figure 69).
24. Install output shaft and rear support tool J-25013 onto the case, as shown in Figure 68.
25. Grasp the output shaft at the top (See Figure 69), and install entire rear carrier assembly into case all at one time.
26. Index the rear internal gear parking pawl lugs so they will pass by the parking pawl.
27. Adjust the height of the rear internal gear parking lugs to align with parking pawl tooth, by turning adjusting screw on support fixture J-25013.

NOTE:

Make sure speedometer drive gear is visible through the speedometer gear bore at this time.

28. Install the Lo/Reverse clutch plates into the case, beginning with a steel plate and alternating with a lined plate (See Figure 65).
29. Refer to Figure 74 for proper amount of clutch plates to match the apply ring.

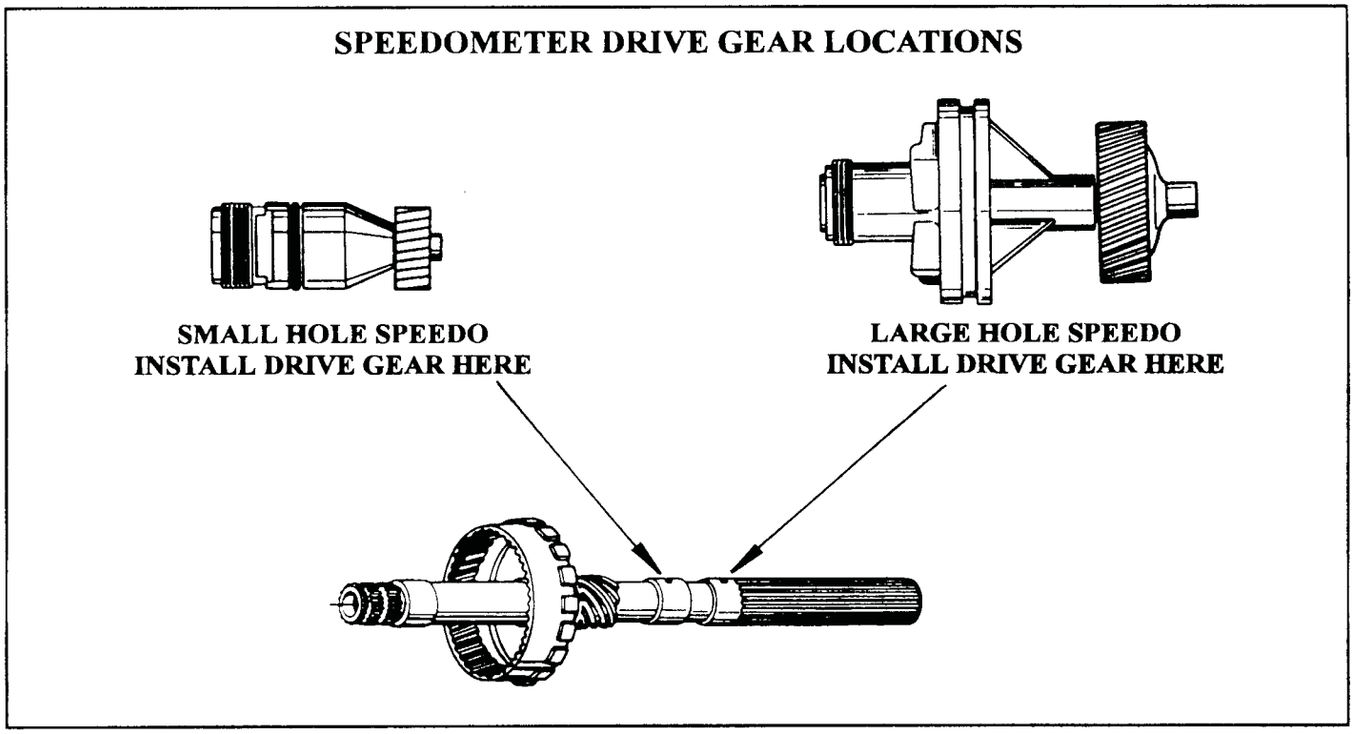


Figure 67

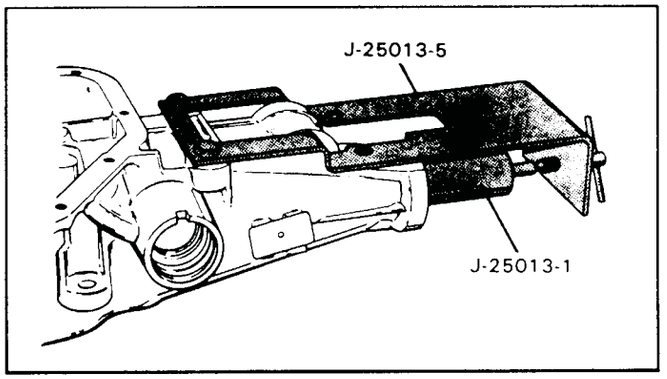
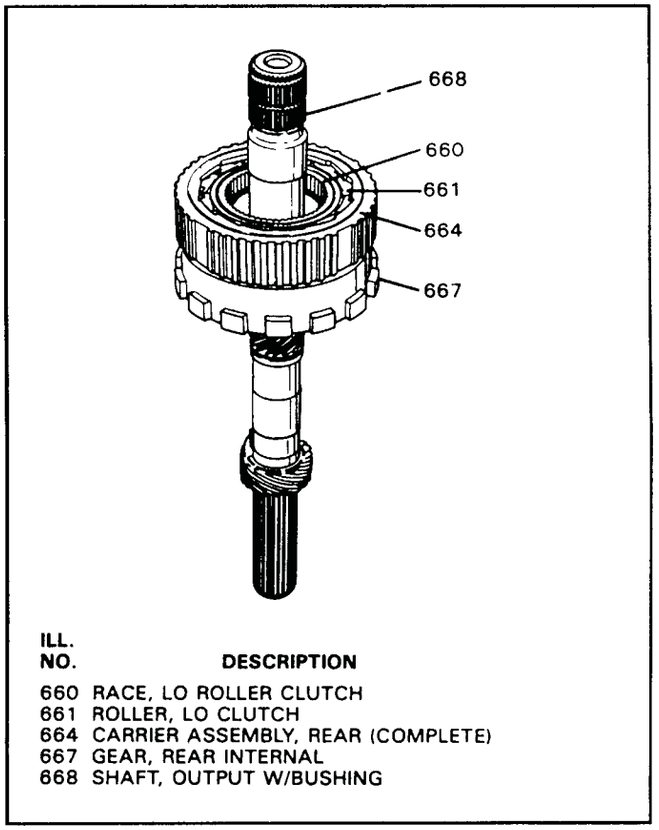


Figure 68

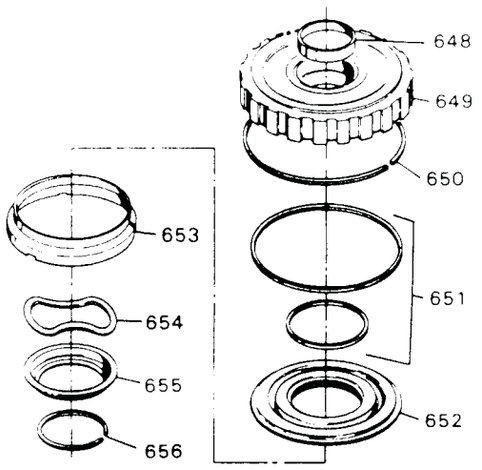
29. You should end up with a steel plate going in the case last, as shown in Figure 65.
30. Install the Lo/Reverse "Wave" plate on top of the last steel plate, as shown in Figure 65.

(Continued on next Page)



ILL. NO.	DESCRIPTION
660	RACE, LO ROLLER CLUTCH
661	ROLLER, LO CLUTCH
664	CARRIER ASSEMBLY, REAR (COMPLETE)
667	GEAR, REAR INTERNAL
668	SHAFT, OUTPUT W/BUSHING

Figure 69



ILL. NO. DESCRIPTION

648 BUSHING, REVERSE CLUTCH HSG. 53.13 X 9.53
649 HOUSING ASSEMBLY, REVERSE & LO CLUTCH
650 SPACER, REVERSE CLUTCH HOUSING
651 SEAL KIT, REVERSE CLUTCH
652 PISTON ASSEMBLY, LO & REVERSE CLUTCH
653 RING, LO & REVERSE
654 SPRING, REVERSE CLUTCH RELEASE (WAVE)
655 RETAINER, LO & REVERSE CLUTCH SUPPORT
656 RING, RETAINER REVERSE CLUTCH HSG. (SNAP)

Figure 70

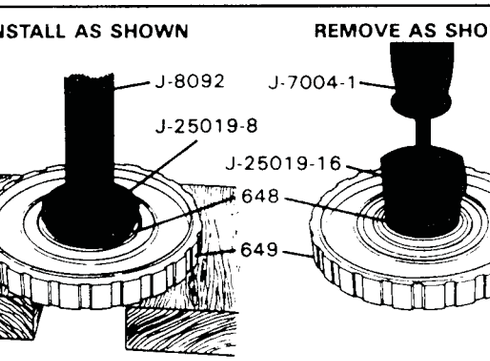
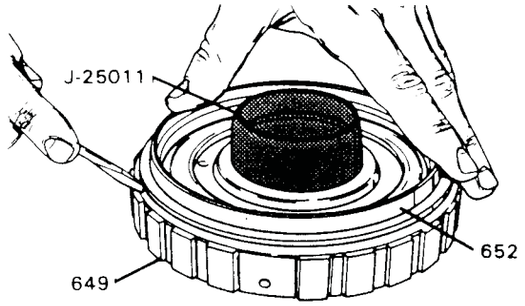


Figure 71

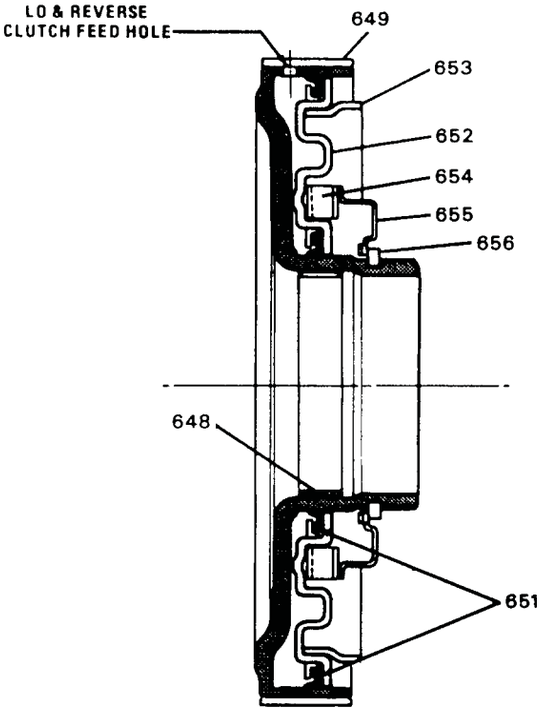
31. Inspect all Lo/Reverse clutch housing parts for any wear and/or damage (See Figure 70).
32. Remove and install new bushing in Lo/Reverse support as necessary, as shown in Figure 71.
33. Install new inner and outer lip seals on the piston, and lubricate with "Trans-Jel" (See Figure 70).
34. Install inner lip seal protector J-25011 on housing as shown in Figure 72.
35. Install the Lo/Reverse piston over the into housing and over seal protector, as shown in Figure 72.
36. Using a small flat blade screwdriver to prevent any seal damage, install piston into the support (See Figure 72).



ILL. NO. DESCRIPTION

649 HOUSING ASSEMBLY, REVERSE & LO CLUTCH
652 PISTON ASSEMBLY, LO & REVERSE CLUTCH

Figure 72



648 BUSHING, REVERSE CLUTCH HSG. 53.13 X 9.53
649 HOUSING ASSEMBLY, REVERSE & LO CLUTCH
651 SEAL KIT, REVERSE CLUTCH
652 PISTON ASSEMBLY, LO & REVERSE CLUTCH
653 RING, LO & REVERSE
654 SPRING, REVERSE CLUTCH RELEASE (WAVE)
655 RETAINER, LO & REVERSE CLUTCH SUPPORT
656 RING, RETAINER REVERSE CLUTCH HSG. (SNAP)

Figure 73

37. Install the return spring, spring retainer, and the snap ring on support, as shown in Figure 70.

1987 200C CLUTCH PLATE AND APPLY RING USAGE CHART

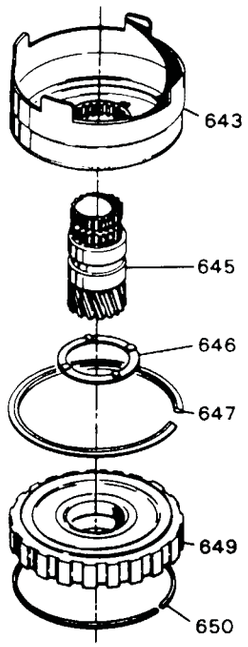
	DIRECT CLUTCH					FORWARD CLUTCH							LO & REVERSE CLUTCH						
	FLAT STEEL PLATES		COMP. FACED PLATES	APPLY RING		WAVED STEEL PLATE	FLAT STEEL PLATES		COMP. FACED PLATES	APPLY RING			WAVED STEEL PLATE	FLAT STEEL PLATES		COMP. FACED PLATES	APPLY RING		
	NO.	THICKNESS	NO.	I.D.	WIDTH*	NO.	THICKNESS	NO.	THICKNESS	NO.	I.D.	WIDTH*	NO.	THICKNESS	NO.	THICKNESS	NO.	I.D.	WIDTH*
ALL MODELS	5	2.32 mm (.091")	5	19	12.5 mm (.490")	1	1.59 mm (.062")	3	1.97 mm (.077")	4	18	13.5 mm (.530")	1	1.97 mm (.077")	7	1.97 mm (.077")	6	0	13.13 mm (.520")

The direct, forward, and lo and reverse clutch flat steel clutch plates and the forward clutch waved steel plate should be identified by their thickness.

The direct and forward clutch production installed composition-faced clutch plates must not be interchanged. For service, direct and forward clutch use the same composition-faced plates.

*Measure the width of the clutch apply ring for positive identification.

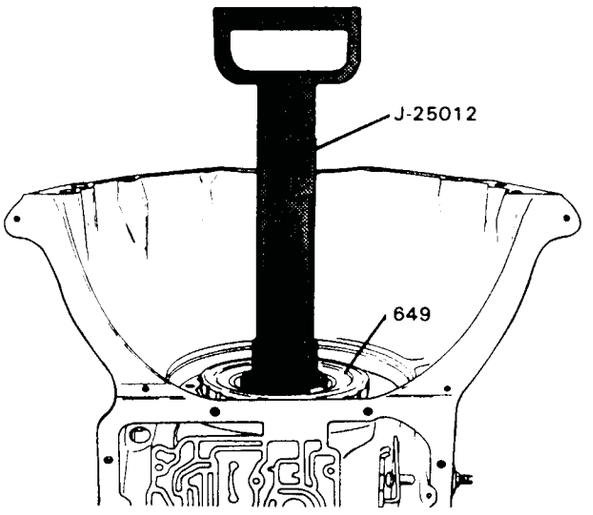
Figure 74



ILL. NO.	DESCRIPTION
643	DRUM, INPUT
645	GEAR, REAR SUN W/BUSHING
646	WASHER, THRUST (DRUM TO HOUSING)
647	RING, SNAP HOUSING TO CASE
649	HOUSING ASSEMBLY, LO & REVERSE CLUTCH
650	SPACER, REVERSE CLUTCH HOUSING

Figure 75

38. Install the apply ring (653) into the piston, shown in Figures 70 and 73. Apply ring is stamped with an I.D. number, and must match the number plates installed (See chart in Figure 74).

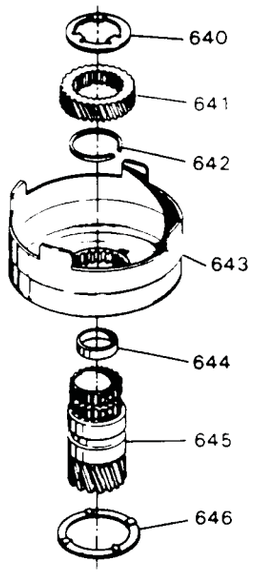


ILL. NO.	DESCRIPTION
649	HOUSING ASSEMBLY, REVERSE & LO CLUTCH

Figure 76

39. Install Lo/Reverse clutch housing spacer, shown in Figure 75.
40. Install the Lo/Reverse clutch housing assembly, using installer J-25012, as shown in Figure 76.
41. Be sure to align feed hole in housing to the feed hole in the case (See Figure 73).
42. Install the beveled snap ring with beveled side up into the case groove on top of the support, with the gap opposite the parking rod.

(Continued on next Page)



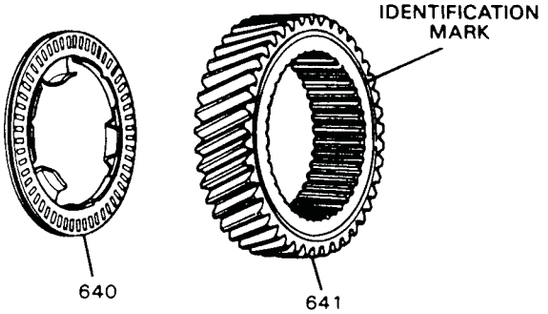
ILL. NO.	DESCRIPTION
640	BEARING, FRONT CARRIER SUN GEAR W/RACE
641	GEAR, FRONT SUN
642	RING, SNAP (DRUM TO SUN GEAR)
643	DRUM, INPUT
644	BUSHING, REAR SUN GEAR
645	GEAR, REAR SUN W/BUSHING
646	WASHER, THRUST (DRUM TO HOUSING)

Figure 77

(Continued from Page 45)

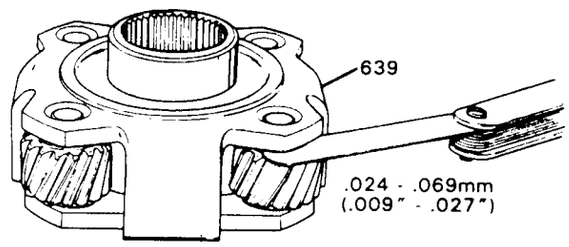
IMPORTANT NOTICE

43. If the Lo/Reverse clutch housing does not seat past the case snap ring groove (Previous Page), proceed as follows.
44. Remove the J-25012 installer tool.
45. Install the rear sun gear and into the case.
46. Rotate rear sun gear back and forth, tapping lightly with the sun gear shell, to align roller clutch inner race and L/R clutch hub splines.
47. Remove the rear sun gear and sun gear shell.
48. Loosen adjusting screw on J-25013-5 on output shaft, to install the beveled snap ring.
49. Repeat the above steps, if necessary.
50. Install sun gear shell onto the rear ring gear, and install the snap ring (See Figure 77).
51. Install thrust washer (646) over sun gear and onto sun gear shell, and retain with "Trans-Jel", shown in Figure 77.
52. Install rear sun gear and shell into case engaging sun gear into rear carrier.
53. Install the front sun gear (641) by splining on the rear sun gear and insure it is against the snap ring (See Figure 77).



ILL. NO.	DESCRIPTION
640	BEARING, FRONT CARRIER SUN GEAR W/RACE
641	GEAR, FRONT SUN

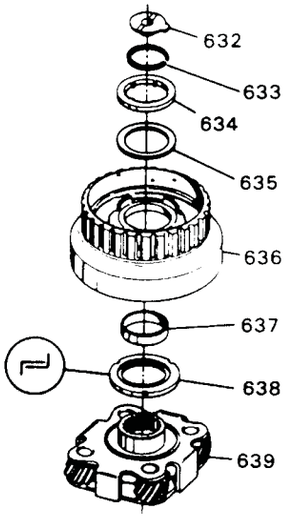
Figure 78



ILL. NO.	DESCRIPTION
639	CARRIER, FRONT

Figure 79

54. Make certain that the identification groove, that is shown in Figure 78, is facing the sun gear shell and snap ring.
55. Install the front carrier sun gear thrust bearing with race onto front sun gear (See Figure 78).
56. Inspect the front carrier for any wear or damage, and measure pinion end play with a feeler gage as shown in Figure 79.
57. Pinion gear end play should be .009" to .027" as shown in Figure 79.
58. Install the front carrier onto the front sun gear, as shown in Figure 80.
59. Install thrust bearing (638) onto front carrier, in the direction shown in Figure 80.
60. Install the front ring gear onto the front carrier as shown in Figure 80.
61. Install thrust washer (635) on front ring gear, as shown in Figure 80.
62. Install selective thrust washer (634) as shown in Figure 80.
63. Install snap ring over output shaft and on top of selective thrust washer (See Figure 80).



ILL. NO.	DESCRIPTION
632	WASHER, THRUST SELECTIVE (FRONT)
633	RING, OUTPUT SHAFT (SNAP)
634	WASHER, SELECTIVE
635	WASHER, FRONT INTERNAL GEAR
636	GEAR, FRONT INTERNAL /BUSHING
637	BUSHING, FRONT INTERNAL GEAR
638	BEARING, FRONT INTERNAL CARRIER THRUST
639	CARRIER, FRONT

Figure 80

64. Move the output shaft upward by turning the adjusting screw inward on the J-25013-5 holding fixture.
65. Make sure snap ring is fully seated in the groove in the output shaft.
66. Do not over expand the snap ring.

MEASURE OUTPUT SHAFT END PLAY

1. Loosen the adjusting screw on J-25013-5 holding fixture, and push output shaft all the way down.
2. Install dial indicator with clamp on case (not on machined surfaces), as shown in Figure 82.
3. Position dial indicator extension against the end of the output shaft, as shown in Figure 82.
4. Zero the dial indicator.
5. Move the output shaft upward, turning adjusting screw on holding fixture, and observe the reading on dial indicator.
6. End play should be .004" to .010".
7. NEVER LET REAR END PLAY EXCEED THE FRONT END PLAY READING.
8. If more or less washer thickness is needed to bring end play within specifications, select the proper washer from the chart in Figure 81.
9. Install the front selective thrust washer on top of the output, shaft as shown in Figure 83, and retain with small amount of "Trans-Jel".

THICKNESS		IDENTIFICATION NUMBER AND/OR COLOR
2.90 - 3.01mm	(0.114" - 0.119")	1 - ORANGE
3.08 - 3.19mm	(0.121" - 0.126")	2 - WHITE
3.26 - 3.37mm	(0.126" - 0.133")	3 - YELLOW
3.44 - 3.55mm	(0.135" - 0.140")	4 - BLUE
3.62 - 3.73mm	(0.143" - 0.147")	5 - RED
3.80 - 3.91mm	(0.150" - 0.154")	6 - BROWN
3.98 - 4.09mm	(0.157" - 0.161")	7 - GREEN
4.16 - 4.27mm	(0.164" - 0.168")	8 - BLACK
4.34 - 4.45mm	(0.171" - 0.175")	9 - PURPLE

Figure 81

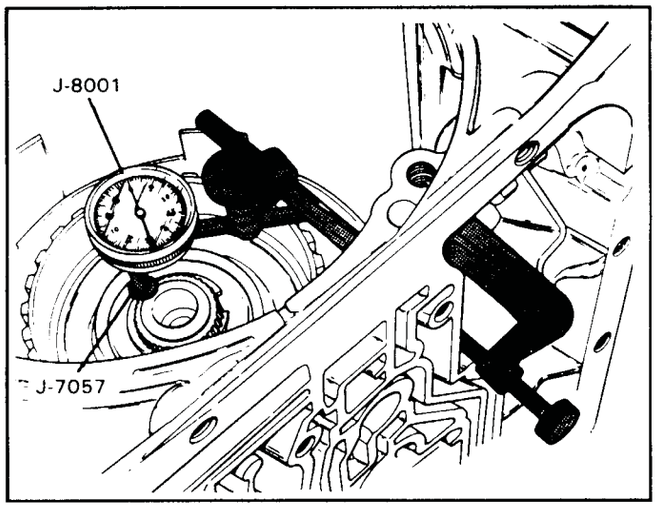


Figure 82

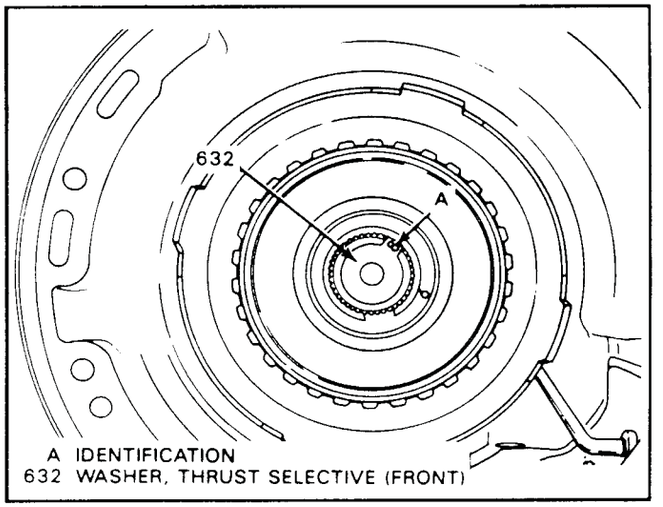
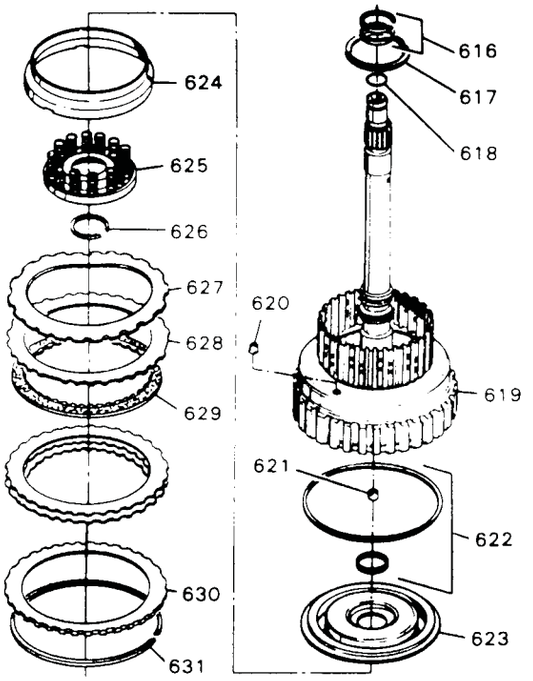


Figure 83



616 SEAL, RING (TURBINE SHAFT)
617 WASHER, DIRECT & FORWARD CLUTCH (THRUST)
618 SEAL, TURBINE SHAFT TO SELECTIVE WASHER
619 HOUSING ASSEMBLY, FORWARD CLUTCH
620 RETAINER, CHECK VALVE W/BALL
621 PLUG, CUP TURBINE SHAFT
622 SEAL KIT, FORWARD CLUTCH PISTON
623 PISTON, FORWARD CLUTCH W/RING
624 RING, FORWARD CLUTCH APPLY
625 RETAINER, FORWARD CLUTCH W/SPRING
626 RING, SNAP FORWARD SPRING RETAINER
627 PLATE, FORWARD CLUTCH (WAVED)
628 PLATE, FORWARD CLUTCH (FLAT STEEL) 2.045
629 PLATE, FORWARD CLUTCH BACKING
630 PLATE, FORWARD CLUTCH (FLAT STEEL) 6.30mm
631 RING, DIRECT CLUTCH PLATE HOUSING (SNAP)

Figure 84

NOTE:

THERE ARE SEVERAL DIFFERENT TYPES OF FORWARD CLUTCH HOUSINGS. SEE FIGURE 27 ON PAGE 23 OF THIS BOOKLET, FOR ALL OF THE DIFFERENT TYPES

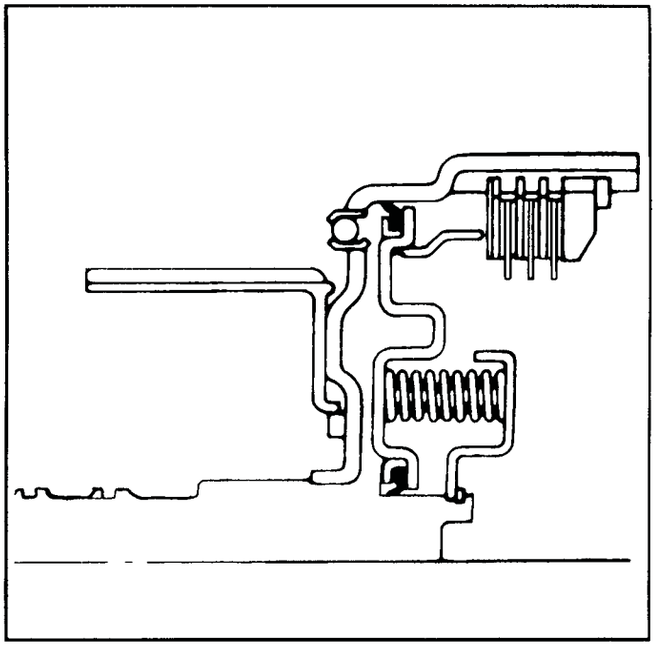
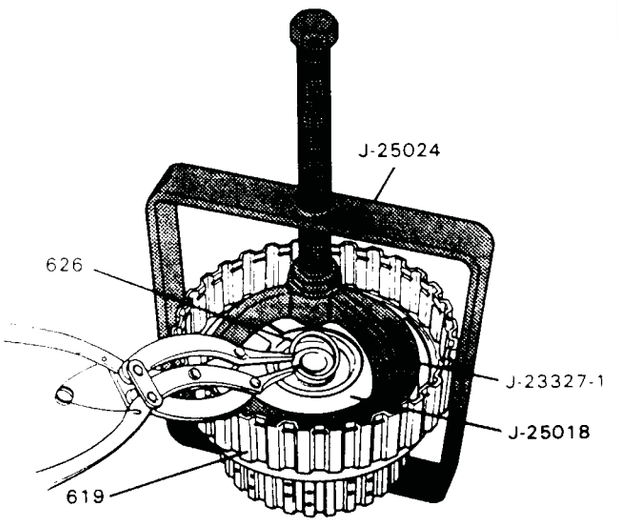


Figure 85

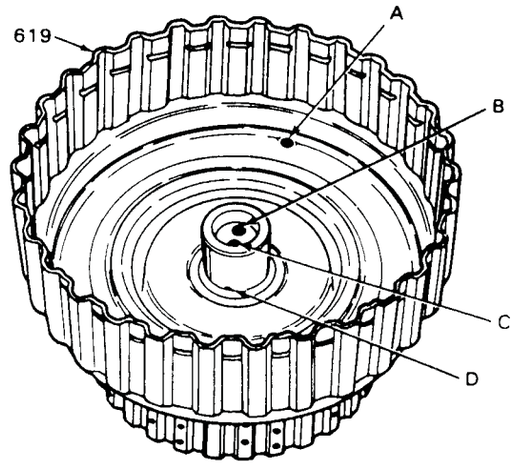
FORWARD AND DIRECT CLUTCH HOUSINGS

1. Clean all parts thoroughly and blow dry with compressed air.
2. Install clutch apply ring into forward clutch piston as shown in Figures 84 and 85.
3. Refer to clutch plate and apply ring chart found in Figure 74, for proper apply ring.
4. Install new inner and outer lip seals onto forward clutch piston with the lips facing away from the spring retainer, as shown in Figure 85, and lube with a small amount of "Trans-Jel".
5. Install forward clutch piston into forward clutch housing, with a rotating motion, and using care so not to cut the lip seals.
6. Install the forward clutch return spring assembly with the springs facing piston (See Figure 84).
7. Compress the return spring assembly using a suitable spring compressor as shown in Figure 86.
8. Install the snap ring, as shown in Figure 86, and remove the spring compressor.
9. Install the forward clutch "Wave" plate on top of the apply ring in housing (See Figure 84).
10. Install the forward clutch plates beginning with a steel plate and alternating with lined plates (See Figure 84).
11. Refer to clutch plate and apply ring chart, found in Figure 74 for proper amount.



ILL. NO.	DESCRIPTION
619	HOUSING ASSEMBLY, FORWARD CLUTCH
626	RING, SNAP FORWARD SPRING RETAINER

Figure 86

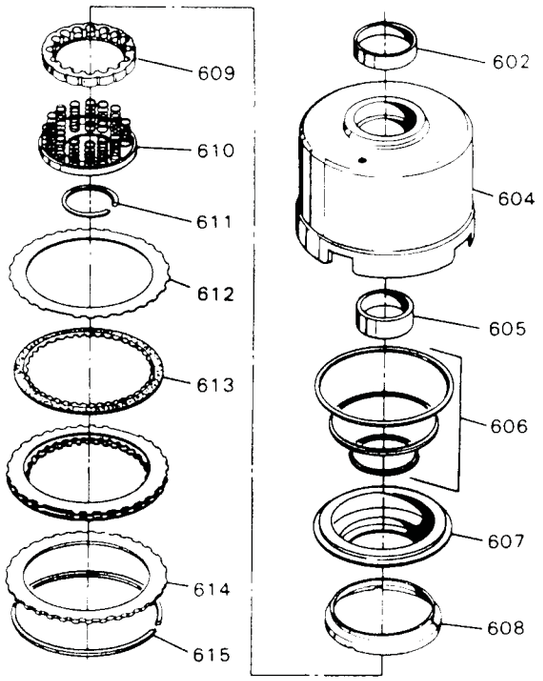


ILL. NO.	DESCRIPTION
A	EXHAUST CHECK BALL
B	LUBE HOLE
C	CUP PLUG
D	FORWARD CLUTCH FEED HOLE
619	HOUSING ASSEMBLY, FORWARD CLUTCH

Figure 87

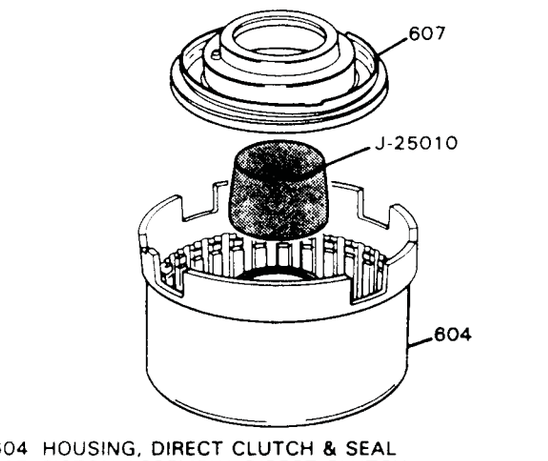
12. Install the forward clutch backing plate with inside bevel facing up, as shown in Figure 85.
13. Install the backing plate snap ring into the forward clutch housing.
14. Install the thrust washer (617) into forward clutch housing, as shown in Figure 84, and retain with a small amount of "Trans-Jel".
15. Air check the forward clutch housing by blowing compressed air into the passage between the sealing rings in the turbine shaft.
16. Insure that the ball capsule is not leaking and that the piston comes on with a dull thud, and no leaks past the lip seals.
17. Install the two sealing rings into the grooves in the turbine shaft (See Figure 84).
18. Set the completed forward clutch housing aside for now, until we have the direct clutch housing done.

(Continued on Page 50)



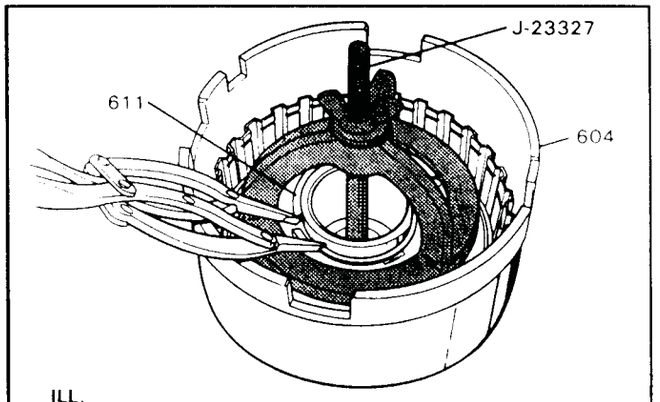
ILL. NO.	DESCRIPTION
602	BUSHING, DIRECT CLUTCH (FRONT)
604	HOUSING, DIRECT CLUTCH & SEAL
605	BUSHING, DIRECT CLUTCH (REAR)
606	SEAL KIT, DIRECT CLUTCH
607	PISTON ASSEMBLY, DIRECT CLUTCH
608	RING, DIRECT CLUTCH APPLY
609	GUIDE, RELEASE SPRING
610	RETAINER & SPRING
611	RING, SPRING RETAINER (SNAP)
612	PLATE, DIRECT CLUTCH (FLAT STEEL) 2.324
613	PLATE, DIRECT CLUTCH (FLAT STEEL)
614	PLATE, DIRECT (FORWARD CLUTCH BACKING)
615	RING, SNAP (FORWARD CLUTCH HOUSING)

Figure 88



604 HOUSING, DIRECT CLUTCH & SEAL
607 PISTON ASSEMBLY, DIRECT CLUTCH

Figure 89

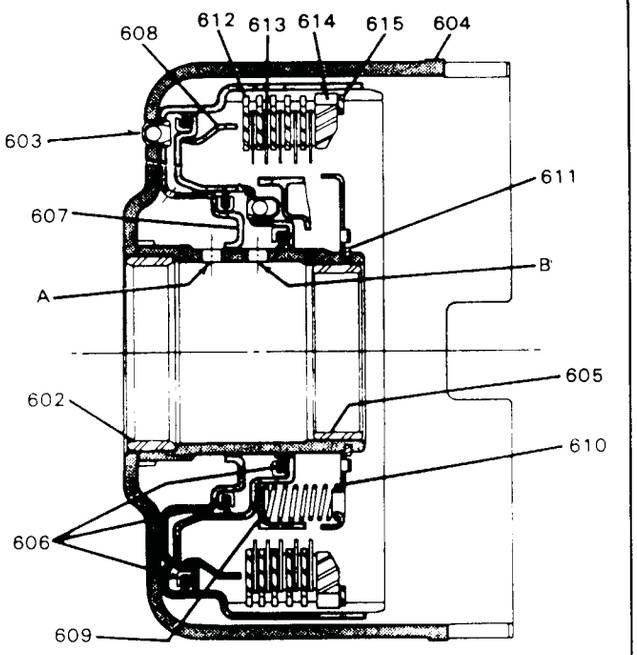


ILL. NO.	DESCRIPTION
604	HOUSING, DIRECT CLUTCH & SEAL
611	RING, SPRING RETAINER (SNAP)

Figure 90

(Continued from Page 49)

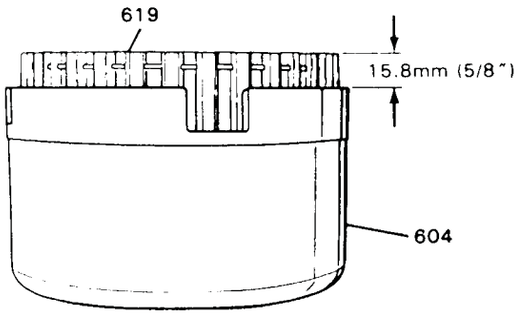
19. Install clutch apply ring into direct clutch piston, as shown in Figures 88 and 91.
20. Refer to clutch plate and apply ring chart found in Figure 74, for proper apply ring.
21. Install new inner and outer lip seals onto direct clutch piston with the lip seals facing away from the apply ring, as shown in Figure 91, and lube with a small amount of "Trans-Jel".
22. Install new center lip seal into direct clutch drum with the lip facing "UP", as shown in Figure 91, and lubricate with small amount of "Trans-Jel".
23. Install seal protector J-25010 onto direct clutch housing hub, as shown in Figure 89.
24. Install direct clutch piston in direct clutch drum, using extreme care when installing piston past snap ring groove in drum.
25. Insert a "Lip Seal Tool" (Loop of Wire) between seal and the housing; rotate the tool around the housing to compress the seal, while gently pushing down on piston.
26. Remove the seal protector.
27. Install the return spring guide (609) into direct clutch drum, with the omitted rib over the check ball capsule in piston, as shown in Figure 91.
28. Install the return spring assembly (610) into the direct clutch drum as shown in Figure 88, and lay the snap ring on top of the retainer.
29. Install a suitable spring compressor tool as shown in Figure 90.
30. Compress the return spring and install the snap ring, using a pair of snap ring pliers, as shown in Figure 90.
31. Remove the spring compressor tool.



A OUTER AREA CLUTCH FEED HOLE (REVERSE ONLY)
B INNER AREA CLUTCH FEED HOLE (THIRD & REVERSE)
602 BUSHING, DIRECT CLUTCH (FRONT)
603 RETAINER, CHECK W/BALL
604 HOUSING, DIRECT CLUTCH & SEAL
605 BUSHING, DIRECT CLUTCH (REAR)
606 SEAL KIT, DIRECT CLUTCH
607 PISTON ASSEMBLY, DIRECT CLUTCH
608 RING, DIRECT CLUTCH APPLY
609 GUIDE, RELEASE SPRING
610 RETAINER & SPRING
611 RING, SPRING RETAINER (SNAP)
612 PLATE, DIRECT CLUTCH (FLAT STEEL) 2.324
613 PLATE, DIRECT CLUTCH (FLAT STEEL)
614 PLATE, DIRECT (FORWARD CLUTCH BACKING)
615 RING, SNAP (FORWARD CLUTCH HOUSING)

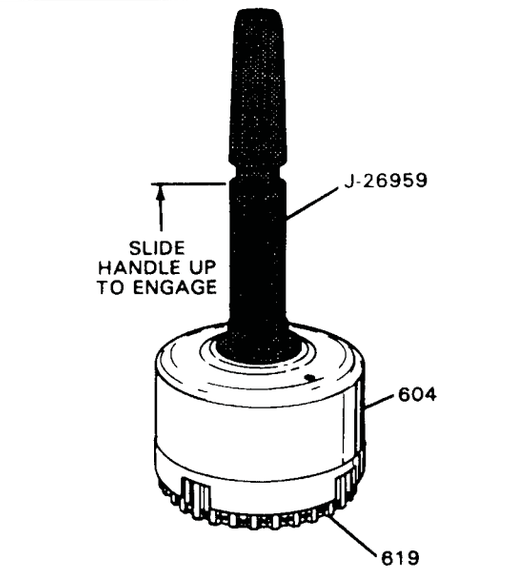
Figure 91

32. Install the direct clutch plates beginning with a flat steel plate and alternating with lined plates, shown in Figure 91.
33. Refer to clutch plate and apply ring chart, found in Figure 74 for proper amount.
34. Install the direct clutch backing plate, with inside bevel facing "UP", as shown in Figure 91.
35. Install the direct clutch backing plate snap ring.
36. Insure that your direct clutch plates turn freely.
37. Position the completed direct clutch housing over a hole in work bench with the clutch plate side facing up.
38. Install the forward clutch housing into the direct clutch housing, by rotating forward clutch back and forth until forward clutch is fully seated.
39. When forward clutch is seated, it will be approximately 5/8" from tang, as shown in Figure 92.



ILL. NO. DESCRIPTION
604 HOUSING, DIRECT CLUTCH & SEAL
619 HOUSING ASSEMBLY, FORWARD CLUTCH

Figure 92

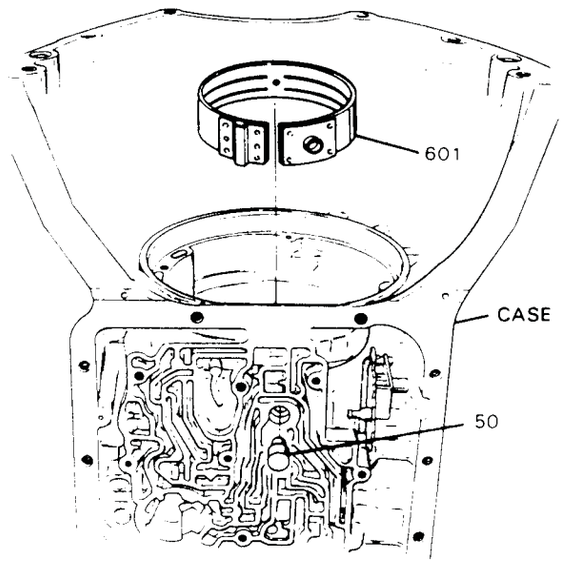


ILL. NO. DESCRIPTION
604 HOUSING, DIRECT CLUTCH & SEAL
619 HOUSING ASSEMBLY, FORWARD CLUTCH

Figure 93

40. Stand the forward and direct clutch housing up as shown in Figure 93.
41. There is an installation tool available to install the assemblies, as shown in Figure 93, that will ease the installation of these drums.
42. These are now ready for installation into the transmission.

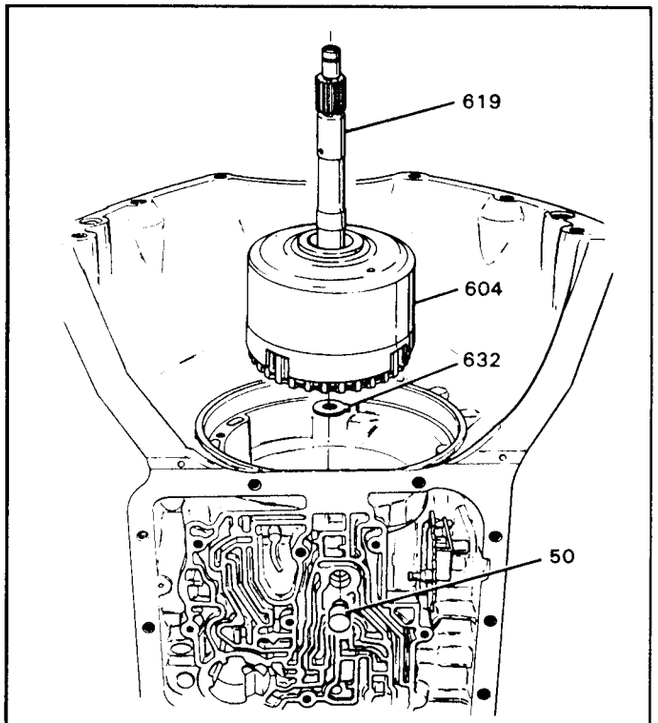
(Continued on next Page)



ILL. NO.	DESCRIPTION
50	PIN, BAND ANCHOR
601	BAND, INTERMEDIATE

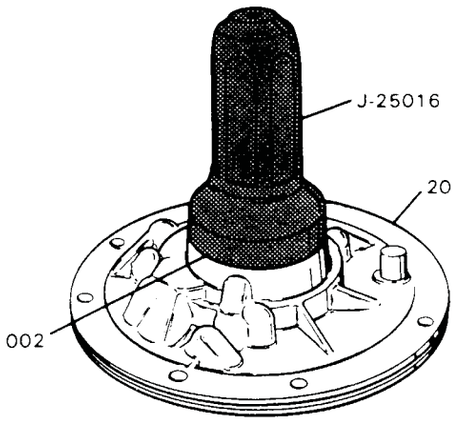
Figure 94

43. Install the intermediate band assembly into the case, as shown in Figure 94.
44. Install the intermediate band anchor through the case passage and engage it into the intermediate band (See Figure 94).
45. Install the pre-assembled forward and direct clutch housing assemblies into the case (See Figure 95).
46. Rotate the drums back and forth until they fully seat into position.
47. When they are properly assembled, the direct clutch housing will be located approximately 1-5/16" from the pump face in the case.



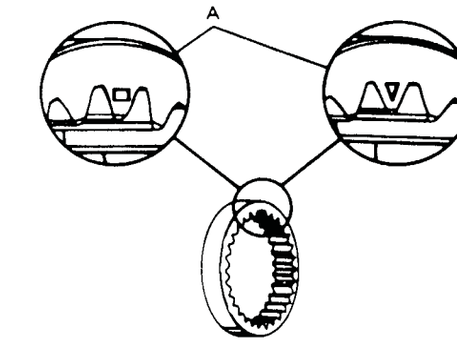
ILL. NO.	DESCRIPTION
50	PIN, BAND ANCHOR
601	BAND ASSEMBLY, INTERMEDIATE
604	HOUSING, DIRECT CLUTCH & SEAL
619	HOUSING ASSEMBLY, FORWARD CLUTCH
632	WASHER, THRUST SELECTIVE (FRONT)

Figure 95



ILL. NO.	DESCRIPTION
002	HELIX SEAL ASSEMBLY, COMPLETE
201	BODY ASSEMBLY, PUMP

Figure 96



A OPTIONAL IDENTIFICATION MARKS

Figure 97

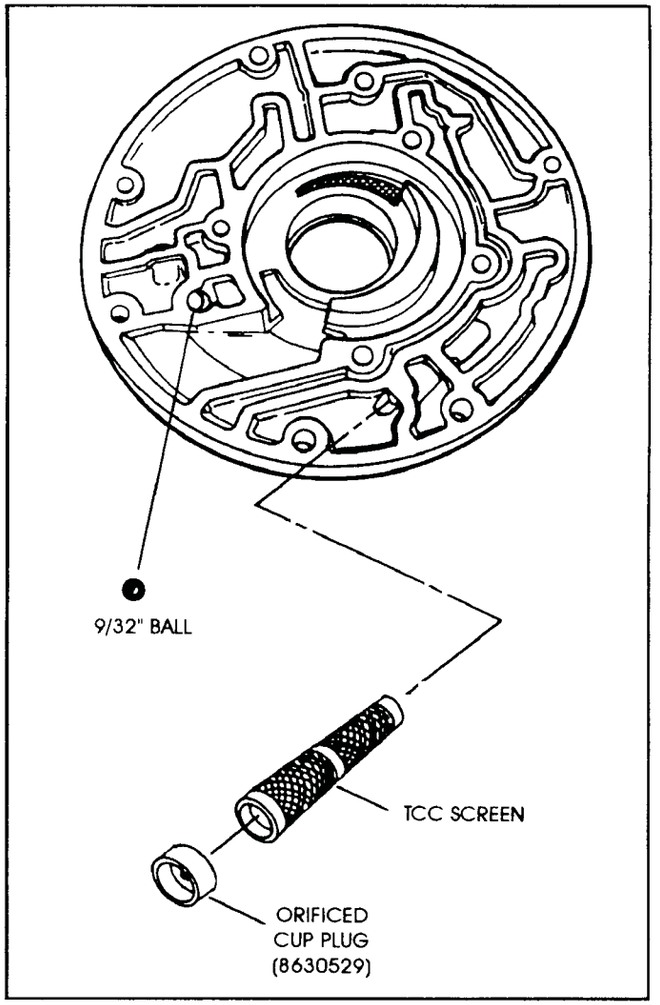
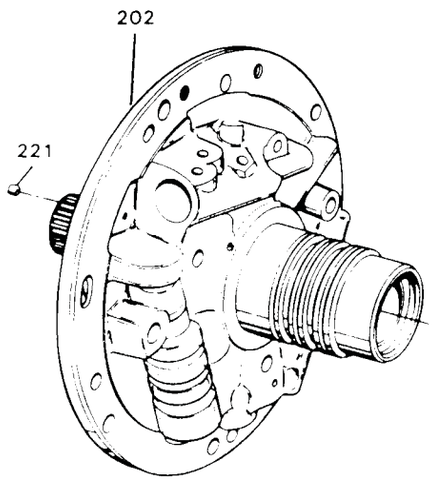


Figure 98

OIL PUMP ASSEMBLY

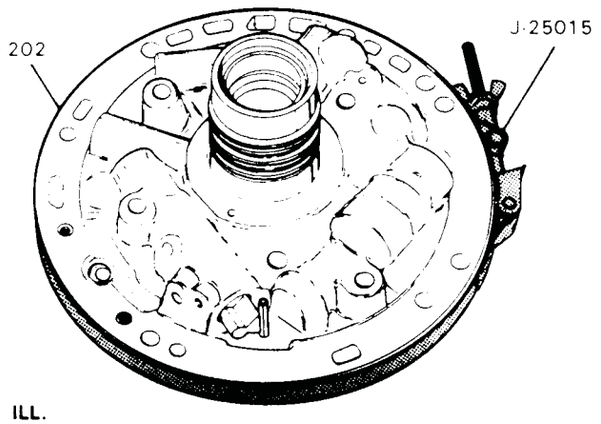
1. Clean all oil pump parts thoroughly and blow dry with compressed air.
2. Install new pump body bushing, if necessary, into using bushing driver or press.
3. Install new front pum seal into pump body using seal driver, as shown in Figure 96.
4. Install TCC screen and orifice cup plug into the pump body in location shown in Figure 98, if it was removed. This cup plug MUST be there and the screen MUST be free of debris, or you will have Lock-Up problems.
5. Install the outer pump gear into the pump body with the identification marks (See Figure 97) facing "DOWN" towards the pump pocket.
6. Install the inner pump gear into the pump body with the identification marks on the drive tangs facing "UP" towards the pump cover.
7. Lubricate the pump gears with transmission fluid.
8. Install the 9/32" (.281") checkball into the pump body in the location shown in Figure 98.
9. This checkball MUST be 9/32" (.281") diameter and no smaller. Retain the checkball with small "Trans-Jel".

(Continued on Page 54)



ILL. NO.	DESCRIPTION
202	COVER ASSEMBLY, PUMP (COMPLETE)
221	PLUG, PUMP COVER (6.1 DIA.)

Figure 99



ILL. NO.	DESCRIPTION
202	COVER ASSEMBLY, PUMP (COMPLETE)

Figure 100

(Continued from Page 53)

10. Insure that orifice cup plug (221) is in place in the pump cover, as shown in Figure 99.

IMPORTANT NOTICE

CHECK YOUR PUMP COVER FOR PRESENCE OF ORIFICE CUP PLUG (222) AS SHOWN IN FIGURE 101. SOME 1989 MODELS REMOVED THIS ORIFICE PLUG AND INSTALLED A BALL CAPSULE IN THE TURBINE SHAFT TO CONTROL CONVERTER CLUTCH APPLY FEEL.

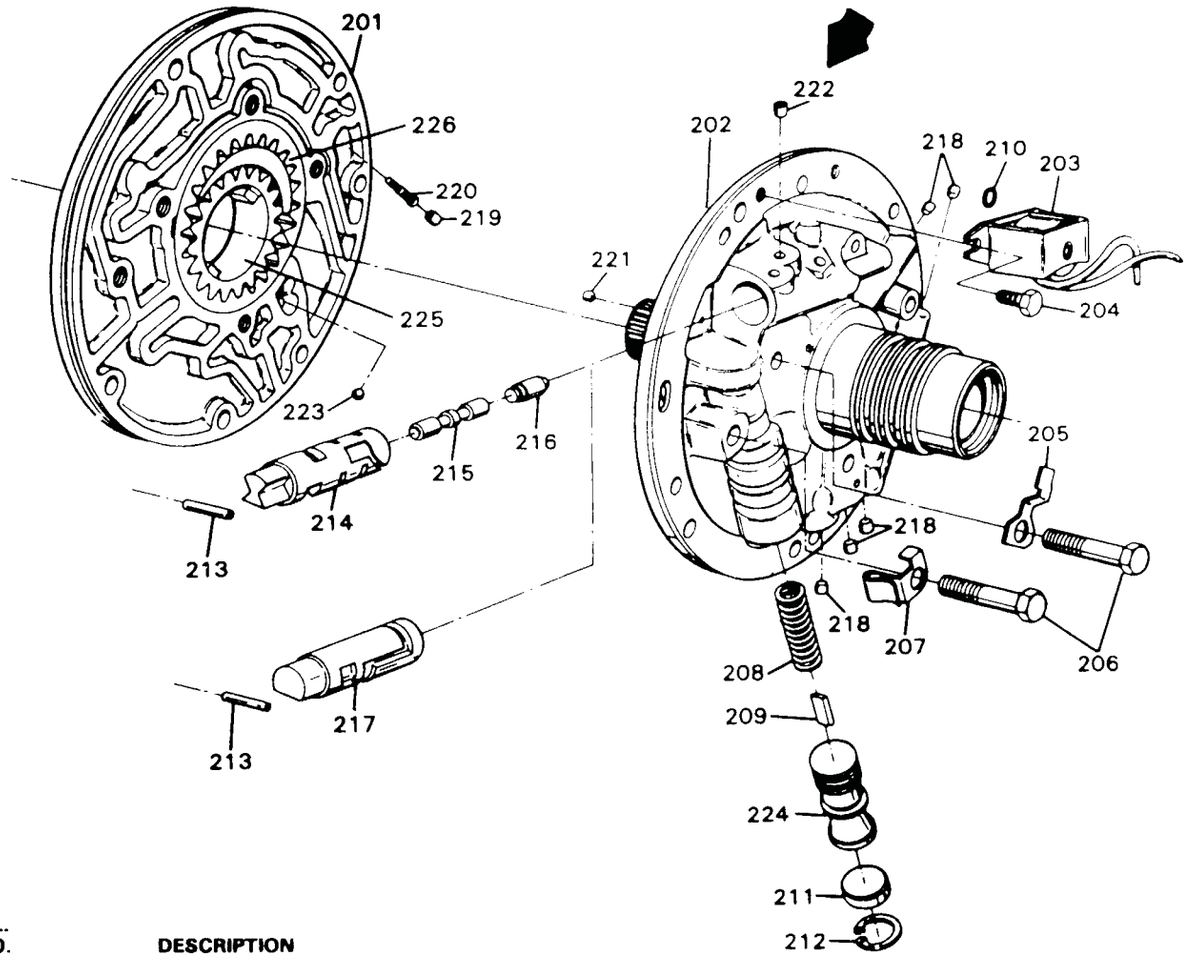
IF YOUR UNIT HAS THIS ORIFICE PLUG (222) YOU CANNOT HAVE BALL CAPSULE IN THE TURBINE SHAFT.

YOU WILL CREATE A HARSH CONVERTER CLUTCH APPLY, OR NO CONVERTER CLUTCH APPLY, DEPENDING ON WHICH WAY YOU MIS-MATCH.

11. Place the oil pump body over a hole in the work bench as shown in Figure 100.
12. Set the pump cover on top of the pump body and align the bolt holes (See Figure 100).
13. Install the pump cover to pump body attaching bolts, finger tight.
14. Install the alignment band J-25015 over the pump assembly, as shown in Figure 100, and tighten the adjusting screw to align pump halves.
15. Place a bolt or screwdriver through one of the pump to case bolt holes to align them.
16. Torque the pump cover to pump body attaching bolts to 18 ft.lbs.
17. Bend the roll pin retainer up far enough to install the roll pin for TCC valve line-up later.
18. We recommend this procedure to ensure that the pressure regulator and TCC control valve line-up are free and operational after the bolts are tight.
19. Remove the alignment band from the oil pump assembly (See Figure 100).

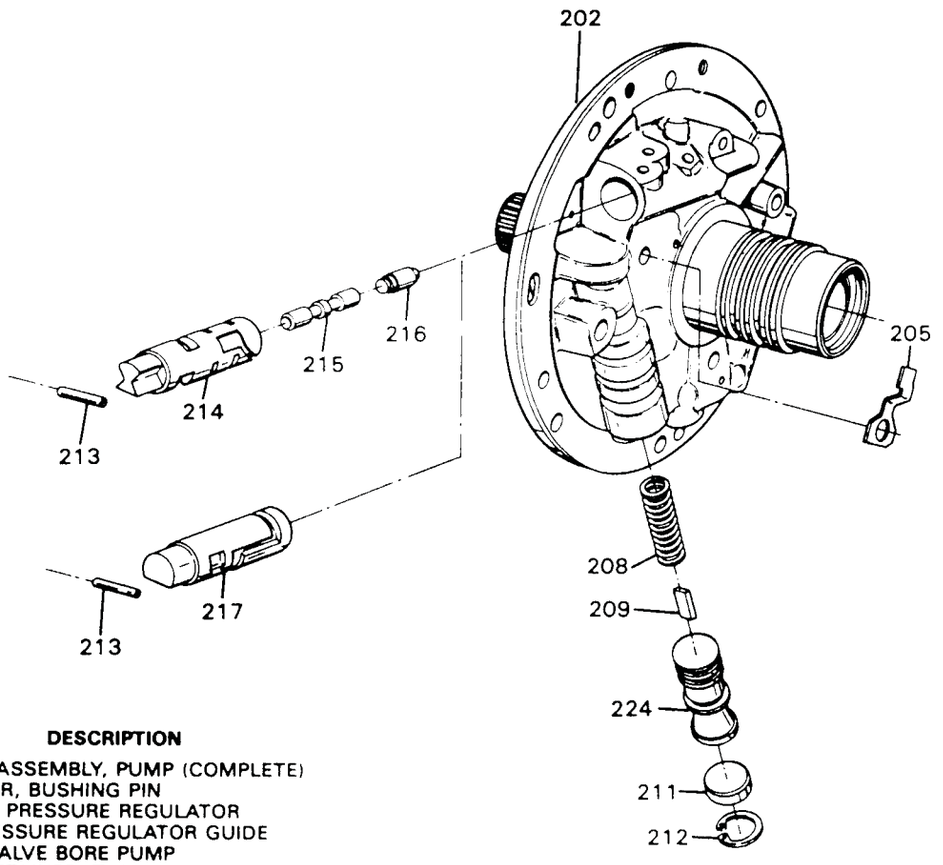
(Continued on Page 56)

OIL PUMP ASSEMBLY



ILL. NO.	DESCRIPTION
201	BODY ASSEMBLY, PUMP
202	COVER ASSEMBLY, PUMP (COMPLETE)
203	SOLENOID & CLIP ASSEMBLY
204	BOLT, HEX M8 X 1.25 X 45
205	RETAINER, BUSHING PIN
206	BOLT, HEX M8 X 1.25 X 45 (5)
207	CLIP, SOLENOID WIRE
208	SPRING, PRESSURE REGULATOR
209	PIN, PRESSURE REGULATOR GUIDE
210	SEAL, "O" RING SOLENOID
211	PLUG, VALVE BORE PUMP
212	RING, RETAINER (TYPE TA INTERNAL)
213	PIN, COIL SPRING
214	BUSHING, CONVERTER CLUTCH VALVE
215	VALVE, CONVERTER CLUTCH
216	VALVE, CONVERTER CLUTCH ACTUATOR
217	BUSHING, NONCONVERTER CLUTCH MODELS
218	PLUG, CUP (.31 DIA.) (5)
219	PLUG, PUMP BODY (C.C. SCREEN)
220	SCREEN
221	PLUG, PUMP COVER (6.1 DIA.)
222	PLUG, PUMP COVER (CONVERTER CLUTCH)
223	BALL (9/32 DIA.)
224	VALVE, PRESSURE REGULATOR
225	GEAR, PUMP DRIVE
226	GEAR, PUMP DRIVEN

Figure 101



ILL. NO.	DESCRIPTION
202	COVER ASSEMBLY, PUMP (COMPLETE)
205	RETAINER, BUSHING PIN
208	SPRING, PRESSURE REGULATOR
209	PIN, PRESSURE REGULATOR GUIDE
211	PLUG, VALVE BORE PUMP
212	RING, RETAINER (TYPE TA INTERNAL)
213	PIN, COIL SPRING
214	BUSHING, CONVERTER CLUTCH VALVE
215	VALVE, CONVERTER CLUTCH
216	VALVE, CONVERTER CLUTCH ACTUATOR
217	BUSHING, NONCONVERTER CLUTCH MODELS

Figure 102

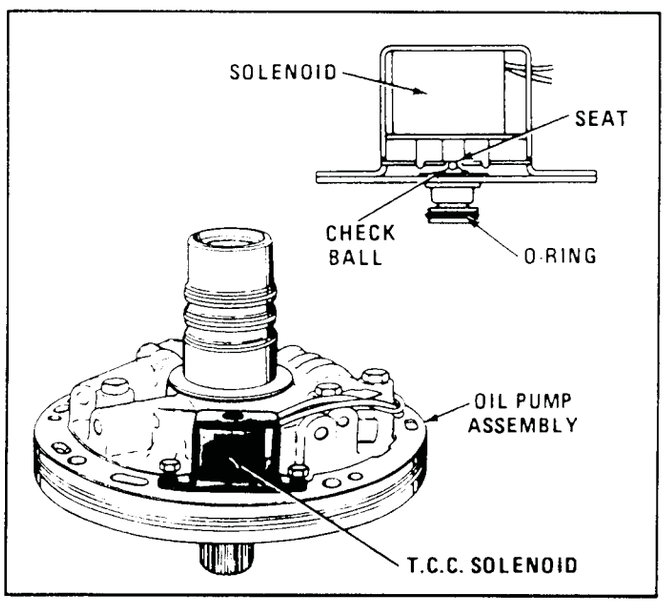


Figure 103

(Continued from page 54)

20. Install pressure regulator spring into the bore in pump cover, guide inside of the spring, pressure regulator valve with stem end facing out, and the bore plug hole side out as shown in Figure 102.
21. Compress the assembly and install the snap ring with the flat side facing out (See Figure 102).
22. Install the TCC acuator valve into the bore in the pump cover, as shown in Figure 102.
23. Install the TCC apply valve into the bushing and install the entire assembly into the pump cover as shown in Figure 102.
24. Install the roll pin (213) into pump cover, shown in Figure 102, and bend the retainer back down to retain the roll pin.
25. Lubricate both valve trains with transmission oil before assembly.

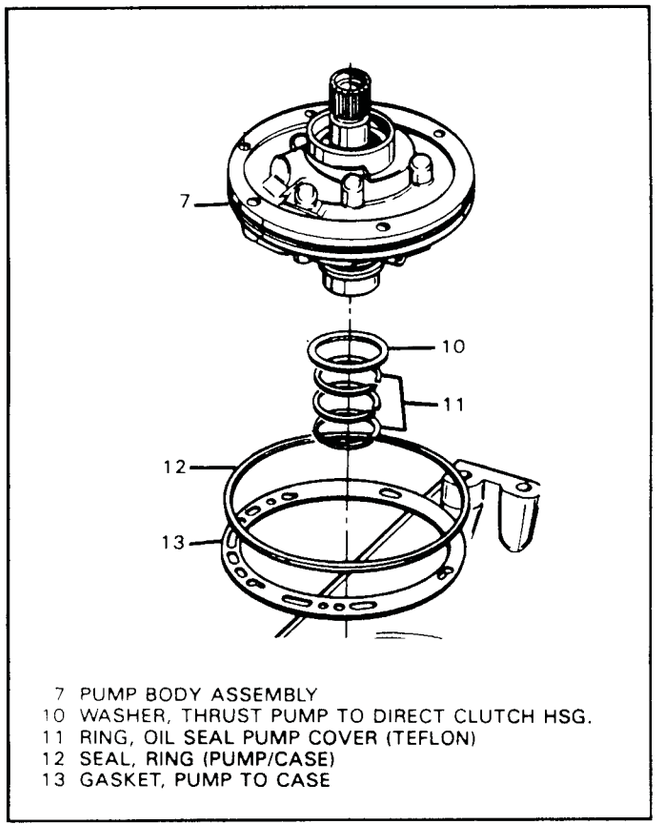
26. Install new "O" ring onto the lock-up solenoid and lubricate with small amount of "Trans-Jel" (See Figure 103).
27. Install the lock-up solenoid into the pump cover in the position shown in Figure 103.
28. Torque the two bolts to 35 in.lbs.
29. Install thrust washer (10) onto the pump assembly as shown in Figure 104, and retain with a small amount of "Trans-Jel".
30. Install the three sealing rings into the grooves on pump cover as shown in Figure 104, with the scarf cuts assembled properly.
31. Place a small amount of "Trans-Jel" on each scarf cut to retain the ring ends and prevent damage on installation.
32. Install a new oil pump to case "O" ring into the groove in pump and ensure it is not twisted.
33. Install new oil pump to case gasket into the case and retain with small amount of "Trans-Jel".
34. Install oil pump to case alignment pins, as shown in Figure 105.
35. Place a small amount of "Trans-Jel" around the pump to case "O" ring, and inside the pump bore in the case.
36. Before installing the oil pump assembly, ensure that the intermediate band anchor pin lug aligned with the band.
37. Install the completed oil pump assembly into the case, over the alignment pins, as shown in Figure 105.
38. Start pump to case bolts with new washers, except one bolt hole, as this will be used to check the end play.

NOTE:

If turbine shaft cannot be rotated as the pump is being pulled into place, the forward or direct clutches have not been indexed properly. This condition MUST be corrected BEFORE the pump is pulled fully into place or damage to the direct clutch plates will result.

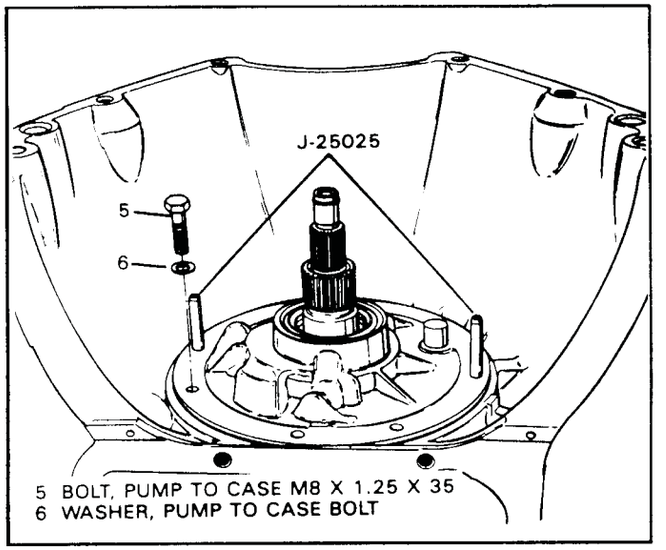
39. Replace alignment pins with bolts and with new washers, and torque bolts to 18 ft.lbs. (See Figure 105).
40. Make sure the turbine shaft rotates freely.
41. It is now time to check the front end play.

(Continued on next Page)



7 PUMP BODY ASSEMBLY
10 WASHER, THRUST PUMP TO DIRECT CLUTCH HSG.
11 RING, OIL SEAL PUMP COVER (TEFLON)
12 SEAL, RING (PUMP/CASE)
13 GASKET, PUMP TO CASE

Figure 104



5 BOLT, PUMP TO CASE M8 X 1.25 X 35
6 WASHER, PUMP TO CASE BOLT

Figure 105

FRONT END PLAY SELECTIVE WASHER CHART

Thickness (mm)	Thickness (in.)	Identification		Part Number
		Number	Color	
1.66 - 1.77	0.065 - 0.070	1	—	8639291
1.79 - 1.90	0.070 - 0.075	2	—	8639292
1.92 - 2.03	0.076 - 0.080	3	Black	8639293
2.05 - 2.16	0.081 - 0.085	4	Lt. Green	8639294
2.18 - 2.29	0.086 - 0.090	5	Scarlet	8639295
2.31 - 2.42	0.091 - 0.095	6	Purple	8639296
2.44 - 2.55	0.096 - 0.100	7	Cocoa Brown	8639297
2.57 - 2.68	0.101 - 0.106	8	Orange	8639298
2.70 - 2.81	0.106 - 0.111	9	Yellow	8639299
2.83 - 2.94	0.111 - 0.116	10	Lt. Blue	8639300
2.96 - 3.07	0.117 - 0.121	11	Blue	8639301
3.09 - 3.20	0.122 - 0.126	12	—	8639302
3.22 - 3.33	0.127 - 0.131	13	Pink	8639303
3.35 - 3.46	0.132 - 0.136	14	Green	8639304
3.48 - 3.59	0.137 - 0.141	15	Gray	8639305

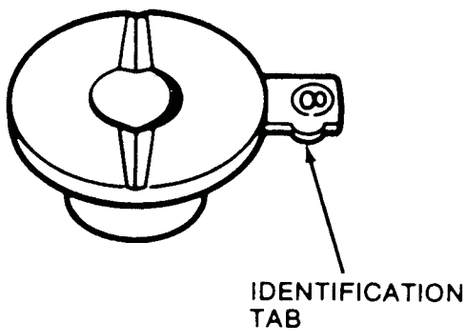


Figure 106

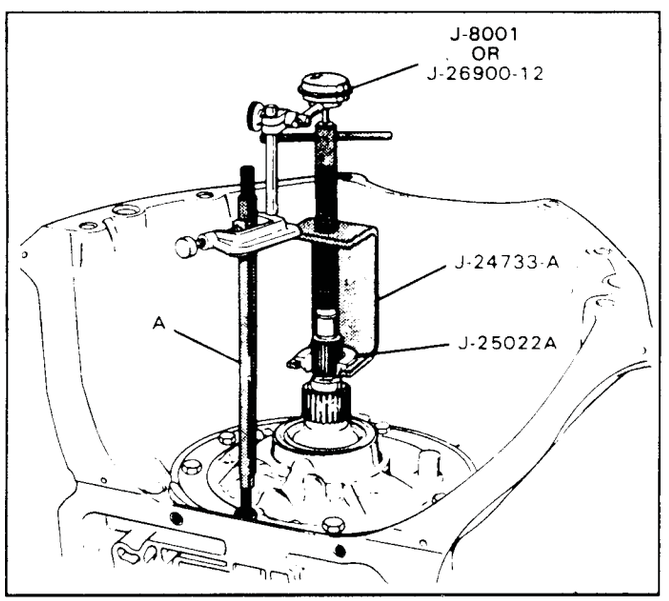


Figure 107

FRONT END PLAY MEASUREMENT

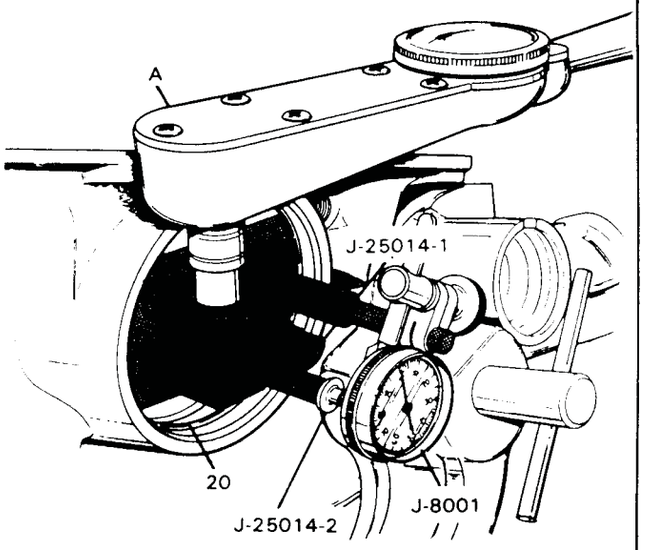
1. Install dial indicator and the turbine shaft lifting tool on transmission, as shown in Figure 107.
2. Remove all rear end play by turning the adjusting screw in on the holding fixture on the rear of the transmission.
3. Set the dial indicator to zero.
4. Pull the turbine shaft upward with the lifting tool (See Figure 107), and read front end play.
5. Front end play should be .015" to .025".

NOTE:
REAR END PLAY SHOULD ALREADY HAVE BEEN RECORDED. NEVER LET REAR END PLAY EXCEED FRONT END PLAY.

6. If more or less end end play is required, select the proper thrust washer from the chart in Figure 106 and install. The selective washer which controls front end play is placed on top of the output shaft before the drums are installed, and is shown in Figure 106.

BAND APPLY PIN MEASUREMENT

1. Install measuring tool J-25014-2 in intermediate servo bore, and retain with servo cover snap ring, as shown in Figure 108.
2. Install pin J-25014-1 into the tool. Tapered end of pin must be properly located against the band apply lug.
3. Install dial indicator on J-25014-2 zero post, as shown in Figure 108, and zero dial indicator.
4. Align stepped side of pin J-25014-1 with torquing arm of J-25014-2 (See Figure 108).
5. Apply 100 in.lbs. of torque to hex nut on the side of gage. Slide dial indicator over the gage pin.
6. Read the dial indicator to determine which apply pin should be used, and make the selection using the chart in Figure 109.
7. If a different apply pin is required disassemble the intermediate servo and install at this time.



ILL NO.	DESCRIPTION
A	TORQUE WRENCH
20	RING, SERVO COVER RETAINER

Figure 108

DIAL INDICATOR TRAVEL		APPLY PIN IDENTIFICATION
.0 - .72mm	(.0" - .029")	1 RING
.72 - 1.44mm	(.029" - .057")	2 RINGS
1.44 - 2.16mm	(.057" - .086")	3 RINGS
2.16 - 2.88mm	(.086" - .114")	WIDE BAND

Figure 109

ILL. NO.	DESCRIPTION
20	RING, SERVO COVER RETAINER
21	COVER, INTERMEDIATE SERVO
22	SEAL, "O" RING (INTERMEDIATE SERVO COVER)
23	RING, OIL SEAL (OUTER)
24	PISTON, INTERMEDIATE SERVO (OUTER)
25	RING, OIL SEAL (INNER)
26	PISTON, INTERMEDIATE SERVO (INNER)
27	RING, OIL SEAL PISTON (INNER)
28	SPRING, INTERMEDIATE SERVO CUSHION
29	RING, SNAP
30	RETAINER, SERVO SPRING
31	SPRING, INTERMEDIATE SERVO (INNER)
32	PIN, INTERMEDIATE BAND APPLY
33	SEAL, INTERMEDIATE BAND APPLY PIN
34	RING, GOVERNOR COVER RETAINER
35	COVER KIT, GOVERNOR W/SEAL
36	SEAL KIT, GOVERNOR W/COVER
37	SEAL, GOVERNOR COVER
39	GOVERNOR

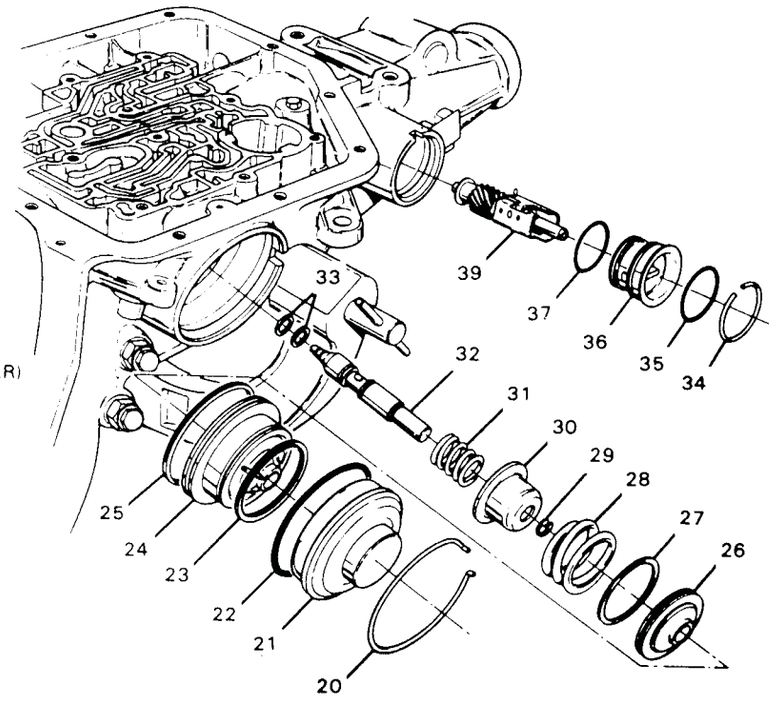


Figure 110

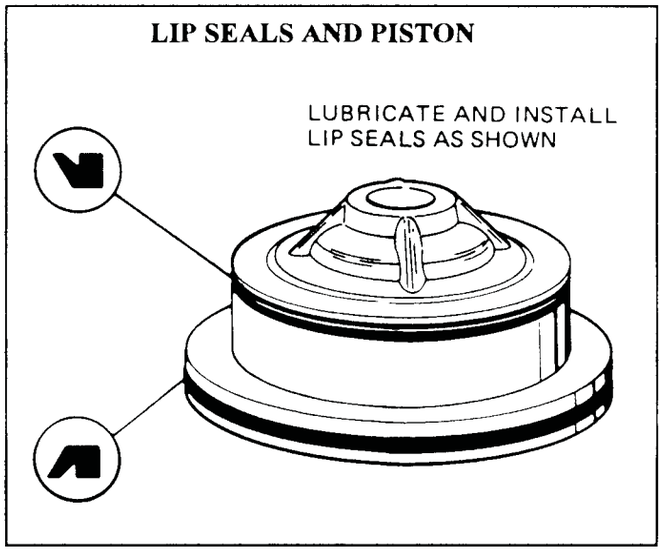


Figure 111

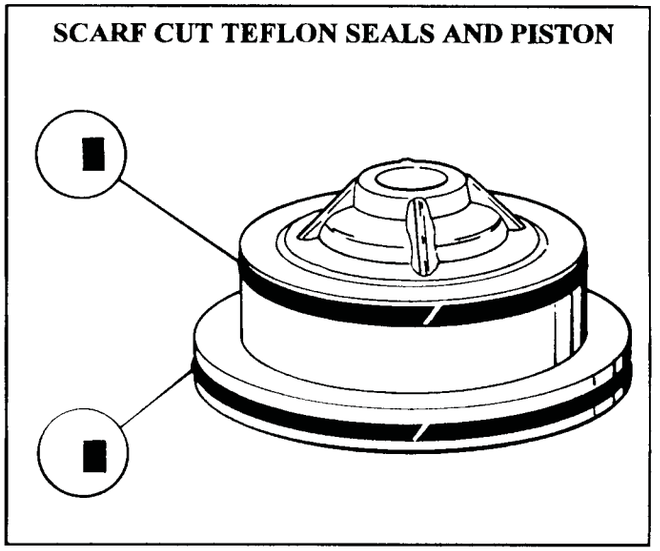
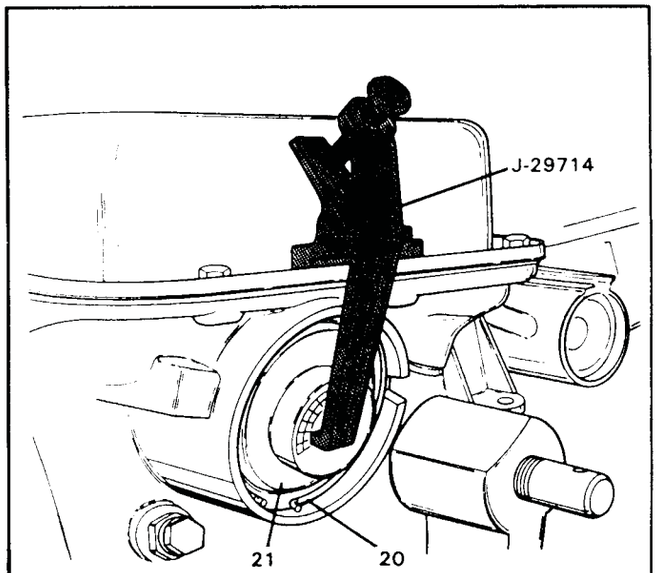


Figure 112

INTERMEDIATE SERVO ASSEMBLY

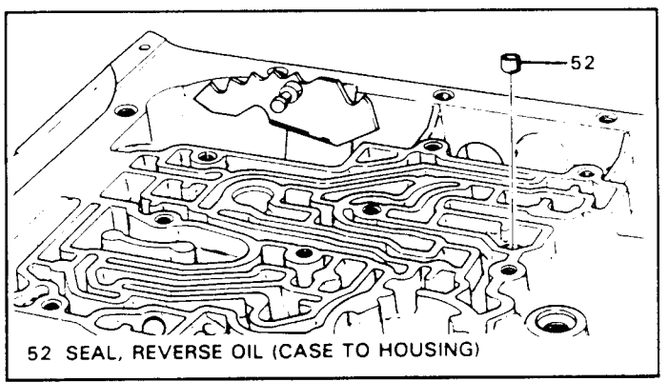
1. Assemble the intermediate servo assembly using Figure 110 as a guide.
2. Install new seals on the intermediate servo piston as shown in either Figure 111 or Figure 112, depending on which type of piston and seals that you are using.
3. Install new "O" ring on intermediate servo cover and lubricate with small amount of "Trans-Jel".
4. Install intermediate servo piston into the servo cover, and install the intermediate servo assembly into the case bore.
5. Make sure the tapered end of the band apply pin is seated against the band lug.

6. Install J-29714 compressor tool on case, as shown in Figure 113.
7. Compress the servo cover by turning the hex nut on the tool (See Figure 113).
8. Install the servo cover snap ring into transmission case, as shown in Figure 113.
9. Remove the servo compressor tool.
10. Install new "O" ring on the case connector, and install case connector, as shown in Figure 114.
11. Install new "O" rings onto governor cover, and lubricate with small amount of "Trans-Jel".
12. Install new seal on governor shaft and install the governor into the governor cover.
13. Install the governor and cover assembly into case as shown in Figure 110.
14. Rotate the governor and cover assembly, and the output shaft slightly. The governor fits tight in the bore over the last 1/16".
15. Install the governor cover retaining ring into the case, as shown in Figure 110.
16. Install the Lo/Reverse clutch oil seal into the case as shown in Figure 113A, with rubber seal facing the support.



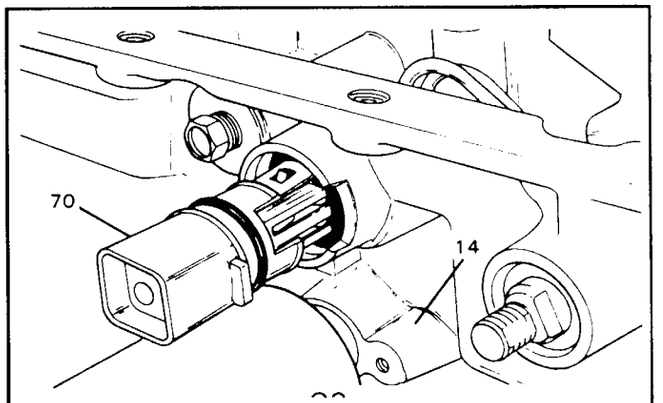
ILL NO.	DESCRIPTION
20	RING, SERVO COVER RETAINER
21	COVER, INTERMEDIATE SERVO

Figure 113



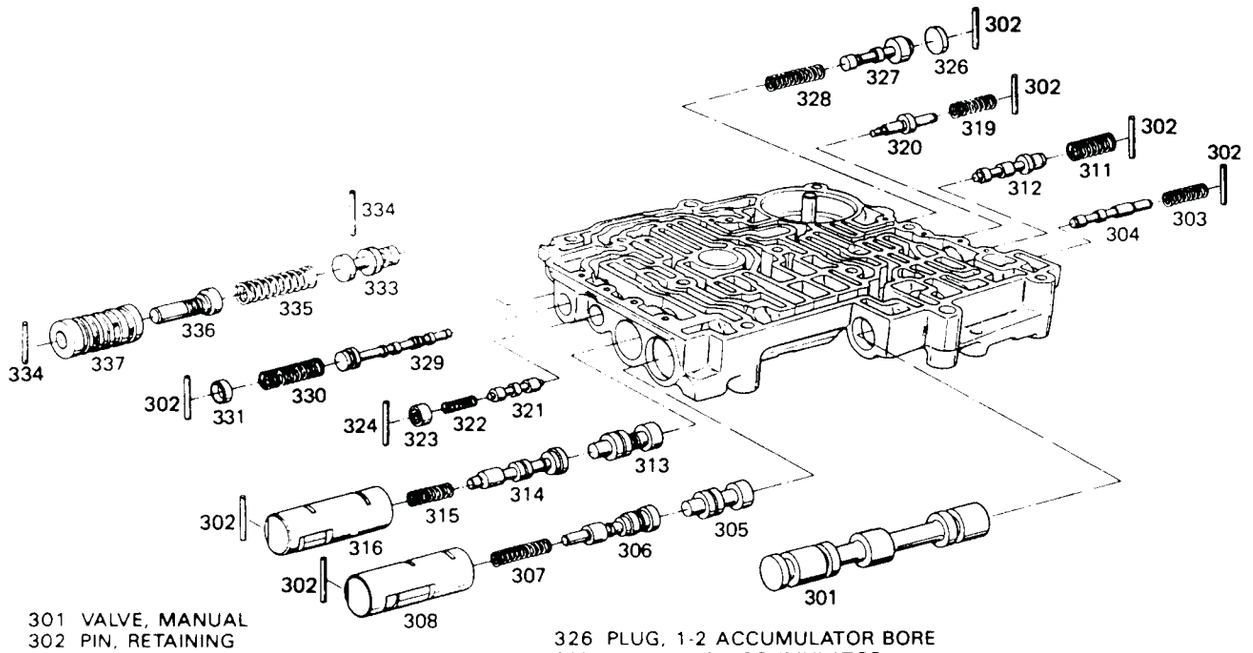
52 SEAL, REVERSE OIL (CASE TO HOUSING)

Figure 113A



ILL. NO.	DESCRIPTION
14	CASE, TRANSMISSION
70	ELECTRICAL CONNECTOR & "O" RING ASM.

Figure 114



301 VALVE, MANUAL
302 PIN, RETAINING
303 SPRING, INTERMEDIATE BOOST
304 VALVE, INTERMEDIATE BOOST
305 VALVE, 2-3 SHIFT
306 VALVE, 2-3 THROTTLE
307 SPRING, 2-3 THROTTLE VALVE
308 BUSHING, 2-3 THROTTLE VALVE
311 SPRING, LOW OVERRUN CLUTCH
312 VALVE, LOW OVERRUN CLUTCH
313 VALVE, 1-2 SHIFT
314 VALVE, 1-2 THROTTLE
315 SPRING, 1-2 THROTTLE VALVE
316 SPRING, 1-2 THROTTLE VALVE
319 SPRING, DIRECT CLUTCH EXHAUST
320 VALVE, DIRECT CLUTCH EXHAUST
321 VALVE, REVERSE BOOST
322 SPRING, REVERSE BOOST
323 PLUG, REVERSE BOOST BORE
324 PIN, RETAINING
326 PLUG, 1-2 ACCUMULATOR BORE
327 VALVE, 1-2 ACCUMULATOR
328 SPRING, 1-2 ACCUMULATOR VALVE
329 VALVE, SHIFT T.V.
330 SPRING, SHIFT T.V. VALVE
331 PLUG, SHIFT T.V. BORE
333 VALVE, THROTTLE
334 PIN, RETAINING (2)
335 SPRING, THROTTLE VALVE
336 PLUNGER, THROTTLE VALVE
337 BUSHING, THROTTLE VALVE PLUNGER
338 PIN, RETAINING
339 SPRING, 1-2 ACCUMULATOR
340 SEAL, 1-2 ACCUMULATOR PISTON
341 SEAL, 1-2 ACCUMULATOR PISTON

Figure 115

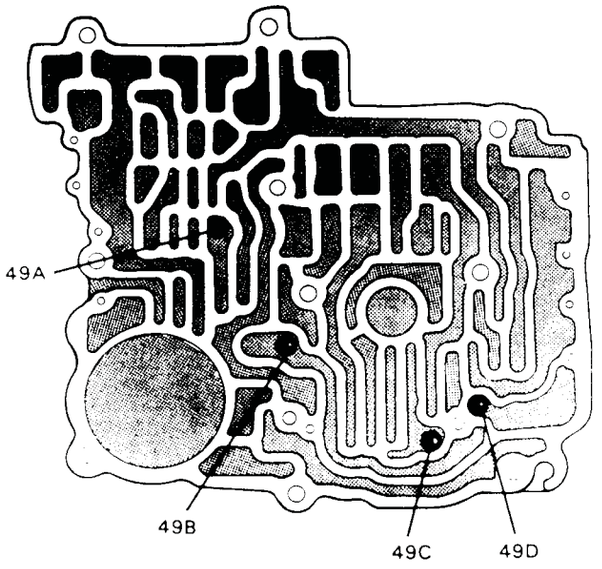
VALVE BODY AND BOTTOM PAN

1. Clean the valve body assembly thoroughly with clean solvent and blow dry with compressed air.
2. Move the valves with a pick or small screwdriver to dislodge any dirt or debris and blow again with compressed air.
3. Position the valve body as shown in Figure 115 on a clean surface.
4. Remove the valves, springs and bushings and lay out on a clean surface in the exact sequence they are removed.
5. Clean all parts with clean solvent and blow dry with compressed air.
6. Assemble the valve body exactly as shown in Figure 115. Give particular attention to position of valve lands and bushing passages.
7. Install four (4) steel checkballs into the valve body, in the locations shown in Figure 116, and retain with a small amount of "Trans-Jel".
8. Install the 1-2 accumulator spring and piston into case, as shown in Figure 117.

NOTE:

FIGURE 117 SHOWS A CHECKBALL IN THE CASE. WE RECOMMEND THAT YOU LEAVE OUT THIS CHECKBALL.

9. Install guide pins into the case in the locations shown in Figure 117.
10. Install case to spacer plate gasket (Stamped "C") over the guide pins and onto the case.
11. Install the spacer plate over the guide pins and on to the case, as shown in Figure 117.

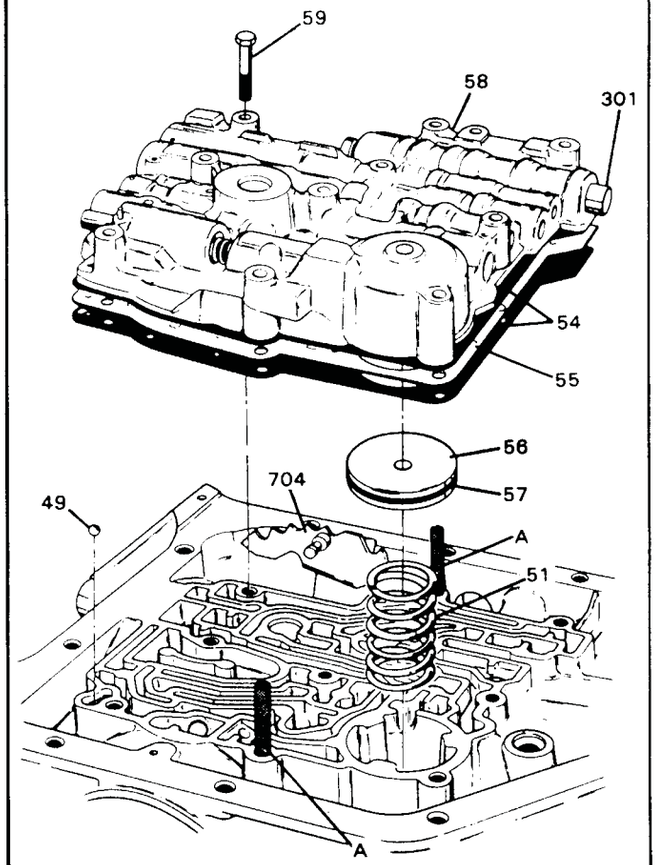


ILL. NO.	DESCRIPTION
49A	CHECK BALL #4
49B	CHECK BALL #3
49C	CHECK BALL #2
49D	CHECK BALL #1

Figure 116

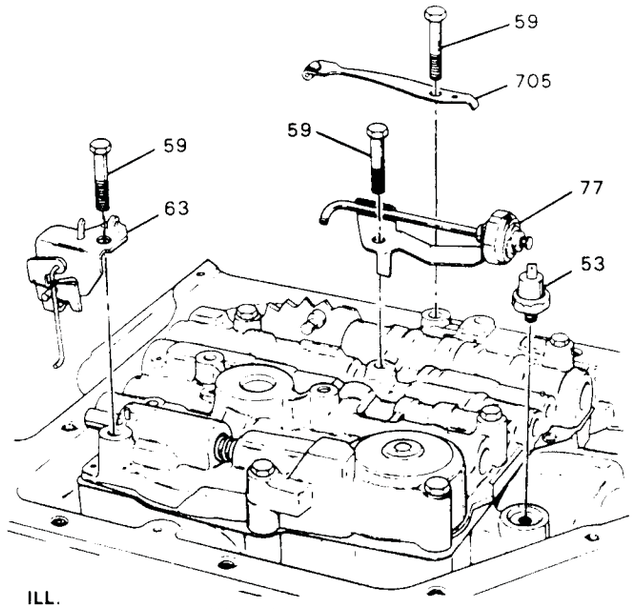
12. Install spacer plate to valve body gasket (Stamped "V") over the guide pins and onto spacer plate as shown in Figure 117.
13. Carefully install the valve body assembly onto the case, and connect the manual valve on the detent lever pin (See Figure 117).
14. Install two valve body bolts to retain valve body in position, and remove guide pins.

(Continued on next Page)



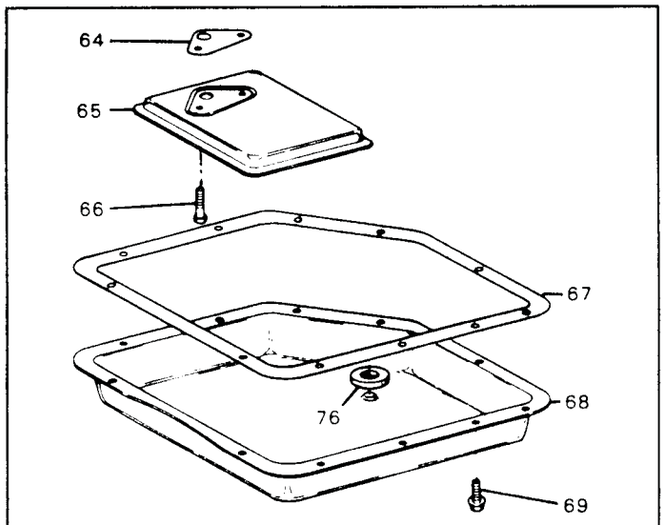
ILL NO.	DESCRIPTION
A	GUIDE PINS
49	BALL, CHECK (5)
51	SPRING, 1-2 ACCUMULATOR PISTON
54	GASKET, VALVE BODY/SPACER PLATE
55	PLATE, VALVE BODY SPACER
56	PISTON, 1-2 ACCUMULATOR
57	SEAL, ACCUMULATOR PISTON
58	VALVE, CONTROL
59	BOLT, HEX HEAD 6.3 X 1 X 45
301	MANUAL VALVE
704	DETENT LEVER

Figure 117



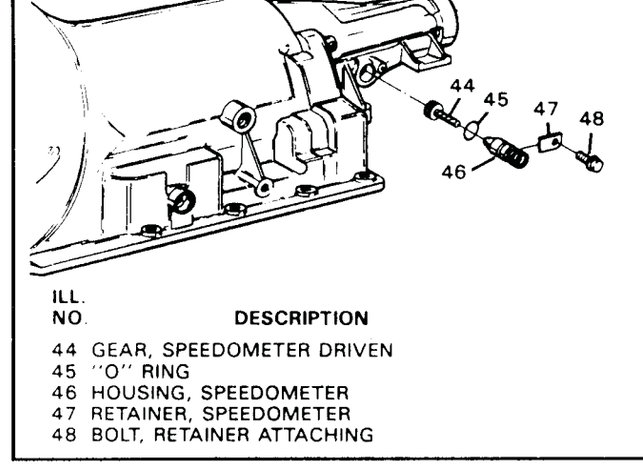
ILL. NO.	DESCRIPTION
53	SWITCH, PRESSURE TRANSMISSION VALVE BODY
59	BOLT, HEX HEAD 6.3 X 1 X 45
63	ASSEMBLY, T.V. LEVER & BRACKET
77	PRESSURE SWITCH BRACKET ASM., 3RD CLUTCH
705	ROLLER, DETENT MANUAL & SPRING

Figure 118



ILL NO.	DESCRIPTION
64	GASKET, TRANSMISSION OIL PUMP SCREEN
65	SCREEN ASSEMBLY, TRANSMISSION OIL
66	BOLT, HEX HEAD 6.3 X 1 X 55
67	GASKET, TRANSMISSION OIL
68	PAN, TRANSMISSION OIL
69	SCREW & CONICAL WASHER ASM., HEX HEAD
76	MAGNET

Figure 119



ILL. NO.	DESCRIPTION
44	GEAR, SPEEDOMETER DRIVEN
45	"O" RING
46	HOUSING, SPEEDOMETER
47	RETAINER, SPEEDOMETER
48	BOLT, RETAINER ATTACHING

Figure 120

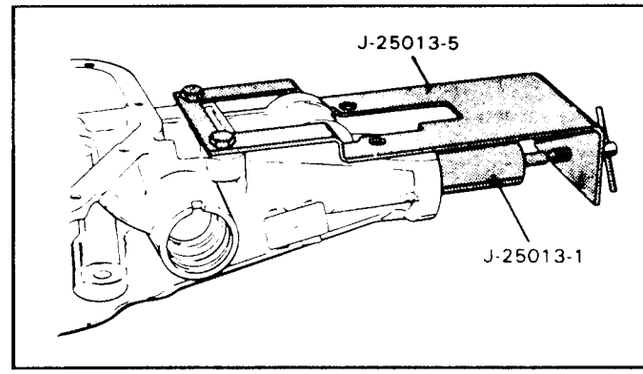
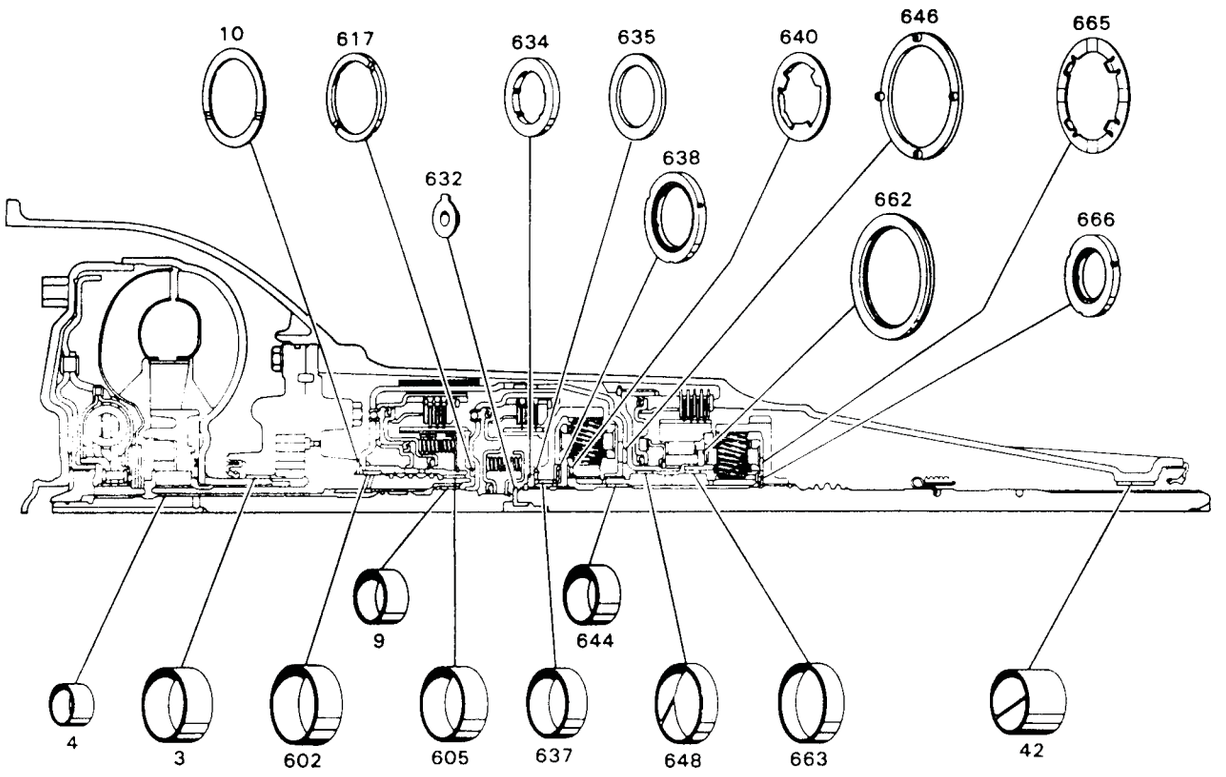


Figure 121

(Continued from Page 63)

15. Install manual detent roller and spring assembly as shown in Figure 118.
16. Install the throttle lever and bracket assembly and retain with valve body bolt (See Figure 118).
17. Install the 3rd clutch pressure switch, as shown in Figure 118.
18. Install the remaining valve body bolts and torque to 11 ft.lbs.
19. Install governor pressure switch (If Used), and connect all wires, and install into clips.
20. Install new filter and gasket and torque the bolts to 11 ft.lbs. (See Figure 119).
21. Install new pan gasket and bottom pan and torque bolts to 12 ft.lbs.
22. Install speedometer driven gear and housing into case bore and torque bolt to 8 ft.lbs., as shown in Figure 120.
23. Remove output shaft holding fixture from the rear of transmission (See Figure 121).

THRUST WASHER AND BUSHING LOCATIONS



3 BUSHING, PUMP BODY
4 BUSHING, PUMP COVER (FRONT)
9 BUSHING, PUMP COVER (REAR)
10 WASHER, THRUST PUMP TO DIRECT CLUTCH HSG.
42 BUSHING, TRANSMISSION CASE (REAR)
602 BUSHING, DIRECT CLUTCH (FRONT)
605 BUSHING, DIRECT CLUTCH (REAR)
617 WASHER, DIRECT & FORWARD CLUTCH (THRUST)
632 WASHER, THRUST SELECTIVE (FRONT)
634 WASHER, SELECTIVE
635 WASHER, FRONT INTERNAL GEAR
637 BUSHING, FRONT INTERNAL GEAR
638 BEARING, FRONT INTERNAL CARRIER THRUST
640 BEARING, FRONT CARRIER SUN GEAR W/RACE
644 BUSHING, REAR SUN GEAR
646 WASHER, THRUST (DRUM TO HOUSING)
648 BUSHING, REVERSE CLUTCH HSG. 53.13 X 9.53
662 WASHER, REAR CARRIER TO LO ROLLER CL. THRUST
663 BUSHING, REAR CARRIER
665 WASHER, REAR CARRIER TO INT. GEAR THRUST
666 BEARING, THRUST (SUN GEAR TO INT. GEAR)

Figure 120

TORQUE SPECIFICATIONS

DESCRIPTION OF USAGE	QUANTITY	SIZE	TORQUE ASSEMBLY
PUMP BODY TO PUMP COVER	5	M8 x 1.25 x 45	20.0 - 27.0 N·m (15 - 20 ft.-lbs.)
PUMP ASSEMBLY TO CASE	6	M8 x 1.25 x 35	20.0 - 27.0 N·m (15 - 20 ft.-lbs.)
PARKING LOCK BRACKET TO CASE	2	M8 x 1.25 x 20	20.0 - 27.0 N·m (15 - 20 ft.-lbs.)
TRANSMISSION OIL PAN TO CASE	11	M8 x 1.25 x 16	8.0 - 14.0 N·m (6 - 10 ft.-lbs.)
MANUAL SHAFT TO INSIDE DETENT LEVER	1	M10 x 1.5	27.0 - 34.0 N·m (20 - 25 ft.-lbs.)
COOLER CONNECTOR – BRASS	2	1/4 - 18 NPSF	35.0 - 40.0 N·m (26 - 30 ft.-lbs.)
LINE PRESSURE – TAKE-OFF	1	1/8 - 27 NPTF	7.0 - 14.0 N·m (5 - 10 ft.-lbs.)
THROTTLE LEVER, LINK & BRACKET TO CASE	1	M6.3 x 1.0 x 45	13.0 - 17.0 N·m (9 - 12 ft.-lbs.)
CONTROL VALVE ASSEMBLY TO CASE	7	M6.3 x 1.0 x 45	13.0 - 17.0 N·m (9 - 12 ft.-lbs.)
OIL SCREEN TO CASE	2	M6.3 x 1.0 x 55	13.0 - 17.0 N·m (9 - 12 ft.-lbs.)
SPEEDOMETER DRIVEN GEAR RETAINER TO CASE	1	M6.3 x 1.0	8.0 - 14.0 N·m (6 - 10 ft.-lbs.)
GOVERNOR PRESSURE SWITCH	1	1/8 - 27 NPTF	7.0 - 14.0 N·m (5 - 10 ft.-lbs.)
SOLENOID ASSEMBLY TO PUMP	2	M5 x .8 x 12.0	3.0 - 5.0 N·m (2 - 4 ft.-lbs.)

Figure 121

REQUIRED SPECIAL TOOLS

TOOL NO.	NAME	TOOL NO.	NAME
J-25015	OIL PUMP BODY & COVER ALIGNMENT BAND	J-25010	DIRECT CLUTCH SEAL PROTECTOR
J-25016	FRONT OIL PUMP SEAL INSTALLER	J-25011	REVERSE CLUTCH SEAL PROTECTOR
J-25020-01	CONVERTER STATOR & TURBINE END-PLAY CHECKING FIXTURE	J-25022	END-PLAY CHECKING FIXTURE ADAPTER
J-25023	REVERSE CLUTCH SELECTIVE SHIM GROUP	J-23327	CLUTCH SPRING COMPRESSOR
J-25012	REVERSE CLUTCH HOUSING INSTALLER & REMOVER	J-22269-01	DIRECT CLUTCH SPRING COMPRESSOR
J-25018	FORWARD CLUTCH SPRING COMPRESSOR	J-21426	REAR OIL SEAL INSTALLER
J-25019	BUSHING SERVICE SET	J-25024	FORWARD CLUTCH SPRING COMPRESSOR
J-25014	INTERMEDIATE BAND APPLY PIN GAUGE	J-21427-01	SPEEDO GEAR PULLER
J-25021	TURBINE SHAFT & DIRECT CLUTCH INSTALLER	J-24773	GAGING FIXTURE
J-25025	ALIGNMENT PIN & STUD SET	J-8092	DRIVER HANDLE
J-25013	OUTPUT SHAFT & REAR UNIT SUPPORT FIXTURE	J-7004	SLIDE HAMMER
		J-8001	DIAL INDICATOR SET
		J-8433	PULLER
		J-8763-02	HOLDING FIXTURE & BASE
		J-3289-20	

Figure 122

THM 200C

NO CONVERTER CLUTCH APPLY, OR HARSH CONVERTER CLUTCH APPLY

CHANGE: Beginning on October 8, 1986 (Julian Date 281), a new design turbine shaft that incorporates a ball capsule to cushion converter clutch apply, was introduced on ALL 1987 model THM 200C transmissions, as shown in Figure 123.

This change made it necessary to remove the orifice cup plug (222), shown in Figure 124, that was used to cushion converter clutch apply on ALL PREVIOUS model THM 200C transmissions.

INTERCHANGEABILITY:

(1) If you are using the new design turbine shaft with the ball capsule, the orifice cup plug (222) shown in Figure 124, MUST BE REMOVED.
IF YOU INSTALL THE NEW DESIGN TURBINE SHAFT WITH ORIFICE CUP PLUG (222) IN THE TRANSMISSION, NO CONVERTER CLUTCH OR EXTREMELY LATE CONVERTER CLUTCH WILL BE THE COMPLAINT.

(2) If you are using the previous turbine shaft without the ball capsule, the orifice cup plug (222) shown in Figure 124, MUST BE PRESENT.
IF YOU INSTALL THE PREVIOUS DESIGN TURBINE SHAFT WITHOUT ORIFICE CUP PLUG (222) IN THE TRANSMISSION, HARSH CONVERTER CLUTCH APPLY WILL BE THE COMPLAINT.

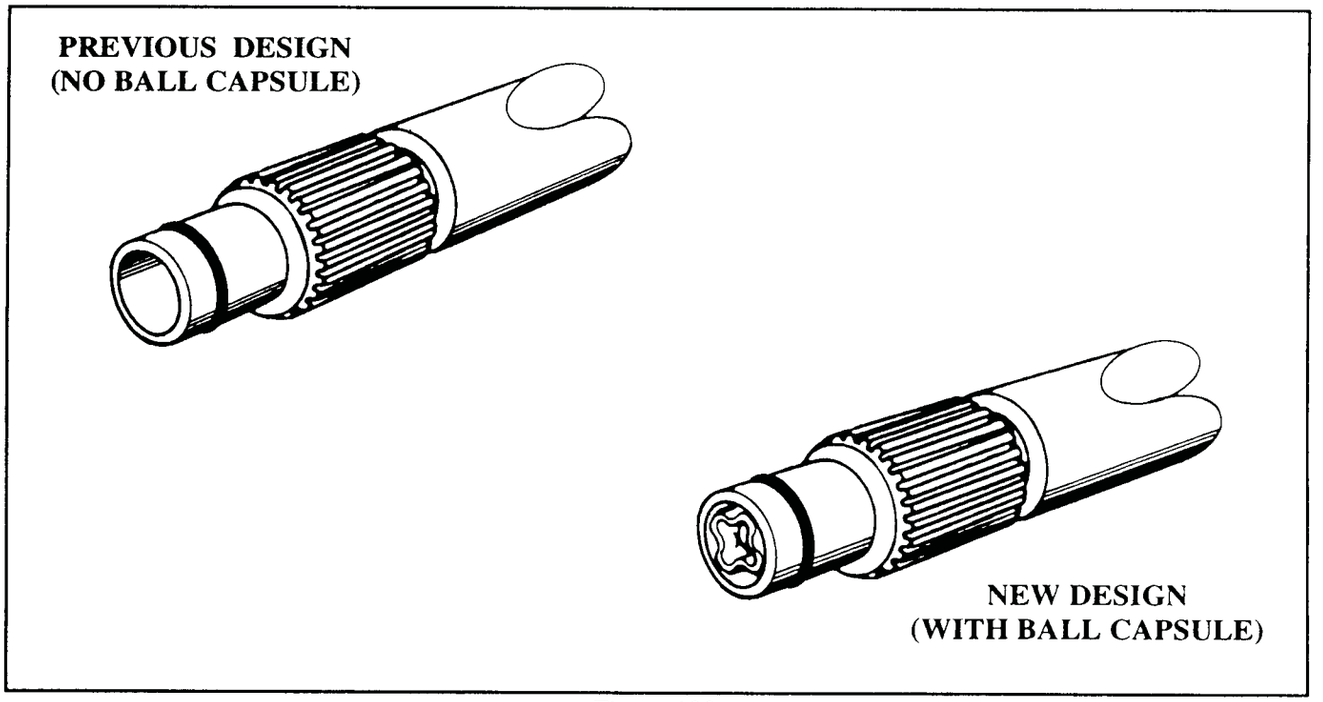
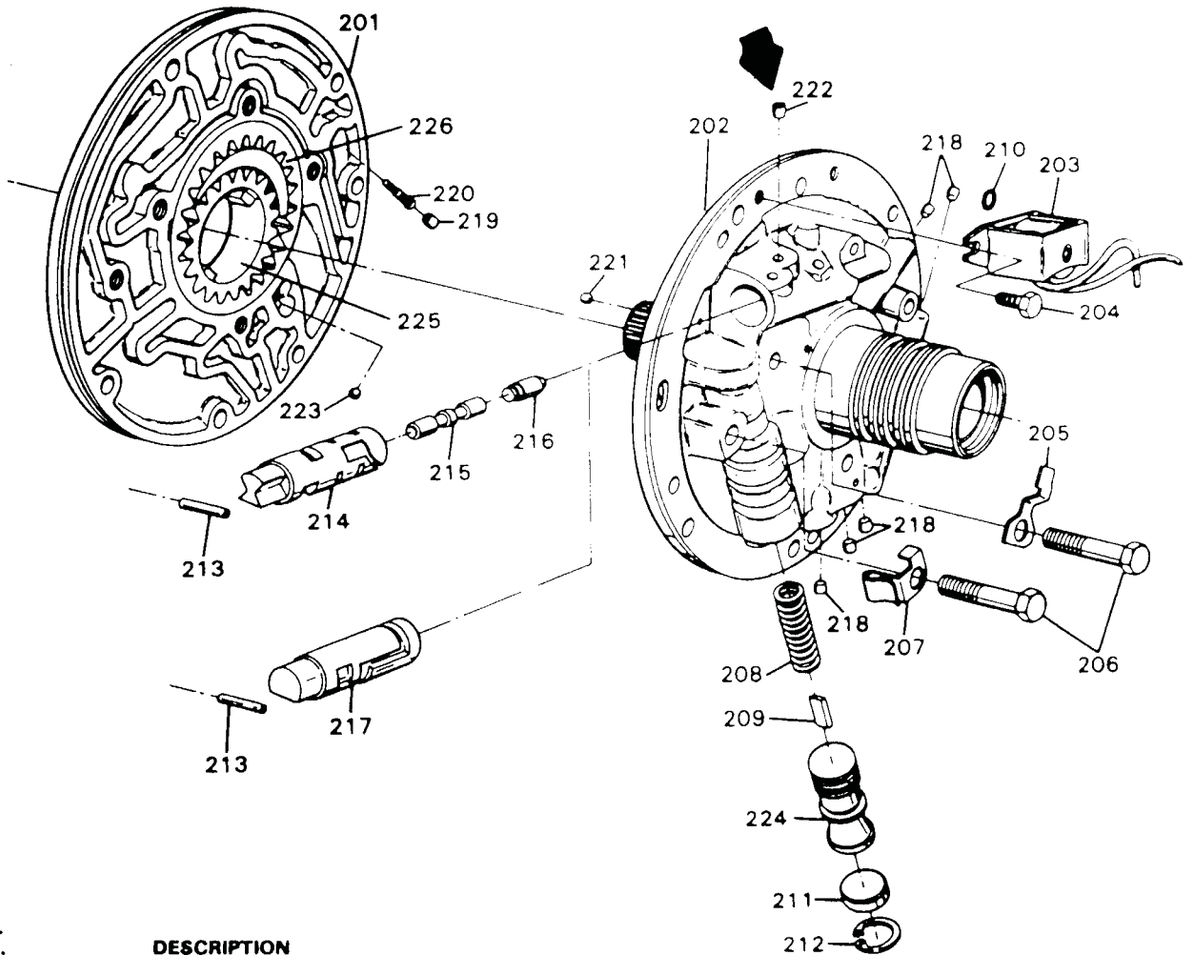


Figure 123



ILL. NO.	DESCRIPTION
201	BODY ASSEMBLY, PUMP
202	COVER ASSEMBLY, PUMP (COMPLETE)
203	SOLENOID & CLIP ASSEMBLY
204	BOLT, HEX M8 X 1.25 X 45
205	RETAINER, BUSHING PIN
206	BOLT, HEX M8 X 1.25 X 45 (5)
207	CLIP, SOLENOID WIRE
208	SPRING, PRESSURE REGULATOR
209	PIN, PRESSURE REGULATOR GUIDE
210	SEAL, "O" RING SOLENOID
211	PLUG, VALVE BORE PUMP
212	RING, RETAINER (TYPE TA INTERNAL)
213	PIN, COIL SPRING
214	BUSHING, CONVERTER CLUTCH VALVE
215	VALVE, CONVERTER CLUTCH
216	VALVE, CONVERTER CLUTCH ACTUATOR
217	BUSHING, NONCONVERTER CLUTCH MODELS
218	PLUG, CUP (.31 DIA.) (5)
219	PLUG, PUMP BODY (C.C. SCREEN)
220	SCREEN
221	PLUG, PUMP COVER (6.1 DIA.)
222	PLUG, PUMP COVER (CONVERTER CLUTCH)
223	BALL (9/32 DIA.)
224	VALVE, PRESSURE REGULATOR
225	GEAR, PUMP DRIVE
226	GEAR, PUMP DRIVEN

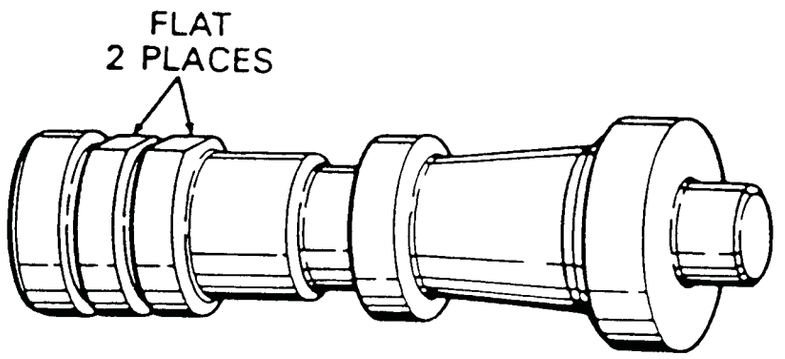
Figure 124

THM 200C
ENGINE STALL, REVERSE ONLY

COMPLAINT: The engine stalls when the transmission selector lever is placed into the Reverse position, but is okay when placed into the Drive position.

CAUSE: One possible cause may be a cross leak between the pump halves, or cross leak between the pump gears and cover (Excessive Side Clearance).

CORRECTION: An in car repair can be made by removing the Pressure Regulator Valve from the pump cover, and filing two "Flats" on the lands, as shown in Figure 125. You can also purchase a new Pressure Regulator Valve that has already been modified and is available under OEM part number 8638950.



200-C PRESSURE REGULATOR VALVE
(PART # 8638950)

Figure 125

THM 200C

NO REVERSE, NO 2ND OR 3RD, 1ST GEAR ONLY AND NO UPSHIFT

COMPLAINT: Some vehicles may display a no reverse and a no upshift condition with the selector lever placed in the proper position.

CAUSE: The cause may be, the splines stripped on the inside of the sun gear shell where it splines onto the sun gear (See Figure 126).

CORRECTION: Always replace the sun gear shell with the newest design level which has ***hardened*** splines. The ***hardened*** sun gear shell can be recognized by the black appearance from the heat treating process in the spline area (See Figure 126).

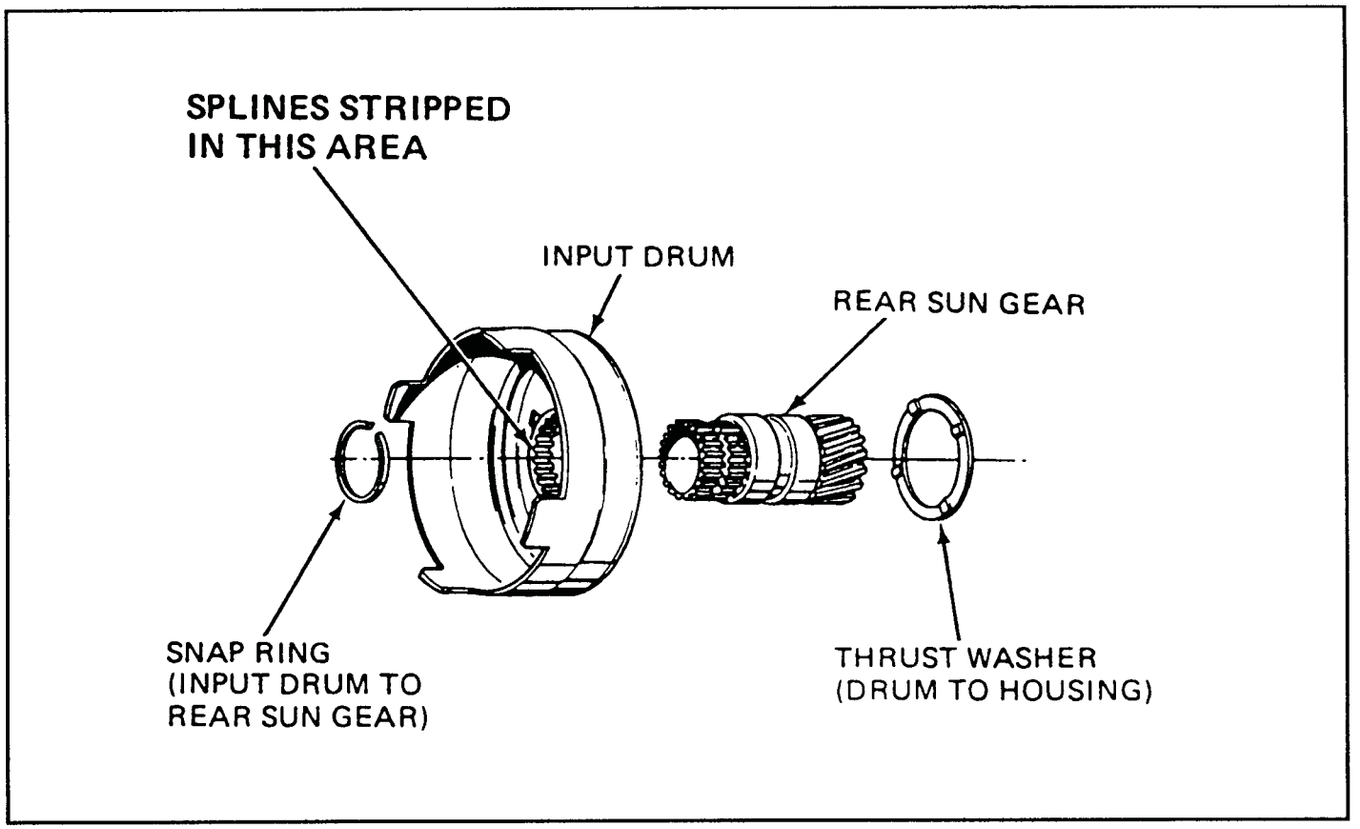


Figure 126

THM 200C

NEW DESIGN OUTPUT SHAFT AND GOVERNOR GEAR

Beginning in mid-year 1980 as a running change, the Output Shaft and Governor Assembly were changed in production to a revised ratio. The revised governor rotates approximately 1.23 times for each revolution of the output shaft, for improved shift timing.

The previous Output Shaft contains 14 governor drive teeth and ***requires*** a governor with 14 teeth on the governor gear.

The revised Output Shaft contains 16 governor drive teeth and can be identified by a groove located to the rear of the drive teeth as shown in Figure 127. The revised output shaft ***requires*** a governor with 13 teeth on the gear and can be identified by the tinted green color of the plastic gear as shown in Figure 127.

THESE PARTS ARE NOT INTERCHANGEABLE.

14 TOOTH OUTPUT SHAFT *REQUIRES* 14 TOOTH GOVERNOR
16 TOOTH OUTPUT SHAFT *REQUIRES* 13 TOOTH GOVERNOR

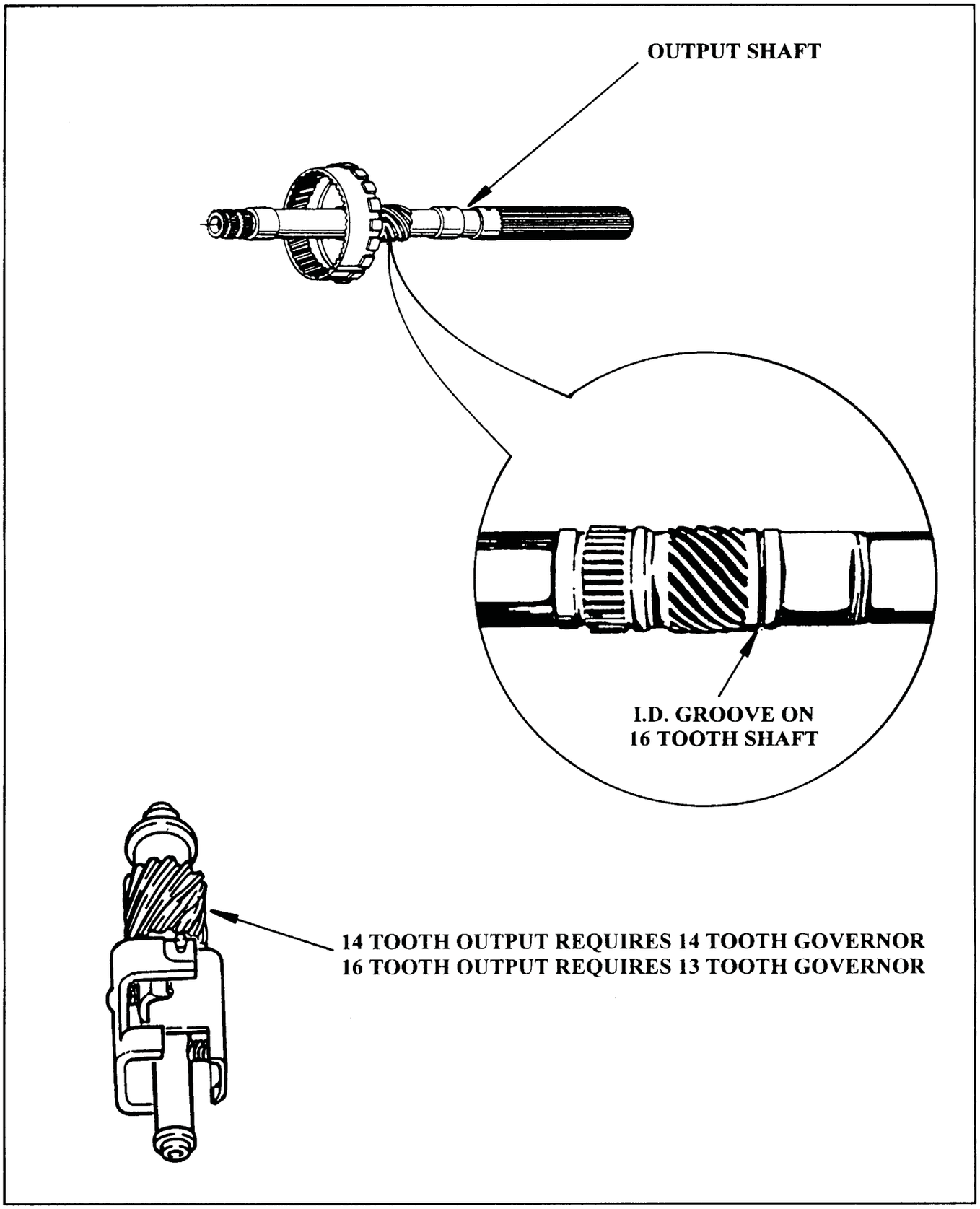


Figure 127

THM 200C

FORWARD CLUTCH CHANGES FOR 1987 MODELS

CHANGE: Beginning on August 4, 1986 (Julian Date 216) all 1987 model THM 200C transmissions were produced with a new design ***"feed/bleed"*** system for the forward clutch pack.

REASON: This system gives improved cushioning during forward clutch apply, to help reduce a harsh Park/Neutral to Drive engagement feel.

PARTS AFFECTED:

(1) FORWARD CLUTCH HOUSING - Check ball capsule in the housing has been eliminated (See Figure 128).

(2) FORWARD CLUTCH PISTON - Now has two "bleed" holes added on the surface where the wave plate seats (See Figure 128).

(3) FORWARD CLUTCH WAVE PLATE - An additional wave plate added next to the backing plate (See Figure 128).

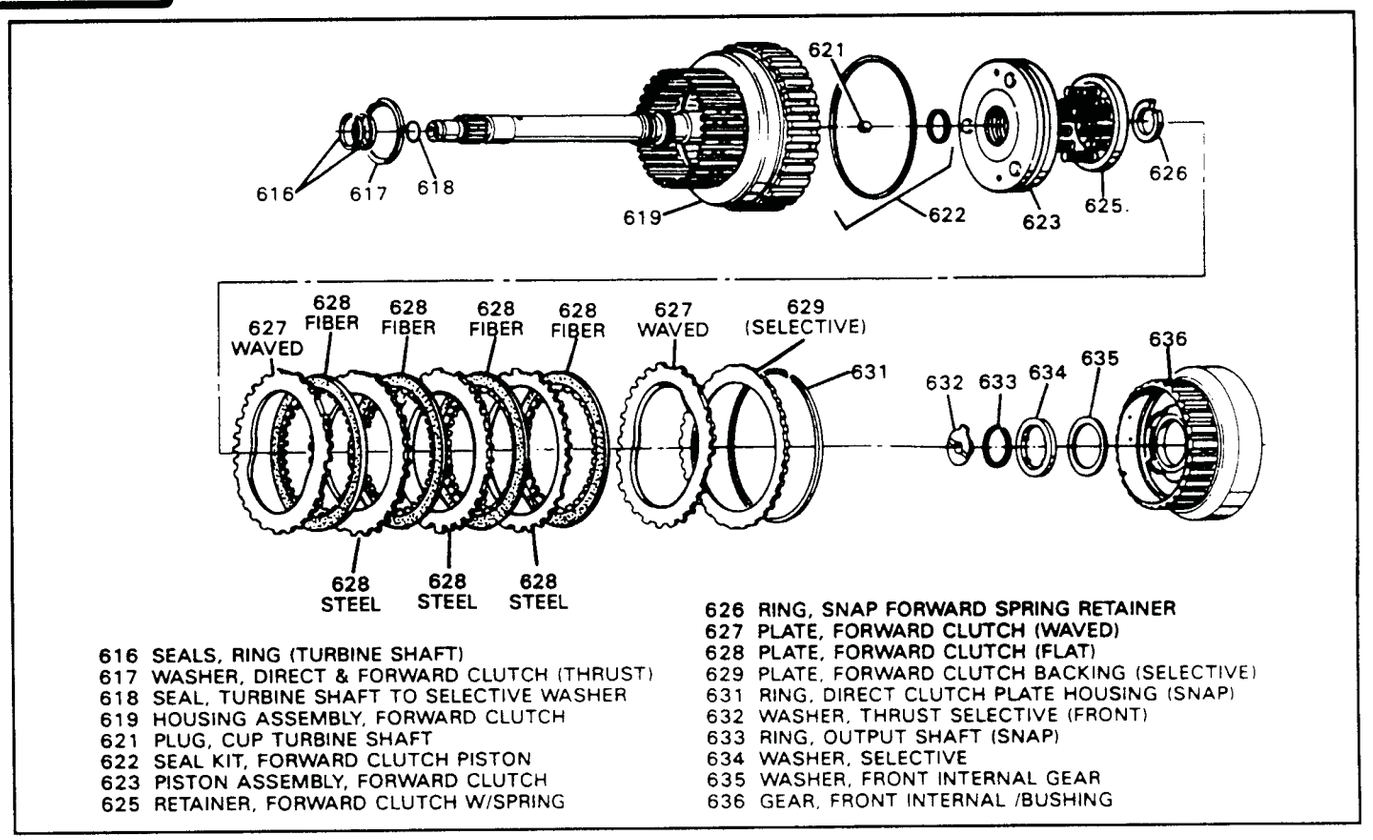
(4) INPUT INTERNAL RING GEAR - Dimensional changes that will not allow the previous ring gear to be used with the "feed/bleed" system parts.

SERVICE INFORMATION:

Neutral/Drive Shift Package (Contains all parts needed)	8638957
Forward Clutch Housing (Feed/Bleed)	8638956
Forward Clutch Piston (Feed/Bleed)	8648721
Input Internal Ring Gear	8639947
Backing Plate, Selective (I.D. "7" Figure 130)	8657267
Backing Plate, Selective (I.D. "6" Figure 130)	8657266
Backing Plate, Selective (I.D. "X" Figure 130)	8657618
Backing Plate, Selective (I.D. "5" Figure 130)	8657265
Backing Plate, Selective (I.D. "4" Figure 130)	8657264

SERVICE NOTE:

Backing plate clearance should be .028"-.059", with an evenly distributed 20 lbs. of pressure against the backing plate (See Figure 129).



616 SEALS, RING (TURBINE SHAFT)
617 WASHER, DIRECT & FORWARD CLUTCH (THRUST)
618 SEAL, TURBINE SHAFT TO SELECTIVE WASHER
619 HOUSING ASSEMBLY, FORWARD CLUTCH
621 PLUG, CUP TURBINE SHAFT
622 SEAL KIT, FORWARD CLUTCH PISTON
623 PISTON ASSEMBLY, FORWARD CLUTCH
625 RETAINER, FORWARD CLUTCH W/SPRING
626 RING, SNAP FORWARD SPRING RETAINER
627 PLATE, FORWARD CLUTCH (WAVED)
628 PLATE, FORWARD CLUTCH (FLAT)
629 PLATE, FORWARD CLUTCH BACKING (SELECTIVE)
631 RING, DIRECT CLUTCH PLATE HOUSING (SNAP)
632 WASHER, THRUST SELECTIVE (FRONT)
633 RING, OUTPUT SHAFT (SNAP)
634 WASHER, SELECTIVE
635 WASHER, FRONT INTERNAL GEAR
636 GEAR, FRONT INTERNAL /BUSHING

Figure 128

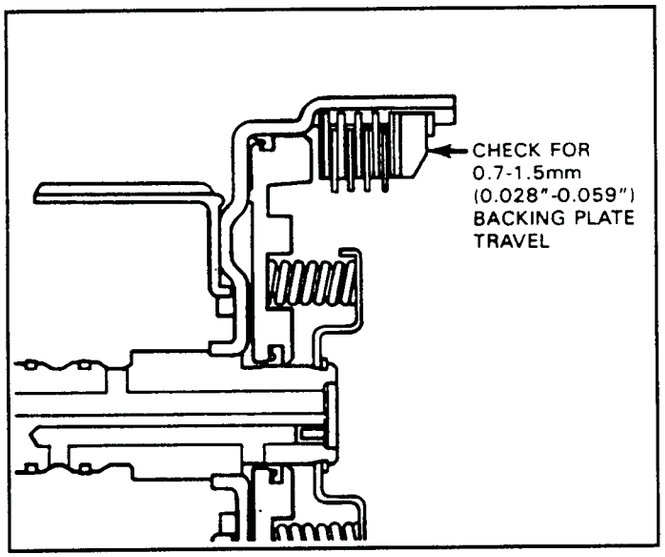


Figure 129

FORWARD CLUTCH BACKING PLATE SELECTION	
ALL MODELS	
BACKING PLATE TRAVEL = 0.7mm - 1.5mm (0.028" - 0.059")	
PLATE THICKNESS	**IDENTIFICATION**
3.70mm - 4.15mm (.146" - .163")	7
4.25mm - 4.70mm (.167" - .185")	6
4.80mm - 5.25mm (.189" - .207")	X
5.35mm - 5.80mm (.211" - .228")	5
5.90mm - 6.35mm (.232" - .250")	4

Figure 130

THM 200C
HARSH COAST DOWNSHIFT CLUNK

COMPLAINT: Harsh coast downshift clunk when coming to a stop with the selector lever in the Drive position.

CAUSE: The cause may be the intermediate band not exhausting quick enough and/or governor oil not exhausting quick enough.

CORRECTION: Inspect the spacer plate for the intermediate band exhaust hole as shown in Figure 131, and enlarge to 9/64" if necessary.
Also remove the spring from the primary (thickest) weight on the governor as shown in Figure 132.

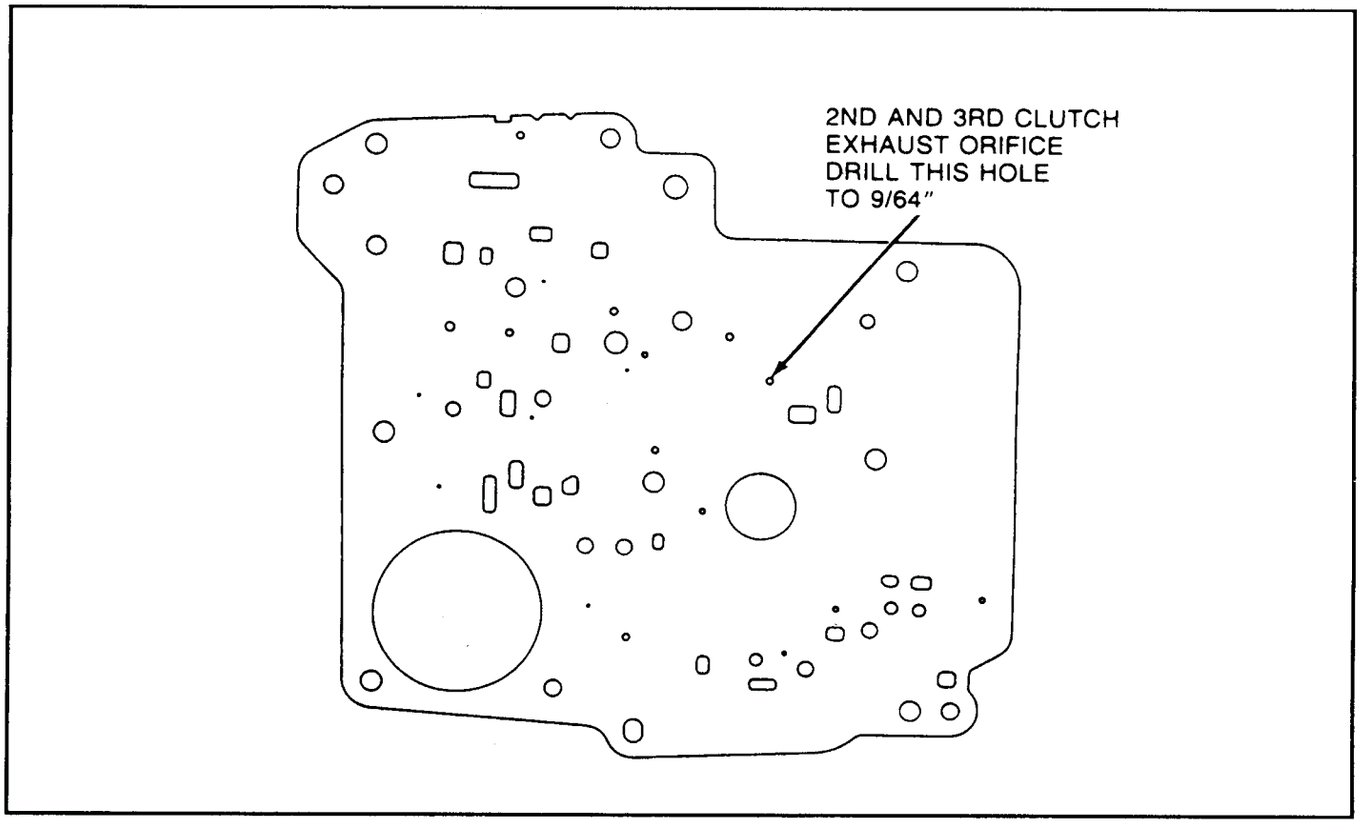


Figure 131

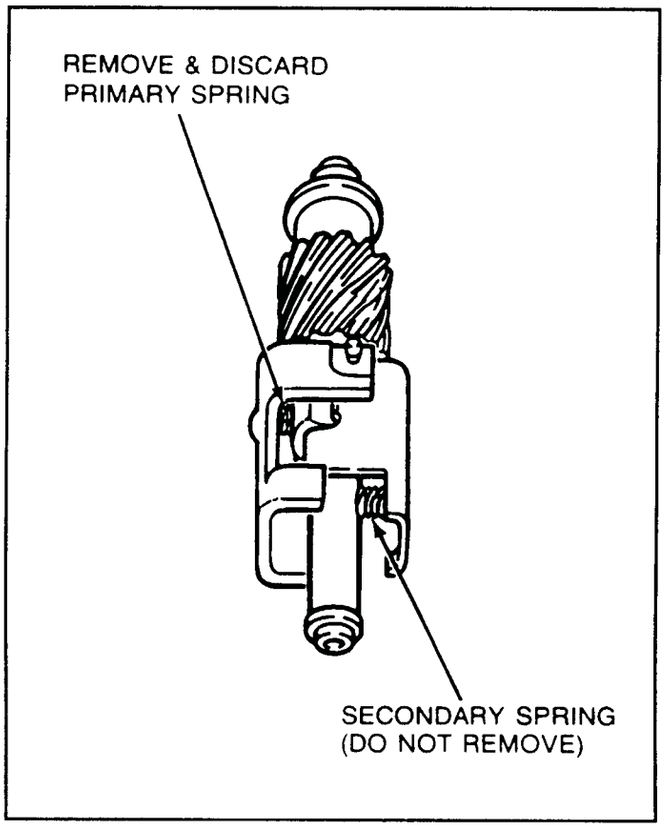


Figure 132

THM 200C
NEW 3RD CLUTCH OIL PRESSURE SWITCH

Beginning November 1st, 1983, a new third clutch oil pressure switch and bracket assembly (Figure 133) went into production for some 1984 model THM 200C transmissions.

When servicing any 1984 THM 200C transmission that necessitates the third clutch oil pressure switch be replaced, compare the oil pressure switch being replaced to the previous and new oil pressure switches as shown in Figure 133.

Order the proper switch for your needs using the OEM part numbers in Figure 133.

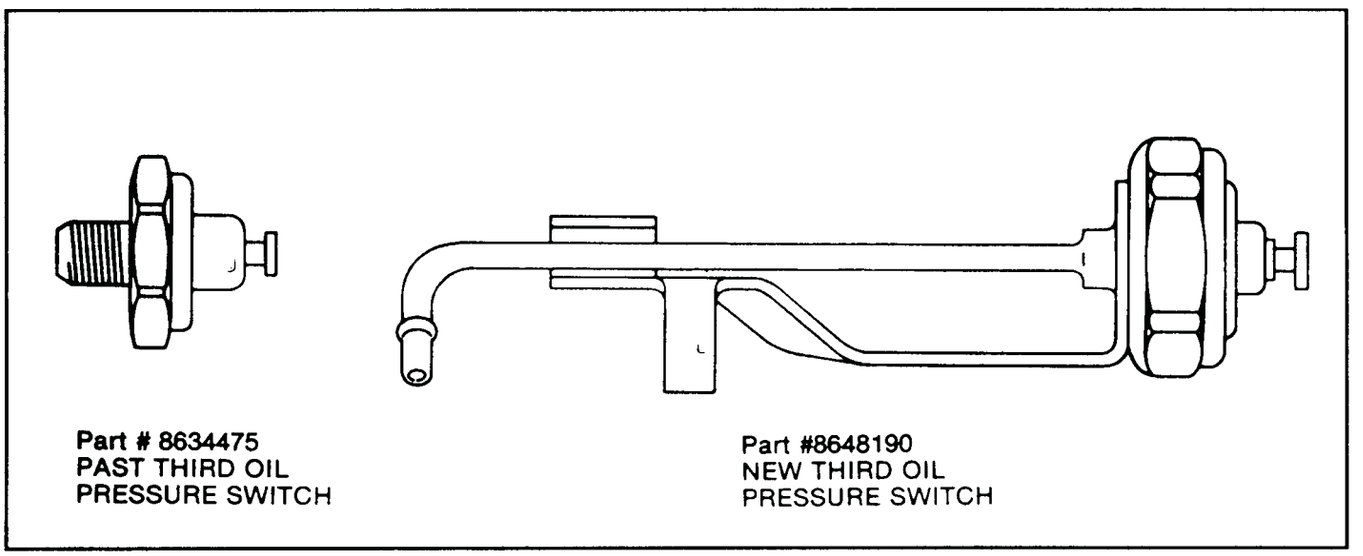


Figure 133

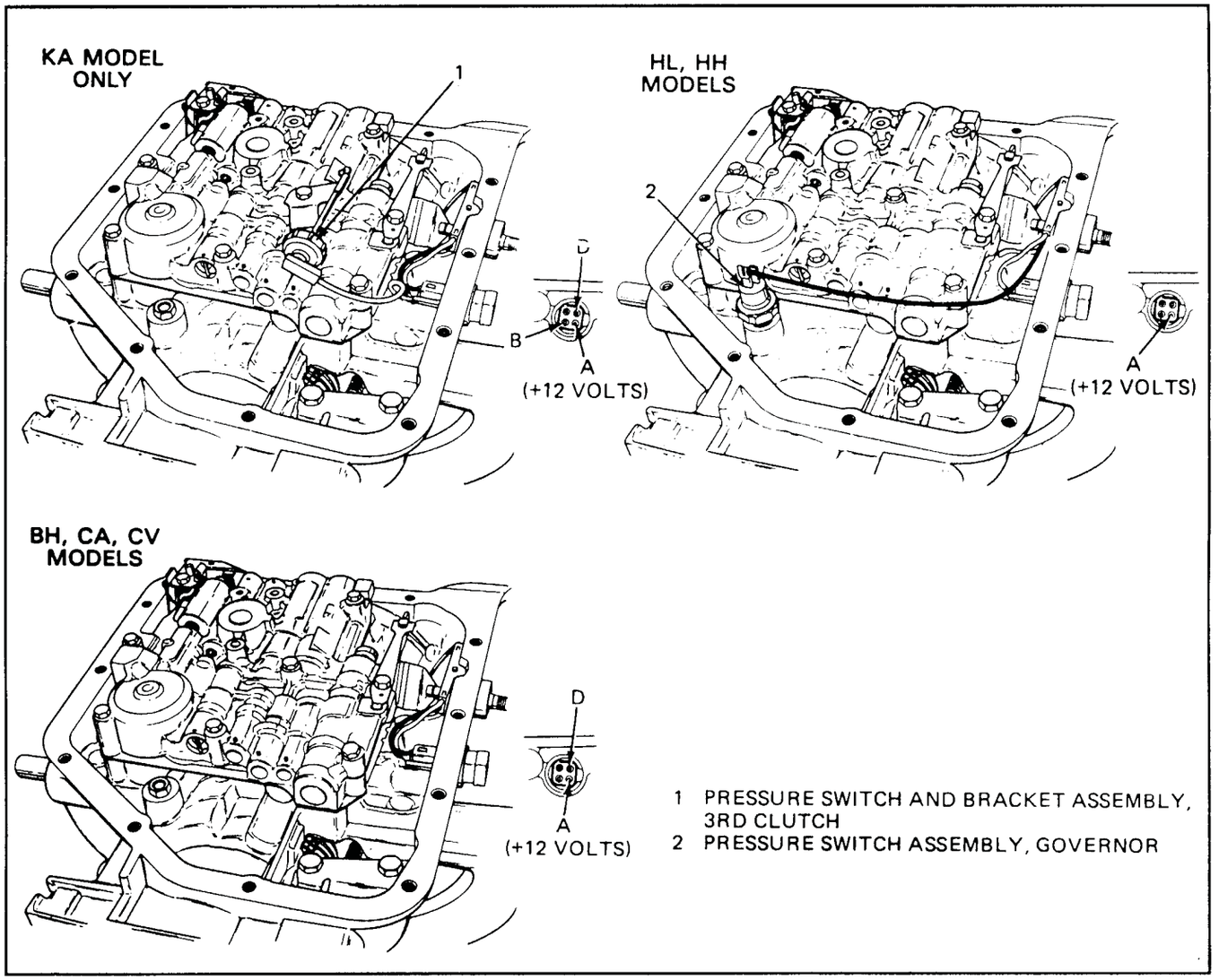


Figure 134

THM 200C OIL PUMP AIR CHECK PROCEDURE

	SYSTEM	CHECK
1	Direct Clutch	Direct air in at (1 IN) port. Air should come out at (1 OUT) only.
2	Reverse	Direct air in at (2 IN) port. Air should come out at (1 OUT) and (2 OUT).
3	Cooler To Lube	Direct air in at (3 IN) port. Air should come out at both (3 OUT) passages. **NOTE:** The hole on the outside of sleeve is on same axis line as hole on inside of sleeve.
4	Drive	Direct air in at (4 IN) port. Air should come out at (4 OUT) port, inside of sleeve only.
5	To Cooler	Direct air in at (5 IN) port. Air should come out around stator shaft from gear pocket.

NOTE: There should never be any air exhausting from the (5) cup plugs that seal the drilled passages.

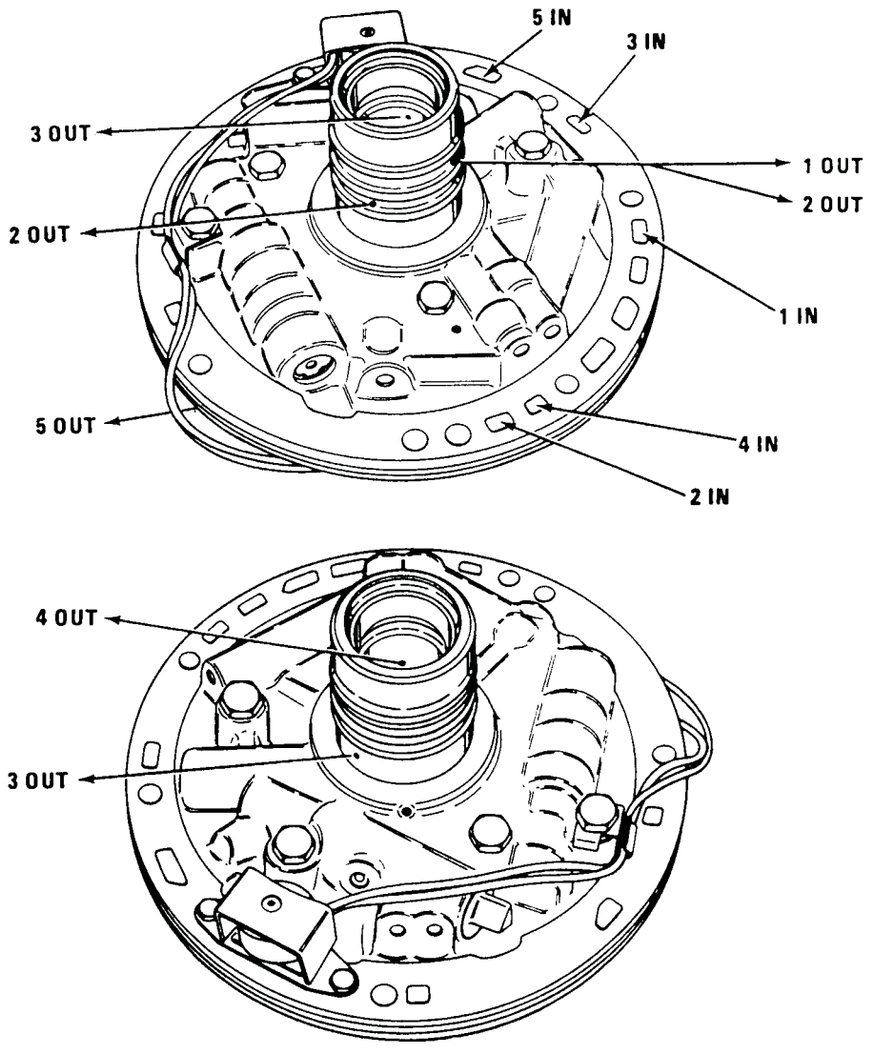


Figure 135